

# BizTalk Server 2000

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# BizTalk Server 2000

 <p>Microsoft <b>BizTalk</b> <b>Server</b></p>	<p>Microsoft BizTalk Server 2000 is a Microsoft .NET Enterprise Server product that unites, in a single product, enterprise application integration (EAI) and business-to-business (B2B) integration. BizTalk Server 2000 enables developers, IT professionals, and business analysts to build dynamic business processes that span applications, platforms, and businesses over the Internet.</p> <p>BizTalk Server 2000 features include the ability to design and use XLANG schedules; integrate existing applications; define document specifications and specification transformations; and monitor and log run-time activity. BizTalk 2000 features include:</p> <ul style="list-style-type: none"><li>• Administration</li><li>• Document Tracking</li><li>• Orchestration Design</li><li>• Messaging</li><li>• XML Tools</li></ul>
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## [Check out the BizTalk Server Developer Center](#)

The BizTalk Server Developer Center provides developers information and insights for using BizTalk Server to automate, integrate, and facilitate business information processing.

<b>In This Library Section</b>	<b>Essentials</b>
<ul style="list-style-type: none"><li>• <a href="#">Product Documentation</a></li><li>• <a href="#">BizTalk Server 2000 Tutorial</a></li><li>• <a href="#">Technical Articles</a></li><li>• <a href="#">Code Samples</a></li></ul>	<ul style="list-style-type: none"><li>• <a href="#">BizTalk Server 2000 Service Pack 1a (English)</a></li><li>• <a href="#">BizTalk Server 2000 Service Pack 2</a></li><li>• <a href="#">BizTalk Server 2000 Pre-requisite QFEs</a></li><li>• <a href="#">BizTalk Server 2000 Security Release: MS03-016</a></li><li>• <a href="#">Windows Management Instrumentation in BizTalk Server 2000 Help File</a></li><li>• <a href="#">White Papers</a></li><li>• <a href="#">Training and Events</a></li><li>• <a href="#">Support</a></li><li>• <a href="#">Newsgroups</a></li><li>• <a href="#">Community</a></li></ul>

# BizTalk 2000 - Getting Started with Microsoft BizTalk Server 2000



## Getting Started with Microsoft BizTalk Server 2000

A member of the Microsoft .NET Enterprise Server family of products, Microsoft BizTalk Server 2000 unites, in a single product, enterprise application integration (EAI) and business-to-business (B2B) integration. BizTalk Server 2000 enables developers, IT professionals, and business analysts to easily build dynamic business processes that span applications, platforms, and businesses over the Internet.

In addition to BizTalk Server 2000, Microsoft, with industry partners, has led innovation on enabling technologies that are necessary for Internet-based business solutions, including BizTalk Framework 2.0, which is a platform-independent, Extensible Markup Language (XML) framework for application integration and electronic commerce. BizTalk Framework 2.0 is not a standard, but it builds upon existing standards, such as the Simple Object Access Protocol (SOAP). SOAP is also a key technology in other members of the .NET product line, such as Microsoft Visual Studio .NET. BizTalk Framework 2.0 provides the basis for interoperable reliable messaging for BizTalk Server 2000.

For more information about BizTalk Framework 2.0, as well as information about BizTalk Server 2000 product resources such as community services, a large library of schemas, and white papers, go to the Microsoft BizTalk Server 2000 Web site (<http://www.microsoft.com/biztalk>).

This section introduces the features, services, application model, and administration model of BizTalk Server 2000. You can also find topics about using online Help and Microsoft Accessibility options. Additionally, the BizTalk Server 2000 Glossary is included. The following topics are covered in this section:

- [Introducing Microsoft BizTalk Server 2000](#)
- [BizTalk Server Glossary](#)
- [Differentiating BizTalk Server 2000 Standard and Enterprise Edition Features](#)
- [How to Use Help](#)
- [Accessibility for People with Disabilities](#)
- [Contacting Microsoft Product Support Services](#)

# Introducing Microsoft BizTalk Server 2000

Microsoft BizTalk Server 2000 provides a powerful Web-based development and execution environment that integrates loosely coupled, long-running business processes, both within and between businesses. BizTalk Server can handle transactions that run as long as weeks or months, not just minutes or hours.

BizTalk Server 2000 features include the ability to design and use XLANG schedules; integrate existing applications; define document specifications and specification transformations; and monitor and log run-time activity.

The server provides a standard gateway for sending and receiving documents across the Internet, as well as providing a range of services that ensure data integrity, delivery, security, and support for the BizTalk Framework and other key document formats.

The following topics are covered in this section:

- [BizTalk Server Features](#)
- [BizTalk Services](#)
- [BizTalk Server Application Model](#)
- [BizTalk Server Administration Model](#)
- [BizTalk Server Glossary](#)

# BizTalk Server Features

The following table provides information about BizTalk Server features and how to use them.

Feature	Function
<p><b>Administration</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Server Administration</a></li> <li>• <a href="#">Programmatic Administration</a></li> </ul>	<ul style="list-style-type: none"> <li>• Create and manage servers and server groups.</li> <li>• Configure global server group properties, such as the location for the <a href="#">Shared Queue database</a> and the <a href="#">Tracking database</a>.</li> <li>• Configure server settings.</li> <li>• Configure and manage <a href="#">receive functions</a>.</li> <li>• View and manage document queues.</li> <li>• Programmatically access the XLANG Scheduler System Manager, group managers, XLANG schedule instances, and XLANG ports.</li> </ul>
<p><b>Document Tracking</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Tracking Documents</a></li> </ul>	<ul style="list-style-type: none"> <li>• Track the progress of documents processed by Microsoft BizTalk Server 2000.</li> <li>• Search for, display, view, and save complete copies of any <a href="#">interchange</a> or document processed by BizTalk Server 2000.</li> <li>• Create queries to extract essential information from the Tracking database in an easy-to-view format.</li> <li>• Extract, store, and analyze important user-defined data from within documents.</li> </ul>
<p><b>Orchestration Design</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Designing BizTalk Orchestrations</a></li> </ul>	<ul style="list-style-type: none"> <li>• Create drawings that describe business processes, and programmatically implement these drawings within an integrated design environment.</li> <li>• Compile <a href="#">XLANG schedule drawings</a> into <a href="#">XLANG schedules</a>.</li> <li>• Define the flow of data between messages within business processes.</li> </ul>
<p><b>Messaging</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Using BizTalk Messaging Manager</a></li> <li>• <a href="#">Accessing the BizTalk Messaging Configuration Object Model</a></li> </ul>	<ul style="list-style-type: none"> <li>• Manage the exchange of data locally or remotely using <a href="#">BizTalk Messaging Manager</a>.</li> <li>• Manage the exchange of data programmatically using the BizTalk Messaging Configuration object model.</li> <li>• Create and manage <a href="#">channels</a>, <a href="#">messaging ports</a>, <a href="#">document definitions</a>, <a href="#">envelopes</a>, <a href="#">organizations</a>, and <a href="#">distribution lists</a>.</li> </ul>

## XML Tools

- [Creating Specifications](#)
- [Mapping Data](#)

- Create and manage [specifications](#).
- Create records and fields, and set their properties.
- Map records and fields from a [source specification](#) to records and fields of a [destination specification](#).
- Use [functoids](#) to implement powerful data-transformation functionality.

# BizTalk Services

Microsoft [BizTalk Server 2000](#) provides a complete set of messaging and orchestration services that you can use to automate your business and data-exchange processes.

## BizTalk Messaging Services

[BizTalk Messaging Services](#) include receiving incoming documents, parsing the documents to determine their specific format, extracting key identifiers and identifying specific processing rules, delivering documents to their respective destinations, and tracking documents. Also included are services for [data mapping](#), receipt generation and correlation, and services to ensure data integrity and security.

### Receive functions

BizTalk Server 2000 provides [receive functions](#) that enable the server to monitor documents posted at specified locations. BizTalk Server 2000 supports the following receive functions, which are configured by using BizTalk Server Administration:

- File
- Message Queuing

BizTalk Server 2000 also supports the following protocols, which are configured by using ASP pages or a Microsoft Exchange script:

- HTTP (by using an .asp page)
- HTTPS (by using an .asp page)
- SMTP (by using a Microsoft Exchange script)

### Transport services

BizTalk Server 2000 provides [transport services](#) that enable the transmission of documents to their destinations. BizTalk Server 2000 supports the following transport services:

- HTTP
- HTTPS
- SMTP
- File
- Message Queuing
- Application integration components
- [Loopback](#)

### Data parsers

BizTalk Server 2000 supports data [parsers](#) for a variety of industry document standards, such as [ANSI X12](#), [UN/EDIFACT](#), and valid, well-formed [Extensible Markup Language \(XML\)](#). BizTalk Server 2000 also supports BizTalk Framework 2.0. For more information about BizTalk Framework 2.0, go to the Microsoft BizTalk Server 2000 Web site ([www.microsoft.com/biztalk/](http://www.microsoft.com/biztalk/)). Parser support for flat files is also available. You can also register and use your own custom parser components.

### Data validation

BizTalk Server 2000 provides data validation by verifying each instance of a document against a [specification](#). If the document does not adhere to the specification rules, the document is placed into a [suspended queue](#) for further analysis.

## Reliable document delivery

BizTalk Server 2000 provides reliable document delivery by using configurable BizTalk Messaging Services properties. These properties include setting service windows for sending documents, sending or receiving receipts, setting the number of retries, and setting the time between retries. BizTalk Server 2000 supports the use of BizTalk Framework-compliant [envelopes](#), which provide reliable messaging features. For more information about BizTalk Framework 2.0, go to the Microsoft BizTalk Server 2000 Web site ([www.microsoft.com/biztalk/](http://www.microsoft.com/biztalk/)). BizTalk Server 2000 also queues documents to a central location. In the event of a server failure, rollover mechanisms enable new servers to take control of documents and process them.

## Security

BizTalk Server 2000 supports encryption and digital signatures. Public-key encryption technology is supported for all documents that are transmitted by using BizTalk Server 2000 transport services. BizTalk Server 2000 also supports decryption and signature verification for the documents that it receives.

## BizTalk Orchestration Services

[BizTalk Orchestration Services](#) include the integration of long-running business processes with the applications that run those business processes. This integration is provided by an executable business-process file called an [XLANG schedule](#). Additional services provide control for running XLANG schedule instances.

A key feature of BizTalk Orchestration Services is the ability to handle complex transactions that run as long as weeks or months, not just minutes or hours. Another important feature is the ability to implement concurrent actions within a single XLANG schedule.

## XLANG schedules

An XLANG schedule is a business process implemented by connecting each step in the process to a technology component or service that executes the step. An XLANG schedule is then run by a service called the [XLANG Scheduler Engine](#). The engine controls the instantiation, execution, [dehydration](#), and [rehydration](#) of an XLANG schedule, or multiple instances of one or more schedules.

## Implementation Technologies

Implementation technologies that are supported by BizTalk Orchestration Services include BizTalk Messaging Services, COM components, Message Queuing Services, and Windows Script Components.

## XLANG language

XLANG is a language that describes the logical sequencing of business processes, as well as the implementation of the business process by using various technology components or services. The XLANG language is expressed in Extensible Markup Language (XML).

# BizTalk Server Application Model

Microsoft [BizTalk Server 2000](#) provides tools and services that enable you to create executable applications for controlling your business processes and the exchange of data between [trading partners](#) and applications within your business. For a list of the services provided by BizTalk Server 2000, see [BizTalk Services](#).

Integrating [BizTalk Orchestration Services](#) and [BizTalk Messaging Services](#) enables you to control the exchange of documents and [messages](#) between your trading partners and internal applications by using multiple [transport services](#). It also provides:

- Control over complex, [long-running transactions](#) and business processes.
- Reliable delivery of documents and messages.
- Data validation by verifying each [document instance](#) against a [specification](#).
- Data mapping by using [maps](#) to transform document structure and format.
- Data security and integrity by using encryption and digital signature certificates.
- Receipt generation and correlation support.

For more information about configuring BizTalk Server 2000 to send or receive receipts, see [Understanding Receipts](#).

For more detailed information about how you can integrate BizTalk Orchestration Services and BizTalk Messaging Services, see [Integrating BizTalk Services](#).

# BizTalk Server Administration Model

The following table describes the four main areas of administration in Microsoft BizTalk Server 2000 and relevant administrative functions of each area.

Area of administration	Administrative function overview
Server administration	<ul style="list-style-type: none"> <li>• Configure and manage server groups and servers.</li> <li>• Configure and manage receive functions.</li> <li>• Manage queues.</li> </ul>
Application administration	<ul style="list-style-type: none"> <li>• Configure and manage the COM+ applications that host XLANG schedules.</li> <li>• Configure and manage the default XLANG Scheduler application.</li> </ul>
Programmatic administration	<ul style="list-style-type: none"> <li>• Configure XLANG system managers, XLANG group managers, XLANG schedule instances, and XLANG ports.</li> </ul>
Database administration	<ul style="list-style-type: none"> <li>• Configure, manage, and maintain the following databases: <ul style="list-style-type: none"> <li>• BizTalk Messaging Management</li> <li>• Orchestration Persistence</li> <li>• Tracking</li> <li>• Shared Queue</li> </ul> </li> </ul>

## Server administration

In BizTalk Server 2000, server administration includes tasks such as managing and configuring server groups, adding, deleting and configuring servers, adding and configuring receive functions, managing the Shared Queue for each server group, and so on. The following table describes the general server administrative tasks, their description, and where to find more information.

Administrative task	Description	Where to find more information
Configure servers and server groups	<ul style="list-style-type: none"> <li>• Configure the connections for the Tracking and Shared Queue databases.</li> <li>• Configure transport services and parser order.</li> <li>• Configure server settings.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Add, Delete, and Configure a Server Group</a></li> <li>• <a href="#">Add, Delete, and Configure Servers in a Group</a></li> </ul>
Manage queues	<ul style="list-style-type: none"> <li>• Delete and resubmit interchanges and documents.</li> <li>• View data and error messages.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Manage Queues</a></li> </ul>
Manage receive functions	<ul style="list-style-type: none"> <li>• Configure receive functions.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Manage Receive Functions for a Server Group</a></li> </ul>
Troubleshooting	<ul style="list-style-type: none"> <li>• Troubleshoot server and document processing problems.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Manage Event Viewer</a></li> <li>• <a href="#">Troubleshooting BizTalk Server Administration</a></li> </ul>

## Application administration

Application administration includes configuring and managing the COM+ applications that host XLANG schedules, the default

XLANG Scheduler application, and the Orchestration Persistence database that is created when you install BizTalk Server 2000. The following table describes the general application administrative tasks, their description, and where to find more information.

Administrative task	Description	Where to find more information
Manage the default XLANG scheduler application	<ul style="list-style-type: none"> <li>Change the default settings for the XLANG Scheduler application.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Manage the Default XLANG Scheduler Application and Database</a></li> </ul>
Manage COM+ applications	<ul style="list-style-type: none"> <li>Create COM+ applications to run specific XLANG schedules.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Manage Other COM+ Applications That Host XLANG Schedules</a></li> </ul>

## Programmatic administration

The management and administration of servers and applications can be done programmatically. The following table describes the general programmatic administrative tasks, their description, and where to find more information.

Administrative task	Description	Where to find more information
Manage Queues	<ul style="list-style-type: none"> <li>View interchange and document data.</li> <li>Change the BizTalk Messaging Management database.</li> <li>Read from the Shared Queue database.</li> </ul>	<ul style="list-style-type: none"> <li>For more information about using Windows Management Instrumentation (WMI) and WMI Application programming, go to the MSDN Online Library (<a href="http://msdn.microsoft.com/library/default.asp">msdn.microsoft.com/library/default.asp</a>) and search for "WMI Application Programming".</li> <li><a href="#">WMI Overview</a></li> <li><a href="#">Accessing the Suspended queue</a></li> </ul>
Configure and manage the XLANG Scheduler System Manager, group managers, XLANG schedule instances, and XLANG ports	<ul style="list-style-type: none"> <li>Start, stop, and retrieve information about the XLANG Scheduler System Manager and group managers.</li> <li>Stop, suspend, resume, and retrieve information about all the schedules associated with a group.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Administering XLANG Schedules</a></li> </ul>

## Database management

In addition to regular database maintenance and administration, such as compressing data files and backing up the database and transaction file logs, you must perform other database-related tasks, such as maintaining connectivity between BizTalk Server and Microsoft SQL Server, adding, deleting, and restoring databases, configuring new databases, and so on. The following table describes general database administrative tasks, their description, and where to find more information.

Administrative task	Description	Where to find more information
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<p>Manage data bases</p>	<ul style="list-style-type: none"> <li>● Configure and/or change the BizTalk Messaging Management database.</li> <li>● Create and configure new persistence databases.</li> <li>● Restore and/or manually remove the Tracking and Shared Queue databases.</li> </ul>	<ul style="list-style-type: none"> <li>● <a href="#">Configure the BizTalk Messaging Management database</a></li> <li>● <a href="#">Change the BizTalk Messaging Management database for a server</a></li> <li>● <a href="#">Change the settings for the default Orchestration Persistence database</a></li> <li>● <a href="#">Manage Databases for a Server Group</a></li> </ul>
<p>Monitor traffic to the databases</p>	<ul style="list-style-type: none"> <li>● Configure server settings.</li> </ul>	<ul style="list-style-type: none"> <li>● <a href="#">Understanding server properties</a></li> <li>● <a href="#">Optimizing Server Properties</a></li> </ul>

# abort

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

A

To cancel a transaction that is in progress, and to run an alternate business process instead.

## action

To send or receive a message. Send or receive actions can be synchronous or asynchronous, depending upon which application services are implemented in an XLANG schedule.

## ANSI X12

EDI standards set by Accredited Standards Committee X12, whose work is approved by the American National Standards Institute.

## asynchronous communication

A single message that is either sent or received within the context of a single communication action.

See also: [synchronous communication](#)

B

## binding

A process by which the technology used to implement a port is specified.

See also: [port](#)

## BizTalk Document Tracking

A Web-based user interface (UI) that is used to access all BizTalk Messaging Services tracking information. It can also track XLANG schedule status for BizTalk Orchestration Services.

## BizTalk Editor

A tool with which you can create, edit, and manage specifications. With BizTalk Editor you can create a specification based on a specification template, an existing schema, certain types of document instances, or a blank specification.

## BizTalk Framework

A platform-neutral e-commerce framework that is based on Extensible Markup Language (XML) schemas and industry standards. The framework enables integration across industries and between business systems, regardless of platform, operating system, or underlying technology. Specifically, it is composed of three things: schema, products, and services. For more information about the BizTalk Framework, go to the BizTalk Web site ([www.microsoft.com/biztalk/](http://www.microsoft.com/biztalk/)).

## BizTalk Mapper

A tool with which you can create maps that define the correspondence between the records and fields in one specification and the records and fields in another specification. A map contains an Extensible Stylesheet Language (XSL) style sheet that is used by BizTalk Server to perform the transformation described in the map.

## BizTalk Messaging Management database

A Microsoft SQL Server database that stores the information related to all server configurations, including group and server settings, receive functions, and all messaging configuration information for the objects that are created by using BizTalk Messaging Manager, or by accessing the BizTalk Messaging Configuration object model.

## BizTalk Messaging Manager

A graphical user interface (UI) that can be used to configure BizTalk Messaging Services to exchange documents between trading partners and applications of the home organization.

See also: [BizTalk Messaging Services](#)

## **BizTalk Messaging Services**

Services that include sending, receiving, parsing, and tracking documents; receipt generation and correlation; and data mapping, integrity, and security.

See also: [BizTalk Messaging Manager](#)

## **BizTalk Orchestration Designer**

A design tool used to create drawings that describe long-running, loosely coupled, executable business processes. The XLANG schedule drawing is compiled into an XLANG schedule that is used to execute the automated business process.

## **BizTalk Orchestration Services**

Services that include designing, compiling, and running XLANG schedules. Additional services include the ability to create custom COM+ applications to host dedicated XLANG schedule instances, and the persistence of XLANG schedules.

## **BizTalk Server 2000**

A new Microsoft product for business-process automation and application-integration both within and between businesses. BizTalk Server 2000 provides a powerful Web-based development and execution environment that integrates loosely coupled, long-running business processes, both within and between companies.

BizTalk Server 2000 features include the composition of new and existing XLANG schedules; integration among existing applications; the definition of document specifications and specification transformations; and the monitoring and logging of run-time activity.

The server provides a standard gateway for sending and receiving documents across the Internet, as well as providing a range of services that ensure data integrity, delivery, security, and support for the BizTalk Framework and other key document formats.

## **BizTalk Server Administration**

A Microsoft Management Console (MMC) interface that is used to administer the BizTalk Server 2000 group of servers and their properties, to monitor receive functions, and to monitor work items in the Microsoft SQL Server queues that are used by the server group.

C

## **channel**

A set of properties that designates the source of documents and defines specific processing steps that are performed by BizTalk Messaging Services before a document is delivered to the destination designated by the messaging port or distribution list with which the channel is associated.

See also: [open channel](#), [open messaging port](#), [receipt channel](#), [source application](#), [trading partner](#), [pass-through submission](#), [source organization](#)

## **channel filtering**

To compare the value of fields within a document instance to values in expressions designated within a channel. This comparison filters the selection of which channel or channels the server invokes to process a document.

## **checkpoint**

A storage location in the Shared Queue database in which the current state of a work item is stored. In case of a server failure, documents that were queued to the failed server can be retrieved from the Shared Queue database and redistributed to other servers within the server group, based on the information provided by the checkpoint.

## **code list**

A list of code values used as abbreviations for a variety of textual information. For example, ST is the code list value for Ship To and is most commonly used to qualify an address.

## **commit**

To implement all changes requested by a pending transaction. This action occurs when all actions within a transaction are

successfully completed.

## Communication shapes

Shapes that are used to identify the exact content of a message and type of application service that is implemented within an XLANG schedule drawing. This category of shapes includes Constants, Message, Port, and Port References.

See also: [Flowchart shapes](#), [Implementation shapes](#), [XLANG schedule drawing](#)

## compensation

A process by which reparation is made for a completed transaction. For example, if payment has been made for an order that then cannot be fulfilled, the payment is returned to the purchaser.

## compile

In BizTalk Mapper, to create an Extensible Stylesheet Language Transformations (XSLT) version of a map that can be used by BizTalk Server. The map is stored in the WebDAV repository and used by BizTalk Server to translate one document format into another document format.

See also: [data mapping](#), [data translation](#), [Extensible Markup Language \(XML\)](#), [map](#)

## concurrency

Two or more actions that are carried out at the same time.

D

## data mapping

In BizTalk Mapper, to create a correspondence between the records and fields of a source specification and the records and fields of a destination specification.

See also: [compile](#), [data translation](#)

## data translation

A process that converts data from one format to another format. Data translation occurs within BizTalk Server at run time. The rules that are specified in a map are used to convert data from a source specification format to a destination specification format, as well as to perform any operations or calculations that are required on the data.

See also: [compile](#), [data mapping](#), [Extensible Markup Language \(XML\)](#), [map](#)

## decision

A process that evaluates one or more rules sequentially. In BizTalk Orchestration Designer, a decision is represented by the **Decision** shape. Rules are Microsoft Visual Basic Scripting Edition (VBScript) expressions that are used by **Decision** and **While** shapes.

## dehydrate

To store all state information for an XLANG schedule instance in a SQL Server database while the XLANG Scheduler Engine is waiting to receive a message before executing the next action in the business process.

See also: [XLANG Scheduler Engine](#)

## dehydrated schedule

A schedule that is stored in a database temporarily while waiting for receipt of a message before continuing to the next action in the sequence. All state information about the schedule is stored in the database until the message is received. Dehydrating schedules reduces the load on the computer that is hosting the schedule.

## delimited flat file

A file that contains one or more records that are represented as a group of fields separated by a delimiter character. The records themselves are also separated by delimiter characters.

## **destination application**

A home-organization application that has been designated in a messaging port as the destination for documents.

See also: [home organization](#)

## **destination organization**

A trading partner organization that has been designated in a messaging port as the destination for documents.

See also: [openness](#), [source organization](#), [organization](#)

## **destination specification**

The specification in a map that represents the outgoing document. BizTalk Mapper maps from a source specification to a destination specification.

See also: [source specification](#)

## **dictionary**

A collection of properties associated with each item of work processed by BizTalk Server. These properties are exposed in BizTalk Editor so that users can tell BizTalk Server how to find values within document instances for properties that are used to locate a messaging port.

## **distribution list**

A group of messaging ports that can be used to send the same document to several different trading partner organizations or applications of the home organization. In the BizTalk Messaging Configuration object model, this is referred to as a port group.

See also: [home organization](#), [messaging port](#), [trading partner](#)

## **document definition**

A set of properties that represents a specific document. Document definition properties include a pointer to a document specification and can include global tracking fields and selection criteria.

See also: [global tracking fields](#), [selection criteria](#)

## **document instance**

A representation of the actual data that is sent to BizTalk Server. A document instance differs from a specification in that the specification defines the structure of the data, while a document instance is a representation of the specific data contained in a structure.

See also: [global tracking fields](#), [pass-through submission](#)

## **document standard**

The structure that defines a transaction set, such as an X12 850 standard. An implementation guideline can be created from a document standard.

## **document type**

A designation for the type of document on which a specification is based. For example, if a specification is based on 850Schema.xml from the X12 standard, when that specification is opened in BizTalk Editor, 850 appears in the document type field on the **Reference** tab for the root node.

## **document type definition (DTD)**

A standard definition that specifies which elements and attributes might be present in other elements and attributes and that specifies any constraints on their ordering, frequency, and content.

## **dynamic port**

A port that requires that specific location information be provided for an XLANG schedule at run time. The location for a dynamic

port is provided by a message that passes the location information to the reference for the port at run time.

See also: [port](#), [static port](#)

## dynamic queue

A queue that has an unknown address. Ports that use a Message Queuing implementation can use a dynamic queue when the location of the queue is not known. The address of this queue must be provided by a message that passes the queue address to the reference for the port at run time.

See also: [static queue](#), [per-instance queue](#)

E

## electronic data interchange (EDI)

A set of standards used to control the transfer of documents, such as purchase orders and invoices, between computers.

See also: [selection criteria](#)

## envelope

1. A set of properties that defines an envelope. Envelope properties include an envelope format and can include a pointer to an envelope specification.

2. Header and footer information, or header information only, that encapsulates or precedes document data for transport.

## envelope format

The format of documents that an envelope can contain; for example, XML or X12.

## Extensible Markup Language (XML)

A specification developed by the World Wide Web Consortium (W3C) that enables designers to create customized tags beyond the capabilities of standard HTML. While HTML uses only predefined tags to describe elements within the page, XML enables tags to be defined by the developer of the page. Tags for virtually any data item, such as a product or an amount due, can be used for specific applications. This enables Web pages to function as database records.

See also: [compile](#), [map](#), [data translation](#), [XML-Data Reduced \(XDR\)](#), [XPath](#)

## Extensible Stylesheet Language (XSL)

A style sheet format for Extensible Markup Language (XML) documents. XSL is used to define the display of XML in the same way that cascading style sheets (CSS) are used to define the display of Hypertext Markup Language (HTML). BizTalk Server uses XSL as the translation language between two specifications.

F

## Flowchart shapes

Shapes that represent the routing logic in an XLANG schedule drawing. This category of shapes includes Abort, Action, Begin, Decision, End, Fork, Join, Transaction, and While.

See also: [Communication shapes](#), [Implementation shapes](#), [Flowchart stencil](#), [XLANG schedule drawing](#)

## Flowchart stencil

A drawing stencil provided by BizTalk Orchestration Designer. The **Flowchart** stencil provides all the shapes that can be used to design the process flow of a business process that can be executed by a running XLANG schedule.

See also: [Flowchart shapes](#), [Implementation stencil](#)

## functoid

Built-in reusable function that enables complex structural manipulation operations between source specification elements, destination specification elements, and other functoids.

See also: [link](#)

## Functoid Palette

A toolbox that contains all functoids that can be used to create relationships between source specification elements and destination specification elements.

G

## global tracking fields

Document specification fields, designated in a document definition, that are logged to a tracking database for each instance of an actual document processed by BizTalk Messaging Services.

See also: [document instance](#), [document definition](#)

H

## home organization

An object that represents your business in BizTalk Messaging Manager. The home organization is created for you when BizTalk Server 2000 is installed. Only the home organization can have applications.

See also: [destination application](#), [distribution list](#), [organization](#), [source application](#), [trading partner](#)

I

## Implementation shapes

Shapes that represent the technologies that the XLANG Scheduler Engine supports. This category of shapes includes BizTalk Messaging, COM Component, Message Queuing, and Script Component.

See also: [Communication shapes](#), [Flowchart shapes](#), [Implementation stencil](#)

## Implementation stencil

A drawing stencil provided by BizTalk Orchestration Designer. The **Implementation** stencil provides all the shapes that can be used to bind a port to an implementation technology.

See also: [Flowchart stencil](#), [Implementation shapes](#)

## implementation technologies

Technologies used to implement a port in an XLANG schedule. The technologies supported by the XLANG Scheduler Engine include COM components, Windows Script Components, Message Queuing Services, and BizTalk Messaging Services.

## industry standard

A defined standard that is used for the exchange of information. Standards are extensible, and they follow a well-defined set of rules, or syntax.

## inner transaction

A transaction that is contained within the process flow of another transaction.

See also: [long-running transaction](#), [nested transaction](#), [transaction](#), [outer transaction](#)

## interchange

A collection of one or more document instances that comprises a single transmission and is exchanged from application to application within an organization or from one trading partner to another.

L

## line-of-business (LOB) application

An organization's primary business application. BizTalk Server 2000 supports numerous communication protocols that enable

line-of-business applications to reliably send and receive information.

## link

In Microsoft BizTalk Mapper, a simple value-copy (or name-copy) operation from a field in the source specification to a field in the destination specification, or to a functoid.

See also: [functoid](#)

## long-running transaction

A collection of actions that send and receive messages over an indefinite period of time. Typically, long-running transactions contain several nested short-lived transactions.

See also: [short-lived transaction](#), [inner transaction](#), [nested transaction](#), [outer transaction](#), [transaction](#)

## Loopback

A specific type of transport service that enables the return of current state data to the application from which the state data originated. Loopback uses the **SubmitSync** method call to restore the state data to the original application.

See also: [transport services](#)

M

## map

An XML file that defines the correspondence between the records and fields in one specification and the records and fields in another specification. A map contains an Extensible Stylesheet Language (XSL) style sheet that is used by BizTalk Server to perform the transformation described in the map. Maps are created in BizTalk Mapper.

See also: [compile](#), [Extensible Markup Language \(XML\)](#), [data translation](#)

## mapping

The process of specifying the way in which data in one structure is transformed into another structure.

## message

1. A packet of data that is sent or received by an XLANG schedule.
2. In BizTalk Orchestration Designer, a shape on the **Data** page that corresponds to the messages in an XLANG schedule. **Message** shapes are composed of uniquely named fields, each containing a single data item of a specified data type.

## messaging port

A set of properties that directs how documents are enveloped, secured, and transported to a designated destination organization or application.

See also: [distribution list](#)

## moniker

A name that represents an object and may include the complete path or address that identifies the location of the object.

See also: [port](#)

N

## nested transaction

One or more transactions that are contained within the process flow of a larger transaction.

See also: [inner transaction](#), [long-running transaction](#), [transaction](#), [outer transaction](#)

## node path

An expression used to obtain XML element and attribute information, select data that matches specific criteria, and perform

comparisons on the data retrieved. More formally known as XPath.

See also: [XPath](#)

## **non-self-routing document**

A document that is missing one or more of the following pieces of routing information: source organization identifier, destination organization identifier, or document definition.

O

## **open channel**

A channel that is explicitly declared as open to any source organization. The source data for an open channel is passed to BizTalk Messaging Services either within the document or in a parameter submitted with the document.

See also: [channel](#), [openness](#), [source organization](#)

## **open messaging port**

A messaging port that is explicitly declared as open to any destination organization. The destination data for an open messaging port is passed to BizTalk Messaging Services either within the document or in a parameter submitted with the document.

See also: [channel](#), [openness](#), [source organization](#)

## **openness**

A lack of explicit information about a source in a channel or destination in a messaging port. Channels contain information that identifies the source. Messaging ports contain information that identifies the destination. If a channel is designated as an *open source*, the source information is not explicitly declared in the channel and is provided by other means. Usually this information is contained in the instance of the document that is sent, or it is set as parameters in a **Submit** method call. Similarly, if a messaging port is designated as an *open destination*, the destination information is not explicitly declared in the messaging port and is instead provided in the document instance or in the parameters of a **Submit** method call.

See also: [destination organization](#), [open channel](#), [open messaging port](#), [source organization](#)

## **organization**

A trading partner or a business unit within a trading partner, or, in the case of the home organization, your own business.

See also: [source organization](#), [destination organization](#), [home organization](#), [organization identifier](#), [trading partner](#)

## **organization identifier**

A set of properties that uniquely identifies an organization. An organization can have multiple organization identifiers. Organization identifiers consist of the following properties: a name, a qualifier, and a value.

See also: [organization](#)

## **outer transaction**

A transaction that contains one or more transactions within its process flow.

See also: [inner transaction](#), [long-running transaction](#), [nested transaction](#), [transaction](#)

P

## **parser**

A component of BizTalk Server that translates non-XML files (for example, X12, EDIFACT, and flat file) into XML files.

## **pass-through submission**

A submission that bypasses the parsing, decoding, decryption, transformation, and signature verification stages of processing. The document instance is passed directly to the channel that is specified in the submission parameters. This type of submission can be used to transmit binary files without data corruption, or to use only the server transport and global tracking features.

See also: [channel](#), [document instance](#)

## per-instance queue

A queue that is created for use with each new instance of an XLANG schedule.

See also: [dynamic queue](#), [static queue](#)

## persistence database

A database that is used to store XLANG schedule state when an XLANG schedule is dehydrated. A default database called the Orchestration Persistence database is provided during installation when you install BizTalk Server 2000.

## pipeline component

A component created to integrate applications with BizTalk Server 2000. Developers can use either the **IPipelineComponent** or the **IPipelineComponentAdmin** interface, or the lighter-weight **IBTSAppIntegration** interface, to develop these components.

## port

A named location that uses a specific implementation. In BizTalk Orchestration Designer, a port is defined by the location to which messages are sent or from which messages are received, and the technology that is used to implement the communication action. The location is uniquely identified by the name of the port.

See also: [dynamic port](#), [moniker](#), [port location](#), [port reference](#), [port implementation](#), [port name](#), [binding](#), [static port](#)

## port group

A group of messaging ports that can be used to send the same document to several different trading partner organizations or applications. In BizTalk Messaging Manager, this is referred to as a distribution list.

## port implementation

A specific technology used by a port to implement a communication action.

See also: [port](#), [port location](#), [port reference](#), [port name](#)

## port location

The location associated with a specific port. The location is also dependent on the port implementation that is used. Each implementation provides a different type of location for the port.

See also: [port](#), [port implementation](#), [port name](#), [port reference](#)

## port name

A unique identification for a port. This identification is used to correlate the port location with a specific port.

See also: [port](#), [port implementation](#), [port location](#), [port reference](#)

## port reference

A unique message that contains the port location for every port in an XLANG schedule. The **Port References** shape is located on the **Data** page. Any data flow into or out of this message contains the port location for a port.

See also: [port location](#), [port](#), [port implementation](#), [port name](#)

## positional flat file

A file that contains fields that are the same fixed length, and contains records that have a common end-of-record terminator.

Q

## quiescent state

A state that represents processing activity that is inactive or at rest, or when a process is in standby mode.

R

## receipt channel

A channel that contains the information necessary to process a receipt that can be returned to the sender of a document.

See also: [channel](#)

## receive functions

Functionality that enables any BizTalk server(s) to monitor directories and submit documents to BizTalk Server for processing. BizTalk Server 2000 supports File and Message Queuing receive functions.

## rehydrate

To retrieve all state information for an XLANG schedule instance from a SQL Server database after a message is received by the XLANG Scheduler Engine.

See also: [XLANG Scheduler Engine](#)

## reliable messaging

A feature of BizTalk Framework 2.0 protocol that supports guaranteed, once-only delivery of documents in heterogeneous environments across the Internet.

## resubmit

A procedure that submits interchanges or documents to BizTalk Server from the Suspended queue. The document is processed from the point of failure.

## Retry queue

A table within the Shared Queue database in Microsoft SQL Server. The Retry queue is associated with a server group that contains items of work scheduled for transmission after an initial transmission has been attempted.

See also: [Shared Queue database](#), [transport services](#), [Scheduled queue](#), [Suspended queue](#), [Work queue](#)

## routing logic

The set of rules that determines the sequence of execution within an XLANG schedule. Routing logic is implemented by the **Decision** shape in BizTalk Application Designer.

S

## Scheduled queue

A table within the Shared Queue database in Microsoft SQL Server. The Scheduled queue is associated with a server group that contains interchanges that have been received but not yet processed by BizTalk Server.

See also: [Retry queue](#), [Shared Queue database](#), [Suspended queue](#), [Work queue](#)

## schema

The definition of the structure of an XML file. A schema contains property information as it pertains to the records and fields within the structure.

## selection criteria

A name-value pair designated in a document definition. The name-value pairs are used to uniquely identify a document definition for inbound EDI interchanges, based on values found in the functional group header, and to insert values in the functional group header for outbound EDI interchanges.

See also: [document definition](#), [electronic data interchange \(EDI\)](#)

## self-routing document

A document that contains all the necessary routing information, such as source and destination organization identifiers and a document definition, in the routing tags or within the document.

## **serializer**

A component of BizTalk Server that translates XML files into non-XML files (for example, X12, EDIFACT, and flat files).

## **server group**

A collection of individual servers that is centrally managed, configured, and monitored.

## **Shared Queue database**

A Microsoft SQL Server database that is shared by all servers within a server group. The Shared Queue database stores all checkpoint information related to documents processed by BizTalk Server. If a server fails, other computers that use the same Shared Queue database can continue to retrieve messages from and post messages to the Work queue. This provides redundancy and process load balancing. The Shared Queue database is graphically presented in BizTalk Server Administration as a series of distinct queues.

See also: [Retry queue](#), [Scheduled queue](#), [Suspended queue](#), [Work queue](#)

## **short-lived transaction**

A collection of grouped actions that are performed as a single logical unit of work.

See also: [long-running transaction](#), [transaction](#)

## **source application**

A home-organization application that has been designated in a channel as the source of documents.

See also: [channel](#), [home organization](#)

## **source organization**

A trading partner organization that has been designated in a channel as the source of documents.

See also: [channel](#), [destination organization](#), [open channel](#), [open messaging port](#), [organization](#), [trading partner](#), [openness](#)

## **source specification**

The specification in a map that represents the incoming document. BizTalk Mapper maps from a source specification to a destination specification.

See also: [destination specification](#)

## **specification**

A BizTalk Server-specific XML schema. Specifications are created in BizTalk Editor and can be based on industry standards (such as EDIFACT, X12, and XML) or on flat files (delimited, positional, or delimited and positional). BizTalk Mapper uses specifications, opened as source specifications and destination specifications, to create maps.

## **state**

The condition at a particular time of any of numerous elements of computing.

See also: [XLANG schedule state](#)

## **static port**

A port that requires that all necessary information be provided for an XLANG schedule at design time. The designer who creates the XLANG schedule must know the location to which messages are sent or from which messages are received, as well as the technology chosen to implement the communication action.

See also: [dynamic port](#), [port](#)

## **static queue**

A queue that has a well-known address. Ports that use a Message Queuing implementation can use a static queue when the location of the queue is known and does not change.

See also: [dynamic queue](#), [per-instance queue](#)

## **Suspended queue**

A table within the Shared Queue database in Microsoft SQL Server. The Suspended queue is associated with a server group. The queue contains work items for which any error or failure was encountered during processing. The queue stores the documents until they can be corrected and reprocessed, or simply deleted.

See also: [Retry queue](#), [Scheduled queue](#), [Shared Queue database](#), [Work queue](#)

## **synchronous communication**

Messages that are sent or received in pairs and that occur within the context of a single communication action.

See also: [asynchronous communication](#)

T

## **Tracking database**

A Microsoft SQL Server database associated with a server group that enables the tracking of documents that are processed by the server either individually or in batches. You can also track XLANG schedule status.

## **trading partner**

An external organization with which your home organization exchanges electronic data. The messaging ports, distribution lists, channels, and XLANG schedules that you create govern the exchange of documents among trading partners.

See also: [channel](#), [source organization](#), [distribution list](#), [home organization](#), [organization](#)

## **transaction**

A discrete activity within a computer system, such as an entry of a customer order or an update of an inventory item. Transactions are usually associated with database management, order-entry, and other online systems. In BizTalk Orchestration Designer, transactions are represented as a collection of actions that are grouped within a **Transaction** shape.

See also: [inner transaction](#), [long-running transaction](#), [nested transaction](#), [outer transaction](#), [short-lived transaction](#)

## **transaction set**

A collection of segments in an EDI schema that has a specific order and a particular meaning for a particular business transaction.

## **transport services**

A set of services that includes network protocols and application integration components (AICs). BizTalk Server 2000 supports a core set of transport services. This enables the server to send documents to organizations or applications whether or not the applications are capable of communicating directly with the server by using a COM interface. BizTalk Server 2000 supports the File, HTTP, HTTPS, and SMTP network protocols and Message Queuing. Transport services are also referred to as transport components.

See also: [Retry queue](#), [Loopback](#)

U

## **UN/EDIFACT**

The international EDI standard as developed through the United Nations. This standard is commonly used in Europe, as well as Japan and other Asian countries and regions. Also known as United Nations/Electronic Data Interchange For Administration, Commerce, and Transport.

V

## **version**

In BizTalk Server 2000, either a specific release number for a specification or the industry-standard version number from which a specification is created.

W

## **Web Distributed Authoring and Versioning (WebDAV)**

An extension to the HTTP 1.1 standard that exposes a hierarchical file storage media, such as a file system, over an HTTP connection. WebDAV locks documents to prevent users from accidentally overwriting each other's changes. It also enables users to share and work with server-based documents, regardless of their authoring tools, platforms, or the type of Web servers on which the files are stored.

## **well-formed XML**

A standard that dictates that an XML document that has a single root and elements must nest completely or not at all.

## **Work queue**

A table within the Shared Queue database in Microsoft SQL Server. The Work queue is associated with a server group. It contains interchanges that are currently being processed by BizTalk Server 2000.

See also: [Retry queue](#), [Scheduled queue](#), [Shared Queue database](#), [Suspended queue](#)

X

## **XLANG identity**

A globally unique ID that is used to distinguish version instances of an XLANG schedule drawing. This property is read-only and cannot be changed. Every time an XLANG schedule drawing is updated, this identity is also updated. The XLANG identity can be used to correlate an XLANG schedule with the specific version of an XLANG schedule drawing from which the schedule was compiled.

## **XLANG language**

A language that describes the logical sequencing of business processes, as well as the implementation of the business process by using various application services. The XLANG language is expressed in XML.

## **XLANG schedule**

Specific business processes expressed in the XLANG language. An XLANG schedule is saved with the file extension .skx.

See also: [XLANG schedule drawing](#), [XLANG schedule instance](#), [XLANG Scheduler Engine](#)

## **XLANG schedule drawing**

A drawing that represents a business process. In BizTalk Orchestration Designer, once a drawing is complete, it can be compiled and run as an XLANG schedule. An XLANG schedule drawing is saved with the file extension .skv.

See also: [Communication shapes](#), [Flowchart shapes](#), [XLANG schedule](#), [XLANG Scheduler Engine](#)

## **XLANG schedule instance**

An evocation of a schedule. An XLANG schedule represents only the business process and implementation services. A single instance, or multiple instances, of an XLANG schedule can be run by the XLANG Scheduler Engine. Different instances of the same XLANG schedule contain different messages, but all instances follow the same business-process rules.

See also: [XLANG schedule](#), [XLANG Scheduler Engine](#)

## **XLANG schedule state**

The information contained in an XLANG schedule instance. This information includes messages that have been sent or received by that instance, any COM objects used by that instance, and the progress of that instance toward the completion of the business process.

See also: [state](#)

## **XLANG Scheduler**

The default COM+ application that is installed when you install BizTalk Server 2000. This application is used to host running

instances of XLANG schedules.

## **XLANG Scheduler Engine**

A service that runs XLANG schedule instances and controls the activation, execution, dehydration, and rehydration of an XLANG schedule.

See also: [dehydrate](#), [rehydrate](#), [XLANG schedule drawing](#), [XLANG schedule instance](#), [XLANG schedule](#)

## **XML-Data Reduced (XDR)**

An XML Schema dialect proposed by Microsoft and submitted to the World Wide Web Consortium (W3C) in 1998. Like XML-Data, XDR is a syntax for Extensible Markup Language (XML) schemas that define the characteristics of an XML document. XDR is a subset of XML-Data.

See also: [Extensible Markup Language \(XML\)](#)

## **XPath**

A comprehensive language used for navigating through the hierarchy of an XML document. XPath expressions can obtain XML element and attribute information, select data that matches specific criteria, and perform comparisons on the data retrieved. Also called a node path.

See also: [Extensible Markup Language \(XML\)](#), [node path](#)

# Differentiating BizTalk Server 2000 Standard and Enterprise Edition Features

There are several differences between the standard and enterprise editions of Microsoft BizTalk Server 2000. The information that follows explains these differences and the benefits that you can expect if your organization decides to upgrade to the enterprise edition.

In BizTalk Server 2000 Standard Edition documentation, all BizTalk Server features except for the following enterprise edition extensibility features are documented:

- Creating custom parsers
- Creating custom serializers
- Creating custom correlators
- Creating custom functoids
- Creating custom import modules
- Creating application integration components (AICs)

Also, BizTalk Server 2000 Standard Edition does not contain any samples that relate to the features in the previous list.

The following topics provide more detailed information about the differences between the standard and enterprise editions, as well as a list of Help topics that apply only to the enterprise edition:

- [BizTalk Server Scalability](#)
- [BizTalk Server Group Support](#)
- [BizTalk Orchestration Services Support](#)
- [BizTalk Messaging Services Support](#)
- [Extensibility Support](#)

# BizTalk Server Scalability

BizTalk Server 2000 Enterprise Edition fully utilizes all the processors on any computer on which the server runs. Using all processors enables the server to achieve high scalability and performance by using the complete hardware configuration of the computer.

BizTalk Server 2000 Standard Edition uses only a single processor, irrespective of the hardware on which the server is run. The processor that is used is always the processor that is referenced by a processor affinity mask of 1.

Most aspects of BizTalk Server scaling are unavailable in the standard edition. The documentation on BizTalk Server performance and scalability applies primarily to the enterprise edition. You can use the information in this documentation to learn about the benefits of upgrading to the enterprise edition.

For more information about BizTalk Server performance and scalability, see [Enhancing Performance and Scalability](#).

# BizTalk Server Group Support

BizTalk Server 2000 Enterprise Edition supports groups that enable the server to scale out to handle heavier loads. You can add one or more servers within a single group that share the same BizTalk Server configuration information, or you can create multiple groups.

BizTalk Server 2000 Standard Edition is designed to handle smaller loads than the enterprise edition. If you configure BizTalk Server for more than one server or group, the BizTalk Messaging Service does not start and does not process documents; you will receive an error message. You must change the BizTalk Server configuration to work with only one server and one group before the BizTalk Messaging Service will start.

The topics listed in the following table are the primary Help topics that apply only to the enterprise edition of BizTalk Server 2000. This list is not intended to be an exhaustive list. You can use the information in these topics to learn about the benefits of upgrading to the enterprise edition.

<b>Description</b>	<b>Topic title</b>
Moving servers among different BizTalk Messaging Management databases	<a href="#">Moving servers between BizTalk Messaging Management databases</a>
Moving remote servers among different BizTalk Messaging Management databases	<a href="#">Moving remote servers between BizTalk Messaging Management databases</a>
Changing the BizTalk Messaging Management database that is used	<a href="#">Changing the BizTalk Messaging Management database</a>
Removing multiple servers from the BizTalk Messaging Management database	<a href="#">Removing servers from the BizTalk Messaging Management database</a>

# BizTalk Orchestration Services Support

BizTalk Server 2000 Enterprise Edition supports COM+ applications that host groups of XLANG schedules. All XLANG schedules in a group share the same configuration settings for various factors such as transaction support, synchronization, and security. These settings are specified in the COM+ application that hosts the group of XLANG schedules. In the enterprise edition, this design enables different groups of schedules to use configurations that address different application needs. This design facilitates scaling up to a large number of organizations and applications while at the same time separating processes that might require specific configuration settings such as security. To configure a COM+ application to host groups of XLANG schedules, an **XLANG** tab with configuration options is provided for all newly created COM+ applications.

BizTalk Server 2000 Standard Edition does not support the ability to create multiple COM+ applications that can be dedicated to hosting groups of XLANG schedules. A single COM+ application, the default XLANG Scheduler application, is created during installation, and this application is used to host all XLANG schedules, regardless of any special configuration needs. In the standard edition, the **XLANG** tab used to configure COM+ applications to host XLANG schedules is not available on any COM+ application except the default XLANG Scheduler application.

The topics listed in the following table are the primary Help topics that apply only to the enterprise edition of BizTalk Server 2000. This list is not intended to be an exhaustive list. You can use the information in these topics to learn about the benefits of upgrading to the enterprise edition.

Description	Topic title
Creating and configuring XLANG schedule host applications	<a href="#">Create and Configure an XLANG Schedule Host Application</a>
Creating a COM+ application to host an XLANG schedule	<a href="#">Create a COM+ application to host XLANG schedules</a>
Configuring a COM+ application that hosts XLANG schedules	<a href="#">Configure a COM+ application to host XLANG schedules</a>
Managing COM+ applications that host XLANG schedules	<a href="#">Manage Other COM+ Applications That Host XLANG Schedules</a>
Changing application identities for COM+ applications	<a href="#">Change the application identity for a COM+ application</a>
Changing the DSN settings for COM+ applications	<a href="#">Change the DSN settings for a COM+ application</a>
Shutting down COM+ applications that host XLANG schedules	<a href="#">Shut down a COM+ application that hosts XLANG schedules</a>

# **BizTalk Messaging Services Support**

BizTalk Server 2000 Enterprise Edition is a complete business-to-business and enterprise-application integration solution that scales up to a large number of trading partners and internal applications that interact with BizTalk Server.

BizTalk Server 2000 Standard Edition is optimized for a small business that interacts with a limited number of external trading partners and applications. The standard edition supports the creation of five new organizations and five applications within an organization.

In the standard edition, all BizTalk Server 2000 Help topics are relevant for creating and maintaining organizations and applications. The only limitation is the number of organizations and applications that you can create.

# Extensibility Support

BizTalk Server 2000 Enterprise Edition supports product extensibility that enables more complex document processing. The extensions available in BizTalk Server Enterprise Edition are as follows:

- **Custom parsers.** To enable parsing of formats that are not supported in the native parsers provided by BizTalk Server 2000, the enterprise edition enables you to create custom parser components that conform to a well-defined parser interface. You can configure these components in BizTalk Server to parse documents for the format(s) that they support.
- **Custom serializers.** To enable serializing of documents into proprietary or other formats that are not supported by serializers provided by BizTalk Server 2000, the enterprise edition enables you to create custom serializer components that conform to a well-defined serializer interface. You can configure these components in BizTalk Server to serialize documents into the format(s) that they support.
- **Custom receipt correlators.** To enable the processing or generation of custom receipts when you exchange documents with a trading partner, the enterprise edition enables you to create custom receipt correlator components by using and implementing interfaces provided with BizTalk Server 2000. A custom parser is required to process a custom receipt and a custom serializer is required to generate a custom receipt.
- **Custom functoids.** BizTalk Mapper provides functionality that enables you to specify transformations by using objects called functoids. BizTalk Server 2000 provides a variety of functoids that perform many common operations such as string manipulation, mathematical operations, logical operations, and so on. You might have other transformation-functionality requirements that require custom functoids. The enterprise edition enables you to create your own custom functoids.
- **Custom import modules.** BizTalk Editor provides functionality that enables you to import files with an XML, DTD, or XDR format. You might want to import other file formats. The enterprise edition enables you to create your own custom import modules.
- **Custom pipeline components.** The enterprise edition enables you to create custom components that extend BizTalk Server functionality when performing operations such as encryption, encoding, and signing.

BizTalk Server 2000 Standard Edition is designed for minimal configuration and customization needs. The standard edition does not support the extensibility features listed previously for the enterprise edition. BizTalk Server 2000 Help for BizTalk Server 2000 Standard Edition does not contain any advanced Help topics related to custom components, and no samples that describe the use of these components are provided.

For a complete list of BizTalk Messaging Services samples that are available in the standard edition, see [BizTalk Messaging Services Code Samples](#).

# How to Use Help

This section includes information about the Microsoft BizTalk Server 2000 Help system. The following topics are covered:

- [Help Overview](#)
- [Finding a Help Topic](#)
- [Bookmarking a Help Topic](#)
- [Copying a Help Topic](#)
- [Printing a Help Topic](#)
- [Changing the Font Size](#)
- [Using Language Filtering](#)
- [Help Viewer Shortcut Keys](#)

# Help Overview

The Microsoft BizTalk Server 2000 Help system uses HTML to format and display information. The Help Viewer provides an integrated table of contents, an index, and a full-text search feature so that you can find information easily. Book icons open to reveal sub-books and topics. To expand the table of contents and view topics within a book, click the expand indicator (+) next to a book title. When you click the collapse indicator (-), the topics are hidden. The Help Viewer has the added benefit of enabling you to see the table of contents, index, or search results at the same time you are viewing a Help topic.

The Help Viewer also includes the **Favorites** tab, which you can use to bookmark topics. This enables you to quickly display topics that you refer to often.

To learn more about BizTalk Server 2000, you can use the table of contents to browse through the documentation. When you click a topic in the table of contents, information is displayed in the content pane of the Help window.

The table of contents is organized in books according to the major features and functions that BizTalk Server 2000 provides. Within each book, you can find chapters that contain the following information:

- How To
- Concepts
- Troubleshooting
- Resources

For procedural and task-based information, start with the How To chapters. For more general information about BizTalk Server 2000, its features, and other information, start with the Concepts and Resources chapters.

For programming information in the BizTalk Server 2000 Interface Reference, you can use a language-filtering tool to view information specific to Microsoft Visual Basic, Visual C++, or both.

## Related Topics

[Bookmarking a Help Topic](#)

[Copying a Help Topic](#)

[Changing the Font Size](#)

[Finding a Help Topic](#)

[Help Viewer Shortcut Keys](#)

[Printing a Help Topic](#)

[Using Language Filtering](#)

# Finding a Help Topic

In the Help Viewer, the following browse and search options are available:

- **Contents tab**

1. To browse through the table of contents, click the **Contents** tab. Double-click the book icons to reveal topic entries and sub-books.
2. Click a table-of-contents entry to display the corresponding topic.

- **Index tab**

1. To see a list of index entries, click the **Index** tab and then either type a word or scroll through the list. Topics are often indexed under more than one entry.
2. Double-click an index entry to display the corresponding topic.

- **Search tab**

1. To locate every occurrence of a word or phrase, click the **Search** tab, type the word or phrase for which you want to search, and then click **List Topics**.  
To improve the search results, combine multiple words or phrases with AND, OR, NEAR, or NOT.
2. Double-click a search results entry to display the corresponding topic.

- **Favorites tab**

1. To bookmark a topic, use the **Contents**, **Index**, or **Search** tab to locate and then display a topic.
2. Click the **Favorites** tab and click **Add** to save the topic title to the **Topics** list.
3. Double-click a bookmark in the **Topics** list to quickly display the topic.

## Related Topic

[Help Viewer Shortcut Keys](#)

# Bookmarking a Help Topic

1. Use the **Contents**, **Index**, or **Search** tab to locate and then display the topic you want to bookmark.
2. Click the **Favorites** tab and click **Add**.

The Help Viewer adds the topic title to the **Topics** list. Later, you can return to this list and double-click the bookmark to quickly display the topic.

## **Notes**

- You can create a list of favorite/frequently visited Help topics.
- To remove a bookmark from the **Topics** list, click the bookmark and click **Remove**.

## **Related Topics**

[Finding a Help Topic](#)

[Help Viewer Shortcut Keys](#)

# Copying a Help Topic

1. In the topic pane of the Help Viewer, right-click inside the topic you want to copy and click **Select All**.
2. Inside the topic, right-click again and click **Copy**.  
This copies the topic to the Clipboard.
3. Open the document to which you want to copy the topic.
4. Click the place in your document where you want the information to appear.
5. On the **Edit** menu, click **Paste**.

## Notes

- If you want to copy only part of a topic, select the part you want to copy, right-click the selection, and then click **Copy**.
- Step numbers are not copied to the Clipboard.

## Related Topics

[Finding a Help Topic](#)

[Printing a Help Topic](#)

# Printing a Help Topic

- Right-click the topic you want to print and click **Print**.

## ◆ Important

- To print a single topic, on the **Contents** tab, select a topic. On the **Help** toolbar, click **Print**, and then click **Print the selected topic**. It is recommended that the page orientation be set to **Landscape**; however, printing code samples, large illustrations, and significant text might result in incomplete printing.
- To print all topics within a book, on the **Contents** tab, select a book. On the **Help** toolbar, click **Print**, and then click **Print the selected heading and all subtopics**. It is recommended that the page orientation be set to **Landscape**; however, printing code samples, large illustrations, and significant text might result in incomplete printing.

## Related Topics

[Finding a Help Topic](#)

[Help Viewer Shortcut Keys](#)

# Changing the Font Size

You can increase the font size of text for easier viewing, or you can decrease the font size to see a representation of the layout of a page.

- On the toolbar, click the **Font** () button to increase or decrease the text size.

# Using Language Filtering

To provide only the information that is relevant to your programming environment, BizTalk Server 2000 Help implements a language-filtering tool. On the title bar of topics in BizTalk Server 2000 Interface Reference, you will find a filter (  ) button that provides a language menu. This menu gives you the choice of viewing documentation tailored either to Visual C++ or to Visual Basic. If you choose **Show All**, you will see information for both languages. Regardless of your language selection, you will always see information (such as general concepts) that is relevant to both languages.

- To view the language-filtering options, click the filter (  ) button on the title bar and click one of the following options:
  - C++
  - Visual Basic
  - Show All

## Note

- When you select a language-filtering option, that selection remains in effect for all other pages that you view until you change the option again.

# Help Viewer Shortcut Keys

You can use shortcut keys to accomplish tasks in the BizTalk Server 2000 Help Viewer. The following table is a quick reference to the shortcut keys available in Help Viewer.

## Note

- Functionality that is not included in this list can be obtained by using the numeric keypad to move the mouse pointer with MouseKeys. For more information about MouseKeys in Windows 2000 Server Help, see "Using the keyboard to move the mouse pointer". In Windows 2000 Professional Help, see "To move the mouse pointer by using MouseKeys".

## Help Viewer shortcut keys

Press	To
ALT+SPACEBAR	Display the system menu.
SHIFT+F10	Display the Help Viewer shortcut menu. <b>Note</b> <ul style="list-style-type: none"><li>• Use this shortcut when the focus is in the topic pane.</li></ul>
ALT+TAB	Switch between the Help Viewer and other open windows.
ALT+O	Display the <b>Options</b> menu.
ALT+O, and then press T	Hide or show the navigation pane.
CTRL+TAB	Switch to the next tab in the navigation pane.
CTRL+SHIFT+TAB	Switch to the previous tab in the navigation pane.
UP ARROW	Move up one topic in the table of contents, index, or search results list.
DOWN ARROW	Move down one topic in the table of contents, index, or search results list.
PAGE UP	Move up one page in the table of contents, index, or search results list.
PAGE DOWN	Move down one page in the table of contents, index, or search results list.
F6	Switch focus between the navigation pane and the topic pane.
ALT+O, and then press R	Refresh the topic that appears in the topic pane.
UP ARROW or DOWN ARROW	Scroll through a topic.
CTRL+HOME	Move to the beginning of a topic.
CTRL+END	Move to the end of a topic.
CTRL+A	Highlight all text in the topic pane.
ALT+O, and then press P	Print a topic.
ALT+O, and then press B	Move back to the previously viewed topic.
ALT+O, and then press F	Move forward to the next (previously viewed) topic.
TAB	Move between related topics. <b>Note</b> <ul style="list-style-type: none"><li>• Use this shortcut when the focus is in the topic pane.</li></ul>
ALT+F4	Close the Help Viewer.

## Contents tab shortcut keys

Press	To
ALT+C	Display the <b>Contents</b> tab.
RIGHT ARROW	Open a book.
LEFT ARROW	Close a book.
BACKSPACE	Return to the previous open book.
UP ARROW or DOWN ARROW	Select a topic.
ENTER	Display the selected topic.

## Index tab shortcut keys

Press	To
ALT+N	Display the <b>Index</b> tab.
UP ARROW or DOWN ARROW	Select a keyword in the list.
ALT+D or ENTER	Display the associated topic.

### Search tab shortcut keys

Press	To
ALT+S	Display the <b>Search</b> tab.
ALT+L	Start a search.
ALT+D or ENTER	Display the selected topic.

### Favorites tab shortcut keys

Press	To
ALT+I	Display the <b>Favorites</b> tab.
ALT+A	Add a topic to the Topics list.
ALT+P	Select a topic in the Topics list.
	<p> <b>Note</b></p> <ul style="list-style-type: none"> <li>Use this shortcut when the focus is in the topic pane and you want to move to the Topics list.</li> </ul>
ALT+R	Remove a topic from the Topics list.
ALT+D	Display a topic from the Topics list.

### Related Topic

[Help Overview](#)

# Accessibility for People with Disabilities

Microsoft is committed to making its products easier for everyone to use. For information about features that make Microsoft BizTalk Server 2000 more accessible, see the following:

- [Help Viewer Shortcut Keys](#)
- [BizTalk Server Administration Shortcut Keys](#)
- [BizTalk Document Tracking Shortcut Keys](#)
- [BizTalk Orchestration Designer Shortcut Keys](#)
- [BizTalk Messaging Manager Shortcut Keys](#)
- [BizTalk Editor Shortcut Keys](#)
- [BizTalk Mapper Shortcut Keys](#)

## **Note**

- For further information about accessibility options, in Windows 2000 Server Help, in the Getting Started with Windows 2000 book, see Accessibility for People with Disabilities. In Windows 2000 Professional Help, see the chapter Accessibility for Special Needs.

# Contacting Microsoft Product Support Services

**Product name:** Microsoft BizTalk Server 2000

**Support options:** To get the latest information on your support options, go to the Microsoft Product Support Services Web site ([support.microsoft.com/directory/productsupportoption.asp](http://support.microsoft.com/directory/productsupportoption.asp)) and select BizTalk Server 2000 from the product list.

**Worldwide:** Support options, hours, and cost in your country/region may differ from the United States; check with your local office for details.

**Conditions:** Microsoft product support services are subject to then-current prices, terms, and conditions, which are subject to change without notice.

# BizTalk Server 2000 Tutorial

## Business-to-Business Automated Procurement

In this tutorial you will learn how to configure Microsoft BizTalk Server 2000 to establish and run a business-to-business automated procurement process.

You will also learn how BizTalk Server components and services work together to integrate loosely coupled, long-running business processes, both within and between businesses.

### Note

The BizTalk Server 2000 Tutorial is also provided in Microsoft Word format. To print the Tutorial, you must use this version. If you do not have Word installed, you can view the file using Microsoft WordPad or Microsoft Word 97/2000 Viewer. The Tutorial.doc file is located in \Program Files\Microsoft BizTalk Server\Documentation on the BizTalk Server installation drive.

## Requirements

To successfully complete this tutorial, you must install BizTalk Server 2000 and all its dependencies. For a complete list of the hardware and software requirements for BizTalk Server 2000, see [Installing BizTalk Server 2000](#).

## Scenario

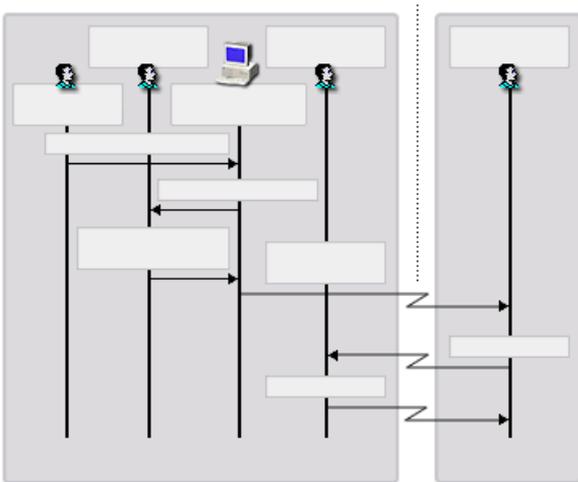
This scenario provides a comprehensive overview of the key elements of BizTalk Server 2000. ProElectron, Inc. (the buyer organization) uses BizTalk Server 2000 to implement a business-to-business automated procurement process with Bits, Bytes, & Chips, Inc. (the seller organization).

ProElectron uses an [XLANG schedule](#) to control the flow of [messages](#) through the system. If a purchase order request is equal to or less than \$1000, a purchase order is generated and sent to Bits, Bytes, & Chips. Otherwise, the process terminates.

The buyer's system uses [BizTalk Messaging Services](#), which receives, routes, and transforms the purchase order to match the Bits, Bytes, & Chips format, and then extracts the data.

Both systems also use a number of auxiliary components that work in conjunction with BizTalk Server 2000 to perform key data-processing tasks.

The following illustration is an interaction diagram for the business-to-business automated procurement system implemented by ProElectron and Bits, Bytes, & Chips. Arrows denote the flow of data among roles and entities.



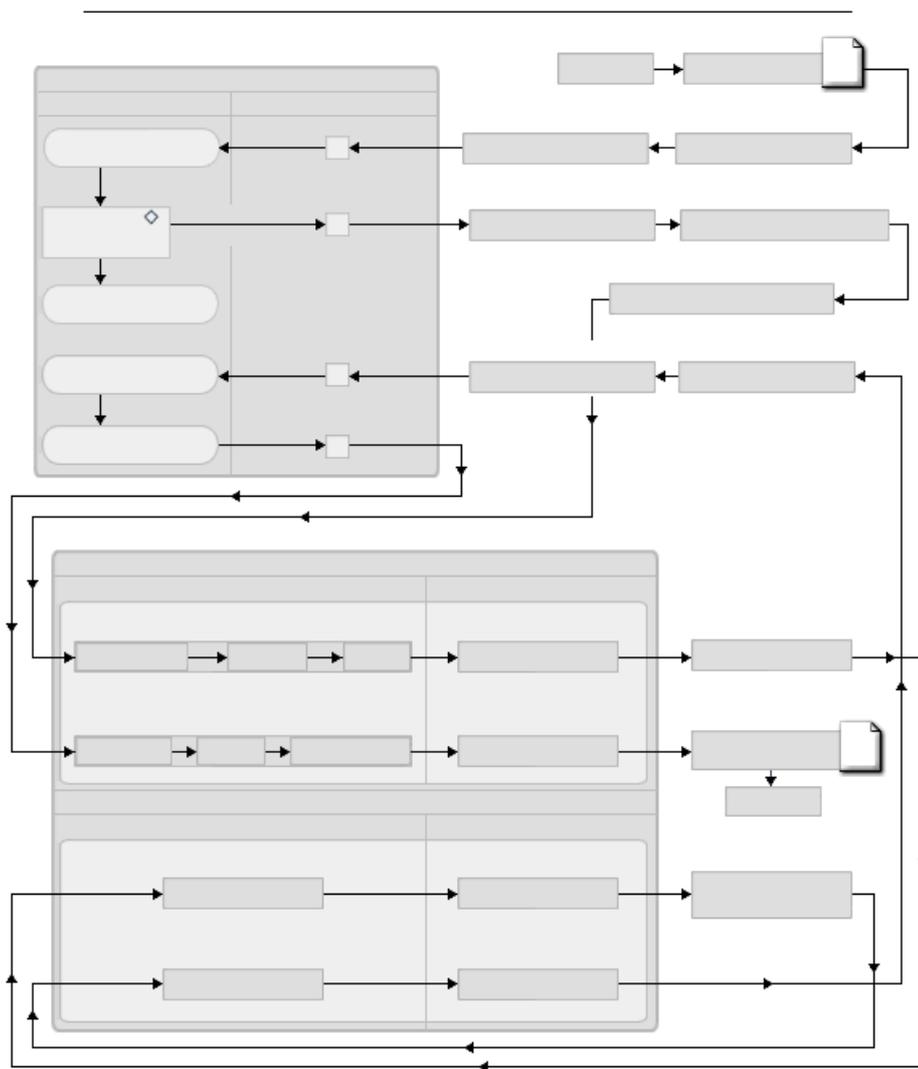
Internet  
Order  
Application  
Invoice  
Payment  
**Bits, Bytes,  
& Chips, Inc**  
Purchase  
order  
PO request  
approval

PO approval  
**ProElectron, Inc**  
Purchase request  
User  
PO  
Approver  
Finance  
Supplier

◆ **Important**

- For the purposes of this scenario, both the buyer and seller systems are configured on a single installation of BizTalk Server 2000.

The following illustration shows the movement of the documents through the buyer and seller systems. It also shows the interaction between the XLANG schedule, BizTalk Messaging Services, and the auxiliary components. This illustration is a useful reference that you might want to print and have available as you work through the modules in this tutorial.



Send  
Payment  
Receive Invoice  
Decision  
PO Req  
>\$1000  
End  
Receive  
PO Req  
XLANG Schedule

File receive function  
Buyer file directory  
WSC Component  
ASP File  
Message queue  
Yes (Deny)  
No  
(Approve)  
Script Component  
Messaging Port  
Messaging Port  
Channel for Invoice  
Channel for PO  
Channel  
Port to ProElectron  
via HTTP  
Port to Bits, Bytes,  
& Chips via AIC  
Port to Bits, Bytes, & Chips via Local File  
POtoINVAIC  
SubmitProElectronPO  
Port to Bits, Bytes,  
& Chips via HTTP  
Channel for  
Invoice to Payment  
Channel for  
POReq to PO  
Channel  
BizTalk Messaging  
Message Queuing  
Action  
Port  
Data  
Data  
ExecuteTutorial  
PO Request Receive Function at ProElectron  
DropInvoicetoMSMQ  
ReceiveInvoice  
PORequestApproval  
ReceivePOReq  
Message Queuing  
Message queue  
Application  
PO Req  
PO Req

**Start**

**Buyer System**

**BizTalk Messaging Services**

**Stop**

AIC

PO to Invoice

Seller file

directory

Payment

Seller

Buyer

Payment

Invoice

Note: Directional arrows denote flow of data.

Invoice

Invoice

Map

Map  
PO  
PO  
PO  
PO  
ASP File

## **Seller System BizTalk Orchestration**

### **Contents**

#### **Module 1: Modeling Business Processes**

In this module, you learn how to:

- Use [BizTalk Orchestration Designer](#) to create an [XLANG schedule drawing](#) that models the procurement processes for ProElectron. For more information, see [Designing BizTalk Orchestrations](#).
- Compile the XLANG schedule drawing into an XLANG schedule. For more information, see [Compile an XLANG schedule drawing into an XLANG schedule](#).
- Run the XLANG schedule to see how a message moves through the buyer system.

#### **Module 2: Creating Specifications and Maps**

In this module, you learn how to:

- Use [BizTalk Editor](#) to create document [specifications](#). For more information, see [Create and Validate Specifications](#).
- Use [BizTalk Mapper](#) to create [maps](#). For more information, see [Create new maps](#).

#### **Module 3: Configuring BizTalk Messaging Services**

In this module, you learn how to:

- Use [BizTalk Messaging Manager](#) to configure BizTalk Messaging Services for Bits, Bytes, and Chips. For more information, see [Using BizTalk Messaging Manager](#).
- Use [BizTalk Server Administration](#) to create a File [receive function](#) for Bits, Bytes, and Chips. For more information, see [Add a File receive function](#).

#### **Module 4: Completing the XLANG Schedule**

In this module, you learn how to:

- Implement a [port](#) in the XLANG schedule drawing that you started in Module 2 by using a BizTalk Messaging implementation. For information about the differences between ports and messaging ports, see [Understanding Port Implementations](#) and [Understanding Messaging Ports](#).
- Complete the XLANG schedule drawing and compile it into an XLANG schedule.
- Run the schedule to understand the complete movement of messages between the buyer and seller systems.

#### **Shortcuts**

Shortcuts enable you to save time and effort by using an existing XLANG schedule, document specification, a map, or a configuration script. By using shortcuts, you can advance to subsequent sections of the tutorial.

To use shortcuts, the components must be installed on drive C.

Continue to [Preliminary Setup](#).

# Preliminary Setup

Before you begin the tutorial, you must create the following:

- One folder containing four subfolders.
- Two local Web site folders containing ASP files.
- Two message queues for the buyer system.

Continue to [Create folders](#).

# Create folders

In this procedure, you create one folder that contains four subfolders. You use two of the subfolders as locations for messages as they move into and out of the buyer and seller systems, and two as content folders for the buyer and seller Web sites.

To create the folders:

1. In Windows Explorer, browse to the root directory of your C:\ drive.

## ⚠ Caution

- You must create the following folders on your C:\ drive.
2. Create a new folder on the root of the C:\ drive; name the folder **TutorialFiles**.
  3. Click the new folder called **TutorialFiles** and create four subfolders with the following names:
    - **Buyer**
    - **Seller**
    - **SubmitPO**
    - **InvoiceToQueue**

Continue to [Copy files](#).

# Copy files

In this procedure, you copy files needed to complete the tutorial.

1. On the BizTalk Server installation drive, browse to **\Program Files\Microsoft BizTalk Server\Tutorial\DocSpecsandMaps** and copy **POReqtoPO.xml**.
2. Paste the file to **\Program Files\Microsoft BizTalk Server\BizTalkServerRepository\Maps\Microsoft**.
3. Use the following table to copy and paste additional files to the **TutorialFiles** subfolders.

<b>Copy from:</b>	<b>Paste to:</b>
\Program Files\Microsoft BizTalk Server\Tutorial\Components\SubmitPO\Solution\SubmitProElectronPO.asp	C:\TutorialFiles\SubmitPO
\Program Files\Microsoft BizTalk Server\Tutorial\Components\InvoicetoQueue\Solution\DropInvoicetoMSMQ.asp	C:\TutorialFiles\InvoiceToQueue
\Program Files\Microsoft BizTalk Server\Tutorial\Components\InvoicetoQueue\Solution\Global.asa	C:\TutorialFiles\InvoiceToQueue

Continue to [Create local Web site folders](#).

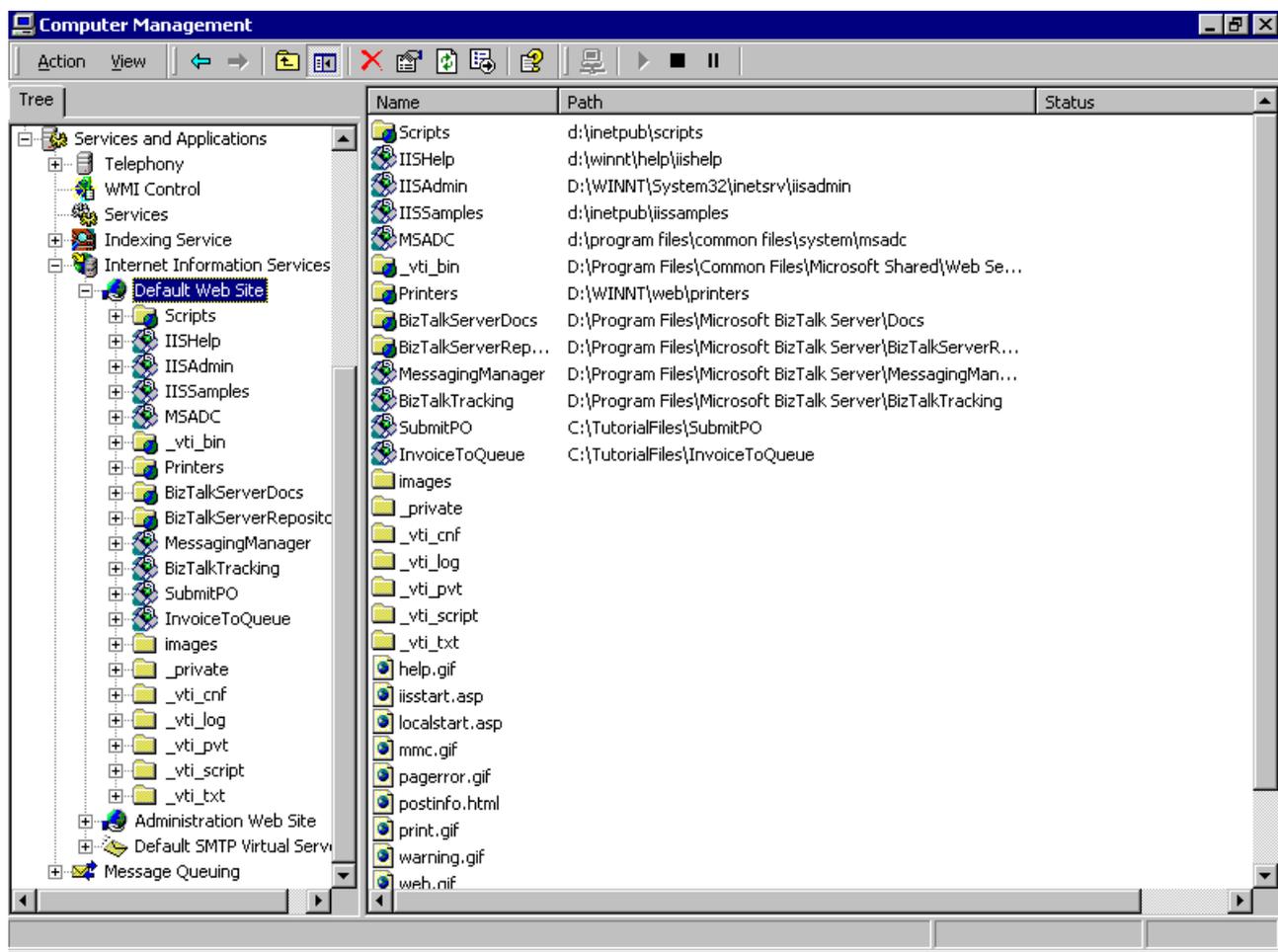
# Create local Web site folders

In this procedure, you create two virtual directories. The first directory simulates the buyer Web site that receives invoices. The second directory simulates the seller Web site that receives purchase orders.

1. On the **Start** menu, point to **Settings** and click **Control Panel**.
2. Double-click **Administrative Tools**.
3. Double-click **Computer Management**.  
The Computer Management console appears.
4. In the Computer Management console tree, expand **Services and Applications**, expand **Internet Information Services**, and then click **Default Web Site**.
5. On the **Action** menu, point to **New** and click **Virtual Directory**.  
The Virtual Directory Creation Wizard opens.
6. On the **Welcome to the Virtual Directory Creation Wizard** page, click **Next**.
7. On the **Virtual Directory Alias** page, in the **Alias** box, type **SubmitPO** and click **Next**.
8. On the **Web Site Content Directory** page, click **Browse**.
9. Browse to **C:\TutorialFiles\SubmitPO**, click **OK**, and then click **Next**.
10. On the **Access Permissions** page, click **Next**.
11. Click **Finish** to close the Virtual Directory Creation Wizard.
12. In the Computer Management console tree, click **Default Web Site**.
13. To create the folder that simulates the buyer Web site, repeat steps 5 through 11, with the following variations:
  - In step 7, in the **Alias** box, type **InvoiceToQueue**.
  - In step 9, browse to **C:\TutorialFiles\InvoiceToQueue**.

Your Computer Management console should appear similar to the following illustration.

Click the illustration to enlarge or reduce.



1. Close the Computer Management console.

Continue to [Create message queues](#).

# Create message queues

In this procedure, you create two message queues to enable the buyer system to send and receive messages.

## Note

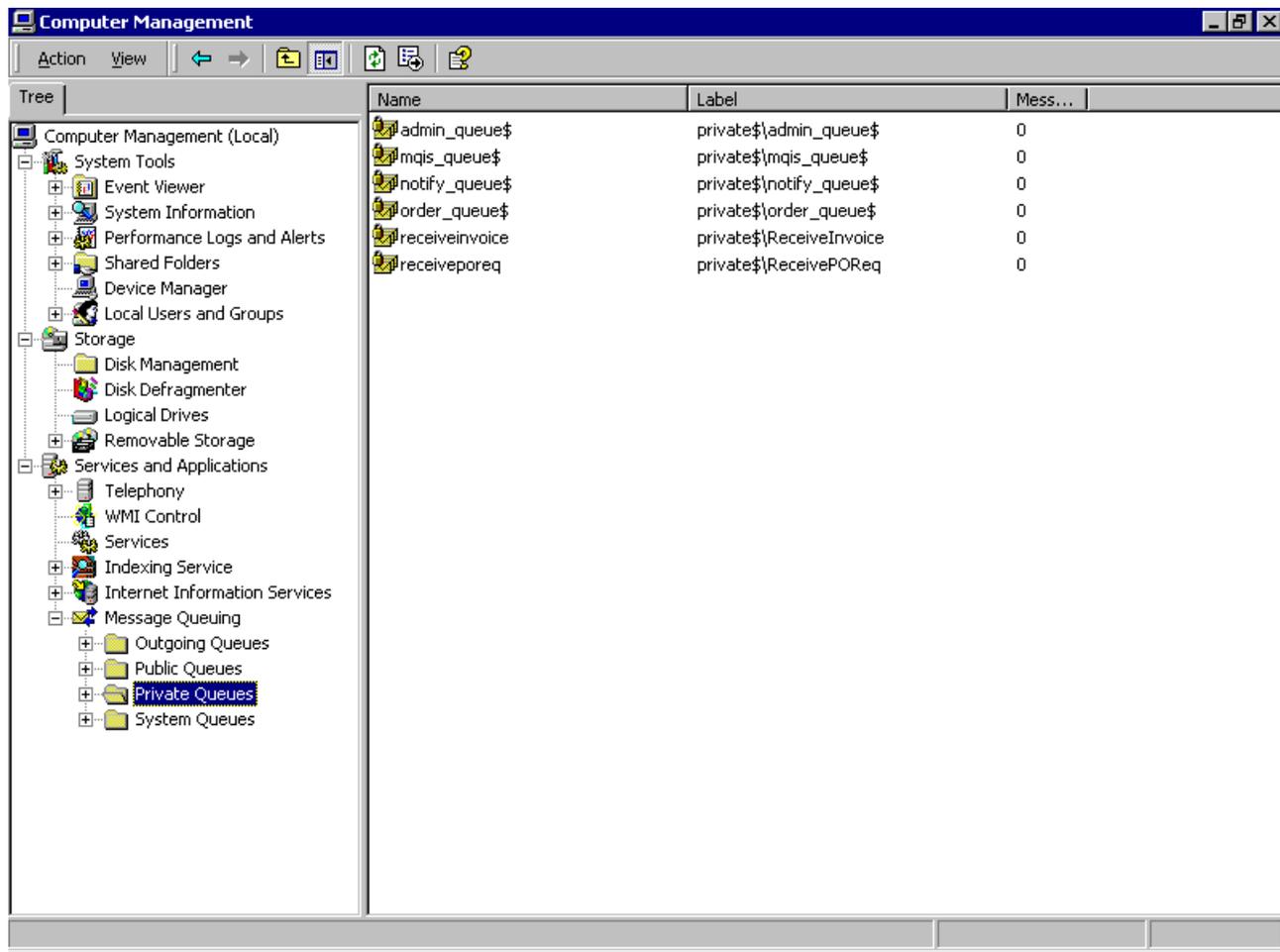
To complete this procedure, Message Queuing must be installed. For instructions about installing Message Queuing, see [Install Message Queuing](#)

To create the message queues:

1. On the **Start** menu, point to **Settings** and click **Control Panel**.
2. Double-click **Administrative Tools**.
3. Double-click **Computer Management**.  
The Computer Management console appears.
4. In the Computer Management console, expand **Services and Applications**, expand **Message Queuing**, and then click **Private Queues**.
5. On the **Action** menu, point to **New** and click **Private Queue**.  
The **Queue Name** dialog box appears.
6. In the **Name** box, type **ReceivePOReq**.
7. Select the **Transactional** check box and click **OK**.
8. To create the second message queue, repeat steps 5 through 7, with the following variation:
  - In step 6, in the **Name** box, type **ReceiveInvoice**.

Your Computer Management console should appear similar to the following illustration.

Click the illustration to enlarge or reduce.



1. Close the Computer Management console.

Continue to [Install the auxiliary components](#).

# Install the auxiliary components

In this procedure, you install the following auxiliary components:

- A Windows Script Component (WSC) on the buyer system that you use to implement a port to an [XLANG schedule](#), and which accepts the approval or denial status for a purchase order request from the XLANG schedule.
- An application integration component (AIC) on the seller system that you use to generate an invoice that is based on the data in the purchase order from the buyer.

## ⚠ Caution

- If these components have been installed previously on your computer, you must first uninstall them. To uninstall the components, go to [Uninstall the auxiliary components](#).

To install the auxiliary components:

1. On the BizTalk Server installation drive, browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Setup**.
2. Double-click **Install\_POtoInvoice.vbs**.  
A message box appears, indicating that the component was successfully installed.
3. Browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Components\POReqApproval\Solution** and click **PORequestApproval.wsc**.
4. On the **File** menu, click **Register**.  
A message box appears, indicating that the component was successfully registered.

Continue to [Module 1: Modeling Business Processes](#).

# Uninstall the auxiliary components

## Caution

Do not use this procedure unless you are removing a previous installation of the components.

1. For the **POtoInvoice** component, browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Setup** on the BizTalk Server installation drive.

2. Double-click **Remove\_POtoInvoice.vbs**.

A message box appears, indicating that the component was successfully uninstalled.

3. For the Windows Script Component, browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Components\POReqApproval\Solution** and click **PORequestApproval.wsc**.

4. On the **File** menu, click **Unregister**.

A message box appears, indicating that the component was successfully unregistered.

To reinstall the components, go to [Install the auxiliary components](#).

# Module 1: Modeling Business Processes

In this module, you use [BizTalk Orchestration Designer](#) to create an [XLANG schedule drawing](#) that describes an automated procurement process. You then compile the XLANG schedule drawing into an executable [XLANG schedule](#), which controls the flow of messages for the buyer system.

## Objectives

- Create an XLANG schedule drawing that describes the automated procurement process. For more information, see [Creating XLANG Schedule Drawings](#).
- Connect the [actions](#) in a logical sequence that describes the business processes. For more information, see [Connect Shapes](#).
- Implement the business processes by connecting actions to [ports](#). For more information, see [Establish the communication flow between an action and a port](#).
- Add a rule to the business processes by writing a script expression. For more information, see [Designing Rules](#).
- Define the data flow for [messages](#). For more information, see [Communication Shapes](#).
- Save the XLANG schedule drawing and compile the drawing into an XLANG schedule. For more information, see [Compiling XLANG Schedules](#).
- Run the XLANG schedule to process the message through BizTalk Server. For more information, see [Running XLANG Schedules](#).

Continue to [Creating the XLANG Schedule for the Buyer](#).

## Related Topic

[Designing BizTalk Orchestrations](#)

# Creating the XLANG Schedule for the Buyer

In this procedure, you model the business processes for the buyer and create an [XLANG schedule](#).

To create the XLANG schedule, continue to [Create the buyer actions](#).

## **Shortcut**

To use the existing XLANG schedule, continue directly to [Run the XLANG schedule](#).

# Create the buyer actions

1. On the **Start** menu, point to **Programs**, point to **Microsoft BizTalk Server 2000**, and then click **BizTalk Orchestration Designer**.
2. On the **Business Process** page, drag the **Action** shape from the **Flowchart** stencil to the left of the **Separator** bar. Position the shape directly below the **Begin** shape.
3. Right-click the **Action** shape and click **Properties**.  
The **Action Properties** dialog box appears.
4. In the **Name** box, type **Receive PO Request** and click **OK**.

## ⚠ Caution

- For this scenario to run correctly, you must type all names exactly as indicated. The tutorial components use these names.
5. On the **Business Process** page, drag the **Decision** shape from the **Flowchart** stencil to the left side of the **Separator** bar. Position this shape below the **Receive PO Request** action.
  6. Right-click the **Decision** shape and click **Add Rule**.  
The **Rule Properties** dialog box appears.
  7. In the **Rule name** box, type **Denied** and click **OK**.

Later in this module, you add a script expression that implements the [decision](#) rule, after you bind the **Decision** shape to the Script Component, which provides the [message](#) and field names.

8. Repeat steps 2 through 4, to create the following three actions:
  - Position a second **Action** shape to the right of the **Decision** shape. Name this action **Send Denial**.
  - Position a third **Action** shape below the **Decision** shape. Name this action **Send Approval**.
  - Position a fourth **Action** shape below the **Send Approval** action. Name this action **Write PO Request to File**.
9. On the **Business Process** page, drag the **End** shape from the **Flowchart** stencil to the left side of the **Separator** bar. Position the shape below the **Send Denial** action.  
If the purchase order request is not approved, the XLANG schedule displays a denial message and ends.
10. On the **Business Process** page, drag the **End** shape from the **Flowchart** stencil to the left side of the **Separator** bar. Position the shape below the **Write PO Request to File** action.  
If the purchase order request is approved, the XLANG schedule writes the purchase order request to a file directory, displays an approval message, and then ends.

Continue to [Connect the buyer actions in a sequence](#).

# Connect the buyer actions in a sequence

1. Click the **Begin** shape to highlight the control handles.



Drag the bottom control handle to the top connection point of the **Receive PO Request** action.

The **Receive PO Request** action represents the start of the business process. When a purchase order request is received, the XLANG schedule starts running.

## **Notes**

- A green box on a highlighted shape indicates a control handle. You can drag control handles to connect to an action.
  - A blue X on a shape indicates a connection point.
  - Connection points on the side of an **Action** shape are used only to connect to ports, not to other **Action** shapes.
2. Repeat step 1 to create a connection for the following action:
    - Connect the **Receive PO Request** action to the **Decision** shape.
  3. Select the **Denied** rule in the **Decision** shape and drag the right control handle of the **Denied** rule to the top connection point of the **Send Denial** action.
  4. Select the **Else** rule in the **Decision** shape and drag the left control handle of the **Else** rule to the top connection point of the **Send Approval** action.

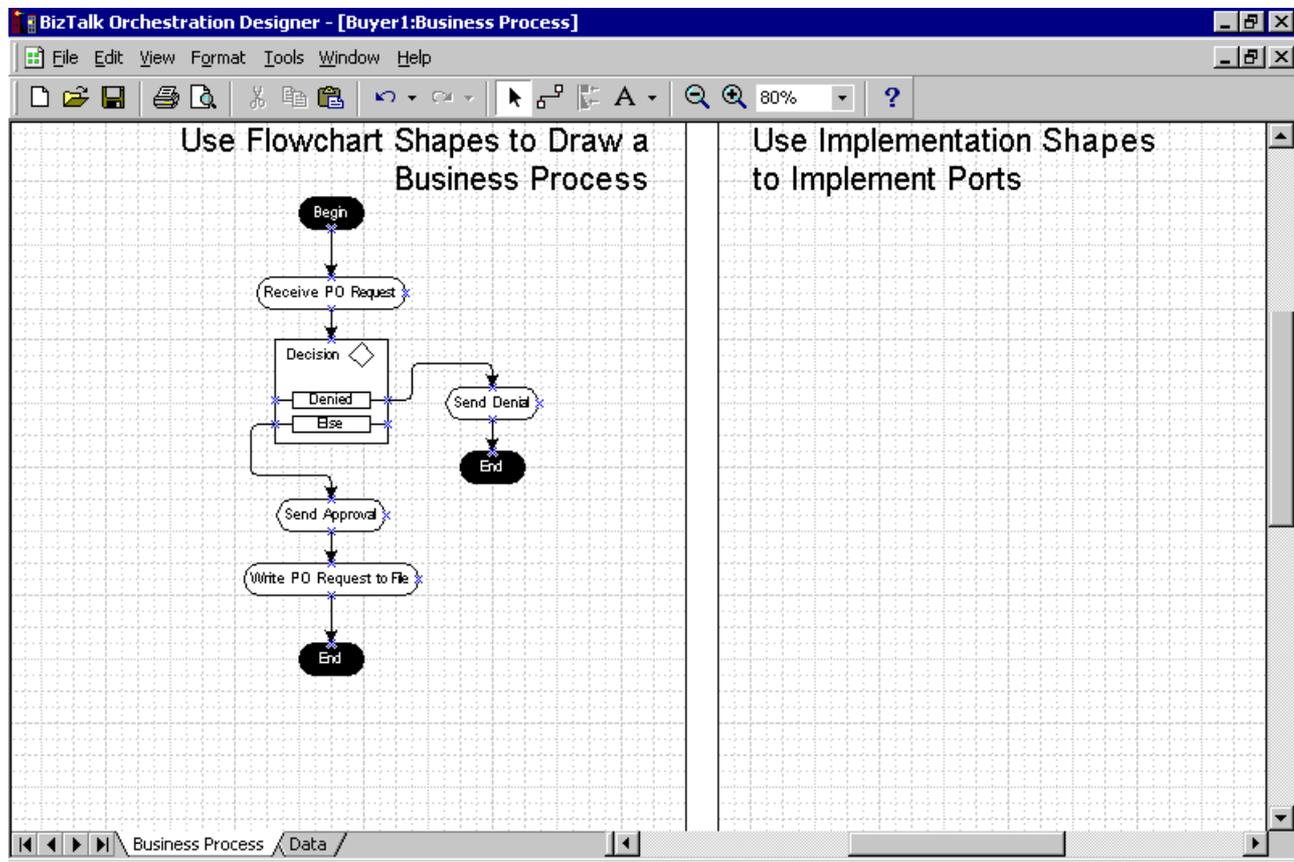
## **Note**

- You can connect the rules in the **Decision** shape to the **Send Approval** and **Send Denial** actions from either the right or left control handle.
5. Connect the **Send Approval** action to the **Write PO Request to File** action.
  6. Connect the **Write PO Request to File** action to the **End** shape positioned below it.
  7. Connect the **Send Denial** action to the **End** shape positioned below it.
  8. On the **File** menu, click **Save As**.

The **Save XLANG Schedule Drawing As** dialog box appears.
  9. Browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Schedule\Lab** on the BizTalk Server installation drive.
  10. In the **File name** box, type **Buyer1** and click **Save**.

The XLANG schedule drawing that you created and saved should appear similar to the following illustration.

Click the illustration to enlarge or reduce.



Continue to [Implement a port by using Message Queuing to receive a purchase order request.](#)

# Implement a port by using Message Queuing to receive a purchase order request

The service is configured to monitor a message queue for a purchase order request. When this occurs, the [XLANG schedule](#) begins processing. For information about the usage of ports and messaging ports in this tutorial, see [Integrating BizTalk Services](#).

To implement the [port](#):

1. On the **Business Process** page, drag the **Message Queuing** shape from the **Implementation** stencil to the right side of the **Separator** bar. Position the **Message Queuing** shape so that it is horizontally aligned with the **Receive PO Request** action.

The Message Queuing Binding Wizard opens.

2. On the **Welcome to the Message Queuing Binding Wizard** page, verify that **Create a new port** is selected.
3. In the **Create a new port** box, type **ReceivePORequest** and click **Next**.
4. On the **Static or Dynamic Queue Information** page, verify that **Static queue** is selected and click **Next**.
5. On the **Queue Information** page, click **Use a known queue for all instances**.
6. In the **Enter the queue name** box, type **.\private\$\ReceivePOReq** and click **Next**.
7. On the **Advanced Port Properties** page, click **Finish**.

On the **Business Process** page, the **ReceivePORequest** port and the associated Message Queuing implementation appear.

Continue to [Create the communication flow for the Receive PO Request action](#).

# Create the communication flow for the Receive PO Request action

1. Select the **Receive PO Request** action and drag the control handle on the right of the **Receive PO Request** action to the left connection point of the **ReceivePORequest** port.

The XML Communication Wizard opens.

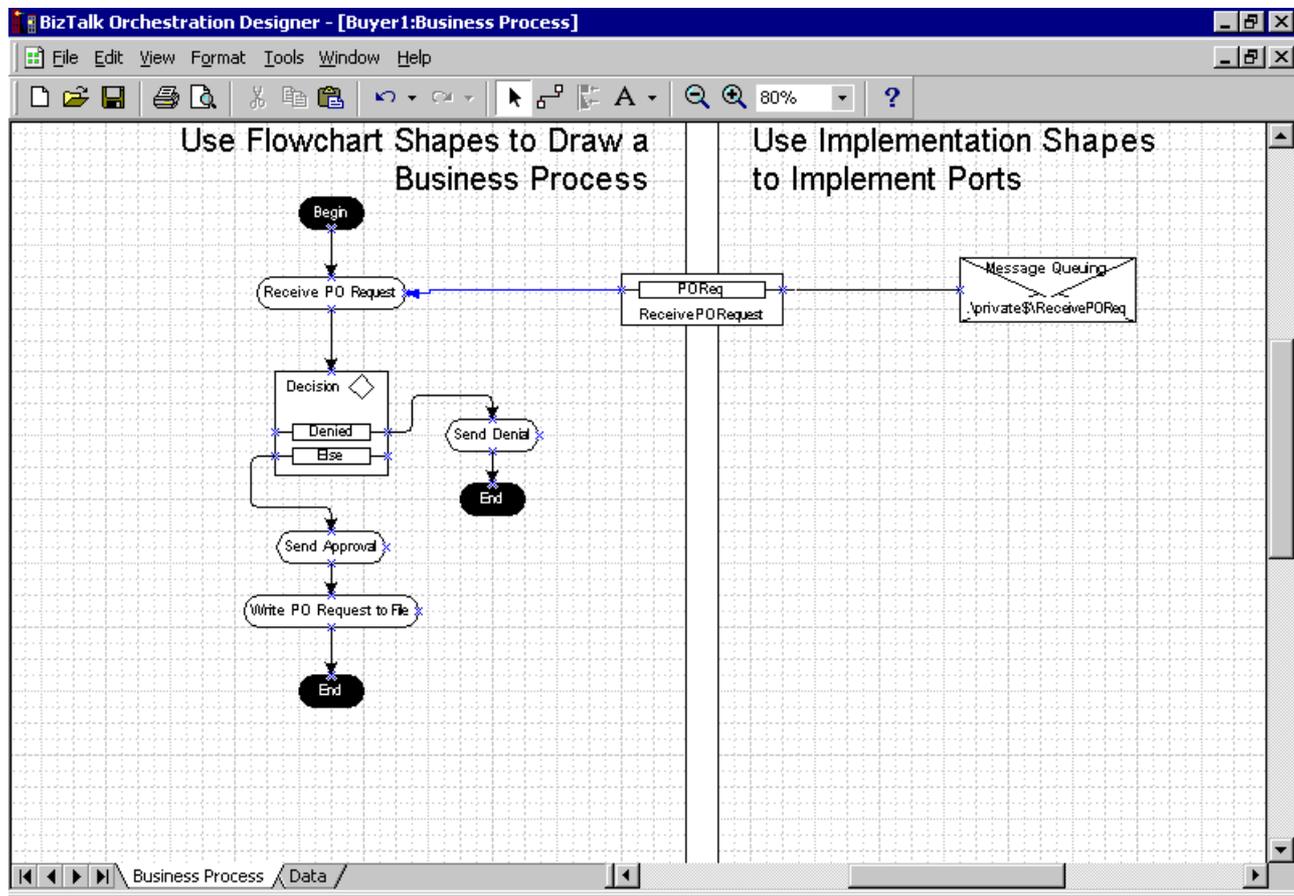
2. On the **Welcome to the XML Communication Wizard** page, click **Receive** and click **Next**.
3. On the **Message Information** page, verify that **Create a new message** is selected.
4. In the **Message name** box, type **POReq** and click **Next**.
5. On the **XML Translation Information** page, verify that **Receive XML messages from the queue** is selected and click **Next**.
6. On the **Message Type Information** page, in the **Message type** box, type **POReq** and click **Next**.
7. On the **Message Specification Information** page, click **Browse**.

The **Browse for Specification** dialog box appears.

8. Browse to **\Program Files\Microsoft BizTalk Server\Tutorial\DocSpecsandMaps** on the BizTalk Server installation drive.
  9. Click **PoReq.xml** and click **Open**.
  10. Click **Add**.
- The **Field Selection** dialog box appears.
11. In the **Select node** area, expand **Total**, click **POTtl**, and then click **OK**.
- In the **Message fields** area, **POTtl** should appear in the list of message fields.
12. Click **Finish**.

After you implement the port and create the communication flow, the XLANG schedule drawing should appear similar to the following illustration.

Click the illustration to enlarge or reduce.



Continue to [Implement a port by using a script component.](#)

# Implement a port by using a script component

The [XLANG schedule](#) passes the value in the total field of the purchase order request to the **Decision** shape. The scripting expression in the [decision](#) rule forks the path of the schedule and sends the appropriate [message](#) to the port implementation that uses a Windows Script Component, based on the total of the purchase order request.

To implement the [port](#):

1. On the Implementation stencil, drag the **Script Component** shape to the right of the **Separator** bar that divides the two sides of the drawing. Position the shape so that it is horizontally aligned with the **Decision** shape.

The Script Component Binding Wizard opens.

2. On the **Welcome to the Script Component Binding Wizard** page, in the **Create a new port** box, type **ApprovalComponent** and click **Next**.
3. On the **Static or Dynamic Communication** page, verify that **Static** is selected and click **Next**.
4. On the **Specify the Script File** page, click **Browse**.
5. Browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Components\POReqApproval\Solution** on the BizTalk Server installation drive.
6. Click **PORequestApproval.wsc**, click **Open**, and then click **Next**.
7. On the **Component Instantiation Information** page, verify that **Use the Prog ID "BTSTutorial.PORequestApproval"** is selected and click **Next**.
8. On the **Method Information** page, click **Check All** and click **Next**.
9. On the **Advanced Port Properties** page, click **Finish**.

Continue to [Define message properties for the script component](#).

# Define message properties for the script component

1. Select the **Send Denial** action and drag the control handle on the right to the **ApprovalComponent** Windows Script Component port.

The Method Communication Wizard opens.

2. On the **Welcome to the Method Communication Wizard** page, verify that **Initiate a synchronous method call** is selected and click **Next**.

3. On the **Message Information** page, verify that **Create a new message** is selected and click **Next**.

4. On the **Message Specification Information** page, in the **Methods** list, click **SendDenial** and click **Finish**.

5. Select the **Send Approval** action and drag the control handle on the right of the **Send Approval** action to the **ApprovalComponent** port.

The Method Communication Wizard opens.

6. On the **Welcome to the Method Communication Wizard** page, verify that **Initiate a synchronous method call** is selected and click **Next**.

7. On the **Message Information** page, verify that **Create a new message** is selected and click **Next**.

8. On the **Message Specification Information** page, in the **Methods** list, click **SendApproval** and click **Finish**.

9. Select the **Write PO Request to File** action and drag the control handle on the right of the **Write PO Request to File** action to the **ApprovalComponent** port.

The Method Communication Wizard opens.

10. On the **Welcome to the Method Communication Wizard** page, verify that **Initiate a synchronous method call** is selected and click **Next**.

11. On the **Message Information** page, verify that **Create a new message** is selected and click **Next**.

12. On the **Message Specification Information** page, in the **Methods** list, verify that **WriteToFile** is selected and click **Finish**.

Continue to [Write the script expression for the decision rule](#).

# Write the script expression for the decision rule

The denial **decision** rule contains properties that define the shape's behavior. The scripting expression refers to data contained in **messages**, and evaluates to either TRUE or FALSE. The scripting expression also defines the logic and variable names that are used by the **Decision** shape.

If the total of the purchase order request exceeds \$1000:

- The **Decision** shape sends a denial message to the port.
- A message box notifies the user of the denial.
- The **XLANG schedule** ends.

If the total of the purchase order request is \$1000 or less:

- The **Decision** shape sends an approval message to the script component.
- The script component displays a message box that notifies the user of the approval.
- The script component writes the purchase order request message to a local file directory.
- The **XLANG schedule** ends.

To write the script expression:

1. Click the **Data** tab at the bottom of the page.

The **Data** page appears.

2. View the **POReq** message to find the field name.

To write the script expression, both the message name and the field name are required. In this case, the message name is **POReq** and the field name is **POTtl**.

3. Click the **Business Process** tab at the bottom of the page.

The **Business Process** page appears.

4. Right-click the **Decision** shape and click **Properties**.

The **Decision Properties** dialog box appears.

5. Verify that **Denied** is selected and click **Edit**.

The **Rule Properties** dialog box appears.

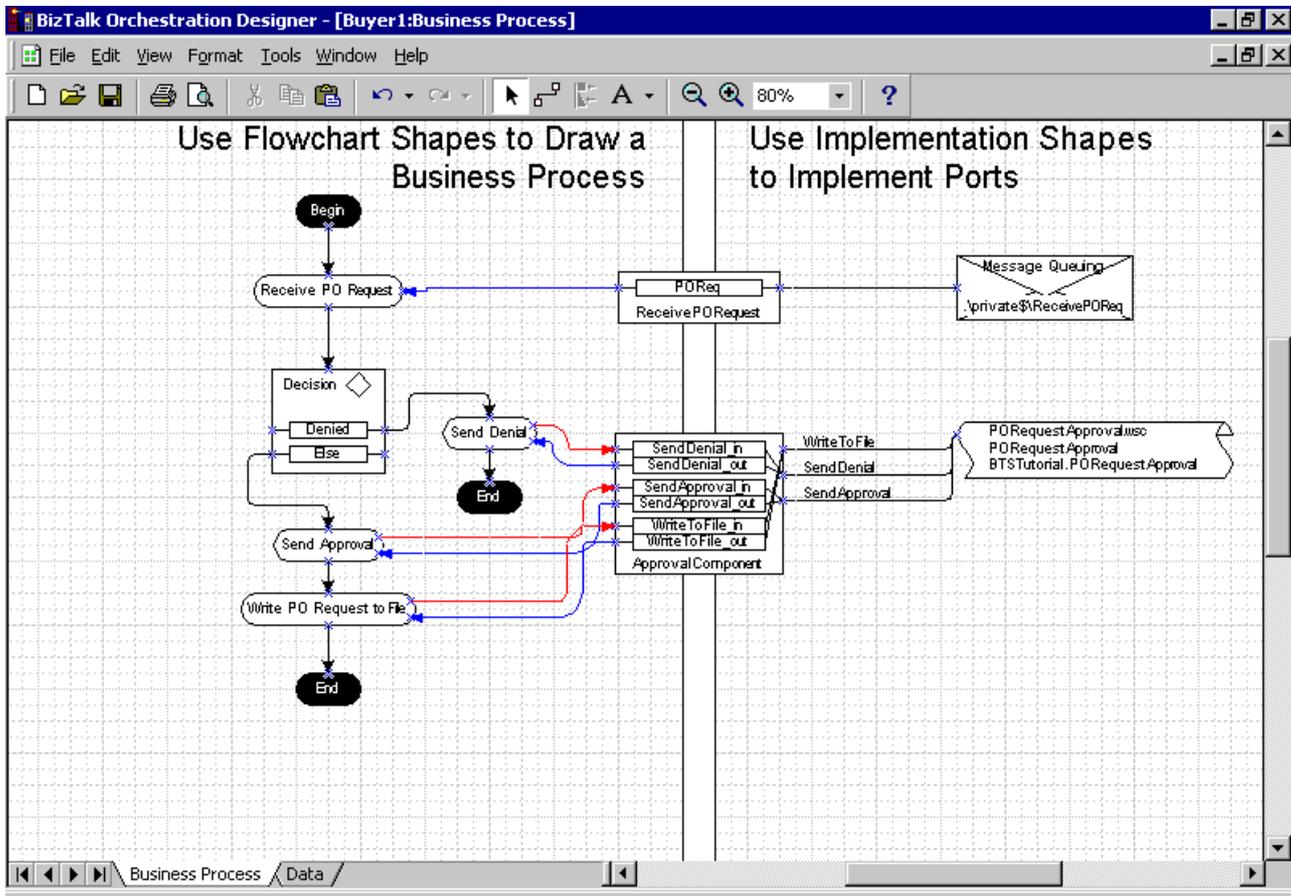
6. In the **Script expression** box, type **POReq.POTtl > 1000**.

This indicates that if the total field in the purchase order request is greater than \$1000, the request is denied.

7. Click **OK** to close the **Rule Properties** dialog box, and click **OK** to close the **Decision Properties** dialog box.

The **XLANG schedule** drawing should appear similar to the following illustration.

Click the illustration to enlarge or reduce.



Continue to [Define the data flow.](#)

# Define the data flow

To define data flow within the business process, you create connections between fields in **Message** shapes on the **Data** page.

To define the data flow:

1. Click the **Data** tab at the bottom of the page.

The **Data** page appears.

2. In the **POReq** message, click the **Document** field and drag the control handle on the right to a connection point on the **Document** field in the **SendDenial\_in** message.
3. Repeat step 2 by clicking the **Document** field and dragging the highlighted control handle on the right from the **POReq** box to a connection point on following fields:

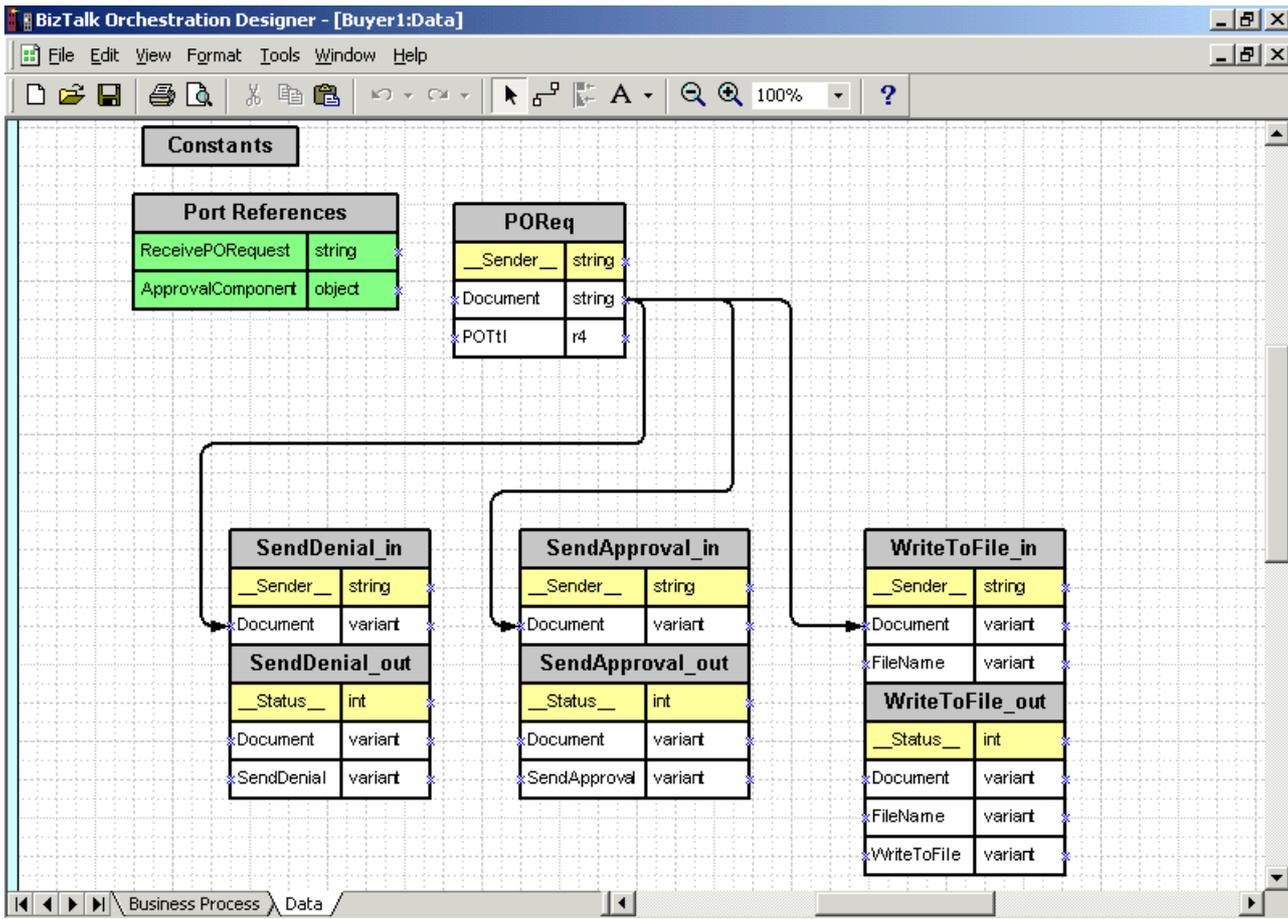
- The **Document** field in the **SendApproval\_in** box.
- The **Document** field in the **WriteToFile\_in** box.

## Note

- Click the **Document** field of the **POReq** message before trying to drag the control handle to the other fields.

The completed **Data** page should appear similar to the following illustration.

Click the illustration to enlarge or reduce.



Continue to [Save the XLANG schedule drawing.](#)

# Save the XLANG schedule drawing

- On the **File** menu, click **Save Buyer1.skv**.

Continue to [Compile the XLANG schedule](#).

# Compile the XLANG schedule

1. On the **File** menu, click **Make XLANG Buyer1.skx**.

The **Save XLANG Schedule to** dialog box appears.

2. Verify that the XLANG schedule will be saved to the **\Program Files\Microsoft BizTalk Server\Tutorial\Schedule\Lab** folder on the BizTalk Server installation drive and click **Save**.

3. On the **File** menu, click **Exit** to close **BizTalk Orchestration Designer**.

Continue to [Run the XLANG schedule](#).

# Run the XLANG schedule

In this procedure, you run the [XLANG schedule](#) twice to view the approval and denial of purchase order requests.

To run the XLANG schedule:

1. Browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Schedule\Solution** on the BizTalk Server installation drive.
2. Double-click **ExecuteTutorial.exe**. This application is used to activate the XLANG schedule by means of a [moniker](#).  
The **ExecuteTutorial** application opens.
3. Click **Browse for Schedule**.

## Shortcut

If you are using the existing XLANG schedule, browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Schedule\Solution** and continue to step 5.

1. If you created the **Buyer1** XLANG schedule, browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Schedule\Lab** on the BizTalk Server installation drive.
2. Click the **Buyer1.skk** XLANG schedule file, and click **Open**.
3. Click **Browse for Data File** and browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Schedule\SampleData** on the BizTalk Server installation drive.
4. Click **POReqAccept.xml** and click **Open**.
5. Click **Start XLANG Schedule**.

Because its total is less than \$1000, the purchase order request is approved. A message box appears notifying you that the application passed data to the [XLANG Scheduler Engine](#). At this point, the application is finished. A second message box notifies you that the purchase order request has been approved. Click **OK** to close the dialog boxes.

6. Click **End** to close the **ExecuteTutorial** application.

## Important

- If you see an automation error when running this application, check to make sure that you have properly configured the private queue and that its name is correct.

7. Browse to **C:\TutorialFiles\Buyer**.

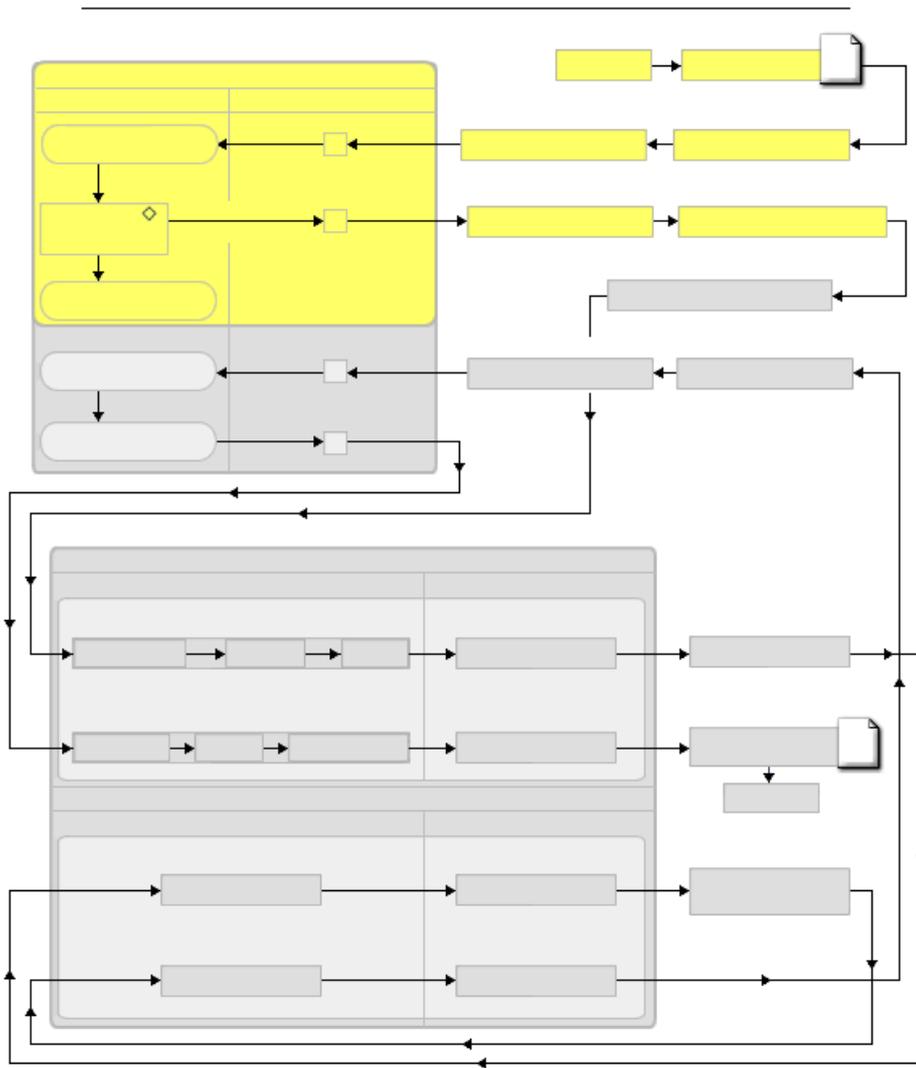
The file name is **POReqXXXXX.xml**, where **XXXXX** represents a unique set of numbers. Double-click the file to open it in Microsoft Internet Explorer. This is a copy of the purchase order request file that the application posted to the message queue. After viewing this file, delete it.

8. Repeat steps 1 through 5 to run the **ExecuteTutorial** application again.
9. Click **Browse for Data File** and browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Schedule\SampleData** on the BizTalk Server installation drive.
10. Click **POReqDeny.xml** and click **Open**.
11. Click **Start XLANG Schedule**.

Because its total exceeds \$1000, the purchase order request is denied. A message box appears notifying you that the application is finished. A second message box notifies you that the document denial has been received. Click **OK** to close the dialog boxes.

12. Click **End** to close the **ExecuteTutorial** application.

The following diagram illustrates the flow of data when you run the XLANG schedule.



- Send
- Payment
- Receive Invoice
- Decision
- PO Req
- >\$1000
- End
- Receive
- PO Req
- XLANG Schedule
- File receive function
- Buyer file directory
- WSC Component
- ASP File
- Message queue
- Yes (Deny)
- No
- (Approve)
- Script Component
- Messaging Port
- Messaging Port
- Channel for Invoice
- Channel for PO
- Channel
- Port to ProElectron via HTTP
- Port to Bits, Bytes,

& Chips via AIC  
Port to Bits, Bytes, & Chips via Local File  
POtoINVAIC  
SubmitProElectronPO  
Port to Bits, Bytes,  
& Chips via HTTP  
Channel for  
Invoice to Payment  
Channel for  
POReq to PO  
Channel  
BizTalk Messaging  
Message Queuing  
Action  
Port  
Data  
Data  
ExecuteTutorial  
PO Request Receive Function at ProElectron  
DropInvoicetoMSMQ  
ReceiveInvoice  
PORequestApproval  
ReceivePOReq  
Message Queuing  
Message queue  
Application  
PO Req  
PO Req

#### **Start**

#### **Buyer System**

#### **BizTalk Messaging Services**

#### **Stop**

AIC  
PO to Invoice  
Seller file  
directory  
Payment  
Seller  
Buyer  
Payment  
Invoice  
Note: Directional arrows denote flow of data.  
Invoice  
Invoice  
Map  
Map  
PO  
PO  
PO  
PO  
ASP File

#### **Seller System**

#### **BizTalk Orchestration**

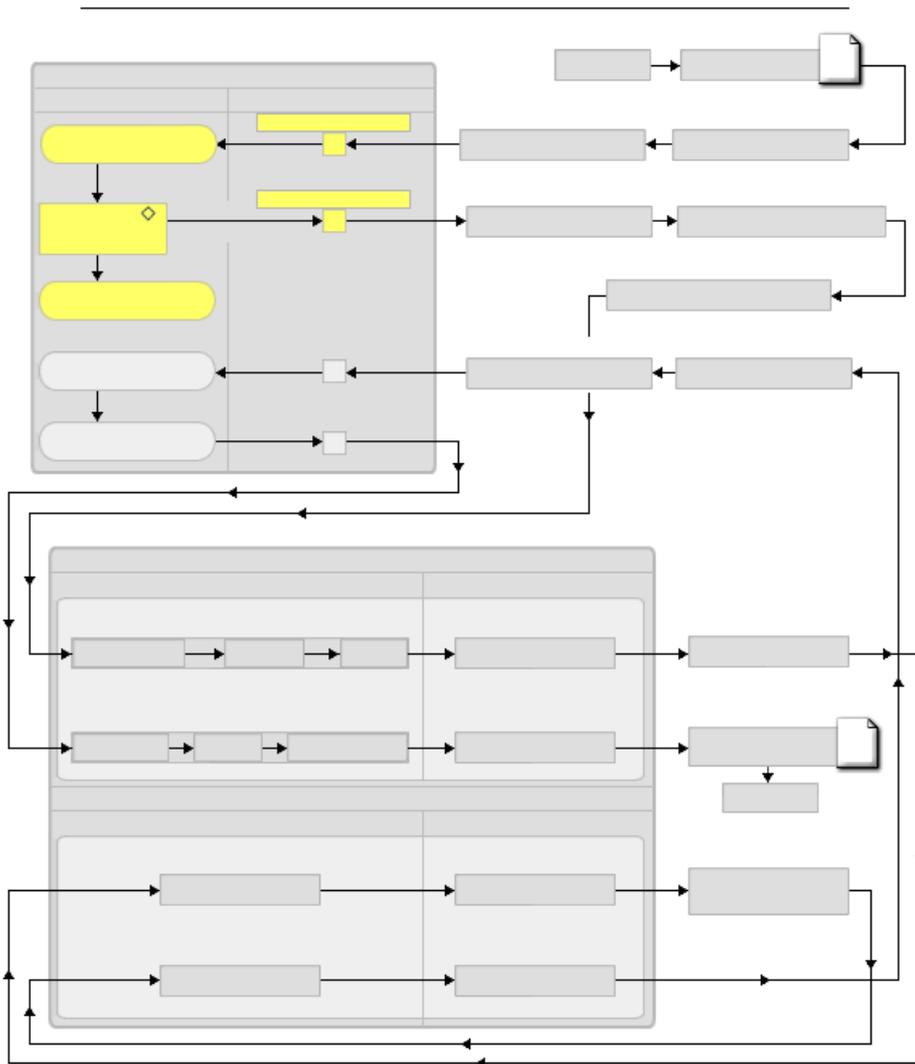
Continue to [Module 1 Summary](#).

# Module 1 Summary

In this module, you accomplished the following:

- Created the [XLANG schedule drawing](#) that described the automated procurement process. For more information, see [Creating XLANG Schedule Drawings](#).
- Connected the [actions](#) in a logical sequence that described the business process. For more information, see [Connect Shapes](#).
- Implemented the business process by connecting actions to [ports](#). For more information, see [Establish the communication flow between an action and a port](#).
- Added a rule to the business process by writing a script expression. For more information, see [Designing Rules](#).
- Defined the data flow for [messages](#). For more information, see [Communication Shapes](#).
- Saved the XLANG schedule drawing and compiled the drawing into the [XLANG schedule](#). For more information, see [Compiling XLANG Schedules](#).
- Ran the XLANG schedule twice to process the purchase order request through BizTalk Server, observing the approval and denial. For more information, see [Running XLANG Schedules](#).

The highlighted areas of the following diagram illustrate the steps you completed in this module.



Send  
Payment  
Receive Invoice

Decision  
PO Req  
> \$1000  
End  
Receive  
PO Req  
XLANG Schedule  
File receive function  
Buyer file directory  
WSC Component  
ASP File  
Message queue  
Yes (Deny)  
No  
(Approve)  
Script Component  
Messaging Port  
Messaging Port  
Channel for Invoice  
Channel for PO  
Channel  
Port to ProElectron  
via HTTP  
Port to Bits, Bytes,  
& Chips via AIC  
Port to Bits, Bytes, & Chips via Local File  
POtoINVAIC  
SubmitProElectronPO  
Port to Bits, Bytes,  
& Chips via HTTP  
Channel for  
Invoice to Payment  
Channel for  
POReq to PO  
Channel  
BizTalk Messaging  
Message Queuing  
Action  
Port  
Data  
Data  
ExecuteTutorial  
PO Request Receive Function at ProElectron  
DropInvoicetoMSMQ  
ReceiveInvoice  
PORequestApproval  
ReceivePOReq  
Message Queuing  
Message queue  
Application  
PO Req  
PO Req  
**Start**  
**Buyer System**  
**BizTalk Messaging Services**  
**Stop**  
AIC  
PO to Invoice  
Seller file  
directory  
Payment  
Seller

Buyer  
Payment  
Invoice

Note: Directional arrows denote flow of data.

Invoice  
Invoice

Map

Map

PO

PO

PO

PO

ASP File

**Seller System**

**BizTalk Orchestration**

Continue to [Module 2: Creating Specifications and Maps](#).

## **Related Topic**

[Designing BizTalk Orchestrations](#)

# Module 2: Creating Specifications and Maps

In this module, you use [BizTalk Editor](#) to create [specifications](#) and [BizTalk Mapper](#) to create [maps](#).

## Objectives

- Create a specification. For more information, see [Creating Specifications](#).
- Add new records and fields to a specification. For more information, see [Add new fields to records](#).
- Create a map. For more information, see [Mapping Data](#).
- Create [links](#) between fields in a map. For more information, see [Creating Links](#).
- Use [functoids](#) to mathematically manipulate values in a map. For more information, see [Understanding Functoids](#).
- Save specifications and maps to the WebDAV repository. For more information, see [Store specifications](#) and [Store maps](#).

Continue to [Using BizTalk Editor](#).

## Related Topic

[Creating Specifications and Mapping Data](#)

# Using BizTalk Editor

You can use [BizTalk Editor](#) to create, edit, and manage [specifications](#).

To use BizTalk Editor to create the payment specification, continue to [Create the payment specification](#).

## **Shortcut**

To use the existing payment specification, continue directly to [Use the existing payment specification](#).

# Use the existing payment specification

1. Copy **PaymentSpec.xml** from **\Program Files\Microsoft BizTalk Server\Tutorial\DocSpecsandMaps** on the BizTalk Server installation drive.
2. Paste the file to **\Program Files\Microsoft BizTalk Server\BizTalkServerRepository\DocSpecs\Microsoft**.

To use BizTalk Editor to create the purchase order request specification, continue to [Create the purchase order request specification](#).

## **Shortcut**

To use the existing purchase order request specification, continue to [Use the existing purchase order request specification](#).

# Create the payment specification

1. On the **Start** menu, point to **Programs**, point to **Microsoft BizTalk Server 2000**, and then click **BizTalk Editor**.
2. On the **File** menu, click **New**.  
The **New Document Specification** dialog box appears.
3. Click the **Blank Specification** icon and click **OK**.
4. In the root node, click **BlankSpecification**.
5. On the **Declaration** tab, double-click the Value field in the Name row, type **Payment**, and then press ENTER.
6. Double-click the Value field in the Model row, click **Open**, and then press ENTER.

Continue to [Add new records to the Payment root node of the payment specification](#).

# Add new records to the Payment root node of the payment specification

1. Right-click the **Payment** root node and click **New Record**.
2. Name this record **PaymentHeader** and press ENTER.
3. Follow steps 1 and 2 to create and name four additional records under the **Payment** root node. These records are all child records of the **Payment** root node. Name the records as follows:
  - **Seller**
  - **Buyer**
  - **Item**
  - **PaymentSummary**

Continue to [Add new records to existing records in the payment specification](#).

# Add new records to existing records in the payment specification

1. Right-click the **Seller** record and click **New Record**.
2. Name the record **Address** and press ENTER.
3. Follow steps 1 and 2 to create child records for the parent records listed in the following table.

Parent record	Child record names
Seller	ContactInfo
Buyer	Address
Buyer	ContactInfo

Continue to [Add new fields to existing records in the payment specification](#).

# Add new fields to existing records in the payment specification

1. Right-click the **PaymentHeader** record and click **New Field**.
2. Name this field **PONumber** and press ENTER.
3. On the **Declaration** tab, double-click the Value field in the Data Type row and click **String**, and then press ENTER.
4. On the **Declaration** tab, double-click the Value field in the Minimum Length row, type **1**, and then press ENTER.
5. On the **Declaration** tab, double-click the Value field in the Maximum Length row, type **22**, and then press ENTER.
6. Follow steps 1 through 5 to create fields for the records or child records listed in the following table. Each record contains multiple fields.

You do not have to create the fields for the buyer because parallel record names exist for the buyer and seller. All records with the same name contain the same record and field information. When you add fields to the Seller/Address or Seller/ContactInfo record, the Buyer/Address or Buyer/ContactInfo record is automatically updated with the same fields.

Parent record	Field name	Data type	Minimum length	Maximum length
PaymentHeader	Date	Date	Not applicable	Not applicable
Seller/Address	Name	String	1	60
	Address1	String	1	55
	Address2	String	1	55
	City	String	2	30
	State	String	2	2
	Zip	String	3	15
	Country	String	2	3
Seller/ContactInfo	Name	String	1	60
	Number	String	1	60
Item	Quantity	Real(r4)	Not applicable	Not applicable
	Price	Real(r4)	Not applicable	Not applicable
	Description	String	1	80
	ExtendedPrice	Real(r4)	Not applicable	Not applicable
PaymentSummary	Total	Real(r4)	Not applicable	Not applicable

Continue to [Store the payment specification to WebDAV](#).



# Use the existing purchase order request specification

1. Copy **POReq.xml** from **\Program Files\Microsoft BizTalk Server\Tutorial\DocSpecsandMaps** on the BizTalk Server installation drive.
2. Paste the file to **\Program Files\Microsoft BizTalk Server\BizTalkServerRepository\DocSpecs\Microsoft**.

Continue to [Using BizTalk Mapper](#).

# Create the purchase order request specification

In this procedure, you create the root node of the purchase order request specification.

To create the root node:

1. On the **File** menu, click **New**.

The **New Document Specification** dialog box appears.

2. Click the **Blank Specification** icon and click **OK**.

3. In the root node, click **BlankSpecification**.

4. On the **Declaration** tab, double-click the Value field in the Name row, type **POReq** and press ENTER.

5. Double-click the Value field in the Model row, click **Open**, and then press ENTER.

Continue to [Add new records to the root node in the purchase order request specification](#).

# Add new records to the root node in the purchase order request specification

1. Right-click the **POReq** root node and click **New Record**.
2. Name this record **Header** and press ENTER.
3. Follow steps 1 and 2 to create and name five additional records under the **POReq** root node. These records are all child records of the **POReq** root node. Name the records as follows:
  - **EmployeeInfo**
  - **BillTo**
  - **ShipTo**
  - **Item**
  - **Total**

Continue to [Add new records to existing records in the purchase order request specification](#).

# Add new records to existing records in the purchase order request specification

1. Right-click the **BillTo** record and click **New Record**.
2. Name the record **Address** and press ENTER.
3. Follow steps 1 and 2 to create and name a child record **Address** for the parent record called **ShipTo**.

Continue to [Add new fields to existing records in the purchase order request specification](#).

# Add new fields to existing records in the purchase order request specification

1. Right-click the **Header** record and click **New Field**.
2. Name this field **Date** and press ENTER.
3. On the **Declaration** tab, double-click the Value field in the Data Type row, click **Date**, and then press ENTER.
4. Right-click the **EmployeeInfo** record and click **New Field**.
5. Name this field **EmpID** and press ENTER.
6. On the **Declaration** tab, double-click the Value field in the Data Type row, click **String**, and then press ENTER.
7. On the **Declaration** tab, double-click the Value field in the Minimum Length row, type **1**, and then press ENTER.
8. On the **Declaration** tab, double-click the Value field in the Maximum Length row, type **60**, and then press ENTER.
9. Follow steps 4 through 8 to create fields for the records or child records listed in the following table. Each record contains multiple fields.

You do not have to create the fields for ShipTo because parallel record names exist for BillTo and ShipTo. All records with the same name contain the same record and field information. When you add fields to the BillTo/Address record, the ShipTo/Address record is automatically updated with the same fields.

Parent record	Field name	Data type	Minimum length	Maximum length
EmployeeInfo	LastName	String	1	30
	FirstName	String	1	30
BillTo/Address	Name	String	1	60
	Address1	String	1	55
	Address2	String	1	55
	City	String	2	30
	State	String	2	2
	Zip	String	3	15
	Country	String	2	3
Item	Quantity	Real(r4)	Not applicable	Not applicable
	Price	Real(r4)	Not applicable	Not applicable
	Description	String	1	80
	UnitofMeasure	String	2	2
	ExtendedPrice	Real(r4)	Not applicable	Not applicable
Total	LinItemTtl	Real(r4)	Not applicable	Not applicable
	QtyTtl	Real(r4)	Not applicable	Not applicable
	POTtl	Real(r4)	Not applicable	Not applicable

Continue to [Save the purchase order request specification](#).



# Using BizTalk Mapper

In this procedure, you use [BizTalk Mapper](#) to create a [map](#) that transforms the data from a [message](#) that conforms to the CommonInvoice [specification](#) into data in a message that conforms to the PaymentSpec specification.

[BizTalk Messaging Services](#) uses a map within a [channel](#) to specify how data in a document of one format is transformed into a document of a different format.

To use BizTalk Mapper to create the map, continue to [Create the InvoiceToPayment map](#).

## **Shortcut**

To use the existing map, continue directly to [Use existing InvoiceToPayment map](#).

# Use existing InvoiceToPayment map

1. Copy **InvoiceToPayment.xml** from **\Program Files\Microsoft BizTalk Server\Tutorial\DocSpecsandMaps** on the BizTalk Server installation drive.
2. Paste the file to **\Program Files\Microsoft BizTalk Server\BizTalkServerRepository\Maps\Microsoft**.

Continue to [Module 3: Configuring BizTalk Messaging Services](#).

# Create the InvoiceToPayment map

1. On the **Start** menu, point to **Programs**, point to **Microsoft BizTalk Server 2000**, and then click **BizTalk Mapper**.
2. On the **File** menu, click **New**.  
The **Select Source Specification Type** dialog box appears.
3. Click the **WebDAV Files** icon and click **OK**.  
The **Retrieve Source Specification** dialog box appears.
4. Double-click the **Microsoft** folder.
5. Click **CommonInvoice.xml** and click **Open**.  
The **Select Destination Specification Type** dialog box appears.
6. Click the **WebDAV Files** icon and click **OK**.
7. Click **PaymentSpec.xml** and click **Open**.

Continue to [Create links between fields](#).

# Create links between fields

In the following procedure, you link fields from the [source specification](#) to fields in the [destination specification](#).

To create links between fields:

1. In the Source Specification tree, expand the **InvoiceHeader** record to display the associated fields.  
For more information, see [Expand tree items](#).
2. In the Destination Specification tree, expand the **PaymentHeader** record to display the associated fields.
3. Drag the **InvoiceHeader/Date** field from the Source Specification tree to the **PaymentHeader/Date** field in the Destination Specification tree. Follow steps 1 through 3 to create links between the fields listed in the following tables.

Source record/field	Destination record/field
InvoiceHeader/Number	PaymentHeader/PONumber

Seller/Address/Name	Seller/Address/Name
Seller/Address/Address1	Seller/Address/Address1
Seller/Address/Address2	Seller/Address/Address2
Seller/Address/City	Seller/Address/City
Seller/Address/State	Seller/Address/State
Seller/Address/PostalCode	Seller/Address/Zip
Seller/Address/Country	Seller/Address/Country

Seller/ContactInfo/ContactName	Seller/ContactInfo/Name
Seller/ContactInfo/ContactNumber	Seller/ContactInfo/Number

Buyer/Address/Name	Buyer/Address/Name
Buyer/Address/Address1	Buyer/Address/Address1
Buyer/Address/Address2	Buyer/Address/Address2
Buyer/Address/City	Buyer/Address/City
Buyer/Address/State	Buyer/Address/State
Buyer/Address/PostalCode	Buyer/Address/Zip
Buyer/Address/Country	Buyer/Address/Country

Buyer/ContactInfo/ContactName	Buyer/ContactInfo/Name
Buyer/ContactInfo/ContactNumber	Buyer/ContactInfo/Number

Item/ItemHeader/Quantity	Item/Quantity
Item/ItemHeader/Price	Item/Price
Item/ItemDescription/Description	Item/Description

InvoiceSummary/InvoiceTotal/Amount	PaymentSummary/Total
------------------------------------	----------------------

Continue to [Use functoids to create links](#).

# Use functoids to create links

In this procedure, you use a [functoid](#) to multiply the Quantity field by the Price field in the [source specification](#), and place this value in the ExtendedPrice field in the [destination specification](#).

To use functoids to create links:

1. On the **View** menu, click **Functoid Palette**.

The **Functoid Palette** appears.

2. Click the **Mathematical** tab, drag the **Multiplication** functoid  to the mapping grid, and then close the **Functoid Palette**.

3. In the Source Specification tree, drag the **Item/ItemHeader/Quantity** field to the functoid.

4. In the Source Specification tree, drag the **Item/ItemHeader/Price** field to the functoid.

5. Drag the **Multiplication** functoid to the **Item/ExtendedPrice** field in the Destination Specification tree.

Continue to [Compile the map](#).

# Compile the map

1. On the **Tools** menu, click **Compile Map**.
2. In the lower pane, click the **Output** tab.

The information on the **Output** tab indicates that an XSL map has been created. Warnings or errors, if any, appear on the **Warnings** tab.

Continue to [Store the map to WebDAV](#).

# Store the map to WebDAV

1. On the **File** menu, click **Store to WebDAV**.

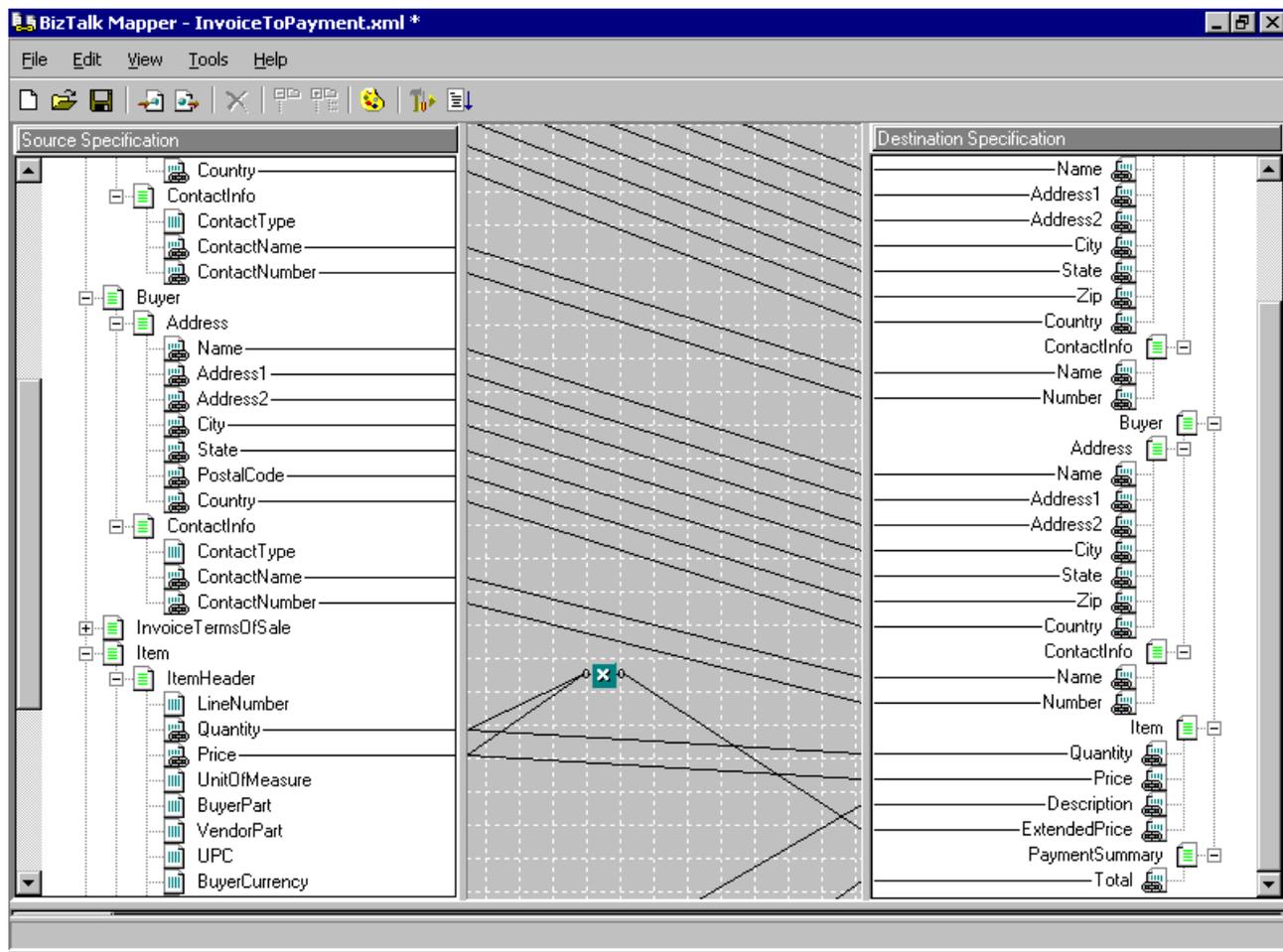
The **Store to WebDAV** dialog box appears.

2. Double-click the **Microsoft** folder.

3. In the **File name** box, type **InvoiceToPayment** and click **Save**.

The map you create should appear similar to the following illustration.

Click the illustration to enlarge or reduce.



1. On the **File** menu, click **Exit** to close the BizTalk Mapper console.

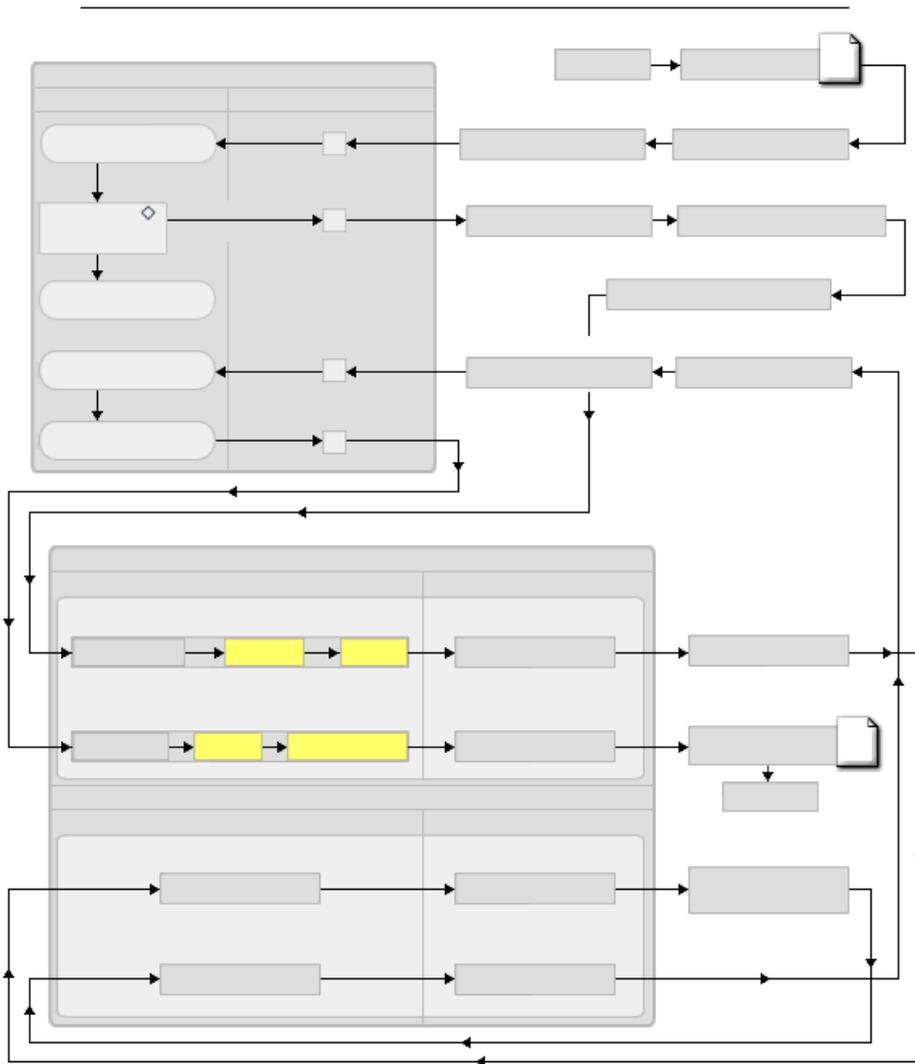
Continue to [Module 2 Summary](#).

# Module 2 Summary

In this module, you accomplished the following:

- Created a specification. For more information, see [Understanding Specifications](#).
- Added new records and fields to a specification. For more information, see [Add new fields to records](#).
- Created a map. For more information, see [Mapping Data](#).
- Created [links](#) between fields in a map. For more information, see [Creating Links](#).
- Used [functoids](#) to mathematically manipulate values in a map. For more information, see [Understanding Functoids](#).
- Saved specifications and maps to the WebDAV repository. For more information, see [Store specifications](#) and [Store maps](#).

The highlighted areas of the following diagram illustrate the steps you completed in this module.



Send  
Payment  
Receive Invoice  
Decision  
PO Req  
>\$1000  
End  
Receive  
PO Req

XLANG Schedule  
File receive function  
Buyer file directory  
WSC Component  
ASP File  
Message queue  
Yes (Deny)  
No  
(Approve)  
Script Component  
Messaging Port  
Messaging Port  
Channel for Invoice  
Channel for PO  
Channel  
Port to ProElectron  
via HTTP  
Port to Bits, Bytes,  
& Chips via AIC  
Port to Bits, Bytes, & Chips via Local File  
POtoINVAIC  
SubmitProElectronPO  
Port to Bits, Bytes,  
& Chips via HTTP  
Channel for  
Invoice to Payment  
Channel for  
POReq to PO  
Channel  
BizTalk Messaging  
Message Queuing  
Action  
Port  
Data  
Data  
ExecuteTutorial  
PO Request Receive Function at ProElectron  
DropInvoicetoMSMQ  
ReceiveInvoice  
PORequestApproval  
ReceivePOReq  
Message Queuing  
Message queue  
Application  
PO Req  
PO Req

**Start**

**Buyer System**

**BizTalk Messaging Services**

**Stop**

AIC

PO to Invoice

Seller file

directory

Payment

Seller

Buyer

Payment

Invoice

Note: Directional arrows denote flow of data.

Invoice

Invoice

Map

Map

PO

PO

PO

PO

ASP File

**Seller System**

**BizTalk Orchestration**

Continue to [Module 3: Configuring BizTalk Messaging Services](#).

## **Related Topic**

[Creating Specifications and Mapping Data](#)

# Module 3: Configuring BizTalk Messaging Services

In this module, you learn how to use [BizTalk Messaging Manager](#) to configure [organizations](#), [channels](#), and [messaging ports](#) for the seller and buyer systems. You also learn how to use [BizTalk Server Administration](#) to configure a [File receive function](#).

## Objectives

- Create [document definitions](#). For more information, see [Create and Manage Document Definitions](#).
- Create organizations. For more information, see [Create and Manage Organizations](#).
- Create messaging ports. For more information, see [Create and Manage Messaging Ports](#) and [Integrating BizTalk Services](#).
- Create channels. For more information, see [Create and Manage Channels](#).
- Use a [map](#) in a channel to transform a document. For more information, see [Mapping Data](#).
- Create receive function. For more information, see [Receive Functions](#).

Continue to [Configuring the Buyer System](#).

## Related Topic

[Using BizTalk Messaging Manager](#)

# Configuring the Buyer System

You use [BizTalk Messaging Manager](#) to create [organizations](#) that represent your [trading partners](#).

To use BizTalk Messaging Manager to configure the buyer system, continue to [Create the organizations for the buyer system](#).

## **Shortcut**

To use a script to configure the buyer system, continue directly to [Configure the buyer system using a configuration script](#).

# Configure the buyer system using a configuration script

This script configures the following:

- A [source organization](#) named **ProElectron on Buyer** on the buyer system.
- A [destination organization](#) named **Bits,Bytes,Chips on Buyer** on the buyer system.
- Four [document definitions](#) that reference [specifications](#) for CommonPO, CommonInvoice, PaymentSpec, and POReq.
- A [messaging port](#) and [channel](#) that define the movement of a purchase order request from the buyer system to the seller system by using an HTTP [transport service](#) to an ASP file on the seller system.
- A messaging port and channel that define the movement of an invoice that has been delivered to the buyer and transform it into a payment document on the seller system.

## ⚠ Caution

- If you used [BizTalk Messaging Manager](#) and [BizTalk Server Administration](#) to configure the buyer system, do not run the configuration script.

To run the script that configures [BizTalk Messaging Services](#) for the buyer system:

1. Browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Setup\MessagingConfigurationScript** on the BizTalk Server installation drive.

2. Double-click **ConfigureBuyer.VBS**.

A message box appears indicating success.

Continue to [Configuring the Seller System](#).

# Create the organizations for the buyer system

## ⚠ Caution

- If you used the configuration script, do not use [BizTalk Messaging Manager](#) and [BizTalk Server Administration](#) to configure the buyer system. Continue to [Configuring the Seller System](#).

1. On the **Start** menu, point to **Programs**, point to **Microsoft BizTalk Server 2000**, and then click **BizTalk Messaging Manager**.
2. If the **BizTalk Messaging Manager** dialog box appears, click **Cancel**.
3. On the **File** menu, point to **New** and click **Organization**.  
The **New Organization** dialog box appears.
4. In the **Organization name** box, type **Bits,Bytes,Chips on Buyer** and click **OK**.
5. Repeat steps 3 and 4, naming the new organization **ProElectron on Buyer**.

Continue to [Create the document definitions for the buyer and seller systems](#).

# Create the document definitions for the buyer and seller systems

In this procedure, you create four [document definitions](#) that reference the document [specifications](#), CommonInvoice, CommonPO, PaymentSpec, and POReq. These document definitions are shared by the buyer and seller systems.

To create the document definitions:

1. On the **File** menu, point to **New** and click **Document Definition**.

The **New Document Definition** dialog box appears.

2. In the **Document definition name** box, type **Purchase Order**.

3. Select the **Document specification** check box and click the **Browse** button.

The **Select a Document Specification from the WebDAV Repository** dialog box appears.

4. Double-click the **Microsoft** folder.

5. Click **CommonPO.xml** and click **Open**.

6. Click **OK** to close the **New Document Definition** dialog box.

7. Repeat steps 1 through 6 to create a new document definition with the following variations:

- Name the new document definition **Invoice**.
- Click the **CommonInvoice.xml** specification from WebDAV.

8. Repeat steps 1 through 6 to create a new document definition with the following variations:

- Name the new document definition **Purchase Order Request**.
- Click the **POReq.xml** specification from WebDAV.

9. Repeat steps 1 through 6 to create a new document definition with the following variations:

- Name the new document definition **Payment**.
- Click the **PaymentSpec.xml** specification from WebDAV.

Continue to [Create a messaging port to Bits, Bytes, & Chips for the buyer system](#).

# Create a messaging port to Bits, Bytes, & Chips for the buyer system

In this procedure, you create a [messaging port](#) for the buyer system. A messaging port defines the destination for a document.

The messaging port that you create has as its [destination organization](#) "Bits,Bytes,Chips on Buyer." This port uses the [HTTP transport service](#) to deliver documents to Bits, Bytes, & Chips.

To create the messaging port:

1. On the **File** menu, point to **New**, point to **Messaging Port**, and then click **To an Organization**.

The New Messaging Port Wizard opens.

2. In the **Name** box, type **Port to Bits,Bytes,Chips via HTTP** and click **Next**.

3. On the **Destination Organization** page, in the **Organization** area, click **Browse**.

The **Select an Organization** dialog box appears.

4. Click **Bits,Bytes,Chips on Buyer** and click **OK**.

5. In the **Primary transport** area, click **Browse**.

The **Primary Transport** dialog box appears.

6. In the **Transport type** list, click **HTTP**.

7. In the **Address** box, after the **http://** prefix, type the *name of your computer*, followed by **/SubmitPO/SubmitProElectronPO.asp**, click **OK**, and then click **Next**.

For example, `http://Computer1/SubmitPO/SubmitProElectronPO.asp`.

To find the name of your computer, complete the following steps:

- a. On the **Start** menu, point to **Settings** and click **Control Panel**.

- b. Double-click **Administrative Tools**.

- c. Double-click **Computer Management**.

The Computer Management console appears.

- d. On the **Action** menu, click **Properties**.

The **Computer Management (Local) Properties** dialog box appears.

- e. Click the **Network Identification** tab.

The name of your computer appears in the **Computer name** field.

8. On the **Envelope Information** page, click **Next**.

9. On the **Security Information** page, verify that the **Create a channel for this messaging port** check box is selected.

10. In the **Channel type** list, click **From an organization** and click **Finish**.

The New Channel Wizard opens.

Continue to [Create a channel from ProElectron for the buyer system](#).

# Create a channel from ProElectron for the buyer system

In this procedure, you create a [channel](#) for the [messaging port](#).

To create the channel:

1. On the **General Information** page, in the **Name** box, type **Channel for POReq to PO** and click **Next**.
2. On the **Source Organization** page, click **Browse**.  
The **Select an Organization** dialog box appears.
3. Click **ProElectron on Buyer**, click **OK**, and then click **Next**.
4. On the **Inbound Document** page, to the right of the **Inbound document definition name** box, click **Browse**.  
The **Select a Document Definition** dialog box appears.
5. Click **Purchase Order Request**, click **OK**, and then click **Next**.
6. On the **Outbound Document** page, to the right of the **Outbound document definition name** box, click **Browse**.  
The **Select a Document Definition** dialog box appears.
7. Click **Purchase Order** and click **OK**.
8. Verify that the **Map inbound document to outbound document** check box is selected.
9. To the right of the **Map reference** box, click **Browse**.  
The **Select a Map from the WebDAV Repository** dialog box appears.
10. Double-click the **Microsoft** folder.
11. Click **POReqtoPO.xml**, click **Open**, and then click **Next**.
12. On the **Document Logging** page, click **Next**.
13. On the **Advanced Configuration** page, click **Finish**.

Continue to [Create a messaging port to Bits, Bytes & Chips within the buyer system](#).

# Create a messaging port to Bits, Bytes, & Chips within the buyer system

In this procedure, the [messaging port](#) sends documents within the buyer system by using the File transport service. The documents are sent internally to the folder specified in the destination address.

To create the messaging port:

1. On the **File** menu, point to **New**, point to **Messaging Port**, and then click **To an Organization**.

The New Messaging Port Wizard opens.

2. In the **Name** box, type **Port to Bits,Bytes,Chips via Local File** and click **Next**.

3. On the **Destination Organization** page, in the **Organization** area, click **Browse**.

The **Select an Organization** dialog box appears.

4. Click **ProElectron on Buyer** and click **OK**.

5. In the **Primary transport** area, click **Browse**.

The **Primary Transport** dialog box appears.

6. In the **Transport type** list, click **File**.

7. In the **Address** box, after **file://**, type **C:\TutorialFiles\Seller\payment%tracking\_id%.xml**. For example, `file://c:\TutorialFiles\Seller\payment%tracking_id%.xml`.

## **Note**

- For the File transport service, the default transport-component setting is to append new files to an existing file in the specified directory. To create a new file with a unique name for each document instance, you must use the following file path format:

```
file://C:\dir\file%tracking_id%.xml
```

8. Click **OK** to close the **Primary Transport** dialog box and click **Next**.

9. On the **Envelope Information** page, click **Next**.

10. On the **Security Information** page, verify that the **Create a channel for this messaging port** check box is selected.

11. In the **Channel type** list, click **From an organization** and click **Finish**.

The New Channel Wizard opens.

Continue to [Create a channel from Bits, Bytes, & Chips for the buyer system](#).

# Create a channel from Bits, Bytes, & Chips for the buyer system

The [channel](#) that you create in this procedure processes invoices that are received from Bits, Bytes, & Chips and uses a [map](#) to transform the invoice into a payment.

To create the channel:

1. On the **General Information** page, in the **Name** box, type **Channel for Invoice To Payment** and click **Next**.

2. On the **Source Organization** page, in the **Organization** area, click **Browse**.

The **Select an Organization** dialog box appears.

3. Click **Bits,Bytes,Chips on Buyer**, click **OK**, and then click **Next**.

4. On the **Inbound Document** page, to the right of the **Inbound document definition name** box, click **Browse**.

The **Select a Document Definition** dialog box appears.

5. Click **Invoice**, click **OK**, and then click **Next**.

6. On the **Outbound Document** page, to the right of the **Outbound document definition name** box, click **Browse**.

The **Select a Document Definition** dialog box appears.

7. Click **Payment** and click **OK**.

8. Verify that the **Map inbound document to outbound document** check box is selected.

9. To the right of the **Map reference** box, click **Browse**.

The **Select a Map from the WebDAV Repository** dialog box appears.

10. Double-click the **Microsoft** folder.

11. Click **InvoicetoPayment.xml**, click **Open**, and then click **Next**.

12. On the **Document Logging** page, click **Next**.

13. On the **Advanced Configuration** page, click **Finish**.

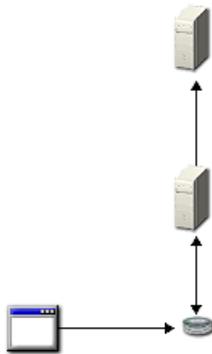
14. On the **File** menu, click **Exit** to close BizTalk Messaging Manager.

Continue to [Create a File receive function for the buyer system](#).

# Create a File receive function for the buyer system

In this procedure, you create a File [receive function](#) that retrieves the buyer's purchase order request from a local file directory and submits it to [BizTalk Messaging Services](#).

The following illustration shows the relationship between the sending business application, the file system, and the receive function.



Sending business application  
File system  
BizTalk Server File receive function  
BizTalk Server  
**Submit**

To create the File receive function:

1. On the **Start** menu, point to **Programs**, point to **Microsoft BizTalk Server 2000**, and then click **BizTalk Server Administration**.
2. Expand **Microsoft BizTalk Server 2000**, expand **BizTalk Server Group**, and then click **Receive Functions**.
3. On the **Action** menu, point to **New** and click **File Receive Function**.  
The **Add a File Receive Function** dialog box appears.
4. In the **Name** box, type **PORequest Receive Function at ProElectron**.
5. In the **Server on which the receive function will run** box, click the name of a server in the BizTalk server group.
6. In the **File types to poll for** box, type **\*.xml**.
7. In the **Polling location** box, type **C:\TutorialFiles\Buyer**.
8. Click the **Advanced** button.  
The **Advanced Receive Function Options** dialog box appears.
9. In the **Channel name** list, click **Channel for POReq to PO** and click **OK**.
10. Click **OK** to close the **Add a File Receive Function** dialog box.
11. Close BizTalk Server Administration.

Continue to [Configuring the Seller System](#).

# Configuring the Seller System

You use [BizTalk Messaging Manager](#) to create [organizations](#) that represent your [trading partners](#).

Continue to [Create the organizations for the seller system](#).

# Create the organizations for the seller system

1. On the **Start** menu, point to **Programs**, point to **Microsoft BizTalk Server 2000**, and then click **BizTalk Messaging Manager**.
2. If the **BizTalk Messaging Manager** dialog box appears, click **Cancel**.
3. On the **File** menu, point to **New** and click **Organization**.  
The **New Organization** dialog box appears.
4. On the **General** tab, in the **Organization name** box, type **Bits,Bytes,Chips on Seller** and click **OK**.
5. Repeat steps 3 and 4, naming the new organization **ProElectron on Seller** and click **OK**.

Continue to [Create a messaging port to Bits, Bytes, & Chips for the seller system](#).

# Create a messaging port to Bits, Bytes, & Chips for the seller system

In this procedure, you create a [messaging port](#) that defines the destination for a document. This messaging port sends documents internally within the seller system using an application integration component (AIC) as the [transport service](#).

An AIC typically serves as an integration point between BizTalk Server 2000 and a back-end application. In this scenario, the AIC functions both as the integration point and as a hypothetical back-end application. The messaging port passes the purchase order to the AIC. The AIC transforms the purchase order into an invoice and submits it to a channel in [BizTalk Messaging Services](#) on the seller system.

The purchase order could also be transformed into an invoice by using a [map](#) in the channel, but for simplicity the AIC performs this function in this scenario.

To create the messaging port:

1. On the **File** menu, point to **New**, point to **Messaging Port**, and then click **To an Organization**.

The New Messaging Port Wizard opens.

2. In the **Name** box, type **Port to Bits,Bytes,Chips via AIC** and click **Next**.

3. On the **Destination Organization** page, in the **Organization** area, click **Browse**.

The **Select an Organization** dialog box appears.

4. Click **Bits,Bytes,Chips on Seller** and click **OK**.

5. In the **Primary transport** area, click **Browse**.

The **Primary Transport** dialog box appears.

6. In the **Transport type** list, verify that **Application Integration Component** is selected and click **Browse**.

The **Select a Component** dialog box appears.

7. Click **POToINVAIC ConvertPOToInvoice** and click **OK**.

8. Click **OK** to close the **Primary Transport** dialog box and click **Next**.

9. On the **Envelope Information** page, click **Next**.

10. On the **Security Information** page, verify that the **Create a channel for this messaging port** check box is selected.

11. In the **Channel type** list, click **From an organization** and click **Finish**.

The New Channel Wizard opens.

Continue to [Create a channel from ProElectron for the seller system](#).

# Create a channel from ProElectron for the seller system

In this procedure, you create a [channel](#) for the [messaging port](#).

The channel that you create has as its [source organization](#) "ProElectron on Seller," which represents the buyer on the seller system. This channel processes purchase orders that are received from ProElectron. Because both the inbound and the outbound [document definitions](#) are identical, no [map](#) reference is required for this channel and no document transformation occurs.

To create the channel:

1. On the **General Information** page, in the **Name** box, type **Channel for PO** and click **Next**.
2. On the **Source Organization** page, in the **Organization** area, click **Browse**.  
The **Select an Organization** dialog box appears.
3. Click **ProElectron on Seller**, click **OK**, and then click **Next**.
4. On the **Inbound Document** page, to the right of the **Inbound document definition name** box, click **Browse**.  
The **Select a Document Definition** dialog box appears.
5. Click **Purchase Order**, click **OK**, and then click **Next**.
6. On the **Outbound Document** page, to the right of the **Outbound document definition name** box, click **Browse**.  
The **Select a Document Definition** dialog box appears.
7. Click **Purchase Order**, click **OK**, and then click **Next**.
8. On the **Document Logging** page, click **Next**.
9. On the **Advanced Configuration** page, click **Finish**.

Continue to [Create a messaging port to ProElectron for the seller system](#).

# Create a messaging port to ProElectron for the seller system

The [destination organization](#) that you create for the [messaging port](#) is named "ProElectron on Seller," which represents the buyer on the seller system. This messaging port sends documents from the seller system to the buyer system. This port uses the HTTP transport service to deliver documents to the specified buyer address.

When this port is used, an invoice [message](#) is sent to an ASP page on the buyer system that then posts the invoice to a message queue on the buyer system.

To create the messaging port:

1. On the **File** menu, point to **New**, point to **Messaging Port**, and then click **To an Organization**.

The New Messaging Port Wizard opens.

2. On the **General Information** page, in the **Name** box, type **Port to ProElectron via HTTP** and click **Next**.

3. On the **Destination Organization** page, in the **Organization** area, click **Browse**.

The **Select an Organization** dialog box appears.

4. Click **ProElectron on Seller** and click **OK**.

5. In the **Primary transport** area, click **Browse**.

The **Primary Transport** dialog box appears.

6. In the **Transport type** list, click **HTTP**.

7. In the **Address** box, after the **http://** prefix, type the **name of your computer**, followed by **/InvoiceToQueue/DropInvoicetoMSMQ.asp**, click **OK**, and then click **Next**.

For example, `http://Computer1/InvoiceToQueue/DropInvoicetoMSMQ.asp`.

To find the name of your computer, complete the following steps:

- a. On the **Start** menu, point to **Settings** and click **Control Panel**.

- b. Double-click **Administrative Tools**.

- c. Double-click **Computer Management**.

The Computer Management console appears.

- d. On the **Action** menu, click **Properties**.

The **Computer Management (Local) Properties** dialog box appears.

- e. Click the **Network Identification** tab.

The name of your computer appears in the **Computer name** field.

8. On the **Envelope Information** page, click **Next**.

9. On the **Security Information** page, verify that the **Create a channel for this messaging port** check box is selected.

10. In the **Channel type** list, click **From an organization** and click **Finish**.

The New Channel Wizard opens.

Continue to [Create a channel from Bits, Bytes, & Chips for the seller system](#).

# Create a channel from Bits, Bytes, & Chips for the seller system

The [channel](#) that you create in this procedure has as its [source organization](#) "Bits,Bytes,Chips on Seller." This channel processes invoices that are sent to ProElectron on the seller system according to the rules of the [messaging port](#), **Port to ProElectron via HTTP**.

To create the channel:

1. On the **General Information** page, in the **Name** box, type **Channel for Invoice** and click **Next**.
2. On the **Source Organization** page, in the **Organization** area, click **Browse**.  
The **Select an Organization** dialog box appears.
3. Click **Bits,Bytes,Chips on Seller**, click **OK**, and then click **Next**.
4. On the **Inbound Document** page, to the right of the **Inbound document definition name** box, click **Browse**.  
The **Select a Document Definition** dialog box appears.
5. Click **Invoice**, click **OK**, and then click **Next**.
6. On the **Outbound Document** page, click **Browse**.  
The **Select a Document Definition** dialog box appears.
7. Click **Invoice**, click **OK**, and then click **Next**.
8. On the **Document Logging** page, click **Next**.
9. On the **Advanced Configuration** page, click **Finish**.
10. On the **File** menu, click **Exit** to close BizTalk Messaging Manager.

Continue to [Module 3 Summary](#).



Receive  
PO Req  
XLANG Schedule  
File receive function  
Buyer file directory  
WSC Component  
ASP File  
Message queue  
Yes (Deny)  
No  
(Approve)  
Script Component  
Messaging Port  
Messaging Port  
Channel for Invoice  
Channel for PO  
Channel  
Port to ProElectron  
via HTTP  
Port to Bits, Bytes,  
& Chips via AIC  
Port to Bits, Bytes, & Chips via Local File  
POtoINVAIC  
SubmitProElectronPO  
Port to Bits, Bytes,  
& Chips via HTTP  
Channel for  
Invoice to Payment  
Channel for  
POReq to PO  
Channel  
BizTalk Messaging  
Message Queuing  
Action  
Port  
Data  
Data  
ExecuteTutorial  
PO Request Receive Function at ProElectron  
DropInvoicetoMSMQ  
ReceiveInvoice  
PORequestApproval  
ReceivePOReq  
Message Queuing  
Message queue  
Application  
PO Req  
PO Req  
**Start**  
**Buyer System**  
**BizTalk Messaging Services**  
**Stop**  
AIC  
PO to Invoice  
Seller file  
directory  
Payment  
Seller  
Buyer  
Payment  
Invoice  
Note: Directional arrows denote flow of data.

Invoice  
Invoice  
Map  
Map  
PO  
PO  
PO  
PO

ASP File

**Seller System**

**BizTalk Orchestration**

Continue to [Module 4: Completing the XLANG Schedule](#).

## **Related Topic**

[Using BizTalk Messaging Manager](#)

# Module 4: Completing the XLANG Schedule

In this module, you use [BizTalk Orchestration Designer](#) to implement a [port](#) by using [BizTalk Messaging Services](#). You then compile and run the completed [XLANG schedule](#).

## Objectives

- Add invoice and payment actions. For more information, see [Add Shapes](#).
- Implement a port using BizTalk Messaging Services. For more information, see [Using the BizTalk Messaging Shape](#).
- Compile and run the completed XLANG schedule. For more information, see [Compiling XLANG Schedules](#) and [Running XLANG Schedules](#).

To complete the XLANG schedule, continue to [Add invoice and payment actions](#).

## Shortcut

To use the existing XLANG schedule, continue directly to [Run the completed XLANG schedule](#).

## Related Topic

[Designing BizTalk Orchestrations](#)

# Add invoice and payment actions

In this procedure, you add an action that receives the invoice from the buyer and another action that sends the payment [message](#) to the seller.

To create the actions:

1. On the **Start** menu, point to **Programs**, point to **Microsoft BizTalk Server 2000**, and then click **BizTalk Orchestration Designer**.

2. On the **File** menu, click **Open**.

The **Open XLANG Schedule Drawing** dialog box appears.

3. If you are using the existing **Buyer1.skv** file, in the **Open XLANG Schedule Drawing** dialog box, browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Schedule\Solution** on the BizTalk Server installation drive, click **Buyer1.skv**, and then click **Open**.

If you created the **Buyer1.skv** file in Module 1, browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Schedule\Lab** on the BizTalk Server installation drive, click **Buyer1.skv**, and then click **Open**.

## **Note**

There will be a blank drawing, in BizTalk Orchestration Designer, which you can close.

4. Highlight the connection between the **Write PO Request to File** action and the **End** action and press DELETE.
5. Move the **End** action down to allow room for two new action shapes.
6. On the **Business Process** page, drag the **Action** shape from the **Flowchart** stencil to the left side of the **Separator** bar. Position the shape directly below the **Write PO Request to File** action.
7. Right-click the **Action** shape and click **Properties**.  
The **Action Properties** dialog box appears.
8. In the **Name** box, type **Receive Invoice** and click **OK**.
9. On the **Business Process** page, drag the **Action** shape from the **Flowchart** stencil to the left side of the **Separator** bar. Position the shape directly below the **Receive Invoice** action.
10. Right-click the **Action** shape and click **Properties**.  
The **Action Properties** dialog box appears.
11. In the **Name** box, type **Send Payment** and click **OK**.
12. Connect the **Write PO Request to File** action to the **Receive Invoice** action.
13. Connect the **Receive Invoice** action to the **Send Payment** action.
14. Connect the **Send Payment** action to the **End** shape.

Continue to [Bind the Message Queuing service to receive an invoice](#).

# Bind the Message Queuing service to receive an invoice

The **Receive Invoice** action is bound to a message queuing service. When an invoice is dropped to the invoice message queue that is defined by the service, it activates the **Receive Invoice** action.

To bind the message queuing service:

1. On the **Business Process** page, drag the **Message Queuing** shape from the **Implementation** stencil to the right side of the **Separator** bar that divides the two sides of the drawing. Position the **Message Queuing** shape so that it is horizontally aligned with the **Receive Invoice** action.

The Message Queuing Binding Wizard opens.

2. On the **Welcome to the Message Queuing Binding Wizard** page, verify that **Create a new port** is selected.
3. In the **Create a new port** box, type **ReceiveInvoice** and click **Next**.
4. On the **Static or Dynamic Queue Information** page, verify that **Static queue** is selected and click **Next**.
5. On the **Queue Information** page, click **Use a known queue for all instances**.
6. In the **Enter the queue name** box, type **.\private\$\ReceiveInvoice** and click **Next**.
7. On the **Advanced Port Properties** page, click **Finish**.

Continue to [Define message properties for the Receive Invoice service](#).

# Define message properties for the Receive Invoice service

1. Select the **Receive Invoice** action and drag the control handle on the right of the **Receive Invoice** action to the **ReceiveInvoice** port.

The XML Communication Wizard opens.

2. On the **Welcome to the XML Communication Wizard** page, click **Receive** and click **Next**.
3. On the **Message Information** page, verify that **Create a new message** is selected.
4. In the **Message name** box, type **CommonInvoice** and click **Next**.
5. On the **XML Translation Information** page, verify that **Receive XML messages from the queue** is selected and click **Next**.
6. On the **Message Type Information** page, in the **Message type** box, type **CommonInvoice** and click **Next**.
7. On the **Message Specification Information** page, click **Finish**.

Continue to [Bind the BizTalk Messaging Services](#).

# Bind the BizTalk Messaging Services

In this procedure, you bind a BizTalk Messaging Service to the [XLANG schedule drawing](#) and name the [channel](#) that is being used.

To bind the BizTalk Messaging Services:

1. On the **Business Process** page, drag the **BizTalk Messaging** shape from the **Implementation** stencil to the right side of the **Separator** bar that divides the two sides of the drawing. Position the **BizTalk Messaging** shape so that it is horizontally aligned with the **Send Payment** action.

The BizTalk Messaging Binding Wizard opens.

2. On the **Welcome to the BizTalk Messaging Binding Wizard** page, verify that **Create a new port** is selected.
3. In the **Create a new port** box, type **SendPayment** and click **Next**.
4. On the **Communication Direction** page, verify that **Send** is selected and click **Next**.
5. On the **Static or Dynamic Channel Information** page, verify that **Static channel** is selected.
6. In the **Enter the name of a known, pre-existing channel** box, type **Channel for Invoice To Payment** and click **Finish**.

Note that **Channel for Invoice To Payment** was created in Module 3.

Continue to [Define message properties for the BizTalk Messaging Services](#).

# Define message properties for the BizTalk Messaging Services

1. Drag the control handle on the right of the **Send Payment** action to the **SendPayment** port.  
The XML Communication Wizard opens.
2. On the **Welcome to the XML Communication Wizard** page, click **Next**.
3. On the **Message Information** page, click **Add a reference to an existing message**, click **CommonInvoice**, and then click **Next**.
4. On the **XML Translation Information** page, verify that **Send XML messages to the queue** is selected and click **Next**.
5. On the **Message Type Information** page, click **Next**.
6. On the **Message Specification Information** page, click **Finish**.

Continue to [Save the completed XLANG schedule drawing](#).

# Save the completed XLANG schedule drawing

1. On the **File** menu, click **Save As**.

The **Save XLANG Schedule Drawing As** dialog box appears.

2. Browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Schedule\Lab**.

3. In the **File name** box, type **Buyer2** and click **Save**.

Continue to [Compile the completed XLANG schedule](#).

# Compile the completed XLANG schedule

1. On the **File** menu, click **Make XLANG Buyer2.skk**.

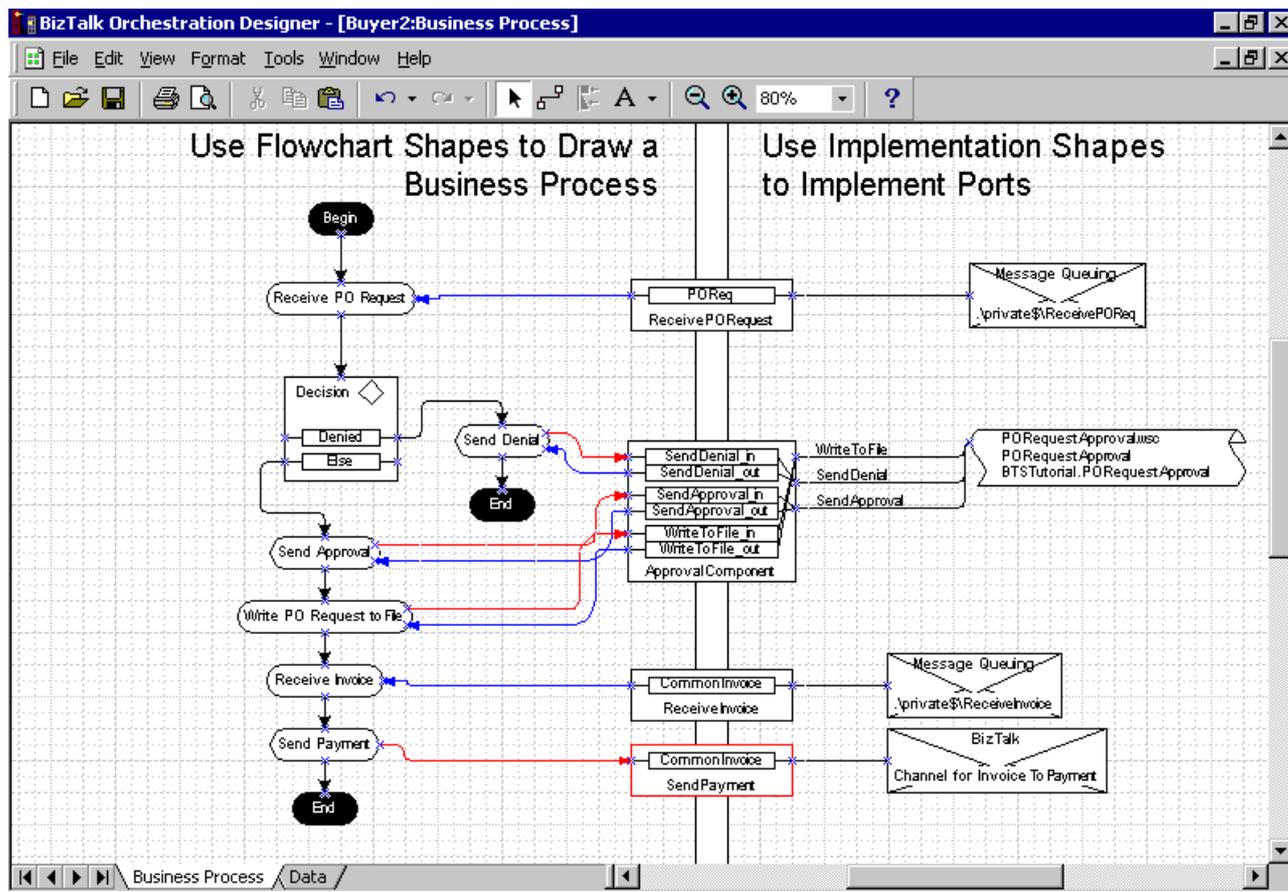
The **Save XLANG Schedule to** dialog box appears.

2. Browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Schedule\Lab** on the BizTalk Server installation drive.

3. In the **File name** box, type **Buyer2** and click **Save**.

Your completed XLANG schedule drawing should appear similar to the following illustration.

Click the illustration to enlarge or reduce.



1. On the **File** menu, click **Exit**.

Continue to [Run the completed XLANG schedule](#).

# Run the completed XLANG schedule

You have completed the configuration of a business-to-business automated procurement solution. You can now run the application that activates the [XLANG schedule](#).

In this procedure, you use an application that activates the XLANG schedule and delivers a purchase order request to the message queue that the schedule is monitoring.

To run the XLANG schedule:

1. Browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Schedule\Solution** on the BizTalk Server installation drive.
2. Double-click **ExecuteTutorial.exe**. This application is used to activate the XLANG schedule by means of a [moniker](#).  
The **ExecuteTutorial** application opens.
3. Click **Browse for Schedule**.

## Shortcut

If you are using the existing XLANG schedule, browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Schedule\Solution** and continue to step 5.

1. If you created the **Buyer2** XLANG schedule, browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Schedule\Lab** on the BizTalk Server installation drive.
2. Click the **Buyer2.skx** XLANG schedule and click **Open**.
3. Click **Browse for Data File** and browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Schedule\SampleData** on the BizTalk Server installation drive.
4. Click **POReqAccept.xml** and click **Open**.
5. Click **Start XLANG Schedule**.

Because its total is less than \$1000, the purchase order request is approved. A message box appears, notifying you that the application passed data to the [XLANG Scheduler Engine](#). At this point, the application is finished. A second message box notifies you that the purchase order request has been approved. Click **OK** to close the dialog boxes.

6. Click **End** to close the **ExecuteTutorial** application.
7. Browse to **C:\TutorialFiles\Seller**.

You see the payment file. The file name is **PaymentXXXX.xml**, where **XXXX** is representative of a unique set of numbers. Double-click the file to open it in Microsoft Internet Explorer.

You have submitted a purchase order request. The purchase order request was approved and ended in a payment [message](#) being posted to the seller system.

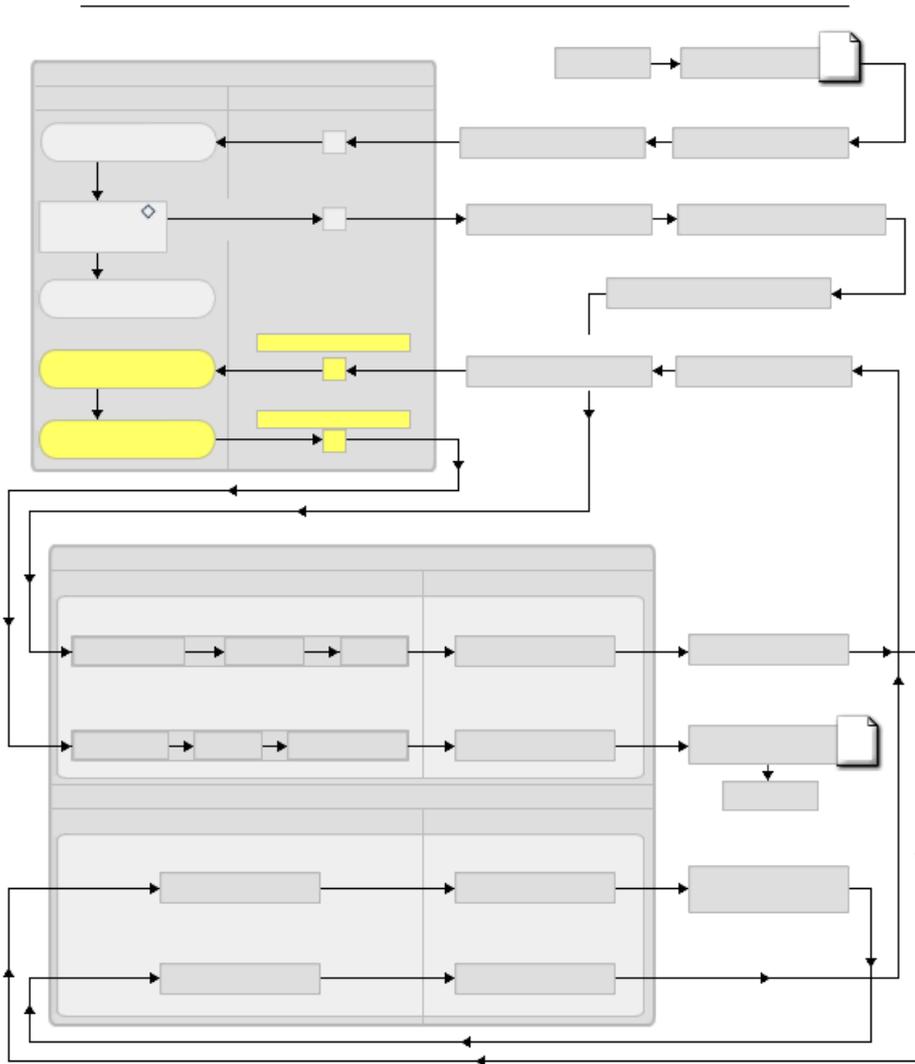
Continue to [Module 4 Summary](#).

# Module 4 Summary

In this module, you accomplished the following:

- Added invoice and payment actions. For more information, see [Connect Shapes](#).
- Implemented a [messaging port](#) using [BizTalk Messaging Services](#). For more information about implementing a messaging port using BizTalk Messaging Services, see [Using the BizTalk Messaging Shape](#).
- Compiled and ran the completed [XLANG schedule](#). For more information, see [Compiling XLANG Schedules](#) and [Running XLANG Schedules](#).

The highlighted areas of the following diagram illustrate the steps you completed in this module.



- Send Payment
- Receive Invoice
- Decision
- PO Req
- >\$1000
- End
- Receive PO Req
- XLANG Schedule
- File receive function
- Buyer file directory
- WSC Component
- ASP File

Message queue  
Yes (Deny)  
No  
(Approve)  
Script Component  
Messaging Port  
Messaging Port  
Channel for Invoice  
Channel for PO  
Channel  
Port to ProElectron  
via HTTP  
Port to Bits, Bytes,  
& Chips via AIC  
Port to Bits, Bytes, & Chips via Local File  
POtoINVAIC  
SubmitProElectronPO  
Port to Bits, Bytes,  
& Chips via HTTP  
Channel for  
Invoice to Payment  
Channel for  
POReq to PO  
Channel  
BizTalk Messaging  
Message Queuing  
Action  
Port  
Data  
Data  
ExecuteTutorial  
PO Request Receive Function at ProElectron  
DropInvoicetoMSMQ  
ReceiveInvoice  
PORequestApproval  
ReceivePOReq  
Message Queuing  
Message queue  
Application  
PO Req  
PO Req  
**Start**  
**Buyer System**  
**BizTalk Messaging Services**  
**Stop**  
AIC  
PO to Invoice  
Seller file  
directory  
Payment  
Seller  
Buyer  
Payment  
Invoice  
Note: Directional arrows denote flow of data.  
Invoice  
Invoice  
Map  
Map  
PO  
PO  
PO

PO  
ASP File  
**Seller System**  
**BizTalk Orchestration**

Continue to [Tutorial Summary](#).

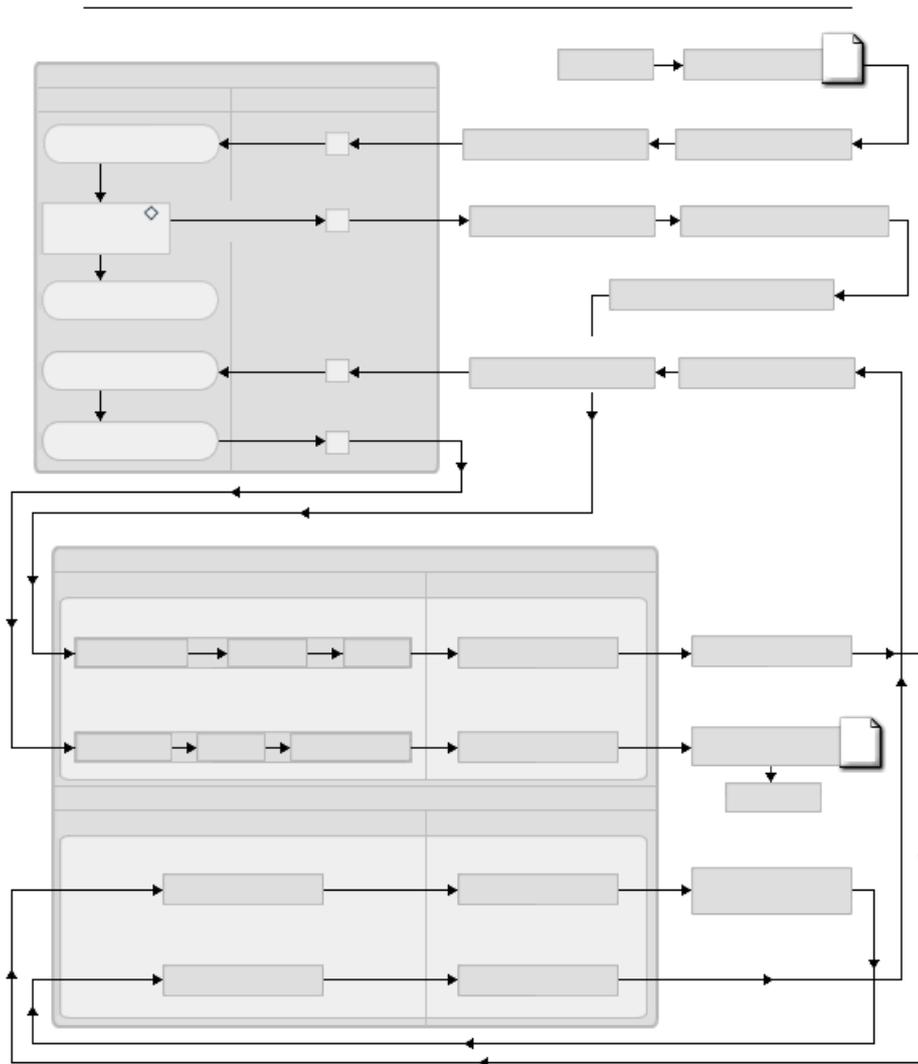
### **Related Topic**

[Designing BizTalk Orchestrations](#)

# Tutorial Summary

In this tutorial you configured Microsoft BizTalk Server 2000 to establish and run a business-to-business automated procurement process.

The following illustration shows the flow of data through BizTalk Server while running the Buyer2 XLANG schedule at the end of Module 4.



- Send
- Payment
- Receive Invoice
- Decision
- PO Req
- > \$1000
- End
- Receive
- PO Req
- XLANG Schedule
- File receive function
- Buyer file directory
- WSC Component
- ASP File
- Message queue
- Yes (Deny)
- No
- (Approve)
- Script Component
- Messaging Port
- Messaging Port

Channel for Invoice  
Channel for PO  
Channel  
Port to ProElectron  
via HTTP  
Port to Bits, Bytes,  
& Chips via AIC  
Port to Bits, Bytes, & Chips via Local File  
POtoINVAIC  
SubmitProElectronPO  
Port to Bits, Bytes,  
& Chips via HTTP  
Channel for  
Invoice to Payment  
Channel for  
POReq to PO  
Channel  
BizTalk Messaging  
Message Queuing  
Action  
Port  
Data  
Data  
ExecuteTutorial  
PO Request Receive Function at ProElectron  
DropInvoicetoMSMQ  
ReceiveInvoice  
PORequestApproval  
ReceivePOReq  
Message Queuing  
Message queue  
Application  
PO Req  
PO Req

**Start**

**Buyer System**

**BizTalk Messaging Services**

**Stop**

AIC  
PO to Invoice  
Seller file  
directory  
Payment  
Seller  
Buyer  
Payment  
Invoice  
Note: Directional arrows denote flow of data.  
Invoice  
Invoice  
Map  
Map  
PO  
PO  
PO  
PO  
ASP File

**Seller System**

**BizTalk Orchestration**

You learned how BizTalk Server components and services work together to integrate loosely coupled, long-running business processes, both within and between businesses.

You also learned how to:

- Use [BizTalk Orchestration Designer](#) to model business processes by creating an [XLANG schedule drawing](#).
- Use [BizTalk Messaging Manager](#) to create [organizations](#), [channels](#), [messaging ports](#), and [document definitions](#).
- Use [BizTalk Editor](#) to create [specifications](#).
- Use [BizTalk Mapper](#) to create [maps](#).
- Compile and run an [XLANG schedule](#).

You have successfully completed the tutorial. For detailed information about creating the auxiliary components used in this tutorial, go to [Appendix: Creating Auxiliary Components](#).

# Appendix: Creating Auxiliary Components

In this appendix, you learn how to create auxiliary components that work in conjunction with Microsoft BizTalk Server 2000 to process data. Each component and its role and relationship in the process are described in detail.

Specifically, you create:

- An application on the buyer system that activates an [XLANG schedule](#) and sends a purchase order request to a message queue that is bound to the XLANG schedule that controls the flow of messages through the buyer system.
- A Windows Script Component (WSC) on the buyer system that accepts the approval or denial status for a purchase order request from the XLANG schedule. If approved, the WSC displays an approval message and writes the purchase order request to a local file directory, where the BizTalk Messaging Services for the buyer system retrieves it. If denied, the WSC displays a denial message and the schedule ends.
- An application integration component (AIC) on the seller system that generates an invoice based on the data in the purchase order from the buyer.
- An ASP file on the buyer system that submits a purchase order to BizTalk Server.
- An ASP file on the seller system that delivers an invoice to a message queue.

Continue to [Creating the Application](#).

# Creating the Application

In this topic, you will create an application that activates an [XLANG schedule](#) and then drops a PO request to a queue. You use this application to test the implementation of the XLANG schedule and the configuration of [BizTalk Messaging Manager](#).

To complete the lab, modify the code in the sample project. You will focus on the code that is specific to activating the XLANG schedule and to dropping a [message](#) into a queue. Ancillary code is provided for you.

Each step corresponds to a segment of code. Look for comment blocks similar to the following example:

```
.....  
'To Do: Step A  
.....
```

Following this code are lines that have question marks (?) indicating placeholders where you must make a change. Replace the question marks with the proper code to complete the lab. For example:

```
Private g_MSMTxDisp As ?
```

should be changed to:

```
Private g_MSMTxDisp As MSMQ MSMQTransactionDispenser
```

## Note

- These lines of code have been commented out. Be sure to remove the comment mark at the beginning of the lines to which you make changes. The steps are not necessarily in order in the code window.

Continue to [Open the application](#).

# Open the application

Browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Schedule\Lab** on the BizTalk Server installation directory.

Double-click **ExecuteTutorial.vbp**.

Continue to [Add the required references to the application](#).

# Add the required references to the application

In this procedure, you enable the application to implement a number of dynamic link libraries (DLLs) required to use Message Queuing, XML, and the scripting run time.

1. On the **Project** menu, click **References**.

2. Select **Microsoft Message Queue 2.0 Object Library**.

The full path for this type library is `\WINNT\System32\msxml2.dll`.

3. Select **Microsoft Scripting Runtime**.

The full path for this DLL is `\WINNT\System32\ScrUn.dll`.

4. Select **Microsoft XML, v 3.0**.

The full path for this DLL is `\WINNT\System32\msxml3.dll`.

5. Click **OK**.

Continue to [Define and initialize the Message Queue objects](#).

# Define and initialize the Message Queue objects

In this procedure, you add the code to use the chosen type libraries. The lettered steps in the following list correspond to the lettered steps in the code provided.

1. In the Project window, expand **Forms**, and then click **Form1 (ExecuteTutorial.frm)**.
2. On the **View** menu, click **Code**.
3. In the **General Declarations** section at step A in the code, create the **Message Queue** objects as shown in the following example:

```
Private g_MSMTxDisp As MSMQ.MSMQTransactionDispenser  
Private g_MSMQQueue As MSMQ.MSMQQueue  
Private g_MSMQInfo As MSMQ.MSMQQueueInfo
```

4. In the **Form\_Load** event section at Step B in the code, initialize the **Message Queue** objects as shown in the following example.

```
Set g_MSMQInfo = CreateObject("MSMQ.MSMQQueueInfo")  
Set g_MSMTxDisp = CreateObject("MSMQ.MSMQTransactionDispenser")
```

Continue to [Add code to place data on a queue](#).

# Add code to place data on a queue

In this procedure, you add a new subroutine called ExecuteMSMQ. This routine is called by the **cmdRunSked\_Click** event. You add the code to call this subroutine in the following procedure.

- Place the following code at the end of the code window in your project at step C:

```
Public Sub ExecuteMSMQ(ByVal strQueuePath As String, DataToQueue As String)
    Dim QueueMsg As New MSMQMessage

    Dim strData As String
    Dim fSend As Boolean
    Dim txt As TextStream
    Dim mybyte() As Byte

    g_MSMQInfo.FormatName = strQueuePath
    Set g_MSMQQueue = g_MSMQInfo.Open(MQ_SEND_ACCESS, MQ_DENY_NONE)
    mybyte = StrConv(DataToQueue, vbFromUnicode)
    QueueMsg.Body = DataToQueue

    Set MSMQTx = g_MSMTxDisp.BeginTransaction
    QueueMsg.send g_MSMQQueue, MSMQTx
    MSMQTx.Commit

    Set QueueMsg = Nothing
    Set MSMQTx = Nothing

End Sub
```

Continue to [Add code to activate the XLANG schedule and call ExecuteMSMQ](#).

# Add code to activate the XLANG schedule and call ExecuteMSMQ

In this procedure, you will add code to the **cmdRunSked\_Click** event that activates the [XLANG schedule](#) and calls code that sends a [message](#) to a queue.

1. In the **cmdRunSked\_Click** event section at step D of the code, call `ExecuteMSMQ`, as shown in the following code:

```
ExecuteMSMQ "DIRECT=OS:.\private$\ReceivePoReq", objfs.OpenTextFile(txtData.Text, ForReading).ReadAll
```

2. In the **cmdRunSked\_Click** event section at step E of the code, call **GetObject** to instantiate the XLANG schedule by moniker, as shown in the following code:

```
Set SendPAQ = GetObject(txtSked.Text)
```

Continue to [Save and compile the application](#).

# Save and compile the application

In this procedure, you save and compile the application.

1. On the **File** menu, click **Save Project**.
2. On the **File** menu, click **Make ExecuteTutorial.exe**.
3. In the **Make Project** dialog box, browse to the folder **\Program Files\Microsoft BizTalk Server\Tutorial\Schedule\Lab** on the BizTalk Server installation directory and click **OK**.

You can now run the application to execute the buyer schedule in Modules 1 and 4.

Continue to [Creating the Windows Script Component](#).

# Creating the Windows Script Component

In this topic, you create a Windows Script Component (WSC) that is bound to the [XLANG schedule](#). The purpose of the WSC is to display a message box with approval or denial status of the purchase order request, and to optionally write the purchase order request to a local file if it is approved.

Continue to [Add script to register the component](#).

# Add script to register the component

In this procedure, you add script that allows the component to be registered to the file.

1. On the **Start** menu, point to **Programs**, point to **Accessories**, and then click **Notepad**.
2. Add the following script:

```
<?xml version="1.0"?>
<component>
<?component error="true" debug="true"?>
<registration
  description="PORequestApproval"
  progid="BTSTutorial.PORequestApproval"
  version="1.00"
  classid="{2938621b-40fc-48e2-827c-bed74e21a538}"
>
</registration>
```

Because you are using the same class ID as the preconfigured component, the old component is overwritten in the registry.

Continue to [Add script to implement the methods](#).

# Add script to implement the methods

This component exposes three methods. The first method sends an approval status in the form of a message box that is displayed to the user. The second method sends a denial status, also in the form of a message box that is displayed to the user. The [decision](#) as to which method is called is dictated by the decision rule in the [XLANG schedule](#) drawing. The last method writes the purchase order to a local file if the purchase order request has been approved.

1. Add the three method signatures to the end of the file:

```
<public>
  <method name="SendApproval">
    <PARAMETER name="Document"/>
  </method>
  <method name="SendDenial">
    <PARAMETER name="Document"/>
  </method>
  <method name="WriteToFile">
    <PARAMETER name="Document"/>
    <PARAMETER name="FileName"/>
  </method>
</public>
```

2. Add the script that implements the methods to the end of the file:

```
<implements type="Behavior" id="Behavior"/>

<script language="VBScript">
<![CDATA[

function SendApproval(Document)
  MsgBox "Scheduler Engine Accepted document :" + vbcrLf + + vbcrLf + Document, 0, "Document Approval Re
ceived"
end function

function SendDenial(Document)
  MsgBox "Scheduler Engine Denied document :" + vbcrLf + + vbcrLf + Document, 0, "Document Denied"
end function

function WriteToFile(Document, FileName)
  dim objFileSys, strTimeNow

  if FileName = "" then
    FileName = "c:\TutorialFiles\Buyer\POReq*.xml"
  end if

  'Generate a Unique Number used to generate unique files using a mask
  strTimeNow = left(Replace(CStr(FormatDateTime(Now(), 3)),":",""), 6)

  'Create File System Object
  Set objFileSys = CreateObject("Scripting.FileSystemObject")

  'Create the Specified file, write the document data and close
  Set filestream = objFileSys.CreateTextFile(Replace(FileName, "*", strTimeNow), False)
  filestream.writeline Document
  filestream.close
end function

]]>
</script>
```

</component>

3. On the **File** menu, click **Save As**.

The **Save As** dialog box appears.

4. Browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Components\POReqApproval\Lab** on the BizTalk Server installation drive.
5. In the **File name** box, type **PoRequestApproval.wsc**.
6. In the **Save as type** box, click **All Files** and click **Save**.
7. Close Notepad.
8. Browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Components\POReqApproval\Lab** on the BizTalk Server installation drive.
9. Right-click **PoRequestApproval.wsc** and click **Register**.

This component can be substituted for the preconfigured WSC used in Module 1. To use this component, you must remove the existing WSC [binding](#) from the schedule and then create a new WSC binding that points to your component.

Continue to [Delete the WSC component](#).

# Delete the WSC component

In this procedure, you delete the WSC component from the Buyer2 XLANG schedule drawing. You can rebind the component you have created.

1. On the **Start** menu, point to **Programs**, point to **Microsoft BizTalk Server 2000**, and then click **BizTalk Orchestration Designer**.
2. To use the drawing created in Module 4, open the **Buyer2.skv** file located at **\Program Files\Microsoft BizTalk Server\Tutorial\Schedule\Lab** on the BizTalk Server installation drive.  
  
To use the existing Buyer2 drawing, open the **Buyer2.skv** file located at **\Program Files\Microsoft BizTalk Server\Tutorial\Schedule\Solution** on the BizTalk Server installation drive.
3. Click the **Script Component** shape and press DELETE.
4. Click the **Data** tab.
5. Delete the **SendApproval**, **SendDenial**, and **WritetoFile** messages.

You are now ready to use your WSC component in the schedule. Do the following:

1. Implement a port to **Buyer2.skv** by using your WSC component. For an example of how to do this, see [Implement a port by using a script component](#). However, use your component instead of the component in the procedure.
2. Define the method communication for the [port implementation](#). For an example of how to do this, see [Define message properties for the script component](#).
3. Define the data flow for the port. For an example of how to do this, see [Define the data flow](#).
4. Save the XLANG file. For an example of how to do this, see [Save the XLANG schedule drawing](#).
5. To test your component, run the **ExecuteTutorial** application located at **\Program Files\Microsoft BizTalk Server\Tutorial\Schedule\Solution** on the BizTalk Server installation drive.

Continue to [Creating the Application Integration Component \(AIC\)](#).

# Creating the Application Integration Component (AIC)

In this topic, you create a new application integration component called POTOINVAIC that converts a purchase order document into an invoice document using the MSXML DOM.

Continue to [Create an ActiveX DLL project for the AIC](#).

# Create an ActiveX DLL project for the AIC

1. Start Microsoft Visual Basic 6.0.
2. In the **New Project** dialog box, click the **New** tab, click **ActiveX DLL**, and then click **Open**.  
This creates a new project for your component, called Project 1.
3. To rename both the project and the control to something more meaningful, in the project tree window, click **Project1**. In the properties window, change the **(Name)** property to **POtoInvAIC**.
4. In the project tree window, click **Class1(Class1)**. In the properties window, change the **(Name)** property to **ConvertPOtoInvoice**.

Continue to [Add the required references for the AIC](#).

# Add the required references for the AIC

In this procedure you enable the component to implement a number of interfaces required by BizTalk Server 2000.

1. On the **Project** menu, click **References**.

2. Click **Microsoft BizTalk Server Application Interface Components 1.0 Type Library**.

The full path for this type library is \Program Files\Microsoft BizTalk Server\btscomplib.tlb.

3. Select **Microsoft BizTalk Server Interchange 1.0 Type Library**.

The full path for this type library is \Program Files\Microsoft BizTalk Server\cisapi.tlb.

4. Select Microsoft Scripting Runtime.

The full path for this DLL is \WINNT\System32\Scrun.dll. Use this library to create a file system object and open a text stream that is used to write a purchase order to disk.

5. Select Microsoft XML, v 3.0.

The full path for this DLL is \WINNT\System32\msxml3.dll.

6. Click **OK**.

Continue to [Implement the required interface](#).

# Implement the required interface

For BizTalk Server to recognize a component as an AIC, it must implement one of two interfaces. For the purposes of this tutorial, you implement the **IBTSAppIntegration** interface.

1. In the **Project** window, click the **ConvertPOtoInvoice** class module.
2. On the **View** menu, click **Code**.
3. Add the following line of code at the top of the code window to ensure that all variables are explicitly declared to minimize simple errors:

```
Option Explicit
```

4. Implement the required interface by adding the following line of code after the **Option Explicit** statement:

```
Implements IBTSAppIntegration
```

Continue to [Define and initialize the class objects](#).

# Define and initialize the class objects

In this procedure, you add code to define the MSXML class objects to create the XML files using the DOM. You will create a string variable that points to the project style sheet that converts a purchase order into an invoice.

1. Place the following code beneath the **Implements IBTSAppIntegration** statement:

```
'Class Object Defines
Private m_DOMCommonPO As MSXML2.DOMDocument
Private m_DOMStylesheet As MSXML2.DOMDocument
Private m_objSubmit As BTSInterchangeLib.Interchange

'Embedded Project Stylesheet to Convert CommonPO to CommonInvoice
Private m_strStylesheet As String
```

2. Add the following code, to initialize the XML DOM objects that will convert the purchase order to an invoice, as well as the **Interchange** object that submits the final invoice document to BizTalk Server:

```
Private Sub Class_Initialize()
'Create DOM/Interchange Objects
    Set m_DOMCommonPO = New MSXML2.DOMDocument
    Set m_DOMStylesheet = New MSXML2.DOMDocument
    Set m_objSubmit = New BTSInterchangeLib.Interchange

'Configure DOM Objects to be Synchronous
    m_DOMCommonPO.async = False
    m_DOMStylesheet.async = False

'Fill Stylesheet Embedded String
    m_strStylesheet = m_strStylesheet + ""

End Sub
```

Continue to [Implement the interface method](#).

# Implement the interface method

The **ProcessMessage** method of the **IBTSAppIntegration** interface takes an incoming XML common purchase order document transmitted from BizTalk Server and performs a translation on the data to convert it into an XML common invoice document. The common invoice document is then submitted back to BizTalk Server. The intent is to simulate a back end system that receives purchase orders and eventually returns an invoice for those purchase orders.

1. Add the function definition and dimension variables, as in the following code:

```
Private Function IBTSAppIntegration_ProcessMessage( _  
    ByVal bstrDocument As String) As String  
    Dim bstrInvoiceDocument As String  
    Dim objScripting As New Scripting.FileSystemObject  
'Initialize ProcessMessage to null  
    IBTSAppIntegration_ProcessMessage = ""
```

2. Add the code to load the received data into a DOM object and validate that it is in the proper format by adding the following code beneath the **IBTSAppIntegration\_ProcessMessage** statement:

```
m_DOMCommonPO.loadXML bstrDocument  
  
If m_DOMCommonPO.parseError.errorCode <> 0 Then 'The data was not valid XML  
'Raised errors are not caught in the component, and will be sent back to 'BizTalk Server  
    Err.Raise m_DOMCommonPO.parseError.errorCode, "AICSample.ConvertPOToInvoice Component", _  
        "The provided document was not valid XML and could not be processed because:" + _  
        vbCrLf + vbCrLf + m_DOMCommonPO.parseError.reason + vbCrLf + " on line: " + _  
        CStr(m_DOMCommonPO.parseError.Line) + vbCrLf + "at position: " + _  
        CStr(m_DOMCommonPO.parseError.linepos)  
End If
```

3. Add code to use the resource file that contains XSL code that converts a purchase order to an invoice by adding the following code beneath the **End If** statement:

```
If m_strStylesheet = "" Then  
    m_strStylesheet = StrConv(LoadResData(101, "CUSTOM"), vbUnicode)  
  
End If  
m_DOMStylesheet.loadXML m_strStylesheet  
bstrInvoiceDocument = m_DOMCommonPO.transformNode(m_DOMStylesheet)  
  
If bstrInvoiceDocument = "" Then ' Mapping Failed Raise an Error  
    Err.Raise vbObjectError + 100, "AICSample.ConvertPOToInvoice Component", _  
        "The provided CommonPO document could not be translated into a Common Invoice " + _  
        "as the map produced blank output."  
End If
```

4. Add code to submit the invoice document to BizTalk Messaging Services by adding the following code beneath the **End If** statement:

```
IBTSAppIntegration_ProcessMessage = m_objSubmit.Submit(BIZTALK_OPENNESS_TYPE_NOTOPEN, bstrInvoiceDocument,  
, , "Bits,Bytes,Chips on Seller", , "ProElectron on Seller")  
  
End Function
```

The submit call returns the submission ID, which in this case is not used.

Continue to [Terminate the class objects](#).

# Terminate the class objects

To ensure that all objects are released from memory when the class terminates, add this code to the end of your project:

```
Private Sub Class_Terminate()  
    Set m_DOMCommonPO = Nothing  
    Set m_DOMStylesheet = Nothing  
    Set m_objSubmit = Nothing  
End Sub
```

Continue to [Create the resource file](#).

# Create the resource file

In this procedure, you add the resource file that contains the XSL for transforming a purchase order into an invoice.

1. On the **Add-Ins** menu, click **Add-In Manager**.

The **Add-In Manager** dialog box appears.

2. Click **VB 6 Resource Editor**.

3. In the **Load Behaviour** area, click **Loaded/Unloaded** to load the resource editor, click **Load on Startup**, and then click **OK**.

4. On the **Tools** menu, click **Resource Editor**.

5. Click the **Add Custom Resource** icon on the tool bar.

The **Open a Custom Resource** dialog box appears.

6. Browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Components\POtoInvoice\Lab**, click **POtoINVAIC.txt**, and then click **Open**.

## Caution

- Make sure that the ID of your resource is 101. By default, the first resource you create will have an ID of 101, but this number increments by one if you change the resource. To change the resource ID to 101, right-click the resource ID and click **Properties**. In the ID box, type 101.

1. Click the **Save** icon.

The **Save Resource File As** dialog box appears.

2. Browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Components\POtoInvoice\Lab**.

3. In the **File name** box, type **POtoInvAICLab.RES** and click **Save**.

4. Close the Resource Editor.

Continue to [Build the component and set binary compatibility](#).

# Build the component and set binary compatibility

Since you are creating a new component, you must build the component at this point, and then set the project properties for binary compatibility with the newly created DLL. Binary compatibility ensures that each time you compile the DLL you do not generate a new globally unique identifier (GUID) for the object.

1. On the **File** menu, click **Save Project As**.

The **Save File As** dialog box appears.

2. Browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Components\POToInvoice\Lab** on the BizTalk Server installation directory.

3. In the **File name** box, type **ConvertPOtoInvoice.cls** and click **Save**.

The **Save Project As** dialog box appears.

4. Browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Components\POToInvoice\Lab** on the BizTalk Server installation directory.

5. In the **File name** box, type **POTtoInvAICLab** and click **Save**.

6. On the File menu, click Make POTtoInvAICLab.dll.

The **Make Project** dialog box appears.

7. Browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Components\POtoInvoice\Lab** on the BizTalk Server installation directory and click OK.

8. On the **Project** menu, click **POTtoInvAICLab Properties**.

9. Click the **Component** tab.

10. Click **Binary Compatibility**.

11. Click **Browse** ([...]) and browse to **\Program Files\Microsoft BizTalk Server\Tutorial\POtoInvoice\Lab** on the BizTalk Server installation drive.

12. Click **POTtoInvAICLab.dll** and click **Open**.

13. Click **OK**.

Continue to [Register the AIC](#).

# Register the AIC

In this procedure, you register the AIC so that it can be recognized by BizTalk Server. BizTalk Server looks at the list of registered COM components and then queries those components to determine which of these implement either the **IBTSAppIntegration** interface or the **IPipelineComponent** interface. All components that meet this criteria are displayed in a list of components in [BizTalk Messaging Manager](#).

1. On the **Start** menu, point to **Settings** and click **Control Panel**.

2. Double-click **Administrative Tools**.

3. Double-click **Component Services**.

The Component Services console appears.

4. In the console tree, expand **Component Services, Computers, My Computer**, and then click **COM+ Applications**.

5. Right-click **COM+ Applications**, point to **New**, and then click **Application**.

The COM Application Install Wizard opens.

6. On the **Welcome to the COM Application Install Wizard** page, click **Next**.

7. On the **Install or Create a New Application** page, click **Create an empty application**.

8. In the **Enter a name for the new application** box, type **POToInvAICLab**.

9. In the **Activation type** area, click **Server application** and click **Next**.

10. In the **Account** area, click **Interactive User-the current logged on user** and click **Next**.

## **Note**

- The current logged on user must be a member of the BizTalk Server Administrators group and must remain logged on while running this scenario.

11. Click **Finish**.

12. In the console tree, expand **COM+ Applications** and expand the new package you created, called **POToInvAICLab**.

13. Click **Components**.

14. Browse to **\Program Files\Microsoft BizTalk Server\Tutorial\Components\POtoInvoice\Lab** on the BizTalk Server installation drive.

15. Drag the **POToInvAICLab.dll** to the **Components** folder in **Component Services**.

16. Close **Component Services**.

You can now reconfigure the port to use the new AIC, using the following steps:

1. Open BizTalk Messaging Manager.

2. In the **Search** area, click **Messaging ports** and click **Search now**.

3. In the **Messaging port name** list, double-click **Port to Bits,Bytes,Chips via AIC**.

4. On the **General Information** page, click **Next**.

5. On the **Destination Organization** page, in the **Primary transport** area, click **Browse**.

The **Primary Transport** dialog box appears.

6. Click **Browse**.
7. In the **Available Components** list, click **POToInvAICLab ConvertPOtoInvoice** and click **OK**.
8. Click **OK** to close the **Primary Transport** dialog box, and then click **Finish**.
9. Test your component by running the **ExecuteTutorial** application located at **\Program Files\Microsoft BizTalk Server\Tutorial\Schedule\Solution** on the BizTalk Server installation drive.

# BizTalk Server 2000 Administration

BizTalk Server 2000 administration is divided into the following parts:

## Installing BizTalk Server 2000

This section provides information about installing Microsoft BizTalk Server 2000. The information includes guidelines for hardware and software requirements, and instructions for complete, tools, and custom installations. For more information about installing Microsoft BizTalk Server 2000, see [Installing BizTalk Server 2000](#).

## Understanding Security

This section covers how businesses can securely exchange data with trading partners when they use BizTalk Server 2000. BizTalk Server takes advantage of the security features included in Microsoft Windows 2000 and Microsoft SQL Server. For more information about security and BizTalk Server 2000, see [Understanding Security](#).

## Enhancing Performance and Scalability

The section provides information about enhancing performance of BizTalk Server and creating scalable solutions. Issues and guidelines covered in this section include identifying potential bottlenecks, addressing latency, and managing databases. For more information about creating a scalable, high-performance solution, see [Enhancing Performance and Scalability](#).

## Administering Servers and Applications

This section covers how to administer servers and XLANG-related applications. Topics covered in this section include how to centrally configure and manage servers in multiple groups, configuring and managing receive functions, managing the Shared Queue, and managing the COM+ applications that host XLANG schedules. For more information about administering servers and applications, see [Administering Servers and Applications](#).

## Tracking Documents

This section provides information about how to track interchanges and documents processed by BizTalk Server 2000. Topics covered in this section include how to create queries and advanced queries, how to save interchange, document, and custom-search data, and understanding interchange record, document record, and receipt results. For more information about tracking documents, see [Tracking Documents](#).

### Note

- The file path to open various Microsoft Windows 2000 services and tools, such as Component Services or Administrative Tools, is different depending on whether you are using a computer that is operating on Windows 2000 Server or Windows 2000 Professional. For more information, see [Open Component Services](#).

In Microsoft BizTalk Server 2000 Help, the paths to these services and tools have been documented based on a Windows 2000 Server installation. If you are using Windows 2000 Professional, refer to Windows 2000 Professional Help for more information about how to open the service or tool that you are interested in using.

## Related Topic

[BizTalk Server Administration Model](#)

# Installing BizTalk Server 2000

Welcome to the Microsoft® BizTalk™ Server 2000 installation guide. It provides guidelines for hardware and software requirements, and complete instructions for the following installation options:

- [Complete Installation](#). Enables you to perform a complete installation of BizTalk Server 2000 that includes all BizTalk services and tools.
- [Tools Installation](#). Enables you to perform a complete installation of the BizTalk Server 2000 tools, including BizTalk Orchestration Designer, BizTalk Document Tracking, BizTalk Editor, and BizTalk Mapper. The BizTalk Server 2000 parser, serializer, correlation, and run-time binaries are not installed.
- [Custom Installation](#). Enables you to perform a custom installation that includes any combination of BizTalk Server 2000 tools and services.

This guide includes the following topics:

- [Hardware and Software Requirements](#)
- [Installation Instructions](#)

# Hardware and Software Requirements

This section includes information about minimum hardware requirements and configuration options to install Microsoft BizTalk Server 2000. It also includes installation instructions for the prerequisite software needed for BizTalk Server 2000.

The following topics are covered in this section:

- [Minimum Hardware Requirements](#)
- [Recommended Configuration to Optimize Performance for Document Messaging](#)
- [Software Requirements](#)
- [Windows 2000 Prerequisites](#)
- [Installing SQL Server 7.0 or SQL Server 2000](#)
- [Installing Visio 2000 SR-1A](#)

# Minimum Hardware Requirements

The minimum hardware requirements for a basic installation of Microsoft BizTalk Server 2000 include:

- An Intel® Pentium 300 processor.
- 128 megabytes (MB) of RAM.
- A 6-gigabyte (GB) hard disk.
- A CD-ROM drive.
- A network adapter card.
- A VGA or Super VGA monitor.
- A Microsoft Mouse or compatible pointing device.

# Recommended Configuration to Optimize Performance for Document Messaging

The following are guidelines to help you achieve optimal performance with BizTalk Server 2000:

- Build a three-computer configuration. In a three-computer configuration, install BizTalk Server 2000 on one computer, install the Tracking database on a second computer, and install the BizTalk Messaging Management and Shared Queue databases on a third computer.
- For a configuration in which a single server is performing all processing and receiving functions, configure two BizTalk Server 2000 servers, one dedicated to processing and the other dedicated to receiving.
- Install the Tracking database on a computer with multiple physical hard disks. The optimal configuration includes four SCSI II hard disks and a SCSI II controller. The first hard disk is dedicated to document-tracking storage. The second hard disk is dedicated to the Microsoft Windows® 2000 system page file. The third hard disk is dedicated to the Tracking transaction log. The fourth hard disk is dedicated to the Distributed Transaction Coordinator (DTC) log.
- Create multiple instances of receive functions to monitor multiple receive locations for documents that are to be processed. To balance the load of documents across several computers, locate the receive functions on separate computers. Each monitoring location must be unique and must have a separate receive function. To avoid overloading any individual receive function, the business application that sends documents must evenly distribute the documents to all the monitoring locations.

## ◆ Important

- For more information about performance enhancements to BizTalk Server, see [Enhancing Performance and Scalability](#).

# Software Requirements

The following table lists the software that must be installed to run Microsoft BizTalk Server 2000.

Complete installation	Tools installation	Custom installation
Microsoft Windows 2000 Server, Microsoft Windows 2000 Advanced Server, or Microsoft Windows 2000 Professional with the NTFS file system and Service Pack 1	Microsoft Windows 2000 Server, Microsoft Windows 2000 Advanced Server, or Microsoft Windows 2000 Professional with the NTFS file system and Service Pack 1	Microsoft Windows 2000 Server, Microsoft Windows 2000 Advanced Server, or Microsoft Windows 2000 Professional with the NTFS file system and Service Pack 1
Microsoft Internet Explorer 5 or later	Microsoft Internet Explorer 5 or later	Microsoft Internet Explorer 5 or later
Microsoft Visio® 2000 SR-1A or later (required to use BizTalk Orchestration Designer)	Microsoft Visio 2000 SR-1A or later (required to use BizTalk Orchestration Designer)	Microsoft Visio 2000 SR-1A or later (required to use BizTalk Orchestration Designer)
Microsoft SQL Server™ 7.0 and SQL Server Service Pack 2 (SP2) or SQL Server 2000		Microsoft SQL Server 7.0 and SQL Server Service Pack 2 (SP2)* or SQL Server 2000
<p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• BizTalk Messaging Manager will not run unless the World Wide Web Publishing Service is running.</li> </ul>	<p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• BizTalk Messaging Manager will not run unless the World Wide Web Publishing Service is running.</li> </ul>	<p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• BizTalk Messaging Manager will not run unless the World Wide Web Publishing Service is running.</li> </ul>

\*Microsoft SQL Server is required for a custom installation only if you install the core BizTalk Services. It is not required for a tools installation.

# Windows 2000 Prerequisites

Microsoft Windows 2000 Server, Microsoft Windows 2000 Advanced Server, and Microsoft Windows 2000 Professional with Service Pack 1 are the recommended platforms for all Microsoft BizTalk Server 2000 installations. Because BizTalk Server 2000 has been thoroughly tested on Windows 2000 with Service Pack 1, this installation guide includes detailed information regarding the necessary configuration of Windows 2000 Server, Windows 2000 Advanced Server, and Windows 2000 Professional in combination with BizTalk Server. After installing Windows 2000 Server, Advanced Server, or Professional with Service Pack 1, you must add a Windows 2000 user account to the Administrators group before you install any software. For more information, see [Add a user account to the Administrators group](#). You must also install Message Queuing. For more information, see [Install Message Queuing](#). If your installation does not include Service Pack 1, you must install it. For more information, see [Install Windows 2000 Service Pack 1](#).

The following topics are covered in this section:

- [Install Windows 2000 Server, Advanced Server, or Professional with Service Pack 1](#)
- [Install Windows 2000 Service Pack 1](#)
- [Install Message Queuing](#)
- [Install Internet Information Services \(IIS\)](#)
- [Configure IIS settings for BizTalk Server 2000](#)
- [Setting Up User Accounts](#)

# Install Windows 2000 Server, Advanced Server, or Professional with Service Pack 1

If Windows 2000 Server, Advanced Server, or Professional is installed on your computer, be sure that you meet the requirements listed in step 2 below.

1. Insert the Windows 2000 Server, Advanced Server, or Professional with Service Pack 1 compact disc into the appropriate drive.  
  
If you do not have a version of Windows 2000 that includes Service Pack 1, first install Windows 2000 and then install Service Pack 1 separately.
2. Run the Windows 2000 Server, Advanced Server, or Professional with Service Pack 1 Setup program and follow the online instructions.

Observe the following requirements:

- Use only alphanumeric characters in the computer name because Microsoft SQL Server supports a limited character set in server computer names.
- Format the partition with the Windows NT File System (NTFS).
- On the **Windows 2000 Components** page, in the **Components** list, click **Message Queuing Services**. If you are installing Windows 2000 Professional, click **Internet Information Services (IIS)** and click **Next**. On the **Message Queuing Type** page, click **Next**.
- On the **Network Settings** page, click **Typical settings**.

## Notes

- After installing Windows 2000 Server, Advanced Server, or Professional with Service Pack 1, you must add a Windows 2000 user account to the Administrators group before you install any software. For more information, see [Add a user account to the Administrators group](#).
- If you did not select **Message Queuing Services** on the **Windows 2000 Components** page during setup, you must install it. For more information, see [Install Message Queuing](#).
- If you did not select **Internet Information Services (IIS)** on the **Windows 2000 Components** page during setup of Windows 2000 Professional, you must install it. For more information, see [Install Internet Information Services \(IIS\)](#).
- If your installation did not include Service Pack 1, you must install it. For more information, see [Install Windows 2000 Service Pack 1](#).
- The Windows 2000 Server, Advanced Server, or Professional partition must be converted to the most recent version of NTFS. Setup automatically performs this update if the existing file system is the old version of NTFS. If the existing partition is FAT or FAT32, you are given the option to convert to NTFS. When prompted, choose NTFS.

# Install Windows 2000 Service Pack 1

1. Insert the Windows 2000 Service Pack 1 compact disc into the appropriate drive.

You can also go to the downloads area of the Microsoft Windows 2000 Web site ([www.microsoft.com/windows2000/](http://www.microsoft.com/windows2000/)) to download Windows 2000 Service Pack 1 or to order the compact disc.

2. Run the Windows 2000 Service Pack 1 Setup program and follow the online instructions.

# Install Message Queuing

1. On the **Start** menu, point to **Settings** and click **Control Panel**.
2. Double-click **Add/Remove Programs**.  
The **Add/Remove Programs** dialog box appears.
3. Click **Add/Remove Windows Components**.  
The Windows Components Wizard opens.
4. In the **Components** list, select the **Message Queuing Services** check box and click **Next**.
5. On the **Message Queuing Type** page, click **Next**.
6. Click **Finish** to close the wizard.

## **Note**

- Accept the default settings when installing the Message Queuing Services component.

# Install Internet Information Services (IIS)

1. On the **Start** menu, point to **Settings** and click **Control Panel**.

2. Double-click **Add/Remove Programs**.

The **Add/Remove Programs** dialog box appears.

3. Click **Add/Remove Windows Components**.

The Windows Components Wizard opens.

4. In the **Components** list, select the **Internet Information Services (IIS)** check box and click **Next**.

5. Click **Finish** to close the wizard.

# Configure IIS settings for BizTalk Server 2000

To avoid problems accessing and saving specifications to the BizTalk Server 2000 repository, you must turn off the **Enable authoring** option in Internet Information Services (IIS).

1. On the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Internet Services Manager**.
2. Click the expand indicator (+) for the local IIS server.
3. Right-click **Default Web Site** and click **Properties**.  
The **Default Web Site Properties** dialog box appears.
4. Click the **Server Extensions** tab and clear the **Enable authoring** check box.

# Setting Up User Accounts

If you are installing BizTalk Server 2000 for development purposes only, you can create a standard user account. For more information, see [Add a user account to the Administrators group](#). If you are installing BizTalk Server 2000 for production purposes, you should create a service account. For more information, see [Create a service account](#). If you do not create a service account, which is a regular user account with specific properties, BizTalk Server 2000 is automatically configured for the interactive user (the user who is currently logged on during the setup process). If BizTalk Server 2000 is set up with an interactive user, it fails if the specified user logs off from the server.

The following topics are covered in this section:

- [Add a user account to the Administrators group](#)
- [Create a service account](#)

# Add a user account to the Administrators group

1. Log on as Administrator.

On the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Computer Management**.

2. In the console tree, click the expand indicator (+) for **Local Users and Groups**.

3. Click **Groups** and, in the details pane, double-click **Administrators**.

The **Administrators Properties** dialog box appears.

4. Click **Add**.

5. In the **Look in** box, click your computer name.

6. In the text box that contains the text <<*Type names separated by semicolons or choose from list*>>, delete the text and type your domain and user name in the following format:

***Domain\user name***

7. Click **OK**.

8. If necessary, on the **Enter Network Password** page, complete the following:

- In the **Connect as** box, type your domain and user name in the following format:

***Domain\user name***

- In the **Password** box, type the password associated with your user name and click **OK**.

- Click **OK** to close the **Administrators Properties** dialog box.

9. If necessary, restart the computer and log on using your domain user account.

# Create a service account

1. Log on as Administrator.
2. On the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Computer Management**.  
The **Computer Management** dialog box appears.
3. In the console tree, click the expand indicator (+) for **System Tools** and click **Local Users and Groups**.
4. Click **Users**, right-click anywhere in the details pane, and then click **New User**.  
The **New User** dialog box appears.
5. In the **User name** box, type a name for the service account; in the **Password** box, type a password; and then type the same password in the **Confirm password** box.
6. Clear the **User must change password at next logon** check box, click **Create**, and then click **Close**.
7. Close the **Computer Management** window.
8. On the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Local Security Policy**.  
The **Local Security Settings** dialog box appears.
9. In the console tree, click the expand indicator (+) for **Local Policies** and click **User Rights Assignment**.
10. In the details pane, double-click **Act as part of the operating system**, click **Add**, click the account name you just created from the list box, click **Add**, and then click **OK** twice.
11. Repeat steps 8-10 for the **Log on as a service** policy.

If BizTalk Server 2000 is already installed and using the interactive user account, complete the following steps after you have created a service account.

1. On the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Services**.
2. In the details pane, double-click **BizTalk Messaging Service**.  
The **BizTalk Messaging Service Properties (Local Computer)** dialog box appears.
3. Click the **Log On** tab and click **This account**.
4. Click **Browse**, locate the user account name you created, and double-click it.
5. In the **Password** box, type the same password you previously associated with the user account name; in the **Confirm Password** box, type the password again and then click **OK**.
6. A message box appears; click **OK**.
7. Restart the computer.

# Installing SQL Server 7.0 or SQL Server 2000

Prior to installing Microsoft BizTalk Server 2000, you must install Microsoft SQL Server 7.0 and SQL Server Service Pack 2 (SP2) or Microsoft SQL Server 2000. When you install BizTalk Server 2000, the installation procedure creates four BizTalk Server 2000 databases (the BizTalk Messaging Management database, the Shared Queue database, the Tracking database, and the Orchestration Persistence database) within SQL Server.

## ◆ Important

- If you plan to install BizTalk Server 2000 on a computer that has Microsoft Windows 2000 Professional with Service Pack 1, you must install SQL Server 7.0 and SQL Server Service Pack 2 (SP2) or SQL Server 2000 on another computer. Windows 2000 Professional does not support SQL Server 7.0 or SQL Server 2000 installations. When you install the databases for BizTalk Server 2000, you need to specify the name of the computer where you installed SQL Server 7.0 or SQL Server 2000.

Before you install SQL Server, verify that your logon account is a member of the Windows 2000 Administrators group on the computer on which you want to install SQL Server. For more information about adding your logon account, see [Add a user account to the Administrators group](#).

If you install SQL Server 2000, you must specify mixed authentication. By default, when you install SQL Server 2000, the authentication mode is set to Windows 2000 only. BizTalk Server 2000 uses SQL Authentication to access the BizTalk Messaging Management, Shared Queue, and Tracking databases and does not work with this setting. Verify that you have the authentication mode set to mixed before installing BizTalk Server 2000. For more information, see [Set SQL authentication mode for SQL Server 2000](#).

If you install SQL Server on a cluster and you plan to install BizTalk Server 2000 on another computer, you must install SQL Server client tools on the computer where BizTalk Server 2000 is installed. A cluster is a collection of servers that act as a single server. For more information, see [Install SQL Server client tools](#). When complete, you must use the Client Network Utility to change the default network library from named pipes to TCP/IP. For more information, see [Change the default network library to TCP/IP](#).

When you install SQL Server 7.0 or SQL Server 2000, it is important to use the correct collation settings. Collation refers to a set of rules that determines how data is sorted and compared. Character data is sorted using rules that define the correct character sequence, with options for specifying case sensitivity, accent marks, kana character types, and character width. For instance, to store Japanese characters, select case-sensitive sort order to distinguish Japanese-Hiragana from Japanese-Katakana when setting up SQL Server. For more information about collation settings, on the **Start** menu, point to **Programs**, point to **Microsoft SQL Server**, and then click **Books Online**. The topics, [Using SQL Collation](#) and [Windows Collation Sorting Styles](#), provide additional information.

The following topics are covered in this section:

- [Install SQL Server 7.0 or 2000](#)
- [Check for SQL Server 7.0 Service Pack 2](#)
- [Install SQL Service Pack 2 for SQL Server 7.0](#)
- [Install SQL Server client tools](#)
- [Change the default network library to TCP/IP](#)
- [Set SQL authentication mode for SQL Server 2000](#)
- [Verify that SQL Server is running](#)
- [Avoid unnecessary disk space allocation](#)
- [SQL Server and BizTalk Server 2000 Database Interactions](#)

# Install SQL Server 7.0 or 2000

1. Insert the Microsoft SQL Server compact disc into the appropriate drive.
2. Run the SQL Server Setup program and follow the online instructions.

The setup wizard walks you through the steps necessary to install SQL Server, but you must observe the following requirements:

- On the **Setup Type** page, click **Typical**.
- On the **Services Accounts** page, use a domain user account (if connected to a network).
- When installing SQL Server 2000, specify mixed authentication.

## ◆ Important

- If you install SQL Server 7.0, you must install SQL Service Pack 2 (SP2). You can check to see whether you have SP2 installed by using the Query Analyzer. For more information, see [Check for SQL Server 7.0 Service Pack 2](#). For more information about installing SQL SP2, see [Install SQL Service Pack 2 for SQL Server 7.0](#).

# Check for SQL Server 7.0 Service Pack 2

1. On the **Start** menu, point to **Programs**, point to **Microsoft SQL Server 7.0**, and then click **Query Analyzer**.

The **Connect to SQL Server** dialog box appears.

2. Click **OK**.

If your server name does not appear in the **SQL Server** list, select it from the list or type it in, and then click **OK**.

3. In the **Query** box, type **SELECT @@VERSION**.

4. On the **Query** menu, click **Execute**.

The first line of the query return indicates the version of SQL Server that is running. If you have SP2 installed, you should see 7.00.842.

# Install SQL Service Pack 2 for SQL Server 7.0

1. Insert the SQL Service Pack 2 compact disc into the appropriate drive.
2. Run the SQL Service Pack 2 Setup program and follow the online instructions.

# Install SQL Server client tools

1. Insert the Microsoft SQL Server compact disc into the appropriate drive.
2. Run the SQL Server Setup program and follow the online instructions.

The setup wizard walks you through the steps necessary to install SQL Server, but you must observe the following requirements:

- On the **Installation Selection** page, click **Create a new instance of SQL Server, or install Client Tools**.
- On the **Installation Definition** page, click **Client Tools Only**.

# Change the default network library to TCP/IP

1. On the **Start** menu, point to **Programs**, point to **Microsoft SQL Server 7.0** or **Microsoft SQL Server**, and then click **Client Network Utility**.

The **SQL Server Client Network Utility** dialog box appears.

2. If you have installed Microsoft SQL Server 7.0, on the **General** tab, in the **Default network library** list, click **TCP/IP**.

-Or-

If you have installed Microsoft SQL Server 2000, on the **Network Libraries** tab, in the **Network Library** list, click **TCP/IP**.

3. Click **OK**.

# Set SQL authentication mode for SQL Server 2000

1. Click **Start**, point to **Programs**, point to **Microsoft SQL Server**, and then click **Enterprise Manager**.
2. Click the expand indicator (+) for **Microsoft SQL Servers** and for **SQL Server Group**.
3. Right-click the name of your server and click **Properties**.  
The **SQL Server Properties** dialog box appears.
4. Click the **Security** tab, click **SQL Server and Windows**, and then click **OK**.

# Verify that SQL Server is running

Before installing BizTalk Server 2000, verify that SQL Server is running on your server. This is necessary because BizTalk Server 2000 must create four SQL databases during installation.

1. On the **Start** menu, point to **Programs**, point to **Microsoft SQL Server** (if you installed SQL Server 2000) or **Microsoft SQL Server 7.0** (if you installed SQL Server 7.0), and then click **Service Manager**.

The **SQL Server Service Manager** dialog box appears.

2. In the **Server** list, verify that the name of the server is the name of your computer.

If it is not, click the drop-down arrow to view a list of available servers and scroll to locate your server.

3. In the **Services** list, click **MSSQLServer** (for SQL Server 7.0) or **SQL Server** (for SQL Server 2000).

4. Verify that the MSSQLServer or SQL Server service is running.

The service is running if the **Start/Continue** button in the dialog box is unavailable. Also, at the bottom of the dialog box is a message that states that the service is running. For example, \\<servername>—MSSQLServer—Running.

5. If the service is not running, the **Start/Continue** button is available; click it to start the service.

# Avoid unnecessary disk space allocation

1. Click **Start**, point to **Programs**, point to **Microsoft SQL Server 7.0** or **Microsoft SQL Server**, and then click **Enterprise Manager**.
2. Click the expand indicator (+) for **Microsoft SQL Servers, SQL Server Group, <server name>**, and **Databases**.
3. Right-click the BizTalk Messaging Management database and click **Properties**.  
The BizTalk Messaging Management database properties dialog box appears.
4. Click the **Options** tab.
5. In the **Settings** area, select the **Truncate log on checkpoint** and the **Auto shrink** check boxes and click **OK**.

## **Note**

- If you have Microsoft SQL Server 2000 installed, you can only select the **Auto shrink** check box.

6. Repeat steps 3 through 5 for the Tracking and Shared Queue databases.

## **Important**

- You can complete this procedure only if you have BizTalk Server 2000 installed. For more information about installing BizTalk Server 2000, see [Installation Instructions](#).

## **Note**

- During setup, the BizTalk Messaging Management database object name defaults to **InterchangeBTM**; the Tracking database object name defaults to **InterchangeDTA**; and the Shared Queue database object name defaults to **InterchangeSQ**. You may have renamed these default database object names during setup.

# SQL Server and BizTalk Server 2000 Database Interactions

To avoid unnecessary disk space allocation, use the **Truncate log on checkpoint** and **Auto shrink** features of Microsoft SQL Server. Otherwise, the SQL Server logs can consume large amounts of disk space.

## Related Topic

[Avoid unnecessary disk space allocation](#)

# Installing Visio 2000 SR-1A

Because BizTalk Orchestration Designer is a Microsoft Visio 2000-based user interface, you must have Visio 2000 Service Release 1A installed on your computer prior to using BizTalk Orchestration Designer. BizTalk Orchestration Designer has been tested with Visio 2000 Standard Edition SR-1A, and might work with later versions of Visio.

The following topic is covered in this section:

- [Install Visio 2000 Standard Edition SR-1A](#)

# Install Visio 2000 Standard Edition SR-1A

1. Insert the Visio 2000 Standard Edition SR-1A compact disc (or a later version of Visio 2000 Standard Edition) into the appropriate drive.
2. Run the Visio 2000 Standard Edition SR-1A Setup program and follow the online instructions.

## **Note**

- For more information, see the Microsoft Visio 2000 Standard Edition SR-1A documentation.

# Installation Instructions

You can install Microsoft BizTalk Server 2000 using the Installation Wizard (Microsoft BizTalk Server.msi) or using Microsoft Windows Installer (Msiexec.exe). The Installation Wizard is a step-by-step process in which you select options that correspond to specific property values. The Microsoft Windows Installer allows you to specify property values from the command line. You can use this method to install BizTalk Server 2000 silently (without constant interaction or prompts). A silent installation of BizTalk Server 2000 is ideal for test scenarios or as part of a large-scale enterprise deployment. Regardless of which installation you perform, it is recommended that you maintain a record of the following information for later use:

- BizTalk Server group names
- SQL Server names
- User names
- Passwords
- The BizTalk Messaging Management database name
- The Tracking database name
- The Shared Queue database name
- The WebDAV repository URL

## ◆ Important

- BizTalk Server 2000 requires Microsoft XML Parser version 3.0. This release of BizTalk Server 2000 automatically installs Microsoft XML (MSXML) Parser version 3.0. If you install other versions of the MSXML parser, it might cause unexpected results with BizTalk Server 2000.

## ✍ Note

- During BizTalk Server 2000 installation, the installation program determines the hard-disk space availability of your computer. A complete installation will require approximately 52 megabytes (MB), not including the requirements of the BizTalk Messaging Management database, the Tracking database, the Shared Queue database, and the Orchestration Persistence database. A tools installation will require approximately 30 MB of hard disk space. A custom installation will require approximately 2 to 52 MB of hard disk space, not including database requirements, depending on the services and tools that you install.

Before you run Setup, verify that your logon account is a member of the Windows 2000 Administrators group for the computer on which you are installing BizTalk Server 2000. For more information about joining the Administrators group, see [Add a user account to the Administrators group](#).

## ✍ Note

- If BizTalk Server was installed using an interactive user, it will not start if a user is not logged on to BizTalk Server 2000. All COM+ packages run under an interactive user account, not the local system account. This means that the service starts only if a user is logged on to BizTalk Server 2000. For example, if a user is not logged on to BizTalk Server 2000 when a client application submits documents to BizTalk Server 2000 remotely, the service does not start. To avoid this situation, create a service account or have the user who starts the service lock the computer and keep the services running in the background. For more information about creating a service account, see [Create a service account](#).

The following topics are covered in this section:

- [Complete Installation](#)
- [Tools Installation](#)
- [Custom Installation](#)

- [Silent Installation](#)
- [Removing BizTalk Server 2000](#)

# Complete Installation

You can use the following section to perform a complete installation of BizTalk Server 2000 that includes all BizTalk services, tools, and samples.

The following topics are covered in this section:

- [Perform a complete installation of BizTalk Server 2000](#)
- [Start the World Wide Web Publishing Service](#)
- [Install BizTalk Document Tracking Remotely](#)

# Perform a complete installation of BizTalk Server 2000

1. Insert the Microsoft BizTalk Server 2000 Setup compact disc into the appropriate drive.
2. Run the Microsoft BizTalk Server 2000 Setup program and follow the online instructions.

## ◆ Important

- The setup wizard guides you through the steps necessary to install BizTalk Server 2000. You must observe the requirements listed in the following steps.
  - BizTalk Server 2000 requires Microsoft XML Parser version 3.0. This release of BizTalk Server 2000 automatically installs Microsoft XML (MSXML) Parser version 3.0. If you install other versions of the MSXML parser, it might cause unexpected results with BizTalk Server 2000.
3. On the **License Agreement** page, read the license agreement, click **I accept this license agreement**, and then click **Next**.

## 📌 Note

- If you do not accept the license agreement, you cannot continue with the installation.
4. On the **Customer Information** page, type your name in the **User name** box, type the name of your company in the **Organization** box, click either **Anyone who uses this computer (all users)** or **Only for me** if you want to limit access to BizTalk Server 2000, and then click **Next**.
  5. On the **Destination Folder** page, click **Next** to install BizTalk Server 2000 to the folder shown on the page, or click **Change** to select another location.
  6. On the **Setup Type** page, click **Complete** and click **Next**.
  7. On the **Configure BizTalk Server Administrative Access** page, in the **Group name** box, type the group name that you want to use (or accept the default, **BizTalk Server Administrators**).

## 📌 Notes

- To create a group name, adhere to the following group naming restrictions:
  - The group name must be different from any other group or user name on this computer.
  - The group name cannot contain the following characters: ` ! @ # \$ % ^ & \* ( ) + = [ ] { } | \ ; " ' < > , . ?
  - The group name cannot consist solely of periods (.) or spaces.
  - Do not rename this group without also modifying the value of "AdminGroupName" in the Windows registry under HKEY\_LOCAL\_MACHINE\SOFTWARE\Microsoft\BizTalk Server\1.0\NTGroups. BizTalk Server 2000 relies on this registry key to find the group.
8. In the **Group description** box, type a new description for the group name or accept the default and click **Next**.
  9. On the **Microsoft BizTalk Server Service Log On Properties** page, click the default setting, **Local system account**, or click **This account** to limit BizTalk Server 2000 access to a specific user.

If you select **This account**, type a new user name or accept the default name in the **User name** box, type a valid password in the **Password** box.

If you do not want BizTalk Services to automatically start when setup completes, clear the **Start service after setup completes** checkbox. BizTalk Services will not automatically start, but Orchestration Services will.

## 📌 Notes

- BizTalk Server setup will grant **Log on as a service** and **Act as part of the operating system** rights to the account specified on the **Microsoft BizTalk Server Service Log On Properties** page.

- If you select **This account**, specify an account that is in the Windows 2000 Administrators group. To configure certificates for the S/MIME components by using BizTalk Messaging Manager, you must belong to a user account in the Windows 2000 Administrators group, and BizTalk Messaging Services must be running as a local system account or as a user account in the Windows 2000 Administrators group.

10. Click **Next**.

11. On the **Ready to Install the Program** page click **Install**.

The BizTalk Server 2000 installation procedure might take several minutes.

12. When the **Welcome to the Microsoft BizTalk Server 2000 Messaging Database Setup Wizard** page appears, click **Next**.

During BizTalk Server 2000 database setup, you are prompted for logon information (server, database, user name, and password) to configure the BizTalk Messaging Management, Tracking, and Shared Queue databases.

#### ⚠ **Caution**

- Do not change the code, such as stored procedures or triggers, in the BizTalk Messaging Management, Tracking, and Shared Queue databases. Do not access the database directly. Do not directly call the stored procedures. Make all changes to the database by using the methods and properties of the BizTalk Messaging Configuration object model. Making changes to the database directly bypasses many constraints enforced by the BizTalk Messaging Configuration object model and either causes the server to function incorrectly or corrupts the database.

13. On the **Configure a BizTalk Messaging Management Database** page, click either **Create a new BizTalk Messaging Management database** or **Select an existing database** and type a server name and user information in the following text boxes:

- **Server name**
- **User name**
- **Password**
- **Database**

You can choose unique server and database names and type new information or accept the defaults.

#### ♦ **Important**

- If you are installing BizTalk Server 2000 on a computer that has Microsoft Windows 2000 Professional with Service Pack 1, the **Server name** you must specify is the name of the computer where you installed Microsoft SQL Server 7.0 or Microsoft SQL Server 2000.
- If you select **Create a new BizTalk Messaging Management database** and choose an existing database, you should manually delete the contents of the database. For more information about deleting database content, on the **Start** menu, point to **Programs**, point to **Microsoft SQL Server**, and then click **Books Online**. To create a new database with the same name as an existing database on the same server, it is recommended that you manually delete the database content. BizTalk Server setup only verifies if a stored procedure required by the database exists, rather than verifying if all the variables required by the database exist. If a stored procedure exists, BizTalk Server setup does not modify the database. If the stored procedure does not exist, BizTalk Server setup deletes the database. Then it reinitializes the BizTalk Messaging Management database tables. The above-mentioned information is true for the Shared Queue and Tracking databases.
- If you are set up more than one BizTalk Server installation and want to centrally manage the BizTalk Messaging Management database, it is highly recommended that you review information about BizTalk Server database interactions. For more information about configuring the database, see [Changing the BizTalk Messaging Management database](#).

14. Click **Next**.

15. On the **Configure a BizTalk Server Group** page, type the name that you want to use as your BizTalk Server group in the **Group name** box or accept the default (**BizTalk Server Group**), and then click **Next**.

You can also click **Select an existing BizTalk Server group** and select a name from the **Group Name** list.

#### **Notes**

- The group name cannot contain the following characters: ` ! @ # \$ % ^ & \* ( ) + = [ ] { } | \ ; \ " ' < > , . ?

16. On the **Configure a Tracking Database** page, repeat the procedure in step 13 and click **Next**.

#### **Important**

- If you change the default **User name** on the **Configure a Tracking Database** page, the account that you specify must have SA-level permissions. This account is used to create a SQL Server user login. After installing BizTalk Server, change the account user name and password to remove SA-level access to the Tracking database by the BizTalk Server service. For more information, see [Configure connection properties for a server group](#). Or you can change the SA-level permission for the account used during setup. For more information about changing SQL Server account permissions, on the **Start** menu, point to **Programs**, point to **Microsoft SQL Server**, and then click **Books Online**.

17. On the **Configure a Shared Queue Database** page, repeat the procedure in step 13 and click **Next**.

18. On the **Verify BizTalk Server Group** page, verify that the information in the **BizTalk Server group properties** box is correct and click **Next**.

19. On the final page of the **Microsoft BizTalk Server 2000 Messaging Database Setup Wizard**, click **Finish** to complete the configuration of the BizTalk Messaging Management, Tracking, and Shared Queue databases.

20. On the **Welcome to the Microsoft BizTalk Server 2000 Orchestration Persistence Database Setup Wizard** page, click **Next** to install the Orchestration Persistence database.

#### **Note**

- If you click **Cancel**, BizTalk Server 2000 is installed, but the Orchestration Persistence database and the Data Source Name (DSN) are not installed. You can install the database and the DSN later. For more information, see [Create a new persistence database](#), [Configure the default XLANG Scheduler application](#), and [Configure a COM+ application to host XLANG schedules](#).

21. On the **Configure a default Orchestration Persistence Database** page, click either **Create a new default Orchestration Persistence database** or **Select an existing database** and then choose a server name and type database information in the appropriate text boxes or, accept the defaults.

#### **Important**

- If you select **Create a new default Orchestration Persistence database** and choose a database with the same name, on the same server, as an existing database, BizTalk Server setup deletes everything in the database. BizTalk Server setup then reinitializes the Orchestration Persistence database tables.
- If you are installing BizTalk Server 2000 on a computer that has Windows 2000 Professional with Service Pack 1, the **Server name** you specify is the name of the computer where you installed SQL Server 7.0 or SQL Server 2000.

#### **Notes**

- The Orchestration Persistence database is created based on the current user log-on identity.
- To use SQL Server remotely, you must have the appropriate permissions set for the Orchestration Persistence database. If you have not reconfigured the identity for the XLANG Scheduler Engine, permissions will be granted to the interactive user (the user who was logged on during installation of BizTalk Server 2000). If you have reconfigured the identity for the XLANG Scheduler Engine to match a service account you created or another unique user account, you must set permissions to match the reconfigured identity.

22. Click **Finish**.

23. On the final page of the Microsoft BizTalk Server 2000 Setup Wizard, click **View Readme** to read important, late-breaking

information about BizTalk Server 2000, and then click **Finish**.

#### **Caution**

- Do not change the impersonation level for any COM+ application. By default, it is set to Impersonate. Changing this security property to Anonymous, Identify, or Delegate may cause problems during installation.

#### **Important**

- To dramatically increase the performance of BizTalk Orchestration Services, in Windows Explorer, browse to Program Files\Common Files\System\ado, and then double-click **adofre15.reg**. In the confirmation dialog box, click **Yes**, and then click **OK**. This procedure changes the ADO threading model from "Apartment threaded" to "Both" and may affect other applications that use ADO. Any provider that is not thread safe cannot be used.

#### **Note**

- BizTalk Messaging Manager will not run unless the World Wide Web Publishing Service is running. For more information about the World Wide Web Publishing Service, see [Start the World Wide Web Publishing Service](#).

# Start the World Wide Web Publishing Service

1. On the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**.
2. In the console tree, click **Services (Local)**.
3. In the details pane, right-click **World Wide Web Publishing Service** and click **Start**.

# Install BizTalk Document Tracking Remotely

When BizTalk Document Tracking is installed from the BizTalk Server 2000 compact disc, a shortcut is created in the program group for BizTalk Server 2000 to access the BizTalk Document Tracking Web application. However, when BizTalk Document Tracking is installed over the Internet, you must manually create a shortcut or a favorite for later access to the Web application. Additionally, to prevent the display of security warning dialog boxes, you must manually configure your browser's settings to trust the Web application.

The following topic is covered in this section:

- [Configure Internet Explorer security settings](#)

# Configure Internet Explorer security settings

1. Click **Start**, point to **Programs**, and then click **Internet Explorer**.

2. On the **Tools** menu, click **Internet Options**.

The **Internet Options** dialog box appears.

3. On the **Security** tab, click **Trusted Sites** and click the **Sites** button.

The **Trusted Sites** dialog box appears.

4. In the **Add this Web site to the zone** box, type the location of the BizTalk Document Tracking server.

To find the location of the BizTalk Document Tracking server, on the **Start** menu, point to **Programs**, point to **Microsoft BizTalk Server 2000**, and then click **BizTalk Document Tracking**. The location of the BizTalk Document Tracking server appears in the **Address** list.

5. Clear the **Require server verification (https:) for all sites in this zone** check box.

6. Click **Add** and click **OK** twice to close the dialog boxes.

# Tools Installation

A Microsoft BizTalk Server 2000 tools installation enables you to install only BizTalk Orchestration Designer, BizTalk Document Tracking, BizTalk Editor, BizTalk Mapper, and the BizTalk Server 2000 Help.

The following topic is covered in this section:

- [Perform a tools installation of BizTalk Server 2000](#)

# Perform a tools installation of BizTalk Server 2000

1. Insert the Microsoft BizTalk Server 2000 Setup compact disc into the appropriate drive and follow the on-screen instructions.

## ◆ Important

- The setup wizard guides you through the steps necessary to install BizTalk Server 2000. Observe the requirements listed in the following steps.

2. On the **License Agreement** page, read the license agreement, click **I accept this license agreement**, and then click **Next**.

## 📌 Note

- If you do not accept the license agreement, you cannot continue with the installation.

3. On the **Customer Information** page, type your name in the **User name** box, type the name of your company in the **Organization** box, click **Anyone who uses this computer (all users)** or **Only for me** if you want to limit access to BizTalk Server 2000, and then click **Next**.

4. On the **Destination Folder** page, click Next.

5. On the **Setup Type** page, click **Tools** and click **Next**.

6. On the **Ready to Install the Program** page of the Microsoft BizTalk Server 2000 Setup Wizard, click **Install**.

7. On the final page of the Microsoft BizTalk Server 2000 Setup Wizard, click **View Readme** to read important, late-breaking information about this release of BizTalk Server 2000.

8. Click **Finish** to complete the installation process.

## ◆ Important

- To dramatically increase the performance of BizTalk Orchestration Services, in Windows Explorer, browse to Program Files\Common Files\System\ado, and then double-click **adofre15.reg**. In the confirmation dialog box, click **Yes**, and then click **OK**. This procedure changes the ADO threading model from "Apartment threaded" to "Both" and may affect other applications that use ADO.

## 📌 Note

- To install the BizTalk Server 2000 interchange component on a remote computer, use the Windows 2000 COM Application Export Wizard.

1. On the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**.

2. In the console tree, expand Component Services, Computers, My Computer, and COM+ Applications.

3. Right-click **BizTalk Server Interchange Application** and click Export.

Follow the on-screen instructions to create an .msi file that you can run on a client computer.

# Custom Installation

A custom Microsoft BizTalk Server 2000 installation enables you to install all the features of BizTalk Server 2000 or only those features that you want.

## Note

- If you want to install the server components of BizTalk Server 2000, you must first install Microsoft SQL Server. For more information, see [Install SQL Server 7.0 or 2000](#).

The following topic is covered in this section:

- [Perform a custom installation of BizTalk Server 2000](#)

# Perform a custom installation of BizTalk Server 2000

1. Insert the Microsoft BizTalk Server 2000 Setup compact disc into the appropriate drive and follow the on-screen instructions.

## ◆ Important

- The setup wizard guides you through the steps necessary to install BizTalk Server 2000. You must observe the requirements listed in the following steps.

2. On the **License Agreement** page, read the license agreement, click **I accept this license agreement**, and then click **Next**.

## 📌 Note

- If you do not accept the license agreement, you cannot continue with the installation.

3. On the **Customer Information** page, type your name in the **User name** box, type the name of your company in the **Organization** box, click **Anyone who uses this computer (all users)** or **Only for me** if you want to limit access to BizTalk Server 2000, and then click **Next**.

4. On the **Destination Folder** page, click Next.

5. On the **Setup Type** page, click **Custom** and click **Next**.

6. On the **Custom Setup** page, follow the on-screen instructions to select the BizTalk Server 2000 components that you want to install.

To perform a different type of installation, click **Back**. Otherwise, click **Next**. Additional pages appear on which you provide additional information, depending on the installation components that you have selected.

7. On the **Ready to Install the Program** page, click Install.

The BizTalk Server 2000 custom installation procedure might take a few minutes.

8. On the final page of the Microsoft BizTalk Server 2000 Setup Wizard, click **View Readme** to read important, late-breaking information about this release of Microsoft BizTalk Server 2000.

9. Click **Finish** to complete the installation process.

## ◆ Important

- BizTalk Messaging Manager will not run unless the World Wide Web Publishing Service is running. To start the World Wide Web Publishing Service:

1. On the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**.
2. In the console tree, click **Services (Local)**.
3. In the details pane, right-click **World Wide Web Publishing Service** and click **Start**.

- To dramatically increase the performance of BizTalk Orchestration Services, in Windows Explorer, browse to Program Files\Common Files\System\ado, and then double-click **adofre15.reg**. In the confirmation dialog box, click **Yes**, and then click **OK**. This procedure changes the ADO threading model from "Apartment threaded" to "Both" and may affect other applications that use ADO.

# Silent Installation

The Microsoft Windows Installer allows you to specify property values from the command line. This method gives you the ability to install Microsoft BizTalk Server 2000 silently (without constant interaction or prompts). A silent installation of BizTalk Server 2000 is ideal for test scenarios or as part of a large-scale enterprise deployment.

The following topic is covered in this section:

- [Perform a silent installation of BizTalk Server 2000](#)

# Perform a silent installation of BizTalk Server 2000

1. Click **Start** and click **Run**.
2. In the **Open** box, type **cmd** and click **OK**.
3. Type the following to install BizTalk Server 2000 silently:

```
msiexec /I "\\server\folder\Microsoft BizTalk Server.msi"  
/qb /Lv*"C:\Temp\install.log" INSTALLLEVEL=200  
ALLUSERS=1  
PIDKEY="your 25-character product key (without dashes)"  
DSNCONFIG="C:\Temp\BizTalkInstall.ini"
```

## ◆ Important

- You must add the ALLUSERS=1 parameter to complete the installation for all users. This parameter also ensures that the services are able to see the registry settings.

## 📝 Notes

- In the preceding code:
  - /I is the command line to install or configure a product.
  - /qb is the command line to present a basic user interface (progress bar only).
  - /Lv\* produces a log file.
  - INSTALLLEVEL=200 installs the server. If you do not specify the INSTALLLEVEL, the value defaults to 100, which is the Tools installation of BizTalk Server 2000.
  - PIDKEY="your 25-character product key (without dashes)" is the product key. For example, PIDKEY=AB6CDEFGH7IJK8LMN45LLT34.
  - DSNCONFIG="C:\Temp\BizTalkInstall.ini" provides installation information to the setup wizard.

You can specify various options at the command line to set properties for a BizTalk Server 2000 installation. Unspecified properties take on the default values. The properties unique to BizTalk Server 2000 are listed in the following table.

Public property	Value	Description
USERNAME (built-in installer property)	<name> Default: {LogonUser}	The name of the user performing the installation. <b>Customer Information</b> dialog box; <b>User name</b> edit box.
COMPANYNAME (built-in installer property)	<organization> Default: {LogonCompany}	The organization name for the user performing the installation. <b>Customer Information</b> dialog box; <b>Organization</b> edit box.
PIDKEY	<product-id> Default: ""	The CD-key of the form ###-##### for the product. <b>Customer Information</b> dialog box; <b>Serial number</b> masked edit box.
INSTALLLEVEL (built-in installer property)	<install level> Default: 100	The feature installation level. For BizTalk Server 2000 setup, 100=Client and 200=Server setup type.
INSTALLDIR (built-in installer property)	<install path> Default: "{ProgramFiles} \Microsoft BizTalk Server"	The destination folder for the installation.

BTS_GROUP_NAME (Complete installation only)	<Group Name> Default: "BTSAdmin"	The name of the BizTalk Server 2000 Windows NT group. <b>ConfigAdminGroup</b> dialog box; <b>Group name</b> edit box.
BTS_GROUP_DESCRIPTION (Complete installation only)	<Group Description> Default: "Members can fully administer Microsoft BizTalk Server"	The description of the BizTalk Server 2000 NT group. <b>ConfigAdminGroup</b> dialog box; <b>Group description</b> edit box.
BTS_USERNAME (Complete installation only)	<username> Default: ""	The logon DOMAIN\name for the BizTalk Server 2000 service. <b>ConfigServiceLogon</b> dialog box; <b>User name</b> edit box.
BTS_PASSWORD (Complete installation only)	<password> Default: ""	The logon password for the BizTalk Server 2000 service. <b>ConfigServiceLogon</b> dialog box; <b>Password</b> edit box.
BTS_SERVER (Complete and Tools installation)	<servername> Default: "localhost"	The name of the BizTalk server to remotely administer. <b>ConfigMgmtDesk</b> dialog box; <b>Server name</b> edit box.
BTS_SDK_SERVER (Complete and Tools installation)	<servername> Default: ""localhost""	The name of the BizTalk server to use for DCOM. <b>ConfigSDK</b> dialog box; <b>Server name</b> edit box.
DSNCONFIG (initialization file)	<pathname> Default: ""	The path of the initialization file for the BTSsetupDB.exe and XLANGsetupDB.exe database setup wizard to use.

## Notes

- The DSNCONFIG property is required to complete a silent installation of BizTalk Server 2000. The initialization path file listed on the command line is passed to the BTSsetupDB.exe and XLANGsetupDB.exe database setup wizards. Use one of the following command-line values:
  - DSNCONFIG="Full path to .ini file for BTSsetupDB.exe and XLANGsetupDB.exe"
  - Or-
  - BTSSETUPDB.INI="Full path to .ini file for BTSsetupDB.exe" and XLANGSETUPDB.INI="Full path to .ini file for XLANGsetupDB.exe"
- The database setup wizard processes the contents of the initialization file using these rules:
  - All [sections] and keys= are optional; if a key is absent, the default value as shown in the sample initialization file is used.
  - If the GroupName exists in the specified BizTalk Messaging Management database, the [InterchangeDTA] and the [InterchangeSQ] sections are ignored since the group defines the values.
  - Specified databases are created if they do not already exist on the specified server.
- The BizTalk Messaging Management database setup and the Orchestration Persistence database setup are mutually independent.
- Depending on the features you install, setup configures either, neither, or both of the following:
  - BizTalk Messaging Management database - only configured if BizTalk Messaging Services and its associated components are installed.
  - Orchestration Persistence database - only configured if Orchestration Service is installed.

- The following properties are used on the command line:
    - DSNCONFIG - specifies location of .ini file to be used by BTSsetupDB.exe and XLANGsetupDB.exe
- Or-
- BTSSETUPDB.INI - specifies location of .ini file to be used by BTSsetupDB.exe
  - XLANGSETUPDB.INI - specifies location of .ini file to be used by XLANGsetupDB.exe

### Sample initialization file with all [sections], keys=, and default values shown

The following is an example of the format of an .ini file needed to silently install BizTalk Server 2000. These command-line properties are required to perform a first-time installation of BizTalk Server 2000 using the Windows Installer.

#### Example SetupDB.ini

```
;-----
; SQL Server connection parameters for BizTalk Messaging Management database
; Required section used by BTSsetupDB.exe only.
; Specify new or existing database.
;
[InterchangeBTM]
Server=localhost
Username=sa
Password=
Database=InterchangeBTM

;-----
; Name for BizTalk Server Group
; Required section used by BTSsetupDB.exe only.
; Specify new or existing server group.
;
[Group]
GroupName=BizTalkGroup

;-----
; SQL Server connection parameters for BizTalk Tracking database
; Required section used by BTSsetupDB.exe only.
; Optional if existing server group specified.
;
[InterchangeDTA]
Server=localhost
Username=sa
Password=
Database=InterchangeDTA

;-----
;
[InterchangeSQ]
Server=localhost
Username=sa
Password=
Database=InterchangeSQ

;-----
; SQL Server connection parameters for Orchestration database
; Required section used by XLANGsetupDB.exe only.
; Specify new or existing Orchestration database.
;
[Orchestration]
Server=localhost
Database=XLANG
```

The following table describes the properties and values of the sample BizTalkDB.ini initialization file.

Property	Value	Description
[InterchangeBTM]	Server=BIZTALK  Database=BizTalkBTM	Log on to this first SQL Server with default user name and password.  Create this BizTalk Messaging Management database if it does not already exist on the server.
[Group]	GroupName=BizTalkServerGroup	The rest of the values are ignored if this group already exists.

[InterchangeDTA]	Server=DTA-SERVER	Log on to this second SQL Server with default user name and password.  Database=BizTalkDTA  Create this Tracking database if it does not already exist on the server.
[InterchangeSQ]	Server=SQ-SERVER	Log on to this third SQL Server with default user name and password.  Database=BizTalkSQ  Create this Shared Queue database if it does not already exist on the server.
[Orchestration]	Server=localhost	Log on to this fourth SQL Server with default user name and password.  Database=Orchestration  Create this XLANG database if it does not already exist on the server.

## Command-line options of Microsoft Windows Installer

Microsoft Windows Installer (Msiexec.exe) is the program that interprets packages and installs products. It also sets an error level on return that corresponds to the Microsoft Win32® error codes. The following table describes command-line options for this program that you can use in addition to the properties and values listed previously.

O p t i o n	Parameters	Meaning
/i	Package ProductCode	Installs or configures a product.
/f	[p o e d c a u m s v] Package ProductCode	Repairs a product. This option ignores any property values entered on the command line. The default argument list for this option is pecms. This option shares the same argument list as the REINSTALLMODE property.  p - Reinstall only if file is missing.  o - Reinstall if file is missing or if an older version is installed.  e - Reinstall if file is missing or an equal or older version is installed.  d - Reinstall if file is missing or a different version is installed.  c - Reinstall if file is missing or the stored checksum does not match the calculated value. Repairs only files that have msidbFileAttributesChecksum in the Attributes column of the File table.  a - Force all files to be reinstalled.  u - Rewrite all required user-specific registry entries.  m - Rewrite all required computer-specific registry entries.  s - Overwrite all existing shortcuts.  v - Run from source and recache the local package.
/a	Package	Administrative installation option. Installs a product on the network.
/x	Package ProductCode	Uninstalls a product.
/j	[u m]Package or [u m]Package /t Transform List or [u m]Package /g LanguageID	Advertises a product. This option ignores any property values entered on the command line.  u - Advertise to the current user.  m - Advertise to all users of the computer.  t - Apply transform to advertised package.  g - Language ID.

/L	[i w e a r u c m o p v + !]Logfile	<p>Specifies the path to a log file; the flags indicate which information to log.</p> <ul style="list-style-type: none"> <li>i - Status messages</li> <li>w - Nonfatal warnings</li> <li>e - All error messages</li> <li>a - Startup of actions</li> <li>r - Action-specific records</li> <li>u - User requests</li> <li>c - Initial UI parameters</li> <li>m - Out-of-memory or fatal exit information</li> <li>o - Out-of-disk-space messages</li> <li>p - Terminal properties</li> <li>v - Verbose output</li> <li>+ - Append to existing file</li> <li>! - Flush each line to the log</li> <li>"" - Wildcard; log all information except the v option. To include the v option, specify "/!*v".</li> </ul>
/m	filename	<p>Generates a Systems Management Server (SMS) status .mif file. Must be used with the install (-i), remove (-x), administrative installation (-a), or reinstall (-f) option. The lsmif32.dll is installed as part of SMS and must be on the path.</p> <p>The fields of the status .mif file are filled with the following information:</p> <ul style="list-style-type: none"> <li>Manufacturer - Author</li> <li>Product - Revision number</li> <li>Version - Subject</li> <li>Locale - Template</li> <li>Serial Number - Not set</li> <li>Installation - Set by lsmif32.dll to "DateTime"</li> <li>InstallStatus - "Success" or "Failed"</li> <li>Description - Error messages in the following order: 1) Error messages generated by installer; 2) Resource from Msi.dll if installation could not commence or user exits; 3) System error message file; 4) Formatted message: "Installer error %i", where %i is the error returned from Msi.dll</li> </ul>
/p	PatchPackage	<p>Applies a patch. To apply a patch to an installed administrative image, you must combine options as follows:</p> <p>/p &lt;PatchPackage&gt; /a &lt;Package&gt;</p>
/q	n b r f	<p>Sets the user interface level.</p> <ul style="list-style-type: none"> <li>q , qn - No UI.</li> <li>qb - Basic UI.</li> <li>qr - Reduced UI with a modal dialog box displayed at the end of the installation.</li> <li>qf - Full UI with a modal dialog box displayed at the end.</li> <li>qn+ - No UI except for a modal dialog box displayed at the end.</li> <li>qb+ - Basic UI with a modal dialog box displayed at the end. The modal dialog box is not displayed if the user cancels the installation.</li> <li>qb- - Basic UI with no modal dialog boxes. /qb+ is not a supported UI level.</li> </ul>

/?		Displays copyright information for the Windows Installer.
/y	module	<p>Calls the system API DllRegisterServer to self-register modules passed in on the command line. For example, <code>msiexec /y my_file.dll</code>.</p> <p>This option is used only for registry information that cannot be added using the registry tables of the .msi file.</p>
/z	module	<p>Calls the system API DllUnRegisterServer to unregister modules passed in on the command line. For example, <code>msiexec /z my_file.dll</code>.</p> <p>This option is used only for registry information that cannot be removed using the registry tables of the .msi file.</p>

## Notes

- In the preceding table:
  - The options `/i`, `/x`, `/f[p|o|e|d|c|a|u|m|s|v]`, `/j[u|m]`, `/a`, `/p`, `/y`, and `/z` should not be used together. The one exception to this rule is that patching an administrative installation requires using both `/p` and `/a`.
  - The options `/t` and `/g` should be used only with `/j`.
  - The options `/l` and `/q` can be used with `/i`, `/x`, `/f[p|o|e|d|c|a|u|m|s|v]`, `/j[u|m]`, `/a`, and `/p`.

## Syntax rules for properties and values

Only public properties can be modified using the command line. All property names on the command line are interpreted as uppercase, but the value retains case sensitivity. If you type `MyProperty` at a command line, the installer overrides the value of `MYPROPERTY` and not the value of `MyProperty` in the Property table. To install a product with `PROPERTY` set to `VALUE`, use the following syntax on the command line. You can put the property anywhere except between an option and its argument.

Correct syntax:

```
msiexec /i A:\Example.msi PROPERTY=VALUE
```

Incorrect syntax:

```
msiexec /i PROPERTY=VALUE A:\Example.msi
```

Property values that are literal strings must be enclosed in quotation marks. Include any white spaces in the string between these marks.

```
msiexec /i A:\Example.msi PROPERTY="Embedded White Space"
```

To clear a public property using the command line, set its value to an empty string.

```
msiexec /i A:\Example.msi PROPERTY=""
```

For sections of text set apart by literal quotation marks, enclose the section with a second pair of quotation marks.

```
msiexec /i A:\Example.msi PROPERTY="Embedded ""Quotes"" White Space"
```

The following is an example of a complicated command line.

```
msiexec /i testdb.msi INSTALLLEVEL=3 /l* msi.log COMPANYNAME="Acme ""Widgets"" and ""Gizmos.""
```

The following example illustrates advertisement options. Switches are not case sensitive.

```
msiexec /JM msisample.msi /T transform.mst /G langid /LIME logfile.txt
```

For more information about Microsoft Windows Installer, go to the MSDN™ Downloads Web site ([msdn.microsoft.com/downloads/](https://msdn.microsoft.com/downloads/)).

# Removing BizTalk Server 2000

Use the Microsoft Windows 2000 Add/Remove Programs utility to remove Microsoft BizTalk Server 2000.

The following topic is covered in this section:

- [Remove BizTalk Server 2000](#)

# Remove BizTalk Server 2000

1. On the **Start** menu, point to **Settings** and click **Control Panel**.
2. Click **Add/Remove Programs**.
3. Click **Microsoft BizTalk Server 2000** and click **Remove**.

The **Add/Remove Programs** dialog box appears.

4. Follow the on-screen instructions and click **Yes** when prompted to remove BizTalk Server 2000.

# Understanding Security

Microsoft [BizTalk Server 2000](#) enables businesses to securely exchange data with [trading partners](#). BizTalk Server takes advantage of the security features offered through Microsoft Windows 2000 and Microsoft SQL Server security.

Windows 2000 security features include the following:

- [Public-key infrastructure](#)
- [Microsoft Component Services](#)
- [Microsoft Cryptography API](#)
- [Smart Cards](#)
- [Kerberos Protocol](#)

Public-key certificate management includes requesting certificates, processing certificates in a certificate-request response, and exchanging certificates with trading partners. These certificates are available for both digital signature and encryption. Exchanging certificates provides a method of securing data with trading partners. However, as a business grows, the process of managing certificates can be time consuming.

Because BizTalk Server takes advantage of Windows 2000 security features, such as Secure Sockets Layer (SSL), Web pages can be created and used by trading partners to securely exchange data using the Internet. SSL, which is implemented in Internet Information Services (IIS), is a protocol designed to provide privacy between a Web client and a Web server. The protocol begins with a handshake phase that negotiates an encryption algorithm, checks the keys (public and private), and authenticates the server to the client. Once the handshake is complete and application data transmission begins, all data is encrypted using the session keys negotiated during the handshake. Support for open PKI (public-key infrastructure) standards and secure protocols, such as IPSec, L2TP, SSL/TLS, and S/MIME, enables a network to be extended to suppliers and partners quickly, while protecting against impostors, data theft, or malicious hackers.

Component Services, one of Windows 2000's Administrative Tools, offers comprehensive component functionality, such as automatic [transaction](#) support for data-integrity protection and simple, but powerful, role-based security.

The following topics are covered in this section:

- [BizTalk Server 2000 Setup and Configuration](#)
- [Transport Services](#)
- [Security for Applications That Host XLANG Schedule Instances](#)
- [Certificates Overview](#)
- [Crypto API](#)
- [Collaborative Data Objects](#)

## Related Topic

[Administrative Privileges](#)

# BizTalk Server 2000 Setup and Configuration

Trading partner transactions must be secure. Microsoft [BizTalk Server 2000](#) addresses security by providing several authentication and encryption components that leverage Microsoft Windows 2000 security services. In addition to Windows 2000 security, BizTalk Server also takes advantage of Microsoft SQL Server security. To keep data secure in the [BizTalk Messaging Management database](#), BizTalk Server relies primarily on SQL Server login security. However, the default BizTalk Orchestration [persistence database](#) relies on Windows 2000 authentication. When creating a COM+ component that hosts schedule instances and its persistence database, you can choose whether to use SQL Server authentication or Windows 2000 authentication. In addition, the administration console uses the Windows Management Interface (WMI) available in Windows 2000 security.

The following topics are covered in this section:

- [Logon Properties](#)
- [Local Policies](#)
- [Using a Service Account](#)
- [Submitting Work Items](#)

# Logon Properties

Logon properties are the initial layer of security for [BizTalk Server 2000](#). These properties control a user's ability to log on to a specific computer. Logon properties require a user to provide a user name and password prior to accessing resources, such as a file share or message queue. Messages received through HTTP and SMTP also use logon properties to ensure security. For example, an ASP page accessed through HTTP would require a user to enter a user name and password prior to displaying the contents of the Web page.

BizTalk Server uses Internet Information Services (IIS) and ASP pages for its [receive functions](#). ASP pages (actually the code behind the pages) provide a layer of security for BizTalk Server by verifying signatures from Secure Sockets Layer (SSL) and maximizing additional security, such as certificates, through IIS. For more information about IIS security, see Internet Information Services in Windows 2000 Help.

## Related Topic

[Administrative Privileges](#)

# Local Policies

Local Policies, which is part of the Local Security Settings console, determine the security options for a user or service account. Local policies are based on the computer a user is logged into, and the rights the user has on that particular computer. To set local policies, on the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, double-click **Local Security Policy**, and then expand the **Local Policies** folder.

Local policies define the privileges and rights for [BizTalk Server 2000](#) users. Local Policies can be used to configure:

- **Audit policy.** Determines which security events are logged into the Security log on the computer (successful attempts, failed attempts or both). (The Security log is part of Event Viewer.)
- **User rights assignment.** Determines which users or groups have logon or task privileges on the computer.
- **Security options.** Enables or disables security settings for the computer, such as digital signing of data, Administrator and Guest account names, floppy drive and CD ROM access, driver installation, and logon prompts.

Other policies in the Local Security Settings console can be configured to maintain the integrity of your data. For example, Account Policies can be used to configure:

- **Password policy.** For local user accounts, determines settings for passwords such as enforcement, and lifetimes.
- **Account lockout policy.** For local user accounts, determines when and for whom an account will be locked out of the system.

## ◆ Important

- Local policies, by definition, are local to a computer. When these settings are imported to a Group Policy object in Active Directory, they will affect the local security settings of any computer accounts to which that Group Policy object is applied. Therefore, it is important to note the order of precedence for security policies. Security policies associated with Group Policy (Organizational Units) override policies established at the local level. Policies from the domain override locally defined policies. In either case, user account rights may no longer apply if there is a local policy setting that overrides those privileges. This is important because the behavior of Microsoft Windows 2000 can be quite different from the behavior in Microsoft Windows NT. For example, when password policies are configured for the Domain group policy (as they are by default), they affect every computer in that domain. This means that the local account databases (on individual workstations) in the domain have the same password policy as the domain itself.

## 📌 Note

- Do not set Local Policies for public keys. Public keys provide security protection for BizTalk Server. Public keys are a component of certificates that are used to encrypt and decrypt data. By adding additional policies to a public key, BizTalk Server will not be able to use the associated certificate.

## Related Topic

[Administrative Privileges](#)

# Using a Service Account

A service account is similar to an interactive user account because they both enable a user to access computer and/or network resources. A service account is a regular user account with specific properties that allow it to act as part of the operating system. Whereas, an interactive user account refers to the user currently logged on during the [BizTalk Server 2000](#) setup process.

If the identity is set to interactive user, the application runs only when a user is logged on. Therefore, if BizTalk Server is set up with an interactive user account, it fails if the specified user logs off from the server. Choosing interactive user identity, though, carries security risks, because the application runs under the identity of the logged-on user without that user's knowledge or consent. For instance, if the application is running on a computer while an administrator is logged on, the application runs under the administrator's identity, potentially making calls as such on behalf of clients.

If the identity is set to a service account, it can act as part of the operating system and allow users to access applications on a server even when the user is not logged on to the computer.

For more information about service accounts, see [Create a service account](#).

## Related Topic

[Create a service account](#)

# Submitting Work Items

Controlling a user's ability to send work items to [BizTalk Server 2000](#) can be accomplished using the BizTalk Server Interchange Application COM+ component. The BizTalk Server Interchange Application COM+ component uses the following security configuration properties:

- Authentication level
- Impersonation level
- Access permissions
- Launch permissions
- Configuration permissions

To control a user's ability to send work items, a role must first be added to the BizTalk Server Interchange Application, which is one of the COM+ applications, and then associate the role with the **Submit** and **SubmitSync** methods.

The following topics are covered in this section:

- [Add a role to the BizTalk Server Interchange Application](#)
- [Associate a new role with the Submit and SubmitSync methods](#)

## Related Topic

[Administrative Privileges](#)

# Add a role to the BizTalk Server Interchange Application

1. On the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**.

The Component Services console appears.

2. Expand **Component Services**, **Computers**, **My Computer**, and **COM+ Applications**.

3. Right-click **BizTalk Server Interchange Application** and click **Properties**.

The **BizTalk Server Interchange Application Properties** dialog box appears.

4. Click the **Advanced** tab and, in the **Permission** area, clear the **Disable changes** check box, click **OK**, and then in the message dialog box, click **Yes**.

5. Repeat step 3.

6. Click the **Security** tab and, in the **Authorization** area, select the **Enforce access checks for this application** check box.

7. In the **Security level** area, click **Perform access checks at the process and component level. Security property will be included on the object context. The COM+ security call is available**.

8. Click **OK**.

9. In the message dialog box, click **Yes**.

10. Expand **BizTalk Server Interchange Application**.

11. Double-click the **Roles** folder, right-click the folder, point to **New**, and then click **Role**.

The **Role** dialog box appears.

12. Type a name for the role and click **OK**.

13. In the message dialog box, click **Yes**.

14. Expand the role you just created, double-click the **Users** folder, right-click **Users**, point to **New**, and then click **User**.

15. In the **Select Users or Groups** box, type the full name of the user you want to add.

16. When you have finished adding user accounts to the role, click **OK**.

## Note

- For each user account or group assigned to the role, an icon appears in the **Users** folder. The new role membership will be activated when the application is started.

## Related Topic

[Shut down the BizTalk Server Interchange Application](#)

# Associate a new role with the Submit and SubmitSync methods

1. On the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**.

The Component Services console appears.

2. Expand **Component Services**, **Computers**, **My Computer**, **COM+ Applications**, **BizTalk Server Interchange Application**, **Components**, **BizTalk.Interchange.1**, **Interfaces**, **Interchange**, and **Methods**.

3. Right-click **Submit** and click **Properties**.

The **Submit Properties** dialog box appears.

4. Click the **Security** tab.

5. In the **Roles explicitly set for selected item(s)** area, select the check box for the role you just created in the [Add a role to the BizTalk Server Interchange Application](#) procedure and click **OK**.

6. Right-click **SubmitSync** and click **Properties**.

The **SubmitSync Properties** dialog box appears.

7. Click the **Security** tab.

8. In the **Roles explicitly set for selected item(s)** area, select the check box for the role you just created in the [Add a role to the BizTalk Server Interchange Application](#) procedure and click **OK**.

## Note

- A new role for the BizTalk Server Interchange Application must first be created before the **Submit** and **SubmitSync** methods can be associated with it.

## Related Topic

[Shut down the BizTalk Server Interchange Application](#)

# Transport Services

Microsoft [BizTalk Server 2000](#) supports a core set of [transport services](#). These transport services enable the server to send documents to [organizations](#) or applications whether or not the applications are capable of communicating directly with the server by using a COM interface. BizTalk Server supports the HTTP, HTTPS, and SMTP network protocols and Message Queuing.

The following topics are covered in this section:

- [HTTP and HTTPS](#)
- [SMTP](#)
- [Message Queuing 2.0](#)
- [File](#)

## Related Topics

[Select a transport type](#)

[Set Transport Properties](#)

# HTTP and HTTPS

HTTPS is used to provide strong authentication when using HTTP to gain access to content on the Web. The most common use of HTTPS is to provide an encrypted connection to an authenticated Web server. When clients attempt to establish an HTTPS connection, typically triggered by browsing to a URL beginning with `https://`, the client and server jointly negotiate a security protocol to use and then exchange authenticating information.

Microsoft Internet Explorer 5 or later supports common secure communication protocols for HTTP [transactions](#), including the following:

- Transport Layer Security (TLS version 1.0)
- Secure Sockets Layer (SSL versions 2 and 3)
- Private Communications Technology (PCT version 1.0).

Each protocol provides both encryption services (for confidentiality of exchanged data) and authentication services (for mutual identification between clients and servers). SSL support, which is provided through the built-in HTTPS [transport service](#), adds server-to-server authentication and transport layer encryption to an [interchange](#).

BizTalk Server and HTTPS can be used to securely exchange data within an [organization](#) or with a [trading partner](#) by means of HTTP. The following provides specific details regarding how [BizTalk Server 2000](#) uses HTTP and HTTPS to send and receive data.

## Send

The HTTP and HTTPS transport services can be used to secure data that is sent to an application or trading partner. Security for these transport services relies on certificates.

For example, prior to sending data over HTTP, a BizTalk Server administrator sends a copy of the client certificate to a trading partner. The trading partner retains a copy of the certificate in the BizTalk store. In the future, the certificate is used to authenticate the trading partner sending data. A unique certificate manager must be created to send or export a certificate to a trading partner.

## Receive

To secure data over HTTP, BizTalk Server uses Microsoft Internet Information Services (IIS) and ASP pages. When using HTTPS to connect to IIS, the client and browser negotiate a common protocol to secure the [channel](#). In cases where the server and client have multiple protocols in common, IIS secures the channel with a supported protocol, such as SSL. To secure data that is received by BizTalk Server over HTTP, the process is identical. The ASP page serves as the gateway for sending data to BizTalk Server. If the data is secure, BizTalk Server receives the data provided the ASP code uses the **Submit** method or the **SubmitSync** method to make a call.

## Related Topics

[Select a transport type](#)

[Set Transport Properties](#)

# SMTP

SMTP (Simple Mail Transfer Protocol) is a protocol for sending e-mail messages between servers. SMTP is a common protocol for sending mail over the Internet. An e-mail message can be retrieved with an e-mail client using either POP or IMAP. In addition, SMTP is used to send messages from a mail client to a mail server. When configuring an e-mail application, both the POP or IMAP server and the SMTP server must be specified.

SMTP can be used to securely exchange data within an [organization](#) or with a [trading partner](#). [BizTalk Server 2000](#) uses SMTP to send and receive data using the following methods:

## Send

BizTalk Server implements a transport protocol to send data over SMTP. At a minimum, SMTP requires that data be MIME-encoded. This process enables BizTalk Server to identify where a set of data ends and the next set of data begins. However, MIME-encoding does not provide security. S/MIME is the secure MIME version. Documents encoded using built-in S/MIME encoding components ensure document integrity, authentication of the sending party, and payload encryption. BizTalk Server creates an S/MIME document with the encrypted message as the body of the document. To add this security layer, a certificate must be associated with the MIME-encoded message. MIME encoding can be specified when [messaging ports](#) are created in [BizTalk Messaging Manager](#). This is also where certificates are specified.

## Receive

To implement security on the receive side of SMTP using Microsoft Exchange Server, an administrator must create a receive account for BizTalk Server. Once the account is set up, trading partners send their public keys to Exchange Server, which authenticates the sender (trading partner). The public key is added to the Exchange Server certificate store.

When Exchange Server receives a message, the **Submit** method sends the data to BizTalk Server. BizTalk Server verifies the certificate against the public key; if they match, BizTalk Server decrypts the data and processes the document.

## Related Topics

[Messaging Port Elements](#)

[Select a transport type](#)

[Select an encryption certificate](#)

[Set Transport Properties](#)

# Message Queuing 2.0

Message Queuing 2.0 supports privacy and security using the following:

- Access control
- Auditing
- Encryption
- Authentication

Message Queuing also takes advantage of the Kerberos V5 security protocol available with Microsoft Windows 2000. In addition, Message Queuing supports 128-bit encryption as well as 40-bit encryption. Message Queuing can also be used to integrate applications, implement a push-style business-event delivery environment between applications, and build reliable applications that work over unreliable but cost-effective networks.

Message Queuing can be used to securely exchange data within an [organization](#) and with a [trading partner](#). [BizTalk Server 2000](#) uses Message Queuing to send and receive data using the following methods:

## Send

The first layer of security for Message Queuing is a user name and password, which is required by anyone to store data or retrieve data from Message Queuing. In addition, Message Queuing can store data that has a certificate. Users are able to specify a certificate for data stored on a message queue using [BizTalk Messaging Manager](#).

## Receive

If an administrator creates logon properties for a message queue, a user name and password must be used to retrieve the data. Creating logon properties forms a fundamental layer of security. If a trading partner has added a certificate to the data, a copy of its private key must be received to decrypt the data before BizTalk Server can process the package.

## Related Topics

[Add a Message Queuing receive function](#)

[Configure advanced properties for File or Message Queuing receive functions](#)

[Configure a Message Queuing receive function: General tab](#)

[Configure a Message Queuing receive function: Services tab](#)

[Select a transport type](#)

[Set Transport Properties](#)

# File

Microsoft Windows 2000 ensures data and system protection by defining discretionary file access control. The Windows NTFS file system, required for [BizTalk Server 2000](#), can prevent users from damaging key system or application files. NTFS also provides robust security for the supporting files in an application.

File storage can be used to securely exchange data within an [organization](#) and with a [trading partner](#). File storage can also be used to send and receive data using the following:

## Send

The first layer of security for file storage is a user name and password. A user name and password is required by anyone storing or retrieving data from a folder. In addition, folders can store data that has a certificate associated with it. To use this added layer of security, use [BizTalk Messaging Manager](#) to create a certificate for the data to be stored in a folder.

## Receive

If logon properties for a folder have been applied, a user name and password must be used to retrieve the data. An administrator can also designate access levels (read, delete, and so on) to the file directory for specific users. If a trading partner has added a certificate to the data, a copy of its private key must be received to decrypt the data before BizTalk Server can process the package. Inbound documents can also be digitally signed to ensure that the sending source cannot deny that it sent the document.

## Related Topics

[Add a File receive function](#)

[Configure advanced properties for File or Message Queuing receive functions](#)

[Configure a File receive function: General tab](#)

[Configure a File receive function: Services tab](#)

[Select a transport type](#)

[Set Transport Properties](#)

# Security for Applications That Host XLANG Schedule Instances

After installing [BizTalk Orchestration Services](#), security levels can be set for the following:

- Creating new [XLANG schedule instances](#)
- Interacting with existing XLANG schedule instances
- Administrative functions relating to XLANG schedule instances
- Applications hosting XLANG schedule instances.

Applications that host XLANG schedule instances rely on role-based security, which is an automatic service provided by COM+. Role-based security enables users to construct and enforce an access control policy for COM+ applications. With a flexible and extensible security configuration model, role-based security offers considerable benefits over enforcing all security within components. There are two default COM+ applications, the [XLANG Scheduler](#) and the XLANG Scheduler Persistence Helper, which are automatically created when BizTalk Orchestration Services are installed. The XLANG Scheduler COM+ application has four roles that can be used to ensure the security of schedule instances regardless of the COM+ application in which they execute. The four roles are:

- **XLANG Schedule Creator.** This role allows specified users to create XLANG schedule instances. For instance, if an administrator wants a user to be able to create an XLANG schedule instance, the administrator must add the user to the membership list for this role. Any user who is not listed as a member of this role and attempts to create an XLANG schedule instance will see an error message indicating that access has been denied. In addition, an entry is generated in the event log indicating that access has been denied.
- **XLANG Schedule User.** This role allows specified users to interact with XLANG schedule instances. For instance, if an administrator wants a user to be able to interact with an schedule instance, the administrator must add the user to the membership list for this role. Any user who is not listed as a member of this role and attempts to interact with a schedule instance will see an error message indicating that access has been denied. In addition, an entry is generated in the event log indicating that access has been denied.
- **XLANG Scheduler Administrator.** This role can be used to indicate who has administrative rights to the following tasks:
  - Determining whether a COM+ application is able to act as a host for XLANG schedule instances.
  - Setting the DSN type for a COM+ application that is hosting XLANG schedule instances and setting the state management value for the level of persistence the COM+ application needs to support.
  - Shutting down all XLANG schedule instances.
  - Suspending, resuming, or terminating an XLANG schedule instance.
- **XLANG Scheduler Application.** This role is used by the XLANG Scheduler to interact with any COM+ application that a user creates. Therefore, the role must include the same identity that the COM+ application is using to run.

The following topics are covered in this section:

- [Best Practices for Securing COM+ Applications](#)
- [Securing the Orchestration Persistence Database](#)
- [Confirming the Sender's Identity](#)

## Related Topic

[XLANG Schedules](#)

# Best Practices for Securing COM+ Applications

Using roles, an administrator can administratively construct an authorization policy for an application, choosing (down to the method level, if necessary) which users can access which resources. Because all [XLANG schedules](#) are hosted in COM+ server applications, access to the installed COM objects can be limited by configuring security properties for various roles.

## ◆ Important

- If security properties are added at the component level, individual components, interfaces, and methods based on the role settings at these levels are also limited. For more information about COM+ security, go to the MSDN Online Library Web site ([msdn.microsoft.com/library/default.asp](https://msdn.microsoft.com/library/default.asp)), and browse to the Security in COM+ page.

## Recommendations for securing COM+ applications

The following recommendations apply primarily to securing deployed applications:

- **Do not configure a COM+ application as an interactive user.** COM+ applications that use the interactive user identity can be used only if a user is logged on to the computer where the application resides. If no one is logged on, the COM+ application cannot run. In addition, if a user creates a COM+ application using interactive user, it will be more difficult to configure access to its [persistence database](#) and other resources. For more information about service accounts, see [Using a Service Account](#).
- **Reconfigure the identity for XLANG Scheduler.** During setup, the [XLANG Scheduler](#) identity is automatically configured as Interactive User. This configuration is suitable for most developers. On production systems, you should change the identity property for the XLANG Scheduler so that the application runs under a unique user account. The identity is used by all [messages](#) sent by the XLANG Scheduler.

### 📌 Note

- When using the client for Microsoft Windows 2000 Terminal Services to initiate an XLANG schedule, the COM+ application hosting the [XLANG Scheduler Engine](#) must have its identity set to a valid Windows 2000 user or group name. The identity of the COM+ application is set on the **Identity** page of the properties dialog box for that application. The identity cannot be set to interactive when using the XLANG Scheduler Engine through a session hosted by Terminal Services.
- **Create a new COM+ application with a unique identity for every application that is hosting XLANG schedule instances.** Create a new COM+ application with a unique identity for each business process, such as purchasing, with unique security requirements. This enables individual security levels to be specified for each application. In addition, it safeguards from excessive damage that can be done by unstable application code and makes it easier to audit the operations of individual applications.
- **Install application-specific components into their associated business processes.** This protects data and keeps out applications that do not have access to these components, provided the server application is adequately protected.

### 📌 Note

- Each COM+ application must contain at least one component. If an application-specific component is not installed, a placeholder component in the application must be created and installed, or the COM+ application will not be available.
- **Change the membership list of the XLANG Scheduler roles from their defaults to provide added security.** When BizTalk Server is installed, the XLANG Scheduler is created and configured with the following roles, shown with their default settings:
  - **XLANG Schedule Creator.** Membership role defaults to Everyone.
  - **XLANG Schedule User.** Membership role defaults to Everyone.
  - **XLANG Scheduler Administrator.** Membership role defaults to Administrators.
  - **XLANG Scheduler Application.** Membership role defaults to Everyone.

## Related Topics

Change the application identity for the default XLANG Scheduler application

Create a COM+ application to host XLANG schedules

XLANG Schedules

# Securing the Orchestration Persistence Database

When a COM+ application that hosts [XLANG schedule instances](#) is created, a [persistence database](#) must be associated with the COM+ application. Therefore, first create a persistence database in Microsoft SQL Server. When creating a database, a user must choose whether to use SQL Server authentication or Microsoft Windows 2000 authentication for security. After creating the database, a user needs to give permission rights to the COM+ application that will be created later to host XLANG schedule instances. Make sure that the COM+ application has permissions to both create tables and create procedures to the persistence database associated with it. The interaction between the [BizTalk Orchestration Services](#) and the default BizTalk Server Orchestration Persistence database is based on the Windows 2000 security model rather than on SQL Server.

## Related Topic

[Manage the Default XLANG Scheduler Application and Database](#)

# Confirming the Sender's Identity

During schedule design, various shapes can be used to describe [implementation technologies](#) used to implement a [port](#) in a business process. The COM Component shape represents a technology that can be used to implement a port by using a method call for each [message](#) that is sent or received. The Script Component shape represents a technology that can be used to implement a port by using a method call for each message that is sent or received. The Message Queuing shape represents a technology that is used to implement a port. Message Queuing [transport services](#) are used to send or receive messages. When adding one of the three technologies, a user can require that the sender's identity be confirmed prior to receiving messages.

For more information about COM components, Windows Script components, or Message Queuing security for [XLANG schedules](#), see [Implement a port by using a COM component](#), [Implement a port by using a Windows Script Component](#), and [Implement a port by using Message Queuing](#).

## Related Topics

[Using the COM Component Shape](#)

[Using the Message Queuing Shape](#)

[Using the Script Component Shape](#)

# Certificates Overview

Digital certificates bind a cryptographic key with one or more attributes of a user. Issued by certification authorities, the certificates protect the Internet by assuring the authenticity of network messages. This technology and its underlying digital signatures are now helping to increase the widespread deployment of electronic commerce on the Internet.

The following topics are covered in this section:

- [Understanding Certificates](#)
- [Certificates Needed by BizTalk Server](#)
- [Certificate Name Restrictions](#)

# Understanding Certificates

Microsoft [BizTalk Server 2000](#) relies heavily on the security provided by certificates. Through the use of public keys, which encrypt the data, and private keys, which enable the data to be decrypted, BizTalk Server can send data that can be trusted and can ensure that the data it processes is secure. Public Key Policies, which are part of the Microsoft Management Console, enable a user to configure encrypted data recovery agents for Encrypting File System (EFS), domain-wide root certificate authorities, trusted certificate authorities, and so on. Certificates also contain digital signatures, which can be applied to documents and verified on inbound documents using the BizTalk Server native support for digital signatures.

Certificates are used to authenticate and secure exchanges of information on non-secured networks, such as the Internet. Certificates can be managed for a user, a computer, or a service. The X.509-based Public Key Certificate Server built into Windows 2000 Server lets [organizations](#) issue public-key certificates for authentication to their users, without depending on commercial Certification Authority (CA) services.

BizTalk Server supports certificates through [BizTalk Messaging Manager](#). Certificates make it easy to encrypt, decrypt, and digitally sign data. Public-key encryption technology is supported for all documents that are transmitted using BizTalk Server [transport services](#). BizTalk Server also supports decryption and signature verification for the documents that it receives.

## MachineKeys versus UserKeys

When obtaining certificates, it is best to use MachineKeys, which are associated with the computer, rather than UserKeys, which are associated with the current, logged on user. If a user, currently logged onto a server, obtains a certificate with UserKeys only that user can access the certificate because the certificate UserKey contains the user's logon information. Therefore, if users need to access certificates with UserKeys in BizTalk Server, BizTalk Server must be run in the context of that user. To enable any user to log onto BizTalk Server and access keys, certificates must have MachineKeys.

For BizTalk Server to access the Certificates (Local Computer), BizTalk Server must run as LocalSystem or Administrator. Additionally, if UserKeys are used, BizTalk Server must run in the context of that user, who also must be an administrator.

# Certificates Needed by BizTalk Server

A certificate server stores certificates for a user and for a computer. Every user has a certificate store, and every computer has its own certificate stores. If a user creates a certificate, Windows 2000 assumes the certificate is for the user. An [organization](#) needs to store its certificates in the Personal store located under the Certificates (Local Computer) of the Certificates console. However, to provide the proper security, [BizTalk Server 2000](#) needs all [trading partner](#) certificates to be stored in the BizTalk store located under the Certificates (Local Computer) of the Certificates console.

During design time, when [messaging ports](#) and [channels](#) are created, a user needs to have all trading partner certificates associated with the BizTalk store, under Certificate (Local Computer) of the Certificates console, rather than with the user. When specifying security, such as encryption or signature verification, for trading partners through the [BizTalk Messaging Manager](#), the certificates displayed are the trading partner certificates located in the BizTalk store. BizTalk Messaging Manager displays the certificates located in the Personal store under Certificate (Local Computer) of the Certificates console when specifying security, such as verified decryption and signing, for SSL clients. Where certificates are located is important because at run time, when a user attempt to process documents through BizTalk Server, the computer is acting as the background service, and it is this service that needs to access the certificates.

There are two ways to resolve issues about where certificates are stored:

- If a user has already created certificates, Windows 2000 has stored them in the user store. The certificates must be moved from the user store to the corresponding store under Certificates (Local Computer). This process is done through the certificate manager.
- If a user has created a service account, all the certificates are associated with the computer, rather than with the user.

## Certificate management through Windows 2000

BizTalk Server provides certificate management through Microsoft Windows 2000. Tightly integrated within the Windows 2000 security model is IIS 5.0, which includes a certificate server. This lets organizations issue and manage Internet-standard X.509 digital certificates. In addition to key management services in IIS 5.0, the Microsoft certificate server in IIS 5.0 provides customizable services for issuing and managing digital certificates. A certificate server performs a central role in the management of software security systems to enable secure communications across the Internet, corporate intranets, and other non-secure networks.

The following topic is covered in this section:

- [Create a certificate manager](#)

## Related Topics

[Select a certificate for outbound signature](#)

[Select a certificate to verify inbound document decryption](#)

[Select a certificate to verify inbound document signature](#)

[Select an encryption certificate](#)

# Create a certificate manager

1. On the **Start** menu, click **Run** and type **mmc**.

The **Console1** dialog box appears.

2. On the **Console** menu, click **Add/Remove Snap-in**.

The **Add/Remove Snap-in** dialog box appears.

3. Click **Add**.

The **Add Standalone Snap-in** dialog box appears.

4. Click **Certificates** and click **Add**.

The **Certificates snap-in** dialog box appears.

5. Click **Computer account**, click **Next**, and then click **Finish**.

6. In the **Add Standalone Snap-in** dialog box, click **Certificates** and click **Add**.

The **Certificates snap-in** dialog box appears.

7. Click **Computer account**, click **Next**, click **Finish**, click **Close**, and then click **OK** to close the dialog boxes.

## Related Topic

[Certificates Overview](#)

# Certificate Name Restrictions

Microsoft [BizTalk Server 2000](#) does not allow identical names for certificates. If identical names for certificates exist, only one of the certificates can be selected in [BizTalk Messaging Manager](#). For example, if an [organization](#) uses two certificates that have the same name and reference, it is impossible for the organization to use both certificates. If the organization uses one of the certificates, the other certificate disappears from the list of available certificates in the **Channel** dialog box.

# Crypto API

Microsoft [BizTalk Server 2000](#) uses Crypto API to secure data it processes. Recent developments in cryptography have added additional uses, including mechanisms for authenticating users on a network, ensuring the integrity of transmitted information, and preventing users from denying ownership of their transmitted messages.

Any application, message, data, and so on that uses encryption and uses Microsoft-specific encryption, such as Microsoft Windows 2000 for generating certificates, uses Crypto API. BizTalk Server uses Crypto API for [receive functions](#) that a user specifies when using a custom-made COM+ component such as preprocessing component, which enables BizTalk Server to handle unique encryption components.

# Collaborative Data Objects

Microsoft [BizTalk Server 2000](#) requires MIME encoding for all its data, whether sending the data or receiving it. Through the use of Collaborative Data Objects (CDOs), which are part of the Windows 2000 environment, data can be encoded and processed by BizTalk Server. For example, before BizTalk Server can send a catalog that contains text and graphics, it first needs the data (graphics) to be changed from binary to string. CDOs encode the text and graphics into a string format so that BizTalk Server can process it.

# Enhancing Performance and Scalability

Understanding the various components of [BizTalk Server 2000](#) enables you to create scalable, high performance solutions. There are several methods, such as identifying potential bottlenecks, addressing latency, and managing databases, which you can use to increase the performance of BizTalk Server. However, the extent to which you can achieve an optimal solution depends on the complexity of your [organization's](#) system architecture and your budget requirements.

Optimizing the [BizTalk Messaging Management database](#), the [Shared Queue database](#), the [Tracking database](#), and the [Orchestration Persistence database](#) is critical to achieving optimal performance with BizTalk Server. For more information about optimizing the databases, see [Scale Up the Databases](#) and [Scale Out the Databases](#).

The following topics are covered in this section:

- [Scaling BizTalk Server](#)
- [Performance Optimization](#)

# Scaling BizTalk Server

To optimize performance, it is highly recommended that you distribute key components across multiple servers. The key components of [BizTalk Server 2000](#) include:

- **BizTalk Services.** These services include [BizTalk Messaging Services](#) and [BizTalk Orchestration Services](#). For more information, see [BizTalk Services](#).
- **Databases.** These databases include the [BizTalk Messaging Management, Tracking, Shared Queue, and Orchestration Persistence](#) databases.
- **Transport services.** The [transport services](#) include HTTP, File, SMTP, and Message Queuing. Each component has unique scaling requirements.

The following topics are covered in this section:

- [Scaling BizTalk Server Vertically](#)
- [Scaling BizTalk Server Horizontally](#)

## Related Topics

[Managing BizTalk Server Databases](#)

[Managing the BizTalk Messaging Management Database](#)

[Persistence](#)

[Set Transport Properties](#)

[Shared Queue Database](#)

[Tracking Database](#)

# Scaling BizTalk Server Vertically

By using multiple processors and significant memory, you can vertically scale (scale up) [BizTalk Server 2000](#). Scaling BizTalk Server vertically requires fewer servers and simplifies site management, but is more costly than scaling a system horizontally or improving software architecture. In addition, once capacity on existing hardware is maximized, you must begin to scale the system horizontally.

The following topics are covered in this section:

- [Scale Up BizTalk Server](#)
- [Scale Up the Databases](#)
- [Scale Up the Transport Services](#)

# Scale Up BizTalk Server

To scale [BizTalk Server 2000](#) vertically, the following are recommended:

- Increase the processor size (such as the Pentium III and its Xeon derivatives with large level II caches).
- Use symmetric multiple processing (SMP) servers that accommodate up to eight CPUs.
- Decrease file I/O and network bottlenecks.
- Run Microsoft Windows 2000 Server on four-way SMP servers.

## Note

- When running Microsoft Windows 2000 Server on one CPU, adding three additional CPUs improves performance, but does not increase the processing speed of one CPU by a multiple of four.

## Recommended solutions for scaling BizTalk Server vertically

To achieve optimal performance with BizTalk Server, the following is recommended:

- A multi-processor PIII Xeon MHz processor system (the highest MHz possible for maximum performance), capable of being upgraded to eight CPUs.
- A 1- to 2-MB L2 Processor Cache (increases parsing performance).
- 512 MB of RAM (more if an [organization](#) is processing multiple megabyte documents).
- Multiple 100 Mbps (megabits per second), or greater, network cards connected to 100 MB/s switch ports to increase network I/O throughput.
- Provide multiple disks and controllers for Message Queuing and Distributed Transaction Coordinator (DTC) file and log operations. Write DTC log operations to a central remote server to offload file I/O contention on the local BizTalk Server.
- Use dual honed network interface cards (NICs) in the BizTalk Servers to separate HTTP processes from the Shared Queue and BizTalk Messaging Management databases dedicated SQL Server processes.
- These recommendations assume that BizTalk Server is running on a dedicated server. If the BizTalk Services are sharing the server with other application services, additional hardware is recommended.

# Scale Up the Databases

To vertically scale the databases, you must determine the disk configuration. To determine the disk configuration, you must consider throughput, fail-over, and cost.

The following table identifies the options available and compares each option relative to each other.

RAID level	Cost	Effective disk utilization percentage	Speed	Fault tolerance
0 (Striping)	Low	100	Fast	Low
1 (Mirroring)	High	50	Medium	High
5 (Striping with parity)	Medium	Effective disk space is the total space of all disks in the array combined minus 1 (for parity)	Slow	Moderate (only because performance degrades with a failed disk)

To achieve optimal performance, it is recommended that you install an efficient caching Redundant Array of Independent Disks (RAID) controller with a fast CPU and a high amount of RAM that is nonvolatile. You can also combine multiple RAID levels to achieve desired performance. For example, RAID 0 provides the best performance, but does not provide fault tolerance. RAID 1 provides the best fault tolerance, but does not provide the best performance (due to writing data to one disk, as opposed to multiple disks, concurrently). To achieve optimal performance, you can combine RAID 1 and RAID 0 by mirroring a set of striped disks.

## Notes

- RAID 5 does not meet or exceed the speed or cost of any other RAID level. RAID 5 provides key advantages, but is slower when writing data to disk than RAID 0 or RAID 1.
- For any strategy, the number of available disk controllers is critical. You can significantly improve overall performance by using one disk per controller. When configuring disks, effectively using disk channels is equally important. Disk channels are disks that share the same controller. These disks may be configured as stand-alone disks, or configured to run as part of an array. For example, if there are 10 disks in a server, 5 disks each in two arrays, and each array is connected to its own controller, there would be 2 disk channels.

Ideally, the [BizTalk Messaging Management](#), [Shared Queue](#), [Tracking](#), and [Orchestration Persistence](#) databases should be on separate disk channels. However, if your [organization's](#) system environment requires that the databases reside on individual servers, it is important to understand the use of each database when planning for this deployment scenario:

- The BizTalk Messaging Management database contains all the configuration information, such as organizations, [server groups](#), servers, [channels](#), and [messaging ports](#), for BizTalk Server. This information is read and cached in Microsoft SQL Server memory. This database receives the least activity of the four databases and can reside on the same disk channel as one of the other three databases if necessary.
- The Shared Queue database manages the data for all the queues. Every document that uses [asynchronous communication](#) is sent to and stored in the Shared Queue database. When BizTalk Server is ready to handle the document, it is removed from the Shared Queue database for processing. Because this database manages all [transactions](#), data is written to and read from the Shared Queue database frequently.
- The Tracking database tracks documents that pass through the server, either individually or in batches. This database stores both the data and its logging information. Therefore, data is often written to the Tracking database, but data is rarely read from the database.
- The Orchestration Persistence database stores the structure of the [XLANG schedules](#), progress of activated [XLANG schedule instances](#), and [messages](#) that are sent or received when an XLANG schedule instance begins or completes a transaction, the system is shut down, or when the XLANG schedule instance is [dehydrated](#).

## Optimization recommendations to vertically scale the databases

Consider the following for optimal performance of BizTalk Server databases:

- A multi-processor PIII Xeon MHz processor system (the highest MHz possible for maximum performance), capable of being upgraded to eight CPUs.

- 512 MB of RAM (more if an organization is processing multiple megabyte documents).
- Optimize the underlying Microsoft SQL Server databases and logs based on standard database best practices. For more information about SQL Server, on the **Start** menu, point to **Programs**, point to **Microsoft SQL Server**, and then click **Books Online**.
- If you initially plan to complete only a few transactions, you can install the databases on the same disk I/O channel. As more transactions are being processed, add disks and/or controllers to a server and move the databases to these new disk I/O channels. Additionally, an individual database can be moved to a new server. For more information about scaling the databases horizontally, see [Scale Out the Databases](#).

To optimize the BizTalk Messaging Management database:

- Install the database on the same disk I/O channel as the Shared Queue database or the Tracking database. The contents of the BizTalk Messaging Management database are read and cached in Microsoft SQL Server memory.
- If an organization processes a high volume of data, consider placing this database on its own disk I/O channel so as not to hinder the performance of the Shared Queue or the Tracking databases.

To optimize the Shared Queue database:

- If the CPU exceeds 80 percent, add additional CPUs.
- If disk queue length averages more than 1 or, if disk I/O utilization is greater than 100 percent, add additional physical disks.
- Install the database on its own dedicated disk I/O channel.
- Purchase disks with the fastest access times, and controllers with the highest throughput.
- Consider RAID 0 and mirror it to obtain fault tolerance.

To optimize the Tracking database:

- Add more physical disks and additional disk space than currently exists on the Shared Queue database.
- Estimate the average document size for a single transaction. Multiply the document size by the number of times the document will be logged to the Tracking database. This estimate suggests the amount of document storage space required per document in the Tracking database. Multiply the document storage space value by the throughput requirement to determine the amount of space needed before the Tracking database becomes full. Ensure that the Tracking database has adequate space to accommodate logging an average document size.
- Install this database on its own disk I/O channel due to the high volume of data that is written to it. A separate disk I/O channel is particularly important in heavy transaction environments.

#### **Note**

- There is size limit for tracking [interchanges](#) and documents, which if exceeded, greatly affects the performance of BizTalk Server. For more information about the size limit, see [Interchange and document size limit](#).

To optimize the Orchestration Persistence database:

- Because data is written to and read from this database frequently, the database should have a dedicated disk I/O channel. It is best to purchase disks with the fastest access times, and controllers with the highest throughput, if possible. Consider RAID 0 and mirror it to achieve fault tolerance.
- If the CPU capacity exceeds 80 percent, add more CPUs.
- If the disk queue length averages more than 1, or if disk I/O utilization is greater than 100 percent, add more physical disks.

## **Related Topic**



# Scale Up the Transport Services

BizTalk Server 2000 supports four [transport services](#). Each of these transport services can be scaled vertically:

- HTTP
- File
- SMTP
- Message Queuing

The following topics are covered in this section:

- [HTTP/HTTPS \(Scale Up\)](#)
- [File \(Scale Up\)](#)
- [SMTP \(Scale Up\)](#)
- [Message Queuing \(Scale Up\)](#)

# HTTP/HTTPS (Scale Up)

## Receive

The HTTP/HTTPS [receive function](#) sends documents to [BizTalk Server 2000](#) by calling the BizTalk Server **Interchange** object. BizTalk Server does not have a unique HTTP/HTTPS receive function. The HTTP receive function calls a local object. Therefore, no network latency exists to affect performance. However, because the HTTP receive function and BizTalk Server both reside on the same server, the HTTP receive function must perform two functions: transport data and process data.

In high-volume environments, running the HTTP receive function and BizTalk Services on the same server degrades the performance of both. Additionally, if secure sockets layer (SSL, also referred to as HTTPS) is used to receive documents, performance is degraded further due to decryption processing. Depending on the security needs of an [organization](#), data may need to be encrypted using HTTPS. This added level of security may affect the performance of BizTalk Server.

## Send

BizTalk Server is a native HTTP/HTTPS client. If a [channel](#) is configured to use HTTP/HTTPS as its outbound [transport service](#), BizTalk Server uses HTTP/HTTPS to send data to a [trading partner's](#) HTTP/HTTPS server. You cannot move the HTTP/HTTPS outbound transport service to a separate server from the server on which [BizTalk Messaging Services](#) resides. If a server is configured to participate in work-item processing and it processes a document that uses an HTTP/HTTPS transport service, this same server sends the document. For more information about work-item processing, see [Scale Up BizTalk Server](#).

BizTalk Server functions as an HTTP client, which affects the document-serializing power of the server. If the port is using HTTPS, the performance of the HTTP transport service is greatly affected. SSL accelerator cards cannot be used when acting as an HTTPS client because these cards only enhance HTTPS server performance.

## Recommended optimization for HTTP/HTTPS

To optimize performance for the HTTP/HTTPS, which enhances the performance of BizTalk Server:

- Configure the inbound HTTP/HTTPS receive service on a separate server than BizTalk Server. If the inbound HTTP/HTTPS receive service cannot be installed on a separate server than BizTalk Server, use a faster CPU or, add more CPUs.
- Increase the CPU MHz that is required for BizTalk Server (to accommodate the additional need for sending documents) and add additional CPUs until the desired performance level is achieved.
- Apply best practices when using ASP pages with the receive or send HTTP/HTTPS service. For more information about optimizing ASP pages and Internet Information Services, go to the Internet Information Services Help Web site ([localhost/iisHelp](#)) and click **Active Server Pages Guide**.

# File (Scale Up)

## Receive

Although performance is high when using a File [receive function](#) for business-to-business [transactions](#), a File receive function is not secure for Internet-based transactions, and therefore is not widely used. However, for application-to-application transactions within a corporation, a File receive function can provide optimal performance without jeopardizing security. In addition, a File receive function can be used securely with external [trading partners](#) provided it is combined with another receive function, such as SMTP or HTTP. The SMTP or HTTP receive function can accept a document from a trading partner (using HTTPS or S/MIME for security) and write the file to an internal file system directory. Then BizTalk Server can use a File receive function to receive the document. This combination of transports may not increase performance, but will provide greater flexibility and security.

### Note

- Using S/MIME significantly degrades the performance of BizTalk Server.

## Send

The security and performance issues detailed for a File receive function are also applicable for sending documents using a File transport service.

### **Recommended optimization for File receive function and File transport service**

To optimize performance for the File receive function and File transport service, which enhances the performance of BizTalk Server:

- Use a local file directory rather than a remote file directory to reduce network latency.
- Use disk arrays to achieve high throughput. For more information about disk array speed and redundancy tradeoffs, see [Scale Up the Databases](#).

# SMTP (Scale Up)

## Receive

The SMTP [receive function](#) is similar to the HTTP receive function for inbound [transactions](#) in that there is no native SMTP receive function built into [BizTalk Server](#). An SMTP receive function can receive a document through an event-based mechanism and send the document to [BizTalk Server](#). If an SMTP receive function exists, BizTalk Server accepts the MIME/SMIME-encoded document and prepares it for processing.

## Send

The same security and performance issues listed in the inbound S/MIME and outbound HTTP/HTTPS sections apply here. If a [channel](#) uses SMTP as a [transport service](#) in a [messaging port](#) or [port](#), the processing server processes the document and sends it to the receiving application.

### Note

- BizTalk Server performance is significantly degraded if a digital certificate is needed to S/MIME-encode the outbound document.

## Recommended optimization for SMTP

To optimize performance for SMTP, which enhances the performance of BizTalk Server:

- The performance level achieved depends greatly on the SMTP service that is used for receiving documents. An [organization](#) may have an SMTP server that is used to perform this function. However, if an SMTP server does is not available and an organization chooses to use Microsoft Exchange Server or another third-party messaging system, the server may need a significant amount of additional hardware to maintain an adequate performance level for BizTalk Server. The SMTP server must be able to invoke an event-based mechanism, which is capable of sending documents to BizTalk Server.
- If an organization chooses to run BizTalk Server on a SMTP server, CPU performance will be impacted. To minimize the impact to performance, use a faster CPU.
- If an organization uses S/MIME, BizTalk Server performance is significantly degraded. To reduce the overall performance impact of S/MIME to BizTalk Server, use faster CPUs.

# Message Queuing (Scale Up)

## Receive

Message Queuing generally uses a high volume of disk I/O to receive and send messages. Message Queuing is transactional, which is highly recommended to improve fault-tolerance. However, it is only transactional on a local server. If Message Queuing is used to improve fault-tolerance, an adequate number of disks must be installed on each [BizTalk Server](#) to handle the increased disk I/O.

## Send

Sending documents by using Message Queuing creates the same security and performance issues as receiving documents by using Message Queuing.

## Recommended optimization for Message Queuing

To optimize performance for Message Queuing, which enhances the performance of BizTalk Server:

- Use transactional queues (local queues on BizTalk Server, rather than remote queues, must be used for transactional queues to receive) and a fast disk I/O channel. Local queues do not need to query Microsoft Active Directory; however, a public message queue must query Active Directory. Therefore, reading data from and writing data to local message queues results in better performance. Non-transactional local queues can be used to achieve better performance. However, non-transactional local queues do not provide the same reliability offered by transactional queues. Additional memory is also required.

### Note

- For more information about how to define hardware requirements for Message Queuing, see "Selecting Message Queuing server hardware" in Windows 2000 Server Help.
- The maximum limit for Message Queuing messages is 4 MB. If documents exceed 4 MB, the Message Queuing [transport service](#) cannot be used. The [Orchestration Persistence](#) database has a 2-MB document size limit.
- Message Queuing is database-intensive if journaling is used. Ensure that the standard rules for optimizing databases are applied when setting up Message Queuing transport services.
- To maximize throughput, separate data and logs and use multiple disks and controllers.

# Scaling BizTalk Server Horizontally

A successful [BizTalk Server 2000](#) implementation uses both a vertical and horizontal (scale out) strategy. Scaling vertically minimizes the number of servers required. Scaling horizontally provides the following benefits:

- **Heightened performance.** Performance exceeds what could cost-effectively be accomplished on a single server.
- **Server fault-tolerance.**
- **Separation and optimization of the different components.** Performance of BizTalk Services, the databases, and the [transport services](#) can be increased.

Scaling hardware horizontally minimizes costs. However, as site management complexity increases, your [organization](#) must begin scaling vertically.

The following topics are covered in this section:

- [Scale Out BizTalk Messaging Services](#)
- [Scale Out the Databases](#)
- [Scale Out the Transport Services](#)

## Related Topic

[Scaling BizTalk Server](#)

# Scale Out BizTalk Messaging Services

[BizTalk Messaging Services](#) can be scaled horizontally by using [server groups](#). Server groups are collections of individual servers that are centrally managed, configured, and monitored. For more information about adding and configuring server groups, see [Groups and Servers](#).

Servers that are members of the same server group share the following:

- A [Shared Queue database](#) that monitors activity in the BizTalk Server state engine.
- A [Tracking database](#) that logs document activity and generates reports.
- A [BizTalk Messaging Management database](#) that stores configuration information.
- [Receive functions](#).
- All components that the server requires at run time, such as transport components and application integration components (AICs), as well as [data translation](#), data encryption, and signing.

A BizTalk Server group does not provide a load-balancing mechanism for either receiving inbound documents or for facilitating document submission by using Distributed Component Object Model (DCOM). It does provide multiple-server work processing. Once a document is sent to the Shared Queue database, any server in the group can process, serialize, and send it out. This functionality allows for one server in a group to send a document that another server processes.

An [organization](#) can have multiple server groups for the following reasons:

- Group similar [transport services](#) (HTTP or File)
- Enhanced security
- [Trading partner](#) categorization

You can also use server groups to avoid duplicating organization, [channel](#), and [messaging port](#) configurations. Server groups share databases. Configuration information for the organization, group, channel, and messaging port is stored in the BizTalk Messaging Management database. Therefore, two or more BizTalk Server groups can share the same BizTalk Messaging Management database.

## Note

- If two or more BizTalk Server groups share the same BizTalk Messaging Management database, each group must have its own Shared Queue, Tracking, and [Orchestration Persistence](#) databases, which are shared by all members of the group.

## Recommended solutions for scaling BizTalk Server horizontally

To optimize BizTalk Server performance:

### Separate transport services and receive functions

By separating transport services and receive functions for BizTalk Server groups, you can achieve higher performance. The level of performance you can achieve depends on the number of documents being processed and the complexity of the data translation. BizTalk Server provides separate thread pools for receiving and processing data. Separating transport services and receive functions reduces context switching by eliminating the need for the server to alternate between send and receive operations.

All servers process work-items by default, which involves picking up work from the Shared Queue database, processing it, and then sending it out using the transport service the channel is configured to use (process outbound work). This process degrades the overall performance of the CPU because context switching must occur. Provided you use two or more servers, you can eliminate this degradation by enabling at least one server to function as a receive service. To configure a server to act as a receive service, you can use [BizTalk Server Administration](#) to disable the **Participate in work-item processing** functionality and create a new receive function for the server. For more information about disabling the **Participate in work-item processing** functionality, see [Configure a server in a group](#). For more information about setting up a File receive function, see [Add a File receive function](#). For more information about setting up a Message Queuing receive function, see [Add a Message Queuing receive function](#).

## Note

- For Message Queuing, only transacted reads can be done from local queues, so only one server can read from that queue.

BizTalk Server receives documents if one of the following conditions exist:

- A receive function has been configured on the same server as BizTalk Server.
- SMTP or HTTP process has been configured to call the **Submit** method on the server where BizTalk Server has been installed.

### **Prioritize parsers**

By prioritizing [parsers](#), you can optimize the performance of BizTalk Server. BizTalk Server provides four data parsers:

- [XML](#)
- EDIFACT
- [X12](#)
- Flat file

When BizTalk Server receives a document, it attempts to parse the document in the order in the previous list. By moving the most commonly used parsers to the top of the list, you can improve the performance of BizTalk Server. For more information about configuring the parser order, see [Configure the parse order for a server group](#).

Because the parser-order functionality is a server group setting, it is recommended that you create a separate group for each data type (XML, EDIFACT, X12, flat file) that is processed. Then, specify the appropriate parser priorities set for each group.

The following topic is covered in this section:

- [Component Load Balancing](#)

# Component Load Balancing

Component load balancing (CLB) is a feature of Microsoft Application Center 2000. To use CLB, Application Center 2000 must be installed on the same server as Microsoft [BizTalk Server 2000](#). CLB enables [organizations](#) to load-balance the **BizTalk.Interchange.1** component in the COM+ Services manager. CLB is a load-balancing mechanism for COM components. In a BizTalk Server environment, CLB provides the ability for an HTTP transport to use the **Submit** method to call a cluster of BizTalk Servers instead of to a single server (to the sending application, using the **Submit** method to call the cluster still appears as a submission to a node). A cluster is a collection of servers that act as a single server. For example, if you use a cluster of HTTP servers, a single submission can go to any of the three servers. Without CLB, the HTTP [transport services](#) must be configured to send to one of the three servers. In the latter scenario, if the server that an HTTP service was configured to send to failed, the HTTP transport service would need to be reconfigured to send to a different server in the BizTalk Server group.

## ◆ Important

- Do not replicate the default [XLANG Scheduler](#) application or any COM+ applications that host [XLANG schedules](#). If component load balancing is used, these COM+ applications must be installed on each server. You can replicate COM components that are bound to XLANG schedules.

# Scale Out the Databases

To horizontally scale the databases, install each database on its own server. In high-volume [transaction](#) environments, installing a database on a unique server enables the server's CPU, disk I/O, and memory resources to be allocated to the appropriate database.

## Recommended optimization for horizontally scaling the databases

To optimize database performance of BizTalk Server:

- Install each database on a separate server with 933 MHz, or greater, CPU. Do not install any of the databases on the same server as [BizTalk Server 2000](#).
- Install any COM+ application that hosts [XLANG schedules](#) on its own server with 933 MHz, or greater, CPU.
- Multiple 100 Mbps (megabits per second), or greater, network cards connected to 100 mb/s switch ports to increase network I/O throughput.
- For an [organization](#) that is processing a small number of documents, use a database that can be upgraded easily. If processing needs increase, move the [Shared Queue database](#), [Tracking database](#), and [Orchestration Persistence database](#) to their own servers. However, moving the [BizTalk Messaging Management database](#) is more difficult. It is highly recommended that the server on which the BizTalk Messaging Management database is stored contain suitable disk space and memory available to cache the configuration as document processing needs increase.
- For the Tracking database, install fast network hardware to compensate for the high volume of uncompressed data that is exchanged between BizTalk Server and the database.

### Note

- There is a size limit for tracking [interchanges](#) and documents, which if exceeded greatly affects the performance of BizTalk Server. For more information about the size limit, see [Interchange and document size limit](#).

## Related Topic

[Scaling BizTalk Server](#)

# Scale Out the Transport Services

BizTalk Server supports four [transport services](#). Each of these transport service can be scaled horizontally:

- HTTP
- File
- SMTP
- Message Queuing

The following topics are covered in this section:

- [HTTP/HTTPS \(Scale Out\)](#)
- [File \(Scale Out\)](#)
- [SMTP \(Scale Out\)](#)
- [Message Queuing \(Scale Out\)](#)

# HTTP/HTTPS (Scale Out)

## Receive

The HTTP/HTTPS [receive function](#) can be horizontally scaled by using a Web cluster. For example, a [trading partner](#) can send a document to one address, but the submission can be routed to any server in the cluster. Web clusters are a feature of the network load-balancing (NLB) service included with Microsoft Windows 2000 Advanced Server. For more information about configuring NLB, see Windows 2000 Advanced Server Help. To improve the performance of [BizTalk Server](#), you can configure a Web cluster to place received documents into a file directory or a message queue, or you can configure it to send documents directly to BizTalk Server through one of the following two methods:

- By statically configuring each server to send documents to a BizTalk Server.
- By configuring each server to send documents to a Web cluster of BizTalk Servers (servers that are members of the same group) by using the Microsoft Application Center 2000 component load balancing (CLB) functionality.

### ◆ Important

- Do not replicate the default [XLANG Scheduler](#) application or any COM+ applications that host [XLANG schedules](#). If component load balancing is used, these COM+ applications must be installed on each server. You can replicate COM components that are bound to XLANG schedules.

## Send

Horizontally scaling the send HTTP/HTTPS [transport service](#) is an inherent feature of using multiple servers in a group that are configured to participate in work-item processing. The HTTP/HTTPS send functionality cannot be separated from the BizTalk Server that processes documents because sending functionality is used on every server in the group that is configured to participate in work-item processing.

## Recommended optimization for HTTP/HTTPS

To optimize the HTTP/HTTPS transport service, which enhances the performance of BizTalk Server:

- Dedicate the receive HTTP/HTTPS transport to a separate server from the BizTalk Services (in high-volume [transaction](#) environments). In addition, have the HTTP/HTTPS server send documents to a File or Message Queue receive function, or call the **Submit** method on the BizTalk Server **Interchange** object using DCOM. Dedicating the receive HTTP/HTTPS transport or having the HTTP/HTTPS server send documents to a receive function introduces network latency; however, configuring the HTTP/HTTPS transport server and the BizTalk Server separately enables you to accommodate their unique architectures and optimize each. In addition, by separating these servers, you can maintain optimal performance on the BizTalk Server because it is not affected by the cost of using SSL for encryption/decryption.
- Create a load-balanced cluster of HTTP/HTTPS transport servers. This will further enhance the performance of the receive HTTP/HTTPS transport because it provides horizontal scaling redundancy. For more information about using the network load-balancing service to create a Web cluster, see Windows 2000 Advanced Server Help.
- Forecast how many documents need to be processed by servers in a group configured to participate in work-item processing. Then determine how many [channels](#) use [messaging ports](#) that require the send HTTP/HTTPS transport. Combine the channels that use the send HTTP/HTTPS transport into a single group. This will allow all servers in the group configured to participate in work-item processing to serialize documents that use any transport.
- Apply best practices when using ASP pages with the receive or send HTTP/HTTPS service. For more information about optimizing ASP pages and Internet Information Services, go to the Internet Information Services Help Web site ([localhost/iisHelp](#)). Then, click **Active Server Pages Guide**.
- Use Message Queuing or a File transport services on a local system with a receive function, rather than calling the **Submit** method to poll documents into BizTalk Server.

# File (Scale Out)

## Receive

The File [receive function](#) can be separated from the servers or can reside on the server. Although separating the File receive function to a separate server can minimize performance impact to the disk I/O, network latency will impact performance when attempting to retrieve the file.

## Send

Scaling horizontally is accomplished with multiple servers in the group processing documents and then sending them to File [transport service](#). Performance will depend on whether or not [BizTalk Server](#) is used as the receive function, or whether or not BizTalk Server is configured as a separate server as the receive function.

## Recommended optimization for a File receive function or File transport service

To optimize a File receive function or File transport service, which will enhance the performance of BizTalk Server:

- Store the File receive function on a separate server from BizTalk Server. This solution; however, does not address the performance impact resulting from network latency, which occurs when attempting to retrieve the file. Store the File receive function on a separate server from BizTalk Server will also reduce the disk I/O impact on the performance of BizTalk Server. Additionally, this separation of servers will keep unknown applications from placing files on BizTalk Server, or making requests, which can maximize server resources and cause poor performance.
- Configure a receive function to run on every server in the group polling the same File receive function to ensure that all servers in the group are retrieving documents for processing. File receive services are configured by default to run on a server within a group. Therefore, if you have five servers in a group and you configure a File receive function to run on one server in the group, when a File receive function is polled at \\receiveserver\receive\location, only the one server of the five retrieves files for processing. This limits the number of document-processing servers to one for the entire group. The remaining four servers are not capable of retrieving files from the receive function to parse.
- Configure a File receive function on a separate server from BizTalk Server. This will keep unknown applications from retrieving files from BizTalk Server. Because sending files and receiving files are different processes, all servers in the group that are configured to participate in work-item processing send out files. Horizontal scalability is based only on the number of servers in the group that are configured to participate in work-item processing.

# SMTP (Scale Out)

## Receive

SMTP can receive documents from [BizTalk Server](#), but it cannot send documents to BizTalk Server. To send a document to BizTalk Server, SMTP must be able to invoke an event-based mechanism to poll the received message and send it to a file share or a message queue, or send the document using the BizTalk Server **Interchange** object. The SMTP servers, which are capable of providing these event-based mechanisms (Microsoft Exchange Server or a third-party messaging server), typically use a high volume of hardware resources. Therefore, adding this functionality to a server will degrade its ability to process documents.

## Send

Lightweight SMTP [transport services](#) that do not have event-based mechanisms can be used for sending documents using SMTP. The SMTP transport server sending the document simply acts as a relay agent. The outbound SMTP server is configured at the group level, not at the server level. Therefore, if the SMTP transport exists on one server in a group, the server containing the SMTP transport service would use it to send outbound documents. All other servers in the group would use the same server for SMTP outbound.

## Recommended optimization for SMTP

To optimize the SMTP, which will enhance the performance of BizTalk Server:

- Configure the SMTP transport to execute on a separate server from the BizTalk Services (for send and receive functionality). In most cases, an [organization](#) will have an SMTP server on its network that can be used for send and receive functionality.

# Message Queuing (Scale Out)

## Receive

You must decide whether to have the Message Queuing [receive function](#) on the same server as [BizTalk Server](#), or to install it on a separate server. If you are using a transacted queue, the Message Queuing receive function must reside on the same server. However, if you are not using a transacted queue, the Message Queuing receive function can reside on a separate server. You must decide whether to incur the affects on performance by having the disk I/O on the local BizTalk Server or the network latency of the multiple server communication. In the latter example, the need for disk I/O would still exist, but it would exist only on the remote server instead of the local server. For more information about how to define hardware requirements for the Message Queuing service, see "Selecting Message Queuing server hardware" in Windows 2000 Server Help.

## Send

Sending documents by using Message Queuing creates the same security and performance issues as receiving documents by using Message Queuing.

## Recommended optimization for Message Queuing

To optimize performance for Message Queuing, which will enhance the performance of BizTalk Server:

- Message Queuing is database-intensive if journaling is used. Ensure that the standard rules for optimizing databases are applied when setting up Message Queuing [transport services](#). For example, separate data and logs and use multiple disks and controllers to maximize throughput.

# Performance Optimization

To meet your [transaction](#) requirements and enhance performance, you must optimize [BizTalk Server 2000](#). In addition to BizTalk Server, you can optimize Microsoft Windows 2000 and database interactions to enhance performance. After configuring your system, test it, and then evaluate the results to determine if your initial configuration can meet your transaction requirements. It is likely that you will need to reconfigure your architecture to achieve optimal performance. After each reconfiguration, test it again and evaluate the results. Once you have achieved your desired results, initiate a maintenance plan, because server performance changes over time, and the quantity and type of transactions that your [organization](#) handles may change.

The following topics are covered in this section:

- [General Performance Recommendations](#)
- [Architecture Design, Review and Testing](#)
- [Maintaining Performance](#)

# General Performance Recommendations

This section provides general recommendations for optimizing system settings, and includes topics for optimizing [BizTalk Server 2000](#) settings, to obtain increased performance. For example:

- Optimize Microsoft Windows 2000 settings. Apply best practices, such as not running unnecessary services or protocols, to improve Microsoft Windows 2000 performance. Many techniques used to optimize Windows 2000 also can be used to optimize BizTalk Server. For more information about optimizing Microsoft Windows 2000 settings, see Best Practices in Windows 2000 Help.
- Maintain fast, reliable network connectivity between [transport services](#), BizTalk Services ([BizTalk Orchestration Services](#) and [BizTalk Messaging Services](#)), and the databases (100 megabits per second or higher Ethernet). To optimize network throughput, use multiple adapters in each server, with a unique switch port for each, with inbound and outbound [transactions](#) separated between the network interface cards (NICs). When used in conjunction with Microsoft Windows 2000 NLB or Microsoft Application Center 2000 component load balancing (CLB) (**Interchange** or **IPipelineComponent**), performance is significantly increased.

## ◆ Important

- Do not replicate the default [XLANG Scheduler](#) application or any COM+ applications that host [XLANG schedules](#). If CLB is used, these COM+ applications must be installed on each server. You can replicate COM components that are [bound](#) to XLANG schedules.

The following topics are covered in this section:

- [Optimizing BizTalk Orchestration Services](#)
- [Optimizing BizTalk Messaging Services](#)

## Related Topic

[Scaling BizTalk Server](#)

# Optimizing BizTalk Orchestration Services

Using [BizTalk Orchestration Services](#), you can optimize [XLANG schedules](#) and the contents contained within schedules. By understanding how schedules use memory and how the structure of a business-process flow affects performance, you can design schedules that improve the performance of BizTalk Orchestration Services. [Implementation technologies](#) that are supported by BizTalk Orchestration Services include [BizTalk Messaging Services](#), COM components, Message Queuing Services, and Windows Script Components. By optimizing these components and services, you can further enhance the performance of BizTalk Orchestration Services.

The following topics are covered in this section:

- [Optimizing XLANG Schedules](#)
- [Optimizing the Contents of XLANG Schedules](#)

# Optimizing XLANG Schedules

An [XLANG schedule](#) can contain a large number of internal business processes. The business processes may include [short-lived transactions](#) or [long-running transactions](#). While [BizTalk Server](#) does not control the contents of these processes, it does manage the flow of information through these processes within an XLANG schedule. When designing an XLANG schedule, whether it consists of several short-lived transactions or long-running transactions, consider the following:

- An [XLANG schedule](#) instance runs in memory each time it is invoked.
- Multiple XLANG schedules may run on the same server.
- Several different XLANG schedules may be running concurrently, with multiple XLANG schedule instances.

The [Orchestration Persistence database](#) provides a mechanism, called [dehydration](#), to control the memory that is used by running XLANG schedules. Dehydration occurs if an XLANG schedule instance is waiting for a message, and no other activity is occurring within the XLANG schedule. At this point, the [XLANG Scheduler Engine](#) dehydrates the XLANG schedule instance to maximize performance. Dehydrating an XLANG schedule instance consists of persisting all instance-specific states to a database and removing the instance from memory. Only a small portion of the XLANG schedule instance remains in memory within the XLANG Scheduler Engine. When a [message](#) arrives at a [port](#) for the XLANG schedule instance, the instance is [rehydrated](#). Rehydrating an XLANG schedule instance consists of restoring the instance from the database to memory.

An XLANG schedule instance remains dehydrated until it is either rehydrated or explicitly terminated by an administrator. This enables a business process to run reliably for an extended time period. For more information about configuring hydration settings, see [Dehydration and Rehydration](#). While dehydration and rehydration saves memory, it does affect performance. Because dehydration and rehydration requires that data be read and written to the Orchestration Persistence database, network latency is incurred.

## ◆ Important

- To dramatically increase the performance of [BizTalk Orchestration Services](#), in Windows Explorer, browse to Program Files\Common Files\System\ado, and then double-click **adofre15.reg**. In the confirmation dialog box, click **Yes**, and then click **OK**. This procedure changes the ADO threading model from "Apartment threaded" to "Both" and may affect other applications that use ADO.

# Optimizing the Contents of XLANG Schedules

An [XLANG schedule](#) describes the business process and the [binding](#) of that process to [implementation technologies](#). The performance of an XLANG schedule often mirrors the performance level of the [actions](#) contained within it. There are a number of relevant issues for optimizing the contents of an XLANG schedule. Some of these are things specific to an XLANG schedule, while others are applicable to authoring any distributed application:

- **Reset the dehydration value to conserve memory for XLANG schedules.** The default wait time is 0 seconds. You can change this time. Any time less than or equal to 180 seconds causes the XLANG schedule to never [dehydrate](#). Any time greater than 180 seconds causes the XLANG schedule to dehydrate immediately. For more information about wait times and XLANG schedule dehydration, see [Dehydration and Rehydration](#) and [Synchronous and Asynchronous Communication](#).
- **Use persistent components.** Persistent components, such as `IPersistStream` or `IPersistStreamInit`, enable the [XLANG Scheduler Engine](#) to dehydrate XLANG schedules flexibly.
- **Run the COM objects on the same server as the Orchestration Persistence database.** This ensures that the XLANG schedule does not incur the network latency.
- **Run COM+ packages in-process to achieve optimal performance.** Although running a COM+ package in-process can affect the stability of the COM+ application (For example, if one component within the application fails, the entire application can fail.), it is significantly faster than running the application out-of-process. To avoid this potential instability, be sure to heavily test the components within the application for stability prior to deploying the application to a production environment.
- **Batch work into a single transaction.** Persisting the state of an [XLANG schedule instance](#) at the beginning and end of a [transaction](#) greatly impacts the computer's resources. However, batching work items in a single transaction greatly reduces this impact to performance. In addition, an XLANG schedule cannot dehydrate in the middle of a Microsoft Distributed Transaction Coordinator (MSDTC) transaction. MSDTC transactions are quick, but they degrade performance. Group multiple actions within a single MSDTC transaction, provided the actions can be completed quickly.
- **Long-running transactions should be accomplished asynchronously and XLANG schedules should be designed to complete COM calls quickly.** Results from asynchronous work can be communicated back to the XLANG schedule instance through message queues, or through COM calls. With COM, the name of a "response" [port](#) can be passed in the form of a [moniker](#) that will be valid even with computer restarts.

## Related Topic

[Moniker Syntax](#)

# Optimizing BizTalk Messaging Services

To optimize [BizTalk Messaging Services](#):

- Send documents to a [server group](#). BizTalk Server groups are used to distribute work across multiple servers. To send data to [BizTalk Server](#), use the following methods:
  - Configure a [receive function](#) (such as Message Queuing or File).
  - Call the **Submit** method on the BizTalk Server **Interchange** object.

Using receive functions provides better performance than using the **Submit** method to call the **Interchange** object because the receive functions run within BizTalk Services and can cache the internal state of objects. Whereas, the **Submit** method runs out-of-process and has to rebuild its internal state for each call.

Calling the **Interchange** object for submission rather than using a receive function uses more resources because the **Interchange** object needs to be created outside the BizTalk Server process. However, if the **Interchange** object is used, there are two methods available for sending data to the servers in a group:

- Statically configure portions of the total submissions to specific servers within the group. Although this does not provide much fault tolerance if the server, which has a [transport service](#), is statically mapped to a BizTalk Server that has failed.
- Use the Microsoft Application Center 2000 component load-balancing (CLB) functionality to improve performance. BizTalk Server groups do not provide load balancing for the submission of documents. In addition to load balancing, CLB provides fault tolerance. For more information about CLB, see [Component Load Balancing](#).

## ◆ Important

- Do not replicate the default [XLANG Scheduler](#) application or any COM+ applications that host [XLANG schedules](#). If component load balancing is used, these COM+ applications must be installed on each server. You can replicate COM components that are [bound](#) to XLANG schedules.

The following topics are covered in this section:

- [Creating and Optimizing Specifications](#)
- [Creating and Optimizing Maps](#)
- [Optimizing BizTalk Server Group Properties](#)
- [Optimizing Server Properties](#)
- [Optimizing Registry Settings](#)
- [Optimizing Encryption](#)
- [Optimizing Communication](#)
- [Configuring Firewalls](#)

# Creating and Optimizing Specifications

If the default global tracking settings are used, [BizTalk Server 2000](#) can support a 20-MB [XML](#) Unicode format document. For other file types, such as an [ANSI](#) flat-file, BizTalk Server does not support a 20-MB file size because any file that is not XML has to be converted to XML. The conversion process adds XML tags to the data, thus increasing the size of the document that BizTalk Server needs to process. Other file types must be less than 20 MB to maintain optimal performance by BizTalk Server. The amount of memory required to process a document that has been converted to XML depends on the original structure of the document. If global tracking settings are enabled, XML Unicode format documents that are larger than 20-MB can be processed without greatly impacting BizTalk Server performance.

## Note

- Exceeding the size limit for tracking [interchanges](#) will impact the performance of BizTalk Server. For more information about the size limit, see [Interchange and document size limit](#). Performance is also affected by document logging. For more information about document logging, see [Set document logging properties](#).

When designing [specifications](#), you can configure validation rules within a specification. For example, you can specify that a field contain a particular data type (such as a string) or more complex rules, (such as requiring a field to be validated against a list of 80 values). The latter requires that the data be checked against 80 values and, if it does not conform to one of them, the specification fails validation. Specification validation in BizTalk Server is enabled by default; it affects performance but ensures the validity of the data being sent or received. You can disable validation, which increases performance and might not adversely affect the validity of data because BizTalk Server has several other mechanisms for validating data. For example, if you have a [map](#) that requires certain data types and values and specification validation is disabled, the data successfully passes the parsing phase but fails during the serializing phase when the map is applied. If other mechanisms (such as maps that rely on valid data) are available, specification validation can be disabled to avoid the potential performance degradation caused by the validation process. Alternatively, you might choose to do so because you have agreed to data standards with business partners and have validated these [transactions](#). You might also choose to do so because you have complete control of how the data is sent (such as application-to-application transactions).

The following registry setting can be used to disable validation:

- **NoValidation.** If specification validation is not required (documents are not validated against a specification for settings such as minimum/maximum values, data types, and/or required values), set this to a non-zero value and the data will not be validated. This might help with performance, but may result in non-valid data being sent. Changing the specification validation to a non-zero value may be the right option for servers that are receiving documents for which the [organization](#) has control over the structure.

The registry setting is accomplished at the individual server level. When specification validation is on, every document processed by the server is validated against its specification. This performs more slowly than if no specification validation were used.

## Recommended solutions for optimizing document size and specifications

To optimize performance of BizTalk Server:

- Do not include more fields and/or attributes in specifications than necessary. Increased fields and attributes equate to increased memory requirements for BizTalk Server. A larger specification requires a proportional increase in memory. For example, the [EDI](#) specifications included with BizTalk Server are compliant with EDI standards. Typically, most organizations that use EDI specifications only require approximately ten percent of the entire specification. So, if an organization and its [trading partner](#) use only ten percent of the entire specification, the unnecessary records and fields can be deleted and the modified specification can be used for transactions.
- If specification validation is enabled, do not specify validation rules in specifications for fields that will contain valid data. For example, if a field contains a number but will be processed only as a string (a phone number, for example), do not specify that it must be numeric. In this situation it is not necessary to specify a data type because the default data type is string. Therefore the data type field could be left blank. Specifying acceptable values for a field takes longer to validate than a simple data type validation.

# Creating and Optimizing Maps

Translating data, as part of a [transaction](#), may reduce the performance of [BizTalk Server 2000](#). [Mapping specifications](#) can be CPU-intensive, which can reduce BizTalk Server's ability to process the overall transaction. The level to which BizTalk Server is affected depends largely on the complexity of the [map](#) being used for translation. For example, mapping a field called productID in the [source specification](#) to a field called itemID in the [destination specification](#) is not as intensive as performing a complex mathematical operation on the data being translated.

## Recommended solutions for designing maps

- Use [functoids](#) only when needed. Functoids use script, which causes BizTalk Server to load a scripting engine. This may degrade performance as opposed to native [XML](#) transformations.
- Use the **Database Lookup** functoid only when needed. BizTalk Server must establish a database connection, query for data, populate a recordset, and close the connection each time this functoid is used. This may degrade performance of BizTalk Server.
- Avoid invoking COM objects within functoid scripts and using custom functoids. Both of these techniques cause BizTalk Server to instantiate an instance of a COM object. This affects the performance of the overall operation. In addition, the performance of instantiating COM objects is affected by the answers to the following questions:
  - Is it in-process or out-of-process?
  - Is the object local or remote?
  - How well is the object written?
  - Is it transactional?
- Analyze each map to determine how to achieve optimal performance. For example, two different techniques can be used to concatenate two source fields together and have the resultant value placed in two different destination fields. The first concatenation technique would be to use one concatenation functoid and map its output to two places. The second concatenation technique would be to use two functoids each with a single output [link](#) to a destination source field. The first technique is slightly more efficient due to the fact that the script, which runs as part of the functoid, is only called once. Through testing, you can determine which techniques result in the best performance.

# Optimizing BizTalk Server Group Properties

In [BizTalk Server Administration](#), you can specify the following properties in the **BizTalk Server Group Properties** dialog box:

- **Messaging Management object cache refresh interval (seconds).** This field can be set to a maximum of 300 seconds. [BizTalk Server 2000](#) caches configurations (such as [channels](#), [messaging ports](#), [envelopes](#), and [document definitions](#)) in memory to avoid calling the database each time. If these objects are not regularly changed, set this value to 300 to reduce the number of times data is written to and read from the database. Because BizTalk Server refreshes management objects every five minutes, the service must be restarted for the change to take effect immediately.
- **Disable document tracking.** The **Tracking** tab can be used to enable or disable document tracking. If tracking is not used, disable this field to minimize the number of read/writes to the database for a single [transaction](#). If this field is enabled, BizTalk Server connects to the database and logs data. Do not disable this field unless tracking is not needed. However, it is highly recommended that document tracking remain enabled. For more information about setting tracking properties, see [Configure tracking properties for a server group](#).

## Note

- A size limit exists for tracking [interchanges](#). If the size limit is exceeded, the performance of BizTalk Server will be affected. For more information about the size limit, see [Interchange and document size limit](#). Performance is also affected by document logging. For more information about document logging, see [Set document logging properties](#).
- **Arrange the server call sequence.** BizTalk Server [parsers](#) can be prioritized if a group is predominately receiving a particular document type. BizTalk Server has four parsers that it uses to parse data: [XML](#), [EDIFACT](#), [X12](#), and [Flat File](#). When BizTalk Server receives a document, it tries to parse it using these parsers in the order in which they are listed. If an [organization](#) primarily receives a particular document type, the order of the parsers should be changed so that the first one matches the type of documents being received.

## Related Topic

[Scale Out BizTalk Messaging Services](#)

# Optimizing Server Properties

In [BizTalk Server Administration](#), you can set the following properties in the **<Server> Properties** dialog box:

- **Create multiple instances of receive functions.** This will enable [BizTalk Server](#) to poll multiple [receive functions](#) for documents that are processed. To balance the load of documents across several computers, locate the receive functions on separate computers. Each polling location must be unique and must have a separate receive function. To avoid overloading any individual receive function, the business application that sends documents must evenly distribute the documents to all the polling locations.
- **Maximum number of receive function threads allowed.** You can specify how many receive function worker threads per processor you want for a receive function. Setting this too low can cause a slow down in BizTalk Server because it uses I/O completion ports. Setting this too high should not have serious effects, but it might cause performance degradation. You can adjust this number to find the optimal value for their setup. The recommended value for the **Maximum number of receive function threads allowed**, is 4.
- **Maximum number of worker threads allowed.** You can specify the number of worker threads per processor for the processing side. By appropriately adjusting the number of worker threads, you can improve performance. In BizTalk Server Administration, right-click a server in the console tree and click **Properties**. Change the default value in the **Maximum number of worker threads per processor allowed** box. The default value is 4. The recommended value is from 10 to 16, depending on the deployment.

# Optimizing Registry Settings

You can optimize the registry settings to improve [BizTalk Server](#) performance. All keys should be added as DWORD values to HKLM\System\Current Control Set\Services\BTSSVC. To improve performance, you can implement the following registry setting adjustments:

- **NoValidation.** Use this registry key to disable [specification](#) validation. If specification validation is not required (documents are not validated against a specification for minimum/maximum values, data types, or required values, for example), set this to a non-zero value and the data will not be validated. While this may improve performance, it may result in non-valid data being sent. This setting would be appropriate for servers that are receiving documents for which the [organization](#) controls the structure.
- **ParserRefreshInterval.** By default this is set to 60,000 (60 seconds). This value indicates how often BizTalk Server should check the database to see if a new [parser](#) has been added (this is the only group-level property that is refreshed while the server is running). If no new parsers will be added, set this value to 0 and BizTalk Server will not check the database. This value is also used to verify if new parsers have been added to the [Tracking database](#) group settings or, if the settings have been altered.
- **CacheSize.** Use this registry key to indicate how large the BizTalk Server management object cache is allowed to grow. The default value for this is 20. Therefore, as soon as the BizTalk Server object cache exceeds 20 [channels](#), [messaging ports](#), [envelopes](#), or [document definitions](#), BizTalk Server must delete some items from memory. If a server has a high volume of memory, this value can be set higher (above 20) and BizTalk Server will keep more in memory. This does not affect the refresh interval. BizTalk Server deletes the cached objects and reloads them when they have expired.
- **BatchSize.** Use this value only with the Message Queue [receive function](#). By default the BatchSize is set to 20. To improve performance, BizTalk Server reads up to 20 items at a time from the queue and sends all 20 within one [transaction](#). Reducing the number of times data is written to a database will greatly improve performance. If a deadlock occurs, and BizTalk Server ends the transaction, it must [resubmit](#) the items. BizTalk Server does not lose the documents. Values that exceed 20 have not been tested. Do not set this value to 0.

The following topic is covered in this section:

- [Improve processing performance](#)

# Improve processing performance

1. Click **Start**, click **Run**, type **regedit** and then type **OK**.
2. In the **Registry Editor** dialog box, click the expand indicator (+) for the **HKEY\_LOCAL\_MACHINE** node; expand **SYSTEM**, **CurrentControlSet**, and **Services**, and then click **BTSSvc**.
3. Right-click in the details pane, point to **New**, and then click **DWORD Value**.
4. Type **NoValidation** and press ENTER twice.  
The **Edit DWORD Value** dialog box appears.
5. In the **Value data** box, type any nonzero value, such as 1, and then click **OK**. The default value is 0 (validation).
6. Right-click in the details pane, point to **New**, and then click **DWORD Value**.
7. Type **ParserRefreshInterval** and press ENTER.
8. Right-click in the details pane, point to **New**, and then click **DWORD Value**.
9. Type **CacheSize** and press ENTER twice.  
The **Edit DWORD Value** dialog box appears.
10. In the **Value data** box, type the number of [channels](#), [messaging ports](#), [envelopes](#), and [document definitions](#) that you expect to or do have in memory.
11. Right-click in the details pane, point to **New**, and then click **DWORD Value**.
12. Type **BatchSize** and press ENTER twice.  
The **Edit DWORD Value** dialog box appears.
13. In the **Value data** box, type a value for the number of items you want to process as a batch.

# Optimizing Encryption

Using encryption or other security mechanisms may decrease the performance of [BizTalk Server](#). When using encryption, the following is recommended:

- **Increase CPU clock rating (MHz).** Increasing the number of processors will increase performance.
- **Increase the number of servers.**
- **Use a faster CPU.**
- **Separate BizTalk Server functionality.** For example, send and [receive functions](#) can be placed on separate servers. The HTTPS [transport service](#) can also be placed on a separate server.
- **Use an existing virtual private network (VPN) if File or Message Queuing is used.** If a VPN is available, data transfer is secure. It is not required to secure BizTalk Server [transactions](#) if all data transfer conducted with [trading partners](#) is secured through a VPN.
- **Purchase encryption hardware accelerator cards.** Accelerator cards provide dedicated processors that may eliminate the performance impact of encryption and decryption on a server's CPU. Accelerator cards are less expensive than adding multiple CPUs.

# Optimizing Communication

BizTalk Server provides both [synchronous communication](#) and [asynchronous communication](#) integration mechanisms. [BizTalk Server 2000](#) can accept documents through COM integration or through server [receive functions](#) (File or Message Queuing).

Typically, when a document is sent to BizTalk Server, it is placed in the [Shared Queue database](#). BizTalk Server polls the database and then processes the document. This process is an asynchronous communication mechanism. It uses the Microsoft SQL Server database as a queue for [check-pointing](#) documents that are waiting to be processed. This extra layer of abstraction allows the [transport service](#) to send documents to BizTalk Server independent of the transport mechanism used to deliver the documents.

A synchronous communication interchange bypasses all queues and processes all the components required by the [messaging port](#) on the calling thread. For synchronous communication protocols, an optional response document is returned, if available. This method is valid only for a single [channel](#) match and only for a single messaging port (not [distribution lists](#)). If the parameters that are set cause multiple channels to match, a synchronous communication submission returns an error which indicates that multiple channel matches are not allowed for a synchronous communication submission. This method can be used only for single document [interchanges](#). If the submission contains multiple documents, an error is returned for synchronous submissions, which indicates that multiple document submissions are not allowed. This method does not support groups. Synchronous communication is not scalable. Synchronous communication uses a single thread to process a [transaction](#) and cannot be load-balanced with other BizTalk Servers in the group because the entire process must run on the server that sends documents.

The synchronous communication mechanism sends documents directly to BizTalk Server for immediate processing. BizTalk Server blocks the return to the caller of the **Interchange::SubmitSync** interface until processing is completed, whereby a response document is delivered to the caller. This mechanism is available only to the COM-based integration method.

## Recommended solutions for optimizing synchronous and asynchronous communication

To optimize performance of BizTalk Server:

- To achieve optimal performance and scalability, asynchronous communication is highly recommended. Asynchronous communication is highly scalable and provides a high-level of throughput. Synchronous communication calls provide a near-immediate response to the caller under a high volume of transactions because each **SubmitSync** call runs under a separate thread. However, if there are many calls at once, this leads to many threads running on a single server thereby degrading the overall performance of BizTalk Server. Microsoft Windows 2000 is designed to context switch between all the threads, thus degrading the overall performance of BizTalk Server. Additionally, the following criteria cause a synchronous communication submission to fail but do not cause an asynchronous communication submission to fail:
  - If the transaction criteria matches more than one channel.
  - If the interchange contains multiple documents.
- [Self-routing documents](#) may degrade the performance of BizTalk Server.

# Configuring Firewalls

Firewalls help secure internal networks, but introduce latency and may potentially create a single point of failure. Even if a load-balancing mechanism is used to alleviate the single point of failure, a firewall can reduce a network's performance.

When configuring a [BizTalk Server 2000](#) environment with a firewall, two primary configurations are recommended:

- **Configuration 1.** Install servers on an internal corporate network and some, which communicate to [trading partners](#), on a corporate demilitarized zone (DMZ). A company that wants to host its own Internet services without sacrificing unauthorized access to its private network uses a DMZ. The DMZ is the boundary between the Internet and an internal network's line of defense, usually a combination of firewalls and bastion hosts, which are gateways between inside networks and outside networks. The servers in the DMZ should use local [transport services](#), such as HTTP, Message Queue, or SMTP. In this environment, all inbound and/or outbound [transactions](#) will pass through a firewall. The servers in the DMZ send documents through another firewall to Microsoft SQL Server. This configuration will allow servers, such as BizTalk Server and HTTP in the DMZ, to communicate with Microsoft SQL Server through an internal firewall.
- **Configuration 2.** Install the servers on a corporate network. Trading partners exchanging documents through the Internet send their data using SMTP/HTTP servers in the DMZ (first firewall of protection). These servers then send the data to the servers residing on the corporate network through a second firewall.

Configuration 1 and 2 will impact performance. To avoid a noticeable degradation in performance, you can construct the firewall to accommodate a typical number of transactions between an [organization](#) and its trading partners.

# Architecture Design, Review and Testing

The key components of [BizTalk Server 2000](#) include the BizTalk Services, the BizTalk Server databases, and the [transport services](#). Poor configuration of any component can degrade the performance of the entire system.

This section provides comprehensive detail about defining, testing, and refining the architecture of BizTalk Server to optimize performance.

The following topics are covered in this section:

- [Architectural Design](#)
- [Architecture Testing and Analysis](#)

## Related Topic

[Scaling BizTalk Server](#)

# Architectural Design

To accurately determine the number of the documents that can be processed by [BizTalk Server 2000](#), you must first consider if the following are in use:

- [Specification validation](#)
- Application Integration Components
- [Transport services](#)
- Encryption
- [BizTalk Orchestration Services](#)
- Firewalls
- [Maps](#)

You must also consider the size of the documents being processed, as well as the current server configuration.

Performance testing is successful when accomplished with controlled processes. It is important to start with a few variables and then slowly add additional variables. When performance begins to degrade, you can easily identify the cause of degradation.

The following topics are covered in this section:

- [Develop Transaction Components](#)
- [Identify Transports](#)
- [Initial Architecture](#)

## Related Topics

[Administering Servers and Applications](#)

[BizTalk Orchestration Services](#)

[Creating Application Integration Components](#)

[Creating Specifications](#)

[Mapping Data](#)

[Run XLANG Schedules](#)

[Use BizTalk Orchestration Designer](#)

# Develop Transaction Components

To develop [transaction](#) components, you must design transactions and set transaction properties for business processes. For more information about designing transactions and setting transaction properties, see:

- [Designing Business Processes](#)
- [Designing Transactions](#)
- [Transaction Properties for an XLANG Schedule Drawing](#)

For information about techniques that can help you to determine the most efficient transaction configuration, see [Evaluating the Performance of a Configuration](#).

To develop transaction components, you must first determine the transaction types that the components process. In an application-to-application and/or business-to-business environment, you must determine transaction needs and transaction profiles. For example, you might have a scenario in which a single transaction receives a custom [XML](#) purchase order and [maps](#) it to a standard EDI purchase order, which is later processed by a custom internal application.

This scenario requires that you create a [specification](#) for the XML purchase order and a specification for the EDI purchase order. To create these specifications, use [BizTalk Editor](#), which includes XML and EDI templates. Because the templates include all potential records and fields, you can remove unnecessary records and fields, and then save the templates as the final specifications. During design time, any fields in a specification that require validation decrease the performance of [BizTalk Server 2000](#). For more information about optimizing specifications, see [Creating and Optimizing Specifications](#).

In addition to creating a specification, you must map data. Because there are a number of ways to [translate](#) data in map files (by using XSLT translations, [functoids](#), or a custom script), all of which affect performance, it is important to test different translation methods. Testing one method of data translation over another helps to reduce performance impacts to BizTalk Server as a result of mapping. For more information, see [Creating and Optimizing Maps](#).

## Related Topics

[Designing Business Processes](#)

[Designing Transactions](#)

[Identify Transports](#)

[Transaction Properties for an XLANG Schedule Drawing](#)

# Identify Transports

To determine how to send and receive data, consider if the following are in use:

- Business-to-business [transactions](#)
- Application-to-application transactions
- [Transport services](#) (send and receive)
- Encryption
- HTTPS or S/MIME

Consider whether different transports are needed based on the type of transactions you are processing. Determine whether unique transports are required for business-to-business and application-to-application transactions or if the same transports can be used for these two types of transactions.

# Initial Architecture

To successfully plan an initial architecture, consider the following:

- One server with Microsoft SQL Server and [BizTalk Server](#) can be used to process a low volume of [transactions](#).
- Installing BizTalk Server and SQL Server on separate machines can be used for moderate volume of transactions.
- An existing SMTP [transport service](#) can be used to send and receive data. Placing this server on a separate server is recommended for this transport type.
- HTTP, Message Queuing, or File transport services can be used to write data to disk drives on other servers than the local BizTalk Server, which can improve BizTalk Server performance.

An initial architecture should contain as many separate servers as possible. For example, within a company, one person may administer SMTP servers and Message Queuing, whereas another person may handle security policies. The goal of the initial architecture is to determine how many servers are needed and the hardware required by those servers to process the anticipated work. After you determine the required number of servers, test the initial architecture.

## Related Topic

[Architecture Testing and Analysis](#)

# Architecture Testing and Analysis

Prior to testing the architecture, define the architectural components, determine the [transaction](#) needs and profiles, determine what transaction components need to be developed, and determine the necessary [transports](#). Begin this process by creating a baseline, which will require the following:

- Configure [BizTalk Messaging Services](#), [organizations](#), [document definitions](#), [channels](#), and [messaging ports](#) needed to process transactions.
- Configure [BizTalk Orchestration Services](#).
- Install and/or configure any COM+ applications, [BizTalk Server](#) channels, databases, or message queues required for [XLANG schedules](#).

Once a baseline has been established, process transactions using BizTalk Server. This test helps to identify factors affecting performance.

The following topic is covered in this section:

- [Evaluating the Performance of a Configuration](#)
- [Improving the Architecture](#)

## Related Topics

[Architectural Design](#)

[Scaling BizTalk Server](#)

# Evaluating the Performance of a Configuration

You can use the Microsoft Windows 2000 Performance tool to test the performance of [BizTalk Messaging Services](#).

To use the Performance tool, on the **Start** menu, point to **Programs**, point to **Administrative Tools**, and then click **Performance**. The System Monitor, which is part of the Performance tool, graphically displays counter readings as they change over time. There are, however, different counters that should be monitored depending on the system component being monitored. Numerous white papers are available describing how to monitor performance for Windows 2000, IIS, SQL Server, and the Message Queue; however, the following tables lists only some of the primary objects and counters to monitor. In addition, the table contains specific information regarding the objects and counters to monitor to determine BizTalk Messaging Services performance.

Object	Counter	Observation	Component affected
Active Server Pages	Requests queued	There should not be a significant queue except at peak periods.	HTTP transport services that use .asp pages
	Requests/sec	Indicates the volume of ASP requests the HTTP transport services are receiving (if using ASP). If files are posted to an HTTP page, this counter does not provide any pertinent information.	HTTP transport services that use .asp pages
	Request wait time	Close to zero.	HTTP transport services that use .asp pages
Network Segment	Bytes received per second/Bytes sent per second	If this number is close to the capacity of the connection, and processor and memory use are moderate, the connection may affect performance.	All
Process, Internet Information Service	Private bytes	Monitor this for memory leaks or size approaching maximum available RAM.	HTTP transport service
Memory	Available bytes	Available bytes should not stay below 10 MB consistently. If so, a memory spike would cause paging to disk to start.	All
	Page Faults/sec, Memory: Pages Input/sec, and Memory: Page Reads/sec	If these numbers are low, the server should be responding to requests quickly. If they are high, an increase the amount of RAM on your server may be needed.	All
Physical Disk	Disk read/writes/sec	Combined, these two counters should be significantly under the maximum capacity for the disk device. To enable this counter, on the <b>Start</b> menu, point to <b>Programs</b> , point to <b>Accessories</b> , and then click <b>Command Prompt</b> . At the Command Prompt, type <b>diskperf -y</b> . Then, restart the computer.	SQL Server, Message Queue, and File transport services
	% Disk time	This counter should be well below 100 percent. If it is above this value (and it can go into the 1000 percent range), add more physical disks or move one of the databases to another server.	SQL Server, Message Queue, and File transport services
	Current Disk Queue Length	This counter is the number of requests outstanding on the disk at the time the performance data is collected. This counter should average less than 2 for good performance.	BizTalk Server SQL Server
SQL Server	I/O transactions/sec	Indicates how much activity the SQL server actually performs.	SQL Server
BizTalk Server	Documents Processed/sec	Indicates how quickly BizTalk Server 2000 is polling documents from its <a href="#">Work queue</a> and sending them.	<a href="#">BizTalk Messaging Services</a>

<b>BizTalk Server</b>	Documents Received/sec	Indicates how quickly BizTalk Server is sending documents to the Work queue. This number reflects only the number of documents BizTalk Server has received (this includes documents that fail parsing), not the number of documents BizTalk Server checkpoints to its Work queue. The number of documents that are checkpointed to the Work queue is essentially equal to the Documents Processed/sec counter.	BizTalk Messaging Services
<b>BizTalk Server</b>	<a href="#">Synchronous</a> Submissions/sec, <a href="#">Asynchronous</a> Submissions/sec	Indicates how quickly the <b>Submit</b> method and/or the <b>SubmitSync</b> method calls occur. Because each interchange can contain any number of documents, this counter is not useful for determining documents processed. If pass-through (processing interchanges without parsing them) is being used exclusively, this is the counter you need to monitor to determine inbound performance.	BizTalk Messaging Services
<b>Message Queue</b>	Messages in queue	This number should not get extremely large (over 50K) because it will cause excessive memory use on the Message Queue server and degrade the performance of the entire system.	Message Queue transport service
<b>System</b>	Processor Queue Length	This counter displays the number of threads waiting to be executed in the queue that is shared by all processors on the system. If this counter has a sustained value of two or more threads, the processor is degrading the performance of the entire system.	All
	Context switches/sec	If this is a high number on BizTalk Server, it could be because send and <a href="#">receive functions</a> are running on the same server. If this is the case, consider separating the send and receive functions to separate servers.	All
<b>Processor</b>	%Processor Time	If this counter's value is high, while the network adapter card and disk I/O remain well below capacity, the processor is affecting performance. On a multiprocessor computer, examine this counter to identify any imbalance. Additionally, while peak utilization can be 100 percent, sustained utilization should be below this value. All server elements can be scaled horizontally.	All
<b>WebService</b>	Get or post requests/sec	Indicates the volume of files being received through the HTTP <b>get/post</b> methods.	HTTP transport service

There are no counters specific to the SMTP transport service listed because there are a variety of SMTP transport service products available. Regardless of the SMTP transport service being used, monitor the volume of messages sent to and from BizTalk Server. Monitoring the counters listed in the table enables you to identify performance degradation. Because all the components work together to determine the health of a system, do not make drastic changes to your system configuration based on the poor performance of one.

Data obtained from performance monitoring is also useful for identifying symptoms that can contribute to problems. For example, a high amount of disk activity may indicate that SQL Server is writing a large amount of data to disk, but it may also indicate that the system is often paging to disk. Excessive disk paging typically indicates that memory is too low. In this case, the disk activity is the indicator of a problem, but not the problem.

## Related Topic

[Scaling BizTalk Server](#)

# Improving the Architecture

By identifying areas that affect performance, you can refine the system architecture to achieve optimal results. For example, hardware may need to be upgraded, or different components of [BizTalk Server](#) may need to be moved to separate servers. Additionally, you might need to adjust BizTalk Server settings. For more information about adjusting settings, see [Optimizing Server Properties](#).

Ensure that changes are made methodically. After implementing a change, such as adding CPUs, changing a setting, or separating functionality to separate servers, document the change, and then test the new configuration to determine if performance has improved. If the new configuration enhances performance, then you can continue to modify the configuration. However, if the new configuration is degrading performance, re-configure the system to its previous state, and analyze the data to determine what may be contributing to the problem.

## Related Topic

[Evaluating the Performance of a Configuration](#)

# Maintaining Performance

To maintain performance, create an ongoing maintenance plan to ensure the health and future performance of [BizTalk Server](#). BizTalk Server will most likely process increased numbers of documents over time. Although the initial BizTalk Server architecture may have performed well, if the number of [transactions](#) has increased over time, it may not be capable of sustaining the same level of performance unless the system architecture or configuration is modified. Hardware failures, or out of memory conditions, also can affect the performance of a system.

The following topics are covered in this section:

- [Creating a Performance Maintenance Plan](#)
- [Using Application Center 2000](#)

# Creating a Performance Maintenance Plan

A successful monitoring plan includes:

- **A detailed plan of which counters to monitor.** For example, there are several Windows 2000 System Monitor counters, thresholds to monitor, and possible interpretations of the problems that might be indicated by the thresholds. Additionally, you can also monitor application-level problems such as whether SQL Server queries should return valid data or return hardware problem conditions.
- **Identifying processes for resolving performance issues.** For example, a Windows 2000 event-log message might be written, e-mail notification might be enabled, or a custom program might start a series of events.
- **Defining which performance thresholds generate a notification.** For example, a monitoring tool might be configured to write an event to the Windows 2000 event log if the CPU reaches 90-percent use capacity. However, if the CPU stayed at 90-percent use capacity for more than 5 minutes, an e-mail message might be sent. Defining different actions for different problem-severity levels depends on the monitoring tool that you use.
- **Defining the course of action in response to events published in Windows 2000 event logs.** Windows 2000, BizTalk Server 2000, SQL Server, and native Microsoft [transport services](#) such as Message Queuing and HTTP write events to the Windows 2000 event log. This event log contains valuable information that may indicate impending problems on one of the servers in a BizTalk Server system. If addressed early, you can avoid a system failure that would degrade the performance of the overall system. A plan should include the frequency at which the logs are monitored and archived, and include the party responsible for the tasks. A third-party tool can be used to accumulate the logs from multiple servers and write them to a database for consolidated analysis. These tools can also be used to purge the logs from the servers.
- **Determining the required tools for performance monitoring.** The built-in Windows 2000 System Monitor tool examines performance counters and can take action when a predefined condition occurs. For more information about configuring System Monitor alerts, see "Setting up a monitoring configuration" in Windows 2000 Help. Additionally, Microsoft Application Center 2000, as well as a number of other third-party tools, perform this functionality with additional features such as logging to a database and performing application-level tests.

# Using Application Center 2000

Microsoft Application Center 2000 contains a tool called Health Monitor. Health Monitor supercedes the functionality of the Windows 2000 event log and system monitor tools. It allows administrators to set up monitors. These monitors include checking TCP/IP, performance monitor counter thresholds, event log errors, and WMI events. Conditions can be configured for these monitors so that when certain criteria are met, for example, when a threshold of 90 percent on a CPU is met or exceeded, an action occurs such as a taking a server offline or sending an e-mail message to an administrator. These tools can be used to proactively monitor and maintain the performance of [BizTalk Server 2000](#).

## ◆ Important

- Do not replicate the default [XLANG Scheduler](#) application or any COM+ applications that host [XLANG schedules](#). If component load balancing is used, these COM+ applications must be installed on each server. You can replicate COM components that are bound to XLANG schedules.

# Administering Servers and Applications

The administration features provided by Microsoft BizTalk Server 2000 help you to efficiently and effectively administer all installations of BizTalk Server 2000. There are 4 areas of administration in BizTalk Server 2000:

- Server administration
- Application administration
- Programmatic administration
- Database administration

This section covers server administration and programmatic administration. For more information about application and database administration, see [BizTalk Server Administration Model](#). Server administration includes configuring and managing server groups, servers, receive functions, and the Shared Queue for each server group. Application administration includes configuring and managing the COM+ applications that host XLANG schedules, the default XLANG Scheduler application and the Orchestration Persistence database.

The following topics are covered in this section:

- [Server Administration](#)
- [Programmatic Administration](#)

## Related Topic

[BizTalk Server Administration Model](#)

# Server Administration

BizTalk Server Administration provides a central user interface (UI) from which you can:

- Add and manage servers installed with Microsoft BizTalk Server 2000 in [server groups](#).
- Configure server group properties, such as the location for the [Shared Queue](#) and [Tracking databases](#).
- Configure and manage [receive functions](#).
- View and manage queues.

For help with specific tasks, see [How To](#).

For general background information, see [Concepts](#).

For problem-solving instructions, see [Troubleshooting BizTalk Server Administration](#).

## Related Topic

[BizTalk Server Administration Environment](#)

# How To...

This section provides task-specific information about using BizTalk Server Administration. It is highly recommended that you review the [Concepts](#) section to fully understand all the features and capabilities of BizTalk Server Administration.

The following topics are covered in this section:

- [Open BizTalk Server Administration](#)
- [Open Component Services](#)
- [Add users to the BizTalk Server Administrators group](#)
- [Configure the BizTalk Messaging Management database](#)
- [Refresh the administration console](#)
- [Start the BizTalk Messaging Service](#)
- [Add, Delete, and Configure a Server Group](#)
- [Add, Delete, and Configure Servers in a Group](#)
- [Run Servers in a Group](#)
- [Manage Queues](#)
- [Manage Databases for a Server Group](#)
- [Manage Receive Functions for a Server Group](#)
- [Manage Event Viewer](#)
- [Manage XLANG Applications and Databases](#)

# Open BizTalk Server Administration

- On the **Start** menu, point to **Programs**, point to **Microsoft BizTalk Server 2000**, and then click **BizTalk Server Administration**.

# Open Component Services

- On the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**.

# Add users to the BizTalk Server Administrators group

To add users to the BizTalk Server Administrators group, you must be a member of the Windows 2000 Administrators group. For more information about adding users to the Windows 2000 Administrators group, see [Add a user account to the Administrators group](#).

1. On the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Computer Management**.
2. Expand **System Tools**, expand **Local Users and Groups**, and then click the **Groups** folder.  
The folder contents appear in the details pane.
3. In the details pane, click **BizTalk Server Administrators**.
4. On the **Action** menu, point to **All Tasks** and click **Add to Group**.  
The **BizTalk Server Administrators Properties** dialog box appears.
5. Click **Add**.
6. In the **Look in** list, click your domain or computer name.
7. In the list that contains the users and computers associated with the domain or computer you selected in step 6, click the user account to add, click **Add**, and then click **OK**.
8. Click **OK** to close the **BizTalk Server Administrators Properties** dialog box.

## Notes

- This procedure is based on the assumption that the BizTalk Server Administration group name is **BizTalk Server Administrators**.
- If necessary, log off and log in using your user account.

## Related Topic

[Administration Privileges](#)

# Configure the BizTalk Messaging Management database

1. In BizTalk Server Administration, click **Microsoft BizTalk Server 2000**.

2. On the **Action** menu, click **Properties**.

The Microsoft **BizTalk Server 2000 Properties** dialog box appears.

3. On the **General** tab, you can change the following properties:

- **SQL database name.** Type the name of the BizTalk Messaging Management database that you want all server groups to use.
- **SQL Server name.** Type the name of the server that stores the Microsoft SQL Server database on which the BizTalk Messaging Management database is stored.
- **User name.** You can change the SQL Server logon user name that is used to connect to the server on which the BizTalk Messaging Management database is stored.
- **Password.** You can change the SQL Server logon password that is used to connect to the server on which the BizTalk Messaging Management database is stored.

4. Click **OK**.

## Caution

- Use this procedure if you need to bring the BizTalk Messaging Management database offline for maintenance. However, you must point to a replicated database, not a different BizTalk Messaging Management database that has other server groups associated with it. For more information about changing the database, see [Changing the BizTalk Messaging Management database](#).

## Notes

- When you change either the BizTalk Messaging Management database or point the server groups to a different Microsoft SQL Server, you must complete the following steps:
  1. Stop all servers in the **Microsoft BizTalk Server 2000** node. For more information about how to stop servers, see [Stop a server in a group](#).
  2. Shut down the BizTalk Server Interchange Application. For more information about how to shut down the BizTalk Server Interchange Application, see [Shut down the BizTalk Server Interchange Application](#).
  3. Restart all servers in the **Microsoft BizTalk Server 2000** node. For more information about how to restart servers, see [Start a server in a group](#).

When you change the BizTalk Messaging Management database or point the server groups to a different Microsoft SQL Server, all BizTalk servers in the central BizTalk Messaging Management database are updated with the new information.

- If you change the BizTalk Messaging Management database of your existing server and then add your existing server to a new group, you might encounter problems when you submit a document to your existing server. To avoid potential problems, stop all servers in the Microsoft BizTalk Server 2000 node, shut down the BizTalk Server Interchange Application, and then restart all the servers in the Microsoft BizTalk Server 2000 node. For more information about how to stop a server, see [Stop a server in a group](#). For more information about shutting down the BizTalk Server Interchange Application, see [Shut down the BizTalk Server Interchange Application](#). For more information about how to restart servers, see [Start a server in a group](#).

## Related Topics

[Changing the BizTalk Messaging Management database](#)

[Shut down the BizTalk Server Interchange Application](#)

[Start a server in a group](#)

Stop a server in a group

# Refresh the administration console

1. In BizTalk Server Administration, expand **Microsoft BizTalk Server 2000**, and expand the items in the console tree until you locate the item that you want to refresh. You might need to expand server groups, Queues, Receive Functions, and Servers to find the item you want to refresh.
2. Click the item you want to refresh.
3. On the **Action** menu, click **Refresh**.

## Notes

- In BizTalk Server Administration, you can refresh the status of the following items:
  - The Microsoft BizTalk Server 2000 node
  - Server groups
  - Servers
  - Queues
  - Receive functions
- You can perform this procedure on any item in the console tree. When you refresh the administration console at the root, all items in the administration console are refreshed. When you refresh a server group, only the items in that group are refreshed.
- There is no automatic refresh cycle for the administration console. Perform this procedure to view the current status of server groups, servers, receive functions, the number of items in a queue, and so on.

## Related Topics

[Groups and Servers](#)

[Receive Functions](#)

[Using Queues](#)

# Start the BizTalk Messaging Service

1. On the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**.
2. Verify that **Services (Local)** is selected.
3. In the details pane, click **BizTalk Messaging Service**.
4. On the **Action** menu, click **Start**.

# Add, Delete, and Configure a Server Group

You can perform the following procedures to add, delete, and configure a [server group](#):

- [Add a server group](#)
- [Configure general properties for a server group](#)
- [Configure connection properties for a server group](#)
- [Configure tracking properties for a server group](#)
- [Configure the parser order for a server group](#)
- [Delete a server group](#)

# Add a server group

1. In BizTalk Server Administration, click **Microsoft BizTalk Server 2000**.

2. On the **Action** menu, point to **New** and click **Group**.

The **New Group** dialog box appears.

3. In the **Group name** box, type the name of the new server group.

4. In the **Tracking database** area:

- In the **Tracking database name** box, type the name of the Tracking database for this server group.
- In the **Tracking SQL Server name** box, type the name of the server on which the Tracking database for this server group is stored.
- In the **User name** and **Password** boxes, type the Microsoft SQL Server logon user name and password that are used to connect to the server on which the Tracking database is stored.

**User name** is a required field. **Password** is an optional field. Leave this field blank if a password is not required to connect to the server.

5. In the **Shared Queue database** area:

- In the **Shared Queue database name** box, type the name of the Shared Queue database for this server group.
- In the **Shared Queue SQL Server name** box, type the name of the server on which the Shared Queue database for this server group is stored.
- In the **User name** and **Password** boxes, type the SQL Server logon user name and password that are used to connect to the server on which the Shared Queue database is stored.

**User name** is a required field. **Password** is an optional field. Leave this field blank if a password is not required to connect to the server.

6. Click **OK**.

## ◆ Important

- Do not use any of the following characters in the name of the server group: ` ! @ # \$ % ^ & \* ( ) + = [ ] { } | \ ; " ' < > , . ?. For more information about invalid characters, see [WMI Overview](#).

## 📝 Note

- This procedure creates a server group. To configure the server group with additional settings, see [Configure general properties for a server group](#).

## Related Topics

[Add, Delete, and Configure Servers in a Group](#)

[Configure general properties for a server group](#)

[Groups and Servers](#)

[Managing the BizTalk Messaging Management Database](#)

[Shared Queue Database](#)

[Tracking Database](#)

[WMI Overview](#)

# Configure general properties for a server group

1. In BizTalk Server Administration, expand **Microsoft BizTalk Server 2000**, and then click the server group you want to configure.

2. On the **Action** menu, click **Properties**.

The **BizTalk Server Group Properties** dialog box appears.

3. In the **SMTP host** box, type the Simple Mail Transfer Protocol (SMTP) host name that this server group uses.

This field is optional. Use this configuration if you use BizTalk Server to send documents to a trading partner or to an internal application by using SMTP .

4. In the **Reliable messaging reply-to URL** box, type the URL this server group uses to receive reliable messaging delivery receipts by using one of the following supported protocols: File, Message Queuing, HTTP, HTTP/S, or SMTP.

For the following transport	Use this prefix
File	file://
Message Queuing	queue://Direct=OS:<servername>\<queuename>
Hyper Text Transport Protocol (http)	http://
Hyper Text Transport Protocol Secure (https)	https://
SMTP	mailto:

If you specify Message Queuing, you must use a format name. In addition, "queue://" must precede the format name. For more information about format names, see [Available Receive Functions](#).

5. In the **Messaging Management object cache refresh interval (seconds)** list, click the number of seconds between cache updates for the server group.

By default, the server updates this cache every 50 seconds.

6. In the **Proxy server** area, select the **Use a proxy server** check box if you want to configure BizTalk Server to connect to the Internet through a proxy server.

Enter the address and port of the proxy server that you want to use.

7. Click **OK**.

8. Perform the following steps only if you made any changes in the **Proxy server** area.

- Stop each server in the group for which you configured the general properties. For more information about stopping a server, see [Stop a server in a group](#).
- Start each server in the group for which you configured the general properties. For more information about starting a server, see [Start a server in a group](#).

## ◆ Important

- The **SMTP host** field is optional. However, you must configure this field if you plan to use SMTP as a transport service in BizTalk Messaging Manager. For example, you cannot choose SMTP as primary or backup transport in BizTalk Messaging Manager unless you have the SMTP host configured here.

## 📝 Notes

- Reliable messaging in BizTalk Server is BizTalk Framework 2.0 compliant. For more information about reliable messaging and BizTalk Framework 2.0, go to the Microsoft Web site ([microsoft.com/biztalk/](http://microsoft.com/biztalk/)) and search for "BizTalk Framework 2.0".
- When you configure the **Reliable messaging reply-to URL**, use an active server page (ASP) or message queue with a receive function monitoring it. If you do not want to configure your own ASP page initially, use the ReceiveStandard.asp file shipped with BizTalk Server. You can find this sample ASP page in \Program Files\Microsoft BizTalk Server\SDK\Messaging Samples\Receive Scripts. This page is designed to take posts and submit them to BizTalk Server. For more information about implementing a secure site, go to the MSDN Online Library Web site ([www.msdn.microsoft.com/library/default.asp](http://www.msdn.microsoft.com/library/default.asp))

and search for the article "Implementing a Secure Site with ASP".

- If you specify the URL to include *localhost* in the **Reliable messaging reply-to URL** box, the receive function will not work properly. Do not specify *localhost* in this field.
- The response to an HTTP post is expected to be text. If the response requires binary data, encode the binary data using MIME or UUEncode.

## Related Topics

[Administration Cache](#)

[Available Receive Functions](#)

[Start a server in a group](#)

[Stop a server in a group](#)

# Configure connection properties for a server group

1. In BizTalk Server Administration, expand **Microsoft BizTalk Server 2000**, and then click the server group that you want to configure.

2. On the **Action** menu, click **Properties**.

The **BizTalk Server Group Properties** dialog box appears.

3. Click the **Connection** tab.

4. In the **Tracking database** area:

- In the **Tracking database name** box, type the name of the Tracking database that you want this server group to use.
- In the **Tracking SQL Server name** box, type the name of the Microsoft SQL Server that stores the Tracking database that you want this server group to use.
- In the **User name** and **Password** boxes, type the Microsoft SQL Server logon user name and password that are used to connect to the server on which the Tracking database is stored.

5. In the **Shared Queue database** area:

- In the **Shared Queue database name** box, type the name of the Shared Queue database that you want this server group to use.
- In the **Shared Queue SQL Server name** box, type the name of the Microsoft SQL Server that stores the Shared Queue database that you want this server group to use.
- In the **User name** and **Password** boxes, type the SQL Server logon user name and password that are used to connect to the server on which the Shared Queue database is stored.

6. Click **OK**.

## Note

- If you change information in the **Tracking database** or **Shared Queue database** areas, you must complete the following steps:
  1. Stop all servers in the **Microsoft BizTalk Server 2000** node. For more information about how to stop servers, see [Stop a server in a group](#).
  2. Shut down the BizTalk Server Interchange Application. For more information about how to shut down the BizTalk Server Interchange Application, see [Shut down the BizTalk Server Interchange Application](#).
  3. Restart all servers in the **Microsoft BizTalk Server 2000** node. For more information about how to restart servers, see [Start a server in a group](#).
- If you change any values in the **Tracking database** area, you must update the connection string in the Connection.vb file with the new Tracking database information. You can find Connection.vb in the \Program Files\Microsoft BizTalk Server\BizTalkTracking\VBScripts folder. The Initial Catalog property in the connection string contains the name of the Tracking database. Update this property to update the Tracking database name. The connection string in the Connection.vb file is:

```
Const g_ConnectionString = "Provider=SQLOLEDB.1;  
Persist Security Info=False;User ID=dta_ui_login;  
Password=;Initial Catalog=<databasename>;  
Data Source=<servername>;Connect Timeout=15"
```

## Related Topics

Available Receive Functions

Groups and Servers

Shut down the BizTalk Server Interchange Application

Start a server in a group

Stop a server in a group

# Configure tracking properties for a server group

1. In BizTalk Server Administration, expand **Microsoft BizTalk Server 2000**, and then click the server group that you want to configure.
2. On the **Action** menu, click **Properties**.  
The **BizTalk Server Group Properties** dialog box appears.
3. Click the **Tracking** tab.
4. Select the **Enable document tracking** check box and any of the following options that you want to use:
  - Select the **Log incoming interchange** check box to log incoming interchanges.
  - Select the **Log outgoing interchange** check box to log outgoing interchanges.
  - Select the **Log the original MIME-encoded message** check box to log MIME-encoded messages.
5. Click **OK**.

## **Caution**

- You can disable tracking by clearing the **Enable document tracking** check box. However, you will lose important BizTalk Server 2000 functionality if you disable document tracking. For more information about tracking, see [Understanding Tracking Settings For a Server Group](#).

## **Note**

- If the **Enable document tracking** check box is not selected, the **Log incoming interchange**, **Log outgoing interchange**, and **Log the original MIME-encoded message** check boxes are unavailable.

## **Related Topics**

[Groups and Servers](#)

[Understanding Tracking Settings for a Server Group](#)

# Configure the parser order for a server group

1. In BizTalk Server Administration, expand **Microsoft BizTalk Server 2000**, and then click the server group for which you want to configure the parser order.
2. On the **Action** menu, click **Properties**.

The **BizTalk Server Group Properties** dialog box appears.

3. Click the **Parsers** tab.

The parsers are listed in the **Arrange the server call sequence** box in the following order:

- BizTalk.ParserXML.1
- BizTalk.ParserEdifact.1
- BizTalk.ParserX12.1
- BizTalk.ParserFFile.1

You can improve BizTalk Server performance by moving the most commonly used parsers closer to the top of the list.

1. In the **Arrange the server call sequence** box, click the parser that you want to move and click either the up or down arrow to move the selected parser higher or lower in the server call sequence.
2. When the parsers are arranged in the order you want, click **OK**.

## Note

- The **Refresh** button picks up new parsers registered in the local registry. If you want a new parser to appear in the **Arrange the server call sequence** box, you must click the **Refresh** button on the server on which the parser is registered.

## Related Topic

[Using the IBizTalkParserComponent Interface](#)

# Delete a server group

1. In BizTalk Server Administration, expand **Microsoft BizTalk Server 2000**, and then expand the server group that you want to delete.
2. Click a server in the server group that you want to delete.
3. On the **Action** menu, click **Stop**.  
Repeat steps 2-3 for each server in the group until you have stopped all servers in the group.
4. Click the server group.
5. On the **Action** menu, click **Delete**.  
The **User Action Confirmation** dialog box appears.
6. Click **Yes**.

## Notes

- You cannot delete a server group that contains one or more running servers. To stop the servers and delete the server group, you must have Windows 2000 Administrator privileges for all the servers in the group.
- The Tracking and Shared Queue databases associated with the server group remain in Microsoft SQL Server even after you delete the group. To remove the Tracking and Shared Queue databases, you must manually delete them. For more information about how to delete these databases, see [Remove the Tracking and Shared Queue databases](#).

## Related Topics

[Groups and Servers](#)

[Remove the Tracking and Shared Queue databases](#)

[Stop a server in a group](#)

# Add, Delete, and Configure Servers in a Group

The following procedures are used to add, delete, and configure servers in a group:

- [Add a server to a group](#)
- [Delete a server from a group](#)
- [Configure a server in a group](#)
- [Change the BizTalk Messaging Management database for a server](#)

# Add a server to a group

1. In BizTalk Server Administration, expand **Microsoft BizTalk Server 2000**, and then click the server group to which you want to add a server.
2. On the **Action** menu, point to **New**, and then click **Server**.

The **Add a BizTalk Server** dialog box appears.

3. In the **BizTalk Server name** box, type the name of an existing server on which you have a complete installation of BizTalk Server 2000.
4. Click **OK**.

## **Note**

- To view the global properties for the server group to which you added the server by right-click the group, and click **Properties**.

## **Related Topics**

[Groups and Servers](#)

[Run Servers in a Group](#)

[Understanding server properties](#)

# Delete a server from a group

1. In BizTalk Server Administration, expand **Microsoft BizTalk Server 2000**, expand the server group that contains the server that you want to delete, and then click the server.
2. On the **Action** menu, click **Stop**.  
The server finishes processing all current interchanges and documents.
3. On the **Action** menu, click **Delete**.  
The **User Action Confirmation** dialog box appears.
4. Click **Yes**.

## **Note**

- You cannot delete a server from a server group if a receive function(s) points to it to process documents. You can edit the receive function(s) to point to other servers, or you can delete the receive function(s) if it no longer can be used.

## **Related Topics**

[Free interchanges from a server](#)

[Groups and Servers](#)

[Manage Receive Functions for a Server Group](#)

[Run Servers in a Group](#)

# Configure a server in a group

1. In BizTalk Server Administration, expand **Microsoft BizTalk Server 2000**, expand the server group that contains the server you want to configure, and then click the server.

2. On the **Action** menu, click **Stop**.

You cannot change server configuration settings while the server is running.

3. On the **Action** menu, click **Properties**.

The **<Computername> Properties** dialog box appears.

4. In the **Maximum number of receive function threads allowed** box, type a number in the range from 1 through 128.

The default value is 4. For more information about how to configure this option, see [Understanding server properties](#).

5. If you want the server to process items in the Work queue, select the **Participate in work-item processing** check box.

When this check box is selected, the server processes documents in the Work queue. Clear this check box if you do not want the server to process documents in the Work queue. For more information about how to configure this option, see [Understanding server properties](#).

6. In the **Maximum number of worker threads per processor allowed** box, type a number in the range from 1 through 128.

The default value is 4. For more information about how to configure this option, see [Understanding server properties](#).

7. In the **Time between BizTalk Server Scheduler calls (milliseconds)** box, type a number in the range from 1 through 4,294,967,295.

The default value is 200. For more information about how to configure this option, see [Understanding server properties](#).

8. Click **OK**.

9. Right-click the server you configured and click **Start**.

## Note

- If the **Participate in work-item processing** check box is not selected, the **Maximum number of worker threads per processor allowed** and **Time between BizTalk Server Scheduler calls (milliseconds)** check boxes are unavailable.

## Related Topics

[Groups and Servers](#)

[Run Servers in a Group](#)

[Understanding server properties](#)

# Change the BizTalk Messaging Management database for a server

1. In BizTalk Server Administration, expand **Microsoft BizTalk Server 2000**, expand the server group that contains the server for which you want to change the BizTalk Messaging Management database, and then click the server.
2. On the **Action** menu, click **Stop**.
3. On the **Action** menu, click **Delete**.

The **User Action Confirmation** dialog box appears.

4. Click **Yes**.
  5. Close BizTalk Server Administration.
  6. On the **Start** menu, point to **Programs**, point to **Accessories**, and then click **Windows Explorer**.
  7. Browse to **\Program Files\Microsoft BizTalk Server\Setup**.
  8. Click **BTSsetupDB.exe**.
  9. On the **File** menu, click **Open**.
- The Microsoft BizTalk Server 2000 Database Setup Wizard opens.
10. On the **Welcome to the Microsoft BizTalk Server 2000 Database Setup Wizard** page, click **Next**.
  11. On the **Configure a BizTalk Messaging Management Database** page, click **Create a new BizTalk Messaging Management database**.
- Or—
- Click **Select an existing database**.
12. In the **Server name** box, click the name of the server where the new or existing BizTalk Messaging Management database is located.
  13. In the **User name** and **Password** boxes, type a valid user name and password to access the SQL server, if required.
  14. In the **Database** box, type the name of the new or existing BizTalk Messaging Management database.
  15. Click **Next**.
  16. On the **Configure a BizTalk Server Group** page, click **Create a new BizTalk Server group**. In the **Group name** box, type the name of the new group, and then click **Next**.

—Or—

Click **Select an existing BizTalk Server group**. In the **Group name** list, click the name of the existing group, and then click **Next**.

You can only select an existing BizTalk Server group if you selected an existing database in step 11.

17. If necessary, click **Create a new Tracking database** and click **Next**.

—Or—

Click **Select an existing database**. In the **Server name** list, click a server. In the **User name** and **Password** boxes, type a valid Microsoft SQL Server user name and password, if required. In the **Database** box, type the name of the database. Click **Next**.

18. If necessary, click **Create a new Shared Queue database**, and then click **Next**.

—Or—

Click **Select an existing database**. In the **Server name** list, click a server. In the **User name** and **Password** boxes, type a valid SQL Server user name and password, if required. In the **Database** box, type the name of the database. Click **Next**.

19. On the **Verify BizTalk Server Group** page, verify the information you entered, and then click **Next**.

20. On the **Completing the Microsoft BizTalk Server 2000 Database Setup Wizard** page, click **Finish**.

21. Open BizTalk Server Administration.

22. Expand **Microsoft BizTalk Server 2000**, expand the server group that contains the server for which you just changed the BizTalk Messaging Management database, and then click the server.

23. On the **Action** menu, click **Start**.

#### ◆ Important

- Use this procedure to associate a server with a different BizTalk Messaging Management database. For more information about moving servers between BizTalk Messaging Management databases, see [Moving servers between BizTalk Messaging Management databases](#). For more information about changing the BizTalk Messaging Management database for server groups, see [Changing the BizTalk Messaging Management database](#).

## Related Topics

[Changing the BizTalk Messaging Management database](#)

[Managing BizTalk Server Databases](#)

[Moving servers between BizTalk Messaging Management databases](#)

# Run Servers in a Group

The following procedures are used to run servers in a group:

- [Start a server in a group](#)
- [Stop a server in a group](#)
- [Free interchanges from a server](#)

# Start a server in a group

1. In BizTalk Server Administration, expand **Microsoft BizTalk Server 2000**, expand the server group that contains the server that you want to start, and then click the server.
2. On the **Action** menu, click **Start**.

## Notes

- Starting a server in a server group means starting the BizTalk Messaging Service on the server. After the BizTalk Messaging Service is running, the server can receive, transmit, process, and track documents that are queued to the Microsoft SQL Server databases.
- The **Start** option is available only if the server is stopped. If the server is running, the command is unavailable.

## Related Topics

[Add, Delete, and Configure Servers in a Group](#)

[Administration Cache](#)

[Groups and Servers](#)

[Stop a server in a group](#)

# Stop a server in a group

1. In BizTalk Server Administration, expand **Microsoft BizTalk Server 2000**, expand the server group that contains the server that you want to stop, and then click the server.
2. On the **Action** menu, click **Stop**.

## Notes

- Stopping a server in a server group means stopping the BizTalk Messaging Service on the server. After the BizTalk Messaging Service is stopped, the server cannot receive, transmit, process, or track documents that are queued to the Microsoft SQL Server databases.
- If you want to redistribute interchanges associated with a server that you have stopped, see [Free interchanges from a server](#).

## Related Topics

[Add, Delete, and Configure Servers in a Group](#)

[Administration Cache](#)

[Free interchanges from a server](#)

[Groups and Servers](#)

# Free interchanges from a server

This procedure is used to free interchanges from a server so that the interchanges can be redistributed to other servers in the group if the original server is stopped or taken offline.

1. In BizTalk Server Administration, expand **Microsoft BizTalk Server 2000**, expand the server group that contains the server on which you want to free interchanges, and then click the server.
2. On the **Action** menu, click **Stop**.
3. On the **Action** menu, point to **All Tasks**, and then click **Free Interchanges**.

## Related Topics

[Add, Delete, and Configure Servers in a Group](#)

[Groups and Servers](#)

[Stop a server in a group](#)

# Manage Queues

The following procedures are covered in this topic:

- [Move documents to the Suspended queue](#)
- [View error descriptions](#)
- [View interchanges](#)
- [View documents](#)
- [Resubmit documents](#)
- [Delete documents](#)

# Move documents to the Suspended queue

1. In BizTalk Server Administration, expand **Microsoft BizTalk Server 2000**, expand the group that contains the document that you want to move, and then expand **Queues**.
2. Expand the queue that contains the document that you want to move, and then click the document.
3. On the **Action** menu, point to **All Tasks**, and then click **Move to Suspended Queue**.

## Related Topics

[Suspended queue](#)

[Using Queues](#)

# View error descriptions

1. In BizTalk Server Administration, expand **Microsoft BizTalk Server 2000**, expand the group that contains the document that you want to view, expand **Queues**, and then click **Suspended Queue**.
2. In the details pane, click the document that you want to view.
3. On the **Action** menu, click **View Error Description**.

## Related Topics

[Suspended queue](#)

[Using Queues](#)

[View documents](#)

[View interchanges](#)

# View interchanges

1. In BizTalk Server Administration, expand **Microsoft BizTalk Server 2000**, expand the group that contains the interchange that you want to view, expand **Queues**, and then click **Suspended Queue**.
2. In the details pane, click the interchange that you want to view.
3. On the **Action** menu, click **View Interchange**.

The **Document Content** dialog box appears.

## Notes

- If you try to view a large interchange, the data might be truncated. You can view up to 4 MB of data in the **Document Content** dialog box.
- If BizTalk Server could not parse the interchange, you might see binary data in the **Document Content** dialog box. For more information about parser errors, see [Parsing errors](#).
- **View Interchange** is an available menu option for the following Suspended queue states:
  - Custom Component
  - Parsing
  - Encoding
  - Signing
  - Encrypting
  - Transmitting
- **View Interchange** and **View Document** never appear on the **Action** menu at the same time.

## Related Topics

[An interchange or document appears as binary data in the Suspended queue](#)

[Suspended queue](#)

[Using Queues](#)

[View documents](#)

[View error descriptions](#)

# View documents

1. In BizTalk Server Administration, expand **Microsoft BizTalk Server 2000**, expand the group that contains the document that you want to view, expand **Queues**, and then click **Suspended Queue**.
2. In the details pane, click the document that you want to view.
3. On the **Action** menu, click **View Document**.

The **Document Content** dialog box appears.

## Notes

- If you try to view a large document, the data might be truncated. You can view up to 4 MB of data in the **Document Content** dialog box.
- **View Document** is an available menu option for the following Suspended queue states:
  - Document Validation
  - Channel Selection
  - Mapping
  - Correlating
  - Serializing
- **View Interchange** and **View Document** never appear on the **Action** menu at the same time.

## Related Topics

[An interchange or document appears as binary data in the Suspended queue](#)

[Suspended queue](#)

[Using Queues](#)

[View error descriptions](#)

[View interchanges](#)

# Resubmit documents

1. In BizTalk Server Administration, expand **Microsoft BizTalk Server 2000**, expand the group that contains the document that you want to resubmit, expand **Queues**, and then click **Suspended Queue**.
2. In the details pane, click the document that you want to resubmit.
3. On the **Action** menu, point to **All Tasks**, and then click **Resubmit**.

## Notes

- This procedure, Resubmit documents, can also be used to retransmit documents.
- Not all documents in the Suspended queue can be resubmitted. In some situations, you must delete the document and submit it again from the original application or organization. For more information about documents in the Suspended queue, see [Suspended queue](#).

## Related Topics

[Suspended queue](#)

[Using Queues](#)

# Delete documents

1. In BizTalk Server Administration, expand **Microsoft BizTalk Server 2000**, expand the group that contains the document that you want to delete, expand **Queues**, and then click **Suspended Queue**.
2. In the details pane, click the document that you want to delete.
3. On the **Action** menu, click **Delete**.  
The **User Action Confirmation** dialog box appears.
4. Click **Yes**.

## Related Topics

[Suspended queue](#)

[Using Queues](#)

# Manage Databases for a Server Group

The following procedures are used to manage databases for a server group:

- [Shut down the BizTalk Server Interchange Application](#)
- [Remove the Tracking and Shared Queue databases](#)
- [Manually restore the Tracking database](#)
- [Manually restore the Shared Queue database](#)

# Shut down the BizTalk Server Interchange Application

1. On the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**.
2. Expand **Component Services**, expand **Computers**, expand **My Computer**, and then expand **COM+ Applications**.
3. Click **BizTalk Server Interchange Application**.
4. On the **Action** menu, click **Shut down**.

## Note

- You can shut down the BizTalk Server Interchange Application from a remote server. If you do this, expand the *<remotecomputername>* instead of **My Computer** in step 1.

## Related Topics

[Administration Cache](#)

[Configure connection properties for a server group](#)

[Configure tracking properties for a server group](#)

[Groups and Servers](#)

[Open Component Services](#)

[Tracking Database](#)

# Remove the Tracking and Shared Queue databases

1. On the **Start** menu, point to **Programs**, point to **Microsoft SQL Server**, and then click **Enterprise Manager**.
2. Expand **Microsoft SQL Servers**, expand **SQL Server Group**, and then expand the individual server that contains the databases that you want to delete.
3. Expand the **Databases** folder, and then click the database that you want to delete.
4. On the **Action** menu, click **Delete**.  
The **Delete Database** dialog box appears.
5. Click **Yes**.

## Note

- The default name for the Tracking database is InterchangeDTA. The default name for the Shared Queue database is InterchangeSQ.

## Related Topics

[Groups and Servers](#)

[Shared Queue Database](#)

[Stop a server in a group](#)

[Tracking Database](#)

# Manually restore the Tracking database

1. On the **Start** menu, point to **Programs**, point to **Microsoft SQL Server**, and then click **Enterprise Manager**.
2. Expand **Microsoft SQL Servers**, expand **SQL Server Group**, and then expand the server on which you want to restore the database.
3. Click **Databases**.
4. On the **Action** menu, click **New Database**.  
The **Database Properties** dialog box appears.
5. On the **General** tab, in the **Name** box, type a name for the Tracking database, and then click **OK**.
6. On the **Start** menu, point to **Programs**, point to **Microsoft SQL Server**, and then click **Query Analyzer**.  
The **Connect to SQL Server** dialog box appears.
7. Click **OK**.
8. If you have Microsoft SQL Server 7.0 installed, in the **Query** window, in the **DB** list, click the name of the new Tracking database.  
—Or—  
If you have Microsoft SQL Server 2000 installed, on the **Objects** tab, click the name of the new Tracking database.
9. Click the **Load SQL Script**  button.
10. Browse to **\Program Files\Microsoft BizTalk Server\Setup**.
11. Click **BTS\_Tracking\_Schema.sql**, and then click **Open**.
12. Click the **Execute Query** button.
13. Click the **Load SQL Script** button.
14. Verify that you are in the folder **\Program Files\Microsoft BizTalk Server\Setup**.
15. Click **BTS\_Reporting.sql**, and then click **Open**.
16. Click the **Execute Query** button.
17. Click the **Load SQL Script** button.
18. Verify that you are in the folder **\Program Files\Microsoft BizTalk Server\Setup**.
19. Click **BTS\_Tracking\_Logic.sql**, and then click **Open**.
20. Click the **Execute Query** button.
21. Click the **Load SQL Script** button.
22. Verify that you are in the folder **\Program Files\Microsoft BizTalk Server\Setup**.
23. Click **BTS\_WorkflowEvents.sql**, and then click **Open**.
24. Click the **Execute Query** button.

25. Click the **Load SQL Script** button.
26. Verify that you are in the folder **\Program Files\Microsoft BizTalk Server\Setup**.
27. Click **BTS\_WorkflowSchema.sql**, and then click **Open**.
28. Click the **Execute Query** button.
29. Close SQL Query Analyzer and SQL Server Enterprise Manager.

**⚠ Caution**

- When you manually restore the Tracking database, you lose all data. If you need to keep this data, back up the data before you restore the Tracking database.

**📌 Note**

- Use this procedure if the Tracking database becomes corrupted or damaged.

**Related Topic**

[Manually restore the Shared Queue database](#)

# Manually restore the Shared Queue database

1. On the **Start** menu, point to **Programs**, point to **Microsoft SQL Server**, and then click **Enterprise Manager**.
2. Expand **Microsoft SQL Servers**, expand **SQL Server Group**, and then expand the server on which you want to restore the database.
3. Click **Databases**.
4. On the **Action** menu, click **New Database**.  
The **Database Properties** dialog box appears.
5. On the **General** tab, in the **Name** box, type a name for the Shared Queue database and then click **OK**.
6. On the **Start** menu, point to **Programs**, point to **Microsoft SQL Server**, and then click **Query Analyzer**.  
The **Connect to SQL Server** dialog box appears.
7. Click **OK**.
8. If you have Microsoft SQL Server 7.0 installed, in the **Query** window, in the **DB** list, click the name of the new Shared Queue database.  
—Or—  
If you have Microsoft SQL Server 2000 installed, on the **Objects** tab, click the name of the new Shared Queue database.
9. Click the **Load SQL Script**  button.
10. Browse to **\Program Files\Microsoft BizTalk Server\Setup**.
11. Click **BTS\_Core\_Schema.sql**, and then click **Open**.
12. Click the **Execute Query** button.
13. Click the **Load SQL Script** button.
14. Verify that you are in the folder **\Program Files\Microsoft BizTalk Server\Setup**.
15. Click **BTS\_Core\_Logic.sql**, and then click **Open**.
16. Click the **Execute Query** button.
17. Close SQL Query Analyzer and SQL Server Enterprise Manager.

## **Caution**

- When you manually restore the Shared Queue database, you lose all data. If you need to keep this data, back up the data before you restore the Shared Queue database.

## **Note**

- Use this procedure if the Shared Queue database becomes corrupted or damaged.

## **Related Topic**

[Manually restore the Tracking database](#)

# Manage Receive Functions for a Server Group

The following procedures are used to manage receive functions for a server group:

- [Add a File receive function](#)
- [Configure a File receive function: General tab](#)
- [Configure a File receive function: Services tab](#)
- [Add a Message Queuing receive function](#)
- [Configure a Message Queuing receive function: General tab](#)
- [Configure a Message Queuing receive function: Services tab](#)
- [Configure advanced properties for File or Message Queuing receive functions](#)
- [Delete a receive function](#)

# Add a File receive function

1. In BizTalk Server Administration, expand **Microsoft BizTalk Server 2000** and expand the server group to which you want to add the File receive function.

2. Click **Receive Functions**.

3. On the **Action** menu, point to **New**, and then click **File Receive Function**.

The **Add a File Receive Function** dialog box appears.

4. In the **Name** box, type the name of the File receive function.

5. In the **Comment** box, add a brief description (optional).

6. In the **Server on which the receive function will run** list, click the name of a server in the group.

7. In the **File types to poll for** box, type the extension of the files that BizTalk Server receives.

The file type extension must be written in the following syntax:

*\*.ext*

For example: \*.xml

8. In the **Polling location** box, type either the logical path or the universal naming convention (UNC) path to the directory this receive function uses as the file receiving location.

9. In the **Preprocessor** list, click the name of the custom preprocessor.

Leave this blank if you are not using a custom preprocessor.

10. In the **User name** and **Password** boxes, type a valid user name and password to connect to the file receive location (optional).

This is required only when the receive location is protected and a valid user name and password are required to connect to the server.

11. To customize the receive function for non-self-routing documents, or to specify openness or pass-through options, click **Advanced**.

For more information about advanced options,

see [Configure advanced properties for File and Message Queuing receive functions](#).

## Notes

- This procedure creates a File receive function with the default settings. To configure the File receive function with additional settings, see [Configure a File receive function: General tab](#).

- If you want to poll for more than one file type, use any standard wildcard format.

For example: \*.\* or \*.x?!

- If you configure one or more File receive functions to monitor the same directory, use three-letter file extensions. If you use file extensions of more than three letters, verify that the first three letters are unique.

For example: \*.xml, \*.1xml, \*.12xml

- File receive functions cannot process read only files.

- Verify that each receive function that you create has a unique name. You cannot assign identical names to receive functions.

## Related Topics

[Available Receive Functions](#)

[Configure advanced properties for File and Message Queuing receive functions](#)

[Configure a File receive function: General tab](#)

[Configure a File receive function: Services tab](#)

[Custom Preprocessors](#)

[Receive Functions](#)

# Configure a File receive function: General tab

1. In BizTalk Server Administration, expand **Microsoft BizTalk Server 2000**, expand the server group for which you want to configure a File receive function, and then expand **Receive Functions**.
2. Click the File receive function you want to configure.
3. On the **Action** menu, click **Properties**.  
The **Properties** dialog box appears.
4. In the **Comment** box, add a brief description (optional).
5. In the **Security** area, in the **User name** and **Password** boxes, type a valid user name and password to connect to this receive function.  
This is required only when the receive location is protected and a valid user name and password are required to connect to the server.
6. If you want to temporarily shut down the functionality of this receive function, select the **Disable receive function** check box, and then click **Yes** to confirm your choice.

## Note

- File receive functions cannot process read only files.

## Related Topics

[Configure advanced properties for File and Message Queuing receive functions](#)

[Configure a File receive function: Services tab](#)

# Configure a File receive function: Services tab

1. In BizTalk Server Administration, expand **Microsoft BizTalk Server 2000**, expand the server group for which you want to configure a File receive function, and then expand **Receive Functions**.
2. Click the File receive function that you want to configure.
3. On the **Action** menu, click **Properties**.  
The **Properties** dialog box appears.
4. Click the **Services** tab.
5. In the **Server on which the receive function will run** list, click the server name.
6. In the **Polling location** box, type either the logical path or the universal naming convention (UNC) path to the directory this receive function uses as the file receive location.
7. In the **File types to poll for** box, type the extension of the files that BizTalk Server receives.  
The file type extension must be written in the following syntax:  
`*.ext`  
For example: \*.doc
8. In the **Preprocessor** list, click the name of the custom preprocessor.  
Leave this blank if you are not using a custom preprocessor.
9. Click **OK**.

## Note

- If you want to receive multiple file types, use any standard wildcard format.  
For example: \*.\*
- If you configure one or more File receive functions to monitor the same directory, use three-letter file extensions. If you use file extensions of more than three letters, verify that the first three letters are unique.  
For example: \*.xml, \*.1xml, \*.12xml
- File receive functions cannot process read only files.

## Related Topics

[Available Receive Functions](#)

[Configure advanced properties for File and Message Queuing receive functions](#)

[Custom Preprocessors](#)

# Add a Message Queuing receive function

1. In BizTalk Server Administration, expand **Microsoft BizTalk Server 2000** and expand the server group for which you want to add a Message Queuing receive function.

2. Click **Receive Functions**.

3. On the **Action** menu, point to **New**, and then click **Message Queuing Receive Function**.

The **Add a Message Queuing Receive Function** dialog box appears.

4. In the **Name** box, type the name of the Message Queuing receive function.

5. In the **Comment** box, add a brief description (optional).

6. In the **Server on which the receive function will run** list, click the name of a server in the group.

7. In the **Polling location** box, type the server and Message Queuing names that this receive function uses as the receive location.

For example:

**Direct=OS:**<servername>\<queuename>

Select the processing server on which the queue resides. Transactional messaging is only supported by local queues.

8. In the **Preprocessor** list, click the custom preprocessor.

Leave this blank if you are not using a custom preprocessor.

9. In the **User name** and **Password** boxes, type a valid user name and password to connect to Message Queuing.

This is required only when the receive location is not on the server processing interchanges and documents.

10. To customize the receive function for non-self-routing documents, or to specify openness or pass-through options, click **Advanced**.

For more information about advanced options,

see [Configure advanced properties for File and Message Queuing receive functions](#).

## ◆ Important

- Do not prefix the <servername>\<queuename> with "queue://" in the **Polling location** box. This is different from the general properties for a server group for which you use "queue://". For more information about Message Queuing syntax, see [Available Receive Functions](#). For more information about properties for a server group, see [Configure general properties for a server group](#).

## 📝 Notes

- For more information about custom preprocessing, see [Custom Preprocessors](#).
- A Message Queuing receive function will not work unless the user name and password supplied to BizTalk Server is running has read permission on the queue.
- To ensure reliability, you must use transactional queues. If you use nontransactional queues, messages might be lost. For more information about transactional queues, go to the MSDN Online Library Web site ([msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp)), and search on the keywords "Message Queuing".
- Verify that each receive function that you create has a unique name. You cannot assign identical names to receive functions.

## Related Topics

[Available Receive Functions](#)

[Configure advanced properties for File and Message Queuing receive functions](#)

[Configure a Message Queuing receive function: General tab](#)

[Custom Preprocessors](#)

[Receive Functions](#)

# Configure a Message Queuing receive function: General tab

1. In BizTalk Server Administration, expand **Microsoft BizTalk Server 2000**, expand the server group for which you want to configure a Message Queuing receive function, and then expand **Receive Functions**.
2. Click the Message Queuing receive function that you want to configure.
3. On the **Action** menu, click **Properties**.  
The **Properties** dialog box appears.
4. In the **Comment** box, add a brief description (optional).
5. In the **Security** area, in the **User name** and **Password** boxes, type a valid user name and password to connect to the Message Queue.  
This is required only when the receive location is not on the processing server.
6. If you want to temporarily shut down the functionality of this receive function, select the **Disable receive function** check box, and then click **Yes** to confirm your choice.

## Related Topics

[Configure a Message Queuing receive function: Services tab](#)

[Receive Functions](#)

# Configure a Message Queuing receive function: Services tab

1. In BizTalk Server Administration, expand **Microsoft BizTalk Server 2000**, expand the server group for which you want to configure a Message Queuing receive function, and then expand **Receive Functions**.
2. Click the Message Queuing receive function that you want to configure.
3. On the **Action** menu, click **Properties**.  
The **Properties** dialog box appears.
4. Click the **Services** tab.
5. In the **Server on which the receive function will run** list, click the server name.
6. In the **Polling location** box, type the server and Message Queuing names that this receive function uses as the receive location.  
For example:  
**Direct=OS:<servername>\<queue>**
7. In the **Preprocessor** list, click the custom preprocessor.  
Leave this option blank if you are not using a custom preprocessor.
8. Click **OK**.

## ◆ Important

- Do not prefix the <servername>\<queue> with "queue://" in the **Polling location** box. This is different from the general properties for a server group for which you use "queue://". For more information about Message Queuing syntax, see [Available Receive Functions](#). For more information about server group properties, see [Configure general properties for a server group](#).

## 📌 Note

- For more information about custom preprocessing, see [Custom Preprocessors](#).

## Related Topics

[Available Receive Functions](#)

[Configure general properties for a server group](#)

[Custom Preprocessors](#)

# Configure advanced properties for File or Message Queuing receive functions

1. In BizTalk Server Administration, expand **Microsoft BizTalk Server 2000**, expand the server group for which you want to configure a receive function, expand **Receive Functions**, and then click the receive function that you want to configure.
2. On the **Action** menu, click **Properties**.  
The **Properties** dialog box appears.
3. Click the **Advanced** tab.
4. In the **Openness** list, you can select:
  - **Not open**. Click this option when the source and destination are both explicitly declared in the receive function or in the document instance, and BizTalk Server does not have to parse the document for this information.
  - **Open Destination**. Click this option when the destination information is not explicitly declared in the messaging port. The destination is dynamically specified in the document instance or a submission parameter.
  - **Open Source**. Click this option when the source information is not explicitly declared in the channel. The source is dynamically specified in the document instance or a submission parameter.
5. If you want to bypass all processing, such as decoding, decryption, signature verification, parsing and so on, and only transport an interchange, select the **Submit with a pass-through flag** check box.  
You must select a channel if you select the **Submit with a pass-through flag** check box.
6. In the **Envelope name** list, click the name of an envelope definition.  
Choose an envelope if you plan to receive flat files. Otherwise, leave this blank.
7. In the **Channel name** list, click the name of a channel.
8. In the **Document definition name** list, click the name of a document definition.
9. In the **Source and destination** area, in the **Source selected** area, click **Browse**.  
The **Select Source** dialog box appears.
10. In the **Organization qualifier** list, click the type of source organization qualifier.
11. In the **Organization identifier value** list, click the source-organization identifier value and click **OK**.
12. In the **Source and destination** area, in the **Destination selected** area, click **Browse**.  
The **Select Destination** dialog box appears.
13. In the **Organization qualifier** list, click the type of destination organization qualifier.  
If you send documents to a distribution list, in the **Organization qualifier** list, you must choose **GROUP**.
14. In the **Organization identifier value** list, click the destination-organization identifier value, and then click **OK**.
15. Click **OK**.

## ◆ Important

- Before you can assign any of the objects in the following list as advanced properties of a receive function, you must create them. These objects are either created in BizTalk Messaging Manager or they are created programmatically and stored in the BizTalk Messaging Management database.
  - Envelopes

- Channels
- Document definitions
- Source qualifiers
- Source-organization identifier values
- Destination qualifiers
- Destination-organization identifier values

#### Notes

- If you click **Open Source** or **Open Destination** in the **Openness** list, the **Submit with a pass-through flag** check box is unavailable.
- If you want to send a document to a distribution list, you must select **GROUP** in the **Organization qualifier** list in the **Select Destination** dialog box.
- All the advanced receive-function properties are optional and can be left blank. For more information about submitting documents, see [Routing](#) or [Understanding Receive Functions and Document Routing](#).
- If the **Submit with a pass-through flag** check box is enabled, only the **Channel** list is available.
- A pass-through submission bypasses the parsing, decryption, and decoding functions of BizTalk Server 2000. For more information about submitting documents with the pass-through flag set, see [Understanding Receive Function Advanced Properties](#). For more information about submitting, see [Submitting](#).

#### Related Topics

[Receive Functions](#)

[Routing](#)

[Submitting](#)

[Understanding Receive Function Advanced Properties](#)

[Understanding Receive Functions and Document Routing](#)

# Delete a receive function

1. In BizTalk Server Administration, expand **Microsoft BizTalk Server 2000**, expand the server group in which you want to delete a receive function, and then expand **Receive Functions**.
2. Click the receive function that you want to delete.
3. On the **Action** menu, click **Delete**.  
The **User Action Confirmation** dialog box appears.
4. Click **Yes**.

## Related Topic

[Receive Functions](#)

# Manage Event Viewer

You can use the Event Viewer included in BizTalk Server Administration to help you troubleshoot server and document processing problems. The Event Viewer appears in the console tree of BizTalk Server Administration. All application-related errors for BizTalk Server 2000 are labeled BizTalk Server errors. All XLANG schedule-related errors are labeled [XLANG Scheduler](#) errors.

The following procedures are used to manage the Event Viewer:

- [Configure Event Viewer for BizTalk Server errors](#)
- [View application-related errors in Event Viewer](#)

# Configure Event Viewer for BizTalk Server errors

1. In BizTalk Server Administration, expand **Event Viewer**.

2. Click **Application**.

3. On the **Action** menu, click **Properties**.

The **Application Properties** dialog box appears.

4. Click the **Filter** tab.

5. In the **Event source** list, click one of the following:

- **BizTalk Server**. This option filters the event sources for error messages that are related to BizTalk Messaging Services.
- **XLANG Scheduler**. This option filters the event sources for error messages that are related to BizTalk Orchestration Services.

6. Click **OK** to close the **Application Properties** dialog box.

# View application-related errors in Event Viewer

1. In BizTalk Server Administration, expand **Event Viewer**.
2. Click **Application**.  
Application error messages are listed in the details pane.
3. Click a message in the details pane.
4. On the **Action** menu, click **Properties**.

## **Note**

- This procedure assumes you configured the Event Viewer to display only BizTalk Server and XLANG Scheduler errors. For more information about how to display BizTalk Server and XLANG Scheduler errors, see [Configure Event Viewer for BizTalk Server errors](#).

## **Related Topic**

[Configure Event Viewer for BizTalk Server errors](#)

# Manage XLANG Applications and Databases

This section provides information about how to manage COM+ applications that host XLANG schedules. It also includes information about managing the default XLANG Scheduler application and Orchestration Persistence database that is created when you install BizTalk Server 2000.

BizTalk Server 2000 provides a COM+ application called the XLANG Persistence Helper, which is used by all COM+ applications that host XLANG schedule instances. You should not change the configuration of the XLANG Persistence Helper in any way after setup completes.

The following procedures are covered in this section:

- [Manage the Default XLANG Scheduler Application and Database](#)
- [Manage Other COM+ Applications That Host XLANG Schedules](#)
- [Monitor Running XLANG Schedules](#)

## Notes

- For more information about Microsoft SQL Server, on the **Start** menu, point to **Programs**, point to **Microsoft SQL Server**, and then click **Books Online**.
- For Component Services Administration Help, on the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**. In the console tree, right-click **Component Services**, and then click **Help**.
- For more information about Component Services and COM+, go to the MSDN Online Library Web site ([msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp)), and browse to Component Services in the Platform SDK.

## Related Topics

[Running XLANG Schedules](#)

[Run XLANG Schedules](#)

# Manage the Default XLANG Scheduler Application and Database

The default XLANG Scheduler application and Orchestration Persistence database are created during the installation of BizTalk Server 2000. On production systems or systems running Microsoft Terminal Server, you need to change the default settings for this application and database. You can also create new COM+ applications to host XLANG schedule instances and new persistence databases to store XLANG schedule state information.

For information about creating a new COM+ application to host XLANG schedule instances see [Create a COM+ application to host XLANG schedules](#).

For more information about security and performance issues related to changing the default settings for the default XLANG Scheduler application, see [Security for Applications that Host XLANG Schedule Instances](#).

The following procedures are covered in this section:

- [Configure the default XLANG Scheduler application](#)
- [Change the application identity for the default XLANG Scheduler application](#)
- [Change the settings for the default Orchestration Persistence database](#)
- [Shut down all XLANG applications](#)
- [Restart all XLANG applications](#)
-  **Notes**
- For more information about Microsoft SQL Server, on the **Start** menu, point to **Programs**, point to **Microsoft SQL Server**, and then click **Books Online**.
- For Component Services Administration Help, on the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**. In the console tree, right-click **Component Services**, and then click **Help**.
- For more information about Component Services and COM+, go to the MSDN Online Library Web site ([msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp)), and browse to Component Services in the Platform SDK.

## Related Topics

[Running XLANG Schedules](#)

[Run XLANG Schedules](#)

# Configure the default XLANG Scheduler application

The default XLANG Scheduler application and default Orchestration Persistence database are created during the installation of BizTalk Server 2000. On production systems or systems running Microsoft Terminal Server, you need to change the default settings for this application and database. You can also create new COM+ applications to host XLANG schedule instances and new persistence databases to store XLANG schedule state information.

For information about creating a new COM+ application to host XLANG schedule instances see [Create a COM+ application to host XLANG schedules](#).

For more information about security and performance issues related to changing the default settings for the default XLANG Scheduler application, see [Security for Applications that Host XLANG Schedule Instances](#).

1. On the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**.
2. In the console tree, expand **Component Services**, expand **Computers**, expand **My Computer**, and then expand **COM+ Applications**.
3. Click **XLANG Scheduler**. On the **Action** menu, click **Properties**.
4. It is highly recommended that you change the application identity of the default XLANG Scheduler application, particularly on production systems or systems running Microsoft Terminal Server. For more information, see [Change the application identity for the default XLANG Scheduler application](#).
5. It is highly recommended that you change the default database settings for the Orchestration Persistence database. For more information, see [Change the settings for the default Orchestration Persistence database](#).

## Notes

- The data source name (DSN) and the COM+ application must be the same. For example, if the COM+ application hosting the XLANG Scheduler Engine is called XLANG Scheduler, the DSN must also be called XLANG Scheduler.
- For Component Services Administration Help, on the **Start** menu, point to **Settings**, and then click **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**. In the console tree, right-click **Component Services**, and then click **Help**.
- For more information about Component Services and COM+, go to the MSDN Online Library Web site ([msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp)), and browse to Component Services in the Platform SDK.

## Related Topics

[Change the application identity for the default XLANG Scheduler application](#)

[Change the DSN settings for a COM+ application](#)

[Change the settings for the default Orchestration Persistence database](#)

[Create a new persistence database](#)

[Creating an Instantiating Application](#)

[Restart all XLANG applications](#)

[Running XLANG Schedules](#)

[Run XLANG Schedules](#)

[Shut down all XLANG applications](#)

# Change the application identity for the default XLANG Scheduler application

It is recommended that you change the default interactive user account for the default XLANG Scheduler application to a service account.

For more information about security and performance issues related to changing the default settings for the default XLANG Scheduler application, see [Security for Applications that Host XLANG Schedule Instances](#).

1. On the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**.
2. In the console tree, expand **Component Services**, expand **Computers**, expand **My Computer**, and then expand **COM+ Applications**.
3. Click **XLANG Scheduler**. On the **Action** menu, click **Properties**.
4. On the **Advanced** tab, in the **Permission** area, clear the **Disable changes** check box, and then click **OK**.

The following message appears: The applications were created by one or more external products. Are you certain the changes you are about to make are supported by these products?

5. Click **Yes**.

The **XLANG Scheduler Properties** dialog box closes.

6. Click **XLANG Scheduler**. On the **Action** menu, click **Properties**.
7. On the **Identity** tab, in the **Account** area, click **This user**.
8. Type the information for the account that you want to use.
9. Click **OK**.

The following message appears: The applications were created by one or more external products. Are you certain the changes you are about to make are supported by these products?

10. Click **Yes**.

## Notes

- For Component Services Administration Help, on the **Start** menu, point to **Settings**, and then click **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**. In the console tree, right-click **Component Services**, and then click **Help**.
- For more information about Component Services and COM+, go to the MSDN Online Library Web site ([msdn.microsoft.com/library/default.asp](https://msdn.microsoft.com/library/default.asp)), and browse to Component Services in the Platform SDK.

## Related Topics

[Change the settings for the default Orchestration Persistence database](#)

[Configure the default XLANG Scheduler application](#)

[Running XLANG Schedules](#)

[Run XLANG Schedules](#)

[Security for Applications that Host XLANG Schedule Instances](#)

# Change the settings for the default Orchestration Persistence database

When you install BizTalk Server 2000, the Orchestration Persistence database is set up and configured with default settings. You can change these default settings to a configuration that is suitable for the system you are running.

1. On the **Start** menu, point to **Programs**, point to **Microsoft SQL Server**, and then click **Enterprise Manager**.
2. Expand **Microsoft SQL Servers**, expand **SQL Server Group**, expand the server that contains the default database, and then expand **Databases**.
3. Click the XLANG database. On the **Action** menu, click **Properties**.
4. There are six tabs on which you can set various database properties:
  - **General**
  - **Data Files**
  - **Transaction Log**
  - **Filegroups**
  - **Options**
  - **Permissions**

For more information about configuring databases in Microsoft SQL Server, see Microsoft SQL Server Books Online.

## ◆ Important

- This procedure assumes that you set up the default database with the name XLANG.

## 📝 Notes

- The primary database and transaction log files are created by using the database name as the prefix. For example, *XLANGdb\_Data.mdf* and *XLANGdb\_Log.ldf*. The primary file contains the system tables for the database.
- The maximum database size is determined by the amount of disk space available and the licensing limits for the version of Microsoft SQL Server that you are using.
- The object name of the Default Orchestration database is **XLANG**. You can change this name during the installation process.
- For more information about SQL Server, on the **Start** menu, point to **Programs**, point to **Microsoft SQL Server**, and then click **Books Online**.

## Related Topics

[Change the application identity for the default XLANG Scheduler application](#)

[Configure the default XLANG Scheduler application](#)

[Running XLANG Schedules](#)

[Run XLANG Schedules](#)

[Security for Applications that Host XLANG Schedule Instances](#)

# Shut down all XLANG applications

1. On the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click click **Component Services**.
2. In the console tree, expand **Component Services**, expand **Computers**, expand **My Computer**, and then expand **COM+ Applications**.
3. Click **XLANG Scheduler**. On the **Action** menu, click **Properties**.
4. On the **XLANG** tab, in the **Controlled shutdown** area, click **All XLANG Applications**.

## ⚠ Caution

- You must follow this procedure to execute a controlled shutdown for all COM+ applications. Doing this saves the state for all running XLANG schedules to the persistence database. For more information, see [Persistence](#).

Do not right-click a COM+ application and click **Shut down**. One of the following might occur:

- If running XLANG schedules are fully transactional, an uncontrolled shutdown causes any executing transactions to abort.
- If running XLANG schedules are not fully transactional, data that is in process in the schedule is lost.

## 💡 Important

- You cannot restart [dehydrated XLANG schedules](#) if the data source name (DSN) is not available or if it is incorrectly configured. For more information about configuring a DSN for the default XLANG Scheduler application, see [Configure the default XLANG Scheduler application](#).

## 📝 Notes

- For Component Services Administration Help, on the **Start** menu, point to **Settings**, and then click **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**. In the console tree, right-click **Component Services**, and then click **Help**.
- For more information about Component Services and COM+, go to the MSDN Online Library Web site ([msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp)), and browse to Component Services in the Platform SDK.

## Related Topics

[Configure the default XLANG Scheduler application](#)

[Restart all XLANG applications](#)

[Running XLANG Schedules](#)

[Run XLANG Schedules](#)

[Shut down a COM+ application that hosts XLANG schedules](#)

# Restart all XLANG applications

1. On the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**.
2. In the console tree, expand **Component Services**, expand **Computers**, expand **My Computer**, and then expand **COM+ Applications**.
3. Click **XLANG Scheduler**. On the **Action** menu, click **Properties**.
4. On the **XLANG** tab, in the **Restart dehydrated XLANG applications** area, click **All XLANG Applications**.

## ◆ Important

- You cannot restart [dehydrated XLANG schedules](#) if the data source name (DSN) is not available or if it is incorrectly configured. For more information about configuring a DSN for the default XLANG Scheduler application, see [Configure the default XLANG Scheduler application](#).
- When you restart dehydrated applications, this process starts the rehydration of the dehydrated schedules asynchronously. The rehydration process is not immediate. Use XLANG Event Monitor to determine when the rehydration process is complete. For more information about the XLANG Event Monitor tool, see the Readme.htm file associated with the tool. Both XLANG Event Monitor (XLANGMon.exe) and the readme installed by the Microsoft BizTalk Server 2000 Setup Wizard are located in the following installation directory: \Program Files\Microsoft BizTalk Server\SDK\XLANG Tools.

## 📝 Notes

- For Component Services Administration Help, on the **Start** menu, point to **Settings**, and then click **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**. In the console tree, right-click **Component Services**, and then click **Help**.
- For more information about Component Services and COM+, go to the MSDN Online Library Web site ([msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp)), and browse to Component Services in the Platform SDK.

## Related Topics

[Configure the default XLANG Scheduler application](#)

[Running XLANG Schedules](#)

[Run XLANG Schedules](#)

[Shut down a COM+ application that hosts XLANG schedules](#)

[Shut down all XLANG applications](#)

# Manage Other COM+ Applications That Host XLANG Schedules

Most COM+ applications that host XLANG schedules must be created when the XLANG schedule is developed. You must take into consideration security and performance needs for the applications and the schedules, and you might want to create specific COM+ applications to run specific schedules. For more information, see [Run XLANG Schedules](#) and [Running XLANG Schedules](#).

The following procedures are covered in this section:

- [Create a new persistence database](#)
- [Change the application identity for a COM+ application](#)
- [Change the DSN settings for a COM+ application](#)
- [Shut down a COM+ application that hosts XLANG schedules](#)

## Notes

- For more information about Microsoft SQL Server, on the **Start** menu, point to **Programs**, point to **Microsoft SQL Server**, and then click **Books Online**.
- For Component Services Administration Help, on the **Start** menu, point to **Settings**, and then click **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**. In the console tree, right-click **Component Services**, and then click **Help**.
- For more information about Component Services and COM+, go to the MSDN Online Library Web site ([msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp)), and browse to Component Services in the Platform SDK.

## Related Topics

[Running XLANG Schedules](#)

[Run XLANG Schedules](#)

# Create a new persistence database

1. On the **Start** menu, point to **Programs**, point to **Microsoft SQL Server**, and then click **Enterprise Manager**.
2. Expand **Microsoft SQL Servers**, expand **SQL Server Group**, expand the server for which you want to add a new database, and then expand **Database**.
3. Click **Databases**. On the **Action** menu, click **New Database**.
4. On the **General** tab, in the **Name** box, type a name for the new database, and then click **OK**.

This action creates a new database with the default values set. You can change the default values. For more information about configuring databases in Microsoft SQL Server, see Microsoft SQL Server Books Online.

## Notes

- The primary database and transaction log files are created by using the database name as the prefix. For example, *XLANGdb\_Data.mdf* and *XLANGdb\_Log.ldf*. The primary file contains the system tables for the database.
- The maximum database size is determined by the amount of disk space available and the licensing limits for the version of Microsoft SQL Server that you are using.
- For more information about SQL Server, on the **Start** menu, point to **Programs**, point to **Microsoft SQL Server**, and then click **Books Online**.

## Related Topics

[Configure the default XLANG Scheduler application](#)

[Running XLANG Schedules](#)

[Run XLANG Schedules](#)

[Security for Applications that Host XLANG Schedule Instances](#)

# Change the application identity for a COM+ application

1. On the **Start** menu, point to **Settings**, click to **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**.
2. In the console tree, expand **Component Services**, expand **Computers**, expand **My Computer**, and then expand **COM+ Applications**.
3. Click the COM+ application for which you want to change the identity, and on the **Action** menu, click **Properties**.
4. On the **Advanced** tab, in the **Permission** area, verify that the **Disable changes** check box is cleared, and then click **OK**.  
The properties dialog box closes.
5. Right-click the COM+ application again, and then click **Properties**.
6. On the **Identity** tab, in the **Account** area, click **This user**.
7. Type the information for the account that you want to use.
8. Click **OK**.  
The following message appears: The applications were created by one or more external products. Are you certain the changes you are about to make are supported by these products?
9. Click **Yes**.

## Notes

- For more information about security and performance issues the application identity settings for a COM+ application that hosts XLANG schedules, see [Security for Applications that Host XLANG Schedule Instances](#).
- For Component Services Administration Help, on the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, double-click **Component Services**, and then click **Help**.
- For more information about Component Services and COM+, go to the MSDN Online Library Web site ([msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp)), and browse to Component Services in the Platform SDK.

## Related Topics

[Change the settings for the default Orchestration Persistence database](#)

[Configure the default XLANG Scheduler application](#)

[Running XLANG Schedules](#)

[Run XLANG Schedules](#)

[Security for Applications that Host XLANG Schedule Instances](#)

# Change the DSN settings for a COM+ application

1. On the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**.
2. In the console tree, expand **Component Services**, expand **Computers**, expand **My Computer**, and then expand **COM+ Applications**.
3. Click the COM+ application for which you want to change data source name (DSN) settings. On the **Action** menu, click **Properties**.
4. On the **XLANG** tab, click **Configure DSN**.  
The **ODBC Data Source Administrator** dialog box appears.
5. Change any settings that you want to change.

## ⚠ Caution

- After you change DSN settings, on the **XLANG** tab, do not click **Initialize Tables**. This action will destroy any data already in the existing database.

## 💡 Important

- The DSN and the COM+ application must use the same name. For example, if the COM+ application is called XLANG Scheduler, the DSN must also be called XLANG Scheduler.
- For more information about configuring a DSN and using data sources (ODBC), click **Help** in the **ODBC Data Source Administrator** dialog box.

## 📝 Notes

- For Component Services Administration Help, on the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, double-click **Component Services**, and then click **Help**.
- For more information about Component Services and COM+, go to the MSDN Online Library Web site ([msdn.microsoft.com/library/default.asp](https://msdn.microsoft.com/library/default.asp)), and browse to Component Services in the Platform SDK.

## Related Topics

[Running XLANG Schedules](#)

[Run XLANG Schedules](#)

[Security for Applications that Host XLANG Schedule Instances](#)

# Shut down a COM+ application that hosts XLANG schedules

1. On the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**.
2. In the console tree, expand **Component Services**, expand **Computers**, expand **My Computer**, and then expand **COM+ Applications**.
3. Click the COM+ application that hosts XLANG schedules that you want to shut down. On the **Action** menu, click **Properties**.
4. On the **XLANG** tab, in the **Controlled shutdown** area, click **This XLANG Application**.

## ⚠ Caution

- You must follow this procedure to execute a controlled shutdown for all COM+ applications. Doing this saves the state for all running XLANG schedules to the persistence database. For more information, see [Persistence](#).

Do not right-click a COM+ application and click **Shut down**. One of the following might occur:

- If running XLANG schedules are fully transactional, an uncontrolled shutdown triggers all On Failure and Compensation error-handling processes.
- If running XLANG schedules are not fully transactional, data that is in process in the schedule is lost.

## 💡 Important

- You cannot restart [dehydrated XLANG schedules](#) if the data source name (DSN) is not available or it is incorrectly configured. For more information about configuring a DSN for a COM+ application that hosts XLANG schedules, see [Configure a COM+ application to host XLANG schedules](#).

## 📝 Notes

- When you create a COM+ application to host XLANG schedules, the **Restart dehydrated applications** options is not available. For more information about how to restart dehydrated applications, see [Restart all XLANG applications](#).
- For Component Services Administration Help, on the **Start** menu, point to **Settings**, and then click **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**. In the console tree, right-click **Component Services**, and then click **Help**.
- For more information about Component Services and COM+, go to the MSDN Online Library Web site ([msdn.microsoft.com/library/default.asp](https://msdn.microsoft.com/library/default.asp)), and browse to Component Services in the Platform SDK.

## Related Topics

[Configure a COM+ application to host XLANG schedules](#)

[Restart all XLANG applications](#)

[Running XLANG Schedules](#)

[Run XLANG Schedules](#)

[Shut down all XLANG applications](#)

# Monitor Running XLANG Schedules

You can monitor running XLANG schedules by using either XLANG Event Monitor or Windows 2000 Event Viewer.

- **XLANG Event Monitor.** When the XLANG Scheduler Engine executes XLANG schedules, it generates various kinds of events, showing the progress of the schedule instances. You can use XLANG Event Monitor to monitor XLANG schedule events, and see the progress of the schedule instances. You can monitor the default XLANG Scheduler application or you can monitor the custom COM+ applications that you create to host XLANG schedules. XLANG Event Monitor can subscribe to all events published by the host applications on any number of local or distributed computers. XLANG Event Monitor can also store these events to a file for later analysis.

For specific information about using XLANG Event Monitor, see the Readme.htm file associated with the tool. Both XLANG Event Monitor (XLANGMon.exe) and the readme installed by the Microsoft BizTalk Server 2000 Setup Wizard are located in the following installation directory: \Program Files\Microsoft BizTalk Server\SDK\XLANG Tools.

- **Windows 2000 Event Viewer.** Windows 2000 Event Viewer publishes event messages related to XLANG schedules. For more information about using Event Viewer to view error messages see the following references:
  - For information about configuring Event Viewer to filter for XLANG schedule error messages, see [Configure Event Viewer for BizTalk Server errors](#).
  - For general information about Event Viewer, in Windows 2000 Server Help, in the Event Viewer chapter, see "Using Event Viewer".

The following topic is covered in this section:

- [XLANG Schedule Error Messages](#)

## Related Topic

[Configure Event Viewer for BizTalk Server errors](#)

# XLANG Schedule Error Messages

The error messages in the following list are returned when a running XLANG schedule generates the error. These messages can be viewed in Windows 2000 Event Viewer.

Message name	Value	Description
ID_CAT_UNKNOWN	0x1	SVC%0
ID_CAT_NAME_SVC	0x2	NameSvc%0
ID_CAT_ENGINE	0x3	Engine%0
ID_CAT_SYSTEM_MGR	0x4	SystemMgr%0
ID_CAT_GROUP_MGR	0x5	GroupMgr%0
ID_CAT_WFSVC_MGR	0x6	WFSvcMgr%0
ID_CAT_OBJECT_MODEL	0x7	WFOBJECTMODEL%0
ID_CAT_BINDING	0x8	WFBINDING%0
ID_CAT_COMMENT_LAST	0x9	<>%0
IDS_I_MTSSTOCOM_LAUNCH_FINISH	0x1000	An unauthorized client attempted to create a new instance of an XLANG schedule. The remainder of the moniker string and the identity of the client are shown in the following message. The client's security identifier (SID) is included as binary data: %1%0
ID_W_NOT_USER	0x2001	An unauthorized client attempted to gain access to an existing instance of an XLANG schedule. The remainder of the moniker string identifying the instance and the identity of the client are shown in the following message. The client's security identifier (SID) is included as binary data: %1%0
IDS_E_COMSVCS_INTERNAL_ERROR	0x3000	The XLANG Scheduler Engine has detected an inconsistency in its internal state. Please contact Microsoft Product Support Services to report this error: %1%0

IDS_COMSVCS_RESOURCE_ERROR	0 x 3 0 0 1	The XLANG Scheduler Engine has detected the absence of a critical resource and has caused the process that hosted it to end: %1%0
IDS_COMSVCS_INTERNAL_ERROR_ASSERT	0 x 3 0 0 2	COM+ internal error. Please contact Microsoft Product Support Services to report this error. Assertion failure: %1%0
ID_E_USER_EXCEPTION	0 x 3 0 0 3	The system has called a scheduled component and that component has failed and generated an exception. This indicates a problem with the scheduled component. Notify the developer of this component that a failure has occurred and provide the following information: %1%2%0
ID_INITIALIZE_FOR_DTC	0 x 3 0 0 4	The XLANG Scheduler Engine was unable to initialize for transactions that are required to support transactional components. Make sure that MS DTC is running: %1%0
ID_E_CANT_CREATE_COMPONENT	0 x 3 0 0 5	The XLANG Scheduler Engine was unable to create a user component that is required by the running XLANG schedule. Detailed information is provided in the following message. %1%0
ID_E_PROGRAM_ID_NOT_FOUND	0 x 3 0 0 6	The XLANG Scheduler Engine was unable to convert the Programmatic ID in the following message to a COM class ID: %1%0
ID_E_CANT_CREATE_INTERCEPTOR	0 x 3 0 0 7	The XLANG Scheduler Engine was unable to create an interceptor object for the interface ID shown in the following message. Probable causes for this are 1) the interface isn't registered properly; 2) no type library is provided for the interface; or 3) the file that contains the interface type information can't be loaded. The port name associated with this interceptor is: %1%0
ID_E_INTERFACE_NOT_SUPPORTED	0 x 3 0 0 8	The XLANG Scheduler Engine detected an inconsistency between the port implementation and the COM components to which it refers. A component listed in the port implementation has failed to support the expected interface. The class ID of the component and the IID that it failed to support are shown in the following message. The port name associated with this component is: %1%0
ID_E_UNKNOWN_METHOD	0 x 3 0 0 9	The XLANG Scheduler Engine received a call to a method that was not specified in the port implementation for this XLANG schedule. The IID and method number are shown in the following message. The name of the port on which the call arrived is: %1%0
ID_E_UNKNOWN_DISPATCH_METHOD	0 x 3 0 0 A	The XLANG Scheduler Engine received a call through the <b>IDispatch::Invoke()</b> interface to a method that no longer exists. The dispatch ID for the method is shown in the following message. The name of the port on which the call arrived is: %1%0

ID_E_NAME D_PARAMS	0 x 3 0 0 B	The XLANG Scheduler Engine received a call through <b>IDispatch::Invoke()</b> interface to a method that contains na med arguments. Use positional arguments instead. The dispatch ID for the method is shown in the following mess age. The name of the port on which the call arrived is: %1%0
ID_E_BAD_I NVOKE_PAR AMS	0 x 3 0 0 C	The XLANG Scheduler Engine received a call through the <b>IDispatch::Invoke()</b> interface to a method with an incor rect number of parameters. The IID and the dispatch ID for the method are shown in the following message. The n ame of the port on which the call arrived is: %1%0
ID_E_BAD_R ETURN_POI NTER	0 x 3 0 D	The XLANG Scheduler Engine received an incorrect Out parameter through the <b>IDispatch::Invoke()</b> interface fro m a method. The reference returned was either not valid (NULL or a bad pointer) or does not support the expecte d interface. The expected dispatch ID is shown in the following message. The name of the message containing the bad port reference is: %1%0
ID_E_ACCES S_CHECK_FA ILURE	0 x 3 0 0 E	The XLANG Scheduler Engine was not able to authorize the client's moniker resolution request. Access is denied.%
ID_E_BAD_I NVOKE	0 x 3 0 0 F	The <b>IDispatch::Invoke()</b> interface call to a method failed. The dispatch ID for the method is shown in the followin g message. The name of the port on which the call was attempted is: %1%0
ID_E_INVOK ED_METHO D	0 x 3 0 1 0	The invoked method, whose dispatch ID is shown in the following message, reported an error. The name of the po rt on which the call was attempted is: %1%0
ID_E_CANT_ GET_TYPEIN FO	0 x 3 0 1 1	The component whose port name and COM CLSID are shown in the following message was unable to supply req uired type information to the XLANG Scheduler Engine.%1%0
ID_E_CANT_I NVOKE_MET HOD	0 x 3 0 1 2	The XLANG Scheduler Engine was unable to deliver a method call to the object associated with the port name sho wn in the following message. The interface and method name that are invoked are also shown.%1%0
ID_E_CANT_ GET_CLASSI NFO	0 x 3 0 1 3	The component whose port name and COM CLSID are shown in the following message was unable to supply req uired type information to the XLANG Scheduler Engine through the <b>IProvideClassInfo::GetClassInfo</b> interface.% 1%0
ID_E_SCRIPT _ERROR	0 x 3 0 1 4	A scripted decision rule in an XLANG schedule instance could not be executed. The error returned by the script en gine is shown in the following message. The script's source code and information about the schedule instance in which the error occurred is also provided.%1%0

ID_E_SCRIPT_ERROR_NOINFO	0 x 3 0 1 5	A scripted decision rule in an XLANG schedule instance has failed. Detailed information regarding the error could not be obtained due to an internal error. The error code is shown in the following message.%1%0
ID_E_SCRIPT_BADCONV	0 x 3 0 1 6	A scripted decision rule in an XLANG schedule instance referred to a message field whose type was incompatible with the VBScript Engine. The XLANG Scheduler Engine attempted to convert the field to a compatible type but was unable to do so. The information in the following message shows the script rule, message, and field involved; as well as the original field variant type and the type to which a conversion was attempted. The field's VARIANT data structure is attached to this log entry as binary data.%1%0
ID_E_SCRIPT_BADARRAY	0 x 3 0 1 7	A scripted decision rule in an XLANG schedule instance referred to a message field containing an array type that is incompatible with the VB script engine. Only variant arrays are supported by Visual Basic Scripting. The information in the following message shows the script rule, message, and field involved. The field's VARIANT data structure is attached to this log entry as binary data.%1%0
ID_E_SCRIPT_BADEXPR	0 x 3 0 1 8	A scripted decision rule in an XLANG schedule instance contained an expression that did not return a Boolean result. The information in the following message shows the script rule and expression involved. The VARIANT data structure returned by the expression is attached to this log entry as binary data.%1%0
ID_E_SCHEDULE_NOT_RUNNING	0 x 3 0 1 9	The XLANG Scheduler Engine received a call to an object associated with a port in a XLANG schedule instance that is not running. The name of the port on which the call arrived is: %1%0
ID_E_INTERNAL_EXCEPTION	0 x 3 0 1 A	A COM+ internal exception occurred. Contact Microsoft Product Support Services to report this error, and provide them with the information in the following message.%1%2%0
ID_E_BAD_DATAFLOW_MESSAGE	0 x 3 0 1 B	There is a problem with the data-flow specification. A message that is indicated as a source of data does not currently exist while this XLANG schedule is running. Detailed information is provided in the following message.%1%0
ID_E_BAD_ARGUMENTVALUE	0 x 3 0 1 C	One of the fields that is used as a parameter for a COM method call has a bad value type in it. This is most likely caused by incorrect or missing data flow. Detailed information is provided in the following message.%1%0
ID_E_DEEP_VARIANT_NESTING	0 x 3 0 1 D	One of the fields that is used as a parameter for a COM method call has more than one nesting level of VARIANTS. The IID and the method's dispatch ID are shown in the following message. The name of the port on which the call arrived is: %1%0
ID_E_BAD_MAPPORTVALUE	0 x 3 0 1 E	A field carrying a mapped port is not valid. Detailed information is provided in the following message.%1%0

ID_E_BAD_C ALLPARAM NUMBER	0 x 3 0 1 F	An incorrect number of parameters are being passed into a call. Detailed information is provided in the following message.%1%0
ID_E_EXECU TINGCALLE DSCCHEDULE	0 x 3 0 2 0	The XLANG schedule cannot be executed as a top-level schedule. Context parameters must be passed to it. Detailed information is provided in the following message.%1%0
ID_E_CANT_ GET_SUPPO RTERRORIN FO	0 x 3 0 2 1	The component whose port name and COM CLSID are shown in the following message was unable to return success from an interface which it claimed to support to the XLANG Scheduler Engine via ISupportErrorInfo::InterfaceSupportsErrorInfo.%1%0
ID_E_PERSIS T_FAILURE	0 x 3 0 2 2	The state of the schedule instance could not be saved to the database. Detailed information is provided in the following message.%1%0
ID_E_TRANS ACTION_CO MMIT_FAILU RE	0 x 3 0 2 3	The system failed to commit a transactional context. Detailed information is provided in the following message.%1%0
ID_E_TRANS ACTION_AB ORTED	0 x 3 0 2 4	The system aborted a transactional context. Detailed information is provided in the following message.%1%0
ID_E_TRANS ACTION_AB ORT_FAILUR E	0 x 3 0 2 5	The system failed to abort a transactional context. The state of this transaction is not known. Detailed information is provided in the following message.%1%0
ID_E_PENDI NGREHYDR ATIONERRO R	0 x 3 0 2 6	The rehydration application encountered an error and is shutting down. Some of the rehydration requests will fail due to this shutdown. Restart the XLANG Scheduler Engine service. Detailed information is provided in the following message.%1%0
ID_E_REHYD RATIONONS TARTUPERR OR	0 x 3 0 2 7	One or more XLANG schedules could not rehydrated because of a system error. There might be problems reading the database or problems with the data that was read. Detailed information is provided in the following message.%1%0
ID_E_REHYD RATIONERR OR	0 x 3 0 2 8	An error was encountered while rehydrating an XLANG schedule. There might be a problem reading the database, or there might be a problem with the information stored. It is probable that the XLANG schedule was not dehydrated properly. Detailed information is provided in the following message.%1%0

ID_E_FOUN DINITIALIZE DTHREAD	0 x 3 0 2 9	The XLANG Scheduler Engine service encountered a critical thread-management error while processing an XLANG schedule. The schedule might fail to continue processing. Contact your technical support.%1%0
ID_E_CALLO NCOMPLETE DSCHEDULE	0 x 3 0 2 A	The XLANG Scheduler Engine service received a call on a completed XLANG schedule instance. The schedule instance has already been removed from memory. The IID for the interface is shown in the following message.%1%0
IDS_MSG_TI MEBOMB_E XPIRED	0 x 3 0 2 B	Thank you for evaluating Microsoft BizTalk Server 2000. The period for this evaluation version has ended. Please contact Microsoft or your software reseller to obtain a licensed version of Microsoft BizTalk Server 2000.%0
ID_E_FIELDP ORTPERSIST ENCEERROR	0 x 3 0 2 C	An error was encountered while attempting to persist an XLANG schedule instance. Detailed information is provided in the following message.%1%0
ID_E_FIELDP ORTREHYDR ATIONERRO R	0 x 3 0 2 D	An error was encountered while attempting to restore a particular sub-component of an XLANG schedule instance from the database. Detailed information is provided in the following message.%1%0
ID_E_SCHED ULEDONE	0 x 3 0 3 0	The XLANG Scheduler Engine encountered an error while marking the XLANG schedule instance as done. Either the database could not be updated or another error was encountered in the final stage. Detailed information is provided in the following message.%1%0
ID_E_COMP ONENT_INC OMPATIBLE_ TXN	0 x 3 0 3 1	The XLANG Scheduler Engine encountered an error while attempting to instantiate a component. Either the component was previously enrolled in a different transaction, or the component was previously not enrolled in a transaction and the current instantiation requires a transaction. Detailed information is provided in the following message.%1%0
ID_E_SUSPE ND_FAILURE	0 x 3 0 3 2	The XLANG schedule instance could not be suspended. Detailed information is provided in the following message.%1%0
ID_E_INITNE W	0 x 3 0 3 3	The XLANG Scheduler Engine received an error when doing <b>IPersistStreamInit::InitNew</b> . The class ID of the component and the error code are shown in the following message. The port name associated with this component is: %1%0
ID_E_POSSIB LEBYOTISSU E	0 x 3 0 3 4	The component you requested could not be created. One possible reason for this is that you have configured the BYOT component inside a COM+ application on this machine. This setting is incompatible with the XLANG Scheduler service. The port name associated with this component is: %1%0

ID_E_FIELDPROCESSING ERROR	0 x 3 0 3 5	The field value provided was not valid. Detailed information is provided in the following message.%1%0
ID_E_NO_OBJECT	0 x 3 0 3 6	The XLANG schedule could not be instantiated. Detailed information is provided in the following message.%1%0
ID_E_STARTUP_FAILED	0 x 3 0 3 7	One or more of the XLANG Group Managers failed to startup with the following error: %1%0
ID_E_NON_SCRIPT_BAD_EXPR	0 x 3 0 3 8	An XLANG schedule instance has a rule comparing fields for data types that are not permitted. Detailed information is provided in the following message.%1%0
E_BTW_PERSIST_REACHED EEOF	0 x 3 0 3 9	The Record set cannot return this row, because the end-of-file (EOF) has been reached.%1%0
ID_E_BAD_DATAFLOW_EMPTYFIELD	0 x 3 0 4 0	There is a problem with the data-flow specification. A field indicated as a source of data is empty. This may be because it could not be persisted earlier. Detailed information is provided in the following message.%1%0
ID_E_CANT_OPEN_DEADLETTER_QUEUE	0 x 3 0 4 1	The XLANG Scheduler engine was unable to create or open the XLANG dead-letter queue for its host COM+ application. The name of the failing COM+ application is: %1%0
ID_E_CANT_XFER_TO_DEADLETTER_QUEUE	0 x 3 0 4 2	The XLANG Scheduler engine was unable to transfer an invalid message to the XLANG dead-letter queue for its host COM+ application. The name of the failing COM+ application is: %1%0
ID_E_CANT_LOADMODULE	0 x 3 0 4 3	The XLANG Scheduler engine was unable to load a required module. This may have been due to compilation/semantic errors with the module. Detailed information is available in the following message: %1%0
ID_E_USER_DATA_EXCEPTION	0 x 3 0 4 4	A value that was received from the client has caused an exception to be raised. This can be caused by incorrectly allocating memory for the data, by a reference counting mismatch, or other data corruption. The most likely source of the problem is in the client code. Detailed information is available in the following message: %1%2%0

E_BTW_INTERNAL_ERROR	0x40001	An internal error has occurred. %1%0
E_EXPORT_FAILED	0x40002	The XLANG schedule could not be processed.%0
E_BTW_UNKNOWN_SHAPE	0x40003	The compiler does not understand the shape. This shape is an unknown shape.%0
E_BTW_INCOMPLETE_FLOW	0x40004	The flow is incomplete because a connector is missing.%0
E_BTW_INCOMPLETE_FLOW_LEFT	0x40005	The flow is incomplete. The shape must have a flow connected to the left connector.%0
E_BTW_INCOMPLETE_FLOW_RIGHT	0x40006	The flow is incomplete. The shape must have a flow connected to the right connector.%0
E_BTW_INCOMPLETE_FLOW_LATERAL	0x40007	The flow is incomplete. Shape not attached to anything on the side.%0
E_BTW_INCOMPLETE_FLOW_TOP	0x40008	The flow is incomplete. The shape must have a flow connected to the top connector.%0
E_BTW_INCOMPLETE_FLOW_BOTTOM	0x40009	The flow is incomplete. The shape must have a flow connected from the bottom connector.%0
E_BTW_INCOMPLETE_FLOW_ANYLINE	0x4000A	The flow is incomplete. Not connected to any shape.%0

E_BTW_MIRRORLIST_INCONSISTENT	0 x 4 0 0 B	Mirror shapes are not found in the On Failure or Compensation pages. Retry after replacing the shape with a new one.%0
E_BTW_BEGIN_INSIDE_TRANSACTION	0 x 4 0 1 0	The <b>Begin</b> shape must not be enclosed within a transaction.%0
E_BTW_END_MULTIPLE_LOOP	0 x 4 0 2 0	Only one <b>End</b> shape may be used in the loop branch.%0
E_BTW_END_IN_TRANSACTION	0 x 4 0 2 1	The <b>End</b> shape cannot be used in the context.%0
E_BTW_SYNCACTION_N_O_PAIR	0 x 4 0 3 0	Binding to COM port requires actions to appear in pairs.%0
E_BTW_INCCOMPLETE_FLOW_BINDING	0 x 4 0 3 1	No binding for this action or port.%0
E_BTW_FIELD_TYPE_NOT_SUPPORTED	0 x 4 0 4 0	Type (variant type=%1) is not supported.%0
E_BTW_ROLE_NOT_SUPPORTED	0 x 4 0 5 0	Contracts (XLANG Schedules with Roles) cannot be compiled.%0
E_BTW_EMPTY_TRANSACTION	0 x 4 0 6 0	The transaction contains no valid shapes.%0
E_BTW_TRANSACTION_NOT_PERMITTED	0 x 4 0 6 1	<b>Transaction</b> shapes are not permitted when the XLANG schedule is treated as a COM+ component. Remove the transaction or edit the properties of the <b>Begin</b> shape to change the transaction model.%0

E_BTW_TRANSACTION_BOUNDARIES_CROSSED	0 x 4 0 6 2	You cannot connect a flow from outside a transaction to a shape within a transaction without first connecting the flow to the transaction. Draw your flow to the top connection point of a transaction to connect it to the transaction. Then, click the transaction to highlight it. Draw another flow from the transaction connection point to the first shape within the transaction. To draw a flow that leaves the transaction, you must first connect the flow to the connection point at the bottom of the transaction. Then, click the transaction to highlight it. Draw another flow from the bottom connection point to the next shape in the business process.%0
E_BTW_TRANSACTION_TERMINATED_PREMATURELY	0 x 4 0 6 3	At least one path within the transaction should flow out of the transaction.%0
E_BTW_NO_RULES_FOR_SWITCH	0 x 4 0 7 0	<b>Decision</b> shapes must contain at least one rule.%0
E_BTW_CANNOT_WAIT_ON_ALL_SWITCH_BRANCHES	0 x 4 0 A 0	Cannot wait on "all" branches from the decision.%0
E_BTW_NO_BRANCH_FOUND	0 x 4 0 A 1	The join cannot find the corresponding fork or decision.%0
E_BTW_JOIN_MISMATCH	0 x 4 0 A 2	Only a single join may be used with a given fork or decision.%0
E_BTW_JOIN_SHARED	0 x 4 0 A 3	The same join cannot be used for flows coming from different forks or decisions.%0
E_BTW_CANNOT_WAIT_ON_SOME_SWITCH_BRANCHES	0 x 4 0 A 4	Not all paths from the decision come to the join.%0
E_BTW_CANNOT_WAIT_ANY_ON_FORK_BRANCHES	0 x 4 0 A 5	Cannot wait "Or". The branches contain process forms that may never finish resulting in hung schedules.%0
E_BTW_DATAFLOW_DISALLOWED_ON_BTM_PORT	0 x 4 0 C 0	This port cannot be used in multiple receive actions or within a single receive action in a loop.%0

E_BTW_MESSAGES_TECHNOT_FOUND	0 x 4 1 1 0	The message is not bound to any port.%0
E_BTW_MESSAGES_TYPE_MISMATCH	0 x 4 1 1 1	Message was used with conflicting types "%1" and "%2".%0
E_BTW_METHODS_TECHNOLOGY	0 x 4 1 2 0	The list of available methods for this communication flow has changed. Re-run the Method Communication Wizard to select a different method and update this communication flow.%0
E_BTW_METHODS_PORT_DATAFLOW	0 x 4 1 A 0	The settings for this port indicate that it is created externally to the XLANG Scheduler Engine. You must designate the source of this port reference by drawing a connection from the appropriate message field.%0
E_BTW_CIRCULAR_DATAFLOW	0 x 4 1 A 1	There appears to be a circular path in the data-flow path for this XLANG schedule.%0
E_BTW_LOOP_RULE_NOT_DEFINED	0 x 4 1 D 0	A rule has not been defined.%0
E_BTW_LOOP_BODY_EXIT_TRANSACTION	0 x 4 1 D 1	The body of the loop cannot exit the enclosing transaction.%0
E_BTW_LOOP_BODY_END_MISSING	0 x 4 1 D 2	The end of the body of the loop is not found.%0
E_BTW_ABORT_TRANSACTION_NOT_IN_TRANSACTION	0 x 4 1 E 0	<b>Abort</b> shapes must be associated with an enclosing transaction.%0
E_BTW_ABORT_TRANSACTION_CONTEXT_INVALID_SCOPE	0 x 4 1 E 1	<b>Abort</b> shapes can refer to current or parent contexts only.%0

E_BTW_END _MULTIPLE_ ABORT	0 x 4 1 E 2	Multiple <b>End</b> shapes are not allowed on the <b>On Failure</b> page.%0
E_BTW_CO MPILER_FAI LED	0 x 5 0 0 0	Compile failed on "%1".%0
E_BTW_PAR SE_FAILED	0 x 5 0 0 1	Parse failed.%0
E_BTW_FIXU P_FAILED	0 x 5 0 0 2	Fixup failed.%0
E_BTW_VALI DATION_FAI LED	0 x 5 0 0 3	Validation failed.%0
E_BTW_NOD E_FAILURE	0 x 5 0 0 4	at node "%1" (%2!d!,%3!d!).%0
E_BTW_STA CK_TOO_MA NY_ITEMS	0 x 5 0 0 5	Too many items were found on the stack.%0
E_BTW_STA CK_UNEXPE CTED_NODE	0 x 5 0 0 6	An unexpected node was found.%0
E_BTW_XML QUERY_RET URNED_ZER O_NODES	0 x 5 0 0 7	The XML Query returned zero nodes.%0
E_BTW_XML QUERY_RET URNED_MU LTIPLE_NOD ES	0 x 5 0 0 8	The XML Query returned multiple nodes.%1%0

E_BTW_XML QUERY_MIS SING_ATTRI BUTE	0 x 5 0 0 9	Required attribute "%1" is missing its value.%0
E_BTW_LOA D_MODULE_ FAILED	0 x 5 0 0 A	Failed to load module "%1".%0
E_BTW_XML _LOAD_FAIL ED	0 x 5 0 0 B	The XML-DOM returned an error at "%1!d!, %2!d!".%0
E_BTW_ERR OR_LOADIN G_PACKAGE	0 x 5 0 0 C	0x%1!X! error occurred while trying to load the following URL: "%2".%0
E_BTW_NA MED_LIST_H AS_DUPLICA TE_ENTRIES	0 x 5 0 0 D	The list has duplicate entries with the name "%1".%0
E_BTW_REQ UIRED_ELEM ENT_MISSIN G	0 x 5 0 0 E	Required element "%1" is missing.%0
E_BTW_ELE MENT_MISSI NG_VALUE	0 x 5 1 0 0	The element value is missing.%0
E_BTW_REFE RENCE_RES OLVE_FAILE D	0 x 5 1 1 0	Unable to resolve "%1" with location value "%2".%0
E_BTW_CON TEXTREF_IN VALID_REFE RENCE	0 x 5 1 2 0	Returning to or "releasing" from an independent (non-enclosing) context is not permitted.%0
E_BTW_CON TEXTREF_SE LF_REFEREN CE	0 x 5 1 2 1	Return or Release referring to a context from within that context is not permitted.%0

E_BTW_ASY NC_ACTION _COM_NOT_ ALLOWED	0 x 5 4 0 0	An asynchronous action must refer to a non-COM port.%0
E_BTW_CON NECTION_P ORT_HAS_T ECH_BINDIN G	0 x 5 4 9 0	The port "%1" used in a connection cannot have technology binding.%0
E_BTW_CON NECTION_P ORT_REUSE D	0 x 5 4 9 1	The port "%1" used in a connection has been used before in the XLANG schedule.%0
E_BTW_TRA NSACTIONS _NESTED	0 x 5 4 B 0	When transactions are nested, the outer transaction must be long-running.%0
E_BTW_TRA NSACTIONS _NESTED_RE TRY	0 x 5 4 B 1	When transactions are nested, the outer transaction cannot have retry count.%0
E_BTW_MES SAGE_HAS_ NO_DECL	0 x 5 5 2 0	Message "%1" has no associated declaration.%0
E_BTW_MES SAGE_HAS_ UNSATISFIE D_DATA_DE PENDENCIE S	0 x 5 5 2 1	Message "%1" has unsatisfied data dependencies on "%2". The dependencies are either not getting created in the flow or are potentially expected on a port in which the "No instantiation" option has been selected.%0
E_BTW_POR T_HAS_NO_ BINDING	0 x 5 5 7 0	Port "%1" has no associated binding.%0
E_BTW_POR T_HAS_UN SATISFIED_D ATA_DEPEN DENCIES	0 x 5 5 7 1	Port "%1" has unsatisfied data dependencies on messages "%2". The dependencies are either not being created in the flow or are potentially expected on a port in which the "No instantiation" option has been selected.%0
E_BTW_RUL E_HAS_NO_ BINDING	0 x 5 5 B 0	Rule "%1" has no associated binding.%0

E_BTW_SCHEDULE_SUSPENDED	0 x 5 5 E 0	The XLANG schedule has been suspended.%0
E_BTW_SCHEDULE_STOPPED	0 x 5 5 E 1	The XLANG schedule has been stopped.%0
E_BTW_PERSIST_FAILED	0 x 5 5 E 2	The state of the XLANG schedule instance could not be saved to the database.%0
E_BTW_SUSPEND_FAILED	0 x 5 5 E 3	The XLANG schedule could not be suspended.%0
E_XLANG_SHUTTING_DOWN	0 x 5 5 E 4	The XLANG Application is shutting down.%0
E_BTW_MESSAGE_BINDING_ON_PORT	0 x 5 7 3 0	The action uses port "%1" whose binding does not define the binding for message "%2".%0
E_BTW_MESSAGE_BINDING_PORT_REF	0 x 5 7 3 1	The message used by this receive action contains a field (%1) that is connected to a port reference (%2) but the dataflow connections do not indicate that the port reference should be received.%0
E_BTW_SOURCE_PORT_HAS_NO_INVOCAATION	0 x 5 7 4 0	The send action refers to port "%1", in which the "No instantiation" option has been selected.%0
E_BTW_MESSAGE_BINDING_PORT_REF	0 x 5 7 4 1	The message used by this source action contains a field (%1) that is connected to a port reference (%2) but the dataflow connections do not indicate that the port reference should be sent.%0
E_BTW_TASK_LIMIT	0 x 5 7 5 0	The task has "%1!d!" actions. The current limit is "%2!d!".%0

E_BTW_SYN C_DIFFEREN T_PORTS	0 x 5 7 6 0	Synchronous action pair refers to different ports: "%1" and "%2".%0
E_BTW_SYN C_SAME_ME SSAGE	0 x 5 7 6 1	Synchronous action pair refers to the same message: "%1".%0
E_BTW_SYN C_ONLY_CO M_ALLOWE D	0 x 5 7 6 2	Synchronous action pair must refer to COM port only.%0
E_BTW_SYN C_SECOND_ MESSAGE_ MUST_BE_O UT_FOR_FIR ST_MESSAG E	0 x 5 7 6 3	In a synchronous action pair the message in the second action must be the out message for the message in the first action.%0
E_BTW_INV ALID_DELAY _TIME	0 x 5 7 7 0	The delay time (%1!d!) is not valid. The delay time cannot be a negative number.%0
E_BTW_CAL L_MESSAGE _SCHEMA_N AME_MISM ATCH	0 x 5 8 0 0	The message specification name "%1" for the message "%2" in the calling XLANG schedule does not match the specification name "%3" in the called XLANG schedule.%0
E_BTW_CAL L_MESSAGE _SCHEMA_R EPRESENTA TION_MISM ATCH	0 x 5 8 0 1	The message specification representation for message "%1" in the calling XLANG schedule does not match the specification representation in the called XLANG schedule.%0
E_BTW_ASSI GNMENT_P ORT_HAS_T ECH_BINDIN G	0 x 5 8 3 0	Port "%1" used in an assignment in a cut form cannot have technology binding.%0
E_BTW_PAR TITION_LIMI T	0 x 5 8 5 0	The partition has "%1!d!" process(es). The current limit is "%2!d!".%0

E_BTW_MESSAGES_USED_IN_PARALLEL	0 x 5 8 5 1	Parallel actions or processes use the same message "%1".%0
E_BTW_PORTS_USED_IN_PARALLEL	0 x 5 8 5 2	Parallel actions or processes use the same port "%1".%0
E_BTW_INVALID_RETRY_COUNT	0 x 5 A 3 0	The retry count "%1!" is not valid. The retry count cannot be negative.%0
E_BTW_INVALID_BACKOFF_VALUE	0 x 5 A 3 1	The back-off value "%1!" is not valid. The back-off value cannot be negative.%0
E_BTW_INVALID_TIMEOUT_VALUE	0 x 5 A 3 2	The timeout value "%1!" is not valid. The timeout value cannot be negative.%0
E_BTW_RESERVED_FIELD_NAME	0 x 5 A 5 0	%1 is a reserved field name.%0
E_BTW_ELEMENT_TYPE_NOT_DEFINED	0 x 5 A 5 1	The element type "%1" is not defined.%0
E_BTW_ELEMENT_TYPE_INCOMPLETE	0 x 5 A 7 0	The element type definition is incomplete. Provide either subelements or dt:type.%0
E_BTW_MULTIPLE_PORTS	0 x 5 A 9 0	Distinct ports "%1" and "%2" are used on the same field.%0
E_XLANG_INVALID_COMPARE_TYPE	0 x 5 A 9 1	Comparison of this data type is not permitted.%0

E_BTW_FIEL D_NOT_MAT CHING_SCH EMA_ELEME NT	0 x 5 A 9 2	FieldBinding for "%1" does not have a matching element in the schema at position "%2!d!".%0
E_BTW_FIEL D_HAS_AMB IGUOUS_DA TAFLOW	0 x 5 A 9 3	A message field cannot have both a data flow from another message field and a reference to a port. One of the data flows must be removed.%0
E_BTW_POR T_TARGET_I NVALID	0 x 5 A 9 4	The type of this field is inappropriate for use as a port reference. Ports bound to a COM component can be communicated as object references or strings. Ports bound to Message Queuing may only be transferred as strings. Internal ports can be communicated only as object references.%0
E_BTW_FIEL D_TARGET_I NVALID	0 x 5 A 9 5	The target field "%1", which is of variant type "%2", cannot get data from source field "%3", which is of variant type "%4".%0
E_BTW_INITI ALIZED_MES SAGEFIELD_I NVALID_OV ERWRITE	0 x 5 A 9 6	The data in field "%1" of an initialized message "%2" cannot be overwritten with data from other message or port in the binding specification.%0
E_BTW_DAT AFLOW_INC OMplete	0 x 5 A B 1	A source action accepting [in] parameters must have the corresponding fields populated by data flow (that is, "from").%0
E_BTW_DAT AFLOW_FR OM_SYSTE M_FIELD	0 x 5 A B 2	Port cannot be initialized from a system field.%0
E_BTW_DAT AFLOW_FR OM_CONST ANT_FIELD	0 x 5 A B 3	Port cannot be initialized from a constant message field.%0
E_BTW_MIS SING_SCRIP T_EXPRESSI ON	0 x 5 A C 0	No script expression was supplied for the rule.%0
E_BTW_BAD _SCRIPT_EX PRESSION	0 x 5 A C 1	%1 %2 at character position %3!d! in "%4"%0

E_BTW_MAP_INVALID_BINDING	0 x 5 A E 0	The binding for message "%1" must contain a reference for mapped port "%2".%0
E_BTW_MESSAGE_BINDING_SCHEMA_MISMATCH	0 x 5 A E 1	There is a mismatch between the binding and schema for the message "%1".%0
E_BTW_MESSAGE_DECLARATION_DATA_UNAVAILABLE	0 x 5 B 0 0	Unable to obtain initialization data for field "%1".%0
E_BTW_LATENCY_INVALID_VALUE	0 x 5 B 2 0	The Latency property value must be a non-negative integer that is less than the maximum long integer "%1!".%0
E_BTW_PORT_LATENCY_ON_INTERNAL	0 x 5 B 2 1	Cannot specify latency on an internal port.%0
E_BTW_MESSAGE_TECHNOLOGY_MISMATCH	0 x 5 B B 0	There is a mismatch between the port "%1" technology "%2" and the message "%3" technology "%4".%0
E_BTW_FIELD_TECHNOLOGY_MISMATCH	0 x 5 B C 0	There is a mismatch between the message "%1" technology "%2" and the field "%3" technology "%4".%0
E_BTW_COM_PORT_NOT_CREATABLE	0 x 5 C 1 0	If a COM port can be invoked, it must have a CLSID, a ProgID, or a moniker.%0
E_BTW_AUTORETURN_COM_PORT_MUST_BE_USED_INSIDE_CONTEXT	0 x 5 C 1 1	The port "%1", which is configured to abort a transaction if a method returns a failure HRESULT, can only be used inside a transaction.%0
E_BTW_COM_PORT_GENERALLY_FAILS	0 x 5 C 1 2	A COM port can be invoked. Please refer to the Windows 2000 documentation.%1%0

E_BTW_COM_PARAMETERS_LIMIT	0	The method has "%1!d!" parameter(s). The current limit is "%2!d!".%0
E_BTW_COM_NO_MATCHING_RETURN	0	The COM method has no matching Return.%0
E_BTW_COM_NO_MATCHING_METHOD	0	The COM Return has no matching method.%0
E_BTW_INVALID_SLOT_NUMBER	0	The slot number "%1!d!" is not valid. Slot numbers cannot be less than the following value: SLOT_NONE(-1).%0
E_BTW_INVALID_INVOKER_KIND	0	The invokeKind value "%1!d!" is not valid. Acceptable values are: 1,2,3,4 and 8.%0
E_BTW_PROXY_DISCONNECTED	0	The proxy has been disconnected.%0
E_BTW_COM_DISPATCH_SLOT_SPECIFIED	0	A slot number cannot be specified for the dispatch interface.%0
E_BTW_COM_SPECIFY_DISPID_OR_SLOT	0	Valid values for dispid or slot must be specified.%0
E_BTW_COM_INVALID_BYREF_FOR_RETURN_MESSAGES	0	Byref should be "1" since "%1" is a <com:return> message.%0
E_BTW_COM_INVALID_NESTED_VARIANTS	0	More than one level of nesting for variants is not permitted.%0

E_BTW_CO M_FIELD_IN DEX_MUST_ BE_NON_NE GATIVE	0 x 5 C 3 2	The index "%1!d!" for the field is not valid. The index must be a non-negative integer.%0
E_BTW_CO M_FIELD_IN DEX_REPEAT ED	0 x 5 C 3 3	The index "%1!d!" for the field has been used before on another field in the message.%0
E_BTW_CO M_FIELD_IN DEX_NOT_C ONTIGUOU S	0 x 5 C 3 4	For synchronous action pair messages "%1" and "%2", the index "%3!d!" for a field is not valid. The field indices for these messages must form a contiguous block of non-negative numbers that start with zero.%0
E_BTW_MS MQ_NO_M QRT_DLL	0 x 5 D 0 0	The Message Queue DLL, MQRT.DLL, cannot be loaded.%0
E_BTW_MS MQ_CREATE CHANNEL	0 x 5 D 0 1	MQBinder: CreateChannel failed for: %1.%0
E_BTW_MS MQ_NOT_C ONFIGURED _PROPERLY	0 x 5 D 0 2	The Message Queuing Service is not configured properly. A queue object could not be opened %1.%0
E_BTW_MS MQ_NO_CE RTIFICATE_A VAILABLE	0 x 5 D 0 3	The Message Queuing Service is not able to obtain a certificate.%1%0
E_BTW_MS MQ_NO_WE LLKNOWN_ QUEUE_NA ME	0 x 5 D 0 4	A message cannot be sent to a known queue because the queue is not named in the XLANG schedule. You must provide a queue name in the XLANG schedule.%1%0
E_BTW_MS MQ_INVALI D_FIELD_TY PE	0 x 5 D 0 5	The field type specified for message "%1" field "%2" is not valid.%0
E_BTW_MS MQ_PORT_ NOT_BOUN D	0 x 5 D 0 6	The Message Queuing port is not bound.%1%0

E_BTW_MS MQ_QUEUE _NOT_TRAN SACTIONAL	0 x 5 D 1 0	The queue does not have the correct transactional properties.%1%0
E_BTW_MS MQ_OPEN_ ACCESSDEN IED	0 x 5 D 1 1	A Message Queuing access denied error occurred when opening the queue. Compare the accessRole specified for the queue in the XLANG schedule with the rights associated to the current user.%1%0
E_BTW_MS MQ_OPEN_ GENERALFAI LURE	0 x 5 D 1 2	A Message Queuing failure occurred when opening the queue. Refer to the Message Queuing Service documentation in Windows 2000 to look up the error code and diagnose as appropriate.%1%0
E_BTW_MS MQ_PORT_ NOT_CREAT ABLE	0 x 5 D 1 3	A port that is implemented by using a message queue must have a queue name.%0
E_BTW_MS MQ_GENER AL_QUEUE_ ACCESS_FAI LURE	0 x 5 D 1 4	A Message Queuing failure occurred when accessing the queue. Refer to the Message Queuing Service documentation in Windows 2000 to look up the error code and diagnose as appropriate.%1%0
E_BTW_MS MQ_INVALID_ MESSAGE_ _VT_TYPE	0 x 5 D 2 0	The Message Queuing message is of unknown format.%1%0
E_BTW_MS MQ_MESSAGE_ UNKNOW N_MESSAGE_ GETYPE	0 x 5 D 2 1	The Message Queuing message is of unknown message type. The message type could not be obtained from the message.%1%0
E_BTW_MS MQ_MESSAGE_ UNAUTHEN TICATED	0 x 5 D 2 2	The Message Queuing message is not authenticated but the port only accepts authenticated messages.%1%0
E_BTW_MS MQ_MESSAGE_ INCORRE CT_AUTHEN TICATE_LE VEL	0 x 5 D 2 3	The Message Queuing message is not authenticated at the requested level.%1%0
E_BTW_MS MQ_MESSAGE_ INVALID_ MESSAGE	0 x 5 D 2 4	The Message Queuing message has a message body that is not valid.%1%0

E_BTW_MS MQ_MESSA GE_NOT_SE ND	0 x 5 D 2 5	The Message Queuing message could not be sent.%1%0
E_BTW_MS MQ_MESSA GE_SCHEMA VALIDATION _FAILED	0 x 5 D 2 6	The Message Queuing message was not successfully validated against the schema that was provided. Check the s chema and the schema path.%1%0
E_BTW_MS MQ_COULD _NOT_CREA TE_MQMESS AGE	0 x 5 D 2 7	The message instance could not be converted to a Message Queuing message %1%0
E_BTW_MS MQ_NO_TR USTRELATIO NSHIP_FOR_ USER	0 x 5 D 2 8	The trust relationship for the provided user could not be established.%1%0
E_BTW_MS MQ_MESSA GE_EMPTY_M ESSAGE	0 x 5 D 2 9	The Message Queuing message has an empty message body.%1%0
E_BTW_MS MQ_MESSA GE_ONLY_O NE_EMPTY_ XPATH_ALL OWED	0 x 5 D 2 A	The Message Queuing message can have only one field with an empty node path (XPath).%0
E_BTW_MS MQ_MESSA GE_ONE_EM PTY_XPATH_ NEEDED	0 x 5 D 2 B	The Message Queuing message must have one field with an empty node path (XPath).%0
E_BTW_MS MQ_MESSA GE_INVALID _MESSAGEB ODY	0 x 5 D 2 C	The Message Queuing message has a message body that is not valid.%1%0
E_BTW_MS MQ_MESSA GE_INVALID _MESSAGES TRING	0 x 5 D 2 D	The Message Queuing message has an invalid string for the message body.%1%0
E_BTW_MS MQ_MESSA GE_UNKNO WN_MESSA GE	0 x 5 D 2 E	The Message Queuing message is an invalid or unknown message and was moved to the dead-letter queue.%1%

E_BTW_MS MQ_MESSA GE_TYPE_CO NFLICTING_ SCHEMA	0 x 5 D 2 F	The Message Queuing messages "%1" and "%2", which are of type "%3" on port "%4", have conflicting specifications in representations. This could be because the name, type, or XPath query does not match for one of the fields in the two representations.%0
E_BTW_MS MQ_DOCU MENT_FIELD _TYPE_NOT_ STRING	0 x 5 D 3 0	A Message Queuing message's field "%1", that has an empty node path (XPath), must be a string data type.%0
E_BTW_MS MQ_DOCU MENT_FIELD _CANNOT_C ONVERT_TO _STRING	0 x 5 D 3 1	A Message Queuing message's field could not be converted to a string.%1%0
E_BTW_MS MQ_DOCU MENT_FIELD _CONVERTI ON_FAILUR E	0 x 5 D 3 2	The Message Queuing message's field could not be converted.%1%0
E_BTW_CAN T_DISPOSE_ MESSAGE	0 x 6 0 0 1	The XLANG schedule instance was bound to a queue that received a message that is not valid. The XLANG Scheduler Engine was unable to transfer this message to the dead-letter queue, so the schedule instance has been terminated.%0

## Related Topic

[Configure Event Viewer for BizTalk Server errors](#)

# Concepts

This section provides detailed conceptual information that is essential to understanding BizTalk Server Administration. It covers administrative tasks such as creating server groups, defining receive functions, and creating databases to manage, view, and log document activity in Microsoft BizTalk Server 2000.

The following concepts are covered in this section:

- [WMI Overview](#)
- [BizTalk Server Administration Environment](#)
- [Administration Cache](#)
- [Managing BizTalk Server Databases](#)
- [Groups and Servers](#)
- [Handling Server Errors](#)
- [Receive Functions](#)
- [Using Queues](#)
- [Administration Privileges](#)

# WMI Overview

Windows Management Instrumentation (WMI) is a data-management layer that is included in Microsoft Windows 2000. Microsoft BizTalk Server 2000 uses the WMI layer to encapsulate administrative functions. When you use BizTalk Server Administration to change group, server, and queue settings, the new values are stored in the BizTalk Messaging Management database through the BizTalk Server WMI provider. In BizTalk Server 2000, this WMI provider uses a Microsoft SQL Server database to store administrative objects. WMI supports a uniform scripting application programming interface (API) that gives applications and scripts access to the WMI provider on a local computer or a remote computer.

## Notes

- WMI has a restriction on syntax and valid characters for a WMI object path. The following is a list of invalid characters. ` ! @ # \$ % ^ & \* ( ) + = [ ] { } | \ ; " ' < > , . ?

Do not use any of these characters when you create a server group name.

- All timestamps are created by using the local time on Microsoft SQL Server. However, the WMI provider refers to all timestamps in coordinated universal time (UTC). The administration console then converts the timestamps back to local time for display.
- To access the WMI database layer programmatically, you can use the InterchangeProvSchema.mof file found in the \Program Files\Microsoft BizTalk Server\Setup folder. This file contains the WMI classes corresponding to the Administration objects. For more information about WMI Application Programming, go to the MSDN Online Library Web site ([msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp)), and search for "WMI Application Programming".

# BizTalk Server Administration Environment

The following topics are covered in this section:

- [BizTalk Server Administration User Interface](#)
- [BizTalk Server Administration Shortcut Keys](#)

# BizTalk Server Administration User Interface

BizTalk Server Administration—also called the administration console—is a Microsoft Management Console (MMC) snap-in that provides a visual representation of the BizTalk Server components that a system administrator can manage. The left side of the administration console is called the console tree and consists of folders and subfolders that represent different items, such as [server groups](#). The right side of the administration console is called the details pane and contains information about the item that is selected in the console tree.

Graphically, Microsoft BizTalk Server 2000 is displayed as a subitem of the Console Root on the left side of the administration console. Each server group configured in BizTalk Server is displayed in a separate subfolder and consists of the queues and [receive functions](#) for that group, as well as the names of servers in the group. Expand any item in the console tree to display additional details about the item in the details pane of the administration console. You can right-click any item to configure it, or to create new items.

## Related Topic

[Open BizTalk Server Administration](#)

# BizTalk Server Administration Shortcut Keys

You can use shortcut keys to accomplish tasks in BizTalk Server Administration. The following table is a quick reference to the Microsoft Management Console shortcut keys.

## Note

- Functionality that is not included in this list can be obtained by using the numeric keypad to move the mouse pointer with MouseKeys. For more information about MouseKeys in Windows 2000 Server and Advanced Server Help, see "Using the keyboard to move the mouse pointer". For more information about MouseKeys in Windows 2000 Professional Help, see "Move the mouse pointer by using MouseKeys".

Press	To
F5	Refresh BizTalk Server Administration. This shortcut key refreshes the current item highlighted in the console tree.
ALT+F4	Close BizTalk Server Administration.
ALT+MINUS SIGN	Display the window menu for the active console window.
SHIFT+F10	Display the <b>Action</b> menu for the selected item.
ALT+A	Display the <b>Action</b> menu for the selected item.
ALT+V	Display the <b>View</b> menu.
F1	View online Help for the selected item.
ALT+ENTER	Display the properties dialog box, if any, for the selected item.

## Related Topic

[Open BizTalk Server Administration](#)

# Administration Cache

When you start BizTalk Server, all items, such as [server groups](#), server group properties, [receive functions](#), connections to the [Shared Queue](#) and [Tracking databases](#), and so on, in BizTalk Server Administration are stored in the administration cache. All items in the cache are refreshed every 50 seconds except for the server database connections and server properties. This means that if you change the general properties for a server group, such as the SMTP host or the reliable messaging reply-to URL, the changes are picked up within 50 seconds. However if you change any server properties, such as the **Maximum number of worker threads per processor allowed**, you must stop and restart the server on which you changed the configuration so the change to be stored in the cache. Or, if you change a connection to the BizTalk Messaging Management, Tracking, or Shared Queue databases, you must stop and restart the servers in the group and shut down the BizTalk Server Interchange Application.

## Related Topics

[Configure general properties for a server group](#)

[Shut down the BizTalk Server Interchange Application](#)

[Start a server in a group](#)

[Stop a server in a group](#)

# Managing BizTalk Server Databases

The three databases associated with [BizTalk Messaging Services](#) are:

- [BizTalk Messaging Management database](#)
- [Tracking database](#)
- [Shared Queue database](#)

The BizTalk Messaging Management database stores information for all server configurations, including group and server settings, and [receive functions](#). The configuration of these administration objects is handled through BizTalk Server Administration or programmatically. The BizTalk Messaging Management database also stores all messaging configuration information for [channels](#), [messaging ports](#), and other messaging objects. Although messaging configuration information is stored in this database, the configuration of the objects is handled either by using [BizTalk Messaging Manager](#) or programmatically by using the BizTalk Messaging Configuration object model. For more information about configuring channels, messaging ports, and so on, see [Using BizTalk Messaging Manager](#) or [Object Model Reference](#).

The Tracking database keeps a log of all [interchanges](#), documents, and receipts that are processed by BizTalk Server. For more information about the Tracking database, see [Tracking Database](#). To configure tracking settings, see [Configure tracking properties for a server group](#). To track specific fields or document-instance data, see [Set Channel Properties](#).

The Shared Queue database holds documents while they are being processed or waiting to be processed. Documents are later removed after they have been processed. For more information about the Shared Queue database, see [Shared Queue Database](#).

The following topics are covered in this section:

- [Managing the BizTalk Messaging Management Database](#)
- [Managing BizTalk Server Group Databases](#)

# Managing the BizTalk Messaging Management Database

For most business implementations, there is one central BizTalk Messaging Management database that is used to configure multiple server groups, servers, channels, messaging ports, and so on. One exception to this guideline is businesses that are third-party vendors. Third-party vendors might need a separate BizTalk Messaging Management database for every customer based on each customer's particular business needs. However, in all other cases, it is strongly recommended that you use a central BizTalk Messaging Management database for all your BizTalk server groups.

From time to time, it might be necessary to remove servers from the central BizTalk Messaging Management database. For example, the server on which your BizTalk Messaging Management database resides might need maintenance. In this case, you must point all server groups to a replicated BizTalk Messaging Management database to keep your BizTalk Server enterprise running. It also might be necessary to move servers between one or more BizTalk Messaging Management databases. For example, if you are a third-party vendor with three customers, A, B, and C. The business from Customer A decreased while the business from Customers B and C increased. You can move the servers that were associated with Customer A's BizTalk Messaging Management database to the databases associated with Customers B and C.

The following topics are covered in this section:

- [Changing the BizTalk Messaging Management database](#)
- [Removing servers from the BizTalk Messaging Management database](#)
- [Moving servers between BizTalk Messaging Management databases](#)
- [Moving remote servers between BizTalk Messaging Management databases](#)

# Changing the BizTalk Messaging Management database

There are two ways to configure the [BizTalk Messaging Management database](#):

- Use the configuration options available during installation.
- Use BizTalk Server Administration to change the server in the **Microsoft BizTalk Server 2000** node.

If you want to centrally manage all your BizTalk servers from a single server, during installation configure all servers to point to a central BizTalk Messaging Management database. If you do this, anytime you open BizTalk Server Administration on any one of those BizTalk servers, the servers listed in the **Microsoft BizTalk Server 2000** node point to the same BizTalk Messaging Management database and can be centrally managed. Once a collection of [server groups](#) point to a central BizTalk Messaging Management database, you typically do not need to change to a different BizTalk Messaging Management database. An exception to this is when you need to bring that database offline for maintenance. In this situation, use BizTalk Server Administration to point all server groups in the **Microsoft BizTalk Server 2000** node to a replication of the original central database. Do not temporarily point server groups to a different central BizTalk Messaging Management database that has other server groups associated with it. If you do, it might be difficult to return to your original BizTalk Messaging Management database configuration.

## Related Topics

[BizTalk Server Groups](#)

[Change the BizTalk Messaging Management database for a server](#)

[Configure the BizTalk Messaging Management database](#)

[Moving Servers between BizTalk Messaging Management databases](#)

# Removing servers from the BizTalk Messaging Management database

If you remove all BizTalk servers from your central [BizTalk Messaging Management database](#), the contents of the database remain intact. Likewise, if you have more than one central BizTalk Messaging Management database in your system and you remove all BizTalk Servers from a central BizTalk Messaging Management database, the contents of the database remain intact. You can add new BizTalk Servers to the central BizTalk Messaging Management database by running the BizTalk Server 2000 Database Setup Wizard and selecting an existing database on the **Configure a BizTalk Messaging Management database** page. For more information about adding or changing the BizTalk Messaging Management database for a server, see [Change the BizTalk Messaging Management database for a server](#).

## Related Topic

[Change the BizTalk Messaging Management database for a server](#)

# Moving servers between BizTalk Messaging Management databases

If you are planning to temporarily move a BizTalk Server from one central [BizTalk Messaging Management database](#) to another, at least one other BizTalk Server must remain in place in one of the [server groups](#) within the original central database. This enables you to easily restore the BizTalk Server to the original central database. Otherwise, to add a new BizTalk Server to the central database, you must run the BizTalk Server Database Setup Wizard and select an existing database on the **Configure a BizTalk Messaging Management database** page. For more information about adding or changing the BizTalk Messaging Management database for a server, see [Change the BizTalk Messaging Management database for a server](#).

## Related Topics

[Change the BizTalk Messaging Management database for a server](#)

[Groups and Servers](#)

# Moving remote servers between BizTalk Messaging Management databases

If you try to add a remote server to a [BizTalk Messaging Management database](#), and that server was originally in a different central BizTalk Messaging Management database, the following error message appears in the Windows Event Log:

A new instance of the WMI class "**MicrosoftBizTalkServer\_Server**" cannot be created in the BizTalk Server WMI provider. The *<servername>* server may already belong to a different BizTalk Server installation.

This error means that an attempt was made to add a remote server that was originally in a different central database. If this procedure was performed within BizTalk Server Administration, the administration console tries to determine if the remote server also belongs to a group in the remote central database. The administration console queries the remote server's Windows Management Instrumentation (WMI) provider to make this determination. If the server does belong to a [server group](#) in the other central database, an error message from the administration console appears and explains that you cannot add a remote server that already belongs to a group in a different central database.

## Related Topics

[Error when moving a remote server to a different BizTalk Messaging Management Database](#)

[WMI Overview](#)

# Managing BizTalk Server Group Databases

Each server group uses two databases, the Shared Queue database and the Tracking database. The Shared Queue database holds all documents and interchanges that are submitted to BizTalk Server 2000 for processing and transmission. The Tracking database tracks and stores incoming and outgoing interchanges for auditing, reconciliation, and dispute-resolution purposes.

To help you organize the logical configuration of your servers and groups, it is important to create unique names for the Shared Queue and Tracking databases that are associated with each server group. For example, if you have two server groups, one called Group1 and one called Group2, label the databases for the first group SharedQueue1 and Tracking1, and label the databases for the second group SharedQueue2 and Tracking2.

## Note

- The [BizTalk Messaging Management database](#) is a different database than the Shared Queue and Tracking databases. This database is used to store information about the configuration of multiple groups and servers, as well as to store information about the configuration of [BizTalk Messaging Services](#). It does not handle document and interchange transmissions or track document and interchange activities.

The following topics are covered in this section:

- [Shared Queue Database](#)
- [Tracking Database](#)

# Shared Queue Database

- All servers in a server group share a single Shared Queue database. All documents and interchanges that are submitted to the servers in a group are stored in the Shared Queue database until they are processed by BizTalk Server.
- The Shared Queue database is graphically represented in BizTalk Server Administration as a series of queues that provide information about the progress of an interchange or document in BizTalk Server. Interchanges and documents are in one of the following queues while they are processed by BizTalk Server.
  - **Work queue.** A list of interchanges and documents that are currently being processed by BizTalk Server.
  - **Scheduled queue.** A list of interchanges and documents that have been processed by BizTalk Server and are waiting for transmission according to the service window. For more information about the service window, see [ServiceWindowInfo](#) property.
  - **Retry queue.** A list of interchanges and documents that are being [resubmitted](#), as well as [reliable messages](#) that are awaiting receipts.
  - **Suspended queue.** A list of interchanges and documents that failed processing for a variety of reasons, including parsing errors, serialization errors, or transmission errors, or that lack a correct channel configuration.

## Related Topics

[Configure connection properties for a server group](#)

[Groups and Servers](#)

[ServiceWindowInfo](#)

[Manage Queues](#)

[Using Queues](#)

# Tracking Database

All servers in a server group share a single Tracking database that stores all information related to interchange and document activity in BizTalk Server. The Tracking database is used to track the status of an interchange or document as it moves through the server. For example, if you want to verify whether an order was sent to a trading partner, you can query the Tracking database. This database can also be used to verify that interchanges and documents are successfully sent or received by BizTalk Server, or it can provide information for reports such as transmission times or receipt responses.

## Defining document tracking and logging parameters for the Tracking database

In BizTalk Server Administration, you can select whether interchanges and documents are tracked. For more information about how to configure tracking settings for a server group, see [Configure tracking properties for a server group](#). If you enable tracking, the following options are available:

- **Log incoming interchange.** With this setting, you can specify that documents received by a BizTalk server are stored in the Tracking database. Incoming documents stored provide an activity record for dispute resolution. This is selected by default.
- **Log outgoing interchange.** With this setting, you can specify that documents sent by BizTalk Server are stored in the Tracking database. This is selected by default.
- **Log the original MIME-encoded message.** With this setting, you can specify that MIME-encoded documents are stored in the Tracking database in their original message format before they are decoded. This is not selected by default.

## Related Topics

[Configure connection properties for a server group](#)

[Configure tracking properties for a server group](#)

[Start a server in a group](#)

[Stop a server in a group](#)

[Using BizTalk Document Tracking](#)

# Groups and Servers

In a data-exchange environment that supports the processing of a large number of documents, multiple servers and databases might be required. Businesses must have a way to centralize and manage document exchange.

Microsoft BizTalk Server 2000 centralizes document exchange by assembling servers into groups and managing and configuring these [server groups](#) by using BizTalk Server Administration.

The following topics are covered in this section:

- [BizTalk Server Groups](#)
- [Relationship between Groups and Servers](#)
- [Group Status States](#)
- [BizTalk Servers](#)

# BizTalk Server Groups

A server group is the key organizing principle in BizTalk Server Administration. Server groups are collections of individual servers that are centrally managed, configured, and monitored.

Servers in a BizTalk server group have in common:

- A Shared Queue database that persists all documents until they are successfully processed.
- A Tracking database that is used to log document and interchange activity and to run reports.
- Receive functions.
- All components that the server requires when processing documents and interchanges, such as transport components, application integration components (AICs), and so on.

A central BizTalk Messaging Management database manages multiple groups and servers. Thus, they share the same configuration information. This configuration information specifies the document-processing logic for the servers. Specify the same BizTalk Messaging Management database for each server installation so that you can remotely administer each server and group from the administration console. Also, if you are setting up multiple server groups for scalability and improved performance, use only one central BizTalk Messaging Management database. Otherwise, these servers cannot share the same BizTalk Messaging Management configuration.

## Related Topics

[Add, Delete, and Configure a Server Group](#)

[BizTalk Servers](#)

[Receive Functions](#)

[Relationship between Groups and Servers](#)

[Using Queues](#)

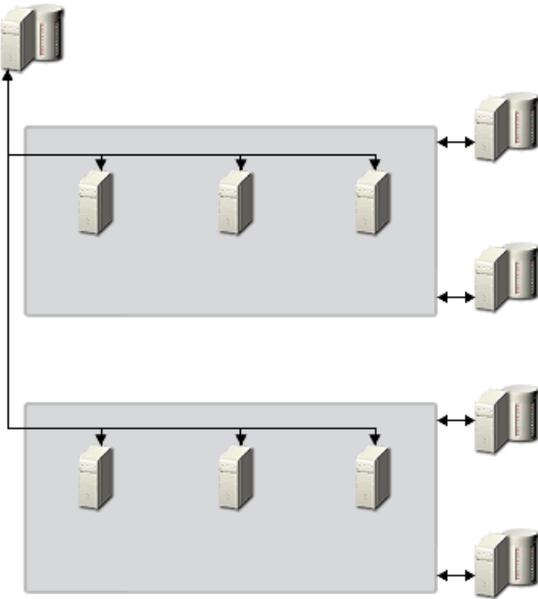
# Relationship between Groups and Servers

Each installation of BizTalk Server 2000 must have at least one server group. The relationship between groups and servers is defined by the following:

- An individual server can belong to only one server group.
- All servers in a group use the same Shared Queue and [receive functions](#).
- All servers in a group share the same components, such as transport components, application integration components (AICs), and so on, to process interchanges and documents.

The following illustration shows the relationship between server groups in BizTalk Server 2000. Servers 1-6 are installed with Microsoft BizTalk Server 2000. Servers A-D are installed with Microsoft SQL Server and are dedicated to database management. Although servers A-D are dedicated to either the [Tracking](#) or [Shared Queue](#) databases, the [BizTalk Messaging Management database](#) can reside on one of these servers because it is relatively small and is not processor intensive. It is strongly recommended that your Shared Queue and Tracking databases reside on two separate servers dedicated to database management, and that you use a single central BizTalk Messaging Management database for all server groups.

## Logical configuration of groups and servers



### Group 2

### Group 1

Tracking

Database

server C

Tracking

Database

server A

Shared

Queue

database

server D

Shared

Queue

database

server B

BizTalk Server 3

BizTalk Server 2

BizTalk Server 6

BizTalk Server 5

BizTalk Server 4  
BizTalk Server 1  
BizTalk Messaging Management database server A

## **Related Topic**

[Managing BizTalk Server Databases](#)

# Group Status States

BizTalk Server Administration enumerates server groups and specifies whether each group can connect to the Tracking and/or the Shared Queue databases. When you click **Microsoft BizTalk Server 2000**, the group states appear under the status bar in the details pane. The group states are:

- **Connected.** Specifies that the group is connected to the Tracking and Shared Queue databases.
- **Tracking connection failed.** Specifies that the group is not connected to the Tracking database.
- **Shared Queue connection failed.** Specifies that the group is not connected to the Shared Queue database.
- **Tracking and Shared Queue connections failed.** Specifies that the group is not connected to the Tracking and Shared Queue databases.

# BizTalk Servers

A server in a server group hosts the appropriate [BizTalk Messaging Services](#) functionality—such as data translation, encryption, digital signing, and document tracking—to manage document exchange between other servers and applications that are external to the BizTalk server group. Each server enqueues and dequeues incoming and outgoing documents to the [Shared Queue database](#), calling the appropriate Component Object Model (COM) methods to transform, serialize, sign, encrypt or decrypt, and transport documents. For applications that do not use the BizTalk Server COM interfaces, BizTalk Server 2000 uses [receive functions](#) to receive data.

Depending on your business needs, you can configure all servers in a group exactly the same. This allows you to add and remove servers in a group easily. Or you can configure some servers in a group to be dedicated to receiving documents.

The following topics are covered in this section:

- [Understanding server properties](#)
- [Server states](#)

## Related Topics

[BizTalk Server Groups](#)

[Relationship between Groups and Servers](#)

# Understanding server properties

When you configure a server in a group, you must balance maximizing throughput and server performance. Your business needs, server capacity, and network bandwidth are some of the factors that influence how you configure server properties. It is highly recommended that you experiment with different combinations in a test setting that simulates your production environment to determine what works best for your installation.

## Maximum number of receive function threads allowed

The maximum number of receive function threads is set on a per-processor basis. The range for this option is 1 through 128. Adjust this number to optimize the performance of the [receive functions](#) that are running on the server. In most cases, increasing the number of receive function threads increases the throughput of the receive functions on the server.

## Participate in work-item processing

When the **Participate in work-item processing** check box is selected, the server processes documents in the [Work queue](#). When this check box is cleared, the server does not process any documents in the Work queue. There are two situations in which you might want to turn off this option. The first situation is if you receive messages from a message queue. Currently, Message Queuing supports only local transactional reads. This means that your queues must be on a server installed with Microsoft BizTalk Server 2000 and that you can configure only one server in a group to read from those queues. To allow the server where the message queue resides to receive as fast as possible, clear the **Participate in work-item processing** check box.

The second situation in which you might want to turn off this option is when you want to maximize performance for BizTalk Server clusters. For example, you might want to dedicate one of the servers in the BizTalk Server group to handle administration tasks.

## Maximum number of worker threads per processor allowed

The maximum number of worker threads is set on a per-processor basis. The range for this option is 1 through 128. A low setting could cause a bottleneck in BizTalk Server in a high traffic situation. A high setting might not have detrimental effects, but it could cause performance degradation.

The **Maximum number of worker threads per processor allowed** and the **Time between BizTalk Server Scheduler calls** are two factors that influence how much traffic there is to the Microsoft SQL Server databases. You can limit the traffic to the SQL databases by setting the number low on the **Maximum number of worker threads per processor allowed** and higher on the **Time between BizTalk Server Scheduler calls**. Likewise, you can increase the traffic to the databases by increasing the number for the maximum number of worker threads and decreasing the settings for the Time between scheduler calls.

### Note

- Clear the **Participate in work-item processing** check box if you do not want to process any work items on this server. Do not set the **Maximum number of worker threads per processor allowed** option to zero.

## Time between BizTalk Server Scheduler calls (milliseconds)

The range for **Time between BizTalk Server Scheduler calls** is 1 through 4,294,967,295. There is a thread that polls for available items in the Work queue. The **Time between BizTalk Server Scheduler calls** controls how often the thread polls the Work queue. If you do not receive a lot of data, keep this number high. If you receive a lot of data, you might want to decrease this number.

## Related Topic

[Configure a server in a group](#)

# Server states

BizTalk Server Administration enumerates the servers in a server group and returns the list of servers. BizTalk Server Administration can return the following states for servers under the status bar in the details pane:

- **Running.** Specifies that the server is running.
- **Access denied.** Specifies that you do not have Windows 2000 Administrator privileges on a server.
- **Error.** Specifies if a server registered with a server group has had BizTalk Server 2000 removed.
- **Stopped.** Specifies if an administrator has stopped a server.
- **Unknown.** Specifies if a server registered with a server group is unavailable for an unknown reason. When this occurs, it is likely that you have lost connectivity with the server.

## Related Topic

[Administration Privileges](#)

# Handling Server Errors

You can configure error handling in BizTalk Server 2000 at the server level through Windows 2000 Event Viewer, which is included in BizTalk Server Administration. The Windows 2000 Event Viewer appears in the console tree of the administration console.

## Logging events

The Windows 2000 Event Viewer creates a log that contains information about hardware, software, and system problems. From the administration console, you can customize the Event Viewer to show application and XLANG Scheduler errors that are specific to BizTalk Server 2000, which makes troubleshooting for BizTalk Server efficient. For more information about customizing Event View for BizTalk Server and XLANG Scheduler errors, see [Manage Event Viewer](#).

For more information about Event Viewer in Windows 2000 Server Help, in the Event Viewer chapter, see "Using Event Viewer".

### Note

- All application errors related to BizTalk Server 2000 are defined as BizTalk Server or XLANG Scheduler errors.

## Related Topic

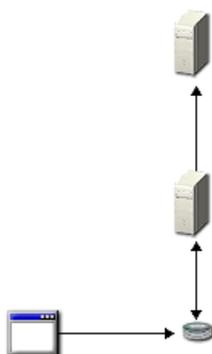
[Manage Event Viewer](#)

# Receive Functions

If you need to receive documents from a receive location and submit them to BizTalk Server, you can configure submit calls programmatically. For more information about submit calls, see [Submitting](#) or the [Submit](#) method. Or you can configure receive functions to process the data. For example, if you need to receive documents from a business organization or application that cannot communicate directly to BizTalk Server through a COM interface, you can use a receive function to submit the interchanges documents to BizTalk Server. Or, if you need to receive from a message queue, you can use a receive function to submit the document to BizTalk Server. BizTalk Server 2000 supports two types of receive functions: File and Message Queuing.

You can create a generic receive function for BizTalk Server 2000 in the administration console in which you define the receive function name, [document definition](#), and so on. For more information about configuring receive functions, see [Manage Receive Functions for a Server Group](#). For more information about advanced properties for receive functions, see [Understanding Receive Function Advanced Properties](#).

The following illustration shows the relationship between the sending business application, the file system, and a generic BizTalk Server receive function.



Sending business application  
File system  
BizTalk Server File receive function  
BizTalk Server  
**Submit**

The following topics are covered in this section:

- [Available Receive Functions](#)
- [Custom Preprocessors](#)
- [Multiple Instances of Receive Function Types](#)
- [Understanding Receive Functions and Document Routing](#)
- [Understanding Receive Function Advanced Properties](#)

# Available Receive Functions

Two types of [receive functions](#) are available in BizTalk Server: File and Message Queuing. Your business practices determine which type of receive function you use and when.

## File receive function

A File receive function is activated when there is activity in the directory that the receive function monitors. To use a File receive function, you must be able to modify the directory. The File receive function removes the files from the directory and submits them to BizTalk Server 2000.

## Message Queuing receive function

A Message Queuing receive function is activated based on activity in a message queue. This receive function extracts the interchange or document from the queue and submits it to BizTalk Server 2000.

When you define the polling location for the message queue, use a format name instead of a path name. BizTalk Server is designed to work with raw Message Queuing application programming interfaces (APIs), and the API calls work only with the format name property. Use the following format name when you configure a Message Queuing receive function:

- **Direct=OS:***<servername>\<queueName>*

### Note

- For more information about Message Queuing and format name, go to the MSDN Online Library Web site ([msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp)), and browse to the Platform SDK, Getting Started, Contents of the Platform SDK, Message Queuing Services page.

# Custom Preprocessors

If you have documents that need to be processed before they are submitted to BizTalk Server, you can create a custom preprocessor and configure the [receive function](#) to call the preprocessor. For example, if you send compressed data and need to decompress it before submitting it to BizTalk Server for processing, configure the receive function to call the custom preprocessor to decompress the data.

## Related Topics

[Class identifier appears in the Preprocessor list](#)

[IBTSCustomProcess](#)

[Preprocessing Documents in a Receive Function](#)

# Multiple Instances of Receive Function Types

There can be multiple instances of a [receive function](#). For example, if multiple business applications use a File receive function to submit documents and [interchanges](#) to BizTalk Server 2000, you can configure either a single instance or multiple instances of the File receive function.

## Note

- Verify that each of the receive functions that you create has a unique name. You cannot assign identical names to receive functions.

## Related Topic

[Manage Receive Functions for a Server Group](#)

# Understanding Receive Functions and Document Routing

When you configure a receive function, determine whether the documents received by the receive function are self-routing or non-self-routing. Self-routing documents contain all the necessary routing information; non-self-routing documents lack some or all routing information.

## Self-routing documents

Self-routing documents have all routing information—the source organization identifier, the destination organization identifier, and the document definition—defined in the routing tags that are defined by the document specification or hard-coded in the document, as in the case of X12 and EDIFACT. Any document for which you can create a specification in [BizTalk Editor](#) can be configured as a self-routing document. Common types of self-routing documents are XML, X12, and EDIFACT. You do not need to configure any advanced properties in the receive function if a document is self-routing, unless you want to override the data provided in the document.

If the source or destination organization qualifiers or the document definition is missing from the document, it is placed in the Suspended queue. Additionally, if you do not specify a source or destination organization qualifier, BizTalk Server uses the default value of *Organization Name* as the organization qualifier and refers to the name of the organization stored in the [BizTalk Messaging Management database](#).

## Non-self-routing documents

Non-self-routing documents are missing all or some of the necessary routing information. When you configure the receive function, the following information must be defined on the **Advanced** tab of the receive function **Properties** dialog box or in the document to be supplied to the receive function:

- Source organization identifier, destination organization identifier, and document definition

—Or—

- [Channel](#)

When you submit a document, BizTalk Server locates a channel to process the document. This can happen in two ways: either by supplying a channel name in the receive function or by supplying the source and destination organization identifiers and the document definition. These three properties help BizTalk Server locate the correct channel. Therefore, if you select a channel, the document definition and source and destination information options are unavailable because the channel supplies all the information that is needed to route the document.

Common types of non-self-routing documents are documents that come from multiple sources (open source) or are going to multiple destinations (open destination).

## Configuring a receive function to manage documents from multiple sources

You can configure a single receive function that handles non-self-routing documents to receive a specific type of document from multiple sources. This is an open source scenario. The location of the source organization, the destination organization, and the document-definition information must be in the document or in parameters submitted along with the document. For example, if you plan to receive purchase orders from multiple customers, but want them all sent to the same destination application, set the document definition and destination organization identifier properties in the receive function. When BizTalk Server parses the document, it locates the supplier organization identifier, combines this information with the parameters in the receive function, finds the correct channel, and then processes the document.

## Related Topics

[Configure advanced properties for File and Message Queuing receive functions](#)

[Manage Receive Functions for a Server Group](#)

[Set source organization properties](#)

# Understanding Receive Function Advanced Properties

You can use advanced properties to configure special types of receive functions based on your business practices.

For example, you can define receive functions to submit:

- Documents that have the **Open source** or **Open destination** property set.
- Documents that have the **Pass-through** property set.
- Documents that specify a channel name.
- Other types of non-self-routing documents.

## Define the Openness property in a document

The following options define the openness of a document:

- **Not open.** Specifies that the source and destination are both explicitly declared in the receive function or the document instance.
- **Open Destination.** Specifies that the destination information is not explicitly declared in the [messaging port](#). The destination is dynamically specified in the document instance or a submission parameter. You must configure the [document definition](#) and the source-organization identifier properties in the receive function or in the document instance in order for BizTalk Server to locate the correct channel.
- **Open Source.** Specifies that the source information is not explicitly declared in the channel. Instead, the source is dynamically specified in the document instance. You must configure the document definition and [destination-organization](#) identifier properties in the receive function or in the document instance in order for BizTalk Server to locate the correct channel.

## Configure receive functions with pass-through

A receive function configured with pass-through bypasses the parsing, decryption, signature verification, transformation and decoding functions of BizTalk Server. Choose this option when you are sending binary large object data or other interchanges that do not require parsing, decryption, and decoding. If you configure a receive function with the **Submit with a pass-through flag** set, you must specify a channel. Otherwise, BizTalk Server cannot process the document.

## Envelope name

If you expect to receive an inbound interchange in a flat file, specify the [envelope](#) format in the receive function. The envelope points to a [specification](#) that tells BizTalk Server how to open and interpret the interchange. If you plan to receive multiple flat-files in a single interchange, the individual flat files must be separated with a delimiter that is postfix or prefix. Infix is not supported. This must be set at the root node of the envelope specification and the document specification when you configure parse properties. For more information about setting parse properties for a flat file, see [Set parse properties](#) and browse to the table "Standard: Custom, Structure Property: Delimited".

## Channel name

Each interchange or document that is submitted to BizTalk Server requires a set of rules for how it is to be processed. The channel contains all the information that the server needs to process the interchange or document. All interchanges and documents that are processed by BizTalk Server must go through a channel. A channel is located in one of two ways. First, when an interchange or document is submitted, BizTalk Server parses the document for the source and destination identifiers and the document definition. If this information is not in the document instance, BizTalk Server then looks at the receive function. Once the source and destination identifiers and the document definition are discovered, BizTalk Server determines which channels have the same document definition, source, and organization identifiers as the received document. When BizTalk Server finds a channel match, the document instance is processed.

The second way channels are located is when they are specified in the receive function. In this case the channel lookup is bypassed and the received document is processed faster.

## Document definition, source organization, and destination organization identifiers

You can configure the document definition, source organization identifier, and/or the destination organization identifier when you receive non-self-routing documents. The routing information that is included in the document that you receive determines which of these properties you define in the receive function. For example, if you receive multiple document types from the same source organization and you always send those documents to the same destination, you can configure the source and destination organization identifiers in the receive function and dynamically define the document definition in the document instance.

## **Related Topics**

[Create envelopes](#)

[Set envelope information properties](#)

[Set parse properties](#)

[Understanding Channels](#)

[Understanding Document Definitions](#)

[Understanding Envelopes](#)

[Understanding Organizations](#)

[Understanding Receive Functions and Document Routing](#)

[Using Envelopes for Inbound Processing](#)

# Using Queues

Microsoft BizTalk Server 2000 provides shared queue management capabilities in BizTalk Server Administration. BizTalk Server Administrators can move documents from any other queue to the [Suspended queue](#). From the Suspended queue, documents can be deleted, [resubmitted](#), or viewed, depending on the processing state of the document. BizTalk Server Administrators can sort and display error messages for documents in the Suspended queue.

The following queues are used to contain incoming and outgoing documents that are in various stages of routing and processing in BizTalk Server:

- [Work queue](#)
- [Scheduled queue](#)
- [Retry queue](#)
- [Suspended queue](#)

## Note

- Interchanges and documents appear in BizTalk Server Administration in the order of "first in, first out." That is, the oldest items in a queue appear first and the newest items appear last. Additionally, up to 15,000 interchanges and/or documents appear in a queue at a time. If there are more than 15,000 actual items in a queue, you must remove or resubmit current items in the queue so that newer items can be displayed. The queue count in the console tree—the number next to the queue in parentheses—represents how many actual items there are in the queue. You can resubmit or delete documents to remove them from a queue.

## Related Topic

[Manage Queues](#)

# Work queue

The Work queue contains documents that are currently being processed by BizTalk Server. Transactions in the Work queue do not remain in the queue very long because they are processed upon arrival. BizTalk Server Administrators can select any document in this queue and move it to the [Suspended queue](#).

## Related Topics

[Move documents to the Suspended queue](#)

[Using Queues](#)

# Scheduled queue

The Scheduled queue contains work items that have been processed by BizTalk Server and are waiting for transmission based on the service window. BizTalk Server Administrators can select any document in this queue and move it to the [Suspended queue](#). For more information about the service window, see [BizTalkServiceWindowInfo Interface](#) object.

## Related Topics

[Move documents to the Suspended queue](#)

[BizTalkServiceWindowInfo Interface](#)

[Using Queues](#)

# Retry queue

The Retry queue contains documents that are being [resubmitted](#) for delivery and documents that are waiting for [reliable messaging](#) receipts. You cannot tell the difference between the two types of transmissions. By default, failed transmissions are retried every five minutes for a maximum of three tries before they are moved to the Suspended queue. These numbers can be changed through [BizTalk Messaging Manager](#) or programmatically. For more information about changing the number of retries, see [Set advanced configuration properties](#), or [RetryCount](#) property and [RetryInterval](#) property.

BizTalk Server Administrators can select any document in this queue and move it to the [Suspended queue](#).

## Related Topics

[RetryCount](#)

[RetryInterval](#)

[Move documents to the Suspended queue](#)

[Set advanced configuration properties](#)

[Using Queues](#)

# Suspended queue

The Suspended queue contains work items that have failed processing for a variety of reasons, including parsing errors, serialization errors, failed transmissions, or the inability to find a [channel](#) configuration. BizTalk Administrators can right-click any document in this queue to choose any of the following options:

- **View Error Description.** Enables BizTalk Administrators to view error descriptions that indicate why the document was sent to the Suspended queue.
- **View Interchange.** Enables BizTalk Administrators to view the contents of an interchange that has failed processing for a variety of reasons, including parsing errors or failed transmissions. **View Interchange** appears for the following states:
  - Initial
  - Custom component
  - Parsing
  - Encoding
  - Signing
  - Encrypting
  - Transmitting
- **View Document.** Enables BizTalk Administrators to view the contents of a document that has failed processing for a variety of reasons, including serialization errors or the inability to find a channel. **View Document** appears for the following states:
  - Document validation
  - Channel selection
  - Field tracking
  - Mapping
  - Correlating
  - Serializing
- **Delete.** Enables BizTalk Administrators to completely remove an entry from the Suspended queue. This action is not recoverable. After a document has been deleted from the Suspended queue, you cannot retrieve it.
- **Resubmit.** Enables BizTalk Administrators to [resubmit](#) interchanges and documents to BizTalk Server for processing.

## Suspended queue states

Interchanges and documents are placed in the Suspended queue for a variety of reasons. The following list explains the Suspended queue states, their associated error messages, and what action you might take in response.

Suspended queue state value	Error message	Error description and possible action
Channel Selection or Transmitting	Unexpected Error	There was an unexpected internal server failure. Resubmit the document.

<b>Channel Selection or Transmitting</b>	Unknown	<p>The interchange or document was marked as "in process" by an inactive server. When the server was restarted, this item was automatically moved to the Suspended queue. There was probably a failure on the original server. Contact the System Administrator for more information.</p> <p>When the problem is corrected, resubmit the document or interchange.</p>
<b>Channel Selection or Transmitting</b>	Out of Memory	<p>The computer on which BizTalk Server is running ran out of memory.</p> <p>Restart the server and resubmit all interchanges and documents in the Suspended queue.</p>
<b>Parsing</b>	Failed Parsing Data	<p>BizTalk Server was unable to parse the data.</p> <p>View the contents of the interchange to determine why BizTalk Server was unable to parse it. Resubmit the interchange using <b>Interchange</b> or a receive function. For more information, see <a href="#">An interchange or document appears as binary data in the Suspended queue</a> or <a href="#">Parsing errors</a>.</p>
<b>Parsing</b>	Missing Data	<p>The information extracted from the incoming data did not contain enough information to locate a channel.</p> <p>View the interchange and find which data is missing. Resubmit the interchange using <b>Interchange</b> or a receive function. For more information, see <a href="#">An interchange or document appears as binary data in the Suspended queue</a> or <a href="#">Parsing errors</a>.</p>
<b>Parsing</b>	"expiresAt" Expired	<p>The <a href="#">BizTalk Framework</a> timestamp "expiresAt" expired. This document is no longer valid. For more information, see <a href="#">An interchange or document appears as binary data in the Suspended queue</a>.</p>
<b>Channel Selection</b>	No Channels Found	<p>BizTalk Server was unable to find any channels that matched this document.</p> <p>Create a channel for the document, or correct the document and then resubmit it.</p>
<b>Channel Selection</b>	Channel Erased	<p>The channel associated with this document was deleted after the document reached the Work queue.</p> <p>Reconfigure the channel, or configure the document for a different channel and resubmit the document.</p> <p>—Or—</p> <p>Do not submit the document and delete it from the Suspended queue.</p>
<b>Channel Selection</b>	Channel Missing	<p>The channel specified by the receive function or submit call could not be found. Configure a channel or reconfigure the document and resubmit it.</p>
<b>Channel Selection</b>	Invalid Channel	<p>The channel specified by the submit call was an open channel. Open channels are not valid for pass-through submit calls.</p> <p>Change the channel and resubmit the document.</p>
<b>Mapping</b>	Failed To Map	<p>The map referenced by the channel is formatted incorrectly.</p> <p>Delete the document from the Suspended queue, correct the map, and submit the document as though it were new.</p>
<b>Serializing</b>	Failed To Serialize	<p>BizTalk Server could not convert the document to its native format. Resubmit the document.</p>
<b>Encoding</b>	Failed Encoding	<p>BizTalk Server could not encode this interchange.</p> <p>Resubmit the interchange.</p>
<b>Signing</b>	Failed Signing	<p>BizTalk Server could not sign this interchange.</p> <p>The certificate might have expired. See the Certificates Microsoft Management Console snap-in for details. For more information about how to view the Certificates snap-in in Windows 2000 Help, in the Manage Certificates chapter, see "Add the Certificates snap-in to the MMC console".</p>
<b>Encrypting</b>	Failed Encrypting	<p>BizTalk Server could not encrypt this interchange.</p> <p>The certificate might have expired. See the Certificates Microsoft Management Console snap-in for details. For more information about how to view the Certificates snap-in in Windows 2000 Help, in the Manage Certificates chapter, see "Add the Certificates snap-in to the MMC console".</p>
<b>Transmitting</b>	Transmission Failure	<p>BizTalk Server could not deliver the interchange.</p> <p>Check the transport address in the channel. Correct the problem and resubmit the interchange.</p>

<b>Transmitting</b>	Timeout Failure	BizTalk Server was unable to complete processing of this interchange before timing out. This could be because the transmission took too long.  If you are using an unreliable transport, check to see if this interchange has been sent before you attempt to resubmit the interchange.
<b>Transmitting</b>	User Move	A BizTalk Server Administrator has moved this document to the Suspended queue.  Resubmit the interchange.
<b>Transmitting</b>	Document Expired	The BizTalk Framework timestamp "receiptRequiredBy" expired. This document is no longer valid.
<b>Document Validation</b>	Document Not Valid	The validation of the document against its specification failed.  Look for the error in the Event Log for more information. Correct the schema and resubmit the document.
<b>Field Tracking</b>	No Fields Tracked	BizTalk Server could not track the requested fields within the document.  View the document to verify that the fields that you want tracked are present, or change the channel configuration for field tracking. Then resubmit the document.
<b>Custom Component</b>	Custom Component Failure	A custom component has failed.  Troubleshoot the custom component or custom preprocessor and submit the interchange.
<b>Correlating</b>	Correlation Failure	There was a failure correlating this receipt.

#### Notes

- In addition to checking the error messages in the Suspended queue, you can also check the Event Log for more information. For more information about the Event Log, see [Manage Event Viewer](#).
- Not all documents in the Suspended queue can be resubmitted. In some situations, you must delete the document and submit it again from the original application or organization.

#### Related Topics

[An interchange or document appears as binary data in the Suspended queue](#)

[Manage Event Viewer](#)

[Manage Queues](#)

[Parsing errors](#)

[Understanding Receive Functions and Document Routing](#)

[Understanding Receive Function Advanced Properties](#)

[Using Queues](#)

# Administration Privileges

To view BizTalk Server Administration, you must be a member of the BizTalk Server Administrators group. If you are logged on as a non-BizTalk Server Administrator, you cannot view items inside the Microsoft BizTalk Server 2000 folder. If you are a member of the BizTalk Server Administrators group, but you are not a member of the Microsoft Windows 2000 Administrators group, you can perform only the following tasks:

- Add and remove [server groups](#)
- View and modify group properties
- Manage all queues and their entries
- Add and remove [receive functions](#)
- View and modify receive function properties

Additionally, if you are administering a server group that contains three servers, for example, Server\_1, Server\_2, and Server\_3, you must have Windows 2000 Administrator privileges on all three servers. If the Windows 2000 Administrator privileges have been changed on Server\_1, and you no longer have administrator privileges, the administration console returns a list of all three servers associated with the group and lists the state of each server. The state of Server\_1 is returned as Access Denied.

If you are a member of both the BizTalk Server Administrators group and the Windows 2000 Administrators group, you can perform the following additional tasks:

- Add servers to and remove servers from a server group
- View and modify server properties
- View server status
- Free interchanges on a server

During setup, the user who runs the BizTalk Server installation is added to the BizTalk Server Administrators group. You can add other users to the BizTalk Server Administrators group. For more information, see [Add users to the BizTalk Server Administrators group](#).

# Troubleshooting BizTalk Server Administration

This section provides a centralized location for information related to troubleshooting BizTalk Server Administration. If you receive error messages, try to find a solution in this section.

Supplemental information related to issues discovered after this documentation release are included in the Readme file located at the root level of the Microsoft BizTalk Server folder.

The following issues are covered:

- [Error getting all groups from a database](#)
- [Interchange and document size limit](#)
- [Transaction time-out discrepancy between Component Services and BizTalk Server 2000](#)
- [BizTalk Messaging Service does not start](#)
- [Slowed performance when deleting a large quantity of documents from the Suspended queue](#)
- [Output validation failure](#)
- [Server does not return all documents in a flat-file interchange](#)
- [Class identifier appears in the Preprocessor list](#)
- [An interchange or document appears as binary data in the Suspended queue](#)
- [BizTalk Server stopped processing documents](#)
- [Receive function does not delete the document](#)
- [Unable to connect to a SQL server installed on a clustered machine](#)
- [Receive functions stopped processing documents](#)
- [Error when moving a remote server to a different BizTalk Messaging Management Database](#)
- [Parsing errors](#)

## Note

- You can also check the error messages in the Suspended queue for more troubleshooting information. For more information about the Suspended queue, error messages, and possible actions, see [Suspended queue](#).
- You can also check the Event Log for detailed information, such as error and warning messages. For more information about the Event Log, see [Manage Event Viewer](#).

# Error getting all groups from a database

**Cause:** The BizTalk Messaging Management database is offline if you receive the following message:

Instances of Microsoft BizTalkServer\_Group cannot be enumerated: The connection to the BizTalk Messaging Management database could not be opened.

**Solution:** Find out why the server is offline and retry the connection when it is back online. For example, you could receive this message if the server that hosts the BizTalk Messaging Management database is offline for maintenance.

# Interchange and document size limit

The maximum supported size limit for a document submitted to BizTalk Server is 20 MB. The maximum supported size limit for an [interchange](#) submitted to BizTalk Server is 20 MB.

If you plan to receive interchanges in XML Unicode format that are larger than 20 MB, it is advisable to turn off global tracking settings. If you plan to receive ANSI flat-file interchanges that are larger than 7-10 MB in size, it is advisable to turn off global tracking settings. For more information about configuring tracking settings for a server group, see [Configure tracking properties for a server group](#).

Similarly, if you plan to receive document instances in XML Unicode format that are greater than 20 MB, it is advisable to turn off document logging settings in BizTalk Messaging Manager. Or, if you plan to receive ANSI flat files that are larger than 7-10 MB, it is advisable to turn off document logging settings in BizTalk Messaging Manager. For more information about storing copies of specific document instances, see [Set document logging properties](#).

## Related Topics

[Configure tracking properties for a server group](#)

[Set document logging properties](#)

# **Transaction time-out discrepancy between Component Services and BizTalk Server 2000**

There is a file time-out discrepancy between Component Services and BizTalk Server 2000. When sending a file that exceeds the default transaction time-out value of 60 seconds through BizTalk Server 2000, BizTalk Server 2000 records the transaction as sent, and the receiving server receives the file without errors. Component Services records the transaction as aborted. Transactions cannot be rolled back.

## BizTalk Messaging Service does not start

**Cause:** The BizTalk Messaging Service does not start if BizTalk Server cannot connect to the SQL server that stores the BizTalk Messaging Management database. All COM+ packages run under an interactive user account, not the local system account. The service starts only if a user is logged on to BizTalk Server. For example, if a client application submits documents to BizTalk Server remotely and no user is logged on to the server running BizTalk Server 2000, the service does not start.

**Solution:** Verify BizTalk Server's connection to the BizTalk Messaging Management database. Verify that Microsoft SQL Server is running properly. You might need to create services account under which to run BizTalk Server. For more information about creating a services account, in Windows 2000 Help, in the Services chapter, see "Select a user account that a service will use to log on".

# Slowed performance when deleting a large quantity of documents from the Suspended queue

**Cause:** You might experience slow performance when you delete a large quantity of documents from the Suspended queue.

**Solution:** If you need to delete all documents from the Suspended queue, you might want to use `PurgeBizTalkSuspendedQueue.vbs`, a sample Microsoft Visual Basic script that is provided for this purpose. After BizTalk Server 2000 installation, you can find this script in the `\Program Files\Microsoft BizTalk Server\SDK\Messaging Samples\Miscellaneous` folder.

## **Caution**

- Do not use this script unless you want to permanently delete the entire contents of the Suspended queue for the specified BizTalk Server group.

# Output validation failure

**Cause One:** The data type of a field in the source specification does not match the data type of the field to which it is linked in the destination specification. This failure is logged to the Event Viewer.

**Solution:** Correct the data type in either the source or destination specification. For more information about source and destination specifications, see [Create and Validate Specifications](#).

**Cause Two:** A [functoid](#) is linked to a field in the destination specification, and the field data type property is not a string.

**Solution:** In the destination specification, change the field data type to **String**. Submit the document to BizTalk Server for processing. For more information about data types, see [Set declaration properties](#).

**Cause Three:** In the destination specification, a field is assigned a constant value that uses a different data type than the data type already assigned to the field.

**Solution:** In the destination specification, change the data type associated with the field. Submit the document to BizTalk Server for processing. For more information about data types, see [Set declaration properties](#).

**Cause Four:** Release indicators are included in EDIFACT data. The release characters are included in the logical character count when validating the maximum physical character limit for a field. This failure is logged to the Event Viewer.

**Solution:** Do not use release indicators in EDIFACT data. BizTalk Server automatically inserts release indicators in outbound data when needed.

## Related Topics

[Create and Validate Specifications](#).

[Set declaration properties](#)

# Server does not return all documents in a flat-file interchange

**Cause:** One of the documents in the interchange does not meet the document specification. For example, one of the documents is missing a required field.

**Solution:** Locate the document that does not meet the specification, fix it, and [resubmit](#) the interchange. Although an error is returned for the document that does not meet the specification, BizTalk Server cannot process all the documents in the interchange. The flat-file structure is an open format and is not designed to implement redundancy checking.

# Class identifier appears in the Preprocessor list

**Cause:** The custom preprocessor is no longer registered.

**Solution:** Check the Event Log to confirm that the custom preprocessor is no longer registered. Then register the custom preprocessor again or choose another preprocessor from the list.

## Related Topics

[Configure a File receive function: Services tab](#)

[Custom Preprocessors](#)

[Preprocessing Documents in a Receive Function](#)

# An interchange or document appears as binary data in the Suspended queue

**Cause One:** BizTalk Server could not parse the interchange or document.

**Solution:** Delete the document from the Suspended queue. Verify that the incoming interchange or document is in a format that BizTalk Server can process (XML, X12, EDIFACT, or flat file). Submit it to BizTalk Server from the original organization or application again.

If BizTalk Server cannot parse a document, it appears as binary data in the Suspended queue because BizTalk Server does not have enough information to read and process the document correctly. For more information about parsing errors, see [Parsing errors](#).

**Cause Two:** BizTalk Server was able to parse the interchange or document, but the data content was not valid. The timestamp "expiresAt" expired and the document is no longer valid. This failure occurs in BizTalk Framework documents that use the "expiredAt" field.

**Solution:** Delete the document from the Suspended queue. This document is no longer valid. Investigate why the document is no longer valid.

**Cause Three:** BizTalk Server could not parse the document because the schema for the document is incorrect. If you receive a flat file and the code page for the document specification is set to UTF-8, BizTalk Server cannot parse the document because UTF-8 is not supported.

**Solution:** If you receive a flat file, check to see if the document specification is correct. If the code page for the document specification is set to UTF-8, BizTalk Server cannot process the document. Delete the document from the Suspended queue. For more information see, [Set reference properties](#).

## Related Topics

[Parsing errors](#)

[Set reference properties](#)

[Suspended queue](#)

# BizTalk Server stopped processing documents

**Cause One:** BizTalk Server cannot continue processing documents if the connection to any of the three databases—[BizTalk Messaging Management](#), [Tracking](#), or [Shared Queue](#)—is lost or if those databases are otherwise inaccessible. This might occur if Microsoft SQL Server is shut down or paused from the Enterprise Manager. If Microsoft BizTalk Server 2000 encounters this error, the BizTalk Messaging Service shuts down gracefully to properly preserve the state of processing and integrity at the moment of failure. An error is logged to the Event Viewer with a full description of the error causing the service to shutdown.

**Solution:** System administrators can use this error for notification that BizTalk Server is offline through pager notification or status delivery through e-mail. Upon such notification the administrator must manually restart the BizTalk Messaging Service through the Services Microsoft Management Console snap-in, and then check the Event Log again to determine whether the error is still present. If it is, the administrator must confirm that Microsoft SQL Server services are available to BizTalk Server. For more information about how to start the BizTalk Messaging Service, see [Start the BizTalk Messaging Service](#).

**Cause Two:** If you have antivirus software on the server on which BizTalk Server 2000 is installed, the default setting in a messaging port might be incorrect.

**Solution:** The default setting for the file transport component is to append files. If you choose the file transport type with its default settings in a messaging port and use antivirus software on the server on which BizTalk Server 2000 is installed, and you send multiple files that have exactly the same name to the same file location, at the same time, BizTalk Server 2000 might stop responding and must be restarted. You can eliminate this problem by changing the default setting for the file transport component in the **BizTalk SendLocalFile Properties** dialog box from **Append to file** to **Overwrite file**. You also can eliminate this problem by creating a unique file for each document instance processed by using the file path format in the messaging port: file://C:\dir\file%tracking\_id%.xml. For more information, see [Specify a transport address](#). If you need to restart the server, see [Start a server in a group](#).

## Related Topic

[Specify a transport address](#)

[Start a server in a group](#)

[Start the BizTalk Messaging Service](#)

# Receive function does not delete the document

**Cause:** The retry interval might be set below the processing capability for the number of documents generated.

**Solution:** Double the retry interval and resubmit the documents to BizTalk Server. For more information about configuring the retry interval, see [Set advanced configuration properties](#).

## Related Topic

[Set advanced configuration properties](#)

# Unable to connect to a SQL server installed on a clustered machine

**Cause:** When Microsoft SQL Server is installed on a cluster, SQL Server can support only clients that connect using TCP/IP.

**Solution:** Install SQL Server client tools and change the default network library to TCP/IP. For more information about installing SQL Server client tools, see [Install SQL Server client tools](#). For more information about changing the default network library, see [Change the default network library to TCP/IP](#).

## Related Topics

[Change the default network library to TCP/IP](#)

[Install SQL Server client tools](#)

# Receive functions stopped processing documents

**Cause:** A single remote server cannot support more than 50 receive functions at the same time.

**Solution:** For more information about supporting multiple receive functions, go to the Microsoft Product Support Services Web site [search.support.microsoft.com/kb/c.asp](https://search.support.microsoft.com/kb/c.asp), and search the Knowledge Base for the following article:

- "Too Many Connections to Remote Share May Cause PRC Failures" (Article number Q221790).

For additional information, see the following Knowledge Base articles:

- "Local System Account and Null Sessions in Windows NT" (Article number Q132679).
- "Service Running As System Account Fails Accessing Network" (Article number Q124184).
- "PRB: Access Denied When Opening a Named Pipe from a Service" (Article number Q126645).
- "FindFirstChangeNotification May Not Notify All Processes on File Changes" (Article number Q188321).

# Error when moving a remote server to a different BizTalk Messaging Management Database

**Cause:** The server might belong to another BizTalk Messaging Management database.

**Solution:** If you try to add a remote server to a BizTalk Messaging Management database, and that server was originally in a different central BizTalk Messaging Management database, the following error message appears in the Windows Event Log:

A new instance of the WMI class "**MicrosoftBizTalkServer\_Server**" cannot be created in the BizTalk Server WMI provider. The <servername> server may already belong to a different BizTalk Server installation.

This error means that an attempt was made to add a remote server that was originally in a different central database. If this procedure was performed within BizTalk Server Administration, the administration console tries to determine if the remote server also belongs to a group in the remote central database. The administration console queries the remote server's Windows Management Instrumentation (WMI) provider to make this determination. If the server does belong to a group in the other central database, an error message from the administration console appears and explains that you cannot add a remote server that already belongs to a group in a different central database.

## Related Topic

[WMI Overview](#)

## Parsing errors

**Cause One:** If you are sending reliable messages, the default settings in a port might be incorrect.

**Solution:** The default setting for the file transport component is to append files. If you choose the file transport type with its default settings and select an envelope with a reliable envelope format in a messaging port, and then send multiple files to the same file location, at the same time, you might have unexpected parsing results. You can eliminate this problem by changing the default setting for the file transport component from **Append to file** to **Overwrite file** in the **BizTalk SendLocalFile Properties** dialog box. For more information about changing the default settings in a port, see [Override messaging port defaults](#).

**Other Causes:** BizTalk Server cannot parse a document for a variety of reasons. Some common reasons are:

- The [interchange](#) or document is in a format that BizTalk Server cannot understand.
- The [schema](#) for the document is incorrect.
- A flat-file interchange has the wrong or invalid schema.
- A flat-file interchange contains invalid characters.
- A flat-file interchange is missing characters.
- A flat-file interchange is missing delimiters.
- A [BizTalk Framework](#) 2.0 document has an invalid alias listed in the port or channel.
- The document container node is missing in a custom XML header.
- An attribute is missing in a custom XML document.
- An EDI document [specification](#) does not match the [envelope](#).

**Solution:** View the interchange or document data to determine why BizTalk Server could not parse the interchange or document. To view the interchange or document data, you can:

- View the first 512 bytes of the interchange or document data. For more information on how to view interchange and document data, see [View interchanges](#) or [View documents](#).
- View the interchange data in the interchange record in [BizTalk Document Tracking](#). For more information about how to view interchanges in BizTalk Document tracking, see [Search by date for interchange and document information](#), [Search by organization for interchange and document information](#), [Search by document type for interchange and document information](#), or [Search for interchange and document information by combining query parameters](#).
- Use the Windows Management Instrumentation (WMI) layer to view the interchange data. For more information about WMI Application Programming, go to the MSDN Online Library Web site [msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp), and search for "WMI Application Programming".

Once you determine why BizTalk Server could not parse the document, correct the problem and [resubmit](#) the interchange or document using **Interchange** or a [receive function](#).

### Related Topics

[An interchange or document appears a binary data in the Suspended queue](#)

[Search by date for interchange and document information](#)

[Search by document type for interchange and document information](#)

[Search by organization for interchange and document information](#)

[Search for interchange and document information by combining query parameters](#)

[Suspended queue](#)

[View documents](#)

[View interchanges](#)

# Programmatic Administration

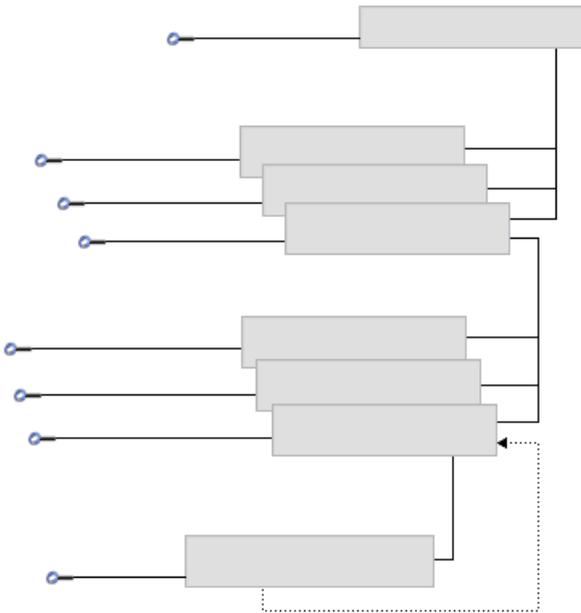
The interfaces in this section provide access to XLANG Scheduler System Managers, XLANG group managers, [XLANG schedule instances](#), and XLANG ports.

The XLANG Scheduler System Manager provides [moniker](#) resolution and maintains a collection of group managers. A group manager runs in every COM+ application that has been designated as an XLANG schedule host, and maintains a collection of XLANG schedule instances. An XLANG schedule instance represents a running XLANG schedule that can be queried for information, such as the schedule's completion status. For XLANG schedules with a COM-bound port, a proxy object can be used to obtain a reference to the interface specified in the port binding.

## Note

- Only one XLANG Scheduler System Manager can exist on each computer.

The following illustration shows the relationship between these interfaces, and the corresponding monikers.



sked://[host]

### System manager

IWFSystemAdmin

sked://[host][!group]

### XLANG schedule instance

XLANG schedule instance

XLANG schedule instance

### Group manager

Group manager

Group manager

WorkflowInstance

IWFProxy

IWFWorkflowInstance

IWFWorkflowInstance

IWFWorkflowInstance

IWFGroupAdmin

IWFGroupAdmin

IWFGroupAdmin

sked://[host][!group]/file.skx

sked://[host][!group]/file.skx/port

Proxy to COM-bound XLANG port

For more information, see [Administering XLANG Schedules](#).

## Related Topic



# Tracking Documents

BizTalk Document Tracking is a stand-alone Web application that you can use to view the progress of documents processed by Microsoft BizTalk Server 2000. You can create queries or advanced queries to extract essential information from the [Tracking database](#) in an easy-to-view format. For example, in BizTalk Document Tracking you can view captured information about the document [source](#) and [destination](#), the document name and [document type](#), and relevant date and time parameters. Or you can create queries that display standard and custom-search fields so you can analyze your business practices. For example, a Purchase Order Total field can be stored for every purchase order sent to suppliers. You can then use this data to analyze and report the monetary volume of purchases to one or several suppliers over a period of time.

In addition, you can configure BizTalk Document Tracking to display interchange and document records individually or in batches. You can also use BizTalk Document Tracking to display, view, and save complete copies of the incoming and outgoing document instances for future reference.

- For help with specific tasks, see [How To](#).
- For general background information, see [Concepts](#).
- For problem-solving instructions, see [Troubleshooting BizTalk Document Tracking](#).

## ◆ Important

- Because BizTalk Document Tracking is accessed as a Web application by using Microsoft Internet Explorer, Microsoft BizTalk Server 2000 Help is accessed differently and Help functionality is somewhat restricted. The **Table of Contents**, **Index**, **Search**, and **Favorites** tabs are not available. You can access all topics through links from the opening page, and through Related Topics links as well as the browser's **Back** button.

If you want to search for a specific Help topic, or if you want to access information about other features and services of BizTalk Server 2000, on the **Start** menu, point to **Programs**, point to **Microsoft BizTalk Server 2000**, and then click **BizTalk Server Documentation**. For Help to be available from the **Start** menu, BizTalk Server 2000 must be installed on your computer.

- Because BizTalk Document Tracking uses Microsoft ActiveX Controls, an ActiveX control download dialog box might appear during selections or query submissions. If this happens, click **Yes** to continue.

## 📝 Note

- A dialog box with the following message might appear during selection or query selection:

This page accesses data on another domain. Do you want to allow this?

To avoid this message in Internet Explorer, you can add a secure Web site to the Trusted site zones on the Security tab of the Internet Options dialog box.

To manually configure your browser's settings to trust this Web application, add the Web application to the list of trusted sites in Internet Explorer. For more information about adding the Web application to the list of trusted sites, see [Configure Internet Explorer security settings](#).

# How To...

This section provides task-specific information that explains how to find, view, and save search results for interchange and document instance records and associated data. It is highly recommended that you review the [Concepts](#) section to fully understand the search capabilities and expected query results.

BizTalk Document Tracking has two levels of searching capability: query and advanced query. You can use queries when you want to locate documents using standard search criteria, such as source organization. You can use advanced queries when you want to locate specific data in documents, such as a Purchase Order Total.

The following procedures are covered in this section:

- [Open BizTalk Document Tracking for the First Time](#)
- [Open BizTalk Document Tracking](#)
- [Add Users to BizTalk Server Report Users Group](#)
- [Use Queries to Search and Sort Interchange and Document Data](#)
- [Use Advanced Queries](#)
- [Save Interchange, Document, and Custom Search Data](#)

# Open BizTalk Document Tracking for the First Time

If you open BizTalk Document Tracking for the first time and if you do not have Windows Common Controls and the BizTalk Document Tracking control installed on your computer, you are prompted to install the components. If you have the components installed on your computer, see [Open BizTalk Document Tracking](#).

1. On the **Start** menu, point to **Programs**, point to **Microsoft BizTalk Server 2000**, and then click **BizTalk Document Tracking**.

The **Web Page Dialog** dialog box appears to prompt you to install the following components:

- Windows Common Controls
- BizTalk Document Tracking Installation Control

2. Click **Continue**, to install the Windows Common Controls.

The **Security Warning** dialog box appears.

3. Click **Yes**, to install the BizTalk Document Tracking Installation Control.

## Note

- A dialog box with the following message might appear during selection or query selection:

This page accesses data on another domain. Do you want to allow this?

To avoid this message in Internet Explorer, you can add a secure Web site to the Trusted site zones on the Security tab of the Internet Options dialog box.

To manually configure your browser's settings to trust this Web application, add the Web application to the list of trusted sites in Internet Explorer. For more information about adding the Web application to the list of trusted sites, see [Configure Internet Explorer security settings](#).

## Related Topics

[Configure Internet Explorer security settings](#)

[Open BizTalk Document Tracking](#)

# Open BizTalk Document Tracking

- On the **Start** menu, point to **Programs**, point to **Microsoft BizTalk Server 2000**, and then click **BizTalk Document Tracking**.

—Or—

If you created a favorite in Microsoft Internet Explorer, you can open BizTalk Document Tracking from Internet Explorer.

## Note

- A dialog box with the following message might appear during selection or query selection:

This page accesses data on another domain. Do you want to allow this?

To avoid this message in Internet Explorer, you can add a secure Web site to the Trusted site zones on the Security tab of the Internet Options dialog box.

To manually configure your browser's settings to trust this Web application, add the Web application to the list of trusted sites in Internet Explorer. For more information about adding the Web application to the list of trusted sites, see [Configure Internet Explorer security settings](#).

## Related Topics

[Configure Internet Explorer security settings](#)

[Open BizTalk Document Tracking for the First Time](#)

# Add Users to BizTalk Server Report Users Group

To view the BizTalk Document Tracking user interface and to save Advanced Query expressions, you must be a member of the BizTalk Server Report Users group.

1. On the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Computer Management**.
2. Expand **System Tools**, expand **Local Users and Groups**, and then click the **Groups** folder.
3. In the details pane, click **BizTalk Server Report Users**.
4. On the **Action** menu, point to **All Tasks**, and then click **Add to Group**.  
The **BizTalk Server Report Users Properties** dialog box appears.
5. Click **Add**.
6. In the **Look in** list, click your domain or computer name.
7. In the list that contains the users and computers associated with the domain or computer you selected in step 6, click the user account to add, click **Add**, and then click **OK**.
8. Click **OK** to close the **BizTalk Server Report Users Properties** dialog box.

# Use Queries to Search and Sort Interchange and Document Data

You can use queries to locate, view, and save interchange and document instance records and associated data using standard search criteria, such as document type or source organization.

The following procedures are covered in this section:

- [Search by date for interchange and document information](#)
- [Search by organization for interchange and document information](#)
- [Search by document type for interchange and document information](#)
- [Search for interchange and document information by combining query parameters](#)
- [Clear search criteria for organizations and document types](#)
- [Customize the Query Results page](#)
- [View search parameters for the Query Results page](#)

## Note

- When you select your query parameters, be as specific as possible. This reduces load on the server and the amount of time it takes to return your query results.
- A dialog box with the following message might appear during selection or query selection:

This page accesses data on another domain. Do you want to allow this?

To avoid this message in Internet Explorer, you can add a secure Web site to the Trusted site zones on the Security tab of the Internet Options dialog box.

To manually configure your browser's settings to trust this Web application, add the Web application to the list of trusted sites in Internet Explorer. For more information about adding the Web application to the list of trusted sites, see [Configure Internet Explorer security settings](#).

# Search by date for interchange and document information

1. In BizTalk Document Tracking, in the **Date Range** area, in the **Display dates in** list, click **Local Time** or **UTC** to specify the time zone of the display dates.

2. In the **From date** list, type the beginning date for the period that you want to track, or click the arrow to display a calendar from which you can select a date.

To change the time, type the beginning time in the list next to the **From date** list, or click the up or down arrow.

3. In the **To date** list, type the end date for the period that you want to track, or click the arrow to display a calendar from which you can select a date.

To change the time, type the end time in the list next to the **To date** list, or click the up or down arrow.

4. Click the **Query** button.

The **Query Results** page appears.

5. To view [interchange](#) data, locate the interchange record that contains the data you want to view and, in the Data column, click a Data icon.

The **View Interchange Data** page appears.

6. To view the [XLANG schedule](#) status for an interchange, in the Schedule column, click a Schedule icon.

The **View Schedule Summary** page appears.

7. To view a document instance record associated with an interchange, click the expand indicator icon (+) next to the interchange that contains the document instance record you want to view.

8. To view the data associated with a [document instance](#), in the Data field, click the Data icon.

The **View Document Instance Data** page appears.

9. To view the data in its native format or XML format, click **View native format** or **View XML format**.

10. To view the receipt data associated with a document instance, in the Receipt field, click the Receipt icon.

A new **Query Results** page appears.

11. Click the expand indicator icon (+) next to the interchange and then click the Data icon in the data field.

12. To view the custom-search field data for a document instance, locate the document for which you want to view the custom-search field data, use the horizontal scroll bar to display the Custom Search field, and then click the Custom Search icon.

The **View Custom Search Field** page appears.

## Notes

- The value you select in the **Display dates in** list controls the search times and the display results. For example, if you select **UTC** in the **Display dates in** list and you specify 0800 in the time field, you search for all data processed on or after 0800 hours in coordinated universal time (UTC). This is not the same as 0800 Local Time.
- The default date setting is seven days prior to the current date.
- The display dates are the BizTalk Server-generated timestamps on the metadata for the document instances and interchanges. They are not dates for the actual document content. To locate documents based on the actual document date, create an **Advanced Query** expression. For more information about advanced queries, see [Build advanced queries](#).
- If you specify only a date range in a query, BizTalk Document Tracking searches for all source and destination organizations and all document types. This single search parameter is not recommended. For best results, always create a query with very specific parameters to limit the number of interchange records returned on the **Query Results** page.
- The XLANG schedule status is the last detected event, processed start time, processed end time, and so on.

## **Related Topics**

[Build advanced queries](#)

[Search by document type for interchange and document information](#)

[Search by organization for interchange and document information](#)

[Search for interchange and document information by combining query parameters](#)

[Understanding Document-Instance Record Results](#)

[Understanding Interchange Record Results](#)

[Understanding Queries](#)

# Search by organization for interchange and document information

1. In BizTalk Document Tracking, in the **Source Selection** list, click the organization(s) for which you want to view interchanges and documents. To select an application that is associated with a source organization, click the expand indicator icon (+) next to the organization, and then click the application(s) you want. To select all source organizations, click **Select All**.

—Or—

In BizTalk Document Tracking, in the **Destination Selection** list, click the organization(s) for which you want to view interchanges and documents. To select an application that is associated with a destination organization, click the expand indicator icon (+) next to the organization, and then click the desired application(s). To select all destination organizations, click **Select All**.

You can choose organizations and applications in the **Source Selection** and **Destination Selection** lists for the same query.

2. Click the **Query** button.

The **Query Results** page appears. Any interchanges that match your query criteria are listed here.

3. To view [interchange](#) data, locate the interchange record that contains the data you want to view and, in the Data column, click the Data icon.

The **View Interchange Data** page appears.

4. To view the [XLANG schedule](#) status for an interchange, in the Schedule column, click a Schedule icon.

The **View Schedule Summary** page appears.

5. To view a document instance record associated with an interchange, click the expand indicator icon (+) next to the interchange that contains the document instance records you want to view.

6. To view the data associated with a [document instance](#), in the Data field, click the Data icon.

The **View Document Instance Data** page appears.

7. To view the data in its native format or XML format, click **View native format** or **View XML format**.

8. To view the receipt data associated with a document instance, in the Receipt field, click the Receipt icon.

A new **Query Results** page appears.

9. Click the expand indicator icon (+) next to the interchange, and then click the Data icon in the Data field.

10. To view the custom-search field data for a document instance, locate the document for which you want to view the custom-search field data, use the horizontal scroll bar to display the Custom Search field, and then click the Custom Search icon.

The **View Custom Search Field** page appears.

## Notes

- If you do not select specific source and destination organizations, the query returns interchange and document records for all source and destination organizations. The options **Clear All** and **Select All** generate the same results on the **Query Results** page. For best results, always create a query with very specific parameters to limit the number of interchange records generated on the **Query Results** page.
- The XLANG schedule status is the last detected event, processed start time, processed end time, and so on.

## Related Topics

[Search by date for interchange and document information](#)

[Search by document type for interchange and document information](#)

[Search for interchange and document information by combining query parameters](#)

[Understanding Document-Instance Record Results](#)

[Understanding Interchange Record Results](#)

[Understanding Queries](#)

# Search by document type for interchange and document information

1. In BizTalk Document Tracking, in the **Document Type Selection** area, click **Show Documents**.
2. In the **Document Type Selection** list, click the document type(s) that you want to find. To select all document types, click **Select All**.
3. Click the **Query** button.  
The **Query Results** page appears.
4. To view [interchange](#) data, locate the interchange record that contains the data you want to view and, in the Data column, click a Data icon.  
The **View Interchange Data** page appears.
5. To view the [XLANG schedule](#) status for an interchange, in the Schedule column, click a Schedule icon.  
The **View Schedule Summary** page appears.
6. To view a document instance record associated with an interchange, click the expand indicator icon (+) next to the interchange that contains the document instance records you want to view.
7. To view the data associated with a [document instance](#), in the Data field, click the Data icon.  
The **View Document Instance Data** page appears.
8. To view the data in its native format or XML format, click **View native format** or **View XML format**.
9. To view the receipt data associated with a document instance, in the Receipt field, click the Receipt icon.  
A new **Query Results** page appears.
10. Click the expand indicator icon (+) next to the interchange, and then click the Data icon in the data field.
11. To view the custom-search field data for a document instance, locate the document for which you want to view the custom-search field data, use the horizontal scroll bar to display the Custom Search field, and then click the Custom Search icon.  
The **View Custom Search Field** page appears.

## Notes

- If you do not select one or more document types to narrow your search, the query returns all document types in the list. For best results, always create a query with very specific parameters to limit the number of interchange records generated on the **Query Results** page.
- The XLANG schedule status is the last detected event, processed start time, processed end time, and so on.

## Related Topics

[Search by date for interchange and document information](#)

[Search by organization for interchange and document information](#)

[Search for interchange and document information by combining query parameters](#)

[Understanding Document-Instance Record Results](#)

[Understanding Interchange Record Results](#)

[Understanding Queries](#)

# Search for interchange and document information by combining query parameters

1. In BizTalk Document Tracking, you can combine any of the following query parameters in a single query session to find and view interchange and document instance records and associated data:

- **Source selection.** For more information about creating queries using the source selection parameter, see [Search by organization for interchange and document information](#).
- **Destination selection.** For more information about creating queries using the destination selection parameter, see [Search by organization for interchange and document information](#).
- **Document type.** For more information about creating queries using the document type parameter, see [Search by document type for interchange and document information](#).
- **Date and time.** For more information about creating queries using date and time parameters, see [Search by date for interchange and document information](#).

2. Click the **Query** button.

# Clear search criteria for organizations and document types

- In BizTalk Document Tracking, click **Clear All** beneath the **Source Selection**, the **Destination Selection**, or the **Document Type Selection** list.

## **Note**

- When you click **Clear All**, BizTalk Document Tracking returns to the default search for all source and destination organizations and for all document types. For best results, always create a query with very specific parameters to limit the number of interchange records returned on the **Query Results** page.

# Customize the Query Results page

1. In BizTalk Document Tracking, in the **Sort Control** area, select the **Group related interchanges** check box.

This step configures the **Query Results** page to display incoming interchanges grouped with associated outgoing interchanges. Clear this check box if you do not want to view incoming interchanges with associated outgoing interchanges.

2. In the **Sort Control** area, in the **Sort order 1** list, click the first sort order option that you want to use. Repeat this step for each sort order list to configure the sort order of your documents on the **Query Results** page.

Each **Sort order** list contains the following options:

- **Source Organization Name**
- **Source Application Name**
- **Destination Organization Name**
- **Destination Application Name**
- **Document Type**
- **Time Processed**

# View search parameters for the Query Results page

1. Define parameters for a query, and then click the **Query** button.

The **Query Results** page appears.

For more information about how to create queries or advanced queries, see:

- [Search by date for interchange and document information](#)
- [Search by organization for interchange and document information](#)
- [Search by document type for interchange and document information](#)
- [Build advanced queries](#)

2. On the **Search Parameters** bar, click the Show icon.

The following search parameters and associated values are listed in the **Search Parameters** area:

- Date Range
- Time Zone
- Expression Name
- Sort Order
- Source Selection
- Destination Selection
- Document Type Selection

## Related Topics

[Build advanced queries](#)

[Search by date for interchange and document information](#)

[Search by document type for interchange and document information](#)

[Search by organization for interchange and document information](#)

# Use Advanced Queries

If you need to locate specific data, such as a document instance with a specific purchase order number, you can use an advanced query to locate the information.

The following procedures are covered in this section:

- [Build advanced queries](#)
- [Locate existing advanced queries](#)
- [Edit existing advanced queries](#)
- [Clear existing advanced queries from a query](#)
- [Delete existing advanced queries](#)

# Build advanced queries

1. In BizTalk Document Tracking, in the **Advanced Query** area, click **New**.

The **Advanced Query Builder** page appears.

2. In the **Source selection** list, click an option to specify your source selection criteria.

This is the name of the captured field for which you are searching.

3. In the **Operators** list, click an operator.

4. In the **Value** box, type a value.

5. In the **AND/OR** list, click either **AND** or **OR** to combine or compare this condition with another condition. This step is optional.

6. Click **Done**.

7. Repeat steps 2 through 6 until you add all conditions you want.

8. Perform one of the following procedures:

- Click **OK** to limit the use of this expression to the current query session.
- Click **Save** to save the expression for future query sessions. In the **BizTalk Document Tracking** dialog box, type the expression name in the **Enter the expression name** box (limit the expression name to 50 characters), and then click **OK**.

## Notes

- The collection of one or more conditions in an advanced query is called an expression.
- If you have the focus on the **Source Selection** list and you click a button, you might need to click the button a second time to activate it.
- In BizTalk Messaging Manager, if you configured a channel or document definition to track custom field(s), those fields appear in the **Source Selection** list. If you have not configured BizTalk Messaging Manager to track any fields, only "<Custom Search>" appears in the **Source Selection** list. For more information about tracking specific fields, see [Set document logging properties](#) and [Select specification fields in a channel](#).

## Related Topics

[Clear existing advanced queries from a query](#)

[Delete existing advanced queries](#)

[Edit existing advanced queries](#)

[Locate existing advanced queries](#)

# Locate existing advanced queries

1. In BizTalk Document Tracking, in the **Advanced Query** area, click **Browse**.

The **Advanced Queries** dialog box appears.

2. Select an existing query, and then click **OK**.

## **Note**

- If you have the focus on the **Source Selection** list and you click a button, you might need to click the button a second time to activate it.

## **Related Topics**

[Build advanced queries](#)

[Clear existing advanced queries from a query](#)

[Delete existing advanced queries](#)

[Edit existing advanced queries](#)

# Edit existing advanced queries

1. In BizTalk Document Tracking, in the **Advanced Query** area, click **Browse**.

The **Advanced Queries** dialog box appears.

2. Select an existing query to edit and then click **Edit**.

The **Advanced Query Builder** dialog box appears.

3. Perform one or more of the following procedures:

- Click **New** to add an additional condition. Specify conditions for each of the four fields, and then click **Done**.
- Click an existing condition, click **Edit**, modify any of the four fields, and then click **Done**.
- Select an existing condition, and then click **Remove**.

4. Click **Save**.

The **Advanced Queries** dialog box appears.

5. Select the query you just edited, and then click **OK**.

## Note

- If you have the focus on the **Source Selection** list and you click a button, you might need to click the button a second time to activate it.

## Related Topics

[Build advanced queries](#)

[Clear existing advanced queries from a query](#)

[Delete existing advanced queries](#)

[Locate existing advanced queries](#)

# Clear existing advanced queries from a query

- In BizTalk Document Tracking, in the **Advanced Query** area, click **Clear** to remove the current expression from the **Expression name** box.

## Note

- If you click the **Refresh** button in Internet Explorer, the advanced query is not cleared from the **Expression name** box.

## Related Topics

[Build advanced queries](#)

[Delete existing advanced queries](#)

[Edit existing advanced queries](#)

[Locate existing advanced queries](#)

# Delete existing advanced queries

1. In BizTalk Document Tracking, in the **Advanced Query** area, click **Browse**.

The **Advanced Queries** page appears.

2. Select a query, and then click **Delete**.

3. Close the **Advanced Queries** dialog box when you are finished.

## **Note**

- If you have the focus on the **Source Selection** list and you click a button, you might need to click the button a second time to activate it.

## **Related Topics**

[Build advanced queries](#)

[Clear existing advanced queries from a query](#)

[Edit existing advanced queries](#)

[Locate existing advanced queries](#)

# Save Interchange, Document, and Custom Search Data

If you configured BizTalk Messaging Manager, the BizTalk Messaging Configuration object model, and/or BizTalk Server Administration to store incoming and outgoing interchanges and their documents, you can save interchanges, document data, and custom-field search data so you can view them offline. This helps you to troubleshoot certain situations or analyze your business practices.

The following procedures are covered in this section:

- [Save interchange data](#)
- [Save document instance data](#)
- [Save custom-field search data](#)

# Save interchange data

1. Define parameters for a query, and then click the **Query** button.

The **Query Results** page appears.

For more information about how to create queries or advanced queries, see:

- [Search by date for interchange and document information](#)
- [Search by organization for interchange and document information](#)
- [Search by document type for interchange and document information](#)
- [Build advanced queries](#)

2. Locate the interchange record that contains the interchange data you want to save and, in the Data field, click the Data icon.

The **View Interchange Data** page appears.

3. Click **Save As**.

4. In the **File name** box, type a name for the file, and then click **Save**.

## Related Topics

[Build advanced queries](#)

[Save custom-field search data](#)

[Save document instance data](#)

[Search by date for interchange and document information](#)

[Search by document type for interchange and document information](#)

[Search by organization for interchange and document information](#)

# Save document instance data

1. Define parameters for a query and click the **Query** button.

The **Query Results** page appears.

For more information about how to create queries or advanced queries, see:

- [Search by date for interchange and document information](#)
  - [Search by organization for interchange and document information](#)
  - [Search by document type for interchange and document information](#)
  - [Build advanced queries](#)
2. Locate the interchange record that contains the document instance data you want to save and click the expand indicator icon (+) to the left of the interchange.
  3. In the Data field, click the Data icon.  
The **View Document Data** page appears.
  4. Click **Save As**.
  5. In the **File name** box, type a name and an extension (either the .xml file extension or the native file extension of the document) for the file, and then click **Save**.

## Related Topics

[Build advanced queries](#)

[Save custom-field search data](#)

[Save interchange data](#)

[Search by date for interchange and document information](#)

[Search by document type for interchange and document information](#)

[Search by organization for interchange and document information](#)

# Save custom-field search data

1. Define parameters for a query, and then click the **Query** button.

The **Query Results** page appears.

For more information about how to create queries or advanced queries, see:

- [Search by date for interchange and document information](#)
- [Search by organization for interchange and document information](#)
- [Search by document type for interchange and document information](#)
- [Build advanced queries](#)

2. Click the expand indicator icon (+) to the left of the interchange record that contains the document you want to view.
3. Use the horizontal scroll bar to display the Custom Search field for the document you want to view and click the Custom Search icon.

The **View Custom Search Field** page appears.

4. Click **Save As**.
5. In the **File name** box, type a name for the file, and then click **Save**.

## Related Topics

[Build advanced queries](#)

[Save document instance data](#)

[Save interchange data](#)

[Search by date for interchange and document information](#)

[Search by document type for interchange and document information](#)

[Search by organization for interchange and document information](#)

# Concepts

This section provides detailed conceptual information that is essential to understanding tracking documents and monitoring activities.

The following topics are covered in this section:

- [BizTalk Document Tracking Environment](#)
- [Using BizTalk Document Tracking](#)
- [Understanding the Tracking Database Schema](#)
- [Understanding How to Find Interchanges and Associated Documents](#)
- [Understanding Query Results](#)
- [Understanding Integrated XLANG Schedule Status for an Interchange](#)

## Note

- A dialog box with the following message might appear during selection or query selection:

This page accesses data on another domain. Do you want to allow this?

To avoid this message in Internet Explorer, you can add a secure Web site to the Trusted site zones on the Security tab of the Internet Options dialog box.

To manually configure your browser's settings to trust this Web application, add the Web application to the list of trusted sites in Internet Explorer. For more information about adding the Web application to the list of trusted sites, see [Configure Internet Explorer security settings](#).

# BizTalk Document Tracking Environment

The following topics are covered in this section:

- [BizTalk Document Tracking User Interface](#)
- [BizTalk Document Tracking Shortcut Keys](#)

# BizTalk Document Tracking User Interface

BizTalk Document Tracking is a stand-alone Web application that you can use to view interchanges and documents that you configured to be tracked in Microsoft BizTalk Server. The main page contains six areas:

- **Date Range**
- **Source Selection**
- **Destination Selection**
- **Advanced Query**
- **Sort Control**
- **Document Type Selection**

You can configure query parameters in the **Date Range**, **Source Selection**, **Destination Selection**, and **Document Type Selection** areas.

The lower-left side of the page contains the **Advanced Query** and **Sort Control** areas. Configure parameters in the **Advanced Query** area to find specific information or custom search fields. Configure options in the **Sort Control** area to specify the sort order on the **Query Results** page.

When you click the **Query** button on the main page, the **Query Results** page appears. If any records in the [Tracking database](#) match your query parameters, interchange records appear in a list. The following table lists and describes the icons that are available on the **Query Results** page.

Click the icon	To
	Access the interchange or document instance data. If you click the data icon in the interchange record, the interchange data appears. If you click the data icon in the document-instance record, the document data appears.
	Expand the interchange record to view the document instance record.
	Collapse the interchange record to hide the document instance record.
	View the XLANG schedule status related to an interchange.
	View a new <b>Query Results</b> page to view the receipt contents. For more information about receipt results, see <a href="#">Understanding Receipt Results</a> .
	View the custom search data.

# BizTalk Document Tracking Shortcut Keys

You can use shortcut keys to accomplish tasks in BizTalk Document Tracking. The following table is a quick reference to the shortcut keys available on the main page.

## Note

- Functionality that is not included in this list can be obtained by using the numeric keypad to move the mouse pointer with MouseKeys. For more information about MouseKeys in Windows 2000 Server Help, see "Using the keyboard to move the mouse pointer". In Windows 2000 Professional Help, see "To move the mouse pointer by using MouseKeys".

Press	To
ALT+N	Open the <b>Advanced Query Builder</b> page.
ALT+B	Open the <b>Advanced Queries</b> page.
ALT+C	Clear the advanced query from the current query session.
ALT+S	Select all organizations and applications in the <b>Source Selection</b> list.
ALT+R	Clear the <b>Source Selection</b> list.
ALT+E	Select all organizations and applications in the <b>Destination Selection</b> list.
ALT+A	Clear the <b>Destination Selection</b> list.
ALT+W	Show all document types in the <b>Document Type Selection</b> list.
ALT+T	Select all document types in the <b>Document Type Selection</b> list.
ALT+L	Clear the <b>Document Type Selection</b> list.
ALT+Q	Open the <b>Query Results</b> page.
ALT+O	Close BizTalk Document Tracking.
ALT+H	View online Help.
ALT+Underlined letter or number of a field name	Move the focus to that particular field. For example, ALT+1 moves the focus to <b>Sort order 1</b> .

The following table lists and describes the shortcut keys available on the **Query Results** page. To open the **Query Results** page, on the main page press ALT+Q.

Press	To
ALT+C	Close the <b>Query Results</b> page.
ALT+H	View online Help
SPACEBAR	Open or close an icon. You must use the TAB key to place the focus on the icon that you want to open or close. For example, if you want to expand an interchange record, press TAB until the focus is on the expand icon for the selected interchange record. Then press SPACEBAR.

The following table lists and describes the shortcut keys available on the **Advanced Query Builder** page. To open the **Advanced Query Builder** page, on the main page press ALT+N.

Press	To
ALT+N	Add a condition to the advanced query expression.
ALT+E	Edit a condition.
ALT+R	Remove a condition from an advanced query expression.
ALT+S	Save the expression.
ALT+O	Limit the use of the expression to the current query session.
ALT+C	Close the <b>Advanced Query Builder</b> page.
ALT+H	View online Help.
ALT+Underlined letter of a field name	Move the focus to that particular field. For example, ALT+V moves the focus to the <b>Value</b> field.

## Note

- If you move the focus to the **Query** area and there is more than one condition in the **Query** area, use the UP and DOWN arrow keys to select the desired condition.

The following lists and describes the shortcut keys available on the **Advanced Queries** page. To open the **Advanced Queries** page, on the main page press ALT+B.

<b>Press</b>	<b>To</b>
ALT+E	Edit an existing expression.
ALT+N	Open the <b>Advanced Query Builder</b> page.
ALT+D	Delete an expression.
ALT+O	Add the expression to the current query.
ALT+C	Close the <b>Advanced Queries</b> page without saving your changes.
ALT+H	View online Help.

# Using BizTalk Document Tracking

You can use BizTalk Document Tracking to do the following:

- Track [interchanges](#) and associated documents processed by Microsoft BizTalk Server 2000.
- Fulfill legal and/or standards requirements to keep copies of all electronic business [transactions](#).
- Answer customer questions quickly and easily. For example, if a customer asks "When did we send trading partner A an invoice?", you can locate the date, time, and whether they returned a receipt.
- Aid in troubleshooting.
- Help resolve disputes.

Documents can be tracked either in batches or as single transactions. BizTalk Document Tracking automatically stores metadata associated with an interchange, such as source and destination information, document type, and date and time parameters. Metadata is stored automatically; however additional fields, such as Purchase Order Date or Purchase Order Total, are captured only if you configure the BizTalk Messaging Configuration object model or BizTalk Messaging Manager to capture this information. For more information about configuring selected fields to be tracked, see [Set Channel Properties](#) or [Set Tracking for Inbound Document Properties](#).

All tracking information—either the metadata or the fields that you configured to be tracked—is stored in the [Tracking database](#) that you configured during installation or when you configured a [server group](#). Through the BizTalk Document Tracking user interface (UI), you can access the data stored in the Tracking database associated with a particular server group. While not all the information that is stored in the Tracking database is available through the user interface, the metadata and the fields that you configured to be tracked are readily available. For example, if you need to track when purchasing application C sent a purchase order to trading partner D and if and when trading partner D responded to the purchase order, this can be accomplished by using BizTalk Document Tracking.

The following topics are covered in this section:

- [Understanding Tracking Settings for a Server Group](#)
- [Understanding Tracking Settings in BizTalk Messaging Manager](#)

## Note

- Reliable messaging receipts are not displayed in the BizTalk Document Tracking user interface.

## Related Topics

[Set Channel Properties](#)

[Set Tracking for Inbound Document Properties](#)

[Tracking Database](#)

# Understanding Tracking Settings for a Server Group

Tracking settings for a [server group](#) determines whether tracking of interchanges is enabled or disabled. This global tracking setting is configured in BizTalk Server Administration. For more information about configuring tracking settings for a server group, see [Configure tracking properties for a server group](#). If the **Enable document tracking** option is selected, you can configure BizTalk Server to log incoming interchanges, log outgoing interchanges, and/or log the original MIME-encoded messages.

When you install Microsoft BizTalk Server 2000, document tracking is automatically enabled, the log incoming interchange and log outgoing interchange options are selected, and the metadata for interchanges is tracked, such as:

- Source organization information
- Destination organization information
- Document type
- Date and time the interchange was processed by BizTalk Server
- Document count
- Error information
- Control ID

In addition to tracking interchanges, you can also configure BizTalk Server to track specific fields, such as Purchase Order Total or Invoice Total. For more information about tracking specific fields, see [Understanding Tracking Settings in BizTalk Messaging Manager](#). If you need to keep a copy of interchanges in their original format for nonrepudiation and commerce law concerns, use the global tracking settings. If you want to create an audit trail for internal purposes, or if you want easy access to data on a per-document basis, configure tracking settings in the BizTalk Messaging Configuration object model or in BizTalk Messaging Manager. You can configure tracking settings in the BizTalk Messaging Configuration object model or in BizTalk Messaging Manager and BizTalk Server Administration; however, this can cause your Tracking database to grow quickly in size and you will store duplicate data.

## Disabling BizTalk Document Tracking settings

If you have absolutely no need to track documents, you can disable BizTalk Document Tracking. However, if you disable document tracking, you lose important functionality. For example, if document tracking is disabled, you cannot:

- Track interchanges and associated documents as they pass through BizTalk Server 2000.
- Fulfill legal and/or standards requirements to keep copies of all electronic business transactions.
- Answer customer questions quickly and easily. For example, if a customer asks "When did we send trading partner A an invoice?", you cannot locate the date, time, and whether they returned a receipt.
- Aid in troubleshooting.
- Help resolve disputes.

To enable or disable document tracking, or to change global tracking settings, use BizTalk Server Administration. For more information about configuring tracking settings for a server group, see [Configure tracking properties for a server group](#).

### Notes

- To open BizTalk Server Administration, on the **Start** menu, point to **Programs**, point to **Microsoft BizTalk Server 2000**, and then click **BizTalk Server Administration**.
- There is a size limit for tracking interchanges and documents. For more information about the size limit, see [Interchange and document size limit](#).

## **Related Topics**

[Configure tracking properties for a server group](#)

[Interchange and document size limit](#)

[Open BizTalk Server Administration](#)

[Understanding Tracking Settings in BizTalk Messaging Manager](#)

# Understanding Tracking Settings in BizTalk Messaging Manager

Configure tracking settings in [BizTalk Messaging Manager](#) if you need to:

- Store complete copies of incoming and outgoing document instances.
- Configure specific fields, such as Purchase Order Total or Purchase Order Date, to be captured.

Unlike tracking properties for a [server group](#), tracking specific fields or storing copies of document instances is not automatically enabled. You must configure these options when you configure the appropriate channel(s) and/or document definition(s) in BizTalk Messaging Manager.

For more information about storing copies of incoming or outgoing document instances, see [Set document logging properties](#). For more information about tracking specific fields, see [Select specification fields in a channel](#).

## Notes

- To open BizTalk Messaging Manager, on the **Start** menu, point to **Programs**, point to **Microsoft BizTalk Server 2000**, and then click **BizTalk Messaging Manager**.
- There is size limit for tracking and storing documents. For more information about the size limit, see [Interchange and document size limit](#).

## Related Topics

[Interchange and document size limit](#)

[Select specification fields in a channel](#)

[Set document logging properties](#)

[Understanding Tracking Settings for a Server Group](#)

# Understanding the Tracking Database Schema

All servers in a server group share a single Tracking database that stores all information related to interchange and document activity in BizTalk Server. The Tracking database is used to track the status of an interchange or document as it moves through the server. The three main tables in the Tracking database are:

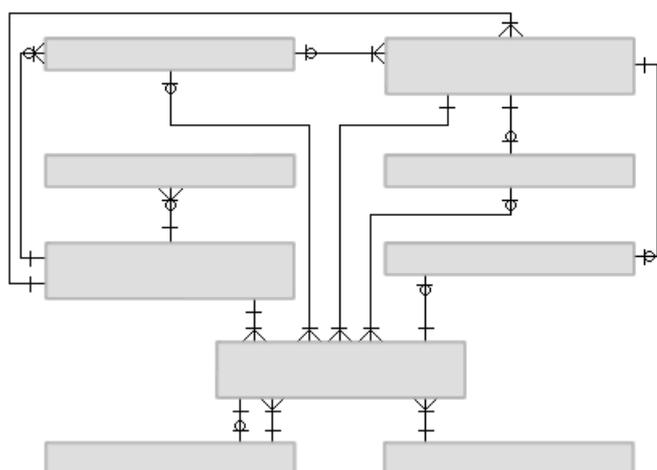
- dta\_interchange\_details
- dta\_outdoc\_details
- dta\_indoc\_details

The supporting tables are:

- dta\_group\_details
- dta\_interchange\_data
- dta\_document\_data
- dta\_debug\_data
- dta\_routing\_details
- dta\_custom\_field\_names
- dta\_MIME\_data

The following illustration shows the overall database schema of the Tracking database. For clarity, only the table names are listed in the following illustration. The lines that connect the tables together demonstrate how the tables are connected through foreign key fields. These key fields and their relationships to other tables are described in detail in the topics [Metadata Core Table Structure](#) and [Structure of Secondary Tables](#).

## Tracking database schema



- dta\_group\_details
- dta\_indoc\_details  
(core table)
- dta\_document\_data
- dta\_routing\_details
- dta\_custom\_field\_names
- dta\_outdoc\_details  
(core table)
- dta\_interchange\_details  
(core table)
- dta\_interchange\_data

dta\_debugdoc\_data

The following topics are covered in this section:

- [Metadata Core Tables](#)
- [Secondary Tables](#)
- [Metadata Core Table Structure](#)
- [Structure of Secondary Tables](#)
- [Related Tables](#)
- [How Interchanges and Documents Are Logged](#)
- [How Receipts Are Logged](#)
- [How Routing Information Is Logged](#)
- [Tracking XLANG Schedule Events in the Tracking Database](#)

# Metadata Core Tables

The core tables store the metadata for interchanges processed by BizTalk Server. Metadata includes source and destination organization information, document type, date and time the interchange was processed, document count, error information, control identification, and so on.

The following three tables form the metadata core of the Tracking database:

- dta\_indoc\_details
- dta\_outdoc\_details
- dta\_interchange\_details

The following table describes the function of each core table.

Table name	Description
dta_indoc_details	Contains one record for each document submitted to BizTalk Server.
dta_outdoc_details	Contains one record for each document generated by BizTalk Server. One document submitted to BizTalk Server could result in one or more documents generated and delivered to a set of respective destinations due to multiple channel matching and port groups. Separation of in and out documents into two tables allows physical representation of this one-to-many relationship.
dta_interchange_details	Contains one record for each interchange processed by BizTalk Server. A direction flag on this table distinguishes submissions from transmissions.

## Related Topic

[Metadata Core Table Structure](#)

# Secondary Tables

The seven secondary tables that support the metadata core tables are:

- dta\_document\_data
- dta\_debugDoc\_data
- dta\_interchange\_data
- dta\_routing\_details
- dta\_group\_details
- dta\_custom\_field\_names
- dta\_MIME\_data

These tables store supporting information, such as document data, routing information, custom search information, and so on. The following table describes the function of each table.

Table name	Description
dta_document_data	Contains one record for every document submitted to or sent by BizTalk Server.
dta_debugDoc_data	Contains one row for every inDoc or outDoc item that is configured (on the messaging channel object) to record its interim XML format.
dta_interchange_data	Contains one row for every interchange submitted to or sent by BizTalk Server. This table also stores any response documents returned to the <b>Interchange::SubmitSync</b> calling application.
dta_routing_details	Functions as a mirror of messaging ports for the purpose of eliminating a cross-database dependency on the <a href="#">BizTalk Messaging Management database</a> . Specifically, it is necessary to track source and destination information relating to documents handled. This information, which comes from the BizTalk Messaging Management database, is repeated here as new permutations are encountered.
dta_group_details	Provides extensibility components (parser, serializer, and receipt correlator) for document formats that employ like-kind document groups (for example, X12 or EDIFACT) within an interchange. This table contains one row for each group parsed or serialized by these components.
dta_custom_field_names	Contains a row for each distinct capture-field node name and data type pair encountered by BizTalk Server. This table is a cross-reference for the dta_outdoc_details table, which uses a foreign key into this table for its capture field names. The dta_indoc_details table is connected to this set of field names indirectly by the existence of a foreign key pointed from the dta_outdoc_details table to its parent in the dta_indoc_details table.
dta_MIME_data	Contains one row for every MIME-encoded interchange submitted to BizTalk Server. This table provides a way for tracking MIME data that contains attachments.

## Related Topic

[Structure of Secondary Tables](#)

# Metadata Core Table Structure

The metadata core tables are linked together as described in this section and store the metadata for all interchanges processed by BizTalk Server, if tracking settings are configured. For more information about configuring tracking settings for a server group, see [Understanding Tracking Settings for a Server Group](#).

## dta\_indoc\_details

This table has a one-to-many relationship with the following table:

- dta\_outdoc\_details

This table has a many-to-one relationship with the following tables:

- dta\_group\_details
- dta\_interchange\_details
- dta\_error\_message
- dta\_validity\_values

This table has a one-to-one relationship with the following tables:

- dta\_debugDoc\_data
- dta\_document\_data
- dta\_error\_message

The dta\_indoc\_details table contains one row per document submitted to BizTalk Server. The following table describes the fields in the dta\_indoc\_details table.

Field name	Description
nInDocKey	Primary key unique record identifier.
nDocumentD ataKey	Foreign key to dta_document_data.
nDebugDocD ataKey	Foreign key to dta_debugDoc_data for XML form of the received document, even if the received document is XML.
nGroupKey	Foreign key to dta_group_details.
nInterchange Key	Foreign key to dta_interchange_details.
uidTrackingG UID	Master tracking key value based on a globally unique identifier (GUID).
dtProcessedTi meStamp	The time the record was created.
nvcSyntax	Code for document syntax (XML,X12,EDIFACT, HL7, and so on). In the case of unrecognized syntax due to parsing failure or <a href="#">pass-through submission</a> , this field has a value of "UNKNOWN".
nvcVersion	Version of the syntax.
nvcRelease	Release of the version.
nvcDocType	Document type or transaction set identifier.
nvcControlID	Unique control number for <a href="#">electronic data interchange (EDI)</a> documents and functional groups.
nIsValid	Code that indicates validation results. Possible values are 0 (invalid), 1 (valid), or 2 (pass-through).
nError	Code that indicates the occurrence of an error. This is the foreign key to dta_error_message, the table that contains the descriptions of the error messages.

## dta\_outdoc\_details

This table has a many-to-one relationship with the following tables:

- dta\_indoc\_details
- dta\_interchange\_details
- dta\_group\_details
- dta\_debugDoc\_data
- dta\_routing\_details
- dta\_error\_message
- dta\_ack\_status
- dta\_data\_level\_values
- dta\_validity\_values

This table has a one-to-one relationship with the following tables:

- dta\_document\_data
- dta\_error\_message

This table has a many-to-many relationship with the following tables:

- dta\_custom\_field\_names
- dta\_ack\_status\_values

The dta\_outdoc\_details table contains one row per document sent by BizTalk Server. The following table describes the fields in the dta\_outdoc\_details table.

Field name	Description
nOutDocKey	Primary key unique record identifier.
nInDocKey	Foreign key to the dta_indoc_details parent record.
nDocumentDataKey	Foreign key to the dta_document_data table.
nDebugDocDataKey	Foreign key to dta_debugDoc_data for XML form of the outgoing document, even if the outgoing document is XML. When an outbound document is sent to a port group, only one copy of the dta_debugDoc_data record is stored, and all resulting dta_outdoc_details records point to it.
nGroupKey	Foreign key to the dta_group_details table.
nInterchangeKey	Foreign key to the dta_interchange_details table.
uidTrackingGUID	Master tracking key value based on a globally unique identifier (GUID).
dtProcessedTimestamp	The time the record was created.
nvcSyntax	Code for document syntax (XML, X12, EDIFACT, HL7, and so on). In the case of unrecognized syntax due to parsing failure or pass-through submission, this field has a value of "UNKNOWN".
nvcVersion	Version of the syntax.

nvcRelease	Release of the version.
nvcDocType	Document type or transaction set identifier.
nvcControlID	Unique control number for EDI documents and functional groups.
nlsValid	Code that indicates validation results. Possible values are 0 (invalid), 1 (valid), or 2 (pass-through).
nError	Code that indicates the occurrence of an error. This is a foreign key to dta_error_message, the table that contains the error message descriptions.
nAckStatus	Code for the status of the receipt. This is a foreign key to dta_ack_status_values, the table that contains the receipt status descriptions.
nRoutingKey	Foreign key to dta_routing_details.
nReceiptFlag	A flag that indicates to which table a receipt is associated. Possible values are 1 (Interchange), 2 (Group), 4 (indoc), 8 (outdoc). For more information about receipts, see <a href="#">How Receipts Are Logged</a> .
nReceiptKey	A unique number that identifies the receipt. For more information about receipts, see <a href="#">How Receipts Are Logged</a> .
ntReceiptDueBy	Receipt deadline timestamp, computed to be the processing timestamp.
nRealName1	Foreign key to dta_custom_field_names.
rlRealValue1	Real capture field 1. This field must be an 8-byte real value.
nRealName2	Foreign key to dta_custom_field_names.
rlRealValue2	Real capture field 2. This field must be an 8-byte real value.
nIntName1	Foreign key to dta_custom_field_names.
nIntValue1	Integer capture field 1.
nIntName2	Foreign key to dta_custom_field_names.
nIntValue2	Integer capture field 2.
nDateName1	Foreign key to dta_custom_field_names.
dtDateValue1	Date capture field 1.
nDateName2	Foreign key to dta_custom_field_names.
dtDateValue2	Date capture field 2.
nStrName1	Foreign key to dta_custom_field_names.
nvcStringValue1	String capture field 1.
nStrName2	Foreign key to dta_custom_field_names.
nvcStringValue2	String capture field 2.
nvcCustomSearch	Binary large object for concatenated string capture as XML.

## dta\_interchange\_details

This table has a one-to-many relationship with the following tables:

- dta\_indoc\_details
- dta\_outdoc\_details
- dta\_group\_details
- dta\_interchange\_data

This table has a many-to-one relationship with the following tables:

- dta\_direction\_values
- dta\_error\_message
- dta\_transport\_type\_values

The dta\_interchange\_details table contains one row per interchange processed by BizTalk Server. The following table describes the fields in the dta\_interchange\_details table.

Field name	Description
nInterchangeKey	Primary key unique record identifier.
nInterchangeDataKey	Foreign key to dta_interchange_data.
nResponseDocDataKey	Foreign key to dta_document_data for the response document returned by the recipient of an outbound transport.
uidInterchangeGUID	Globally unique identifier (GUID) for the interchange.
uidSubmissionGUID	Globally unique identifier (GUID) for the parent submission. Note that this holds the correlation identifier (correlationID) provided from or to <a href="#">BizTalk Orchestration Services</a> . This field is empty if the record is for an inbound interchange that does not come from BizTalk Orchestration Services. For inbound interchanges, this field is populated only if the interchange comes from BizTalk Orchestration Services. For outbound interchanges, this field is always populated.
dtProcessedTimeStamp	The time the record was created.
nvcSyntax	Code for document syntax (XML, X12, EDIFACT, HL7, and so on). In the case of unrecognized syntax due to parsing failure or pass-through submission, this field has a value of "UNKNOWN".
nvcVersion	Version of the syntax.
nvcControlID	Unique control number for electronic data interchange (EDI) interchanges or an identifier for BizTalk Reliable Messages.
nDirection	Flag indicating whether the interchange is incoming or outgoing. Possible values are 0 (outbound) or 1 (inbound). This is a foreign key to dta_direction_values, the table that contains the direction values.
dtTimeSent	Timestamp for a successful transmission.
nError	A code that indicates the occurrence of an error. This is a foreign key to dta_error_message, the table that contains the error message descriptions.
nTestMode	Test or production indicator. This field is reserved and is not used.

nvcSrcAliasQualifier	Sender qualifier value extracted from the submitted or transmitted interchange.
nvcSrcAliasId	Sender identifier value extracted from the submitted or transmitted interchange.
nvcSrcAppName	Interchange level identifier for the source application extracted from the submitted or transmitted interchange.
nvcDestAliasQualifier	Recipient qualifier extracted from the submitted or transmitted interchange.
nvcDestAliasID	Recipient identifier value extracted from the submitted or transmitted interchange.
nvcDestAppName	Interchange level identifier for the destination application extracted from the submitted or transmitted interchange.
nAckStatus	Code for the status of the receipt. This is a foreign key to dta_ack_status_values, the table that contains the receipt status descriptions.
nvcSMTPMessageID	SMTP transport message identifier (for EDIINT). This field is reserved and is not used.
nDocumentsAccepted	The number of documents accepted in the interchange.
nDocumentsRejected	The number of documents rejected in the interchange.
nTransportType	Transmission protocol indicator code. This is a foreign key to dta_transport_type_values.
nvcTransportAddress	Address of the transport target.
nvcServerName	Server that processed the interchange.
nNumberOfBytes	Size of the interchange, in bytes. This field represents what is tracked in the related dta_interchange_data record and can be different than what is actually transmitted. The size can be increased by additional envelope processing and data format conversion during transmission.
nNumberOfTransmissionAttempts	Transmission attempt counter.

## Related Topic

[Understanding Tracking Settings for a Server Group](#)

# Structure of Secondary Tables

The secondary tables store the supporting data for the core tables in the Tracking database. For example, the secondary tables store information such as:

- Custom-field search data
- Routing information
- Interchange data
- Document data

## **dta\_document\_data**

This table has a one-to-one relationship with the following tables:

- dta\_indoc\_details
- dta\_outdoc\_details

The dta\_document\_data table is the central repository for document storage. The following table describes the fields in the dta\_document\_data table.

Field name	Description
nDocumentDataKey	Primary key unique record identifier.
nCodePage	The system code page (for example, 1200-Unicode, 65001-UTF-8, and so on) for the character-encoded stored data. This field has a value of -1 if BizTalk Server does not have any code page information about the data. In this case, the value of the nBLOBType field might provide information about how to interpret the data.
nBLOBType	Flag that indicates the type of data stored in the imgDocumentData field. Possible values are 0 (Unknown) or 1 (XMLDOM Loadable). XMLDOM Loadable indicates that the data can be loaded into and manipulated by the MSXML DOMDocument object. This field is a foreign key to dta_blobtype_values.
imgDocumentData	Storage of a document, as a binary large object.
nNumberOfBytes	The size of the document, in bytes.
nNumberOfRecords	Records or segments comprised in the document.

## **dta\_debugDoc\_data**

This table has a one-to-one relationship with the following table:

- dta\_indoc\_details

This table has a one-to-many relationship with the following table:

- dta\_outdoc\_details

This table is a central repository for debug document storage. The following table describes the fields in the dta\_debugDoc\_data table.

Field name	Description
------------	-------------

nDebugDocDataKey	Primary key unique record identifier.
ntxtDocumentData	Storage of the document, as a binary large object. This is always in Unicode.
nNumberOfBytes	Size of the document, in bytes.
dtProcessEndTimeStamp	The time that the record was created. This is used by the purge job sample located in \Program Files\Microsoft BizTalk Server\SDK\Messaging Samples\SQLServerAgentJobs\DTA_SampleJobs.sql in the BizTalk Server installation directory.

## dta\_interchange\_data

This table has a many-to-one relationship with the following table:

- dta\_interchange\_details

The dta\_interchange\_data table is a central repository for interchange storage and contains one record for each interchange processed by the system. For interchanges submitted to BizTalk Server only, the nlsFile field indicates whether the stored data originally came from the file system. If the flag is set, the nvcOriginalFileName field is a universal naming convention (UNC) path to the file system location where the data originated. The imgInterchangeData field holds the data submitted, regardless of its origination.

Field name	Description
nInterchangeDataKey	Primary key unique record identifier.
nCodePage	The system code page (for example, 1200-Unicode, 65001-UTF-8, and so on) for the character-encoded stored data. This has a value of -1 if BizTalk Server does not have any code page information about the data, or if the data is tracked as a result of a pass-through submission. In this case, the value of the nBLOBType field might provide information about how to interpret the data.
nlsFile	Flag indicating file-based data submission. Possible values are 0 (non-file-based) or 1 (file-based).
nvcOriginalFileName	Universal naming convention (UNC) path to the file, if the nlsFile field has a value of 1.
nBLOBType	Flag that indicates the type of data stored in the imgDocumentData field. Possible values are 0 (Unknown) or 1 (XMLDOM Loadable). XMLDOM Loadable indicates that the data can be loaded into and manipulated by the MSXML DOMDocument object. This field is a foreign key to dta_blobtype_values.
imgInterchangeData	Storage of the interchange, as binary large object.

## dta\_group\_details

This table has a one-to-many relationship with the following tables:

- dta\_indoc\_details
- dta\_outdoc\_details

This table has a many-to-one relationship with the following tables:

- dta\_interchange\_details
- dta\_direction\_values

The dta\_group\_details table creates one row per group processed by extensibility components for electronic data interchange

(EDI). The following table describes the fields in the dta\_group\_details table.

Field name	Description
nGroupKey	Primary key unique record identifier.
nInterchangeKey	Foreign key to dta_interchange_details.
dtProcessedTimeStamp	The time the record was created.
nvcSyntax	Code for document syntax ( <a href="#">XML</a> , <a href="#">X12</a> , <a href="#">EDIFACT</a> , HL7, and so on). In the case of unrecognized syntax due to parsing failure or pass-through submission, this field has a value of "UNKNOWN".
nvcVersion	Version of the standard.
nvcRelease	Release of the version.
nvcFunctionalGroupID	Code for type of documents in the group.
nvcControlID	Unique control number for <a href="#">electronic data interchange (EDI)</a> documents and functional groups.
nvcSrcAppName	Group level identifier for the source application.
nvcDestAppName	Group level identifier for the destination application.
nAckStatus	Code for the status of the receipt. This is a foreign key to dta_ack_status_values, the table that contains the receipt status descriptions.
nDirection	Flag that indicates whether the group was incoming or outgoing. Possible values are 0 (outbound) or 1 (inbound). This is a foreign key to dta_direction_values.
nDocumentsAccepted	<a href="#">Transactions</a> accepted in the group.
nDocumentsRejected	Transactions rejected in the group.
nNumberOfBytes	Size of the interchange, in bytes.

## dta\_routing\_details

This table has a one-to-many relationship with the following table:

- dta\_outdoc\_details

The dta\_routing\_details table contains one row per distinct source or destination information set. Two documents might have identical routing field values at the organization or application level. In this case, these documents are differentiated by document type or some other lower-level filter. When this happens, the dta\_routing\_details table contains rows that are identical except for a difference in their respective parent messaging ports. This link to the parent messaging port is used to facilitate a connection between the BizTalk Messaging Manager user interface functionality and tracking. The following table describes the fields in the dta\_routing\_details table.

Field name	Description
nRoutingKey	Primary key unique record identifier.
nvcSrcOrgName	Source organization name, as specified on the parent <a href="#">channel</a> object.
nvcSrcAppName	Source application name, as specified on the parent channel object.
nvcDestOrgName	Destination organization name, as specified on the parent messaging port object.
nvcDestAppName	Destination application name, as specified on the parent port object.
nvcDistributionName	<a href="#">Distribution list</a> name.
uidChannelGUID	Unique key for the parent channel based on a globally unique identifier (GUID). This is used as a channel correlation key into the BizTalk Messaging Management database.
uidPortGUID	Unique key for the parent port based on a globally unique identifier (GUID). This is a port correlation key into the BizTalk Messaging Management database.

## dta\_custom\_field\_names

This table has a many-to-one relationship with the following table:

- dta\_outdoc\_details

The dta\_custom\_field\_names table contains one row per distinct node name and data type pair captured. The following table describes the fields in the dta\_custom\_field\_names table.

Field name	Description
nNameKey	Primary key unique record identifier.
nvcName	Text of the node name, for example, /CommonPO/Total/@POTotal.
nDataType	Data type contained in the node named.

## dta\_MIME\_data

The dta\_MIME\_data table stores the incoming MIME data processed by BizTalk Server. This provides a way to track MIME data that contains attachments. The following table describes the fields in the dta\_MIME\_data table.

Field name	Description
nMIMEDataKey	Primary key unique record identifier.
uidSubmission GUID	Globally unique identifier (GUID) for the parent submission.
nCodePage	System code page for character-encoded stored data in the imgMIMEData field. For MIME data, the value is 1252 (ASCII) or 1200 (Unicode).
imgMIMEData	Storage of the document as a binary large object.

## Related Tables

There are 13 additional tables in the Tracking database that support the core tables or the supporting tables. These tables store information such as group and interchange correlation keys, receipt status values, data level values, and so on. The following table describes each table and its functionality.

Table name	Function
dta_ack_status_values	Stores the receipt status values. Possible values are None, Pending, Overdue, Accepted, Accepted with errors, and Rejected.
dta_blob_type_values	Stores the binary large object types. Possible values are Unknown and XMLDOM Loadable.
dta_data_level_values	Stores the data level values used in BizTalk Server. Possible values are Interchange, Group, Incoming Document, and Outgoing Document.
dta_direction_values	Stores the direction of the interchange. Possible values are incoming and outgoing.
dta_error_message	Stores the error messages used in BizTalk Document Tracking. Possible values are No error, a custom component could not be called, the interchange could not be parsed, the specified channel does not exist, the interchange could not be serialized, the interchange could not be encoded, the interchange could not be signed, the interchange could not be encrypted, the transmission attempt failed (a retry is pending), the last transmission attempt failed, the document could not be parsed, the document could not be validated, a valid channel could not be found, the document could not be parsed, the document could not be validated, a valid channel could not be found, the document could not be mapped, a valid messaging port could not be found, and the document could not be serialized.
dta_group_correlation_keys	Stores the group correlation keys. The values are dynamically generated for identifying possible group candidates during receipt correlation.
dta_interchange_correlation_keys	Stores the interchange correlation keys. The values are unique and dynamically generated for identifying possible group candidates during receipt correlation.
dta_transport_type_values	Stores the transport type values. Possible values are None, HTTP, SMTP, DCOM, App Integration, Message Queuing, File, HTTP, Open Destination, Loopback, and Orchestration Activity.

dta_ ui_c ode pag e_ch arse t	Stores the system code pages for character encoded data.
dta_ ui_u ser_ quer ies	Stores the advanced queries that individual users create and save.
dta_ valid ity_v alue s	Stores the validity values. Possible values are Not valid, Valid, and Pass-through. A value of Pass-through indicates that the document was not parsed and validity does not apply. For more information about pass-through, see <a href="#">Understanding Receive Function Advanced Properties</a> .
dta_ wf_E vent Data	Contains one record for each property logged in relation to a monitored COM+ event fired by an XLANG schedule. Sets of multiple rows in this table share a common parent in the dta_wf_WorkFlowEvent table.
dta_ wf_ Wor kFlo wEv ent	Contains one record for each monitored COM+ event fired by an XLANG schedule.

# How Interchanges and Documents Are Logged

Different processing scenarios, such as open source, open destination, and pass-through, are logged differently in the Tracking database. The six common processing scenarios are Not open, Open source, Open destination, [Loopback](#), [Pass-through](#), and Expect receipt and Generate receipt (Expect receipt and Generate receipt are considered one scenario). The Expect receipt and Generate receipt processing scenarios are described in [How Receipts Are Logged](#). The remaining processing scenarios are outlined in the following table.

Processing scenario	Description
Not open	Occurs when the source and destination are both explicitly declared in the receive function, the document instance, the <b>Submit</b> method, or the <b>SubmitSync</b> method.
Open source	Occurs when the source information is not explicitly declared in the channel. The channel must be marked as open source, and the submit call or the receive function must specify source openness.
Open destination	Occurs when the destination information is not explicitly declared in the messaging port. The destination is dynamically specified in the document instance, the <b>Submit</b> method, or the <b>SubmitSync</b> method. The port must be marked as open destination, and the submit call or the receive function must indicate destination openness.
Loopback	Occurs when loopback is the specified transport in a channel. Loopback returns the outbound document of a channel to a business application, component, or XLANG schedule that submitted the inbound document using the <b>SubmitSync</b> method. This transport type is available only for a messaging port that connects to an application and is available only through the <b>SubmitSync</b> method.
Pass-through	Occurs when you select the <b>Submit with a pass-through</b> option in the receive function or configure the <b>Pass-through</b> property in the <b>Submit</b> or the <b>SubmitSync</b> method. BizTalk Server does not process the document. This means that the document is not parsed, signed, decrypted, verified, and so on. The document is transported only by BizTalk Server.

The following table outlines what outgoing records are logged in the Tracking database.

Processing scenario	dta_interchange_details (outgoing)	dta_outdoc_details	Response document
Not open	X	X	X
Open source	X	X	X
Open destination	X	X	X
Loopback	X	X	
Pass-through	X	X	X

## Notes

- Response documents are generated only when you use the following transports: HTTP, HTTPS, or AIC. In addition, the recipient address must post return data.
- For the pass-through scenario, the record logged in the dta\_outdoc\_details table is an empty record. The nlsValid field has a value of 2 to designate that this record is associated with a pass-through document, and the nSyntax field has a value of "UNKNOWN". Because BizTalk Server does not process the document, BizTalk Server cannot populate most of the fields in this table with relevant data.

The following table outlines what incoming records are logged in the Tracking database.

Processing scenario	dta_interchange_details (incoming)	dta_indoc_details	Response document
Not open	X	X	X
Open source	X	X	X
Open destination	X	X	X
Loopback	X	X	
Pass-through	X	X	X

## Notes

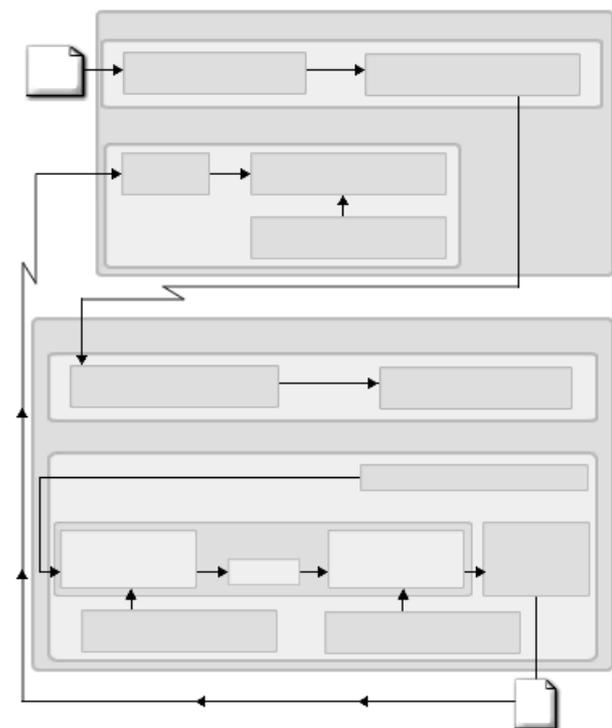
- Response documents are generated only when you use the following transports: HTTP, HTTPS, or AIC. In addition, the recipient address must post return data.
- For the pass-through scenario, the record logged in the dta\_indoc\_details table is an empty record. The nlsValid field has a value of 2 to designate that this record is associated with a pass-through document, and the nSyntax field has a value of "UNKNOWN". Because BizTalk Server does not process the document, BizTalk Server cannot populate most of the fields in this table with relevant data.

## **Related Topic**

[How Receipts Are Logged](#)

# How Receipts Are Logged

The following illustration shows the receipt flow in BizTalk Server.



Generate and send receipt  
Receive and correlate receipt  
Receive and process interchange

## Destination System

### Source System

Messaging port to  
Destination System

PO

Parser

Messaging

port to

Source

System

Outbound

document

definition

Receipt

Document

specification

Document

specification

Inbound

document

definition

Map

Receipt channel

Canonical receipt

Messaging port

to Application

Channel from

Source System

Document

specification

Receipt document

definition

Channel for PO  
Generate and send interchange

In this scenario:

- The source system and the destination system use Microsoft BizTalk Server 2000.
- The source system is sending a purchase order to the destination system, and the source system expects a receipt from the destination system for the purchase order.
- Both systems are configured to expect and generate receipts.

When the purchase order is processed by the source system and sent to the destination system, a record is logged in the dta\_outdoc\_details table. The following table shows what the fields relevant to receipts in that record might look like.

Field name	Sample value	Description
nOutDocKey	1	Is a unique number that identifies the record.
nAckStatus	1	Indicates that a receipt for the document is pending.
nReceiptFlag		Is not populated at this time.
nReceiptKey		Is not populated at this time.

When the destination system receives and processes the purchase order, a record is logged in the dta\_indoc\_details table and two records are logged in the dta\_outdoc\_details table. The record in the dta\_indoc\_details table tracks information relevant to the purchase order. The first record in the dta\_outdoc\_details table tracks information relevant to the purchase order and the second record tracks information relevant to the receipt for the purchase order.

The following table shows what the fields relevant to the purchase order in the record in the dta\_indoc\_details table might look like.

Field name	Sample value	Description
nInDocKey	1	Is a unique number that identifies the record.
nDocType	CommonPO	Identifies the type of document received.

The first record logged in the dta\_outdoc\_details table pertains to the purchase order processed by BizTalk Server. The following table shows what the fields relevant to receipts in that record might look like.

Field name	Sample value	Description
nOutDocKey	10	Is a unique number that identifies the record.
nInDocKey	1	Links the record to the parent record in the dta_indoc_details table.

The second record logged in the dta\_outdoc\_details table pertains to the receipt that is generated by the purchase order. The following table shows what the fields relevant to receipts in that record might look like.

Field name	Sample value	Description
nOutDocKey	2	Is a unique number that identifies the record.
nInDocKey	1	Links the record to the parent record in the dta_indoc_details table.
nAckStatus	0	Receipt does not expect a receipt in return.
nReceiptFlag	4	Indicates that the receipt is associated with a record in the dta_indoc_details table.
nReceiptKey	1	Is a unique number that identifies the receipt record.

When the source system receives the receipt generated by the destination system and a record is logged in the dta\_indoc\_details table, the original record logged in the dta\_outdoc\_details table is updated. The following table shows what the fields that pertain to receipts in the record in the dta\_indoc\_details table might look like.

Field name	Sample value	Description
nInDocKey	9	Is a unique number that identifies the record.
nDocType	997	Identifies the type of document received.

The following table shows what the fields that pertain to receipts in the updated record in the dta\_outdoc\_details table might look like.

<b>Field name</b>	<b>Sample value</b>	<b>Description</b>
nOutDocKey	1	Is a unique number that identifies the record.
nAckStatus	3	Indicates that a receipt was received.
nReceiptFlag	4	Indicates that the receipt is associated with a record in the dta_indoc_details table.
nReceiptKey	9	Is a unique number that identifies the receipt record.

## **Related Topic**

[How Interchanges and Documents Are Logged](#)

# How Routing Information Is Logged

The routing information logged in the Tracking database varies depending on whether the document is incoming or outgoing and how BizTalk Server processed the data. For inbound interchanges, when BizTalk Server receives a document, it views the document instance for routing information. Then, BizTalk Server checks the [receive function](#) or the routing parameters specified in **Interchange::Submit**. If routing information is provided in the receive function or **Interchange::Submit**, those parameters are used to route the document instance. However, the routing information supplied in the document instance is logged in the `dta_routing_details` table in the Tracking database.

For outbound interchanges, the source and destination routing information always comes from the channel, and this information is logged in the `dta_routing_details` table.

This affects what information is shown in the BizTalk Document Tracking user interface for alias information. It does not affect how interchanges submitted to and transmitted from BizTalk Server are related as a single data flow instance.

# Tracking XLANG Schedule Events in the Tracking Database

Action events related to [messages](#) processed by an [XLANG schedule](#) that are exchanged between [BizTalk Messaging Services](#) and [BizTalk Orchestration Services](#) can be tracked in the appropriate tables in the [Tracking database](#). The action events can be viewed by using [BizTalk Document Tracking](#). However, tracking and viewing action events related to messages processed by an XLANG schedule is not automatically enabled when you install BizTalk Server 2000. To enable this feature, you must complete the following steps:

1. Register the sample dynamic-link library (.DLL) file, WorkFlowAudit.dll.

You can find this sample file in the \Program Files\Microsoft BizTalk Server\SDK\XLANG Samples\WorkFlowAudit\bin folder.

2. Run the WorkFlowAuditClient.exe application, to activate WorkFlowAudit.dll.

You can find this sample application in the \Program Files\Microsoft BizTalk Server\SDK\XLANG Samples\WorkFlowAuditClient folder.

For additional information, you can view the documentation (Readme.txt) found in the \Program Files\Microsoft BizTalk Server\SDK\XLANG Samples\WorkFlowAudit\Docs folder.

3. Click the **Start** button in the WorkFlowAuditClient application to initiate the logging of action events related to an XLANG schedule in the Tracking database.

## ◆ Important

- Records are logged in the dta\_wf\_EventData and dta\_wf\_WorkFlowEvent tables only if the WorkFlowAuditClient application is started. To start the WorkFlowAuditClient application, you must complete the three steps listed in this topic. If the WorkFlowAuditClient is stopped, no records are logged in the dta\_wf\_EventData and dta\_wf\_WorkFlowEvent tables.

After you complete these steps, records are logged in the dta\_wf\_EventData and dta\_wf\_WorkFlowEvent tables for messages that are exchanged between BizTalk Orchestration Services and BizTalk Messaging Services. The value logged in the nvcName field in the dta\_wf\_EventData table serves as a link between the dta\_wf\_EventData and dta\_wf\_WorkFlowEvent tables and the dta\_interchange\_details table, a core table in the Tracking database. For more information about the core tables, see [Metadata Core Table Structure](#).

## Messages sent from BizTalk Orchestration Services to BizTalk Messaging Services

All messages that are sent from BizTalk Orchestration Services to BizTalk Messaging Services by using the [BizTalk Messaging port implementation](#) in BizTalk Orchestration Designer are identified by a globally unique identifier (GUID) called the correlation identifier (correlationID). When a message is submitted from BizTalk Orchestration Services to BizTalk Messaging Services, the correlationID is logged in the uidSubmissionGUID field in the dta\_interchange\_details table. In addition, records are logged in the dta\_wf\_EventData and dta\_wf\_WorkFlowEvent tables. This enables you to use BizTalk Document Tracking view the action events related to messages processed by an XLANG schedule.

## Documents sent from BizTalk Messaging Services to BizTalk Orchestration Services

All documents that are submitted to BizTalk Messaging Services are identified by a globally unique identifier called the submission handle (SubmissionHandle). For more information about the submission handle, see [Submit Method](#). When the document is sent from BizTalk Messaging Services to BizTalk Orchestration Services, the submission handle is recorded in the uidSubmissionGUID field in the dta\_interchange\_details table. In addition, when a document is sent from BizTalk Messaging Services to BizTalk Orchestration Services, the following two events occur:

- The submission handle is inserted into the **correlationID** property of the document that is sent to BizTalk Orchestration Services.
- Records are logged in the dta\_wf\_EventData and dta\_wf\_WorkFlowEvent tables. Because the document is sent from BizTalk Messaging Services, the submission handle is logged as the correlationID in the nvcName field in the dta\_wf\_EventData table.

## Viewing action events

To use BizTalk Document Tracking to view action events related to messages processed by an XLANG schedule, you must create a query in BizTalk Document Tracking and then click the XLANG schedule icon. For more information about how to create queries and view XLANG schedule events, see [Use Queries to Search and Sort Interchange and Document Data](#).

## The dta\_wf\_EventData table

The following table contains one record for each property logged in relation to a monitored COM+ event that is generated by an XLANG schedule. Sets of multiple rows in this table share a common parent in the dta\_wf\_WorkFlowEvent table.

Field name	Description
nEventDataId	Integer key field that is incremented automatically.
nWorkflowEventId	Foreign key to the parent event record in dta_wf_EventData.
nvcName	Correlation identifier (correlationID).
nvcValue	Any value. This is usually based on a globally unique identifier (GUID).

## The dta\_wf\_WorkFlowEvent table

The following table is the parent table to dta\_wf\_EventData and contains one record for each monitored COM+ event that is generated by an XLANG schedule.

Field name	Description
nWorkflowEventId	Integer key field that is incremented automatically.
nvcEventId	Type of event.
nvcEventName	Name of the event.
nProcessId	Process identifier for the originating event.
nvcApplicationId	XLANG schedule identifier.
nvcInstancelId	Identifier for the particular instance of the schedule.
nEventTime	Coordinated universal time (UTC) of the event as seconds elapsed since midnight, January 1, 1970.
nEventSubTime	Microseconds added to the <b>ITime</b> argument for time to a microsecond solution.
nEventTick	Value of the high-resolution performance counter when the event originated.
nvcServerName	Server on which the event was detected.
dtDateEntered	Date of the event.

## Related Topics

[Integrating BizTalk Services](#)

[Metadata Core Table Structure](#)

[Submit Method](#)

[Understanding Integrated XLANG Schedule Status for an Interchange](#)

# Understanding How to Find Interchanges and Associated Documents

You can use BizTalk Document Tracking to view all [interchanges](#) and documents using the query parameters that you specify. To maximize your search results and to minimize load on the server, it is important to understand queries and how to use them. For example, if you create a query with very few parameters defined, the query might return thousands of interchange records. This places a high demand on your time and on the server's processing capabilities. This situation is compounded if more than one person is querying the database at the same time.

There are two levels of queries in BizTalk Server: queries and advanced queries. Queries include the most common criteria that are used to narrow query results. Advanced queries allow you to further define query results by using expressions to search for specific data.

The following topics are covered in this section:

- [Understanding Queries](#)
- [Understanding Advanced Queries](#)

# Understanding Queries

The three standard query parameters included in BizTalk Document Tracking are date range and time zone, source and destination identifiers, and document type. You can find interchange and document records by defining one or more of these criteria in a query. For example, you can search for all document types in a specified date range. Or you can find interchanges and documents that are a certain document type and that match selected source and destination organizations.

## Date range and time zone

The date and time listed in BizTalk Document Tracking is the time that the document was processed by BizTalk Server. If you do not specify a date range for the query, the default date range is the previous seven business days. Unlike the **Source Selection**, **Destination Selection**, and **Document Type Selection** lists, you cannot leave the date range blank to search for documents for any date and time. You must always specify a date and time range in BizTalk Document Tracking.

You can also specify whether you want the date and time to display in local time or in coordinated universal time (UTC). Most often, you probably want to view interchanges and documents using local time. However, if you are working with someone who is in a different time zone and you need to create common criteria for defining when a document was sent or received, use coordinated universal time.

## Source and destination organization

You can search for interchanges and documents based on the [source organization](#), the [destination organization](#), or both. In addition, when you create a query you can filter for documents from one or more organizations or all organizations. You can also search for interchanges and documents that originate in an application associated with an organization. For example, if source organization A has a spreadsheet application that sends information to a database application in destination organization B, you can determine when the information was sent and received.

## Document type

You can search for interchanges and documents that have a specific document type, such as a purchase order or an invoice. In a query, you can combine document type criteria with source and destination qualifiers to find interchanges and documents sent and received between you and your trading partners. This type of query can help you analyze the business relationship between you and your trading partners.

## Sort control

There are six sort controls that determine in what order the columns on the **Query Results** page are sorted. The default sort order of a query is as follows:

- **Source organization name.** The name of the source organization for the document.
- **Source application name.** The name of the application in which the document originated.
- **Destination organization name.** The name of the destination organization for the document.
- **Destination application name.** The name of the application to which the document is being sent.
- **Document type.** The type of the document.
- **Time processed.** The time at which the document was processed by BizTalk Server.

## Related Topic

[Understanding Advanced Queries](#)

# Understanding Advanced Queries

If you find that a query returns too many interchange and document records, you can refine your search by implementing query expressions. In the **Advanced Queries** dialog box, you can create a new query expression in the **Advanced Query Builder** or browse through a list of query expressions that you previously saved. The expressions are SQL statements formed by the creation of conditional clauses that you add to the query. You have the following options to help you create an advanced query:

- **Source selection.** A list of the fields on which you want to search. In BizTalk Messaging Manager, if you configured a channel or document definition to track custom field(s), those fields appear in the **Source Selection** list. If you have not configured BizTalk Messaging Manager to track any fields, only "<Custom Search>" appears in the **Source Selection** list. For more information about tracking specific fields, see [Set document logging properties](#) and [Select specification fields in a channel](#).
- **Operators.** A list of the available operators (such as >, <, =, **contains**, or **does not contain**).
- **Value.** You can type a value in this box to indicate the boundary value for the advanced query.
- **AND/OR.** A list that contains the grouping operators (**AND** and **OR**) that are used to combine search conditions.
- **Query.** A list of the queries you created.
- **Logical grouping.** A description of the combined search conditions that you created by using the **AND** and **OR** grouping operators. When you add clauses to a query, information about grouping operators appears in the **Logical grouping** box. For example, the **Logical grouping** box might display the following:

1 **AND** 2 **AND** (3 **OR** 4)

In this example, conditions 1 and 2 apply, and either condition 3 or 4 is combined with conditions 1 and 2.

## Note

- You can have more than one query with the same name.

## Related Topic

[Understanding Queries](#)

# Understanding Query Results

Query results are organized on the **Query Results** page in two levels, interchange records and document records. The highest level of organization is interchange records. An interchange record represents an interchange submitted to or transmitted from BizTalk Server 2000. Interchange records are the parent records for document-instance records and thus help to organize the document-instance records in a meaningful way. For more information about what fields are included in an interchange record, see [Understanding Interchange Record Results](#). Graphically, interchange records appear as rows of data fields with an expand indicator icon at the left end of each row.

If you click the expand indicator icon, the document-instance record(s) appears. Graphically, the document-instance record(s) also appears as a row of data fields. Usually, there is one document-instance record per interchange record. However, if multiple document types are sent in a single interchange, there is a document record for each document type sent in the interchange. For more information about what fields are included in a document instance record, see [Understanding Document-Instance Record Results](#).

The following topics are covered in this section:

- [Tracking Database Schema Basics](#)
- [Understanding Interchange Record Results](#)
- [Understanding Document-Instance Record Results](#)
- [Understanding Receipt Results](#)
- [Understanding Results for Failed Transmissions](#)

# Tracking Database Schema Basics

To understand what appears on the **Query Results** page, it is important to have a basic understanding of the Tracking database schema. There are three core tables in the Tracking database that store the metadata (such as source and destination organization identifiers, date, time, and document type) for every interchange and document processed by BizTalk Server. The database tables are:

- [dta\\_interchange\\_details](#)
- [dta\\_indoc\\_details](#)
- [dta\\_outdoc\\_details](#)

## **dta\_interchange\_details**

The [dta\\_interchange\\_details](#) table stores all the relevant data for interchanges and is the parent table of the [dta\\_indoc\\_details](#) table and the [dta\\_outdoc\\_details](#) table. One record is stored in the table for each interchange processed by BizTalk Server. The fields in interchange records on the **Query Results** page are populated with data from this table. A field in this table designates whether the interchange is incoming or outgoing. For example, if you receive an interchange, it is represented on the **Query Results** page as an incoming interchange record. If you send an interchange, it is represented on the **Query Results** page as an outgoing interchange record. For more information about the [dta\\_interchange\\_details](#) table, see [Metadata Core Tables](#) or [Metadata Core Table Structure](#).

## **dta\_indoc\_details**

The [dta\\_indoc\\_details](#) table stores all data for every document submitted to BizTalk Server. This table is linked to the [dta\\_interchange\\_details](#) table through a primary key. The fields in document-instance records associated with incoming interchange records on the **Query Results** page are populated with data from this table. For example, if you send a document and you want to view the tracking information for that document on the **Query Results** page, you must first locate the appropriate outgoing interchange record. Then, expand the record and the document-instance record appears. That document-instance record is associated with the [dta\\_indoc\\_details](#) table and displays the data in the fields you configured to be tracked. For more information about the [dta\\_indoc\\_details](#) table, see [Metadata Core Tables](#) or [Metadata Core Table Structure](#).

## **dta\_outdoc\_details**

The [dta\\_outdoc\\_details](#) table stores all data for every document generated by BizTalk Server. There might be multiple records in the [dta\\_outdoc\\_details](#) table for every record in the [dta\\_indoc\\_details](#) table because multiple documents can be generated from a single submission. For example, a document submitted to BizTalk Server might be sent to a distribution list of 10 ports. In this case, a single record is logged in the [dta\\_indoc\\_details](#) table and 10 records are logged in the [dta\\_outdoc\\_details](#) table. Thus, one outgoing interchange record with an associated document-instance record appears on the **Query Results** page. The fields in the document-instance record are populated with data from the [dta\\_outdoc\\_details](#) table. For more information about the [dta\\_outdoc\\_details](#) table, see [Metadata Core Tables](#) or [Metadata Core Table Structure](#).

## **Related Topics**

[How Interchanges and Documents Are Logged](#)

[Metadata Core Tables](#)

[Metadata Core Table Structure](#)

[Understanding Document-Instance Record Results](#)

[Understanding Interchange Record Results](#)

[Understanding Receipt Results](#)

[Understanding Results for Failed Transmissions](#)

[Understanding the Tracking Database Schema](#)

# Understanding Interchange Record Results

Based on the query parameters that you specify, one or more interchange records are returned, if matches for your query criteria are found. An interchange record represents an interchange submitted to or transmitted from Microsoft BizTalk Server 2000.

An interchange contains the information shown in the following table.

Interchange column heading	Description
Data	Provides a link to view the interchange data in its native format.
Schedule	Provides a link to the <a href="#">XLANG schedule</a> status information for the individual interchange, if it is available. If there is no XLANG schedule status information associated with the interchange, the following message appears:  There is no schedule information available for this interchange.
Direction	Specifies whether the interchange is submitted to BizTalk Server (incoming) or sent from BizTalk Server (outgoing).
Error	Specifies if there are any errors associated with the document. Possible error messages are: <ul style="list-style-type: none"><li>• no error</li><li>• calling a custom component failed</li><li>• parsing of the interchange failed</li><li>• specified channel does not exist</li><li>• serialization of the interchange failed</li><li>• encoding of the interchange failed</li><li>• signing of the interchange failed</li><li>• encryption of the interchange failed</li><li>• transmission attempt failed (with retry pending)</li><li>• the last transmission attempt failed</li><li>• parsing of the document failed</li><li>• validation of the document failed</li><li>• unable to find a valid channel</li><li>• mapping of the document failed</li><li>• unable to find a valid port</li><li>• serialization of the document failed</li></ul>
Source Organization	Specifies the name of the <a href="#">source organization</a> .
Source Application	Specifies the application from which the document originated.
Destination Organization	Specifies the name of the <a href="#">destination organization</a> .

Destination Application	Specifies the <a href="#">destination application</a> for the document.
Document Type	Specifies the type of the document. If there is more than one document type in an interchange, "<Multiple>" appears in this field.
Document Count	Specifies the number of documents in the interchange.
Control ID	Specifies a unique control number for <a href="#">electronic data interchanges (EDI)</a> or an identifier for BizTalk reliable messages.
Receipt Status	Specifies the receipt status. Possible values for receipt status are: none, pending, overdue, accepted, accepted with errors, or rejected.
Time Processed	Indicates the time at which the interchange was processed. The time is set when the document tracking records are created. Once the field is set, it is not updated.
Time Sent	Specifies the time at which the interchange was sent if the transmission was successful. If the transmission is not successful, it is null. For inbound transmissions, this field is always null.
Source ID Qualifier	Specifies the type of source organization qualifier. This is the qualifier that BizTalk Server uses internally.
Source Identifier	Specifies the source organization identifier value. This is the source identifier as denoted in the data and is used to route the document. This is different from Source ID Qualifier. For more information about routing, see <a href="#">How Routing Information Is Logged</a> .
Destination ID Qualifier	Specifies the type of destination organization qualifier.
Destination Identifier	Specifies the destination organization identifier value. For more information about routing, see <a href="#">How Routing Information Is Logged</a> .

## Related Topics

[Tracking Database Schema Basics](#)

[Understanding Document-Instance Record Results](#)

[Understanding How to Find Interchanges and Associated Documents](#)

# Understanding Document-Instance Record Results

Document instance records in an interchange appear as a row of fields that describe the document information.

The document-instance record results contain the information shown in the following table.

Document column heading	Description
Data	Provides a link to view the data that is contained in the document instance in its native and XML format.
Tracking ID	Indicates a tracking key based on a globally unique identifier (GUID).
Document type	Specifies the type of document. If there are multiple documents in an interchange, this field specifies the document type. There is never more than one document type in this field. Additional document types appear as separate document-instance records.
Compliance	Indicates whether the document is valid. Possible values for compliance are valid or invalid.
Error	Specifies whether there are any errors associated with the document. Possible error messages are: <ul style="list-style-type: none"><li>• no error</li><li>• calling a custom component failed</li><li>• specified channel does not exist</li><li>• transmission attempt failed (with retry pending)</li><li>• the last transmission attempt failed</li><li>• parsing of the document failed</li><li>• validation of the document failed</li><li>• unable to find a valid channel</li><li>• mapping of the document failed</li><li>• unable to find a valid port</li><li>• serialization of the document failed.</li></ul>
Receipt	Provides a link to the receipt information.

The following fields apply only to outgoing documents.

Receipt Status	Specifies the receipt status. Possible values for receipt status are: none, pending, overdue, accepted, accepted with errors, or rejected.
Real 1, Real 2	Specifies data that has been captured from the document content as a real number. There are two fields that can contain real numbers.
Integer 1, Integer 2	Specifies data that has been captured from the document content as an integer value. There are two fields that can contain integers.
Date 1, Date 2	Specifies data that has been captured from the document content as a date value. There are two fields that can contain dates.
String 1, String 2	Specifies data that has been captured from the document content as a string value. There are two fields that can contain strings.
Custom Search	Indicates additional data that has been captured as a string value. The limit for this field is 2 GB.

## Notes

- To configure what information you want tracked in outgoing documents,

see [Select specification fields in a document definition](#) or [Select specification fields in a channel](#).

- If you configure fields (such as integers, reals, strings, dates, or custom fields) in the document definition as optional, if you configure those fields to be tracked, and if these fields are not included in the submitted document instance, the fields do not appear in the query results. BizTalk Document Tracking does not generate an error or warning message to let you know that data is missing from optional fields.
- In a document instance, a 1 is tracked as a -1 if the following conditions are met:
  - The data type is set to Boolean when you set declaration properties for a particular field in BizTalk Editor.
  - The field is selected to be tracked as an integer in the BizTalk Messaging Configuration object model or in BizTalk Messaging Manager.

## Related Topics

[Select specification fields in a channel](#)

[Select specification fields in a document definition](#)

[Tracking Database Schema Basics](#)

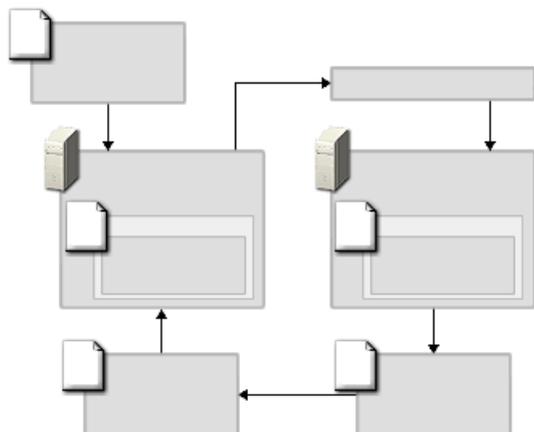
[Understanding How to Find Interchanges and Associated Documents](#)

[Understanding Interchange Record Results](#)

# Understanding Receipt Results

The following illustration shows the receipt flow in BizTalk Document Tracking. In the illustration, Document 1 is first processed by BizTalk Server A and is flagged to expect a receipt (Document 1, Expect receipt flag set). Next, BizTalk Server B picks up the document through a receive function (Document 1, Generate receipt flag set), processes the document, and generates a receipt [Receipt for Document 1 (Outgoing)]. BizTalk Server A then receives the receipt [Receipt for Document 1 (Incoming)].

## Receipt flow



BizTalk  
Server A  
Receipt for  
Document 1  
(Incoming)  
Receipt for  
Document 1  
(Outgoing)  
Generate  
receipt  
flag set  
Expect receipt  
flag set  
Document 1  
Document 1  
Document 1  
BizTalk  
Server B  
Receive Function

When you view the receipt for *Document 1, Expect receipt flag set*, you first locate the appropriate interchange record on the **Query Results** page that corresponds to *Document 1, Expect receipt flag set*. Click the Receipt icon in the receipt field. This opens a new **Query Results** page that contains the interchange record that BizTalk Server A generated when it processed *Document 1, Expect receipt flag set*. Click the Data icon in the Data column. The data displayed is the actual contents of the receipt. In the illustration above, this last step corresponds to *Receipt for Document 1 (incoming)*.

When you view the receipt for *Document 1, Generate receipt flag set*, you must first locate the appropriate interchange record on the **Query Results** page that corresponds to *Document 1, Generate receipt flag set*. Click the Receipt icon in the receipt field. This opens a new **Query Results** page that contains the interchange record that BizTalk Server B generated when it processed *Document 1, Generate receipt flag set*. Expand the interchange record to view the document instance details, and click the Data icon in the Data field. The data displayed is the actual contents of the receipt. In the previous illustration, this last step corresponds to *Receipt for Document 1 (Outgoing)*.

## Notes

- Sending and receiving receipts works only with parsers that can process receipts. For information about receipts, see [Understanding Receipts](#).

- Reliable messaging receipts are not displayed in the BizTalk Document Tracking user interface.

## **Related Topics**

[How Receipts Are Logged](#)

[Tracking Database Schema Basics](#)

# Understanding Results for Failed Transmissions

When a transmission fails, the failure is logged in the [Tracking database](#). However, not all errors that are logged in the Tracking database appear in the BizTalk Document Tracking user interface. Errors appear in the user interface only if a record was logged in the `dta_outdoc_details` table. For more information about the core tables, see [Tracking Database Schema Basics](#) or [Metadata Core Tables](#).

The following table outlines possible error messages and whether records get logged into the various core tables in the Tracking database.

Error message	Records logged	Comments
No error	<code>dta_indoc_details</code> <code>dta_interchange_details (incoming)</code> <code>dta_interchange_details (outgoing)</code> <code>dta_outdoc_details</code>	The appropriate fields are logged in the three core tables.
A custom component could not be called.		This error message appears only if you have a custom preprocessor associated with a receive function. No records are logged in the Tracking database.
The interchange could not be parsed.	<code>dta_interchange_details (incoming)</code>	The interchange and the data are logged if there is a parsing error.
The specified channel does not exist.	<code>dta_indoc_details</code> <code>dta_interchange_details (incoming)</code>	
The interchange could not be serialized.	<code>dta_indoc_details</code> <code>dta_interchange_details (incoming)</code> <code>dta_interchange_details (outgoing)</code> <code>dta_outdoc_details</code>	An empty record is logged in the <code>dta_interchange_details (outgoing)</code> table. If the interchange is resubmitted and it succeeds, the record is updated.
The interchange could not be encoded.	<code>dta_indoc_details</code> <code>dta_interchange_details (incoming)</code> <code>dta_interchange_details (outgoing)</code> <code>dta_outdoc_details</code>	
The interchange could not be signed.	<code>dta_indoc_details</code> <code>dta_interchange_details (incoming)</code> <code>dta_interchange_details (outgoing)</code> <code>dta_outdoc_details</code>	
The interchange could not be encrypted.	<code>dta_indoc_details</code> <code>dta_interchange_details (incoming)</code> <code>dta_interchange_details (outgoing)</code> <code>dta_outdoc_details</code>	

The transmission attempt failed (a retry is pending).	dta_indoc_details dta_interchange_details (incoming) dta_interchange_details (outgoing) dta_outdoc_details	
The last transmission attempt failed.	dta_indoc_details dta_interchange_details (incoming) dta_interchange_details (outgoing) dta_outdoc_details	
The document could not be parsed.	dta_indoc_details dta_interchange_details (incoming)	
The document could not be validated.	dta_indoc_details dta_interchange_details (incoming)	
A valid channel could not be found.	dta_indoc_details dta_interchange_details (incoming)	
The document could not be mapped.	dta_indoc_details dta_interchange_details (incoming) dta_interchange_details (outgoing) dta_outdoc_details	The record in the dta_outdoc_details table records the logging error, and an empty record is logged in the dta_interchange_details (outgoing) table.
A valid messaging port could not be found.	dta_indoc_details dta_interchange_details (incoming) dta_interchange_details (outgoing) dta_outdoc_details	The record in the dta_outdoc_details table records a NoPort error, and an empty record is logged in the dta_interchange_details (outgoing) table.
The document could not be serialized.	dta_indoc_details dta_interchange_details (incoming) dta_interchange_details (outgoing) dta_outdoc_details	Records in the dta_indoc_details and dta_outdoc_details table contain the serialization error.

## Related Topics

[Configure tracking settings for a server group](#)

[Suspended queue](#)

Tracking Database Schema Basics

Understanding the Tracking Database Schema

# Understanding Integrated XLANG Schedule Status for an Interchange

You can track the status of related [XLANG schedules](#) in BizTalk Document Tracking. Actions in schedules on a server can be monitored and stored in the appropriate tables in the [Tracking database](#) with an identifier that correlates them to specific message instances. Storage schema in the Tracking database and correlation are part of Microsoft BizTalk Server 2000, but event subscription functionality is not implemented when you install BizTalk Server 2000. However, a sample for performing tracking integration is provided. After you install BizTalk Server 2000, you can find the source code for this sample in the \Program Files\Microsoft BizTalk Server\SDK\XLANG Samples\WorkflowAudit folder. Additionally, the bin subfolder contains the dynamic-link library (WorkflowAudit.dll), and the Docs subfolder contains the documentation (Readme.txt) for this sample. There is a sample client application located in \Program Files\Microsoft BizTalk Server\SDK\XLANG Samples\WorkflowAuditClient.

# Troubleshooting BizTalk Document Tracking

This section provides general information about BizTalk Document Tracking troubleshooting.

- [Problem displaying BizTalk Document Tracking user interface](#)
- [Interchanges and documents are not stored](#)
- [Nothing is displayed in the query results](#)
- [Tracking fields are not displayed in the query results](#)
- [Too many search arguments](#)

# Problem displaying BizTalk Document Tracking user interface

**Cause:** Microsoft Office Web Components are not installed.

**Solution:** Install Microsoft Office Web Components.

1. Click **Start**, point to **Settings**, and then click **Control Panel**.
2. Double-click **Add/Remove Programs**.  
The **Add/Remove Programs** dialog box appears.
3. Click **Microsoft Office 2000 SR-1 Premium**.
4. Click **Change**.
5. Click **Add or Remove Features**.
6. Click the expand indicator (+) next to **Office Tools**.
7. Click **Office Web Components** and click the option appropriate for your installation.
8. Click **Update Now**.

# Interchanges and documents are not stored

**Cause:** Tracking is turned off in BizTalk Server Administration.

**Solution:** Turn on tracking in BizTalk Server Administration.

1. Click **Start**, point to **Programs**, point to **Microsoft BizTalk Server 2000**, and then click **BizTalk Server Administration**.
2. Expand **Microsoft BizTalk Server 2000** and click the server group for which documents are not being stored.
3. On the **Action** menu, click **Properties**.  
The **BizTalk Server Group Properties** dialog box appears.
4. Click the **Tracking** tab.
5. Select the **Enable document tracking** check box.
6. Select one or more of the following options:
  - **Log incoming interchange**
  - **Log outgoing interchange**
  - **Log the original MIME-encoded message**
7. Click **OK**.

## Related Topic

[Configure tracking properties for a server group](#)

# Nothing is displayed in the query results

**Cause one:** The date and time range is incorrect.

**Solution:** Check that the date and time range is correct. For example, if you sent a document in the past 5 minutes and the time range is set to look for documents in the past 10 minutes or greater, your document will not appear in the query results.

**Cause two:** The data might have been removed from the database.

**Solution:** Contact your Database Administrator for more information.

## Related Topic

[Search by date for interchange and document information](#)

# Tracking fields are not displayed in the query results

**Cause:** BizTalk Server could not convert the data or there is an arithmetic overflow error.

**Solution:** Look for the following error message in the Event Log:

<<*path and file name*>>: The following tracking field for submission <<*globally unique identifier*>> could not be logged:

Tracking field: <<*name of field*>>

Specification field name: <<*name of specification field*>>/DTADataTypeTest/String/@\_String

Actual value: <<*actual value of field*>>

Check and correct the tracking field settings in the document or channel configuration.

## Related Topics

[Select specification fields in a channel](#)

[Set document logging properties](#)

# Too many search arguments

**Cause:** You specified too many options in the Source and/or Destination Selection lists.

**Solution:** Make your query as specific as possible. Reduce the number of options selected in the Source and/or Destination Selection lists and click **Query**.

## Related Topic

[Use Queries to Search and Sort Interchange and Document Data](#)

# BizTalk Server 2000 Application Development

Microsoft BizTalk Server 2000 provides tools and services that allow you to create executable applications for controlling your business processes and the exchange of data between [trading partners](#) and applications within your business.

The following topics are covered in this section:

- [Designing BizTalk Orchestrations](#)
- [Configuring BizTalk Messaging Services](#)
- [Creating Specifications and Mapping Data](#)
- [Integrating BizTalk Services](#)

# Designing BizTalk Orchestrations

BizTalk Orchestration Designer is a Microsoft Visio 2000–based design tool that enables you to create business process drawings that can be compiled and run as [XLANG schedules](#). XLANG is an [XML-based](#) language. An XLANG schedule describes the business process and the binding of that process to application services.

You can use BizTalk Orchestration Designer to create drawings that describe long-running, loosely coupled, executable business processes. Typically, these drawings describe the way interactions and procedures are performed during the completion of a specified process, such as a purchase order request. Often, these business processes are not constrained by time limits. Also, the steps within a business process are loosely coupled. The description of the business process is separate from the implementation logic and sequencing used to perform the process.

For help with specific tasks, see [How To](#).

For general background information, see [Concepts](#).

# How To...

This section provides task-specific information about how to use [BizTalk Orchestration Designer](#) to create [XLANG schedule drawings](#) and compile them into executable [XLANG schedules](#). This section also provides information about how to run an XLANG schedule. It is highly recommended that you review the [Concepts](#) section to fully understand all the features and capabilities of BizTalk Orchestration Designer.

The following procedures are covered in this section:

- [Use BizTalk Orchestration Designer](#)
- [Run XLANG Schedules](#)

# Use BizTalk Orchestration Designer

This section contains procedures that explain how to use [BizTalk Orchestration Designer](#) to design [XLANG schedule drawings](#) and how to compile them into [XLANG schedules](#).

The following procedures are covered in this section:

- [Open and Save XLANG Schedule Drawings](#)
- [View Pages, Shapes, and Stencils](#)
- [Add, Delete, and Connect Shapes](#)
- [Set Conditional Properties](#)
- [Set Concurrency Properties](#)
- [Set Transaction Properties](#)
- [Set Error Handling Properties](#)
- [Implement Ports](#)
- [Send or Receive Messages](#)
- [Draw the Flow of Data between Messages](#)

# Open and Save XLANG Schedule Drawings

The following procedures are covered in this section:

- [Create a new XLANG schedule drawing](#)
- [Open an existing XLANG schedule drawing](#)
- [Save an XLANG schedule drawing](#)

# Create a new XLANG schedule drawing

- In BizTalk Orchestration Designer, on the **File** menu, click **New**.

## Notes

- This procedure opens a new [XLANG schedule drawing](#) within the design window. The **Business Process** page is the default beginning design page. The [Flowchart](#) and [Implementation stencils](#) also open by default when you start a new drawing.
- The file extension for an XLANG schedule drawing is .skv.

## Related Topics

[Open an existing XLANG schedule drawing](#)

[Save an XLANG schedule drawing](#)

# Open an existing XLANG schedule drawing

1. In BizTalk Orchestration Designer, on the **File** menu, click **Open**.

The **Open XLANG Schedule Drawing** dialog box appears.

2. Browse to the XLANG schedule drawing that you want to open, click the drawing, and then click **Open**.

## Notes

- The file extension for an [XLANG schedule drawing](#) is .skv.
- The file extension for an [XLANG schedule](#) is .skx. You cannot open an .skx file within BizTalk Orchestration Designer. To change or update an .skx file, open the source .skv file, make your changes, and then recompile the .skv file into an .skx file.

## Related Topics

[Create a new XLANG schedule drawing](#)

[Save an XLANG schedule drawing](#)

# Save an XLANG schedule drawing

- In BizTalk Orchestration Designer, on the **File** menu, click **Save**.

## Notes

- When you save an [XLANG schedule drawing](#), the drawing is saved with the default name *DrawingX.skv*, where *X* is a number that is appended to the drawing name. You can change the name of the file when you save the drawing.
- You can also click **Save As** on the **File** menu. This option opens the **Save XLANG Schedule Drawing As** dialog box. You can:
  - Rename the file to another name.
  - Save the file in a different location.
- The file extension for an XLANG schedule drawing is `.skv`.
- The file extension for an [XLANG schedule](#) is `.skx`. You cannot open an `.skx` file within BizTalk Orchestration Designer. To change or update an `.skx` file, open the source `.skv` file, make your changes, and then recompile the `.skv` file into an `.skx` file.

## Related Topics

[Create a new XLANG schedule drawing](#)

[Open an existing XLANG schedule drawing](#)

# View Pages, Shapes, and Stencils

BizTalk Orchestration Designer provides several view options that you can use to maximize your drawing area, or to view specific shape or data relationships.

The following procedures are covered in this section:

- [View the Design Pages](#)
- [View Shapes](#)
- [View Stencils](#)
- [Use Multiple Windows](#)
- [Use Annotations](#)
- [Preview, Print, or Resize XLANG Schedule Drawings](#)

# View the Design Pages

The following procedures are covered in this section:

- [View the Business Process page](#)
- [View the Data page](#)
- [View the Business Process and Data pages](#)
- [View Compensation for Transaction pages](#)
- [View On Failure of Transaction pages](#)
- [View a page](#)

## Related Topics

[Use Multiple Windows](#)

[View Shapes](#)

[View Stencils](#)

# View the Business Process page

- On the **View** menu, click **Business Process Page**.

## **Note**

- You can also click the **Business Process** tab at the bottom of the design pages.

## **Related Topics**

[Use Multiple Windows](#)

[View a page](#)

[View Compensation for Transaction pages](#)

[View On Failure of Transaction pages](#)

[View Shapes](#)

[View Stencils](#)

[View the Business Process and Data pages](#)

[View the Data page](#)

# View the Data page

- On the **View** menu, click **Data Page**.

## **Note**

- You can also click the **Data** tab at the bottom of the design pages.

## **Related Topics**

[Use Multiple Windows](#)

[View a page](#)

[View Compensation for Transaction pages](#)

[View On Failure of Transaction pages](#)

[View Shapes](#)

[View Stencils](#)

[View the Business Process and Data pages](#)

[View the Business Process page](#)

# View the Business Process and Data pages

- On the **View** menu, click **Business Process and Data Pages**.

## **Note**

- This view option opens two windows for the same [XLANG schedule](#): a **Business Process** window and a **Data** window. This functionality is similar to that obtained by using the **New Window** option. For more information about opening multiple windows, see [Use Multiple Windows](#).

## **Related Topics**

[Use Multiple Windows](#)

[View a page](#)

[View Compensation for Transaction pages](#)

[View On Failure of Transaction pages](#)

[View Shapes](#)

[View Stencils](#)

[View the Business Process page](#)

[View the Data page](#)

# View Compensation for Transaction pages

- At the bottom of the design pages, click the **Compensation for *Transaction*** tab for the page that you want to view.

## Notes

- The parameter *Transaction* in the name of the page is replaced with the name of the transaction with which the error-handling process is associated.
- For information about how to add a **Compensation for *Transaction*** page to an [XLANG schedule drawing](#), see [Enable Compensation error handling](#).

## Related Topics

[Use Multiple Windows](#)

[View a page](#)

[View On Failure of Transaction pages](#)

[View Shapes](#)

[View Stencils](#)

[View the Business Process and Data pages](#)

[View the Business Process page](#)

[View the Data page](#)

# View On Failure of Transaction pages

- At the bottom of the design pages, click the **On Failure of *Transaction*** tab for the page that you want to view.

## Note

- The parameter *Transaction* in the name of the page is replaced with the name of the transaction with which the error-handling process is associated.
- For information about how to add an **On Failure of *Transaction*** page to an [XLANG schedule drawing](#), see [Enable On Failure error handling](#).

## Related Topics

[Use Multiple Windows](#)

[View a page](#)

[View Compensation for Transaction pages](#)

[View Shapes](#)

[View Stencils](#)

[View the Business Process and Data pages](#)

[View the Business Process page](#)

[View the Data page](#)

# View a page

- Click the tab for the page that you want to view.

## Note

- Tabs for each page are located at the bottom of the design pages.

## Related Topics

[Use Multiple Windows](#)

[View Compensation for Transaction pages](#)

[View On Failure of Transaction pages](#)

[View Shapes](#)

[View Stencils](#)

[View the Business Process and Data pages](#)

[View the Business Process page](#)

[View the Data page](#)

# View Shapes

The following procedures are covered in this section:

- [View Flowchart shapes](#)
- [View Flowchart and Communication shapes](#)
- [View Flowchart, Communication, and Implementation shapes](#)

## Related Topics

[View Stencils](#)

[View the Design Pages](#)

# View Flowchart shapes

- On the **View** menu, click **Flowchart Shapes**.

## Notes

- If you use this option, on the design page only [Flowchart shapes](#) and the connections between them are displayed. This option hides all [ports](#), port [messages](#), [implementations](#), and connections between ports and [actions](#) or between ports and [implementations](#).
- This view option cannot be used on the **Data** page.

## Related Topics

[View Flowchart and Communication shapes](#)

[View Flowchart, Communication, and Implementation shapes](#)

[View Stencils](#)

[View the Design Pages](#)

# View Flowchart and Communication shapes

- On the **View** menu, click **Flowchart and Communication Shapes**.

## Notes

- If you use this option, on the design page [Flowchart shapes](#) and the connections between them are displayed. [Ports](#), port [messages](#), and the connections between ports and [actions](#) are also displayed. This option hides all [implementations](#), and connections between ports and implementations.
- This view option cannot be used on the **Data** page.

## Related Topics

[View Flowchart, Communication, and Implementation shapes](#)

[View Flowchart shapes](#)

[View Stencils](#)

[View the Design Pages](#)

# View Flowchart, Communication, and Implementation shapes

- On the **View** menu, click **Flowchart, Communication, and Implementation Shapes**.

## Notes

- All shapes and the connections between them are displayed.
- This view option cannot be used on the **Data** page.

## Related Topics

[View Flowchart and Communication shapes](#)

[View Flowchart shapes](#)

[View Stencils](#)

[View the Design Pages](#)

# View Stencils

The following procedures are covered in this section:

- [View the Flowchart stencil](#)
- [View the Implementation stencil](#)

## Related Topics

[View Shapes](#)

[View the Design Pages](#)

# View the Flowchart stencil

- On the **View** menu, point to **Stencils** and click **Flowchart** to toggle the **Flowchart** stencil on or off.

## Related Topics

[View Shapes](#)

[View the Design Pages](#)

[View the Implementation stencil](#)

# View the Implementation stencil

- On the **View** menu, point to **Stencils** and click **Implementation** to toggle the **Implementation** stencil on or off.

## Related Topics

[View Shapes](#)

[View the Design Pages](#)

[View the Flowchart stencil](#)

# Use Multiple Windows

The following procedures are covered in this section:

- [Open a new window](#)
- [Tile windows](#)
- [Cascade windows](#)
- [Change the window focus](#)

## Related Topic

[View the Design Pages](#)

# Open a new window

- On the **Window** menu, click **New Window**.

## Note

- Multiple windows provide additional views of the same [XLANG schedule](#). This enables you to:
  - View different pages of the same XLANG schedule at the same time. For example, you can open views for the **Business Process** page, the **Data** page, and a **Compensation for *Transaction*** page.
  - View different parts of the same page of an XLANG schedule at the same time. For example, in one view you can zoom in to see a specific set of shapes in the XLANG schedule; in another view you can zoom out to see the whole schedule.

## Related Topics

[Cascade windows](#)

[Change the window focus](#)

[Tile windows](#)

[View the Design Pages](#)

# Tile windows

- On the **Window** menu, click **Tile**.

## Notes

- Tiling the window views enables you to see several windows at the same time.
- Multiple windows provide additional views of the same [XLANG schedule](#). This enables you to:
  - View different pages of the same XLANG schedule at the same time. For example, you can open views for the **Business Process** page, the **Data** page, and a **Compensation for Transaction** page.
  - View different parts of the same page of an XLANG schedule at the same time. For example, in one view you can zoom in to see a specific set of shapes in the XLANG schedule; in another view you can zoom out to see the whole schedule.

## Related Topics

[Cascade windows](#)

[Change the window focus](#)

[Open a new window](#)

[View the Design Pages](#)

# Cascade windows

- On the **Window** menu, click **Cascade**.

## Notes

- Cascading the window views enables you to bring one window to the front of the screen. You can click the title bars of the other windows to bring them to the front of the screen.
- Multiple windows provide additional views of the same [XLANG schedule](#). This enables you to:
  - View different pages of the same XLANG schedule at the same time. For example, you can open views for the **Business Process** page, the **Data** page, and a **Compensation for *Transaction*** page.
  - View different parts of the same page of an XLANG schedule at the same time. For example, in one view you can zoom in to see a specific set of shapes in the XLANG schedule; in another view you can zoom out to see the whole schedule.

## Related Topics

[Change the window focus](#)

[Open a new window](#)

[Tile windows](#)

[View the Design Pages](#)

# Change the window focus

- On the **Window** menu, click the name of the window to which you want to switch the focus.

## Notes

- The name of a window is the name of the [XLANG schedule](#) with the name of a design page appended to it. For example, Schedule1.skv:Business Process or Schedule1.skv:Data.
- Multiple windows provide additional views of the same XLANG schedule. This enables you to:
  - View different pages of the same XLANG schedule at the same time. For example, you can open views for the **Business Process** page, the **Data** page, and a **Compensation for Transaction** page.
  - View different parts of the same page of an XLANG schedule at the same time. For example, in one view you can zoom in to see a specific set of shapes in the XLANG schedule; in another view you can zoom out to see the whole schedule.

## Related Topics

[Cascade windows](#)

[Open a new window](#)

[Tile windows](#)

[View the Design Pages](#)

# Use Annotations

The following procedures are covered in this section:

- [Add annotations](#)
- [Edit annotations](#)
- [Format text in annotations](#)
- [Delete annotations](#)

# Add annotations

1. In BizTalk Orchestration Designer, on the toolbar, click the **Text Tool (A)** button.
2. Use the mouse pointer to drag over the area where you want to create an annotation.
3. Type the annotation.

## Notes

- To turn off the **Text Tool**, on the toolbar, click the **Pointer Tool (☛)** button.
- Because BizTalk Orchestration Designer uses a custom Microsoft Visio interface, the **Text Tool** button offers two options. The functionality of both of these buttons is identical:
  - The **Text Tool (A)** button
  - The **Text Block Tool (📄)** button

## Related Topics

[Delete annotations](#)

[Edit annotations](#)

[Format text in annotations](#)

# Edit annotations

1. In BizTalk Orchestration Designer, on the toolbar, click the **Text Tool (A)** button.
2. Click the annotation that you want to edit.
3. Edit the annotation.

## Notes

- To turn off the **Text Tool**, on the toolbar, click the **Pointer Tool (☛)** button.
- Because BizTalk Orchestration Designer uses a custom Microsoft Visio interface, the **Text Tool** button offers two options. The functionality of both of these buttons is identical:
  - The **Text Tool (A)** button
  - The **Text Block Tool (📄)** button

## Related Topics

[Add annotations](#)

[Delete annotations](#)

[Format text in annotations](#)

# Format text in annotations

1. In BizTalk Orchestration Designer, on a design page, select one or more annotations that you want to format.
2. On the **Format** menu, click **Text**.  
The **Text** dialog box appears. This dialog box offers several options for the size, font, and appearance of text.
3. Select the options that you want to use and click **OK**.

## Notes

- These options are applied to the annotations that you highlight in the XLANG schedule drawing, and to any new annotations that you create.
- You cannot format annotations when the Text Tool is turned on.
- To select an annotation, click it. To select more than one annotation, press and hold the SHIFT key, and then click the annotations that you want to select.

## Related Topics

[Add annotations](#)

[Delete annotations](#)

[Edit annotations](#)

# Delete annotations

- In BizTalk Orchestration Designer, on a design page, click the annotation that you want to delete and press DELETE.

## Note

- You must turn off the Text Tool before you can delete an annotation from the [XLANG schedule drawing](#).

## Related Topics

[Add annotations](#)

[Format text in annotations](#)

# Preview, Print, or Resize XLANG Schedule Drawings

The following procedures are covered in this section:

- [Use Print Preview](#)
- [Print an XLANG schedule drawing](#)
- [Resize an XLANG schedule drawing](#)

# Use Print Preview

- On the **File** menu, click **Print Preview**.

## Note

- If you change the **Layout Orientation** option from **Landscape** to **Portrait**, you will receive the following message:  
One or more drawing pages are oriented differently from the printed page setup. Click **OK** to print your drawing across multiple pages. To match orientations, change the printed page orientation.  
If you click **OK** and make this change, Print Preview might display the following behavior:
  - When you click **Next Tile** to pan pages forward, and then click **Previous Tile** to pan back to the first page, some shapes might appear in Print Preview as if they are not on the page. This display is harmless. The actual [XLANG schedule](#) will print correctly across several pages.

## Related Topics

[Print an XLANG schedule drawing](#)

[Resize an XLANG schedule drawing](#)

# Print an XLANG schedule drawing

1. On the **File** menu, click **Print**.
2. In the **Print** dialog box, set any options that you want and click **Print**.

## Related Topics

[Resize an XLANG schedule drawing](#)

[Use Print Preview](#)

# Resize an XLANG schedule drawing

1. In BizTalk Orchestration Designer, on the **View** menu, click **Whole Page**.
2. Press and hold CTRL, and then move the mouse pointer to the edge of the page.  
The pointer changes shape to a double arrow at the edge of the page.
3. Click and drag the edge of the page to resize it.

## Related Topics

[Print an XLANG schedule drawing](#)

[Use Print Preview](#)

# Add, Delete, and Connect Shapes

The following procedures are covered in this section:

- [Add shapes](#)
- [Name shapes](#)
- [Delete shapes](#)
- [Delete unused ports and messages](#)
- [Connect Shapes](#)

# Add shapes

- In BizTalk Orchestration Designer, on the **Flowchart** stencil, click a shape and drag it to the design page.

## Notes

- You can add [Flowchart shapes](#) to the **Business Process**, **Compensation for *Transaction***, and **On Failure of *Transaction*** pages. **Flowchart** shapes are not available on the **Data** page.
- For information about adding [Implementation shapes](#) to an [XLANG schedule drawing](#), see [Implement Ports](#).
- You cannot add shapes to the **Data** page. New [messages](#) are created automatically on the **Data** page each time an [action](#) is connected to a [port](#).

## Related Topics

[Connect Shapes](#)

[Delete shapes](#)

[Delete unused ports and messages](#)

[Name shapes](#)

[View the Flowchart stencil](#)

# Name shapes

1. In BizTalk Orchestration Designer, on a design page, right-click a shape and click **Properties**.
2. In the **Shape Properties** dialog box, in the **Name** box, type a name.

## Notes

- The **Name** property of each shape contains a default value that is the name of the shape with a number appended to the name; for example, Action 1. You can replace the default value with a name of your choice.
- You cannot name any of the following shapes: **Abort**, **Begin**, **Decision**, **End**, **Fork**, **Join**, and **While**.
- You can name the following shapes: **Action**, **Transaction**, **Port**, **Message**, and **Rule**.
- Shape names must meet certain naming conventions. The following conventions apply to transactions, ports, messages, rules, and fields:
  - The name must be a valid XML token name. For more information about XML tokens, go to the W3C Web site ([www.w3.org](http://www.w3.org)).
  - The name cannot begin with underscores (\_).
  - The name cannot include colons (:).
  - The name length must be less than or equal to 32 characters.
  - Constant names and message names cannot begin with a numeric character.
- Transaction names in single-byte character sets must be less than or equal to 16 characters in length. Transaction names in double-byte character sets must be less than or equal to 8 characters in length.
- Actions are exempt from all naming conventions except the 32-character size limit.

## Related Topics

[Add shapes](#)

[Connect Shapes](#)

[Delete shapes](#)

[Delete unused ports and messages](#)

# Delete shapes

- Click the shape that you want to delete and press DELETE.

## Notes

- You can delete a connection between two shapes by clicking the connection and pressing DELETE.
- If a shape has connections to other shapes when you delete the shape, all connections are also deleted.
- Any shapes that are enclosed within a [transaction](#) are deleted when you delete the transaction.
- You can delete a BizTalk Messaging or Message Queuing [implementation](#) without deleting the [ports](#) to which these implementations are connected.
- When you delete a COM component or Windows Script Component implementation, the ports to which they are connected are also deleted.
- You can delete a [message](#) by clicking on the message that is contained within a port and pressing DELETE. The associated message is deleted on the **Data** page.

You can also delete messages from the **Data** page. For more information, see [Delete a message](#).

- You cannot delete rules by using the delete procedure. For more information about deleting rules, see the following topics:
  - [Delete a rule from a decision](#)
  - [Delete a rule from a while loop](#)
  - [Delete unused rules](#)

## Related Topics

[Add shapes](#)

[Connect Shapes](#)

[Delete a message](#)

[Delete a rule from a decision](#)

[Delete a rule from a while loop](#)

[Delete unused ports and messages](#)

[Delete unused rules](#)

[Name shapes](#)

# Delete unused ports and messages

- In BizTalk Orchestration Designer, on the **Tools** menu, click **Delete Unused Ports and Messages**.

## Note

- This procedure deletes all unused ports, and any messages that the ports contain, from the XLANG schedule drawing. The corresponding messages on the **Data** page are also removed.

## Related Topics

[Add shapes](#)

[Connect Shapes](#)

[Delete shapes](#)

[Name shapes](#)

# Connect Shapes

The following procedures are covered in this section:

- [Select a shape](#)
- [Connect two shapes](#)
- [Use the Connector Tool](#)
- [Align shapes vertically or horizontally](#)

## Related Topics

[Add shapes](#)

[Delete shapes](#)

[Delete unused ports and messages](#)

[Name shapes](#)

# Select a shape

- In BizTalk Orchestration designer, on a design page, click the shape that you want to select.

The shape that you select is surrounded with a green dashed border. Any control handles (■) available to that shape are enabled.

## Notes

- Selecting a shape enables you to drag control handles (■) from that shape to other shapes.
- Selecting a shape enables you to edit available shape properties, and to cut, copy, paste, clear, or duplicate the shape. Not all of these options are available for every shape.
- If you copy an **Action** shape that is connected to a **Port** shape, the copy of that action also has a connection to the same port.

## Related Topics

[Add shapes](#)

[Connect two shapes](#)

[Delete shapes](#)

[Use the Connector Tool](#)

# Connect two shapes

1. To connect two shapes, select the first shape.

The shape that you select is surrounded with a green dashed border. Any control handles (■) available to that shape are enabled.

2. Drag the appropriate control handle to the connection point (x) of the second shape.

When the connection point is highlighted with a red box (☒), release the mouse button to set the connection.

## Notes

- Process flows are connected from the top and bottom connection points and control handles on shapes.
- Communication flows are connected from the right control handle of an **Action** shape to the left connection point a **Port** shape.
- You also can use the Connector Tool to connect shapes. For more information, see [Use the Connector Tool](#).

## Related Topics

[Add shapes](#)

[Delete shapes](#)

[Select a shape](#)

[Use the Connector Tool](#)

# Use the Connector Tool

1. On the toolbar, click the **Connector Tool** (☒) button.

2. Hover over a control handle (■) that is on the shape from which you want to create a connection.

The control handle is outlined with a red box to indicate that you can drag it.

3. Press and hold the mouse button to drag the control handle from the shape to a connection point (×) on the shape to which you want to create the connection.

When the connection point on the shape is outlined with a red box (☒), release the mouse button to establish the connection.

## Notes

- To turn off the Connector Tool, on the toolbar, click the **Pointer Tool** (☒) button.
- You can add shapes to a page, and perform other operations when the Connector Tool is enabled. However, you might receive an error message. The error message is not valid, and it is harmless. This false error will be corrected in future releases of Microsoft Visio. If you receive this error message, click **OK** and continue. The text of the message is as follows:

Visio internal error: #-1

Action 1246: Drop On Page

First try closing and reopening the file. Next try restarting Visio.

## Related Topics

[Add shapes](#)

[Connect two shapes](#)

[Delete shapes](#)

[Select a shape](#)

# Align shapes along a vertical or horizontal axis

1. In BizTalk Orchestration Designer, on a design page, drag the mouse pointer around the shapes that you want to align along an axis.
2. On the toolbar, click the **Align Shapes** () button.
3. In the **Align Shapes** dialog box, in one of the following areas, click the alignment that you want to use:
  - In the **Up/Down alignment** area, click one of the following buttons:
    -  **Horizontal-Top Alignment**
    -  **Horizontal-Center Alignment**
    -  **Horizontal-Bottom Alignment**
  - In the **Left/Right alignment** area, click one of the following:
    -  **Vertical-Left Alignment**
    -  **Vertical-Center Alignment**
    -  **Vertical-Right Alignment**

## Notes

- You must select shapes on a design page to enable the **Align Shapes** button.
- It is recommended that you align shapes along one axis only. Aligning shapes along both axes simultaneously might result in shapes being placed on top of each other. Press CTRL+Z to undo any changes that you do not want.
- In the **Align Shapes** dialog box, the **Disable Alignment** () button clears an alignment selection.
- The **Create guide and glue shapes to it** check box is always unavailable.
- You can press and hold the SHIFT key, and then click several shapes to select them.

# Set Conditional Properties

The following procedures are covered in this section:

- [Set Decision Conditions](#)
- [Set While Loop Conditions](#)
- [Create Rules](#)

## Related Topic

[Designing Rules](#)

# Set Decision Conditions

The following procedures are covered in this section:

- [Add a rule to a decision](#)
- [Edit a rule in a decision](#)
- [Delete a rule from a decision](#)
- [Determine the evaluation order of rules](#)

## Related Topics

[Create Rules](#)

[Designing Rules](#)

# Add a rule to a decision

1. In BizTalk Orchestration Designer, on a design page, right-click the **Decision** shape for which you want to add a rule and click **Add Rule**.

The **Add Rule** dialog box appears.

2. In the **Add Rule** dialog box, click one of the following options:

- **Create a new rule**

Click **OK**. The **Rule Properties** dialog box appears.

For information about creating rules, see [Create Rules](#).

- **Add an existing rule**

In the **Available rules** list, click the rule that you want to add and click **OK**.

The **Add Rule** dialog box closes, and the rule is added to the decision.

## Notes

- The first time you add a rule to an [XLANG schedule drawing](#), clicking **Add Rule** opens the **Rule Properties** dialog box. The **Add Rule** dialog box appears only if you have one or more previously created rules that you can add to a [decision](#). For more information about the **Rule Properties** dialog box, see [Create Rules](#).
- You can also add a rule to a decision by right-clicking a **Decision** shape, clicking **Properties**, and then clicking **Add**.

## Related Topics

[Create Rules](#)

[Delete a rule from a decision](#)

[Designing Rules](#)

[Determine the evaluation order of rules](#)

[Edit a rule in a decision](#)

# Edit a rule in a decision

1. In BizTalk Orchestration Designer, on a design page, right-click a **Decision** shape and click **Properties**.
2. In the **Decision Properties** dialog box, click the rule that you want to edit and click **Edit**.
3. In the **Rule Properties** dialog box, make the changes that you want and click **OK**.

For more information about the **Rule Properties** dialog box, see [Create Rules](#).

4. To edit another rule, click the rule and click **Edit**.

–Or–

To close the **Decision Properties** dialog box, click **OK**.

## Notes

- In the **Decision Properties** dialog box, you can also add a rule by clicking **Add**.
- You can also edit a rule by right-clicking a rule that is contained within a **Decision** shape, and then clicking **Properties**. This action opens the **Rule Properties** dialog box.

## Related Topics

[Add a rule to a decision](#)

[Create Rules](#)

[Delete a rule from a decision](#)

[Designing Rules](#)

[Determine the evaluation order of rules](#)

# Delete a rule from a decision

1. In BizTalk Orchestration Designer, on a design page, right-click the **Decision** shape for which you want to delete a rule and click **Properties**.
2. Click the rule that you want to delete and click **Delete**.

## Related Topics

[Add a rule to a decision](#)

[Create Rules](#)

[Designing Rules](#)

[Determine the evaluation order of rules](#)

[Edit a rule in a decision](#)

# Determine the evaluation order of rules

1. In BizTalk Orchestration Designer, on a design page, right-click the **Decision** shape and click **Properties**.
2. In the **Decision Properties** dialog box, click the rule for which you want to change the evaluation order.
3. In the **Order** area, click the **Up** or **Down** arrow to move the rule to change the order in which it appears in the list.

## Note

- It is recommended that you order the rules in order of highest priority first. Rules are executed in sequence until a rule evaluates to TRUE. The process flow for the first rule that evaluates to TRUE is followed. If no rules evaluate to TRUE, the Else process flow is followed.

## Related Topics

[Add a rule to a decision](#)

[Create Rules](#)

[Delete a rule from a decision](#)

[Designing Rules](#)

[Edit a rule in a decision](#)

# Set While Loop Conditions

The following procedures are covered in this section:

- [Add a rule to a while loop](#)
- [Edit a rule in a while loop](#)
- [Delete a rule from a while loop](#)
- [Preserve state in a while loop](#)

## Related Topics

[Create Rules](#)

[Designing Rules](#)

# Add a rule to a while loop

1. In BizTalk Orchestration Designer, on a design page, right-click the **While** shape for which you want to add a rule and click **Add Rule**.

The **Add Rule** dialog box appears.

2. In the **Add Rule** dialog box, click one of the following options:

- **Create a new rule**

Click **OK**. The **Rule Properties** dialog box appears.

For information about creating rules, see [Create rules](#).

- **Add an existing rule**

In the **Available rules** list, click the rule that you want to add and click **OK**.

The **Add Rule** dialog box closes and the rule is added to the while loop.

## Notes

- The first time you add a rule to an [XLANG schedule drawing](#), clicking **Add Rule** opens the **Rule Properties** dialog box. The **Add Rule** dialog box appears only if you have one or more previously created rules that you can add to a while loop. For more information about the **Rule Properties** dialog box, see [Create rules](#).
- You can add only one rule to a while loop.

## Related Topics

[Create Rules](#)

[Delete a rule from a while loop](#)

[Designing Rules](#)

[Edit a rule in a while loop](#)

[Preserve state in a while loop](#)

# Edit a rule in a while loop

1. In BizTalk Orchestration Designer, on a design page, right-click the rule that is contained within a **While** shape and click **Properties**.
2. In the **Rule Properties** dialog box, make the changes that you want and click **OK**.

For more information about the **Rule Properties** dialog box, see [Create Rules](#).

## Related Topics

[Add a rule to a while loop](#)

[Create Rules](#)

[Delete a rule from a while loop](#)

[Designing Rules](#)

[Preserve state in a while loop](#)

# Delete a rule from a while loop

- In BizTalk Orchestration Designer, on a design page, right-click the **While** shape for which you want to delete a rule and click **Delete Rule**.

## Related Topics

[Add a rule to a while loop](#)

[Create Rules](#)

[Designing Rules](#)

[Edit a rule in a while loop](#)

[Preserve state in a while loop](#)

# Preserve state in a while loop

1. In BizTalk Orchestration Designer, on a design page, right-click a **While** shape and click **Properties**.
2. In the **While Properties** dialog box, in the **State persistence** area, click one of the following options:
  - **Yes**

The [messages](#) used in each loop iteration are saved as [XLANG schedule state](#). If the loop is part of a [transaction](#) that fails, an **On Failure of Transaction** or **Compensation for Transaction** page is called for each completed loop iteration.
  - **No**

Only messages used in the latest loop iteration are saved as XLANG schedule state. If the loop is part of a [transaction](#) that fails, an **On Failure of Transaction** or **Compensation for Transaction** page is called only once.

## Related Topics

[Add a rule to a while loop](#)

[Create Rules](#)

[Delete a rule from a while loop](#)

[Designing Rules](#)

[Edit a rule in a while loop](#)

# Create Rules

The following procedures are covered in this section:

- [Create a rule](#)
- [Use the expression assistant](#)
- [Add constants to a rule](#)
- [Delete unused rules](#)

## Related Topics

[Designing Rules](#)

[Set Decision Conditions](#)

[Set While Loop Conditions](#)

# Create a rule

You can create rules to evaluate conditions within your business process. Rules are used within [decisions](#) and while loops in an [XLANG schedule](#). When you add a rule to a **Decision** or **While** shape, the **Rule Properties** dialog box appears.

1. In the **Rule Properties** dialog box, in the **Rule name** box, type a name for the rule.

This field is required.

2. In the **Rule description** box, you can type a detailed description of the rule.

This field is optional.

3. Place the cursor in the **Script expression** box to enable the expression assistant.

You can type the script expression that you want to use, or you can use the expression assistant. For more information about using the expression assistant and creating script expressions, see [Use the expression assistant](#).

## ◆ Important

- Because [XML](#) is case sensitive, script expressions must use the same case as [messages](#) and their fields.
- You must place the cursor in the **Script expression** box to enable the expression assistant.

## 📝 Notes

- Shape names must meet certain naming conventions. The following conventions apply to transactions, ports, messages, rules, and fields:
  - The name must be a valid XML token name. For more information about XML tokens, go to the W3C Web site ([www.w3.org](http://www.w3.org)).
  - The name cannot begin with underscores (\_).
  - The name cannot include colons (:).
  - The name length must be less than or equal to 32 characters.
- You cannot name any of the following shapes: **Abort**, **Begin**, **Decision**, **End**, **Fork**, **Join**, and **While**.
- The length of the longest rule name determines the width of the **Decision** or **While** shape in which the rule is used.
- You can add script expressions at any point in the **Script expression** box by placing the cursor at the location where you want to add the expression.
- You cannot create script expressions until you have created the [port implementations](#) and the message communications between [actions](#) and [ports](#).
- Before you compile the [XLANG schedule drawing](#) into an XLANG schedule, you must complete script expressions for all rules in the schedule.

## Related Topics

[Add constants to a rule](#)

[Designing Rules](#)

[Set Decision Conditions](#)

[Set While Loop Conditions](#)

[Use the expression assistant](#)

# Use the expression assistant

1. In the **Rule Properties** dialog box, in the **Expression assistant** area, click a message in the **Message** list.
2. In the **Expression Assistant** area, click a field in the **Field** list.
3. Click **Insert**.
4. In the **Script expression** box, complete the expression.

The expression assistant adds only the message and field that you select. To evaluate the script expression, you must provide the condition for the rule. For example:

```
PORequest.Total < 500
```

You can also combine expressions for more complex conditions. For example:

```
PORequest.Total < 500 AND PORequest.Quantity < 20
```

## ◆ Important

- Because **XML** is case sensitive, script expressions must use the same case as [messages](#) and their fields.
- You must place the cursor in the **Script expression** box to enable the expression assistant.
- The fields that are available in the **Field** list are based upon the message that you choose in the **Message** list. Only fields contained within that message can be used.

## 📝 Notes

- The **Message** list contains a list of all messages and constants available on the **Data** page.
- Rules can use the system fields that are provided on the **Data** page. When used within a rule, a system field is always surrounded by brackets. For example:  

```
Message1.[_Exists_]
```

For more information about system fields, see [Data Handling](#).
- You can use Microsoft Visual Basic functions such as **Date** and **Time** within rules.
- You can add script expressions at any point in the **Script expression** box by placing the cursor at the location where you want to add the expression.
- Before you compile the [XLANG schedule drawing](#) into an [XLANG schedule](#), you must complete script expressions for all rules in the schedule.

## Related Topics

[Add constants to a rule](#)

[Create a rule](#)

[Designing Rules](#)

[Set Decision Conditions](#)

[Set While Loop Conditions](#)

# Add constants to a rule

You can add constants to script expressions in a rule. To use constants, you must first make constants available.

1. On the **Data** page, you must add constants to the **Constants** list if no constants are already available.  
For more information about using constants and adding them to the **Constants** list, see [Use Constants](#).
2. In the **Rule Properties** dialog box, in the **Message** list, click **Constants**.
3. In the **Field** list, click the constant that you want to use and click **Insert**.

## Note

- All constants in the **Constants** list on the **Data** page are available and can be used in a rule.

## Related Topics

[Create a rule](#)

[Designing Rules](#)

[Set Decision Conditions](#)

[Set While Loop Conditions](#)

[Use the expression assistant](#)

# Delete unused rules

- On the **Tools** menu, click **Delete Unused Rules**.

## Notes

- This procedure deletes any rules that are not used in a [decision](#) or a while loop in the [XLANG schedule drawing](#).
- Only rules not currently used within any **While** or **Decision** shapes are removed from the XLANG schedule drawing. Any rules that are used in a **While** or **Decision** shape are not deleted, even if these shapes are not currently connected to any other shapes.

## Related Topics

[Add constants to a rule](#)

[Create a rule](#)

[Use the expression assistant](#)

# Set Concurrency Properties

The following procedures are covered in this section:

- [Create concurrent flows](#)
- [Set the Join Type property](#)
- [Join concurrent flows](#)
- [End a concurrent flow](#)

## ◆ Important

- For more information about [concurrent](#) processes, it is highly recommended that you read [Designing Concurrency](#).

# Create concurrent flows

1. In BizTalk Orchestration Designer, on a design page, click a **Fork** shape.
2. Connect the bottom control handle (■) of the **Fork** shape to the top connection point (×) of a subsequent shape in the flow of the business process.
3. Repeat steps 1 and 2 to create additional [concurrent](#) flows.

## ◆ Important

- For more information about concurrent processes, it is highly recommended that you read [Designing Concurrency](#).

## 📝 Notes

- Only one flow can enter a **Fork** shape from the top connection point.
- As many as 64 flows can exit a **Fork** shape to run concurrent processes.
- You must click the **Fork** shape to select it and activate the control handle each time you want to draw an additional flow.

–Or–

If you want to create several concurrent flows, you can use the Connector Tool to add the flows quickly. For more information about the Connector Tool, see [Use the Connector Tool](#).

- You can add [Flowchart shapes](#) to the **Business Process**, **Compensation for Transaction**, and **On Failure of Transaction** pages. **Flowchart** shapes are not available on the **Data** page.

## Related Topics

[Add, Delete, and Connect Shapes](#)

[Connect two shapes](#)

[End a concurrent flow](#)

[Join concurrent flows](#)

[Select a shape](#)

[Set the Join Type property](#)

[Use the Connector Tool](#)

# Set the Join Type property

1. In BizTalk Orchestration Designer, on a design page, right-click a **Join** shape and click **Properties**.
2. In the **Join type** list, click one of the following options:

- **AND**
- **OR**

## ◆ Important

- For more information about [concurrent](#) processes, it is highly recommended that you read [Designing Concurrency](#).

## 📌 Note

- If you select the **OR** join option, all flows that enter the join can have only one action associated with the flow.

## Related Topics

[Create concurrent flows](#)

[End a concurrent flow](#)

[Join concurrent flows](#)

# Join concurrent flows

1. In BizTalk Orchestration Designer, on a design page, click a shape in the business process that is running a concurrent process.
2. Connect the bottom control handle (■) of the shape to the top connection point (×) of the **Join** shape.
3. Repeat steps 1 and 2 for all concurrent flows that rejoin this particular join.

## ◆ Important

- For more information about [concurrent](#) processes, it is highly recommended that you read [Designing Concurrency](#).

## 📝 Notes

- If you select the **OR** join option, all flows that enter the join can have only one [action](#) associated with the flow.
- As many as 64 flows can enter a **Join** shape at the top connection point.
- Only one flow can leave a **Join** shape from the bottom connection point.
- If you want to join several concurrent flows, you can use the Connector Tool to join the flows quickly. For more information about the Connector Tool, see [Use the Connector Tool](#).
- You can add [Flowchart shapes](#) to the **Business Process**, **Compensation for Transaction**, and **On Failure of Transaction** pages. **Flowchart** shapes are not available on the **Data** page.

## Related Topics

[Add, Delete, and Connect Shapes](#)

[Connect two shapes](#)

[Create concurrent flows](#)

[End a concurrent flow](#)

[Select a shape](#)

[Set the Join Type property](#)

[Use the Connector Tool](#)

# End a concurrent flow

1. In BizTalk Orchestration Designer, on a design page, click a shape in the business process that is running a [concurrent](#) process.
2. Connect the bottom control handle (■) of the shape to the top connection point (✖) of the **End** shape.

This concurrent process ends. It does not rejoin other flows in the [XLANG schedule](#).

## ◆ Important

- For more information about concurrent processes, it is highly recommended that you read [Designing Concurrency](#).

## 📌 Note

- You can add [Flowchart shapes](#) to the **Business Process**, **Compensation for *Transaction***, and **On Failure of *Transaction*** pages. **Flowchart** shapes are not available on the **Data** page.

## Related Topics

[Add, Delete, and Connect Shapes](#)

[Connect two shapes](#)

[Create concurrent flows](#)

[Join concurrent flows](#)

[Select a shape](#)

[Set the Join Type property](#)

[Use the Connector Tool](#)

# Set Transaction Properties

The following procedures are covered in this section:

- [Set Transaction Properties for an XLANG Schedule](#)
- [Set Individual Transaction Properties](#)
- [Describe Component and Message Queuing Transaction Support](#)

## Related Topic

[Designing Transactions](#)

# Set Transaction Properties for an XLANG Schedule

The following procedures are covered in this section:

- [Set the transaction model](#)
- [Set the transaction activation property](#)

## Related Topic

[Designing Transactions](#)

# Set the transaction model

1. In BizTalk Orchestration Designer, on a design page, right-click the **Begin** shape and click **Properties**.

The **Begin Properties** dialog box appears.

2. In the **Transaction model** list, click one of the following options:

- **Include Transactions within the XLANG Schedule**

This option enables an [XLANG schedule](#) to use [transactions](#).

- **Treat the XLANG Schedule as a COM+ Component**

This option disables transaction support for an XLANG schedule. A COM component can then activate the XLANG schedule within the context of a COM+ transaction.

## Notes

- If you set the **Transaction model** property to **Treat the XLANG Schedule as a COM+ Component**, the **Transaction activation** list is enabled.
- If you set the **Transaction model** property to **Treat the XLANG Schedule as a COM+ Component**, do not add transactions to the XLANG schedule drawing. The XLANG schedule drawing will not compile, and you will receive an error message.
- The **XLANG identity** property is a unique ID that is used to distinguish version instances of an XLANG schedule drawing. This property is read-only and cannot be changed. Every time you update an [XLANG schedule drawing](#), this identity is also updated.

You can use the **XLANG identity** property to match versions of an XLANG schedule drawing (.skv) with the associated compiled XLANG schedule (.skx).

- The **Begin** shape is available on the **Business Process**, **Compensation for Transaction**, and **On Failure of Transaction** pages. The **Begin** shape is not available on the **Data** page.

## Related Topics

[Describe Component and Message Queuing Transaction Support](#)

[Designing Transactions](#)

[Set the transaction activation property](#)

# Set the transaction activation property

1. In BizTalk Orchestration Designer, on a design page, right-click the **Begin** shape and click **Properties**.

The **Begin Properties** dialog box appears.

2. In the **Transaction model** list, click **Treat the XLANG Schedule as a COM+ Component**.

When you enable this option, Component Services will treat the XLANG schedule as a COM+ component. This option disables [transaction](#) support for an [XLANG schedule](#). A COM component can then activate the XLANG schedule within the context of a COM+ transaction.

3. In the **Transaction activation** list, click one of the following options:

- **Not Supported**

The XLANG schedule ignores the transaction on its creator's COM+ object context, if present. None of the schedule's actions are performed within the scope of a transaction.

- **Supported**

The XLANG schedule participates in a COM+ transaction if a transaction is present on its creator's COM+ object context.

- **Required**

The XLANG schedule must run within the scope of a transaction. If a transaction is not present on the schedule creator's COM+ object context, a transaction is automatically created and used by the [XLANG Scheduler Engine](#).

- **Requires New**

The XLANG schedule must run within the scope of a new transaction. The XLANG Scheduler Engine automatically creates a new transaction for the schedule that is distinct from any transaction that may have been present on the creator's COM+ object context.

## Notes

- The **XLANG identity** property is a unique ID that is used to distinguish version instances of an [XLANG schedule drawing](#). This property is read-only and cannot be changed. Every time you update an XLANG schedule drawing, this identity is also updated.

You can use the **XLANG identity** property to match versions of an XLANG schedule drawing (.skv) with the associated compiled XLANG schedule (.skx).

- The **Begin** shape is available on the **Business Process**, **Compensation for Transaction**, and **On Failure of Transaction** pages. The **Begin** shape is not available on the **Data** page.

## Related Topics

[Describe Component and Message Queuing Transaction Support](#)

[Designing Transactions](#)

[Set the transaction model](#)

# Set Individual Transaction Properties

The following procedures are covered in this section:

- [Group actions and flows within a transaction](#)
- [Design nested transactions](#)
- [Create flows that enter and leave transactions](#)
- [Name a transaction](#)
- [Set the transaction Type property](#)
- [Set the Timeout property](#)
- [Set the Retry count property](#)
- [Set the Backoff time property](#)
- [Set the Isolation level property](#)

## Related Topic

[Designing Transactions](#)

# Group actions and flows within a transaction

1. In BizTalk Orchestration Designer, on a design page, drag a **Transaction** shape from the **Flowchart** stencil to the left side of the **Separator** bar.
2. Resize the **Transaction** shape to surround the shapes you want enclosed within the [transaction](#).

## Notes

- Any shape or flow within the boundaries of a transaction is considered part of that transaction.
- To select a shape that is within a transaction, click the shape.
- If you delete a transaction that contains shapes within its boundaries, all contained shapes are also deleted.
- Transaction types are denoted by the following colors:
  - **Blue**. This color denotes timed transactions.
  - **Beige**. This color denotes [long-running transactions](#).
  - **Gray**. This color denotes [short-lived](#), DTC-style transactions.
- You can add **Flowchart** shapes to the **Business Process**, **Compensation for Transaction**, and **On Failure of Transaction** pages. **Flowchart** shapes are not available on the **Data** page.

## Related Topics

[Add, Delete, and Connect Shapes](#)

[Create flows that enter and leave transactions](#)

[Designing Transactions](#)

[Design nested transactions](#)

[Name a transaction](#)

# Design nested transactions

1. In BizTalk Orchestration Designer, on a design page, drag a **Transaction** shape from the **Flowchart** stencil and place it within the boundaries of a current [transaction](#).
2. Resize the **Transaction** shape to surround the shapes you want enclosed within the transaction.

## ◆ Important

- When you create a [nested transaction](#), certain properties in the [outer transaction](#) are disabled:
  - The **Short-lived, DTC-style** transaction type is unavailable.
  - All options in the **Transaction options** area are unavailable.
  - The **Timeout** property is still active, but cannot be changed after you create a nested transaction unless you change the transaction type to **Timed transaction**.

## ✍ Notes

- Any shape or flow within the boundaries of a transaction is considered part of that transaction.
- To select a shape that is within a transaction, click the shape.
- If you delete a transaction that contains shapes within its boundaries, all contained shapes are also deleted.
- Transaction types are denoted by the following colors:
  - **Blue**. This color denotes timed transactions.
  - **Beige**. This color denotes [long-running transactions](#).
  - **Gray**. This color denotes [short-lived](#), DTC-style transactions.
- [Flowchart shapes](#) that are not fully contained within an inner transaction are considered part of the outer transaction.
- **Flowchart** shapes contained within an outer transaction might be partially hidden from view if an [inner transaction](#) partially overlaps them and they are not fully contained within the inner transaction. Select these shapes and reposition them so that they do not overlap.
- You can add **Flowchart** shapes to the **Business Process**, **Compensation for Transaction**, and **On Failure of Transaction** pages. **Flowchart** shapes are not available on the **Data** page.

## Related Topics

[Add, Delete, and Connect Shapes](#)

[Create flows that enter and leave transactions](#)

[Designing Transactions](#)

[Group actions and flows within a transaction](#)

[Name a transaction](#)

# Create flows that enter and leave transactions

1. In BizTalk Orchestration Designer, on a design page, click a shape that precedes a [transaction](#) in the flow of the business process.
2. Connect the bottom control handle (■) of the shape to the top connection point (×) of the **Transaction** shape.
3. Click the **Transaction** shape to select it.
4. Connect the top control handle of the **Transaction** shape to the top connection point of the first shape within the transaction that represents the beginning of the transactional flow.
5. From that shape connect the flow to the next shape within the transaction.
6. Connect all the flows within the transaction, and connect any [actions](#) to the [ports](#) for which you want to create a communication flow.
7. From the bottom control handle of the last shape within the transaction, connect the flow to the bottom connection point of the **Transaction** shape.
8. Click the **Transaction** shape to select it.
9. Connect the bottom control handle of the **Transaction** shape to the top connection point of the next shape in the flow of the business process that is outside of the transaction.

## Notes

- To select a shape that is within a transaction, click the shape.
- You can add [Flowchart shapes](#) to the **Business Process**, **Compensation for *Transaction***, and **On Failure of *Transaction*** pages. **Flowchart** shapes are not available on the **Data** page.

## Related Topics

[Add, Delete, and Connect Shapes](#)

[Connect two shapes](#)

[Designing Transactions](#)

[Design nested transactions](#)

[Group actions and flows within a transaction](#)

[Use the Connector Tool](#)

# Name a transaction

1. In BizTalk Orchestration Designer, on a design page, right-click a **Transaction** shape and click **Properties**.

The **Transaction Properties** dialog box appears.

2. In the **Name** box, type a name for the [transaction](#).

## Notes

- Shape names must meet certain naming conventions. The following conventions apply to transactions, ports, messages, rules, and fields:
  - The name must be a valid XML token name. For more information about XML tokens, go to the W3C Web site ([www.w3.org](http://www.w3.org)).
  - The name cannot begin with underscores (\_).
  - The name cannot include colons (:).
  - The name length must be less than or equal to 32 characters.
- Transaction names in single-byte character sets must be less than or equal to 16 characters in length. Transaction names in double-byte character sets must be less than or equal to 8 characters in length.

## Related Topics

[Designing Transactions](#)

[Design nested transactions](#)

[Group actions and flows within a transaction](#)

[Set the Backoff time property](#)

[Set the Isolation level property](#)

[Set the Retry count property](#)

[Set the Timeout property](#)

[Set the transaction Type property](#)

# Set the transaction Type property

1. In BizTalk Orchestration Designer, on a design page, right-click a **Transaction** shape and click **Properties**.

The **Transaction Properties** dialog box appears.

2. In the **Type** area, click one of the following options:

- **Timed transaction**
- **Short-lived, DTC-style**
- **Long-running**

## Related Topics

[Designing Transactions](#)

[Design nested transactions](#)

[Group actions and flows within a transaction](#)

[Name a transaction](#)

[Set the Backoff time property](#)

[Set the Isolation level property](#)

[Set the Retry count property](#)

[Set the Timeout property](#)

# Set the Timeout property

1. In BizTalk Orchestration Designer, on a design page, right-click a **Transaction** shape and click **Properties**.

The **Transaction Properties** dialog box appears.

2. In the **Transaction options** area, in the **Timeout** box, enter a time in seconds.

## Related Topics

[Designing Transactions](#)

[Design nested transactions](#)

[Group actions and flows within a transaction](#)

[Name a transaction](#)

[Set the Backoff time property](#)

[Set the Isolation level property](#)

[Set the Retry count property](#)

[Set the transaction Type property](#)

# Set the Retry count property

1. In BizTalk Orchestration Designer, on a design page, right-click a **Transaction** shape and click **Properties**.

The **Transaction Properties** dialog box appears.

2. In the **Transaction options** area, in the **Retry count** box, enter the number of times a [transaction](#) can be retried before it is considered to have failed.

## Related Topics

[Designing Transactions](#)

[Design nested transactions](#)

[Group actions and flows within a transaction](#)

[Name a transaction](#)

[Set the Backoff time property](#)

[Set the Isolation level property](#)

[Set the Timeout property](#)

[Set the transaction Type property](#)

# Set the Backoff time property

1. In BizTalk Orchestration Designer, on a design page, right-click a **Transaction** shape and click **Properties**.

The **Transaction Properties** dialog box appears.

2. In the **Transaction options** area, in the **Backoff time** box, enter a time in seconds.

## Note

- The **Backoff time** property determines the interval between each attempt to retry the [transaction](#). This option is available only for [short-lived](#), DTC-style transactions. The backoff time is used with the retry count value to determine how long to wait before the next transaction retry. The backoff value is exponential. A backoff value of 2 seconds results in intervals of 2, 4, 8, 16 seconds, and so on between each retry. The formula is **B\*\*R** (**B** raised to the power of **R**), where **B**=backoff time and **R**=current retry count.

## Related Topics

[Designing Transactions](#)

[Design nested transactions](#)

[Group actions and flows within a transaction](#)

[Name a transaction](#)

[Set the Isolation level property](#)

[Set the Retry count property](#)

[Set the Timeout property](#)

[Set the transaction Type property](#)

# Set the Isolation level property

1. In BizTalk Orchestration Designer, on a design page, right-click a **Transaction** shape and click **Properties**.

The **Transaction Properties** dialog box appears.

2. In the **Transaction options** area, in the **Isolation level** list, click one of the following options:

- **Serializable**
- **Read Uncommitted**
- **Read Committed**
- **Repeatable Read**

## Note

- This property can be set only for short-lived, DTC-style transactions.

## Related Topics

[Designing Transactions](#)

[Design nested transactions](#)

[Group actions and flows within a transaction](#)

[Name a transaction](#)

[Set the Backoff time property](#)

[Set the Retry count property](#)

[Set the Timeout property](#)

[Set the transaction Type property](#)

# Describe Component and Message Queuing Transaction Support

The following procedures are covered in this section:

- [Describe the level of transaction support in a COM component](#)
- [Describe the level of transaction support in a Windows Script Component](#)
- [Describe the transaction support provided by a message queue](#)

## Related Topics

[Designing Transactions](#)

[Set the transaction activation property](#)

[Set the transaction model](#)

# Describe the level of transaction support in a COM component

Transaction support for COM components is set within the COM Component Binding Wizard.

1. Open the COM Component Binding Wizard.

For more information about this wizard, see [Implement a port by using a COM component](#).

2. Follow the instructions in the wizard until you reach the **Advanced Port Properties** page.

3. On the **Advanced Port Properties** page, in the **Transaction support** area, click one of the following options:

- **Disabled**

Transaction support for the COM+ component used by this [port implementation](#) is disabled.

- **Not supported**

The COM+ component used by this port implementation does not support transactions.

- **Supported**

The COM+ component used by this port implementation inherits an existing transaction.

- **Required**

The COM+ component used by this port implementation can inherit an existing transaction, or use a new transaction.

- **Requires new**

The COM+ component used by this port implementation requires that a new transaction be used.

## Related Topics

[Add a bound port to an XLANG schedule drawing](#)

[Designing Transactions](#)

[Implement a port by using a COM component](#)

[Modify port implementation properties](#)

[Set the transaction activation property](#)

[Set the transaction model](#)

# Describe the level of transaction support in a Windows Script Component

Transaction support for Windows Script Components is set within the Script Component Binding Wizard.

1. Open the Script Component Binding Wizard.

For more information about this wizard, see [Implement a port by using a Windows Script Component](#).

2. Follow the instructions in the wizard until you reach the **Advanced Port Properties** page.

3. On the **Advanced Port Properties** page, in the **Transaction support** area, click one of the following options:

- **Disabled**

Transaction support for the COM+ component used by this [port implementation](#) is disabled.

- **Not supported**

The COM+ component used by this port implementation does not support transactions.

- **Supported**

The COM+ component used by this port implementation inherits an existing transaction.

- **Required**

The COM+ component used by this port implementation can inherit an existing transaction, or use a new transaction.

- **Requires new**

The COM+ component used by this port implementation requires that a new transaction be used.

## Related Topics

[Add a bound port to an XLANG schedule drawing](#)

[Designing Transactions](#)

[Implement a port by using a Windows Script Component](#)

[Modify port implementation properties](#)

[Set the transaction activation property](#)

[Set the transaction model](#)

# Describe the transaction support provided by a message queue

Transaction support for message queues is set within the Message Queuing Binding Wizard.

1. Open the Message Queuing Binding Wizard.  
For more information about this wizard, see [Implement a port by using Message Queuing](#).
2. Follow the instructions in the wizard until you reach the **Advanced Port Properties** page.
3. On the **Advanced Port Properties** page, in the **Transaction support** area, select or clear the **Transactions are required with this queue** check box.

## Related Topics

[Add a bound port to an XLANG schedule drawing](#)

[Designing Transactions](#)

[Implement a port by using Message Queuing](#)

[Modify port implementation properties](#)

[Set the transaction activation property](#)

[Set the transaction model](#)

# Set Error Handling Properties

The following procedures are covered in this section:

- [Abort a process flow](#)
- [Enable Transaction Error Handling](#)
- [Enable Component Error Handling](#)

## Related Topic

[Handling Exceptions](#)

# Abort a process flow

1. In BizTalk Orchestration Designer, on the **Flowchart** stencil, click the **Abort** shape and drag it to the design page.
2. Connect the process flow from a logical branch that exits a **Decision** shape to the connection point (✖) of the **Abort** shape.

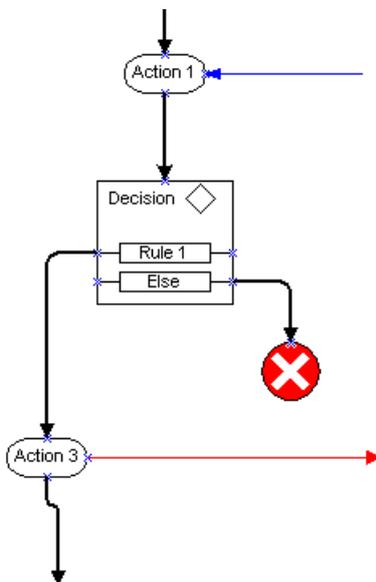
## ◆ Important

- **Abort** shapes are used to [abort](#) a business process in a logical branch. They are used along with [decisions](#).

The use of the **Abort** shape depends upon the needs of your business process. The rules that are contained within a decision are evaluated until a rule evaluates to TRUE. If a rule evaluates to TRUE, the process flows continues to the next action. If no rules evaluate to TRUE, you might choose to abort the process flow.

The following illustration shows an example of a decision condition where, if the rule evaluates to TRUE, the process flow continues to Action 3. If the rule does not evaluate to TRUE, the process flow is aborted.

Click the illustration to enlarge or reduce.



## Related Topics

[Enable Component Error Handling](#)

[Enable Transaction Error Handling](#)

[Handling Exceptions](#)

[Logical Branching](#)

# Enable Transaction Error Handling

The following procedures are covered in this section:

- [Enable On Failure error handling](#)
- [Enable Compensation error handling](#)

## Related Topics

[Abort a process flow](#)

[Handling Exceptions](#)

# Enable On Failure error handling

1. In BizTalk Orchestration Designer, on a design page, right-click a **Transaction** shape and click **Properties**.  
The **Transaction Properties** dialog box appears.
2. In the **On failure** area, click **Add Code**.
3. In the **On failure** area, select the **Enabled** check box.

## Notes

- Clicking **Add Code** creates the **On Failure of Transaction** page that is associated with this [transaction](#). The parameter *Transaction* in the name of the page is replaced with the name of the transaction with which the error-handling process is associated.
- Selecting the **Enabled** check box enables the [XLANG schedule](#) to run the On Failure code for this transaction. If you do not select this check box, you can still design On Failure processes, but they do not run when the XLANG schedule is run.

## Related Topics

[Design nested transactions](#)

[Group actions and flows within a transaction](#)

[Handling Exceptions](#)

# Enable Compensation error handling

1. In BizTalk Orchestration Designer, on a design page, right-click an inner **Transaction** shape in a [nested transaction](#) group and click **Properties**.

The **Transaction Properties** dialog box appears.

2. In the **Compensation** area, click **Add Code**.
3. In the **Compensation** area, select the **Enabled** check box.

## Notes

- Clicking the **Add Code** buttons creates the **On Failure of Transaction** or **Compensation for Transaction** page that is associated with this [transaction](#).
- Selecting the **Enabled** check boxes enables the [XLANG schedule](#) to run the On Failure code or Compensation code for this transaction. If you do not select these check boxes, you can still design On Failure and Compensation processes, but they do not run when the XLANG schedule is run.
- The parameter *Transaction* in the name of the page is replaced with the name of the transaction with which the error-handling process is associated.
- Transaction types are denoted by the following colors:
  - **Blue**. This color denotes timed transactions.
  - **Beige**. This color denotes [long-running transactions](#).
  - **Gray**. This color denotes [short-lived](#), DTC-style transactions.

## Related Topics

[Design nested transactions](#)

[Group actions and flows within a transaction](#)

[Handling Exceptions](#)

# Enable Component Error Handling

The following procedures are covered in this section:

- [Abort a transaction if a COM component returns a failure](#)
- [Abort a transaction if a Windows Script Component returns a failure](#)

## Related Topics

[Abort a process flow](#)

[Handling Exceptions](#)

# Abort a transaction if a COM component returns a failure

[Transaction](#) support for COM components is set within the COM Component Binding Wizard.

1. Open the COM Component Binding Wizard.  
For more information about this wizard, see [Implement a port by using a COM component](#).
2. Follow the instructions in the wizard until you reach the **Advanced Port Properties** page.
3. On the **Advanced Port Properties** page, in the **Error handling** area, select the **Abort the transaction if the method returns a failure HRESULT** check box.

## ◆ Important

- This option determines whether transactions in which the component is used should be aborted when method calls to the component return a failure HRESULT.

This option can only be set if the communication [action](#) that uses this [port](#) is within the process flow of a transaction.

## Related Topics

[Abort a transaction if a Windows Script Component returns a failure](#)

[Add a bound port to an XLANG schedule drawing](#)

[Handling Exceptions](#)

[Implement a port by using a COM component](#)

[Modify port implementation properties](#)

[Set the transaction activation property](#)

[Set the transaction model](#)

# Abort a transaction if a Windows Script Component returns a failure

[Transaction](#) support for Windows Script Components is set within the Script Component Binding Wizard.

1. Open the Script Component Binding Wizard.  
For more information about this wizard, see [Implement a port by using a Windows Script Component](#).
2. Follow the instructions in the wizard until you reach the **Advanced Port Properties** page.
3. On the **Advanced Port Properties** page, in the **Error handling** area, select the **Abort the transaction if the method returns a failure HRESULT** check box.

## ◆ Important

- This option determines whether transactions in which the component is used should be aborted when method calls to the component return a failure HRESULT.

This option can only be set if the communication [action](#) that uses this [port](#) is within the process flow of a transaction.

## Related Topics

[Abort a transaction if a COM component returns a failure](#)

[Add a bound port to an XLANG schedule drawing](#)

[Handling Exceptions](#)

[Implement a port by using a Windows Script Component](#)

[Modify port implementation properties](#)

[Set the transaction activation property](#)

[Set the transaction model](#)

# Implement Ports

BizTalk Orchestration Designer provides four **Implementation** shapes that represent technologies that can be used to implement [port](#) communications. The following table describes these shapes.

Shape name	Description
<b>COM Component</b> 	The <b>COM Component</b> shape represents a technology that can be used to implement a port by using a method call for each <a href="#">message</a> that is sent or received. Drag this shape to the right side of the <b>Separator</b> bar to open the COM Component Binding Wizard.
<b>Script Component</b> 	The <b>Script Component</b> shape represents a technology that can be used to implement a port by using a method call for each message that is sent or received. Drag this shape to the right side of the <b>Separator</b> bar to open the Script Component Binding Wizard.
<b>Message Queuing</b> 	The <b>Message Queuing</b> shape represents a technology that can be used to implement a port. Message Queuing Services are used to send or receive messages. Drag this shape to the right side of the <b>Separator</b> bar to open the Message Queuing Binding Wizard.
<b>BizTalk Messaging</b> 	The <b>BizTalk Messaging</b> shape represents a technology that can be used to implement a port. <a href="#">BizTalk Messaging Services</a> are used to send or receive messages. Either a BizTalk Server <a href="#">messaging port</a> or a <a href="#">channel</a> can be used to implement a port. Drag this shape to the right side of the <b>Separator</b> bar to open the BizTalk Messaging Binding Wizard.

The following procedures are covered in this section:

- [Add an unbound port to an XLANG schedule drawing](#)
- [Add a bound port to an XLANG schedule drawing](#)
- [Implement a port by using a COM component](#)
- [Implement a port by using a Windows Script Component](#)
- [Implement a port by using Message Queuing](#)
- [Implement a port by using BizTalk Messaging](#)
- [Modify port implementation properties](#)

## Related Topics

[Communication Shapes](#)

[Flowchart Shapes](#)

[Implementation Shapes](#)

[Implementing Business Processes](#)

[Match a specific message with a specific port](#)

[Send or Receive Messages](#)

[Understanding Port Implementations](#)

[Using the Method Communication Wizard](#)

[Using the XML Communication Wizard](#)

# Add an unbound port to an XLANG schedule drawing

- In BizTalk Orchestration Designer, on a design page, right-click the **Separator** bar and click **Add New Port**.

## Notes

- You can add a [port](#) to the **Business Process**, **Compensation for *Transaction***, and **On Failure of *Transaction*** pages. Ports are not available on the **Data** page.
- You cannot add shapes to the **Data** page. A [port reference](#) is created automatically on the **Data** page each time you create a new port.
- An unbound port can be implemented by using either Message Queuing or BizTalk Messaging. When you add one of those implementations to the page, the implementation wizard provides the option to select any available unbound ports.

## Related Topics

[Implement a port by using a COM component](#)

[Implement a port by using a Windows Script Component](#)

[Implement a port by using BizTalk Messaging](#)

[Implement a port by using Message Queuing](#)

[Match a specific message with a specific port](#)

[Modify port implementation properties](#)

[Send or Receive Messages](#)

# Add a bound port to an XLANG schedule drawing

- In BizTalk Orchestration Designer, on a design page, drag an **Implementation** shape from the **Implementation** stencil to the right side of the **Separator** bar and follow the steps in the wizard for that implementation.

## Notes

- You can add a [port](#) to the **Business Process**, **Compensation for *Transaction***, and **On Failure of *Transaction*** pages. Ports are not available on the **Data** page.
- You cannot add shapes to the **Data** page. A [port reference](#) is created automatically on the **Data** page each time you create a new port.

## Related Topics

[Implement a port by using a COM component](#)

[Implement a port by using a Windows Script Component](#)

[Implement a port by using BizTalk Messaging](#)

[Implement a port by using Message Queuing](#)

[Match a specific message with a specific port](#)

[Modify port implementation properties](#)

[Send or Receive Messages](#)

# Implement a port by using a COM component

1. In BizTalk Orchestration Designer, on a design page, drag the **COM Component** shape from the **Implementation** stencil to the right side of the **Separator** bar.

The COM Component Binding Wizard opens.

2. On the **Welcome to the COM Component Binding Wizard** page, type a name for the [port](#) that you want to create.

BizTalk Orchestration Designer provides a default [port name](#) with a number appended to it for each new [port implementation](#) that is added. You can change this name.

Click **Next**.

3. On the **Static or Dynamic Communication** page, click one of the following options:

- **Static**

The [XLANG Scheduler Engine](#) instantiates this component.

If you click the **Static** option, the component is automatically destroyed when the [XLANG schedule instance](#) ends.

Click **Next**. Continue to step 4 in this procedure.

- **Dynamic**

If you select this option, another application instantiates the component. A [moniker](#) or a pointer to the object instance must be sent back to the [XLANG schedule](#) as a field in a [message](#). On the **Data** page, a connection must be drawn between that message field and the [port reference](#) for the port that uses this implementation. For more information about sending a message to a specific port, see [Match a specific message with a specific port](#).

Click **Next**. Continue to step 5 in this procedure.

- **No instantiation**

Select this option only to receive data. This option specifies that data is passed into an XLANG schedule by using a method; however, none of the code behind the method call is executed. For more information, see [Data Handling](#).

Click **Next**. Continue to step 5 in this procedure.

For more information about static and dynamic communications, see the following topics:

- [Static and Dynamic Ports](#)
- [Instance Management](#)
- [Using the Script Component Shape](#)

4. On the **Class Information** page, click one of the following options:

- **From a registered component**

A tree control displays all components registered on your computer. Expand the folder for the class that you want, and click the class.

Click **Next**. Continue to step 5 in this procedure.

- **From a moniker**

Type the name of a standard COM moniker to specify the location of the COM component that you want to instantiate. If you use this option, the COM component cannot be used with communications that take place within a [transaction](#) in the XLANG schedule.

Click **Next**. Continue to step 5 in this procedure.

5. On the **Interface Information** page, click the interface that you want to use.

Click **Next**. Continue to step 6 in this procedure.

- If the COM component has only one interface, this page is skipped.
- If the COM component was created in Microsoft Visual Basic, there is one interface of the same name as each class contained within the component. Each interface name is prefaced with an underscore (\_).

6. On the **Method Information** page, select the methods that you want to use.

Click **Next**. Continue to step 7 in this procedure.

#### **Notes**

- If the COM component has only one method, this page is skipped.
- You must select at least one method.
- You can select several methods, or all of them. The **Check All** and **Uncheck All** buttons enable you either to select or deselect all of the methods.

7. On the **Advanced Port Properties** page, in the **Security** area, click one of the following options:

- **Not required**

No attempt is made to confirm the identity of the sender.

- **Optional**

The XLANG Scheduler Engine requests the identity of the sender. The XLANG schedule continues to run whether or not the identity is available.

- **Required**

The XLANG Scheduler Engine requests the identity of the sender. The sender identity is required, and the XLANG schedule ignores the message if the identity is not available.

#### **Note**

- If the XLANG schedule rejects an incoming method call when the identity is required but is unavailable, the error code E\_ACCESSDENIED is returned to the caller.

8. On the **Advanced Port Properties** page, in the **Transaction support** area, click one of the following options:

- **Disabled**

Transaction support for the COM+ component used by this port implementation is disabled.

- **Not supported**

The COM+ component used by this port implementation does not support transactions.

- **Supported**

The COM+ component used by this port implementation inherits an existing transaction.

- **Required**

The COM+ component used by this port implementation can inherit an existing transaction, or use a new transaction.

- **Requires new**

The COM+ component used by this port implementation requires that a new transaction be used.

9. On the **Advanced Port Properties** page, in the **State management** area, click one of the following options:

- **Holds no state**

The component used by this port implementation holds no state across method calls.

- **Holds state, but doesn't support persistence**

The component used by this port implementation holds state during the lifetime of the component, but the

component cannot be persisted.

- **Holds state, and does support persistence**

The component used by this port implementation holds state that can be saved by using either the **IPersistStream** or **IPersistStreamInit** interface. The use of either **IPersistStream** or **IPersistStreamInit** allows the state of the component to be saved for later instantiations, and the component is recreated using the saved state.

10. On the **Advanced Port Properties** page, in the **Error Handling** area, select or clear the **Abort the transaction if the method returns a failure HRESULT** check box.

- ◆ **Important**

- This option determines whether transactions in which the component is used should be aborted when method calls to the component return a failure HRESULT.

This option can only be set if the communication action that uses this port is within the process flow of a transaction.

11. Click **Finish**.

#### ✍ **Notes**

- Shape names must meet certain naming conventions. The following conventions apply to transactions, ports, messages, rules, and fields:
  - The name must be a valid XML token name. For more information about XML tokens, go to the W3C Web site ([www.w3.org](http://www.w3.org)).
  - The name cannot begin with underscores (\_).
  - The name cannot include colons (:).
  - The name length must be less than or equal to 32 characters.
  - Constant names and message names cannot begin with a numeric character.
- You can add port implementations to the **Business Process**, **Compensation for Transaction**, and **On Failure of Transaction** pages. Port implementations are not available on the **Data** page.
- You cannot add shapes to the **Data** page. A port reference is created automatically on the **Data** page each time you create a new port.
- A new port is always created for use with a COM component implementation.
- If you are editing an existing port implementation, on the first page of the implementation wizard, the **Rename current port** option enables you to rename the port.

#### **Related Topics**

[Implement a port by using a Windows Script Component](#)

[Implement a port by using BizTalk Messaging](#)

[Implement a port by using Message Queuing](#)

[Implementation Shapes](#)

[Implementing Business Processes](#)

[Match a specific message with a specific port](#)

[Modify port implementation properties](#)

[Understanding Port Implementations](#)

[Using the COM Component Shape](#)

[Using the Method Communication Wizard](#)



# Implement a port by using a Windows Script Component

1. In BizTalk Orchestration Designer, on a design page, drag the **Script Component** shape from the **Implementation** stencil to the right side of the **Separator** bar.

The Script Component Binding Wizard opens.

2. On the **Welcome to the Script Component Binding Wizard** page, type a name for the **port** that you want to create.

BizTalk Orchestration Designer provides a default **port name** with a number appended to it for each new **port implementation** that is added. You can change this name.

Click **Next**. Continue to step 3 in this procedure.

3. On the **Static or Dynamic Communication** page, click one of the following options:

- **Static**

The **XLANG Scheduler Engine** instantiates this component.

If you click the **Static** option, the component is automatically destroyed when the **XLANG schedule instance** ends.

Click **Next**. Continue to step 4 in this procedure.

- **Dynamic**

If you select this option, another application instantiates the component. A **moniker** or a pointer to the object instance must be sent back to the **XLANG schedule** as a field in a **message**. On the **Data** page, a connection must be drawn between that message field and the **port reference** for the port that uses this implementation. For more information about sending a message to a specific port, see [Match a specific message with a specific port](#).

Click **Next**. Continue to step 4 in this procedure.

- **No instantiation**

Select this option only to receive data. This option indicates that data is passed into the XLANG schedule by using a method; however, none of the code behind the method call is executed.

Click **Next**. Continue to step 4 in this procedure.

For more information about static and dynamic communications, see the following topics:

- [Static and Dynamic Ports](#)
- [Instance Management](#)
- [Using the Script Component Shape](#)

4. On the **Specify the Script File** page, click **Browse**.
5. In the **Select Script File** dialog box, browse to the location of the .wsc file that you want to use, click the file, and then click **Open**.

Click **Next**, and continue with one of the following options:

- If you selected **Static** in step 3, continue to step 6 in this procedure.
- If you selected **Dynamic** or **No instantiation** in step 3, continue to step 7 in this procedure.

6. On the **Component Instantiation Information** page, click one of the following:

- **Use a moniker of the script file**

The path and file name of the script file is automatically provided as the moniker.

Click **Next**. Continue to step 7 in this procedure.

- **Use the Prog ID "Prog ID"**

The Prog ID is automatically provided, and is extracted from the XML in the Windows Script Component file. This is recommended because the path to the script file is not hard-coded.

Click **Next**. Continue to step 7 in this procedure.

7. On the **Method Information** page, select the methods that you want to use.

Click **Next**. Continue to step 8 in this procedure.

#### **Notes**

- If the Windows Script Component has only one method, this page is skipped.
- You must select at least one method.
- You can select several methods, or all of them. The **Check All** and **Uncheck All** buttons enable you either to select or deselect all of the methods.

8. On the **Advanced Port Properties** page, in the **Security** area, click one of the following options:

- **Not required**

No attempt is made to confirm the identity of the sender.

- **Optional**

The XLANG Scheduler Engine requests the identity of the sender. The XLANG schedule continues to run whether or not the identity is available.

- **Required**

The XLANG Scheduler Engine requests the identity of the sender. The sender identity is required, and the XLANG schedule ignores the message if the identity is not available.

#### **Note**

- If the XLANG schedule rejects an incoming method call when the identity is required but is unavailable, the error code E\_ACCESSDENIED is returned to the caller.

9. On the **Advanced Port Properties** page, in the **Transaction support** area, click one of the following options:

- **Disabled**

[Transaction](#) support for the COM+ component used by this port implementation is disabled.

- **Not supported**

The COM+ component used by this port implementation does not support transactions.

- **Supported**

The COM+ component used by this port implementation inherits an existing transaction.

- **Required**

The COM+ component used by this port implementation can inherit an existing transaction, or use a new transaction.

- **Requires new**

The COM+ component used by this port implementation requires that a new transaction be used.

10. On the **Advanced Port Properties** page, in the **Error Handling** area, select or clear the **Abort the transaction if the method returns a failure HRESULT** check box.

#### **Important**

- This option determines whether transactions in which the component is used should be aborted when method calls to the component return a failure HRESULT.

This option can only be set if the communication [action](#) that uses this port is within the process flow of a transaction.

11. Click **Finish**.

#### ◆ Important

- When you use Windows Script Components, they must adhere to the following rules:
  - Argument declarations must be by reference, not by value.
  - Microsoft Visual Basic Scripting subroutines are not supported. Only functions are supported.
  - Multiple components cannot be used within a single .wsc file.

#### ✍ Notes

- Shape names must meet certain naming conventions. The following conventions apply to transactions, ports, messages, rules, and fields:
  - The name must be a valid XML token name. For more information about XML tokens, go to the W3C Web site ([www.w3.org](http://www.w3.org)).
  - The name cannot begin with underscores (\_).
  - The name cannot include colons (:).
  - The name length must be less than or equal to 32 characters.
  - Constant names and message names cannot begin with a numeric character.
- You can add port implementations to the **Business Process**, **Compensation for Transaction**, and **On Failure of Transaction** pages. Port implementations are not available on the **Data** page.
- You cannot add shapes to the **Data** page. A port reference is created automatically on the **Data** page each time you create a new port.
- A new port is always created for use with a Windows Script Component implementation.
- If you are editing an existing port implementation, on the first page of the implementation wizard, the **Rename current port** option allows you to rename the port.
- Windows Script Component files use the file extension .wsc. For more information about Windows Script Components, go to the Windows Scripting Technologies Web site ([msdn.microsoft.com/scripting/default.htm](http://msdn.microsoft.com/scripting/default.htm)) and browse to the Windows Script Components page.
- Windows Script Components that have been run by the XLANG Scheduler Engine cannot be modified until both the XLANG Scheduler Engine and the Windows Script Host are shut down.

#### Related Topics

[Implement a port by using a COM component](#)

[Implement a port by using BizTalk Messaging](#)

[Implement a port by using Message Queuing](#)

[Implementation Shapes](#)

[Implementing Business Processes](#)

[Match a specific message with a specific port](#)

[Modify port implementation properties](#)

[Understanding Port Implementations](#)

[Using the Script Component Shape](#)



# Implement a port by using Message Queuing

1. In BizTalk Orchestration Designer, on a design page, drag the **Message Queuing** shape from the **Implementation** stencil to the right side of the **Separator** bar.

The Message Queuing Binding Wizard opens.

2. On the **Welcome to the Message Queuing Binding Wizard** page, click one of the following options:

- **Create a new port**

BizTalk Orchestration Designer provides a default [port name](#) with a number appended to it for each new [port implementation](#) that is added. You can change this name.

Click **Next**. Continue to step 3 in this procedure.

- **Existing unbound port**

In the **Existing unbound port** list, click the port that you want to use.

Only names for unbound ports appear in the **Existing unbound port** list. An unbound port has no defined implementation.

Click **Next**. Continue to step 3 in this procedure.

3. On the **Static or Dynamic Queue Information** page, click one of the following options:

- **Static queue**

A static queue is a known, preexisting queue. This queue must be known at design time.

Click **Next**. Continue to step 4 in this procedure.

- **Dynamic queue**

If you select this option, on the **Data** page you must create a link from a [message](#) field to the [port reference](#) for this port.

The name of the message queue must be provided by another message prior to the communication [action](#) that occurs by using this port implementation. For more information about matching a specific message with a specific port, see [Match a specific message with a specific port](#).

Click **Next**. Continue to step 5 in this procedure.

For more information about static and dynamic queues, see [Static and Dynamic Ports](#).

4. On the **Queue Information** page, click one of the following options:

- **Create a new queue for every instance**

You must assign the queue a prefix. For example: ".\Private\$\PrivateQueuePrefix" or ".\PublicQueuePrefix". A unique ID will be appended to the prefix for each new queue that is created.

A default queue prefix is provided for you. You can change this default.

If you want to enable someone to reply to this port, a reference to this port must be sent in a message. To do this, select **Create a new queue for every instance** and enter a root queue name. At run time, the [XLANG Scheduler Engine](#) creates a new queue with this root name for every instance, and an instance GUID appended to the root name for each queue created. This queue is deleted when the instance ends.

If you do not plan to send out a reference to this port, there is no need for a per instance queue. You can create a queue that will be used for all instances.

Click **Next**. Continue to step 5 in this procedure.

- **Use a known queue for all instances**

Enter the queue name of a known, preexisting queue. For example: ".\private\$\queuename".

Click **Next**. Continue to step 5 in this procedure.

5. On the **Advanced Port Properties** page, in the **Security** area, click one of the following options:

- **Not required**

No attempt is made to confirm the identity of the sender. The XLANG schedule always receives the message with a blank `__Sender__` field, whether or not the message is authenticated.

- **Optional**

The XLANG Scheduler Engine sends a request for confirmation of the identity of the sender. The XLANG schedule receives the message, whether or not a message is authenticated. If the message is authenticated, the `__Sender__` field contains the Message Queuing message **SenderID** property.

- **Required**

The XLANG Scheduler Engine sends a request for confirmation of the identity of the sender. Confirmation of the sender identity is required. If the message is authenticated, the XLANG schedule receives the message, and the `__Sender__` field contains the Message Queuing message **SenderID** property.

If the message is not authenticated, an application event-log entry is created, and the message is moved to a new queue that is created and named `.\private$\ApplicationName.DeadLetter`.

6. On the **Advanced Port Properties** page, in the **Security** area, select or clear the **Use a Windows Group or User Name to control the queue** check box.

If you select the check box, enter the name of the user or group that is permitted to write messages to the queue. This option is available only if you are using a static queue.

7. On the **Advanced Port Properties** page, in the **Transaction support** area, select or clear the **Transactions are required with this queue** check box.

8. Click **Finish**.

#### **Notes**

- Shape names must meet certain naming conventions. The following conventions apply to transactions, ports, messages, rules, and fields:
  - The name must be a valid XML token name. For more information about XML tokens, go to the W3C Web site ([www.w3.org](http://www.w3.org)).
  - The name cannot begin with underscores (`_`).
  - The name cannot include colons (`:`).
  - The name length must be less than or equal to 32 characters.
  - Constant names and message names cannot begin with a numeric character.
- You can add port implementations to the **Business Process**, **Compensation for *Transaction***, and **On Failure of *Transaction*** pages. Port implementations are not available on the **Data** page.
- You cannot add shapes to the **Data** page. A port reference is created automatically on the **Data** page each time you create a new port.
- If you are editing an existing port implementation, on the first page of the implementation wizard, the **Rename current port** option allows you to rename the port.

#### **Related Topics**

[Implement a port by using a COM component](#)

[Implement a port by using a Windows Script Component](#)

[Implement a port by using BizTalk Messaging](#)

Implementation Shapes

Implementing Business Processes

Match a specific message with a specific port

Modify port implementation properties

Understanding Port Implementations

Using the Message Queuing Shape

Using the XML Communication Wizard

# Implement a port by using BizTalk Messaging

1. In BizTalk Orchestration Designer, on a design page, drag the **BizTalk Messaging** shape from the **Implementation** stencil to the right side of the **Separator** bar.

The BizTalk Messaging Binding Wizard opens.

2. On the **Welcome to the BizTalk Messaging Binding Wizard** page, click one of the following options:

- **Create a new port**

BizTalk Orchestration Designer provides a default [port name](#) with a number appended to it for each new [port implementation](#) that is added. You can change this name.

Click **Next**. Continue to step 3 in this procedure.

- **Existing unbound port**

In the **Existing unbound port** list, click the port that you want to use.

Only names for unbound ports appear in the **Existing unbound port** list. An unbound port has no defined implementation.

Click **Next**. Continue to step 3 in this procedure.

3. On the **Communication Direction** page, click one of the following options:

- **Send**

Click **Next**. Continue to step 4 in this procedure.

- **Receive**

Click **Next**. Continue to step 5 in this procedure.

## Note

- If you choose **Receive**, messages can be received by using an HTTP URL destination, or by using [BizTalk Messaging Manager](#) to configure a [messaging port](#) to instantiate an XLANG schedule, and send messages to a specific port in that schedule. For more information about receiving messages by using an HTTP URL, see [Integrating BizTalk Services](#). For more information about using BizTalk Messaging Manager to configure a messaging port, see [Set destination application properties](#).

4. On the **Static or Dynamic Channel Information** page, click one of the following options:

- **Static channel**

Enter the name of a known, preexisting [channel](#). Click **Finish**.

- **Dynamic channel**

If you select this option, you must configure the port to provide the data that [BizTalk Messaging Services](#) needs at run time to identify the correct channel to process the message.

On the **Data** page, you must create a link from a [message](#) field of a previously received message to the [port reference](#) for this [port](#). The message field must contain a destination address, which BizTalk Messaging Services uses as the destination address for an [open messaging port](#) that is associated with that channel. For more information, see [Integrating BizTalk Services](#).

When you establish the communication flow from an action to this port, you use the XML Communication Wizard. On the **Message Type Information** page, in the **Message type** box, you must enter the name of the inbound [document definition](#) for the channel. BizTalk Messaging Services uses this data to identify the correct channel to process the message. For more information, see [Identification](#).

Click **Finish**.

## Important

- There must be at least one channel configured in BizTalk Messaging Services that uses the specified inbound

document definition. When an action communicates with a port bound to BizTalk Messaging and the specified channel for the binding does not exist, the XLANG schedule instance will failfast with an event log entry.

- There should be only one channel configured in BizTalk Messaging Services that uses the specified inbound document definition and is configured with **XLANG schedule** as its source. For more information, see [Set source application properties](#). That channel also must be associated with an open messaging port. When an action communicates with a port bound to BizTalk Messaging and more than one channel for the binding exists, the XLANG schedule instance will failfast with an event log entry.

5. On the **XLANG Schedule Activation Information** page, click one of the following options:

- **Yes**

This port cannot be used in multiple receive actions or within a single receive action within a loop.

Click **Finish**.

- **No**

Click **Next**. Continue to step 6 in this procedure.

6. On the **Channel Information** page, in the **Channel name** box, type the name of the channel that you want to use. For more information about channels, see [Understanding Channels](#) and [Search for channels](#).

7. On the **Channel Information** page, in the **HTTP URL address where the BizTalk Messaging Service receives documents** box, type the URL address from which BizTalk Server receives documents for this channel.

8. Click **Finish**.

#### ◆ Important

- If you configure a port to activate a new XLANG schedule when a message arrives, you must observe the following restrictions:
  - Only one port in a schedule can be used to activate the schedule when the message arrives.
  - Only one action can receive through this port.
  - This one action cannot be in a loop body.
  - You cannot draw a data flow connection from the port reference for this port to any other message in the schedule.

#### ✍ Notes

- Shape names must meet certain naming conventions. The following conventions apply to transactions, ports, messages, rules, and fields:
  - The name must be a valid XML token name. For more information about XML tokens, go to the W3C Web site ([www.w3.org](http://www.w3.org)).
  - The name cannot begin with underscores (\_).
  - The name cannot include colons (:).
  - The name length must be less than or equal to 32 characters.
  - Constant names and message names cannot begin with a numeric character.
- You can add port implementations to the **Business Process**, **Compensation for Transaction**, and **On Failure of Transaction** pages. Port implementations are not available on the **Data** page.
- You cannot add shapes to the **Data** page. A port reference is created automatically on the **Data** page each time you create a new port.

- If you are editing an existing port implementation, on the first page of the implementation wizard, the **Rename current port** option allows you to rename the port.

## Related Topics

[Implement a port by using a COM component](#)

[Implement a port by using a Windows Script Component](#)

[Implement a port by using Message Queuing](#)

[Implementation Shapes](#)

[Implementing Business Processes](#)

[Integrating BizTalk Services](#)

[Match a specific message with a specific port](#)

[Modify port implementation properties](#)

[Search for channels](#)

[Understanding Channels](#)

[Understanding Port Implementations](#)

[Using the BizTalk Messaging Shape](#)

[Using the XML Communication Wizard](#)

# Modify port implementation properties

1. In BizTalk Orchestration Designer, on a design page, right-click an **Implementation** shape that you want to modify.
2. Click **Properties**.  
The wizard for that **Implementation** shape opens.
3. Follow the steps in the wizard and change any properties that you want to modify.

## Notes

- You can modify [port implementation](#) on the **Business Process**, **Compensation for Transaction**, and **On Failure of Transaction** pages. Port implementations are not available on the **Data** page.
- You cannot add shapes to the **Data** page. A [port reference](#) is created automatically on the **Data** page each time you create a new port.
- On the first page of the implementation wizard, the **Rename current port** option allows you to rename the [port](#).

## Related Topics

[Implement a port by using a COM component](#)

[Implement a port by using a Windows Script Component](#)

[Implement a port by using BizTalk Messaging](#)

[Implement a port by using Message Queuing](#)

[Implementation Shapes](#)

[Implementing Business Processes](#)

# Send or Receive Messages

BizTalk Orchestration Designer provides two forms of communication by which an [XLANG schedule](#) can send or receive messages:

- **Synchronous communication.** Method calls are used to send or receive [synchronous](#) message pairs.
- **Asynchronous communication.** XML messages are used to send or receive [asynchronous](#) messages.

For more information, see [Synchronous and Asynchronous Communication](#).

The following procedures are covered in this section:

- [Establish the communication flow between an action and a port](#)
- [Send or receive synchronous messages](#)
- [Send or receive asynchronous messages](#)
- [Modify the communication flow between an action and a port](#)

## Related Topics

[Synchronous and Asynchronous Communication](#)

[Using the Method Communication Wizard](#)

[Using the XML Communication Wizard](#)

# Establish the communication flow between an action and a port

1. In BizTalk Orchestration Designer, on a design page, click an **Action** shape to select it.
2. Drag the right control handle (■) of the **Action** shape to the connection point (×) of a **Port** shape.  
A communication wizard opens.
3. Continue to one of the following procedures, depending on which type of communication flow you want to create.
  - If you want to create a [synchronous communication](#) flow to a [port](#) that uses a COM Component or Script Component implementation, you must use the Method Communication Wizard. Continue to [Send or receive synchronous messages](#).
  - If you want to create an [asynchronous communication](#) flow to a port that uses a Message Queuing or BizTalk Messaging implementation, or if you want to create an asynchronous communication flow to an unbound port, you must use the XML Communication Wizard. Continue to [Send or receive asynchronous messages](#).

## Notes

- You can also use the Connector Tool to connect shapes. For more information, see [Use the Connector Tool](#).
- You can establish a communication flow between an action and a port on the **Business Process, Compensation for Transaction**, and **On Failure of Transaction** pages. [Actions](#) and ports are not available on the **Data** page.
- You cannot add shapes to the **Data** page. New messages are created automatically on the **Data** page each time an action is connected to a port.

# Send or receive synchronous messages

In BizTalk Orchestration Designer, after you have created a communication flow between an [action](#) and a [port](#) for a [synchronous communication](#), the Method Communication Wizard opens. For more information about creating a communication flow, see [Establish the communication flow between an action and a port](#).

1. On the **Welcome to the Method Communication Wizard** page, click one of the following options:

- **Initiate a synchronous method call**

The [XLANG Scheduler Engine](#) initiates a synchronous method call.

In this case, the XLANG Scheduler Engine sends a method call to a component, waits for a response from the component, and then receives a response.

Click **Next**. Continue to step 3 in this procedure.

- **Wait for a synchronous method call**

The XLANG Scheduler Engine waits to receive a method call that is initiated by another application.

In this case, the XLANG Scheduler Engine waits for another application to initiate the method call. This separate application sends a method call to a component; the XLANG Scheduler Engine waits for a response from the component and then returns a response to the application. The XLANG schedule intercepts both the method request and the method response.

Continue to step 2 in this procedure.

2. On the **Welcome to the Method Communication Wizard** page, to optimize the execution of an [XLANG schedule](#), enter the amount of time (in seconds) that you expect the XLANG Scheduler Engine to wait before a [message](#) arrives.

The default wait time is 0 seconds. You can change this time. Any time less than or equal to 180 seconds causes the XLANG schedule to never [dehydrate](#). Any time greater than 180 seconds causes the XLANG schedule to dehydrate immediately. For more information about wait times and XLANG schedule dehydration, see [Dehydration and Rehydration](#) and [Using the Method Communication Wizard](#).

Click **Next**. Continue to step 3 in this procedure.

3. On the **Message Information** page, click one of the following options:

- **Create a new message**

The name of this message is automatically determined by the method that you select on the next page of this wizard. The data flow for a new message must be connected to other messages on the **Data** page.

Click **Next**. Continue to step 4 in this procedure.

- **Add a reference to an existing synchronous message pair**

A reference to a previously configured message pair is added to this communication flow. These message pairs can be reused only within the same [port](#). They cannot be used by another [port implementation](#).

Click **Finish**.

4. On the **Message Specification Information** page, in the **Methods** list, click the method that you want to use. You can select only one method in the list.

Selecting a method defines the messages for this communication flow. The *IN* and *OUT* parameters are automatically determined by the parameter requirements of the method that you choose. Both parameter lists contain the name and data type of the parameter.

For more information about defining the messages used in a communication flow, see [Synchronous Communication](#).

5. Click **Finish**.

## Notes

- Shape names must meet certain naming conventions. The following conventions apply to transactions, ports, messages, rules, and fields:

- The name must be a valid XML token name. For more information about XML tokens, go to the W3C Web site ([www.w3.org](http://www.w3.org)).
- The name cannot begin with underscores (\_).
- The name cannot include colons (:).
- The name length must be less than or equal to 32 characters.
- Constant names and message names cannot begin with a numeric character.
- The wait time property is not enabled unless you click **Wait for a synchronous method call**.
- The only methods available for use in a synchronous communication are those that were selected for the port implementation. Methods from other port implementations cannot be used, and XML messages from [asynchronous communication](#) flows cannot be used. To change the available methods, rerun the appropriate port implementation wizard and select different methods.
- When you create a synchronous communication, a **Message** is created on the **Data** page. The **Message** corresponds to the method and parameters that are used in the communication flow. The **Message** contains all *IN* parameters for the method, and all *OUT* parameters for the method.

It is possible for a method to contain no parameters; however, the **Message** always contains required system fields. For more information about defining the messages used in a synchronous communication, see [Synchronous Communication](#).

## Related Topics

[Dehydration and Rehydration](#)

[Establish the communication flow between an action and a port](#)

[Implement Ports](#)

[Send or receive asynchronous messages](#)

[Synchronous Communication](#)

[Using the Method Communication Wizard](#)

[Using the XML Communication Wizard](#)

# Send or receive asynchronous messages

1. On the **Welcome to the XML Communication Wizard** page, choose one of the following options:

- **Send**

A [message](#) is sent asynchronously.

Click **Next**. Continue to step 3 in this procedure.

- **Receive**

The [XLANG Scheduler Engine](#) waits until it receives a message before continuing the [XLANG Schedule](#).

Continue to step 2 in this procedure.

2. On the **Welcome to the XML Communication Wizard** page, to optimize the execution of an XLANG schedule, enter the amount of time (in seconds) that you expect the XLANG Scheduler Engine to wait before a message arrives.

The default wait time is 0 seconds. You can change this time. Any time less than or equal to 180 seconds causes the XLANG schedule to never [dehydrate](#). Any time greater than 180 seconds causes the XLANG schedule to dehydrate immediately. For more information about wait times and XLANG schedule dehydration, see [Dehydration and Rehydration](#) and [Using the XML Communication Wizard](#).

Click **Next**. Continue to step 3 in this procedure.

3. On the **Message Information** page, click one of the following options:

- **Create a new message**

In the **Message name** box, type the name of the message. A default message name with a number appended to it is provided; however, you can change this name.

The data flow for a new message must be connected to other messages on the **Data** page.

- **Add a reference to an existing message**

A reference to a previously configured message is added to this communication flow.

Click **Next**, and do one of the following:

- If you clicked **Send** on the **Welcome to the XML Communication Wizard** page, continue to step 4 in this procedure.

- If you clicked **Receive** on the **Welcome to the XML Communication Wizard** page, continue to step 6 in this procedure.

4. On the **XML Translation Information** page, click one of the following options:

- **Send XML messages to the queue**

- **Send messages to the queue as a string**

The XLANG Scheduler Engine must remove the standard XML wrapper from the string.

Data flow in the XLANG Scheduler Engine is handled by using XML. The engine natively sends XML messages to message queues. The engine can also send a message as a string, from which the engine must remove its standard XML wrapper. The data flow must deliver a message in the correct [specification](#) format for this [action](#).

If you choose to send or receive an XML message as a string, the **Message** shape that is created on the **Data** page for this message contains a field named StringData, and you cannot add specification fields to this message.

Click **Next**. Continue to step 5 in this procedure.

5. On the **Message Type Information** page, in the **Message type** box, type a label designation for the message.

The text that you enter is used to label the message as it is sent to the queue.

To continue, do one of the following:

- If, on the **XML Translation Information** page, you clicked **Send XML messages to the queue**, then click **Next**. Continue to step 8 in this procedure.
- If, on the **XML Translation Information** page, you clicked **Send messages to the queue as a string**, then click **Finish**.

6. On the **XML Translation Information** page, click one of the following options:

- **Receive XML messages from the queue**
- **Receive string messages from the queue**

The XLANG Scheduler Engine must wrap the string in the engine's standard XML wrapper.

Data flow in the XLANG Scheduler Engine is handled by using XML. The engine natively receives XML messages from message queues. The engine can also receive a message as a string, which the engine then wraps in XML.

Click **Next**. Continue to step 7 in this procedure.

7. On the **Message Type Information** page, in the **Message type** box, type a label designation for the message.

The text that you enter is used to identify the correct messages to receive from the message queue.

First, the XLANG Scheduler Engine tries to match the message type information with the message label in the queue.

Second, if the message is in an XML format on the queue, the XLANG Scheduler Engine tries to match the message type information with the XML root element of the message on the queue.

To continue, do one of the following:

- If, on the **XML Translation Information** page, you clicked **Receive XML messages from the queue**, click **Next**. Continue to step 8 in this procedure.
- If, on the **XML Translation Information** page, you clicked **Receive string messages from the queue**, click **Finish**.

8. On the **Message Specification Information** page, click **Browse**.

9. In the **Browse for Specification** dialog box, browse to the specification that you want to use, click it, and then click **Open**.

On the **Message Specification Information** page, in the **Message specification** box, the file path and file name of the specification that you selected are entered.

#### **Notes**

- If you do not browse for an existing specification, you can click **Create**. This action opens [BizTalk Editor](#), which enables you to select a specification and modify it as needed for use with this message, or create a new specification.
- If you select a specification by browsing for it, the **Create** button label changes to **Edit**. Click **Edit** to modify the specification that you have selected.

10. On the **Message Specification Information** page, if you want to validate the message against the specification, select the **Validate messages against the specification** check box.

#### **Note**

- This check box is not enabled unless you select a specification for validation.

11. On the **Message Specification Information** page, if you want to add fields to the **Message fields** list, click **Add**.

#### **Important**

- If you want to select additional fields for this message specification, you must use a specification that has been created by using BizTalk Editor. You can adapt any standard or [schema](#) by first importing it into BizTalk Editor and then saving it as a BizTalk specification. For more information, see [Create and Validate Specifications](#).

12. In the **Field Selection** dialog box, in the **Select node** tree, expand any nodes that you want, and then click the field that you want to add. Click **OK**.

## Notes

- When you click a field in the **Select node** tree, the field name is added automatically to the **Field name** box.
  - When you click a field in the **Select node** tree, the node path to that field is added automatically to the **Node path** box. This path can be edited manually. For more information, see [Node Path Fields](#).
  - You cannot select a record node to add to the **Message fields** list. You can select only fields. For more information, see [Node Path Fields](#).
  - If you want to add several fields to the **Message fields** list, in the **Field Selection** dialog box, you must select a field and then click **OK**. On the **Message Specification Information** page, click **Add** and repeat the process to add another field.
13. On the **Message Specification Information** page, if you want to delete fields in the **Message fields** list, click a field in the list and click **Remove**.

## Note

- You cannot delete any required fields. Required fields appear in the **Message fields** list with a yellow background.
14. Click **Finish**.

## Notes

- Shape names must meet certain naming conventions. The following conventions apply to transactions, ports, messages, rules, and fields:
  - The name must be a valid XML token name. For more information about XML tokens, go to the W3C Web site ([www.w3.org](http://www.w3.org)).
  - The name cannot begin with underscores (\_).
  - The name cannot include colons (:).
  - The name length must be less than or equal to 32 characters.
  - Constant names and message names cannot begin with a numeric character.
- The wait time property is not enabled unless you click **Receive**.
- The only messages available for use in an [asynchronous communication](#) are XML messages. All XML messages are available for use, and can be specified for more than one [port](#). You cannot use any of the synchronous message pairs that are created by using the Method Communication Wizard.
- If you are connecting this communication flow to a port that is implemented by using BizTalk Messaging, the direction of the communication (**Send** or **Receive**) is determined by the [port implementation](#) and cannot be set in the XML Communication Wizard. The **Send** or **Receive** option on the first page of the wizard is selected automatically and is unavailable. You must click **Next** and continue to the next page of the wizard to finish the configuration of the communication flow.
- When you create an asynchronous communication, a **Message** is created on the **Data** page. The **Message** corresponds to information sent or received in the communication flow. The **Message** contains required system fields and any additional specification fields that you want. For more information about defining the messages used in an asynchronous messaging communication, see [Asynchronous Communication](#).

## Related Topics

[Asynchronous Communication](#)

[Create and Validate Specifications](#)

[Creating Specifications and Mapping Data](#)

Dehydration and Rehydration

Establish the communication flow between an action and a port

Node Path Fields

Send or receive synchronous messages

Using the XML Communication Wizard

# Modify the communication flow between an action and a port

1. In BizTalk Orchestration Designer, on a design page, right-click the communication flow that is between an [action](#) and a [port](#).

A communication wizard opens.

2. Follow the steps in the wizard to change any properties that you want to modify.

Continue to one of the following procedures, depending on which type of communication flow you want to create.

- If you want to create a [synchronous communication](#) flow to a port that uses a COM Component or Script Component implementation, you must use the Method Communication Wizard. Continue to [Send or receive synchronous messages](#).
- If you want to create an [asynchronous communication](#) flow to a port that uses a Message Queuing or BizTalk Messaging implementation, or if you want to create an asynchronous communication flow to an unbound port, you must use the XML Communication Wizard. Continue to [Send or receive asynchronous messages](#).

## Notes

- You can establish a communication flow between an action and a port on the **Business Process**, **Compensation for Transaction**, and **On Failure of Transaction** pages. Actions and ports are not available on the **Data** page.
- You cannot add shapes to the **Data** page. New [messages](#) are created automatically on the **Data** page each time an action is connected to a port.

## Related Topics

[Establish the communication flow between an action and a port](#)

[Send or receive asynchronous messages](#)

[Send or receive synchronous messages](#)

[Using the Method Communication Wizard](#)

[Using the XML Communication Wizard](#)

# Draw the Flow of Data Between Messages

The following procedures are covered in this section:

- [Select a message](#)
- [Select a field within a message](#)
- [Draw the flow between messages](#)
- [Delete a message](#)
- [Match a specific message with a specific port](#)
- [Use Constants](#)

## Related Topics

[Add, Delete, and Connect Shapes](#)

[Data Handling](#)

# Select a message

- In BizTalk Orchestration Designer, on the **Data** page, click the gray header field for the [message](#) that you want to select.  
The entire message that you select is surrounded with a green dashed border.

## Notes

- You can select the **Constants** list, the **Port References** list, or a **Message**.
- When you select an entire message, you can reposition it on the page by dragging it. Repositioning the messages can clarify the data flows that are drawn between messages.

## Related Topics

[Add, Delete, and Connect Shapes](#)

[Data Handling](#)

[Delete a message](#)

[Draw the flow between messages](#)

[Match a specific message with a specific port](#)

[Select a field within a message](#)

[Use Constants](#)

# Select a field within a message

- In BizTalk Orchestration Designer, on the **Data** page, click a field with a [message](#) that you want to select.

The field that you select is surrounded with a green dashed border. Any control handles (■) available to that field are enabled.

## Related Topics

[Add, Delete, and Connect Shapes](#)

[Data Handling](#)

[Delete a message](#)

[Draw the flow between messages](#)

[Match a specific message with a specific port](#)

[Select a message](#)

[Use Constants](#)

# Draw the flow between messages

1. In BizTalk Orchestration Designer, on the **Data** page, click a field within a [message](#) to enable its control handles (■).
2. Drag the control handle to the connection point (×) of a field in another message to which you want to connect.  
When the connection point is highlighted with a red box (ⓧ), release the mouse button to set the connection.

## Note

- If you want to create several data flows, you can use the Connector Tool to add the flows quickly. For more information about the Connector Tool, see [Use the Connector Tool](#).

## Related Topics

[Add, Delete, and Connect Shapes](#)

[Data Handling](#)

[Delete a message](#)

[Match a specific message with a specific port](#)

[Select a field within a message](#)

[Select a message](#)

[Use Constants](#)

# Delete a message

- In BizTalk Orchestration Designer, on the **Data** page, click the gray header field for the [message](#) that you want to delete and press DELETE.

## Notes

- You cannot delete the **Port References** list.
- You cannot delete the **Constants** list.
- If you select an individual field within a message and press DELETE, the entire message is deleted, not just the field.

## Related Topics

[Add, Delete, and Connect Shapes](#)

[Data Handling](#)

[Draw the flow between messages](#)

[Select a field within a message](#)

[Select a message](#)

# Match a specific message with a specific port

1. Click the field within the **Port References** list that contains the name of the [port](#) to which you want to refer.
2. Drag the control handle (■) from that field to the connection point (×) of the field in a **Message** in which you want to pass the reference to the port.

## ◆ Important

- For more information about correlating messages and port references, see the Following topics:
  - [Instance Management](#)
  - [Data Handling](#)
  - [Understanding Port Implementations](#)

## Related Topics

[Data Handling](#)

[Delete a message](#)

[Draw the flow between messages](#)

[Implement Ports](#)

[Instance Management](#)

[Select a field within a message](#)

[Select a message](#)

[Understanding Port Implementations](#)

[Use Constants](#)

# Use Constants

The following procedures are covered in this section:

- [Add constants](#)
- [Edit constants](#)
- [Delete constants](#)

## Related Topics

[Data Handling](#)

[Field Data Types](#)

[Summary of Data Types and Data Type Values](#)

# Add constants

1. In BizTalk Orchestration Designer, on the **Data** page, right-click the **Constants** list and click **Properties**.

The **Constants Message Properties** dialog box appears.

2. Click **Add**.

The **Constant Properties** dialog box appears.

3. In the **Name** box, type a name for the constant.
4. In the **Data type** list, click the data type for the constant.
5. In the **Value** box, type the value for the constant.
6. Click **OK**, and then click **OK** again.

## Notes

- A default name with a number appended to it is provided for each constant that you create. You can change this name.
- The **Data type description** area provides read-only information about the data type that you select. It might provide a format example for the data type, or a valid range for the value for a data type.

## Related Topics

[Data Handling](#)

[Delete constants](#)

[Edit constants](#)

[Field Data Types](#)

[Summary of Data Types and Data Type Values](#)

# Edit constants

1. In BizTalk Orchestration Designer, on the **Data** page, right-click the **Constants** list and click **Properties**.

The **Constants Message Properties** dialog box appears.

2. In the **Constants** list, click the constant that you want to edit.

3. Click **Edit**.

The **Constant Properties** dialog box appears.

4. Edit any constant properties that you want to change and click **OK**.

## Notes

- For more detailed information about the properties available in the Constant Properties dialog box, see [Add constants](#).
- A default name with a number appended to it is provided for each constant that you create. You can change this name.
- The **Data type description** area provides read-only information about the data type that you select. It might provide a format example for the data type, or a valid range for the value for a data type.

## Related Topics

[Add constants](#)

[Data Handling](#)

[Delete constants](#)

[Field Data Types](#)

[Summary of Data Types and Data Type Values](#)

# Delete constants

1. In BizTalk Orchestration Designer, on the **Data** page, right-click the **Constants** list and click **Properties**.

The **Constants Message Properties** dialog box appears.

2. In the **Constants** list, click the constant that you want to delete.
3. Click **Delete**.

## Related Topics

[Add constants](#)

[Data Handling](#)

[Edit constants](#)

[Field Data Types](#)

[Summary of Data Types and Data Type Values](#)

# Run XLANG Schedules

This section contains procedures that explain how to compile and debug [XLANG schedules](#), as well as how to activate and run an XLANG schedule. To run XLANG schedules, you might also want to create a COM+ application to host dedicated [schedule instances](#).

The following procedures are covered in this section:

- [Compile and Debug XLANG Schedules](#)
- [Create and Configure an XLANG Schedule Host Application](#)

## Related Topics

[Creating an Instantiating Application](#)

[Manage XLANG Applications and Databases](#)

[Running XLANG Schedules](#)

[Security for Applications that Host XLANG Schedule Instances](#)

# Compile and Debug XLANG Schedules

When you create an [XLANG schedule](#) you will want to compile, run, test, and debug the schedule. [BizTalk Orchestration Designer](#) provides features that assist in compiling, running, testing and debugging XLANG schedules.

In BizTalk Orchestration Designer, the following options are available:

- [Compiling](#)
- [Updating method signatures](#)
- [Shutting down running instances](#) of XLANG schedules

In addition to these options, there are two tools that you can use to assist in testing and debugging an XLANG schedule:

- **XLANG Event Monitor.** You can use this tool to monitor running XLANG schedule instances. For specific information about using this tool, see the associated [Readme.htm](#) file. Both XLANG Event Monitor (XLANGMon.exe) and the [Readme](#) installed by the Microsoft BizTalk Server 2000 Setup Wizard are located in the following installation directory: `..\Program Files\Microsoft BizTalk Server\SDK\XLANG Tools`.
- **Windows 2000 Event Viewer.** Windows 2000 Event Viewer can be used to view XLANG schedule errors. For more information, see the following topics:
  - [Manage Event Viewer](#)
  - [Monitor Running XLANG Schedules](#)
  - For more information about Event Viewer, in Windows 2000 Server Help, in the "Event Viewer" chapter, see "Using Event Viewer".

The following procedures are covered in this section:

- [Compile an XLANG schedule drawing into an XLANG schedule](#)
- [Run an XLANG schedule](#)
- [Debug compiled Visual Basic components](#)
- [Refresh method signatures](#)
- [Shut down all running XLANG schedules](#)

## Related Topics

[Create and Configure an XLANG Schedule Host Application](#)

[Creating an Instantiating Application](#)

[Manage XLANG Applications and Databases](#)

[Running XLANG Schedules](#)

[Security for Applications that Host XLANG Schedule Instances](#)

# Compile an XLANG schedule drawing into an XLANG schedule

1. In BizTalk Orchestration Designer, on the **File** menu, click **Make XLANG DrawingX.skx**.  
The **Save XLANG Schedule To** dialog box appears.
2. In the **Save in** list, browse to the location where you want to save the [XLANG schedule](#).
3. In the **File name** list, you can rename the file.
4. Click **Save**.

## Notes

- When you compile an [XLANG schedule drawing](#) into an XLANG schedule, you may receive compiling errors. The error message indicates the possible problem in the drawing, and the affected shape is highlighted with a green, dashed border.
- When you compile an XLANG schedule drawing into an XLANG schedule, the drawing is compiled with the default name *DrawingX.skx*. Where *X* is a number that is appended to the schedule name. You can change the name of the file when you compile the drawing.
- The file extension for an XLANG schedule is *.skx*. An *.skx* file is an XML file that is written in the XLANG language. You cannot open an *.skx* file within BizTalk Orchestration Designer. To change or update an *.skx* file, open the source *.skv* file, make your changes, and then recompile the *.skv* file into an *.skx* file.
- The file extension for an XLANG schedule drawing is *.skv*.

## Related Topics

- [Create and Configure an XLANG Schedule Host Application](#)
- [Creating an Instantiating Application](#)
- [Debug compiled Visual Basic components](#)
- [Manage XLANG Applications and Databases](#)
- [Open and Save XLANG Schedule Drawings](#)
- [Refresh method signatures](#)
- [Run an XLANG schedule](#)
- [Running XLANG Schedules](#)
- [Security for Applications that Host XLANG Schedule Instances](#)
- [Shut down all running XLANG schedules](#)

# Run an XLANG schedule

To run an [XLANG schedule](#), you must create a means to activate the XLANG schedule.

There are two primary ways to do this:

- Configure [BizTalk Orchestration Services](#) and [BizTalk Messaging Services](#) to activate and run XLANG schedules.

For more information, see the following topics:

- [Integrating BizTalk Services](#)
- [Set destination application properties](#)
- Programmatically activate the XLANG schedule by creating an instantiation application such as an ASP page.

For more information, see the following topics:

- [Running XLANG Schedules](#)
- [Creating an Instantiating Application](#)
- [Moniker Syntax](#)

## Related Topics

[Compile an XLANG schedule drawing into an XLANG schedule](#)

[Create and Configure an XLANG Schedule Host Application](#)

[Creating an Instantiating Application](#)

[Debug compiled Visual Basic components](#)

[Manage XLANG Applications and Databases](#)

[Moniker Syntax](#)

[Refresh method signatures](#)

[Running XLANG Schedules](#)

[Security for Applications that Host XLANG Schedule Instances](#)

[Shut down all running XLANG schedules](#)

# Debug compiled Visual Basic components

There might be situations in which you need to debug components built with Microsoft Visual Basic after they have been compiled.

1. In Visual Basic 6.0, open the Visual Basic project that you want to debug.
2. On the **File** menu, click **Make <YourProject>.dll**.
3. In the **Make Project** dialog box, click **Options**.
4. In the **Project Properties** dialog box, on the **Compile** tab, click **Compile to Native Code** and **No Optimization**, and then select the **Create Symbolic Debug Info** check box.
5. Click **OK**, and then click **OK** again to compile your project.
6. Open the Visual Basic .dll project.
7. Set the breakpoints that you want to use.
8. On the **Run** menu click **Start**.

The next time the XLANG schedule calls into your Visual Basic component, the Visual Basic debugger will stop at the breakpoint.

## ◆ Important

- The Visual Basic .dll must be created with the **Create Symbolic Debug Info** check box selected.
- Ensure that the [XLANG Scheduler Engine](#) has not already loaded the .dll. If the .dll has been loaded, you must shut down the engine and retry.

## 📌 Note

- For more information about debugging components, or about Component Services, and COM+, go to the MSDN Online Library Web site ([msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp)), and browse to Component Services in the Platform SDK.

# Refresh method signatures

- In BizTalk Orchestration Designer, on the **Tools** menu, click **Refresh Method Signatures**.

## Notes

- Use this option if you are creating COM+ components at the same time you are creating the [XLANG schedule](#) and you change any of the method parameters in any of the available method calls. This refreshes the available method parameters in the XLANG schedule.
- When you compile an XLANG schedule, **Refresh Method Signatures** is run automatically.

## Related Topics

[Compile an XLANG schedule drawing into an XLANG schedule](#)

[Create and Configure an XLANG Schedule Host Application](#)

[Creating an Instantiating Application](#)

[Debug compiled Visual Basic components](#)

[Manage XLANG Applications and Databases](#)

[Run an XLANG schedule](#)

[Running XLANG Schedules](#)

[Security for Applications that Host XLANG Schedule Instances](#)

[Shut down all running XLANG schedules](#)

# Shut down all running XLANG schedules

- In BizTalk Orchestration Designer, on the **Tools** menu, click **Shut Down All Running XLANG Schedule Instances**.

## Note

- When running an [XLANG schedule instance](#), it is not possible to modify COM components used by that [XLANG schedule](#). This option shuts down all running instances of the schedule, unlocking the file containing the component so you can make changes.

## Related Topics

[Compile an XLANG schedule drawing into an XLANG schedule](#)

[Create and Configure an XLANG Schedule Host Application](#)

[Creating an Instantiating Application](#)

[Debug compiled Visual Basic components](#)

[Manage XLANG Applications and Databases](#)

[Refresh method signatures](#)

[Run an XLANG schedule](#)

[Running XLANG Schedules](#)

[Security for Applications that Host XLANG Schedule Instances](#)

# Create and Configure an XLANG Schedule Host Application

This section contains procedures that explain how to activate and run an [XLANG schedule](#). Although you can use the default [XLANG Scheduler](#) application to run XLANG schedules, it is often useful to create a new COM+ application to run [schedule instances](#).

Due to security, deployment, and configuration issues, most COM+ applications that host XLANG schedules must be created when the XLANG schedule is developed. You must take into consideration security and performance needs for the applications and the schedules. You might want to create a new COM+ application to host dedicated instances of running schedules, or you might want to isolate applications that run specific schedule instances from other XLANG schedules that use different applications.

For more information about security and performance issues related to creating XLANG schedules and a COM+ application to host the schedules, see [Security for Applications that Host XLANG Schedule Instances](#).

For information about how to manage COM+ applications after they have been created, see [Manage XLANG Applications and Databases](#).

The following procedures are covered in this section:

- [Create a COM+ application to host XLANG schedules](#)
- [Configure a COM+ application to host XLANG schedules](#)

## ◆ Important

- For Component Services Administration Help, on the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**. In the console tree, right-click **Component Services** and click **Help**.
- For more information about Component Services and COM+, go to the MSDN Online Library Web site ([msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp)), and browse to Component Services in the Platform SDK.

## Related Topics

[Creating an Instantiating Application](#)

[Manage XLANG Applications and Databases](#)

[Running XLANG Schedules](#)

[Security for Applications that Host XLANG Schedule Instances](#)

# Create a COM+ application to host XLANG schedules

1. On the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**.
2. In the console tree, expand **Component Services**, expand **Computers**, expand **My Computer**, and then click **COM+ Applications** to select it.  
You must first select **COM+ Applications**, and then right-click it. If you do not select it first, the **New** option is not available.
3. Right-click **COM+ Applications**, point to **New**, and then click **Application**.  
The COM Application Install Wizard opens.
4. On the **Welcome to the COM Application Install Wizard** page, click **Next**.
5. On the **Install or Create a New Application** page, click **Create an empty application**.
6. On the **Create an Empty Application** page, type a name for the application, verify that **Server application** is selected, and then click **Next**.
7. On the **Set Application Identity** page, set the application identity to the appropriate account.  
It is recommended that you create a service account for COM+ applications that host [XLANG schedules](#).  
For more information about security and performance issues related to creating an application identity, see [Security for Applications that Host XLANG Schedule Instances](#).
8. Click **Next** and click **Finish**.
9. Right-click the COM+ application that you just created and click **Properties**.
10. On the **XLANG** tab, select the **This application is a host for XLANG schedule instances** check box.
11. To configure the COM+ application, continue to [Configure a COM+ application to host XLANG schedules](#).

## ◆ Important

- For Component Services Administration Help, on the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**. In the console tree, right-click **Component Services** and click **Help**.
- For more information about Component Services and COM+, go to the MSDN Online Library Web site ([msdn.microsoft.com/library/default.asp](https://msdn.microsoft.com/library/default.asp)), and browse to Component Services in the Platform SDK.

## 📌 Notes

- When you create a COM+ application to host XLANG schedules, the **Restart dehydrated applications** options is not available. For more information about how to restart [dehydrated](#) applications, see [Restart all XLANG applications](#).

## Related Topics

[Configure a COM+ application to host XLANG schedules](#)

[Creating an Instantiating Application](#)

[Manage XLANG Applications and Databases](#)

[Running XLANG Schedules](#)

[Security for Applications that Host XLANG Schedule Instances](#)

# Configure a COM+ application to host XLANG schedules

1. On the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**.
2. In the console tree, expand **Component Services**, expand **Computers**, expand **My Computer**, and then expand **COM+ Applications**.
3. Right-click the COM+ application that you want to configure and click **Properties**.
4. It is highly recommended that you create a service account to manage COM+ applications that host [XLANG schedules](#). If you accepted default settings in the COM Application Install Wizard when you created the COM+ application, you might want to change these settings. For more information, see [Change the application identity for a COM+ application](#).
5. Configure DSN settings for the COM+ application. For more information, see [Change the DSN settings for a COM+ application](#).
6. Configure a database for the COM+ application to use. You can:
  - Point to an existing database. For more information, see [Change the DSN settings for a COM+ application](#).
  - Or–
  - Create and configure a new database. For more information, see [Create a new persistence database](#) and [Change the DSN settings for a COM+ application](#).

## Caution

- If you create and configure a new database to use with the COM+ application, you must initialize the database tables after you configure the DSN settings for the COM+ application.

For more information about configuring a DSN and using data sources (ODBC), click **Help** in the **ODBC Data Source Administrator** dialog box.

To initialize new database tables for the COM+ host application that you configure:

1. Right-click the COM+ application and click **Properties**.
  2. Click the **XLANG** tab.
  3. On the **XLANG** tab, click **Initialize Tables**.
- Do not click **Initialize Tables** if you are configuring a COM+ host application and a DSN for an existing database. This action will destroy any data already in the existing database.

## Notes

- For Component Services Administration Help, on the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**. In the console tree, right-click **Component Services** and click **Help**.
- For more information about Component Services and COM+, go to the MSDN Online Library Web site ([msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp)), and browse to Component Services in the Platform SDK.

## Related Topics

[Change the application identity for a COM+ application](#)

[Change the DSN settings for a COM+ application](#)

[Create a COM+ application to host XLANG schedules](#)

[Create a new persistence database](#)

[Creating an Instantiating Application](#)

[Manage XLANG Applications and Databases](#)

[Running XLANG Schedules](#)

[Security for Applications that Host XLANG Schedule Instances](#)

# Concepts

This section provides detailed conceptual information that is essential to understanding BizTalk Orchestration Designer. It provides detailed information about the following topics:

- [BizTalk Orchestration Services](#)
- [Creating XLANG Schedule Drawings](#)
- [Compiling XLANG Schedules](#)
- [Debugging XLANG Schedules](#)
- [Running XLANG Schedules](#)
- [Managing Session State](#)
- [Updating XLANG Schedules](#)

## Note

- It is highly recommended that you review the [How to](#) section for task-specific information about using BizTalk Orchestration Designer.

# BizTalk Orchestration Services

[BizTalk Orchestration Services](#) extends the capabilities of established information-exchange technologies. It enables users to create detailed representations of business processes that can be implemented programmatically within an integrated design environment.

Business-process design and implementation have traditionally been performed in two distinct phases: the visual-design phase and the coding phase. The visual-design phase typically consisted of the analysis of an existing business process (such as corporate procurement), and the creation of a workflow diagram or an interaction diagram to describe the process. The coding phase was usually performed separately. In this paradigm, you would build an abstract visual model of a business process, and then map the model to an implementation framework.

One of the important features of BizTalk Orchestration is the integration of these previously distinct phases within a unified design environment. This design environment provides a versatile drawing surface and a comprehensive set of implementation tools. BizTalk Orchestration enables you to:

- Create [XLANG schedule drawings](#) that describe business processes.
- Implement business processes by connecting specific [actions](#) within a drawing to [ports](#) that represent locations to which [messages](#) are sent, or from which messages are received. Ports are named locations, and messages represent the data sent or received between actions and ports.
- Define the flow of data between messages within business processes.
- Compile XLANG schedule drawings into [XLANG schedules](#). XLANG schedules are executable Extensible Markup Language (XML) representations of the information contained within the drawings.

In addition to the integration of design and implementation functionality, BizTalk Orchestration provides an important additional feature: the ability to create robust, long-running, loosely coupled business processes that span organizations, platforms, and applications. During an [asynchronous](#), loosely coupled, long-running business process, a product that is ordered over the Internet might have to be built from parts that are in inventory. Some of these parts might even be temporarily out of stock. The entire business process might take weeks or months to complete. In contrast, a tightly coupled business process involves the [synchronous](#) exchange of messages. For example, when a customer withdraws money from a bank account, the debiting of the account is immediately followed by the delivery of the money.

BizTalk Orchestration enables you to:

- Create a visual representation of long-running business processes.
- Facilitate the exchange of messages by connecting the actions in your visual representation to ports that are implemented by a certain technology.
- Compile the completed drawing into an executable XML representation of the drawing.
- Reliably execute business processes that may take weeks or months to complete.

The following topics are covered in this section:

- [Understanding Business Processes](#)
- [BizTalk Orchestration Designer Environment](#)
- [XLANG Schedules](#)

## Related Topics

[Creating XLANG Schedule Drawings](#)

[Understanding Business Processes](#)

# Understanding Business Processes

Business processes are as important to business management as assembly lines are to manufacturing. Adhering to a well-defined, formalized set of processes can enable any business to increase productivity and lower costs. A business process defines the message exchange protocol between all of the distributed participants. To define a business process, you must determine the logical order of [actions](#) and the corresponding flow of [messages](#). A business process does not include definitions of the distributed participants who perform these actions.

The sequence of steps in a long-running business process is typically [asynchronous](#). Each step is an action that can be performed by one or more independent, distributed participants. These actions can result in the sending and receiving of messages among the participants, who may or may not be people performing related tasks. A distributed participant might be an automated process that responds to input, or the participant might even be an entirely separate business process. To understand business processes, you must be able to visualize a complex variety of relationships and dependencies. Business process modeling tools, such as workflow diagrams and interaction diagrams, have been developed to visually describe these relationships.

The following topics are covered in this section:

- [Workflow Diagrams](#)
- [Interaction Diagrams](#)

# Workflow Diagrams

Workflow is a business-process design technology that automates and improves procedures within organizations. It is a useful technology for delineating the steps that must be taken, the dependencies that must be enforced, and the approvals that must be obtained during the completion of projects. You can use a workflow application to assign tasks to participants, define individual responsibilities, and describe the relationships among the participants. You can also use a workflow application to set time limits for the completion of projects and the achievement of milestones. However, the workflow technology is typically highly centralized. Participants are assigned tasks and given deadlines, but the workflow engine is responsible for routing completed work items from one participant to the next, and enforcing a schedule. In contrast, BizTalk Orchestration is broader in scope. Participants are autonomous and the responsibility for routing a work item from one participant to another is determined by the participants, not by a centralized application.

## Related Topics

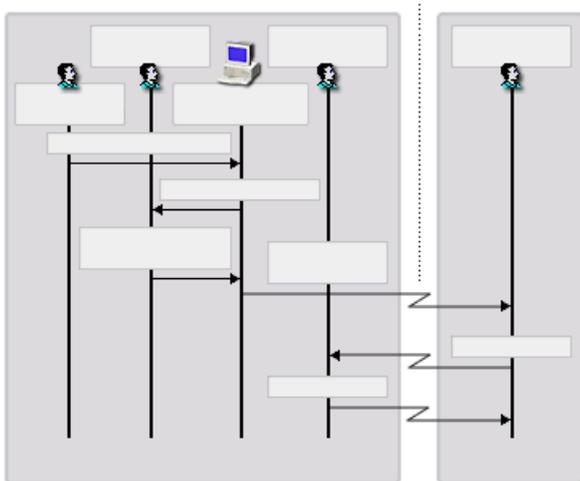
[Interaction Diagrams](#)

[Understanding Business Processes](#)

# Interaction Diagrams

An interaction diagram describes the data flow within a business process and the [messages](#) that are exchanged. BizTalk Orchestration extends the interaction diagram concept by providing definition and control for [decisions](#), [concurrent actions](#), [transactions](#), and supporting actions that cannot be included in an interaction diagram. Designing a business process by using BizTalk Orchestration results in a compiled, executable business process (an [XLANG schedule](#)). In contrast, interaction diagrams are static representations of business processes.

The following illustration shows a typical interaction diagram for an automated procurement system.



Internet  
Order  
Application  
Invoice  
Payment  
**Bits, Bytes,  
& Chips, Inc**  
Purchase  
order  
PO request  
approval  
PO approval  
**ProElectron, Inc**  
Purchase request  
User  
PO  
Approver  
Finance  
Supplier

## Related Topics

[Understanding Business Processes](#)

[Workflow Diagrams](#)

# BizTalk Orchestration Designer Environment

BizTalk Orchestration Designer enables you to create [XLANG schedule drawings](#). An XLANG schedule drawing is a representation of a business process. The drawing is saved as an .skv file, which is a customized version of the Microsoft Visio 2000 file format. The XLANG schedule drawing can then be compiled into an [XLANG schedule](#), which is an XML-structured .skx text file that the [XLANG Scheduler Engine](#) understands. BizTalk Orchestration Designer enables you to create XLANG schedule drawings that include:

- **A visual description of a business process.** This aspect of an XLANG schedule drawing is similar to a workflow diagram or an interaction diagram.
- **A visual representation of configurable ports.** This is the implementation aspect of an XLANG schedule drawing.
- **A visual representation of the connections between shapes.** [Flowchart shapes](#) can be connected to represent process flow in a business process, and [actions](#) can be connected to [ports](#) to represent the flow of communication in a business process.
- **A visual representation of the flow between specified message fields.** This aspect of an XLANG schedule drawing determines the relationship between a message field on one [message](#) and another message field on a different message. By correlating these relationships, you can enable data-sensitive [routing](#).

An XLANG schedule drawing is a representation of the procedures that are performed during a business process. An XLANG schedule drawing can define:

- The message-exchange protocol that [trading partners](#) agree to use.
- Actions that are used to send or receive messages that describe the logical sequence in which actions occur.
- The implementation of ports and the actions to which they are linked.
- The data flow between message fields.

The following topics are covered in this section:

- [Design Pages](#)
- [Flowchart Shapes](#)
- [Implementation Shapes](#)
- [Communication Shapes](#)
- [BizTalk Orchestration Designer Shortcut Keys](#)

# Design Pages

There are four design pages that are accessible within BizTalk Orchestration Designer. You can use these design pages to create different aspects of your [XLANG schedule drawing](#).

- **Business Process page.** On this page you can use [Flowchart shapes](#) and [Implementation shapes](#) to define a business process. For more information about using these shapes, see [Flowchart Shapes](#) and [Implementation Shapes](#).
- **Data page.** On this page you can use [Communication shapes](#) to control the flow of data between message fields. BizTalk Orchestration Designer provides these shapes automatically. For more information about using these shapes, see [Communication Shapes](#).
- **On Failure of *Transaction* page.** On this page you can use **Flowchart** shapes and **Implementation** shapes to design an alternate business process for a failed [transaction](#).
- **Compensation for *Transaction* page.** On this page you can use **Flowchart** shapes and **Implementation** shapes to design an undo process for a committed [nested transaction](#). For more information about transactions, see [Designing Transactions](#).

## Related Topic

[Handling Exceptions](#)

# Flowchart Shapes

BizTalk Orchestration Designer provides eight **Flowchart** shapes that are available on the [Flowchart stencil](#). These shapes are used to describe your business process. The eight shapes on the **Flowchart** stencil can be used to describe the structure and meaning of [XLANG schedules](#). XLANG is an [XML-based](#) language that describes business-process interactions.

The following table lists and describes the **Flowchart** shapes.

Shape name	Description
	<p>The <b>Begin</b> shape is not available on the <b>Flowchart</b> stencil, it cannot be deleted, and you cannot create additional <b>Begin</b> shapes. The <b>Begin</b> shape represents the start of an <a href="#">XLANG schedule drawing</a>. The <b>Begin</b> shape is created automatically on each <b>Business Process</b>, <b>Compensation for Transaction</b>, and <b>On Failure of Transaction</b> page. The <b>Begin</b> shape that appears on the <b>Business Process</b> page has configurable properties. The <b>Begin</b> shapes that appear on the <b>Compensation for Transaction</b> page and the <b>On Failure of Transaction</b> page do not have configurable properties. You cannot enclose a <b>Begin</b> shape within a <a href="#">transaction</a>. The business process sequence must flow from the <b>Begin</b> shape to the first <b>Flowchart</b> shape in your drawing.</p>
	<p>The <b>Action</b> shape represents a process that receives a <a href="#">message</a> from a <a href="#">port</a> or sends a message to a port. The send or receive action can be <a href="#">synchronous</a> or <a href="#">asynchronous</a>, depending on the component or implementation to which the port is <a href="#">bound</a>.</p>
	<p>The <b>Decision</b> shape represents a process that evaluates one or more rules sequentially.</p> <p>This shape has one inbound flow and one or more outbound flows. Each outbound flow is associated with a rule that evaluates to TRUE or FALSE. The first rule that evaluates to TRUE determines which outbound flow is followed in the business process. The sequence of the business process follows the flow from the first rule that evaluates to TRUE. If no rules evaluate to TRUE, the Else flow is followed.</p> <p>The <b>Decision</b> shape must contain at least one rule. Each rule must contain a script expression.</p>
	<p>The <b>While</b> shape contains one rule and represents a process that can be repeated. If the rule evaluates to TRUE, the flow from the rule is followed to completion and then it repeats. If the rule evaluates to FALSE, the Continue flow is followed. When the business process sequence flows from a rule in a <b>While</b> shape, the sequence must conclude in a single <b>End</b> shape.</p> <p>You can also configure the preservation of <a href="#">state</a> for a while loop. By right-clicking a <b>While</b> shape and clicking <b>Properties</b>, you can display the <b>While Properties</b> dialog box. In the <b>State persistence</b> area, you can choose <b>Yes</b> to save the messages used in each loop iteration as XLANG schedule state. If the while loop is part of a transaction that fails, an <b>On Failure of Transaction</b> or <b>Compensation for Transaction</b> page will be called for each completed loop iteration. If you choose <b>No</b>, only messages used in the latest loop iteration will be saved as XLANG schedule state. If the while loop is part of a transaction that fails, an <b>On Failure of Transaction</b> or <b>Compensation for Transaction</b> page will only be called once.</p> <p>When a business process sequence flows to a <b>While</b> shape that is within a <a href="#">nested transaction</a> that fails, the messages and ports that have been created on the <b>On Failure of Transaction</b> or <b>Compensation for Transaction</b> page for the nested transaction will not be available to the <b>On Failure of Transaction</b> page for the <a href="#">outer transaction</a>. Design the On Failure or Compensation code to force the collected messages to flow normally out of the nested transaction.</p>
	<p>The <b>Fork</b> shape introduces <a href="#">concurrency</a> into a business process. One flow can enter a fork, and as many as 64 flows can leave a fork. Each flow that leaves a fork is executed concurrently. All of the business process sequences that flow from a single <b>Fork</b> shape must connect to a single <b>Join</b> shape or terminate in an <b>End</b> shape.</p>
	<p>The <b>Join</b> shape synchronizes concurrent flows in a business process. As many as 64 flows can enter a <b>Join</b> shape, but only one flow leaves a <b>Join</b> shape. The logical operators <b>AND</b> and <b>OR</b> are used to determine how to synchronize the flows. You can set the following <b>Join</b> properties:</p> <ul style="list-style-type: none"> <li>• <b>OR</b>. Enables the first flow that arrives to continue. The other flows will continue to execute.</li> <li>• <b>AND</b>. Synchronizes all incoming flows before the outbound flow can continue.</li> </ul>

<p><b>Transaction</b></p> 	<p>The <b>Transaction</b> shape represents a collection of actions that are either all executed, or else none are. There are three types of <b>transactions</b>:</p> <ul style="list-style-type: none"> <li>• <a href="#">Short-lived transactions</a></li> <li>• <a href="#">Long-running transactions</a></li> <li>• Timed transactions that are long-running</li> </ul> <p>Transactions are used to make an application more reliable and to simplify error handling in large applications.</p> <p>The <b>Transaction</b> shape is limited to a single path in, and a single path out. The <b>Transaction</b> shape cannot contain <b>End</b> shapes. Long-running transactions can contain nested transactions; however, short-lived transactions cannot contain nested transactions. Transaction retry attempts are only permitted for short-lived transactions. If you enclose part of your business process within a short-lived <b>Transaction</b> shape, you can configure the transaction <b>Retry count</b> property. If the short-lived transaction fails, it is retried for the number of times that you have specified.</p> <p>By defining transaction properties, you can make available either the <b>Compensation for Transaction</b> page (for nested transactions) or the <b>On Failure of Transaction</b> page. On either page, you can model the error-handling processes that are specific to the transaction.</p> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>• If the borders of an inner <b>Transaction</b> shape overlap with any of the borders of the outer <b>Transaction</b> shape, the <a href="#">inner transaction</a> will not be nested. Do not allow the borders of an inner transaction to overlap with the borders of an outer transaction.</li> </ul>
<p><b>End</b></p> 	<p>The <b>End</b> shape represents the completion of one process flow. One drawing can use multiple <b>End</b> shapes if the drawing includes <b>Decision</b>, <b>While</b>, or <b>Fork</b> shapes.</p>
<p><b>Abort</b></p> 	<p>The <b>Abort</b> shape terminates execution within a transaction group. This enables either an <b>On Failure of Transaction</b> or <b>Compensation for Transaction</b> error-handling page, or else it retries the transaction.</p>

#### Notes

- For the **Compensation for Transaction** and **On Failure of Transaction** pages, the parameter *Transaction* is replaced with the name that you give to the associated transaction on the **Business Process** page.
- Shape names must meet certain naming conventions. The following conventions apply to transaction shapes, port shapes, messages, rules, and fields:
  - The name must be a valid XML token name. For more information about XML tokens, go to the W3C Web site ([www.w3c.org](http://www.w3c.org)).
  - The name cannot begin with underscores (\_).
  - The name cannot include colons (:).
  - The name length must be less than or equal to 32 characters.
  - Constant names and message names cannot begin with a numeric character.
- Transaction names in single-byte character sets must be less than or equal to 16 characters in length. Transaction names in double-byte character sets must be less than or equal to 8 characters in length.
- Actions are exempt from all naming conventions except the 32-character size limit.
- You cannot name any of the following shapes: **Abort**, **Begin**, **Decision**, **End**, **Fork**, **Join**, and **While**.

#### Related Topics

Communication Shapes

Designing Transactions

Implementation Shapes

# Implementation Shapes

BizTalk Orchestration Designer provides four **Implementation** shapes that are available on the [Implementation stencil](#). These shapes are used to describe the [implementation technologies](#) that are used to implement a [port](#) in a business process.

The following table lists and describes the **Implementation** shapes.

Shape name	Description
<b>COM Component</b> 	The <b>COM Component</b> shape represents a technology that can be used to implement a port by using a method call for each <a href="#">message</a> that is sent or received. Drag this shape to the right side of the <b>Separator</b> bar to open the COM Component Binding Wizard. For more information about the COM component implementation, see <a href="#">Using the COM Component Shape</a> .
<b>Script Component</b> 	The <b>Script Component</b> shape represents a technology that can be used to implement a port by using a method call for each message that is sent or received. Drag this shape to the right side of the <b>Separator</b> bar to open the Script Component Binding Wizard. For more information about the Script Component implementation, see <a href="#">Using the Script Component Shape</a> .
<b>Message Queuing</b> 	The <b>Message Queuing</b> shape represents a technology that can be used to implement a port. Message Queuing Services are used to send or receive messages. Drag this shape to the right side of the <b>Separator</b> bar to open the Message Queuing Binding Wizard. For more information about the Message Queuing implementation, see <a href="#">Using the Message Queuing Shape</a> .
<b>BizTalk Messaging</b> 	The <b>BizTalk Messaging</b> shape represents a technology that can be used to implement a port. <a href="#">BizTalk Messaging Services</a> are used to send or receive messages. Drag this shape to the right side of the <b>Separator</b> bar to open the BizTalk Messaging Binding Wizard. For more information about the BizTalk Messaging implementation, see <a href="#">Using the BizTalk Messaging Shape</a> .

## Note

- Shape names must meet certain naming conventions. The following conventions apply to [transactions](#), ports, messages, rules, and fields:
  - The name must be a valid XML token name. For more information about XML tokens, go to the W3C Web site ([www.w3c.org](http://www.w3c.org)).
  - The name cannot begin with underscores (\_).
  - The name cannot include colons (:).
  - The name length must be less than or equal to 32 characters.
  - Constant names and message names cannot begin with a numeric character.

## Related Topics

[Communication Shapes](#)

[Flowchart Shapes](#)

# Communication Shapes

BizTalk Orchestration Designer provides several **Communication** shapes that indicate the direction of the flow of data into and out of messages. BizTalk Orchestration Designer provides the **Communication** shapes automatically.

The **Port References**, **Constants**, and **Messages** shapes are located on the **Data** page. The **Data** page represents the flow of data between messages used by the **XLANG schedule instance** while the instance is running. To design the flow of data, you can create connections between the fields within the shapes on the **Data** page.

The following table lists and describes the **Communication** shapes.

Shape name	Description
<b>Port</b>	Ports are named locations where messages are sent or received. Right-click the <b>Separator</b> bar and click <b>Add New Port</b> to add an unbound port. Or, drag an <b>Implementation</b> shape to the right side of the <b>Separator</b> bar to add a bound port.  Each port contains messages that correspond to the <b>Messages</b> that appear on the <b>Data</b> page. A message represents the data that is sent or received by an <b>action</b> . The data within a message is separated into a list of fields on the <b>Data</b> page.
<b>Port References</b>	The <b>Port References</b> message contains a list of all ports that are created on the <b>Business Process</b> page. A new reference is added to this list every time a new port is added on the <b>Business Process</b> page. The <b>Port References</b> message enables you to specify the origin of port locations. The <b>Port References</b> message contains one port field for every port in the business process.
<b>Constants</b>	The <b>Constants</b> message provides a way to initialize your <b>XLANG schedule</b> with data. To add a constant to the <b>Constants</b> message, double-click the <b>Constants</b> message, or double-click a field in the <b>Constants</b> message to open the <b>Constants Message Properties</b> dialog box.
<b>Message</b>	<b>Messages</b> contain a list of fields with information about the data that is sent or received in the message.

## Note

- Shape names must meet certain naming conventions. The following conventions apply to **transactions**, ports, messages, rules, and fields:
  - The name must be a valid XML token name. For more information about XML tokens, go to the W3C Web site ([www.w3c.org](http://www.w3c.org)).
  - The name cannot begin with underscores (\_).
  - The name cannot include colons (:).
  - The name length must be less than or equal to 32 characters.
  - Constant names and message names cannot begin with a numeric character.

Each message that is defined on the **Data** page has additional system fields that the **XLANG Scheduler Engine** automatically creates and maintains for each message. These fields can be referenced for descriptive information about the message and can be used in script expressions for rules. The following table summarizes system fields that are created automatically.

System field	Description
__Exists__	This field can be used to test for the existence of a message. The existence of a message is determined by whether the message has been received or sent by the XLANG Scheduler Engine.  This field is not shown within messages on the <b>Data</b> page. It is only used with <b>Decision</b> and <b>While</b> shapes.
__Sender__	This field contains the identity, if known, of the sender of a message.  This field is shown within messages on the <b>Data</b> page.

<p>__Status</p>	<p>This field contains the status returned from a COM method call on a port that is <a href="#">bound</a> to a COM component. This field is shown within the messages on the <b>Data</b> page.</p> <p><b>Notes</b></p> <ul style="list-style-type: none"> <li>• This system field is used only with COM component and Script Component implementations.</li> <li>• The status that is returned is always an HRESULT.</li> </ul>
<p>Document</p>	<p>This field contains a string containing the message body that is sent or received. It always refers to an XML message.</p> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>• This system field is used only with Message Queuing and BizTalk Messaging implementations.</li> </ul>

### ◆ Important

- Each message that is sent from an [XLANG schedule instance](#) must have the source for each field of data defined. To define the source for a field of data, a connection must point to the field from another field in another message.

### 📌 Notes

- The compilation engine used to create an XLANG schedule validates whether a message has all of its input-only fields defined. The schedule will not compile if the input-only fields are partially defined. The arguments to a method can be input, output, or both. The compilation engine ignores the definition requirement for arguments defined as both input and output. If no inbound connections are defined for input-output fields, the schedule will compile, even though there is no definition for the data in the message.

### Related Topics

[Data Handling](#)

[Flowchart Shapes](#)

[Implementation Shapes](#)

# BizTalk Orchestration Designer Shortcut Keys

You can use shortcut keys to accomplish tasks in BizTalk Orchestration Designer. The following table is a quick reference to these shortcut keys.

## Note

- Functionality that is not included in this list can be obtained by using the numeric keypad to move the mouse pointer with MouseKeys. For more information about MouseKeys in Windows 2000 Server and Advanced Server Help, see "Using the keyboard to move the mouse pointer". For more information about MouseKeys in Windows 2000 Professional Help, see "Move the mouse pointer by using MouseKeys".

Press	To
ALT or F10	Activate menu bar.
Alt+F4	Close the active item, or quit the program.
Alt+F7	Cascade windows.
ALT+SPACEBAR	Display the system menu for the active item.
ALT+Underlined letter in a menu name	Display the corresponding menu.
ARROW keys	Move selected shape in arrow direction.
CTRL while dragging an item	Copy selected item.
CTRL+A	Select all.
CTRL+C	Copy selected item on the design page.
CTRL+F4	Close the active drawing.
CTRL+I	Return window to actual size.
CTRL+N	New drawing.
CTRL+O	Open existing drawing.
CTRL+P	Open the <b>Print</b> dialog box.
CTRL+Q	Quit the program.
CTRL+SHIFT with any of the arrow keys	Scroll.
CTRL+SHIFT, then click left mouse key	Zoom in.
CTRL+SHIFT, then click right mouse key	Zoom out.
CTRL+SHIFT+TAB	Toggle tabs of dialog box in back to front order.
CTRL+TAB	Toggle tabs of dialog box in front to back order.
CTRL+V	Paste selected item on the design page.
CTRL+X	Cut selected item on the design page.
CTRL+Y	Redo.
CTRL+Z	Undo.
DELETE	Delete selected item on the design page.
ESC	Cancel the current task.
F1	View the online Help.
F11	Launch text properties dialog box.
F8	Align selected shapes.
LEFT ARROW	When the focus is on a tab in a dialog box, move the focus to the left.
RIGHT ARROW	When the focus is on a tab in a dialog box, move the focus to the right.
SHIFT while dragging an item	Drag item only in a straight horizontal or vertical direction.
SHIFT+TAB	Move the focus counterclockwise in the lower window from the tab to the windows or fields below.
SPACEBAR	Toggle check boxes.
TAB	Move the focus clockwise in the lower window from the tab to the windows or fields below.
Underlined letter in a command name on an open menu	Carry out the corresponding command.

# XLANG Schedules

The compiled version of an [XLANG schedule drawing](#) is an [XLANG schedule](#), and the [XLANG Scheduler Engine](#) runs this schedule. The XLANG Scheduler Engine monitors and controls the business process described in the XLANG schedule, based on the [actions](#), rules, and error-handling processes that are defined for the XLANG schedule.

The following topics are covered in this section:

- [XLANG Overview](#)
- [Instance management](#)
- [Persistence](#)
- [Dehydration and Rehydration](#)
- [Data Handling](#)

# XLANG Overview

XLANG is an XML-based language that describes business-process interactions. BizTalk Orchestration Designer can compile XLANG schedule drawings into XML-structured XLANG schedule files. Because XLANG is XML-based, XLANG schedules must comply with XML rules for well-formed documents and they must conform to a specification or standard schema.

# Instance Management

To understand how the [XLANG Scheduler Engine](#) performs instance management, you must be aware of the distinction between an abstract definition of a business process, and multiple running instances of a business process definition. In BizTalk Orchestration Designer, you design a business process definition and save it as an [XLANG schedule drawing](#) (an .skv file). After you have created an XLANG schedule drawing, you compile it into an [XLANG schedule](#) (an .skx file). After you deploy the XLANG schedule, there are likely to be several instances of the schedule running simultaneously. Each [XLANG schedule instance](#) can have a life span that is independent of the life span of any of the other instances. When you design an application to support multiple XLANG schedule instances, you should be aware of the following issues:

- **Activating new instances of XLANG schedules when messages are received.** You can design your application to activate a new XLANG schedule instance by using the COM function **GetObject** every time a [message](#) is received. For example, if you use an Active Server Page (ASP) to receive a message containing a purchase order or a customer support request, the ASP must use the COM function **GetObject** to activate an XLANG schedule.

You can also use the BizTalk Messaging Binding Wizard to create a port [binding](#) that can serve as a named location to which messages are sent. BizTalk Server 2000 provides an automated mechanism to activate an instance of an XLANG schedule when a port that is bound to BizTalk Messaging receives a message. On the **XLANG Schedule Activation Information** page of the BizTalk Messaging Binding Wizard, you are prompted to confirm whether the [channel](#) has been configured in [BizTalk Messaging Services](#) to send a message to this port after the activation of a new instance of this XLANG schedule. To complete this process, you will have to run the New Messaging Port Wizard in [BizTalk Messaging Manager](#). On the **Destination Application** page of the New Messaging Port Wizard, specify the name of the port and the name and location of the XLANG schedule.

- **Correlating the exchange of messages to XLANG schedule instances.** Every instance of an XLANG schedule is assigned a globally unique identifier (GUID) by the XLANG Scheduler Engine. Therefore, every port on every running instance of an XLANG schedule can be uniquely addressable. This enables direct communication to specific ports on specific XLANG schedule instances. By enabling direct communication through uniquely addressable port locations, the difficulty of using a single location to distribute messages to instances is avoided. The first message sent by a schedule instance will likely be to a [static port](#) (a named location). When the XLANG schedule is activated, this instance will send the locations of its [dynamic ports](#) (per-instance, unique locations) to recipients who will be responsible for communicating back to the ports. This corresponds to e-mail messages that are sent out with unique reply-to addresses. The following list describes dynamic binding support in each of the BizTalk Server binding technologies:

- On the **Static or Dynamic Communication** page of either the COM Component or Script Component Binding Wizard, if you choose **Static**, the XLANG Scheduler Engine will create the XLANG schedule instance of the component. If you choose **Dynamic**, another application must send an interface pointer or [moniker](#) (as a field in a message) prior to the instantiation of the component.

You also have the option of choosing **No instantiation**. For more information about component instantiation, see [Static and Dynamic Ports](#).

- On the **Static or Dynamic Communication** page of the Message Queuing Binding Wizard, if you choose **Static queue** and click **Next**, you will invoke the **Queue Information** page. On the **Queue Information** page you can specify the creation of a separate, [per-instance queue](#) for every XLANG schedule instance, or you can specify the use of a single queue for all running instances. To enable correlation, you must specify the creation of a separate, per-instance queue for every XLANG schedule instance.
- On the **Static or Dynamic Communication** page of the Message Queuing Binding Wizard, if you choose **Dynamic Queue**, another application must send the name of the queue (as a field in a message) prior to sending or receiving messages through the port.
- On the **Static or Dynamic Channel Information** page of the BizTalk Messaging Binding Wizard, you can choose to provide a specific channel name, or indicate that port configuration information will be used by BizTalk Messaging Services to identify the correct channel at run time. For more information about message exchange, see [Integrating BizTalk Services](#).

## ◆ Important

- You must make sure that a message correlates to the same XLANG schedule instance that participated in an earlier communication with a [trading partner](#).
- **Scaling the application.** Any XLANG schedule instances that do not need to be in memory should be [dehydrated](#). An

XLANG schedule instance might not need to be in memory when an XLANG schedule instance is waiting for the arrival of a message.

 **Note**

- All implementation shapes display a shadow to indicate that the location will be bound dynamically and defined at run time.

## **Related Topics**

[Data Handling](#)

[Dehydration and Rehydration](#)

[Managing Session State](#)

[Persistence](#)

# Persistence

The [XLANG Scheduler Engine](#) stores the following information in the [persistence database](#):

- The structure of [XLANG schedules](#).
- The progress of activated [XLANG schedule instances](#).
- [Messages](#) that are sent or received while an XLANG schedule instance is running.

The XLANG Scheduler Engine persists information to enable the following scenarios:

- **To enable the dehydration and rehydration of long-running schedules.** The system may fail during a [long-running transaction](#). When the system is running again, the XLANG Scheduler Engine will have to refer to the persistence database to determine where to resume the schedule.
- **To restore the state of a schedule instance when a transaction fails.** The system may fail during a transaction, causing the transaction to [abort](#). The XLANG Scheduler Engine will have to refer to the persistence database to determine where to resume the schedule.
- **To support the debugging and monitoring of running schedules.** Debugging and monitoring tools can query the persistence database to provide information about the progress of schedule instances.

Support for persisting the [state](#) of an XLANG schedule before the start of a transaction, and after the completion of a transaction, provides durability, ensuring that all committed modifications are permanently in place in the system. This also enables retries of a transaction if a failure occurs. The state of a running schedule instance is persisted under the following circumstances:

- **At the beginning of a transaction.** When the business process sequence flows to the start of a transaction, the transaction retry count must be updated in the persistence database. This will enable the XLANG Scheduler Engine to track the retry count if the system fails during the transaction.
- **At the end of a transaction.** When the business process sequence flows out of a transaction, the schedule state must be updated to enable rollback, if necessary. This update occurs in the context of the transaction to ensure that database persistence is atomic.

## Related Topics

[Dehydration and Rehydration](#)

[Instance Management](#)

[Managing Session State](#)

# Dehydration and Rehydration

If multiple instances of an [XLANG schedule](#) are running simultaneously over a long period of time, it can become impractical to allow all of them to remain in memory. The [XLANG Scheduler Engine](#) provides a [dehydration/rehydration](#) infrastructure to address this problem.

When an [XLANG schedule instance](#) is expected to wait for a [message](#) for an extended period of time, and no other activity is occurring within the schedule, the XLANG Scheduler Engine can dehydrate the XLANG schedule instance. Dehydrating an XLANG schedule instance consists of persisting all of the instance-specific [state](#) to the [persistence database](#) and removing the instance from memory. When a message arrives at a [port](#) address for the dehydrated XLANG schedule instance, the instance will be rehydrated. Rehydrating an XLANG schedule instance consists of restoring the instance from the database to memory.

An XLANG schedule instance will remain dehydrated until it is either rehydrated or explicitly terminated by an administrator. This enables a business process to run reliably for an extended time period.

The XLANG Scheduler Engine can use a latency setting to determine an amount of time that an action can remain inactive before the XLANG schedule instance is dehydrated to the persistence database. The XLANG Scheduler Engine can use this latency setting to dehydrate the XLANG schedule instance to the persistence database, and then rehydrate it later when the message arrives. However, there are several situations during which the latency setting will not cause a schedule to be dehydrated, including:

- **The schedule instance is not in a quiescent state.** This can occur when [actions](#) are being performed on one of the current process flows in the XLANG schedule instance. All of the process flows in the schedule instance must be in the same state before the XLANG Scheduler Engine will dehydrate the XLANG schedule instance. The latency time for all pending actions must exceed a certain threshold before dehydration is performed.
- **There are pending DTC-style transactions.** The XLANG Scheduler Engine will not dehydrate the schedule when it is running a DTC-style [transaction](#), because DTC-style transactions are typically short-lived.
- **There are live ports in the instance that cannot be persisted.** A live port is a port object or a port that has been implemented and that might be used later in the schedule instance. The lifetime of a port is an important issue during the execution of a schedule instance. Ports are [bound](#) to [implementation technologies](#), such as COM interfaces. If the implementation technology that a port is bound to cannot be persisted, and if the implementation technology holds state information that is reused later, the instance cannot be dehydrated and then rehydrated. If the persistence database fails and then runs again later, the state information will be lost and schedule instance execution cannot be resumed from the state of the schedule instance when it was last dehydrated.

When the XLANG Scheduler Engine is shut down, as much information as possible is saved to the persistence database, including all information that is not in a transactional context.

## Related Topics

[Instance Management](#)

[Managing Session State](#)

[Persistence](#)

[Using the Method Communication Wizard](#)

[Using the XML Communication Wizard](#)

# Data Handling

In [XLANG](#), all data is contained within a set of uniquely named [messages](#). New data enters an [XLANG schedule instance](#) when a message is received by an [action](#).

Every [XLANG schedule drawing](#) has one **Data** page. On the **Data** page you can describe the data flow within an [XLANG schedule](#). To indicate that data within one message field flows into another message field, draw an arrow from the source message field to the destination message field.

With the exception of the **Constants** message, none of the message fields within the messages on the **Data** page will initially contain a value. The **Constants** message is initialized with the values that are specified on the **Data** page. It is initialized automatically for each new XLANG schedule instance. For more information about using constants, see [The Constants Message](#). The values of the other displayed messages are set when each message is sent or received in the XLANG schedule instance. A message can be received by more than one action. Every time a message is received, the values for that message will be overwritten. The flow of data into the received message will not be used to set the values for a different received message, even if the message is sent out at another point in the XLANG schedule. Messages that are exclusively sent out will rely on the data flow that is displayed on the **Data** page to set their message fields. A schedule will not compile unless all of the fields are specified for all of the messages that have been sent.

When a field on the **Data** page comes from an [XPath](#) that points to an optional node in the XML schema, use the following guidelines:

- **For received messages when the optional node exists.** If this message is received, and the optional node exists in the XML document, the XPath field stores the node value.
- **For received messages when the optional node does not exist.** If this message is received, and the optional node does not exist, the XPath field will store a null value. You will need to use a **Decision** rule with the VBScript expression `IsNull(Message.Field)` on this field to determine if the received message contains the optional node. If you do not test for the existence of a value, and this field provides data flow into another message that is sent, an error will occur when the [XLANG Scheduler Engine](#) tries to create the message to be sent.
- **For sent messages when the optional node exists.** If this message (with the XPath node pointing to an optional XML node) is being sent, the XLANG Scheduler Engine relies on data flow to create the message. If the node exists in the **Document** field of the message, the XLANG Scheduler Engine overwrites it with the value of the XPath.
- **For sent messages when the optional node does not exist.** If this message (with the XPath node pointing to an optional XML node) is being sent, the XLANG Scheduler Engine relies on data flow to create the message. If the node does not exist in the provided **Document** field, the XLANG Scheduler Engine will not create the node to overwrite. This will cause an error.

For messages that will be received from or sent to a message queue, use the following guidelines:

- **For received messages.** If an [action](#) will receive a non-XML message from a message queue, you must select **Receive string messages from a queue** on the **XML translation information** page of the XML Communication Wizard. In this configuration, the **Message** shape on the **Data** page will display a new **StringData** field. This **StringData** field will contain the non-XML message received from the queue. The **Document** field on the message will contain the **StringData** field, surrounded by the XLANG Scheduler Engine standard XML wrapper.
- **For sent messages.** If an action will send a non-XML message to a message queue, you must select **Send messages to the queue as a string** on the **XML translation information** page of the XML Communication Wizard. In this configuration, the **Message** shape on the **Data** page will display a new **StringData** field. To complete this configuration, you must create a new constant (containing the XLANG Scheduler Engine standard XML wrapper) in the **Constants** message on the **Data** page. The name of this constant is irrelevant, but the data type must be **string**, and the value of the constant must be: `<?xml version="1.0" ?> <StringData> </StringData>`. After you have created this new constant, you must draw a data flow connection from the new constant on the **Constants** message to the **Document** field in the **Message** shape. You must also draw a data flow connection from the field containing the non-XML string, to the new **StringData** field in the **Message** shape.

## Notes

- The direction of data flow is independent of the direction of message flow. Message flow indicates if a message is sent or received.

- If you want to enable the XLANG schedule to receive data by using a method call without instantiating the component, select **No instantiation** on the **Static or Dynamic Communication** page of either the COM or Script Component Binding Wizard. If you select **No Instantiation**, the component is not instantiated, and no code for the method call is executed. Instead, when the XLANG schedule intercepts the method request information, it returns this information as the response. The method call is circumvented.
- If a message is only used within the body of a while loop, the message values are not initialized on every iteration of the loop. If a message is used both inside and outside of the body of a while loop, the message values will be retained throughout each iteration of the loop. The message values might also be retained before and after the business process sequence flows to the **While** shape.
- If a message that is initialized within the **Compensation for** or the **On Failure of** a transaction within a while loop, the message values will not be available outside of the loop.
- If a field within an XML message (including the constants message) with a data type of **char** provides data flow into a method message field, the field will be converted to an **integer** for the method. If the method message field has a data type of **string**, the string will contain the integer value; it will not contain the character. If you encounter this problem, and the source field is part of the constants message, change the data type of the constants field to **string**. If the source field is part of an XML message, you will have to use a component to cast the **char** data type to a **string**.

The following topics are covered in this section:

- [The Data Page](#)
- [The Constants Message](#)
- [The Port References Message](#)
- [Field Data Types](#)
- [System Fields](#)
- [Node Path Fields](#)

# The Data Page

Every [XLANG schedule drawing](#) has a **Data** page. The **Data** page displays:

- One [message](#) shape for every message in the [XLANG schedule](#).
- One **Constants** message.
- One **Port References** message containing a port field for each [port](#) within the XLANG schedule drawing.
- Diagrammatic connections showing the flow of data between the message fields.

Messages consist of a set of uniquely named fields, each containing one data item of a specific data type. Every message in the XLANG schedule is displayed on the **Data** page as a table. Each table displays the name of the message and a listing of field names and their corresponding data types. System fields that do not require data flow are displayed with a yellow background. User fields, and system fields that do require data flow, are displayed with a white background.

Connections on the **Data** page point from the right side of a source message field, to the left side of a destination message field. This connection indicates that the source message field will provide the data for the destination message field. At run time, the [XLANG Scheduler Engine](#) will copy the data from the source message field into the destination message field when the destination message has to be created. If the source message has not arrived yet, a run time error will occur.

## Notes

- The following data types are not supported on the **Data** page:
  - BinHex
  - BinBase64
  - I8
  - UI8

If you have a node in an XML document of type BinHex, BinBase64, I8, or UI8, and you specify that the node should be brought into the scope of the XLANG Scheduler Engine on the **Data** page, using the [XPath](#) to this node, the node will be converted to a string.

- There is a 100-character limit for all field names in XLANG schedules.

## Related Topics

[The Constants Message](#)

[Data Handling](#)

[Field Data Types](#)

[Node Path Fields](#)

[The Port References Message](#)

[System Fields](#)

# The Constants Message

You can use the **Constants** message to initialize an [XLANG schedule instance](#) with data. Within the [XLANG Scheduler Engine](#), the **Constants** message performs a unique function; it is neither sent nor received. It is initialized automatically for each new XLANG schedule instance. To add a constant to the **Constants** message, double-click the **Constants** message, or double-click a field in the **Constants** message to open the **Constants Message Properties** dialog box. Click **Add** on the **Constants Message Properties** dialog box to open the **Constant Properties** dialog box. In the **Constant Properties** dialog box, you can name the constant, choose a data type for the constant, and assign a value to the constant.

## Note

- XML does not handle Windows Locale settings for date formatting. If you want to assign a date in a localized format for a constant, set the constant data type to **string**. If this constant provides data to a field with a **date** data type, the XLANG Scheduler Engine will translate the string to a date, adhering to the localized format.

## Related Topics

[Data Handling](#)

[The Data Page](#)

[Field Data Types](#)

[Node Path Fields](#)

[The Port References Message](#)

[System Fields](#)

# The Port References Message

The **Port References message** contains a list of all [ports](#) that are created on the **Business Process** page. A new reference is added to this list every time a new port is added on the **Business Process** page. The **Port References** message enables you to specify the origin of port locations. The **Port References** message contains one port field for every port in the [XLANG schedule drawing](#).

There are scenarios in which ports in an [XLANG schedule](#) are not known at design time. This can occur if the destination or origin of messages is determined from the contents of other messages. For example, a business process might describe a situation in which an [action](#) must respond to a message with an acknowledgment to the originating [trading partner](#). In this example, the message that is received will typically have a reply-to-address field that contains the originating address of the message. The XLANG schedule must be able to correlate the contents of the reply-to-address field to the destination address of the acknowledgement message. You can use the **Port References** message and an acknowledgement message on the **Data** page to implement this scenario. For more information about message exchange, see [Integrating BizTalk Services](#).

## ◆ Important

- Actions in different branches of a fork cannot communicate with each other. For example, an action in one branch cannot send a message to a queue from which an action on another branch is waiting to receive a message. If you incorrectly design your XLANG schedule drawing to support communication of any kind between actions in different branches, the [XLANG schedule instance](#) might fail at run time; however, an error will not be displayed.

## Related Topics

[The Constants Message](#)

[Data Handling](#)

[Field Data Types](#)

[Node Path Fields](#)

[System Fields](#)

# Field Data Types

BizTalk Orchestration Designer displays all data types with their XML data type name. The following table lists the OLE Automation, Visual Basic, and C program equivalents of the displayed XML data type names.

XML UI View	OLE Automation	Visual Basic	C
<b><i>simple types</i></b>			
boolean	VT_BOOL	Boolean	VARIANT_BOOL
string	VT_BSTR	String	BSTR
cy	VT_CY	Currency	CURRENCY
date	VT_DATE	Date	DATE
dispatch	VT_DISPATCH	Object	IDispatch
error	VT_ERROR		SCODE
i1	VT_I1		signed char
i2	VT_I2	Integer	SHORT
i4	VT_I4	Long	LONG
int	VT_INT		INT
r4	VT_R4	Single	FLOAT
r8	VT_R8	Double	DOUBLE
ui1	VT_UI1	Byte	BYTE
ui2	VT_UI2		USHORT
ui4	VT_UI4		ULONG
uint	VT_UINT		UINT
unknown	VT_UNKNOWN	Object	IUnknown
variant	VT_VARIANT	Variant	VARIANT

## Related Topics

[The Constants Message](#)

[Data Handling](#)

[The Data Page](#)

[Node Path Fields](#)

[The Port References Message](#)

[System Fields](#)

# System Fields

Each [message](#) can also contain a set of system fields that are automatically created by the [XLANG Scheduler Engine](#).

System Field Name	When is this system field displayed?	Description
__Status_	When the message is being received from a <a href="#">port</a> bound to a COM or Script <a href="#">binding</a> .	The HRESULT of the method call.
__Sender_	When the message is sent to or received from any port.	When a message is received, this is the SenderID provided by Message Queuing or COM. When this message is sent, the value is NULL.
Document	When the message is sent or received from a port that is bound to Message Queuing or BizTalk Messaging.	A string containing the message body that is sent or received.

## Related Topics

[The Constants Message](#)

[Data Handling](#)

[Field Data Types](#)

[Node Path Fields](#)

[The Port References Message](#)

# Node Path Fields

When a [port bound](#) to Message Queuing or BizTalk Messaging receives an XML document, you can bring specific document nodes into the data scope of the [XLANG Scheduler Engine](#). If no specific nodes are selected, the XLANG Scheduler Engine will treat the XML document as an opaque string that is carried within the document system field.

You can bring document nodes into the data scope of the XLANG Scheduler Engine by using the **Message Specification** page in the XML Communication Wizard. When you provide an XML [specification](#), the **Add** and **Remove** buttons are enabled.

## Related Topics

[The Constants Message](#)

[Data Handling](#)

[Field Data Types](#)

[The Port References Message](#)

[System Fields](#)

[Using the XML Communication Wizard](#)

# Creating XLANG Schedule Drawings

There are five tasks you must perform when you design an [XLANG schedule](#):

- Draw a representation of the business process that the XLANG schedule will run. Use [Flowchart shapes](#) to describe the flow of the business process on the left side of the design page. Your primary business process is drawn on the **Business Process** page. Alternate processes are drawn on the **Compensation for Transaction**, and **On Failure of Transaction** pages.
- Define rules for the branching [decisions](#) and repeated processes that occur within the business process; define [concurrent](#) processes; and design the [transactions](#) and subordinate transactions required in the business process.
- Create the [port implementations](#) that the business process requires. There are four [implementation technologies](#) available: COM components, Windows Scripting Components, Message Queuing Services, and [BizTalk Messaging Services](#).
- Define the flow of data between messages. All flow of data between messages is drawn on the **Data** page.
- Draw any necessary business processes for transactions that fail. Alternate business processes are drawn on the **Compensation for Transaction**, and **On Failure of Transaction** pages.

## Note

- You can add **Flowchart** and [Implementation shapes](#) to the **Business Process**, **Compensation for Transaction**, and **On Failure of Transaction** pages. These shapes are not available on the **Data** page.

The following topics are covered in this section:

- [Designing Business Processes](#)
- [Handling Exceptions](#)
- [Implementing Business Processes](#)

# Designing Business Processes

In BizTalk Orchestration Designer, the left side of the **Business Process** page is the area in which you can design business processes. A **Separator** bar divides the **Business Process** page into a business process design area on the left side, and an implementation area on the right side.

The following topics are covered in this section:

- [Designing Actions](#)
- [Designing Rules](#)
- [Designing Concurrency](#)
- [Designing Transactions](#)

# Designing Actions

The business process sequence must flow from the **Begin** shape to the first [Flowchart shape](#) in your [XLANG schedule drawing](#). Typically, the first **Flowchart** shape in your XLANG schedule drawing will be an **Action** shape.

There are two configurable properties for a **Begin** shape. In the **Begin Properties** dialog box, you can configure the **Transaction Model** property to determine if **Transaction** shapes are supported within an [XLANG schedule instance](#), or if the [XLANG schedule](#) is activated from within a transactional COM component. The first option enables support for **Transaction** shapes; the second option disables support for **Transaction** shapes.

In the **Begin Properties** dialog box, you can also configure the **Transaction Activation** property and the [XLANG Identity](#) property. For more information about transaction activation see, [Designing Transactions](#).

**XLANG Identity** is a read-only property. It contains a globally unique identifier (GUID) that is used to correlate a version of the XLANG schedule drawing with the XLANG schedule that is generated by it. The GUID is automatically generated when a new drawing is created, and a new GUID is generated whenever the XLANG schedule drawing is changed.

The only configurable property for an **Action** shape is the name of the [action](#). The name of the action cannot be longer than 32 characters. Action names have no affect on the behavior of the XLANG schedule.

## Related Topics

[Designing Concurrency](#)

[Designing Rules](#)

[Designing Transactions](#)

[Flowchart Shapes](#)

# Designing Rules

Rules are Microsoft Visual Basic Scripting Edition (VBScript) expressions that are used by **Decision** and **While** shapes. Rules can include:

- Intrinsic VBScript expressions, such as **Date** and **Time**.
- Expressions that evaluate data within a message field.
- Expressions that can determine whether a [message](#) exists.

A rule contains the following properties that define the behavior of the shape:

- **Rule name.** A required property that is displayed on the [XLANG schedule drawing](#) within the shape that uses the rule. The rule name uniquely identifies the rule. A single, uniquely named rule can be used in multiple **Decision** and **While** shapes. The width of the **Decision** or **While** shape that uses the rule is determined by the rule with the longest name that is contained within the shape.
- **Rule description.** An optional property. It is a description of the rule.
- **Script expression.** A required VBScript expression that refers to data contained in messages. The expression must evaluate to either TRUE or FALSE.

When you design an XLANG schedule drawing, you create the rules and provide name and rule descriptions. When you add [Implementation shapes](#) to the drawing, you add script expressions.

## Notes

- The **Script expression** property is required only when compiling the XLANG schedule drawing into an [XLANG schedule](#).
- There is a message field called the **\_\_Exists\_\_** field that is not shown within messages on the **Data** page. This field can be used to test for the existence of a message. The existence of a message is determined by whether the message has been received or defined by the [XLANG Scheduler Engine](#).

## Related Topics

[Create Rules](#)

[Designing Actions](#)

[Designing Concurrency](#)

[Designing Transactions](#)

[Flowchart Shapes](#)

[Set Decision Conditions](#)

# Designing Concurrency

BizTalk Orchestration Designer supports [concurrent actions](#). The **Fork** and **Join** shapes are used to implement concurrent process flows within an [XLANG schedule](#). You can use the **Fork** shape to create concurrent process flows, and you can use the **Join** shape to synchronize any concurrent process flows that are not terminated by an **End** shape.

## Join properties

The **Join** shape has two properties that you can set. These properties represent the following logical operators:

- **AND**. The XLANG schedule waits until all process flows reach the join before it continues to the next action in the business process.
- **OR**. The XLANG schedule waits for the first process flow that reaches the join, and then it continues to the next action in the business process.

Actions in the other branches of the fork will complete their processes; however, the **OR** join does not wait for them to be completed. If the process flow that exits an **OR** join includes an action that requires data flow from a branch that enters the **OR** join and which has not completed its action by the time this action that exits the join is executed, an error will occur.

## Valid fork and join process flows

Observe the following guidelines when designing concurrent flows in a business process:

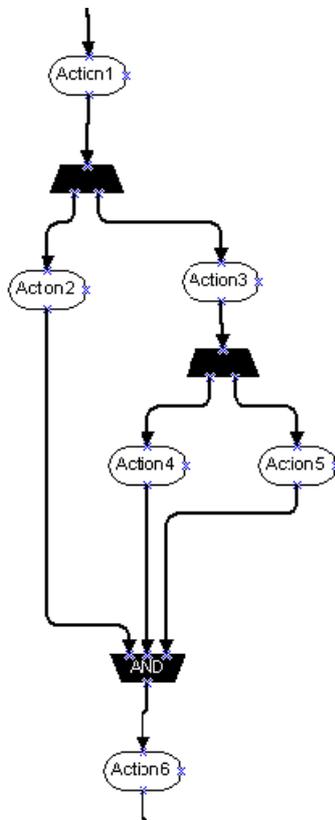
- All forked flows must either terminate with an **End** shape, or be synchronized into a single flow by using a **Join** shape.
- Actions within forked flows cannot communicate with each other. For example, an action in one branch cannot send a message to a queue from which an action on another branch is waiting to receive a message.

### ⚠ Caution

- If you incorrectly design your [XLANG schedule drawing](#) to support communication between actions in different branches, the XLANG schedule instance might fail at run time; however, an error message will not be displayed.
- You cannot use a join to synchronize flows from more than one fork. The **Join** shape can only be used to synchronize flows from a matching fork. There is a one-to-one correspondence between the use of the **Fork** shape and the **Join** shape.

The following illustration shows two forks that are used to create concurrent flows, and a single join that is used in an attempt to synchronize these flows. This connection is not legal. If you attempt this type of connection, you will receive an error message when you compile the XLANG schedule.

Click the illustration to enlarge or reduce.

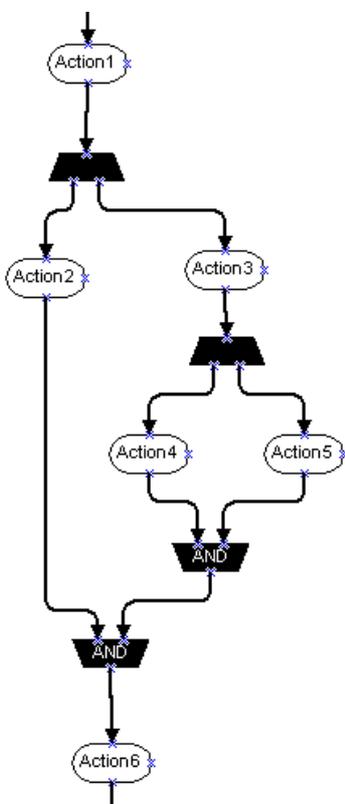


**Figure 1. Concurrent flows that use an illegal join.**

The following two illustrations provide two examples of legal joins.

In figure 2, two forks are matched with two joins. The second fork and join pair are nested within the first fork and join pair.

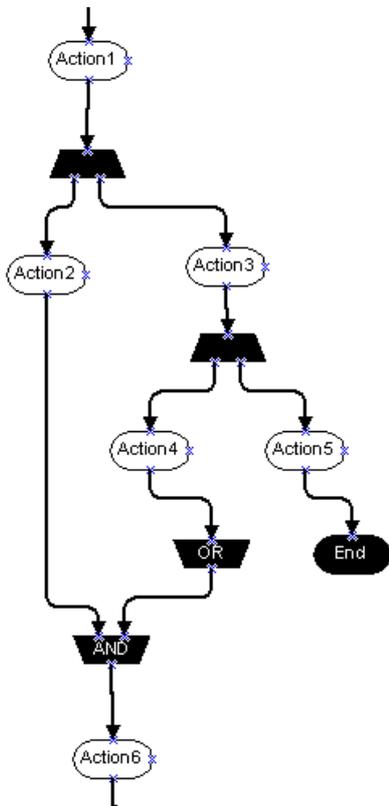
Click the illustration to enlarge or reduce.



**Figure 2. Concurrent flows that use a one-to-one correspondence between the fork and join, and use nested fork-join pairs.**

In figure 3, two forks are matched with two joins. The second fork and join pair are nested within the first fork and join pair. Note that even though one concurrent flow within the second fork and join pair is terminated by an **End** shape, the other concurrent flow must still be synchronized by a matching join before its flow can be synchronized with the concurrent flow from the first fork and join pair.

Click the illustration to enlarge or reduce.

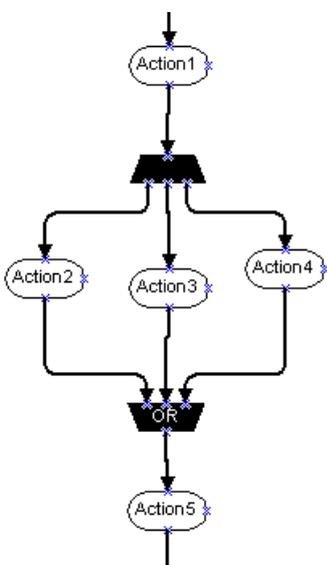


**Figure 3. Concurrent flows that use a one-to-one correspondence between the fork and join, and use nested fork-join pairs as well as an End shape to terminate one flow.**

- When you synchronize multiple concurrent flows with an **OR** join, each process flow that enters the join can contain only one action. If a flow contains more than one action, the flow is not legal.

The following illustration shows an **OR** join that synchronizes multiple concurrent flows. Each flow contains only one action.

Click the illustration to enlarge or reduce.



Designing Actions

Designing Rules

Designing Transactions

Flowchart Shapes

Set Concurrency Properties

# Designing Transactions

BizTalk Orchestration Designer provides a transactional programming model, including error handling and recovery from failed [transactions](#). You can configure **Transaction** shapes to create two additional types of pages in BizTalk Orchestration Designer: the **On Failure of Transaction** page and the **Compensation for Transaction** page. These two pages are used to enable business processes to recover from unsuccessful transactions. **On Failure of Transaction** and **Compensation for Transaction** pages can contain **Transaction** shapes that reference additional **On Failure of Transaction** and **Compensation for Transaction** pages. The **On Failure of Transaction** and **Compensation for Transaction** pages can use the same **Port** shapes and [Implementation shapes](#) that are displayed on the **Business Process** page.

The [short-lived transactions](#) that you design within BizTalk Orchestration Designer have the four ACID attributes. ACID is an acronym that is made up of the following properties:

- **Atomicity.** A transaction represents an atomic unit of work. Either all modifications within a transaction are performed, or none of the modifications are performed.
- **Consistency.** When committed, a transaction must preserve the integrity of the data within the system. If a transaction performs a data modification on a database that was internally consistent before the transaction started, the database must still be internally consistent when the transaction is committed. Ensuring this property is largely the responsibility of the application developer.
- **Isolation.** Modifications made by [concurrent](#) transactions must be isolated from the modifications made by other concurrent transactions. Isolated transactions that run concurrently will perform modifications that preserve internal database consistency exactly as they would if the transactions were run serially.
- **Durability.** After a transaction has committed, all modifications are permanently in place in the system. The modifications persist even if a system failure occurs.

In contrast, [long-running transactions](#) sacrifice isolation for the ability to handle operations that require an extended period of time to complete.

The following topics are covered in this section:

- [Transaction Properties for an XLANG Schedule Drawing](#)
- [Transaction Properties for Specific Transaction Shapes](#)
- [Transaction Properties for a Port Implementation](#)
- [Long-Running Transactions](#)
- [Short-Lived Transactions](#)

## Related Topics

[Designing Actions](#)

[Designing Concurrency](#)

[Designing Rules](#)

[Flowchart Shapes](#)

[Set Transaction Properties](#)

# Transaction Properties for an XLANG Schedule Drawing

By right-clicking the **Begin** shape on the **Business Process** page and clicking **Properties**, you can display the **Begin Properties** dialog box. In the **Begin Properties** dialog box, you can configure the following properties:

- **Transaction Model.** The default setting for this property is **Include transactions within the schedule**.
  - Choose **Include transactions within the schedule** if you are planning to enclose a collection of grouped [actions](#) in a **Transaction** shape within your [XLANG schedule drawing](#). By choosing this option, you will disable the **Transaction Activation property**.
  - Choose **Treat the XLANG schedule as a COM+ component** if you want a COM+ component to activate your [XLANG schedule](#) within its COM+ transactional context. If you choose this option, you will not be able to include [transactions](#) within your XLANG schedule drawing, and your use of the **Fork** shape to implement [concurrency](#) should be restricted. If you do use the **Fork** shape, all of the actions containing calls to COM+ components should be restricted to a single outbound branch. This restriction does not apply if the actions in your XLANG schedule drawing contain calls to COM components. Also, all transactional changes should be performed on a single outbound branch.

By choosing this option, you will enable the **Transaction Activation** property.
- **Transaction Activation.** The default setting for this property is **Not Supported**.
  - **Not Supported.** This selection specifies that the XLANG schedule does not support transactions.
  - **Supported.** This selection specifies that the XLANG schedule might participate in a COM+ transaction.
  - **Required.** This selection specifies that the XLANG schedule requires a COM+ transaction.
  - **Requires New.** This selection specifies that the XLANG schedule must participate in a new transaction. If this setting is enabled, the [XLANG Scheduler Engine](#) will automatically initiate a new transaction that is distinct from the transaction of the caller.
- **XLANG Identity.** For information about the **XLANG Identity** property, see [Flowchart Shapes](#).

## Related Topics

[Designing Transactions](#)

[Long-Running Transactions](#)

[Short-Lived Transactions](#)

[Transaction Properties for a Port Implementation](#)

[Transaction Properties for Specific Transaction Shapes](#)

# Transaction Properties for Specific Transaction Shapes

By right-clicking a **Transaction** shape on the **Business Process** page and clicking **Properties**, you can display the **Transaction Properties** dialog box. In the **Transaction Properties** dialog box, you can configure the following properties:

- **Type.** This property determines the type of [transaction](#) that is used for the selected **Transaction** shape. The default setting for this property is **Short-lived, DTC-style**.
  - Choose **Short-lived, DTC-style** if you want the transaction to group a collection of [actions](#) that are performed as a single logical unit of work exhibiting the four properties of an ACID transaction. For more information about ACID transactions, see [Designing Transactions](#). **Short-lived, DTC-style** transactions are shaded gray on the design page. This option is available for [nested transactions](#) and stand-alone transactions. You cannot choose this option for an [outer transaction](#) that contains a nested transaction.
  - Choose [Long-Running](#) if you want the transaction to group a collection of actions that send and receive [messages](#) over an indefinite period of time. You can also configure a **Long-Running** transaction to group a collection of nested transactions; however, transactions are limited to two levels of nesting. **Long-Running** transactions are shaded yellow on the design page. This option is available for all transactions.
  - Choose **Timed** if you want the **Long-Running** transaction to [abort](#) if it has not completed in a specified amount of time. **Timed** transactions are shaded blue on the design page. This option is available for all transactions.
- **Timeout.** This property determines the amount of time (in seconds) that the transaction will be allowed to run before it aborts. This option is available for **Timed** and **Short-lived, DTC-style** transactions.
- **Retry Count.** This property determines the number of times a process within a **Short-lived, DTC-style** transaction will be run if the process within the transaction does not complete. For each retry, the [state](#) of the application is reset to the starting point of the process within the transaction.
- **Backoff Time.** This property determines the interval between each attempt to retry the transaction. The backoff time is used with the retry count value to determine how long to wait before the next transaction retry. The backoff value is exponential. A backoff value of 2 seconds results in intervals of 2, 4, 8, 16 seconds, and so on between each retry. The formula is  $B^{**}R$  (**B** raised to the power of **R**), where **B**=backoff time and **R**=current retry count. If the backoff time of a specific transaction retry attempt is greater than 180 seconds, the [XLANG schedule instance](#) will be [dehydrated](#) to the [persistence database](#) immediately.
- **Isolation Level.** The isolation level determines the degree to which data within concurrent transactions are accessible to each other. This option is only available for **Short-lived, DTC-style** transactions. You should choose:
  - **Serializable** to prevent [concurrent](#) transactions from making data modifications until the selected transaction is complete. This is the most restrictive of the four isolation levels.
  - **Read Uncommitted** to allow concurrent transactions to make data modifications before the selected transaction is complete. This is the least restrictive of the four isolation levels.
  - **Read Committed** to prevent the selected transaction from accessing data modifications in concurrent transactions until they are committed. This option is the Microsoft SQL Server default setting.
  - **Repeatable Read** to require read locks until the selected transaction is complete.
- **On Failure.** Click **Add Code**, check the **Enabled** check box, and then click **OK** if you want to enable the **On Failure of Transaction** page. You will then be able to use the **On Failure of Transaction** page to design an alternate business process to handle the failure of the selected transaction. This option is available for all transactions.
- **Compensation.** Click **Add Code**, check the **Enabled** check box, and then click **OK** if you want to enable the **Compensation for Transaction** page. You will then be able to use the **Compensation for Transaction** page to design an alternate business process to undo the logical unit of work that was performed in a nested transaction that has already [committed](#). This option is only available for [nested transactions](#).

## Note

- Aborting a nested transaction does not automatically cause an abort of the outer transaction. This enables you to design an

outer transaction that can recover from the failure of a nested transaction. However, the failure of a nested transaction can cause the failure of an outer transaction if the nested transaction's **On Failure of *Transaction*** page or **Compensation for *Transaction*** page is designed to abort the outer transaction.

## Related Topics

[Designing Transactions](#)

[Long-Running Transactions](#)

[Short-Lived Transactions](#)

[Transaction Properties for an XLANG Schedule Drawing](#)

[Transaction Properties for a Port Implementation](#)

# Transaction Properties for a Port Implementation

You can configure transaction properties for COM components and Windows Script components on the **Advanced Port Properties** pages of the COM Component Binding Wizard and the Script Component Binding Wizard. The **Advanced Port Properties** page provides an option to [abort](#) the current [transaction](#) when an error is returned from a method in a component. On the **Advanced Port Properties** page, you can configure the following transactional properties:

- **Transaction support.** The **Transaction support** property specifies the degree to which your component will require, support, or ignore transactions.
  - **Disabled.** This selection specifies that the component will ignore COM transaction management.
  - **Not Supported.** This selection specifies that the component will not participate in a transaction, or propagate the transactions of other components.
  - **Supported.** This selection specifies that if a transaction contains an action that is connected to the port to which the component is bound, the component will be included in the transaction. Otherwise, the component will not have a transaction.
  - **Requires New.** This selection specifies that if a transaction contains an [action](#) that is connected to the [port](#) to which the component is [bound](#), the component will be included in the transaction. If there is no transaction containing an action that is connected to the port to which the component is bound, a new transaction will be created for the component.
  - **Requires new.** This selection specifies that a new transaction will always be created for the component.

## ◆ Important

- BizTalk Orchestration Designer relies on the transactional behavior of the [implementation technologies](#) that are utilized in a [XLANG schedule drawing](#). It does not provide or impose [transactional](#) behavior on a business process if the XLANG schedule drawing contains a **Transaction** shape. If a COM component, Message Queue, or Script is not transactional, the data manipulated by the XLANG schedule drawing will not be modified in a transactional manner.

## 📝 Notes

- When you set the **Transaction Model** property to treat the [XLANG schedule](#) as a COM component, do not use **Transaction** shapes in the XLANG schedule drawing. If you use **Transaction** shapes, and then attempt to compile the XLANG schedule drawing into an XLANG schedule, the compile process will not work. You must remove all **Transaction** shapes from the XLANG schedule drawing before compiling.
- If the use of a COM component occurs in multiple transactions, the COM component must either hold no [state](#) or hold state and support persistence.
- If multiple [actions](#) communicate with a port [bound](#) to a COM or Script component, and these actions can be found within multiple transactions that are not nested within each other, the component instances will be destroyed and instantiated again prior to each new transactional context. If the component holds state, and supports persistence, the reactivation will restore the state. If the component holds state, and does not support persistence, the state will be lost. If the component was instantiated by another application, the [XLANG Scheduler Engine](#) will be able to reactive the component only if it is persistable. If the component was instantiated by another application and cannot be persisted, the XLANG Scheduler Engine will not be able to instantiate the component again, and the [XLANG schedule](#) will fail with an error.

## Related Topics

[Designing Transactions](#)

[Long-Running Transactions](#)

[Short-Lived Transactions](#)

[Transaction Properties for an XLANG Schedule Drawing](#)

[Transaction Properties for Specific Transaction Shapes](#)

# Long-Running Transactions

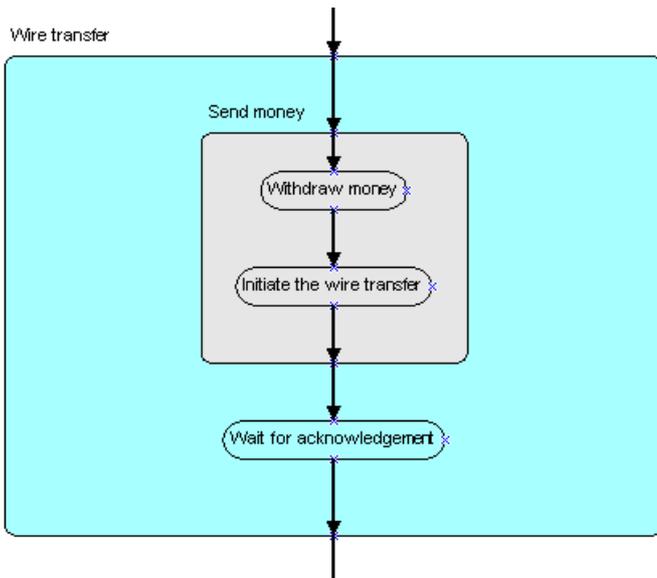
Long-running transactions do not support isolation, one of the four ACID attributes described in [Designing Transactions](#). The data within a long-running transaction are not locked; other processes or applications can modify the data. If your data must be consistent, you should use ACID transactions exclusively. However, because ACID transactions in a long latency environment will cause severe scalability problems, [XLANG schedule drawings](#) support long-running transactions. Long-running transactions enable you to avoid having to lock databases for extended periods of time. During a long-running transaction, [messages](#) are sent and received over an indefinite period of time. Depending on the requirements of the business process that your XLANG schedule drawing describes, you can enclose an entire business process (with the exception of the **Begin** shape and an **End** shape) within a long-running transaction.

Typically, a long-running transaction will contain several [nested short-lived transactions](#). For example, in a simple wire transfer scenario, a long-running transaction might contain the following actions within a nested short-lived transaction:

- Withdraw money from a bank account.
- Initiate the wire transfer process.

The following illustration shows **Send money**, a short-lived transaction that is nested within a long-running transaction called **Wire transfer**. The nested transaction contains the two actions in the simple wire transfer scenario. When the **Initiate the wire transfer** action has completed, the business process sequence flows out of the nested transaction. When this happens, the nested transaction is committed; the money has been withdrawn from a bank account and sent to a destination. At this point, the business process sequence flows to the **Wait for acknowledgement** action in the [outer transaction](#).

Click the illustration to enlarge or reduce.



In this scenario, the **Wire transfer** transaction has been configured as a **Timed** transaction. If the sender has not received an acknowledgement of receipt of the money within the specified amount of time, the outer transaction will **abort**. When this happens, the business process sequence flows to the **Compensation for Send money** page for the nested transaction. Because the nested transaction has already **committed**, the alternate business process must describe actions that can be performed to credit the sender's account. When the business process described in the **Compensation for Send money** page has been performed, the business process sequence flows to the **On Failure of Wire transfer** page for the outer transaction. This page must contain a business process that describes exception handling for the outer transaction. In this case, the business process might be to send follow-up e-mail to inform the participants of the status of the transfer.

## Related Topics

[Designing Transactions](#)

[Flowchart Shapes](#)

[Short-Lived Transactions](#)

# Short-Lived Transactions

A short-lived transaction is a collection of grouped [actions](#) that are performed as a single logical unit of work. This logical unit of work exhibits the four properties of an ACID transaction. For more information about ACID transactions, see [Designing Transactions](#).

## Related Topics

[Designing Transactions](#)

[Flowchart Shapes](#)

[Long-Running Transactions](#)

# Handling Exceptions

The [XLANG Scheduler Engine](#) can trap system errors. BizTalk Orchestration Designer enables you to design [XLANG schedules](#) that will react to XLANG schedule errors at run time. If you enclose part of a business process within a **Transaction** shape, you can design an alternate business process that will run if an error is encountered or if a requirement is not met.

The following topics are covered in this section:

- [System errors](#)
- [Application Errors](#)

## Related Topic

[Set Error Handling Properties](#)

# System Errors

There are three severity levels for system errors that can occur while the [XLANG Scheduler Engine](#) is running. In ascending order of severity, the three levels are:

- Errors that can be trapped within an [XLANG schedule](#).
- Errors that will cause an [XLANG schedule instance](#) to terminate.
- Errors that can cause the XLANG Scheduler Engine to fail.

The following topics are covered in this section:

- [Errors That Can Be Trapped Within an XLANG Schedule](#).
- [Errors That Will Cause an XLANG Schedule Instance to Terminate](#).
- [Errors That Can Cause the XLANG Scheduler Engine to Fail](#).

# Errors That Can Be Trapped Within an XLANG Schedule

The [XLANG Scheduler Engine](#) can trap the following system errors:

- COM errors that cause failure HRESULTs. For example, an Access Denied message from COM that results in a method being called within an [XLANG schedule](#) when permission is inadequate. This can apply to COM or Script [bindings](#).
- [Transaction aborts](#) that are caused by enlisted services, such as the Distributed Transaction Coordinator (DTC) aborting a transaction because the connection to a database was lost. Another example might be the Message Queuing Service aborting a transaction because the Message Queuing Service is unable to queue a [message](#).

To handle a failure HRESULT using logical branching, the `_out` message coming from a method call must be tested within a [decision](#) rule. The HRESULT value will be stored within the `__Status__` field of the `_out` message.

To handle a failure HRESULT using transaction failure processes, the **Abort transaction if HRESULT indicates failure** property must be set on the last page of the COM component or Script component binding wizards. This property cannot be set unless the action is within a transaction.

## ◆ Important

- This option determines whether transactions in which the component is used should be aborted when method calls to the component return a failure HRESULT. This option can only be set if the communication action that uses this port is within the process flow of a transaction

Handling a failure in the **Message Queuing** or **BizTalk Messaging** [implementation technologies](#) can only be performed with transaction failure processes. To do so, the **Use transactional message queues** property on the last page of the **Message Queuing** binding wizard must be set (this is done automatic for BizTalk Messaging).

## 📌 Note

- A Message Queuing send [action](#) that returns successfully indicates that the message has been successfully placed onto the queue. It does not indicate that the message has been delivered.

## Related Topics

[Application Errors](#)

[Errors That Can Cause the XLANG Scheduler Engine to Fail](#)

[Errors That Will Cause an XLANG Schedule Instance to Terminate](#)

[Handling Exceptions](#)

[System Errors](#)

# Errors That Will Cause an XLANG Schedule Instance to Terminate

System errors that cause an [XLANG schedule instance](#) to fail, but that cannot be trapped within an [XLANG schedule](#) include:

- A scheduled method that is not synchronized with the component that is called.
- A scheduled queue that does not exist.
- A scheduled [channel](#) that does not exist.
- Dataflow from a [message](#) that has not arrived yet.

## Related Topics

[Application Errors](#)

[Errors That Can Be Trapped Within an XLANG Schedule](#)

[Errors That Can Cause the XLANG Scheduler Engine to Fail](#)

[Handling Exceptions](#)

[System Errors](#)

# Errors That Can Cause the XLANG Scheduler Engine to Fail

System errors that cannot be trapped by the [XLANG Scheduler Engine](#) can cause the XLANG Scheduler Engine to fail along with all [XLANG schedule instances](#) that are running in the same COM+ application. Among these system errors are certain access violations by components that are running within the XLANG Scheduler Engine's process space. The XLANG Scheduler Engine will attempt to trap these errors, but in many cases the XLANG Scheduler Engine will not be able to trap them.

## Related Topics

[Application Errors](#)

[Errors That Can Be Trapped Within an XLANG Schedule](#)

[Errors That Will Cause an XLANG Schedule Instance to Terminate](#)

[Handling Exceptions](#)

[System Errors](#)

# Application Errors

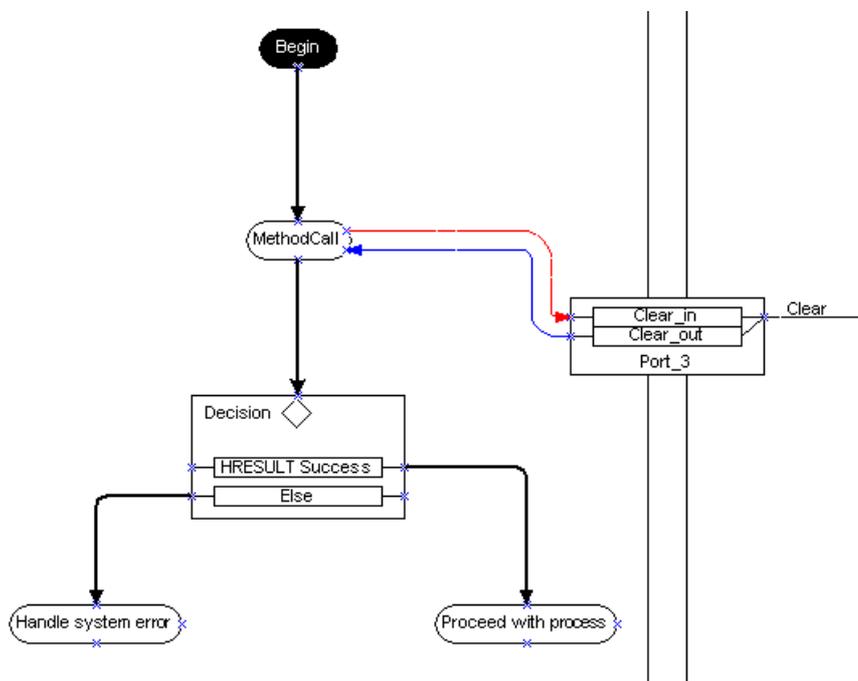
There are three ways to handle errors that can cause [XLANG schedule](#) errors:

- Use [Logical Branching](#).
- Use [Transactional Abort Processes](#).
- Use [Timeouts](#).

# Logical Branching

[Decisions](#) and rules can be used to branch a process flow on any process page (the **Business Process** page, any **On Failure of Transaction** page, or any **Compensation for Transaction** page). The following illustration shows a simple test of method execution.

Click the illustration to enlarge or reduce.



In this example, the `Clear_out` message will have a system field named `__Status__`. In the rule **HRESULT Success**, the script expression would be `Clear_out.__Status__ >= 0`, where a negative HRESULT indicates failure, and 0 or a positive HRESULT indicates success. By using decisions and rules in this way, any data field within any [message](#) can be tested (within the VB Script expression of any rule) for exceptions, not exclusively for HRESULTs.

## Related Topics

[Handling Exceptions](#)

[Timeouts](#)

[Transactional Abort Processes](#)

# Transactional Abort Processes

In BizTalk Orchestration Designer, you can use [transactions](#) to group a collection of [actions](#) that are performed as a single logical unit of work and ensure that all of the actions within the group complete, or none of them complete. By grouping business processes within transactions, BizTalk Orchestration Designer can provide the highest level of structure and reliability.

Process flow within a transaction executes normally, until either the transaction completes, or an [abort](#) event occurs. An abort event can come from one of several places:

- Encountering the **Abort** shape within the process flow.
- An HRESULT failure that is specified to cause an abort in a [port binding](#).
- Any binding technology can, at a system level, introduce a failure event that aborts the transaction. For example, the Message Queuing might fail to put a message on a queue.
- The [XLANG Scheduler Engine](#) may encounter an error that causes it to abort a transaction within a given instance. For example, there may be a DTC error.
- Pausing a schedule may require all transactions within that schedule to abort
- A Timeout within the transaction properties.

When an abort occurs, a transaction may retry from the beginning, depending on the value set in the Retry count property of the transaction group. If, after a transaction has retried the specified number of times, it continues to fail, the **On Failure of Transaction** business process will be called. This **On Failure of Transaction** code provides a structured place to handle the failure of a transaction.

The **On Failure of Transaction** code does not have to undo any work within the transaction. If the ports are bound to transactional resources, the Distributed Transaction Coordinator will handle the rollback of all of the enlisted actions within the transaction. Non-transactional resources will not be rolled back. If the transaction is nested within an [outer transaction](#), and if this [nested transaction](#) has already [committed](#), the business process sequence will flow to the **Compensation for Transaction** business process for the nested transaction. The **Compensation for Transaction** business process is described on the **Compensation for Transaction** page. This alternate business process must contain actions that can be performed to undo the work within the nested transaction.

When the **Compensation for Transaction** or the **On Failure of Transaction** code has completed, the business process sequence will flow out of the bottom of the **Transaction** shape on the **Business Process** page. Actions within the business process sequence that occur after a transaction do not receive an explicit indication of whether the transaction completed or aborted. To enable an explicit indication, you can set a flag within a message field on either the **On Failure of Transaction** page, or the **Compensation for Transaction** page.

## Related Topics

[Handling Exceptions](#)

[Logical Branching](#)

[Timeouts](#)

# Timeouts

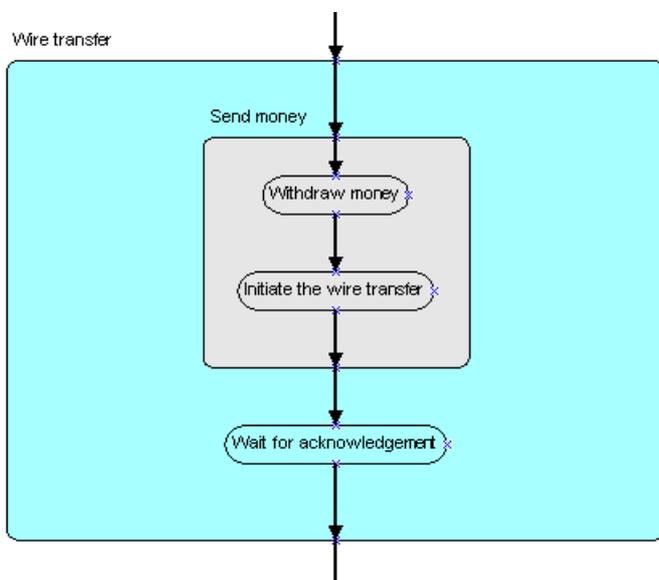
If an [action](#) within a [transaction](#) does not receive an expected [message](#) from a [trading partner](#), the failure is handled as an application error. To test for this error, use timed transactions.

For example, in a simple wire transfer scenario, a timed transaction might contain the following actions within a [nested transaction](#):

- Withdraw money from a bank account.
- Initiate the wire transfer process.

The following illustration shows **Send money**, a nested transaction within a timed transaction called **Wire transfer**. The nested transaction contains the two actions in the simple wire transfer scenario. When the **Initiate the wire transfer** action has completed, the business process sequence flows out of the nested transaction. When this happens, the nested transaction is committed; the money has been withdrawn from a bank account and sent to a destination. At this point, the business process sequence flows to the **Wait for acknowledgement** action in the [outer transaction](#).

Click the illustration to enlarge or reduce.



In this scenario, the **Wire transfer** transaction has been configured as a timed transaction. If the sender has not received an acknowledgement of receipt of the money within the specified amount of time, the outer transaction will [abort](#). When this happens, the business process sequence flows to the **Compensation for Send money** page for the nested transaction. Because the nested transaction has already [committed](#), the alternate business process must describe actions that can be performed to credit the sender's account. When the business process described in the **Compensation for Send money** page has been performed, the business process sequence flows to the **On Failure of Wire transfer** page for the outer transaction. This page must contain a business process that describes exception handling for the outer transaction. In this case, the business process might be to send follow-up e-mail to inform the participants of the status of the transfer.

## Related Topics

[Handling Exceptions](#)

[Logical Branching](#)

[Transactional Abort Processes](#)

# Implementing Business Processes

The [Implementation stencil](#) contains four shapes that correspond to the technologies that can be used to [implement a port](#) in a business process. Because every [action](#) either sends a [message](#) to a [port](#) or receives a message from a port, the semantic meaning of sending or receiving messages varies, depending on the specific [implementation technology](#).

Using [Implementation shapes](#) involves two distinct processes. In the first process, a port is bound to an implementation technology. Conceptually, a port is an abstract location to which a message is sent or from which a message is received. [Binding](#) the port to an implementation defines the type of location to which the port is bound. In the second process, an action is connected to the port. This process defines the [schema](#) of the message that is sent to or received from the port.

BizTalk Orchestration Designer supports four implementation technologies:

- **COM Components.** This technology enables [synchronous communication](#).
- **Windows Scripting Components.** This technology enables synchronous communication.
- **Message Queuing Services.** This technology enables [asynchronous communication](#).
- **BizTalk Messaging Services.** This technology enables asynchronous communication.

The **Separator** bar divides the design page of BizTalk Orchestration Designer into a business-process design area on the left side, and an implementation area on the right side. To open a port binding wizard, drag one of the **Implementation** shapes onto the design page, to the right of the **Separator** bar. You can perform this task on the **Business Process** page, the **On Failure of Transaction** page, and on the **Compensation for Transaction** page.

## Note

- You cannot configure an [envelope](#) in BizTalk Orchestration Designer. Therefore, if you want to submit a flat file to BizTalk Orchestration, use [BizTalk Editor](#) to translate the contents of the flat file to XML. You can then submit the XML file to BizTalk Orchestration.

The following topics are covered in this section:

- [Understanding Port Implementations](#)
- [Synchronous and Asynchronous Communication](#)

# Understanding Port Implementations

A port is a named location that uses a specific implementation. In an [XLANG schedule](#), ports facilitate [synchronous](#) and [asynchronous](#) communications and are used to pass [messages](#) into or out of the schedule.

In BizTalk Orchestration Designer, a port is defined by the [location](#) to which [messages](#) are sent or from which messages are received, and the technology that is used to implement the communication [action](#). Ports are bound on the left side to actions in the business process flow of the XLANG schedule; and they are bound on the right side to an implementation technology that can be used to facilitate the required action. The location is uniquely identified by the name of the port.

The location of a port depends in part on the technology used to implement the port. The following table shows the available port implementations and the location that is associated with each port implementation.

Port implementation	Port location
COM component	A pointer to an activated instance of an object.
Windows Script Component	A pointer to an activated instance of an object.
Message Queuing	A queue path name to a message queue.
BizTalk Messaging	A channel name for a specific BizTalk Messaging <a href="#">channel</a> .

Ports can be described in two ways:

- **Static ports.** A static port requires all information about the port location and implementation be provided for an XLANG schedule at design time. The designer who creates the XLANG schedule must know the location to which messages are sent or from which messages are received, as well as the technology chosen to implement the communication action.
- **Dynamic ports.** A dynamic port requires that specific location information be provided for an XLANG schedule at run time. The implementation for a dynamic port is chosen at design time, but the location of this port is not known until the XLANG schedule is running. The location for a dynamic port is provided by a message that passes the location information to the [reference](#) for the port. This message must arrive at a point in the process flow of the XLANG schedule before the communication that uses this port implementation can be used.

If you want to use a dynamic port for a communication, and the XLANG schedule has not received a message that contains the reference to the port before the schedule tries to complete the action, an error is generated.

Both static and dynamic ports provide options for synchronous and asynchronous communications, but the port implementations for these communications differ depending on the technology that you use to implement the port.

Any port can be either a static port or a dynamic port; however, all ports cannot implement synchronous and asynchronous communications. If you want to create a synchronous communication action you must use a COM or Script component port implementation. If you want to create an asynchronous communication action you must use a Message Queuing or BizTalk Messaging port implementation.

The following topics are covered in this section:

- [Static and Dynamic Ports](#)
- [Using the COM Component Shape](#)
- [Using the Script Component Shape](#)
- [Using the Message Queuing Shape](#)
- [Using the BizTalk Messaging Shape](#)

## Related Topic

[Synchronous and Asynchronous Communication](#)

# Static and Dynamic Ports

[Static](#) and [dynamic](#) port behavior varies depending on the type of implementation you use.

## Port implementations that use COM or Script components

For a port implementation that uses COM or Script components, the static and dynamic properties represent how a component is instantiated:

- **Static.** For an [XLANG schedule](#) that uses a static port, the [XLANG Scheduler Engine](#) instantiates the component that is defined for this port implementation.
- **Dynamic.** For an XLANG schedule that uses a dynamic port, the XLANG Scheduler Engine does not instantiate the component. Instead the XLANG schedule waits for another application to instantiate the component. The object instance must be sent back to the XLANG schedule as a field in a [message](#). On the **Data** page, a connection must be drawn between that message field and the [port reference](#) for the port that uses this implementation. The XLANG schedule intercepts both the method request and the method response from the component.

In addition to the **Static** and **Dynamic** options, there is a third choice:

- **No instantiation.** For an XLANG schedule that uses a port with no instantiation, the component is not instantiated, and no code for the method call is executed. Instead, when the XLANG schedule intercepts the method request information, it returns this information as the response. The method call is circumvented.

## Port implementations that use Message Queuing

In a port implementation that uses Message Queuing, the static and dynamic properties are represented as static and dynamic queues:

- **Static queue.** A static port uses a static queue that is a known, pre-existing queue. You can assign this queue at design time. If you use a static queue, then you can choose to either use a known queue that never changes, or you can create a new instance of the same queue each time the XLANG schedule is run. The per-instance queue is identified by a unique ID that is appended to the name of the queue.
- **Dynamic queue.** A dynamic port uses a dynamic queue that is unknown at design time. The information for a dynamic queue must be provided at run time within a message field. On the **Data** page you must create a link from a message field to the port reference for this port. When a message arrives that contains the queue name, then the XLANG schedule can use the assigned queue. The message that contains the queue name must arrive before the communication that uses this port implementation can be used.

## Port implementations that use BizTalk Messaging

In a port implementation that uses BizTalk Messaging, the static and dynamic properties are represented as static and dynamic channels. Dynamic channels can be used only when you are sending messages. Dynamic channels cannot be used to receive messages.

- **Static channel.** A static port uses a static channel that is a known, pre-existing channel. You can assign this channel at design time, and it never changes.
- **Dynamic channel.** A dynamic port uses a dynamic channel that is unknown at design time. The information for a dynamic channel must be provided at run time within a message field. On the **Data** page you must create a link from a message field to the port reference for this port. When a message arrives that contains the channel name, then the XLANG schedule can use the assigned channel. The message that contains the channel name must arrive before the communication that uses this port implementation can be used.

A port that uses a dynamic channel enables an XLANG schedule to determine which [channel](#) to use at run-time, rather than requiring that a pre-existing channel be defined at design time. This property defines which channel is used when the XLANG schedule passes the message to [BizTalk Messaging Services](#).

The dynamic channel should not be confused with an [open channel](#) that is configured in [BizTalk Messaging Manager](#). An open channel enables the [source organization](#) to be determined at run time from information within the document or in the parameters submitted with the document. This property defines the source of the documents. For more information about open channels, see [Understanding Channels](#).

The message that is passed to a port that uses a dynamic channel could specify either an open channel or a channel that is not open when passing the channel information to BizTalk Messaging Services.

## **Related Topics**

[Implement Ports](#)

[Synchronous and Asynchronous Communication](#)

[Understanding Channels](#)

[Using the BizTalk Messaging Shape](#)

[Using the COM Component Shape](#)

[Using the Message Queuing Shape](#)

[Using the Script Component Shape](#)

# Using the COM Component Shape

The **COM Component** shape enables you to use pre-existing components or applications to perform [actions](#) within an [XLANG schedule](#). Because COM technology is [synchronous](#), there is always a bi-directional flow of [messages](#) when an action is performed. In contrast, the flow of messages for an [asynchronous](#) technology is in one direction.

The [XLANG Scheduler Engine](#) supports sending or receiving messages by the use of **Action** shapes. When you [bind a port](#) to a COM component in BizTalk Orchestration Designer, the port is bound to an interface that is implemented by a COM component that has been registered on your system.

A send action that is connected to the port represents the invocation of a specific method call by the XLANG Scheduler Engine. The *IN* and *IN/OUT* parameters are sent to the port. In return, a message with a [schema](#) that is defined by the *IN/OUT* and *OUT* parameters of the method call is received from the port. The method call is supported by the interface that is bound to the port.

A receive action that is connected to the port waits for an external application to make a method call to the port. The *IN* and *IN/OUT* parameters define the schema of the message that is received by the port, and the *IN/OUT* and *OUT* parameters define the schema of the message that is sent from the port.

For every action that is connected to a port and bound to a COM component, two messages are exchanged. The messages identify the method on the interface that is invoked. The schema for the messages correspond to the *IN* and *IN/OUT* parameters (and to the *IN/OUT* and *OUT* parameters) of the method signature. Because the type library for the components is accessible, BizTalk Orchestration Designer can automatically build the schema for these messages without querying the user for this information.

## ◆ Important

- Use COM components carefully when you implement a long-running business process. If components that hold [state](#) are used in an XLANG schedule, it is recommended that you use components that can be saved by using either the **IPersistStream** or **IPersistStreamInit** interface. This ensures that the XLANG schedule can store its state along with the state of the components. XLANG schedules must be able to hold state and run durably over a long period of time. If components that do not hold state are used, a new instance of the component is created every time the XLANG schedule is rehydrated. However, the use of components that do not hold state should not affect the outcome of the schedule.

Binding is the process of specifying the technology that will implement a port. The COM Component Binding Wizard is made up of the following five pages:

## Welcome to the COM component binding wizard

On the **Welcome to the COM component binding wizard** page you can create and name a port for which you want to define an implementation.

## Static or dynamic communication

On the **Static or dynamic communication** page you can define how the component will be instantiated. The following table lists and describes the static and dynamic communication settings.

Static or Dynamic Communication	Description
Static	Select this option if you can provide the XLANG Scheduler Engine with all of the required information to complete the implementation at design time.
Dynamic	Select this option if the XLANG Scheduler Engine requires additional information at run time to complete the implementation.
No instantiation	Select this option to enable the XLANG schedule to receive data by using a method call without activating the component. When you select <b>No instantiation</b> , method calls to this component are intercepted, the XLANG Scheduler Engine stores the arguments, and the call returns to the caller. The component is never instantiated.

## Class information

On the **Class information** page, you can select a class from a list of registered components or from a [moniker](#).

## Interface information

On the **Interface information** page you can select the interface that you want to use. This page is displayed only if the selected class contains more than one interface. Visual Basic components always have a single interface.

## Method information

On the **Method information** page you can select the methods that you want to use. This page is displayed only if the selected class contains more than one method.

## Advanced port properties

On the **Advanced port properties** page you can configure security, transaction support, state management support, and error handling.

The state management support properties of the **COM Component** shape include:

- Persisting the state of an XLANG schedule before the start of a [transaction](#), and after the completion of a transaction. This provides durability, ensuring that all committed data modifications are permanently in place in the system. This also enables retries of a transaction if a failure occurs.
- Optimizing instance management by enabling the XLANG Scheduler Engine to [dehydrate](#) the XLANG schedule and then [rehydrate](#) the schedule when the message it is waiting for arrives.

You can use the **COM Component** shape to request authenticated user information for the messages that are received.

## Security area

The following table lists and describes the sender identity confirmation settings.

Sender identity confirmation	Description
Not required	Select this option if you want the XLANG schedule to be able to receive a message without knowing the identity of the sender.
Optional	Select this option if you want the XLANG Scheduler Engine to identify the sender when the component receives a message, if the information is available.
Required	Select this option if you do not want the XLANG Scheduler Engine to receive a message unless it can identify the sender.

## Transaction support area

The following table lists and describes the transaction support settings.

Transaction support	Description
Disabled	This is for all non-COM+ components. This option specifies that the component will ignore COM transaction management.
Not Supported	This is only for COM+ components. This option specifies that the component will not participate in a transaction, or propagate the transactions of other components.
Supported	This is only for COM+ components. This option specifies that if a transaction is associated with the port to which the component is bound, the component will be included in the transaction. Otherwise, the component will not have a transaction.
Required	This is only for COM+ components. This option specifies that if a transaction is associated with the port to which the component is bound, the component will be included in the transaction. If there is no transaction associated with the port to which the component is bound, a new transaction will be created for the component.
Requires New	This is only for COM+ components. This specifies that a new transaction will always be created for the component.

## State management support area

The following table lists and describes the state management support settings.

State management support	Description
--------------------------	-------------

Holds no state	This specifies that the XLANG Scheduler Engine will terminate the component instance when it is dehydrated. If you select this setting, the XLANG Scheduler Engine will create a new component instance, if it is required, when the schedule is rehydrated.
Holds state, but doesn't support persistence	This specifies that the XLANG Scheduler Engine will be required to leave the component instance running. If the system fails while the application is dehydrated, any state that has been held in this component will be lost.
Holds state, and does support persistence	This specifies that the XLANG Scheduler Engine will remove the component instance from memory, and then restore it to memory by calling either <b>IPersistStream</b> or <b>IPersistStreamInit</b> on the component during dehydration, and then again during rehydration.

## Error handling area

In the Error handling area, check the **Abort transaction if the method returns a failure HRESULT** check box if you want the XLANG Scheduler Engine to abort the transaction when an error is returned from a method in a component.

### Notes

- When an action communicates with a port bound to a COM component and the specified method does not exist on the component, the XLANG schedule instance will failfast with an event log entry.
- BizTalk Orchestration Designer does not support binding to a COM component method that contains a parameter derived from **IDispatch**. However, BizTalk Orchestration Designer does support binding to COM component methods containing parameters of type **IDispatch**.
- If an application has a reference to a COM component in an XLANG schedule by means of the **IUnknown** interface, that reference will become invalid after the [XLANG schedule instance](#) is dehydrated and rehydrated. All persistable COM components will be properly rehydrated to the state they were in at the time of dehydration, but the interfaces will be assigned new addresses. This is expected and normal behavior. If two or more message fields in any single XLANG schedule instance contain pointers to the same COM component, and the schedule is dehydrated, these message fields will contain pointers to a single COM component after rehydration. However, the COM component will not be the same one that existed before dehydration. It will be a newly created COM component that is similar to the COM component that existed before dehydration. If the original COM component is persistable, the new COM component will have the same state that the original COM component had before dehydration.
- Component uniqueness is not maintained across while loops. If one message within a while loop contains a field that has a pointer to a COM component, and a different message outside the while loop contains a field that has a pointer to the same COM component, after dehydration and rehydration these two message fields will no longer have pointers to a single COM component. The two message fields will have pointers to two separate COM components that are similar to the original COM component. If the original COM component is persistable, the two new COM components will hold the same state that the original COM component had before dehydration.

## Related Topics

[Static and Dynamic Ports](#)

[Synchronous and Asynchronous Communication](#)

[Using the BizTalk Messaging Shape](#)

[Using the Message Queuing Shape](#)

[Using the Method Communication Wizard](#)

[Using the Script Component Shape](#)

# Using the Script Component Shape

The **Script Component** shape enables you to use pre-existing Windows Script component to perform [actions](#) within an [XLANG schedule](#). Because the **Script Component** is [synchronous](#), there is always a bi-directional flow of [messages](#) when an action is performed. In contrast, the flow of messages for an [asynchronous](#) technology is in one direction.

A send action that is connected to the [port](#) represents the invocation of a specific method call by the [XLANG Scheduler Engine](#). The *IN* and *IN/OUT* parameters are sent to the port. In return, a message with a [schema](#) that is defined by the *IN/OUT* and *OUT* parameters of the method call is received from the port. The method call is supported by the interface that is [bound](#) to the port.

A receive action that is connected to the port waits for an external application to make a method call to the port. The *IN* and *IN/OUT* parameters define the schema of the message that is received by the port, and the *IN/OUT* and *OUT* parameters define the schema of the message that is sent from the port.

For every action that is connected to a port and bound to a Script component, two messages are exchanged. The messages identify the method on the interface that is invoked. The schema for the messages corresponds to the *IN* and *IN/OUT* parameters (and to the *IN/OUT* and *OUT* parameters) of the method signature. Because the type library for the components is accessible, BizTalk Orchestration Designer can automatically build the schema for these messages without querying the user for this information.

The XLANG Scheduler Engine waits until the method returns before continuing the business process. To send a message, the XLANG Scheduler Engine invokes the specified method of a Windows Script component.

To create a new Script component binding, drag the **Script Component** shape from the [Implementation stencil](#) onto the BizTalk Orchestration design page, to the right of the **Separator** bar. To edit an existing Script component, right-click the **Script Component** shape and click **Edit Properties**. Both actions start the Script Component Binding Wizard. Binding is the process of specifying the technology that will implement a port. The Script Component Binding Wizard is made up of the following six pages:

## Welcome to the script component binding wizard

On the **Welcome to the script component binding wizard** page you can create and name a port for which you want to define an implementation.

## Static or dynamic communication

On the **Static or Dynamic Communication** page you can define how the component will be instantiated. The following table lists and describes the static and dynamic communication settings.

Static or Dynamic Communication	Description
Static	Select this option if you can provide the XLANG Scheduler Engine with all of the required information to complete the implementation at design time.
Dynamic	Select this option if the XLANG Scheduler Engine requires additional information at run time to complete the implementation.
No instantiation	Select this option to enable the XLANG schedule to receive data by using a method call without activating the component. When you choose <b>No instantiation</b> , method calls to this component are intercepted, the XLANG Scheduler Engine stores the arguments, and the call returns to the caller. The component is never instantiated.

## Specify the script file

On the **Specify the script file** page you can type the path to the Windows Script Component (.wsc) file that you want to use.

## Component instantiation information

On the **Component instantiation information** page you can specify if the XLANG Scheduler Engine will use a [moniker](#) or a Prog ID to instantiate the Script component.

## Method information

On the **Method information** page you can select the methods that belong to the selected class.

## Advanced port properties

On the **Advanced port properties** page you can configure security, transaction support, and error handling. You can use the **Script Component** shape to request authenticated user information for the messages that are received.

## Security area

The following table lists and describes the sender identity confirmation settings.

Sender identity confirmation	Description
Not required	Select this option if you want the XLANG schedule to be able to receive a message without knowing the identity of the sender.
Optional	Select this option if you want the XLANG Scheduler Engine to identify the sender when the component receives a message, if the information is available.
Required	Select this option if you do not want the XLANG Scheduler Engine to receive a message unless it can identify the sender.

## Transaction support area

The following table lists and describes the transaction support settings.

Transaction support	Description
Disabled	This is for all non-COM+ components. This option specifies that the component will ignore COM transaction management.
Not Supported	This is only available if the script is installed as a COM+ component. This specifies that the component will not participate in a transaction, or propagate the transactions of other components.
Supported	This is only available if the script is installed as a COM+ component. This specifies that if a transaction is associated with the port to which the component is bound, the component will be included in the transaction. Otherwise, the component will not have a transaction.
Required	This is only available if the script is installed as a COM+ component. This specifies that if a transaction is associated with the port to which the component is bound, the component will be included in the transaction. If there is no transaction associated with the port to which the component is bound, a new transaction to be created for the component.
Requires New	This is only available if the script is installed as a COM+ component. This specifies that a new transaction will always be created for the component.

## Error handling area

In the Error handling area, check the **Abort transaction if the method returns a failure HRESULT** check box if you want the XLANG Scheduler Engine to start an abort process when an error is returned from a method in a component. To use **On Failure of Transaction** and **Compensation for Transaction** pages, this option must be selected for the XLANG Scheduler Engine. If this option is not selected, error-recovery processes that are defined on either page will not be run.

### ◆ Important

- When you use Windows Script Components, they must adhere to the following rules:
  - Argument declarations must be by reference, not by value.
  - Visual Basic Scripting subroutines are not supported. Only functions are supported.
  - Multiple components cannot be used within a single .wsc file.

### 📝 Notes

- When an action communicates with a port bound to a Script component and the specified method does not exist within the script component, the XLANG schedule instance will failfast with an event log entry.
- Script components that have been run by the XLANG Scheduler Engine cannot be modified until both the XLANG Scheduler

Engine and the Windows Script Host have been shut down.

## **Related Topics**

[Static and Dynamic Ports](#)

[Synchronous and Asynchronous Communication](#)

[Using the BizTalk Messaging Shape](#)

[Using the COM Component Shape](#)

[Using the Message Queuing Shape](#)

[Using the Method Communication Wizard](#)

# Using the Message Queuing Shape

The **Message Queuing** shape enables an [XLANG schedule](#) to communicate with another XLANG schedule (or with an application), in a loosely coupled manner, using a queue. To enable communication between XLANG schedules and applications, messages are dropped onto a queue and then read. A single XLANG schedule may use several [ports](#) that are [bound](#) to the **Message Queuing** shape.

When a port is bound to the **Message Queuing** shape, it is also bound to a message queue. The port can be bound to a named queue, or to a [per-instance queue](#). If a port is bound to a per-instance queue, a unique queue is created and used for each instance of this XLANG schedule. Per-instance queues provide a convenient way for an XLANG schedule to have a separate queue for each [XLANG schedule instance](#).

When an [action](#) is connected to a port that is bound to a message queue, the following information is used to define the way messages will be represented in the schedule:

The message that is sent or received by the action must be defined. Because multiple message types can be stored in a queue, the message type helps identify the type of message that should be received by the action. During a **Send** action, the message type is marked on the label property of the message when it is written to the queue.

The **Message Queuing** shape represents the Message Queuing Service that is used to send or receive [messages](#). To receive a message, the [XLANG Scheduler Engine](#) requires the name of the queue that is used and the name of the root element of the XML [schema](#) that is contained within that message. To send a message, the XLANG Scheduler Engine needs the name of the queue that is used to transmit messages.

If you configure an XLANG schedule instance to use Message Queuing to receive messages, you can use the [XML Communication Wizard](#) to specify the destination format as either XML or string.

To create a new Message Queuing binding, drag the **Message Queuing** shape from the [Implementation stencil](#) onto the BizTalk Orchestration design page, to the right of the **Separator** bar. To edit an existing Message Queuing implementation, right-click the **Message Queuing** shape and click **Edit Properties**. Both actions start the Message Queuing Binding Wizard. Binding is the process of specifying the technology that will implement a port. The Message Queuing Binding Wizard is made up of the following four pages:

## Welcome to the message queuing binding wizard

On the **Welcome to the message queuing binding wizard** page you can create and name a port for which you want to define an implementation, or you can choose an existing, unbound port.

## Static or dynamic queue information

On the **Static or dynamic queue information** page you can specify if the message queue will be defined at design time or at run time. Choose one of the following options:

- Choose [Static queue](#) if you can provide queue information at design time.
- Choose [Dynamic queue](#) if you want the XLANG Scheduler Engine to acquire information from an external source at run time to determine the queue name.

## Queue information

On the **Queue information** page you can create a new queue or specify an existing queue. Choose one of the following options:

- Choose **Create a new queue for every instance** if you want the XLANG Scheduler Engine to create a per-instance queue for every XLANG schedule instance.
- Choose **Use a known queue for all instances** if you want the XLANG Scheduler Engine to use a known queue.

## Advanced port properties

On the **Advanced port properties** page you can configure security and choose whether or not you want to enable transaction support. You can use the **Message Queuing** shape to request authenticated user information for the messages that are received.

## Security area

The following table lists and describes the sender identity confirmation settings.

Sender identity confirmation	Description
Not required	Select this option if you want the XLANG schedule to be able to receive a message without knowing the identity of the sender.
Optional	Select this option if you want the XLANG Scheduler Engine to identify the sender when the component receives a message, if the information is available.
Required	Select this option if you do not want the XLANG Scheduler Engine to receive a message unless it can identify the sender.

You can also select or clear the **Use a Windows Group or User Name to control the queue** check box. If you select the check box, enter the name of the user or group that is permitted to write messages to the queue. This option is available only if you are using a static queue.

## Transaction support area

In the Transaction support area, select the **Transactions are required with this queue** check box to enable [transaction](#) support.

### Notes

- Currently, the supported name format for queues does not enable remote access to a queue on another computer. Use public queues instead of private queues when an XLANG schedule communicates with an application on a remote computer.
- When an action communicates with a port bound to Message Queueing and the specified queue for the binding does not exist, the XLANG schedule instance will failfast with an event log entry.
- It is important that the XLANG Scheduler Engine be able to determine if a queue is transactional or not. If a queue is in a transactional context and a message is sent to the queue, the XLANG Scheduler Engine must know whether the transaction should be used to communicate with the queue. If the port binding is configured with the **Transactions are required with this queue** check box selected, the XLANG Scheduler Engine will failfast the XLANG schedule if it is determined at run time that the queue is not transactional.

## Related Topics

[Static and Dynamic Ports](#)

[Synchronous and Asynchronous Communication](#)

[Using the BizTalk Messaging Shape](#)

[Using the COM Component Shape](#)

[Using the Script Component Shape](#)

[Using the XML Communication Wizard](#)

# Using the BizTalk Messaging Shape

The **BizTalk Messaging** shape represents [BizTalk Messaging Services](#) that are used to exchange [messages](#) between [BizTalk Orchestration Services](#) and BizTalk Messaging Services. To receive a message, the [XLANG Scheduler Engine](#) requires the HTTP URL address used by the BizTalk Messaging Service to receive documents, the name of the [channel](#), and the message type of the outbound [document definition](#). Receiving documents for XLANG schedule activation only requires the message type of the document definition. To send a message, the XLANG Scheduler Engine requires the name of the channel and the message type of the inbound document definition. For more information about exchanging messages between BizTalk Orchestration Services and BizTalk Messaging Services, see [Integrating BizTalk Services](#).

## ◆ Important

- If you configure a [port](#) to activate a new [XLANG schedule](#) when a message arrives, you must observe the following restrictions:
  - Only one port in a schedule can be used to activate the XLANG schedule when the message arrives.
  - Only one [action](#) can receive through this port.
  - This one action cannot be in a loop body.
  - You cannot draw a data flow connection from the [port reference](#) for this port to any other message in the schedule.

To create a new BizTalk Messaging [binding](#), drag the **BizTalk Messaging** shape from the [Implementation stencil](#) onto the BizTalk Orchestration design page, to the right of the **Separator** bar. To edit an existing BizTalk Messaging implementation, right-click the **BizTalk Messaging** shape and click **Edit Properties**. Both actions start the BizTalk Messaging Binding Wizard. Binding is the process of specifying the technology that will implement a port. The BizTalk Messaging Binding Wizard is made up of the following pages:

## Welcome to the BizTalk messaging binding wizard

On the **Welcome to the BizTalk messaging binding wizard** page you can create and name a port for which you want to define an implementation, or you can choose an existing, unbound port.

## Communication direction

On the **Communication direction** page you can specify if you want to configure the [port](#) to send or receive messages.

## Static or dynamic communication

The **Static or dynamic communication** page will only be displayed if you choose **Send** on the **Welcome to the BizTalk Messaging Binding Wizard** page. On the **Static or dynamic communication** page you can specify if you want the XLANG Scheduler Engine to use a **Static channel** that will be defined at design time, or a **Dynamic channel** that will be defined at run time.

## XLANG schedule activation information

On the **XLANG schedule activation information** page you can specify if an XLANG schedule instance will be activated on this receive action. If you choose **Yes**, the BizTalk Messaging Binding Wizard finishes. If you choose **No**, the **Channel Information** page is displayed.

## Channel information

On the **Channel information** page you can specify the name of the channel, and the HTTP URL address used by the BizTalk Messaging Service to receive documents.

## 📝 Notes

- When an action communicates with a port bound to BizTalk Messaging and the specified channel for the binding does not exist, the XLANG schedule instance will failfast with an event log entry.
- Including separate send and receive BizTalk Messaging bindings in a single transaction may result in a deadlock condition that will cause the transaction to fail.

- Action events related to messages processed by an XLANG schedule that are either sent to or received from BizTalk Messaging Services can be tracked in the Tracking database. For more information, see [Tracking XLANG schedule events in the Tracking database](#).

## **Related Topics**

[Static and Dynamic Ports](#)

[Synchronous and Asynchronous Communication](#)

[Using the COM Component Shape](#)

[Using the Message Queuing Shape](#)

[Using the Script Component Shape](#)

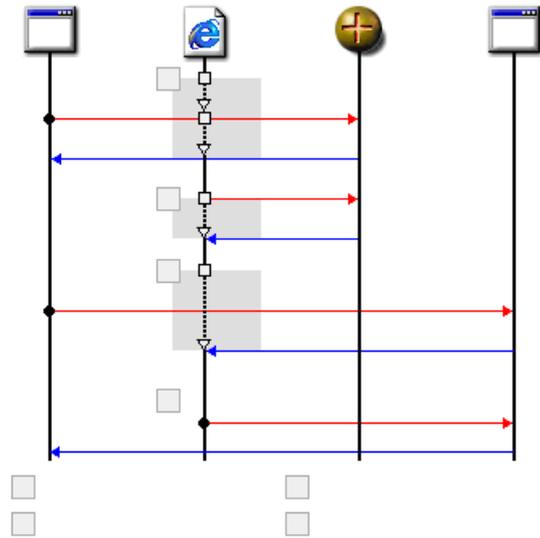
[Using the XML Communication Wizard](#)

# Synchronous and Asynchronous Communication

All communication to a COM or Script component implementation is [synchronous](#). If you want to create a communication flow to a [port](#) that uses a COM component or Script component implementation, you must use the Method Communication Wizard.

All communication to an unbound port, or to a Message Queuing or BizTalk Messaging implementation is [asynchronous](#). If you want to create a communication flow to a port that uses a Message Queuing or BizTalk Messaging implementation, or if you want to create a communication flow to an unbound port, you must use the XML Communication Wizard.

The following illustration and text describes what an [XLANG schedule](#) does for the four possible communication actions.



No  
wait

Wait

Wait

Wait

2

Asynchronous send action

Synchronous send action

Asynchronous receive action

Synchronous receive action

1

3

4

4

3

2

1

Wait

Another  
application

XLANG  
schedule

Com or Script component

Message Queuing or Biztalk Messaging

### 1. **Synchronous receive action**

- a. The XLANG schedule waits for another application to send a method request and instantiate a component.
- b. The schedule intercepts the method request.
- c. The schedule waits for the component to return the method response.
- d. The schedule intercepts the method response.
- e. The schedule continues with the next action in the business process flow.

### 2. **Synchronous send action**

- a. The XLANG schedule initiates the method request and instantiates the component.
- b. The schedule waits for the component to return the method response.
- c. The schedule receives the method response.
- d. The schedule continues with the next action in the business process flow.

### 3. **Asynchronous receive action**

- a. The XLANG schedule waits for another application to send a message to a messaging queue or to a BizTalk Messaging [channel](#).
- b. The XLANG schedule receives the message from the messaging queue or from the channel.
- c. The schedule continues with the next action in the business process flow.

### 4. **Asynchronous send action**

- a. The XLANG schedule sends a message to a messaging queue or to a BizTalk Messaging channel.
- b. The schedule continues with the next action in the business process flow.
- c. Another application receives the message from the message queue or BizTalk Messaging channel.

#### **Notes**

- A special case exists for the synchronous receive action. If you choose **No instantiation** in the COM or Script Component Binding Wizard, the component is not instantiated, and no code for the method call is executed. Instead, when the XLANG schedule intercepts the method request information, it returns this information as the response. The method call is circumvented. For more information about static and dynamic ports and the COM and Script Component Binding Wizards, see the following topics:
  - [Static and Dynamic Ports](#)
  - [Implement Ports](#)
  - [Using the COM Component Shape](#)
  - [Using the Script Component Shape](#)
- Action events related to messages processed by an XLANG schedule that are either sent to or received from BizTalk Messaging Services can be tracked in the Tracking database. For more information, see [Tracking XLANG schedule events in the Tracking database](#).

This section contains information about the following topics:

- [Using the Method Communication Wizard](#)
- [Synchronous Communication](#)
- [Using the XML Communication Wizard](#)
- [Asynchronous Communication](#)

## **Related Topics**

[Implement Ports](#)

[Static and Dynamic Ports](#)

[Using the COM Component Shape](#)

[Using the Script Component Shape](#)

# Using the Method Communication Wizard

On the **Business Process** page, the **Compensation for Transaction** page, and the **On Failure of Transaction** page you can use the Method Communication Wizard to define the flow of [messages](#) between an **Action** shape and a **COM Component** shape or a **Script Component** shape. If a message is sent, the XLANG schedule will call the method with the `_in` message and then wait to receive the `_out` message from the component. If a message is to be received, the [XLANG schedule](#) will wait for another application to send the `_in` message to the method (by calling a method on the [port](#)), and then wait for the `_out` message from the component to be sent back to the other application.

## Notes

- For Visual Basic programmers, **ByVal** parameters will only appear in the `_in` message. All other parameters will appear in both the `_in` message and the `_out` message.
- For C Programmers, **in** parameters will appear in the `_in` message, **out** parameters will appear in the `_out` message, and **in,out** parameters will appear in both messages.
- For Visual Basic programmers and C programmers, if a parameter appears in both the `_in` message and the `_out` message, the `_in` message will contain the contents of what was sent into the method, and the `_out` message will contain the contents of what was returned by the method.

To start the Method Communication Wizard, drag the right control handle (■) of an **Action** shape to the connection point (×) on a port bound to a **COM Component** shape or a **Script Component** shape. The Method Communication Wizard is made up of the following three pages:

## Welcome to the method communication wizard

On the **Welcome to the method communication wizard** page you can specify whether the [XLANG Scheduler Engine](#) will call a method or wait for a method call. If you specify that the XLANG Scheduler Engine will wait for a method call, you can set a latency value to indicate an amount of time in seconds that the XLANG Scheduler Engine is likely to have to wait before a message arrives. If this value is 180 seconds or less, the [XLANG schedule instance](#) will never be [dehydrated](#) to the [persistence database](#). If this value is greater than 180 seconds, the XLANG schedule instance will be dehydrated to the persistence database immediately. By default, the latency value is set to zero, indicating that the message is expected to arrive immediately.

If an XLANG schedule instance is [rehydrated](#) for any reason other than the arrival of a message for which an [action](#) is waiting (and if the XLANG schedule instance then enters a [quiescent state](#)), the specified latency value is used to determine whether or not the XLANG schedule instance will be immediately dehydrated. For example, this can occur when a [concurrent](#) branch receives a message for which it was waiting, or when a computer restart causes all XLANG schedule instances to rehydrate. In this situation, the latency value is evaluated from the point when the XLANG schedule instance enters a quiescent state. If the amount of time from the beginning of the XLANG Scheduler Engine's original waiting period (combined with the latency value) is more than 180 seconds from when the XLANG Scheduler Engine entered the quiescent state after rehydration, the XLANG schedule instance will be dehydrated to the persistence database immediately. This point in the XLANG schedule instance can occur long after the XLANG Scheduler Engine begins monitoring the arrival of a message.

## Message information

On the **Message information** page you can specify whether a new message or a reference to an existing message should be created. If you specify that a reference to an existing message should be created, you can select from a list of previously created messages that have been sent to or received from methods, and which already have corresponding **Message** shapes. If the message you want to use is not listed, specify that a new message should be created, and define the data flow for the new message.

## Message specification information

On the **Message specification information** page you can select a message [specification](#) for the message you created or referenced on the **Message Information** page.

## Related Topics

[Asynchronous Communication](#)

[Dehydration and Rehydration](#)

[Persistence](#)

Synchronous and Asynchronous Communication

Synchronous Communication

Using the XML Communication Wizard

# Synchronous Communication

The only methods available for use in **synchronous** communication are those that were selected for the **port implementation**. Methods from other port implementations cannot be used, and XML messages from **asynchronous** communication flows cannot be used. To change the available methods, rerun the appropriate binding wizard and select different methods.

The *IN* and *OUT* parameters are automatically determined by the parameter requirements of the method that you choose. Both parameter lists contain the name and data type of the parameter. In addition to any parameters associated with the method, a message also contains certain required system fields. A synchronous message always contains the following system fields:

- `__Sender__`

This system field is a required *IN* parameter for the method used in a synchronous message.

- `__Status__`

This system field is a required *OUT* parameter for the method used in a synchronous message.

## Synchronous Messages

When you create a synchronous communication, a **Message** is created on the **Data** page. The **Message** corresponds to the method and parameters that are used in the communication flow. The **Message** contains all *IN* parameters for the method, and all *OUT* parameters for the method.

It is possible for a method to contain no parameters; however, the **Message** always contains required system fields. The **Message** schema is shown in the following example:

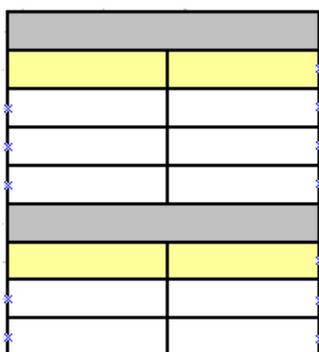
### **Method name\_in**

```
__Sender__    string
parameter 1   Data type 1
parameter 2   Data type 2
parameter n   Data type n
```

### **Method name\_out**

```
__Status__    string
Parameter 1   Data type 1
Parameter 2   Data type 2
Parameter n   Data type n
```

The following illustration shows a synchronous message pair that contains the system fields `__Sender__` and `__Status__`, as well as *IN* and *OUT* parameters for the method call.



### **Method\_out**

```
Data type 3
Data type 2
Data type 1
String
Parameter 2
Parameter 1
Data type 2
Data type 1
Int
__Status__
Parameter 3
Parameter 2
Parameter 1
```

`_Sender_`  
**Method\_in**

## **Related Topics**

[Dehydration and Rehydration](#)

[Persistence](#)

[Synchronous and Asynchronous Communication](#)

[Using the Method Communication Wizard](#)

# Using the XML Communication Wizard

On the **Business Process** page, the **Compensation for Transaction** page, and the **On Failure of Transaction** page you can use the XML Communication Wizard to define the flow of messages between an **Action** shape and a **Message Queuing** shape, a **BizTalk Messaging** shape, or an unbound **port**. To start the XML Communication Wizard, drag the right control handle (■) of an **Action** shape to the connection point (×) on an unbound port, or on a port bound to **Message Queuing** shape or a **BizTalk Messaging** shape. The XML Communication Wizard is made up of the following five pages:

## Welcome to the XML communication wizard

On the **Welcome to the XML communication wizard** page you can specify whether the port will send a **message** to an action, or receive a message from an action. If you are creating the communication between an action and a port that has been implemented using the BizTalk Messaging Shape, the communication direction has already been configured. This occurred when the BizTalk Messaging Binding Wizard was used to create the port binding.

If the port is configured to receive messages, you can set a latency value to indicate an amount of time in seconds that the **XLANG Scheduler Engine** will wait before a message arrives. If this value is 180 seconds or less, the **XLANG schedule instance** will never be **dehydrated** to the **persistence database**. If this value is greater than 180 seconds, the XLANG schedule instance will be dehydrated to the persistence database immediately. By default, latency is set to zero seconds, indicating that the message is expected to arrive immediately.

If an XLANG schedule instance is **rehydrated** for any reason other than the arrival of a message for which an action is waiting (and if the XLANG schedule instance then enters a **quiescent state**), the specified latency value is used to determine whether or not the XLANG schedule instance will be immediately dehydrated. For example, this can occur when a **concurrent** branch receives a message for which it was waiting, or when a computer restart causes all XLANG schedule instances to rehydrate. In this situation, the latency value is evaluated from the point when the XLANG schedule instance enters a quiescent state. If the amount of time from the beginning of the XLANG Scheduler Engine's original waiting period (combined with the latency value) is more than 180 seconds from when the XLANG Scheduler Engine entered the quiescent state after rehydration, the XLANG schedule instance will be dehydrated to the persistence database immediately. This point in the XLANG schedule instance can occur long after the XLANG Scheduler Engine begins monitoring the arrival of a message.

## Message information

On the **Message information** page you can specify whether a new message or a reference to an existing message should be created. If you specify that a new message should be created, define the data flow for the new message. For more information about data flow, see [Data Handling](#). The **Label** property of a message can be used to optimize the performance of a schedule in the following manner:

- If the **Label** property of the message is identical to the **XML root element** that is specified when creating a new **Message** shape, the XLANG Scheduler Engine retrieves the message.
- If the **Label** property does not match the value provided for the **XML root element**, the XLANG Scheduler Engine examines the contents of the message. If the value of the XML root element that is specified when a new **Message** shape is created matches the actual XML root element, the XLANG Scheduler Engine retrieves the message. Otherwise, the XLANG Scheduler Engine leaves the message on the queue and checks the next message.

## XML translation information

On the **XML translation information** page you can specify whether you want messages sent to or received from the queue as XML formatted data or as text strings. If you specify that you want messages sent as text strings, the XLANG Scheduler Engine's standard XML wrapper will be removed from the messages.

## Message type information

On the **Message type information** page you can specify a label that the XLANG Scheduler Engine should use to identify messages of the type you define. The text that you enter is used to identify the correct messages to receive from the message queue. If you select the same message type for two different messages, make sure the field names, field types, and **XPath** queries match exactly. The XLANG Scheduler Engine will report an error if there is an inconsistency between messages of the same message type on the same port. On the **Message type information** page, in the **Message type** box, enter a label designation for the message. The XLANG Scheduler Engine will perform the following procedures, based on the information you provide:

- The XLANG Scheduler Engine will attempt to match the message type information with the message label in the queue. When the message type is not matched, the message will be ignored, and the XLANG Scheduler Engine continues looking

for new incoming messages that might match. This enables multiple actions to receive multiple message types from a single message queue.

- If the message is in XML format on the queue, the XLANG Scheduler Engine will attempt to match the message type information with the XML root element of the message on the queue.

## Message specification information

On the **Message specification information** page you can type the path to the message [specification](#) (.xml) file that you want to use, or you can browse to it. If the message specification you select is a specification that was created using [BizTalk Editor](#), you will be able to add fields to the data scope of the XLANG Scheduler Engine. You can validate messages against the specification by selecting the **Validate messages against the specification** check box. By clicking **Browse** on the **Message specification information** page, you can display the **Browse for specification** dialog box. You can use the **Browse for specification** dialog box to find the specification that you want to use.

If you have not selected a specification, you can click **Create** on the **Message specification information** page to open BizTalk Editor. If you have already selected a specification, you can click **Edit** on the **Message specification information** page to open BizTalk Editor with the selected specification.

By clicking **Add** on the **Message specification information** page, you can display the **Field selection** dialog box. In the **Field selection** dialog box, in the **Select node** tree, you can expand any nodes that you want, and then click the field that you want to add. In the **Field Selection** dialog box, you can edit the name and the [node path](#) for fields you want to add to the message shape for the selected port. The data type fields are displayed, but they are not editable.

### Notes

- Validation is only available when a message is received. If a message is sent, the validation check box is ignored.
- When you click a field in the **Select node** tree, the field name is automatically added to the **Field name** box.
- When you click a field in the **Select node** tree, the node path to that field is automatically added to the **Node path** box.
- Editing the node path manually is useful when you want to extract specific data from within a field. For example, if the field contains an array, you might want to retrieve just one item from the array and not the entire array. However, it is recommended that you refrain from manually editing the node path for your message specification.
- You cannot select a node to add to the **Message fields** list. You can only select fields. A field also might be referred to as a leaf node. For example, you cannot select the **Seller** or **Address** nodes because they contain leaf nodes. The **Name** and **Address** fields can be selected because they are fields that do not contain additional nodes.
- While waiting to receive a message from a message queue, some problems (such as invalid XML messages or insufficient authentication) will cause a dead letter queue to be dynamically created. The dead letter queue is specific to a COM+ application. The dead letter queue will be given the name `.\private$\ApplicationName.DeadLetter`. For example, if a message containing invalid XML arrives on the queue, and you have specified on the XML Translation Information page of the XML Communication Wizard that the XLANG Scheduler Engine is expecting XML messages from the queue, any invalid XML messages will be moved to `.\private$\ApplicationName.DeadLetter`.
- If you design two different XLANG schedules to receive different messages from the same message queue, it is possible that a message might be processed by the wrong XLANG schedule instance. To avoid this problem, use one message queue for each type of message that is received by an XLANG schedule instance.

## Related Topics

[Asynchronous Communication](#)

[Synchronous and Asynchronous Communication](#)

[Synchronous Communication](#)

[Using the Method Communication Wizard](#)

# Asynchronous Communication

An **asynchronous** message is put into a message queue or BizTalk Messaging channel, and the XLANG schedule continues. It does not wait for a response.

The only messages available for use in an asynchronous communication are XML messages. All XML messages are available for use, and can be specified for more than one port. You cannot use any of the **synchronous** message pairs that are created by using the Method Communication Wizard.

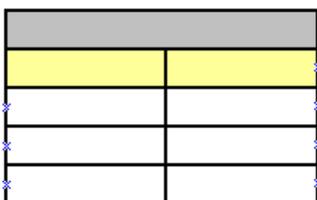
## Asynchronous Messages

When you create an asynchronous communication, a **Message** is created on the **Data** page. The **Message** corresponds to information that is sent or received in the communication flow. The **Message** contains required system fields and any additional specification fields that you want.

The **Message** schema is shown in the following example:

```
Message name  
__Sender__  string  
Document   string  
  Field 1   Data type 1  
  Field 2   Data type 2  
  Field n   Data type n
```

The following illustration shows a message named Message\_1. The system fields \_\_Sender\_\_ and Document are automatically provided and are present in all asynchronous messages. This message also contains two user-selected specification fields.



Field 2  
Field 1  
Document  
Data type 1  
string  
Data type 2  
string  
\_\_Sender\_\_  
**Message\_1**

You can add a **specification** field by using the **Field Selection** dialog box that is in the XML Communication Wizard. In the **Field Selection** dialog box, you can select specification field by clicking a node in the **Select node** tree. When you click a node, the **node path** is added to the **Node path** box. You must select a leaf node. A leaf node is a node with no children. In the following illustration, the node Name is a leaf node; however, the node Address is not a leaf node.

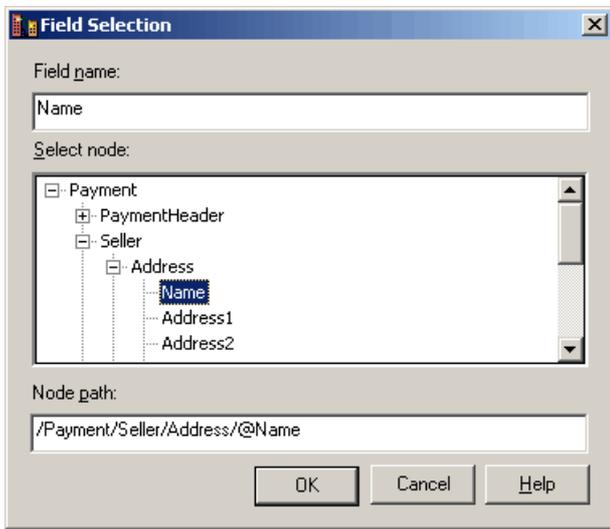
A node path is also known as an **XPath**. You can use the node path as it is selected, or you can type additional criteria to the path. For example, if you select a node that contains an array, you might want to specify a specific index in the array to retrieve, rather than retrieving the entire array.

### Note

- If you choose to send or receive an XML message as a string, the **Message** shape that is created on the **Data** page for this message contains a field named StringData, and you cannot add specification fields to this message.

The following illustration shows the **Field Selection** dialog box.

Click the illustration to enlarge or reduce.



For more information about selecting specification fields and using node paths, see the following topics:

- [Node Path Fields](#)
- [Using the XML Communication Wizard](#)
- [Send or receive asynchronous messages](#)
- [Creating Specifications](#)

## Related Topics

[Creating Specifications](#)

[Dehydration and Rehydration](#)

[Node Path Fields](#)

[Persistence](#)

[Send or receive asynchronous messages](#)

[Synchronous and Asynchronous Communication](#)

[Using the XML Communication Wizard](#)

# Compiling XLANG Schedules

When you have completed an [XLANG schedule drawing](#), you can compile the drawing into an executable [XLANG schedule](#). Before you compile the drawing, make sure the flow of data between [messages](#) has been defined on the **Data** page. An XLANG schedule describes the business process and the [binding](#) of that process to an [implementation technology](#).

BizTalk Orchestration Designer is designed to provide as much useful information as possible when a problem in your XLANG schedule is discovered during the compilation process. If BizTalk Orchestration Designer encounters an error, it highlights the shape that contains the error, displays an error message, and cancels the compilation of the XLANG schedule.

During compilation, BizTalk Orchestration Designer examines each shape to determine if it is complete and correct. The [XLANG Scheduler Engine](#) processes the **Begin** shape on the **Business Process** page first, and then descends recursively through the entire drawing. If the XLANG Scheduler Engine encounters an error, the error will typically occur when the business process flows to a shape in a deeply nested position. To report the error, the XLANG Scheduler Engine constructs an appropriate error message. Then, as the XLANG Scheduler Engine returns up through the stack, each method has an opportunity to concatenate its own error message to the original error message. If none of the methods concatenates an error message to the original error message, the top-level compilation method adds the following generic error message: *Failed to process the XLANG schedule*.

The compiled XLANG schedule contains a globally unique identifier (GUID) that matches the [XLANG Identity](#) property of the **Begin** shape. This identification can be used to correlate a version of the XLANG schedule drawing with the XLANG schedule that generated it.

## Note

- It is highly recommended that you review the [How to](#) section for task-specific information about using BizTalk Orchestration Designer to create XLANG schedule drawings and compile them into executable XLANG schedules.

## Related Topics

[Compile and Debug XLANG Schedules](#)

[Compile an XLANG schedule drawing into an XLANG schedule](#)

[Debugging XLANG Schedules](#)

# Debugging XLANG Schedules

XLANG Event Monitor is a tool that you can use to monitor running [XLANG schedule instances](#). For specific information about using XLANG Event Monitor, see the associated Readme.htm file. Both XLANG Event Monitor (XLANGMon.exe) and the readme installed by the Microsoft BizTalk Server 2000 Setup Wizard are located in the following installation directory: ..\Program Files\Microsoft BizTalk Server\SDK\XLANG Tools.

XLANG Event Monitor includes the following features:

- XLANG Event Monitor displays the [XLANG Scheduler Engine](#) working in real time.
- After the initial enumeration of the running schedules, XLANG Event Monitor monitors events. XLANG Event Monitor can be used to suspend and stop running instances.
- XLANG Event Monitor has a multiple-document interface (MDI)-like user interface that enables you to simultaneously view multiple instance traces.
- It can simultaneously monitor selected applications on multiple computers.
- XLANG Event Monitor provides separate recording and viewing filters.

## Related Topics

[Compile and Debug XLANG Schedules](#)

[Compiling XLANG Schedules](#)

[Monitor Running XLANG Schedules](#)

[XLANG Schedule Error Messages](#)

# Running XLANG Schedules

When installing BizTalk Orchestration Designer, several COM+ applications are installed and configured within Microsoft Windows 2000 Component Services, including the [XLANG Scheduler](#) COM+ application. This application hosts a default instance of the [XLANG Scheduler Engine](#). Each new COM+ application created in Component Services has an **XLANG** tab on the properties dialog box. On the **XLANG** tab you can enable the new COM+ application to host the XLANG Scheduler Engine. The specific COM+ application in which a new [XLANG schedule](#) will execute can be determined through the [moniker](#) syntax used to activate an instance of an XLANG schedule.

The XLANG Scheduler Engine controls the activation, execution, [dehydration](#), and [rehydration](#) of running XLANG schedule instances. To activate an XLANG schedule, you can create a small application that passes the moniker of an XLANG schedule to the XLANG Scheduler Engine. The XLANG Scheduler Engine performs the [actions](#) within the XLANG schedule and continues the business process sequence until it becomes necessary to dehydrate the XLANG schedule. Dehydrating an XLANG schedule occurs when the XLANG Scheduler Engine expects to wait for more than three minutes to receive a [message](#). When the message arrives, the XLANG Scheduler Engine rehydrates the XLANG schedule instance and continues to perform the actions in the business process sequence until the schedule either completes or the XLANG Scheduler Engine has to wait for another message. To support dehydration, you must have a [persistence database](#) configured. The recommended network library is TCP/IP.

To display Microsoft Windows 2000 Component Services information, perform the following procedure:

1. On the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**.
2. In the console tree, expand **Component Services**, expand **Computers**, expand **My Computer**, and then expand **COM+ Applications**.

The **XLANG** tab on the **Component Services Properties** dialog box displays the following options:

- **This application is a host for XLANG schedule instances.** If enabled, this COM+ application might activate instances of XLANG schedules. To direct the activation of a schedule instance to a particular COM+ application, use a moniker form that includes the name of the application. Check this option when you want the application to serve as a host for the XLANG Scheduler Engine.
- **Persistence.** In this area you can configure Microsoft SQL Server to support the dehydration and rehydration of long-running business processes:
  - **Create DSN** creates the ODBC Data Source Name (DSN) for the COM+ application hosting the XLANG Scheduler Engine. A file DSN stores information about a database connection in a file. The file has the extension **.dsn** and by default is stored in the `$(Program Files)\Common Files\ODBC\Data Sources` directory. Click the **Create DSN** button to start the DSN Wizard.
  - **Configure DSN** opens the ODBC Data Source Administrator to manage the data source for XLANG schedules in this COM+ application.
  - **Initialize Tables** creates the tables that are needed to support persistence in the SQL Server database you have defined.

#### ◆ Important

- The Data Source Name configured in the **XLANG Scheduler Properties** dialog box must be the same as the name of the COM+ application.
- **Controlled shutdown.** In this area you can select a valid way to shut down the COM+ applications hosting XLANG schedule instances:
  - **All XLANG Applications** shuts down all COM+ applications that are hosting running XLANG schedule instances.

#### 📌 Note

- If you have selected an application other than the default application, **This XLANG Application** will be displayed.
- **Restart dehydrated XLANG applications.** In this area you can manage dehydrated XLANG applications:
  - **All XLANG Applications** rehydrates all COM+ applications that are hosting XLANG schedule instances and, if possible, continues to run them.

#### ◆ Important

- Do not right-click the COM+ application to shut down running instances of an XLANG schedule. This will leave COM components loaded in memory instead of unloading them correctly. Instead, use the **Controlled Shutdown** area of the **XLANG** tab in the properties for the **XLANG Scheduler** COM+ application.

#### **Notes**

- When using the client for Microsoft Windows 2000 Terminal Services to initiate an XLANG schedule, the COM+ application hosting the XLANG Scheduler Engine must have its identity set to a valid Windows 2000 user or group name. The identity of the COM+ application is set on the **Identity** page of the properties dialog box for that application. The identity cannot be set to interactive when using the XLANG Scheduler Engine through a session hosted by Terminal Services.
- For task-specific information about running an XLANG schedule, see [Run an XLANG Schedule](#).

The following topics are covered in this section:

- [Moniker Syntax](#)
- [Creating an Instantiating Application](#)



## Related Topics

[Creating an Instantiating Application](#)

[Running XLANG Schedules](#)

# Creating an Instantiating Application

An instantiating application passes a [moniker](#) for the completed [XLANG schedule](#) file to the [XLANG Scheduler Engine](#) by using the COM function **GetObject**. The following Microsoft Visual Basic code shows how to do this:

```
Dim objExecute As object
Dim strURL as string

strURL = "sked:///c:\temp\myschedule.skk"

' This enables the XLANG Scheduler Engine to execute the XLANG schedule.
Set objExecute = GetObject(strURL)
```

If you did not specify a [port](#) in the moniker, the **Port** property of the object that is returned by the **GetObject** function enables you to obtain a reference to a port that is bound to a COM component. Similarly, the **FullPortName** property enables you to obtain the full, durable name of a port bound to an [implementation technology](#).

The following code shows how to obtain a proxy to a COM or Script port. This code sample continues from the previous code sample.

```
Dim oPort as Object
Set oPort = objExecute.Port("SchedulePortName")
Call oPort.ComponentMethodName(arg1,arg2,...argN)
```

## Note

- If the port is bound to a COM object that does not support a dual interface, the *oPort* variable must be declared with the appropriate class.

## Related Topics

[Moniker Syntax](#)

[Running XLANG Schedules](#)

# Managing Session State

On the **Advanced Properties** page of the COM Component Binding wizard, you can select a [state](#) management value for the level of persistence that your COM component supports. In the State management support area, select one of the following options:

- **Holds no state.** This specifies that the [XLANG Scheduler Engine](#) will terminate the component instance when it is [dehydrated](#). If you select this setting, the XLANG Scheduler Engine will create a new component instance, if it is required, when the schedule is [rehydrated](#).
- **Holds state, but doesn't support persistence.** This specifies that the XLANG Scheduler Engine will be required to leave the component instance running. If the system fails while the application is dehydrated, any state that has been held in this component will be lost.
- **Holds state, and does support persistence.** This specifies that the XLANG Scheduler Engine will remove the component instance from memory, and then restore it to memory by calling either **IPersistStream** or **IPersistStreamInit** on the component during dehydration, and then again during rehydration.

## Related Topics

[Instance management](#)

# Updating XLANG Schedules

There are two ways to update an [XLANG schedule](#). You can overwrite the original XLANG schedule, or you can add a new XLANG schedule that will run [concurrently](#) with the original XLANG schedule.

To overwrite the original XLANG schedule, use BizTalk Orchestration Designer to create a new [XLANG schedule drawing](#) and then compile the XLANG schedule drawing as an XLANG schedule that has the same name as the original XLANG schedule. The XLANG schedule drawing is saved as an .skv file, which is a customized version of the Microsoft Visio 2000 file format. You can then compile the XLANG schedule drawing into an XLANG schedule, which is an XML-structured .skx text file that the [XLANG Scheduler Engine](#) understands. To update the original XLANG schedule, copy the new .skx file over the original .skx file.

To add a new XLANG schedule that will run concurrently with the original XLANG schedule, use BizTalk Orchestration Designer to create a new XLANG schedule drawing and compile the XLANG schedule drawing as an XLANG schedule with a new name. To ensure that the new XLANG schedule will be correctly activated, you must change the [XLANG schedule instance](#) activation mechanism to point to the new .skx file instead of pointing to the old .skx file. When you have completed this process, new requests for XLANG schedules will create instances of the new XLANG schedule.

Because all XLANG schedules and their components typically work on a per-instance basis, XLANG schedule instances that are in the process of executing the original schedule will continue to run to completion. This includes XLANG schedule instances that have been persisted because the source code of the original schedule has been saved. In this scenario, the execution path will continue to follow the original business process, and new requests for XLANG schedules will create instances of the new XLANG schedule.

## Note

- When an XLANG schedule uses an object with an interface that has changed, you should load the XLANG schedule drawing (the .skv file) into BizTalk Orchestration Designer and compile a new .skx file. This will update the binding information in the .skx file, enabling synchronization with the component's type library.

# Configuring BizTalk Messaging Services

Microsoft [BizTalk Server 2000](#) provides two methods for configuring BizTalk Messaging Services to manage the exchange of documents between [trading partners](#) and applications within your business. You can use either [BizTalk Messaging Manager](#), which is a graphical user interface (UI), or directly access the BizTalk Messaging Configuration object model.

Using BizTalk Messaging Manager or the BizTalk Messaging Configuration object model, you can create [messaging ports](#) and [channels](#) to manage the exchange of data. You also can create [document definitions](#), [envelopes](#), and [organizations](#), which you use to create messaging ports and channels; and [distribution lists](#), which are groups of messaging ports.

## Note

- To access or create objects either by using BizTalk Messaging Manager or the BizTalk Messaging Configuration object model, or to run scripts or applications that access or create such objects, you must belong to a user account in the BizTalk Server Administrators group. The BizTalk Server Administrators group is created when BizTalk Server 2000 is installed. Additional users can be added to this group as necessary. For more information about adding a user account, see [Add users to the BizTalk Server Administrators group](#).

The following topics are covered in this section:

- [Using BizTalk Messaging Manager](#)
- [Accessing the BizTalk Messaging Configuration Object Model](#)

# Using BizTalk Messaging Manager

BizTalk Messaging Manager is a graphical user interface (UI) with which you can manage the exchange of documents by configuring [BizTalk Messaging Services](#). BizTalk Messaging Services can also be configured programmatically. For more information, see [Accessing the BizTalk Messaging Configuration Object Model](#).

## ⚠ Caution

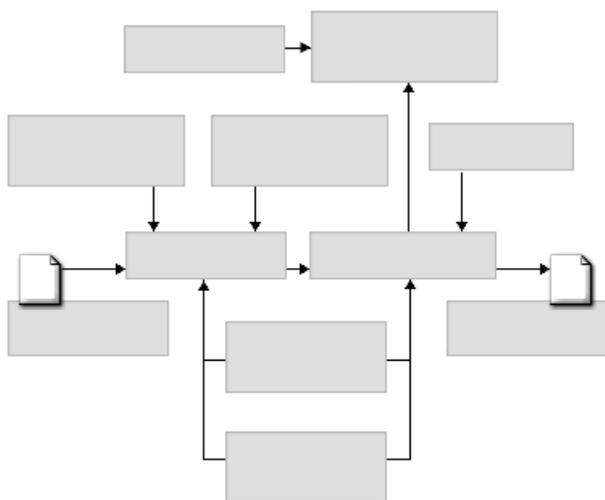
- You should use BizTalk Messaging Manager to configure BizTalk Messaging Services prior to processing documents. Accessing and modifying objects that might be in use while BizTalk Server 2000 is processing documents can produce unexpected results.

Documents can be exchanged between [trading partners](#) and applications within your business. BizTalk Messaging Manager is available both locally from the computer on which BizTalk Server 2000 is installed and remotely as a client application. This enables system administrators to retain security and central control of the server, while enabling remote users to access BizTalk Messaging Manager.

Microsoft BizTalk Server 2000 Help provides information about how to create and manage [channels](#), [messaging ports](#), [document definitions](#), [envelopes](#), and [organizations](#), as well as how to use [distribution lists](#).

## BizTalk Messaging Manager objects

The following illustration shows the relationship between the objects that you can create by using BizTalk Messaging Manager.



Application (Home organization)

Document  
definition  
(Inbound)

### **Messaging Port**

(Destination)

### **Channel**

(Source)

### **Channel**

Envelope

### **Distribution List**

Messaging

Ports

Document

definition

(Outbound)

Organization (Trading partner)

Inbound

document

Outbound

document

The following summary provides a brief overview of the objects that you can create by using BizTalk Messaging Manager. This summary also further explains the relationship between the objects. For more detailed information about each object, click the link at the end of each description to go to the Help topic for that object.

## Channels

Channels are the primary objects in BizTalk Messaging Manager. The purpose of all other BizTalk Messaging Manager objects is to either create channels or support the operation of channels. Channels identify the source of documents, which can be an organization, an application within your business, or an XLANG schedule. Channels also identify inbound and outbound documents by using document definitions. For more information, see [Understanding Channels](#).

## Messaging ports

Messaging ports identify a destination for the documents that are processed by a channel. The destination can be an organization, an application within your business, or an [XLANG schedule](#). A messaging port specifies a destination address to which the documents are sent, how they are transported to that address, and if and how they are secured and enveloped. For more information, see [Understanding Messaging Ports](#).

## Organizations

Organizations represent other trading partners with which you exchange documents. A special organization type, called the [home organization](#), represents your business. You can create applications for the home organization that represent the internal applications that your business uses. Organizations and applications serve as the source for a channel or the destination for a messaging port. For more information, see [Understanding Organizations](#).

## Document definitions

A document definition represents a specific type of document that is processed by BizTalk Server 2000. A document definition provides a pointer to a [specification](#). Specifications define the document structure, type, and version. Channels specify an inbound and an outbound document definition to indicate which documents the server processes. A document definition can be used in any number of channels. For more information, see [Understanding Document Definitions](#).

## Envelopes

Envelopes provide BizTalk Server 2000 with the information that the server needs to either open inbound or create outbound [interchanges](#). Envelopes can be selected from within a messaging port to direct the server in creating outbound interchanges. Envelopes, which are independent of a messaging port, can be used by BizTalk Server 2000 to open inbound interchanges. For more information, see [Understanding Envelopes](#).

## Distribution lists

Distribution lists are groups of messaging ports with which you can send the same document to a group of different trading partner organizations or internal applications. You must create at least one channel for a distribution list, just as you do for an individual messaging port. For more information, see [Understanding Distribution Lists](#).

## Notes

- The objects that you can create by using BizTalk Messaging Manager can also be created programmatically by using the BizTalk Messaging Configuration object model. For more information, see [Accessing the BizTalk Messaging Configuration Object Model](#).
- The objects that you can create by using BizTalk Messaging Manager also use objects that you can create by using other BizTalk Messaging Services user interfaces. Channels use [maps](#), which you can create by using [BizTalk Mapper](#). Document definitions use document specifications, and envelopes use envelope specifications. You can create specifications by using [BizTalk Editor](#).
- For help with specific tasks, see [How To](#).
- For general background information, see [Concepts](#).

# How To...

This section provides task-specific information about how to use BizTalk Messaging Manager. It is highly recommended that you review the [Concepts](#) section to fully understand the relationship between objects that you can create by using BizTalk Messaging Manager.

The following topics are covered in this section:

- [Create and Manage Channels](#)
- [Create and Manage Messaging Ports](#)
- [Create and Manage Organizations](#)
- [Create and Manage Document Definitions](#)
- [Create and Manage Envelopes](#)
- [Use Distribution Lists](#)

# Create and Manage Channels

This section provides task-specific information about how to create and manage [channels](#). It is highly recommended that you review [Understanding Channels](#) in the Concepts section to fully understand channels.

The following procedures are covered in this section:

- [Create channels](#)
- [Search for channels](#)
- [Edit channels](#)
- [Delete channels](#)
- [Set Channel Properties](#)

# Create channels

You must create a [messaging port](#) or a [distribution list](#) before you can create a [channel](#). For more information, see [Create messaging ports](#) or [Create distribution lists](#).

1. In BizTalk Messaging Manager, in the **Search for other items** area, click **Messaging ports** or **Distribution lists** and click **Search Now**.

2. In the **Messaging Port Name** list, click the messaging port for which you want to create a channel.

–Or–

In the **Distribution List Name** list, click the distribution list for which you want to create a channel.

3. In BizTalk Messaging Manager, on the **File** menu, point to **New**, point to **Channel**, and then complete one of the following steps:

- To create a channel from an organization, click **From an Organization**.
- To create a channel from an application, click **From an Application**.

The New Channel Wizard opens.

4. On the **General Information** page, set the properties and click **Next**.

For more information, see [Set general channel-information properties](#).

5. Complete one of the following steps:

- If you are creating a channel from an organization, set the properties on the **Source Organization** page and click **Next**. For more information, see [Set source organization properties](#).
- If you are creating a channel from an application, set the properties on the **Source Application** page and click **Next**. For more information, see [Set source application properties](#).

6. On the **Inbound Document** page, set the properties and click **Next**.

For more information, see [Set inbound document properties](#).

7. On the **Outbound Document** page, set the properties and click **Next**.

For more information, see [Set outbound document properties](#).

8. On the **Document Logging** page, set the properties and click **Next**.

For more information, see [Set document logging properties](#).

9. On the **Advanced Configuration** page, set the properties and click **Next**.

For more information, see [Set advanced configuration properties](#).

10. After you have set all channel properties, on the **Advanced Configuration** page click **Finish** to close the Channel Wizard.

## Notes

- You cannot name a channel using the reserved system name, Reliable Message Acknowledgement Channel.
- You can use this procedure to create either a standard channel or a [receipt channel](#). The procedures in this section contain notes that explain which channel properties are not available when you are creating a receipt channel.
- If you create a messaging port and a channel to use for a [pass-through submission](#) of data, you can use only the service window and the retry count and interval features of the channel, and the transport features of its associated messaging port. You cannot use the verification of decoding or decryption, filtering, document tracking, or mapping features of the channel.
- When you save a channel that references a map that is outside of your local domain, you might receive an error. If you receive an error, download and configure the WinHTTP proxy utility. To download the utility, go to the Microsoft MSDN Web

site ([msdn.microsoft.com/downloads/default.asp](https://msdn.microsoft.com/downloads/default.asp)), and browse to the WinHTTP Proxy Configuration Utility page, which is located in the XML chapter of the Web Development book.

## **Related Topics**

[Delete channels](#)

[Edit channels](#)

[Search for channels](#)

[Set Channel Properties](#)

[Understanding Channels](#)

# Search for channels

1. In BizTalk Messaging Manager, in the **Search for other items** area, click **Channels**.
2. To search for all channels, clear all search criteria and click **Search Now**.
3. Do one or more of the following:
  - To search for channels with a specific name, in the **Search for channels** area, in the **Channel name** box, type the name of the channel that you want to find and click **Search Now**. You can enter an incomplete name and the search returns all possible names that match the incomplete name entry.
  - To search for channels from a specific type of source, in the **Source** list, click a source type and click **Search Now**.
  - To search for channels associated with a specific messaging port or distribution list, in the **Associated with messaging port or distribution list** box, type the name of a messaging port or distribution list and click **Search Now**. You can enter an incomplete name and the search returns all possible names that match the incomplete name entry.
  - To search for channels that use a specific document definition, in the **Using document definition** box, type the name of a document definition and click **Search Now**. You can enter an incomplete name and the search returns all possible names that match the incomplete name entry.

## Notes

- You can set more than one search criteria before clicking **Search Now**.
- To clear the search criteria and search results, click **Clear Search**.
- You can also search for channels associated with a specific messaging port or distribution list by right-clicking the messaging port or distribution list and clicking **Find Channels**.
- If you have a large number of objects for which to search, it might take several minutes to return all the objects. You can narrow the objects returned in a search by using selection criteria.
- The default number of items returned in a search is 500. You can adjust this number. For more information, see [Set server connection options](#).
- You can use the following wildcard characters in the search criteria.

Wildcard character	Description	Example
%	Any string of zero or more characters.	The entry '%open%' finds all names with the word 'open' anywhere in the name.
_ (underscore)	Any single character.	The entry '_ean' finds four-letter names that end with ean (Dean, Sean, and so on).
[ ]	Any single character within the specified range ([a-f]) or set ([abcdef]).	The entry '[C-P]arsen' finds names ending with arsen and beginning with any single character between C and P (Carsen, Larsen, and so on).
[^]	Any single character not within the specified range ([^a-f]) or set ([^abcdef]).	The entry 'de[^s]%' finds all names beginning with de and where the following letter is not s.

## Related Topics

[Delete channels](#)

[Edit channels](#)

[Set Channel Properties](#)



# Edit channels

1. In BizTalk Messaging Manager, in the **Channel Name** list, click the channel that you want to edit.

For information about searching for channels, see [Search for channels](#).

2. On the **File** menu, click **Edit**.

The Channel Properties Wizard opens.

3. On the **General Information** page, edit the appropriate properties.

For more information, see [Set general channel-information properties](#).

After editing the properties on any page, you can click **Finish** to close the Channel Properties Wizard or click **Next** to edit additional channel properties.

4. Complete one of the following steps:

- If you are editing a channel from an organization, edit the appropriate properties on the **Source Organization** page. For more information, see [Set source organization properties](#).
- If you are editing a channel from an application, edit the appropriate properties on the **Source Application** page. For more information, see [Set source application properties](#).

5. On the **Inbound Document** page, edit the appropriate properties.

For more information, see [Set inbound document properties](#).

6. On the **Outbound Document** page, edit the appropriate properties.

For more information, see [Set outbound document properties](#).

7. On the **Document Logging** page, edit the appropriate properties.

For more information, see [Set document logging properties](#).

8. On the **Advanced Configuration** page, edit the appropriate properties.

For more information, see [Set advanced configuration properties](#).

## Notes

- You cannot name a channel using the reserved system name, Reliable Message Acknowledgement Channel.
- When you save a channel that references a map that is outside of your local domain, you might receive an error. If you receive an error, download and configure the WinHTTP proxy utility. To download the utility, go to the Microsoft MSDN Web site ([msdn.microsoft.com/downloads/default.asp](http://msdn.microsoft.com/downloads/default.asp)), and browse to the WinHTTP Proxy Configuration Utility page, which is located in the XML chapter of the Web Development book.

## Related Topics

[Create channels](#)

[Delete channels](#)

[Search for channels](#)

[Set Channel Properties](#)

[Understanding Channels](#)

# Delete channels

1. In BizTalk Messaging Manager, in the **Channel Name** list, click the channel that you want to delete.

For information about searching for channels, see [Search for channels](#).

2. On the **File** menu, click **Delete**.

## Note

- You cannot delete the [receipt channel](#) until all channels that refer to it have been deleted.

## Related Topics

[Create channels](#)

[Edit channels](#)

[Search for channels](#)

[Set Channel Properties](#)

[Understanding Channels](#)

# Set Channel Properties

This section provides task-specific information about how to configure the properties of a channel. The following procedures are covered in this section:

- [Set general channel-information properties](#)
- [Set source organization properties](#)
- [Set source application properties](#)
- [Set inbound document properties](#)
- [Set outbound document properties](#)
- [Set document logging properties](#)
- [Set advanced configuration properties](#)
- [Select a source organization](#)
- [Select a receipt channel](#)
- [Select an inbound document definition](#)
- [Select a certificate to verify inbound document decryption](#)
- [Select a certificate to verify inbound document signature](#)
- [Select an outbound document definition](#)
- [Select a map](#)
- [Select a certificate for outbound signature](#)
- [Override messaging port defaults](#)
- [Override distribution list defaults](#)
- [Set Tracking for Inbound Document Properties](#)
- [Set Channel Filtering Properties](#)

# Set general channel-information properties

1. On the **General Information** page of the Channel Wizard, in the **Name** box, type the name of the channel.
2. In the **Comments** box, type any comments for the channel.
3. If you want to create a [receipt channel](#), select the **This is a receipt channel** check box.

If you are creating a new channel, click **Next**. For instructions about completing the next step, go to [Create channels](#).

If you are editing an existing channel, click **Next**. For instructions about completing the next step, go to [Edit channels](#). When you have completed your changes, click **Finish**.

## Notes

- A receipt channel is a special type of channel that you use to return a receipt to the sender of a document that is received by BizTalk Server 2000. For more information about receipts, see [Understanding Receipts](#).
- You cannot create a receipt channel for an [open messaging port](#) or a [distribution list](#).

## Related Topics

[Create channels](#)

[Edit channels](#)

[Set Channel Properties](#)

# Set source organization properties

1. On the **Source Organization** page of the Channel Wizard, complete one of the following steps:
  - Click **Open source** to create an [open channel](#), which designates that the source is provided either by data within the document or in parameters submitted along with the document, and click **Next**.  
For more information about submitting documents, see [Submitting](#).
  - Click **Organization** to designate a [trading partner](#) organization as the source and proceed to step 2.
2. In the **Organization** area, click **Browse**.  
The **Select an Organization** dialog box appears.
3. Click an organization and click **OK**.  
For more information, see [Select a source organization](#).
4. If you want to override the default [organization identifier](#) for the source organization, click another identifier in the **Organization identifier** list.
5. If you require a receipt from the destination, as specified in the messaging port, select the **Expect receipt** check box and, in the **Receipt interval in minutes** box, type a value or click the up or down arrow to increase or decrease the value.  
The default value is 120 minutes. For more information about receipts, see [Understanding Receipts](#).
6. If you want to generate a receipt to the source, select the **Generate receipt** check box, click **Browse**, and then select a [receipt channel](#).  
For more information, see [Select a receipt channel](#).

If you are creating a new channel, click **Next**. For instructions about completing the next step, go to [Create channels](#).

If you are editing an existing channel, click **Next**. For instructions about completing the next step, go to [Edit channels](#). If you have completed your changes, click **Finish**.

## Notes

- When you select a source organization identifier for use with [X12](#) envelopes, do not select the organization identifier named Organization, or any other identifier that has a qualifier that exceeds 2 characters or a value that exceeds 15 characters.
- When you select a source organization identifier for use with [EDIFACT](#) envelopes, do not select the organization identifier named Organization, or any other identifier that has a qualifier that exceeds 4 characters or a value that exceeds 35 characters.
- If you are editing a channel from a specific organization, the **Open Source** option is not available and you cannot change the source organization. If you are editing an open channel, the **Organization** option is not available.
- If you are creating or editing a receipt channel, the **Expect receipt** and **Generate receipt** properties are not available.

## Related Topics

[Create channels](#)

[Edit channels](#)

[Set Channel Properties](#)

[Understanding Receipts](#)

# Set source application properties

1. On the **Source Application** page of the Channel Wizard, complete one of the following steps:
  - Click **XLANG Schedule** to designate that the source is an [XLANG schedule](#) and click **Next**.  
You should not choose this option if you are creating a channel for an [open messaging port](#). For more information about integrating BizTalk Messaging Services with BizTalk Orchestration Services, see [Integrating BizTalk Services](#).
  - Click **Application** to designate an application of the [home organization](#) as the source and proceed to step 2.
2. In the **Name** list, click an application.
3. If you want to override the default [organization identifier](#) for the home organization, click another identifier in the **Organization identifier** list.
4. If you want to receive a receipt from the destination, select the **Expect receipt** check box and, in the **Receipt interval in minutes** box, type a value or click the up or down arrow to increase or decrease the value.  
The default value is 120 minutes. For more information about receipts, see [Understanding Receipts](#).
5. If you want to generate a receipt to the source, select the **Generate receipt** check box, click **Browse**, and then select a [receipt channel](#).  
For more information, see [Select a receipt channel](#).

If you are creating a new channel, click **Next**. For instructions about completing the next step, go to [Create channels](#).

If you are editing an existing channel, click **Next**. For instructions about completing the next step, go to [Edit channels](#). If you have completed your changes, click **Finish**.

## Notes

- You can create an XLANG schedule by using BizTalk Orchestration Designer.
- When you are creating or editing a receipt channel, or a channel for which an XLANG schedule is specified as the source, the **Expect receipt** and **Generate receipt** properties are not available.

## Related Topics

[Create channels](#)

[Edit channels](#)

[Integrating BizTalk Services](#)

[Set Channel Properties](#)

[Understanding Receipts](#)

# Set inbound document properties

1. On the **Inbound Document** page of the Channel Wizard, to the right of the **Inbound document definition name** box, click **Browse**.

The **Select a Document Definition** dialog box appears.

2. Click a [document definition](#) and click **OK**.

For more information, see [Select an inbound document definition](#).

3. If you want to verify decryption for the inbound document, select the **Verify decryption certificate on inbound document** check box. Then, to the right of the **Certificate to verify decryption** box, click **Browse**.

The **Select Certificate to Verify Decryption** dialog box appears.

4. Select a certificate.

For more information, see [Select a certificate to verify inbound document decryption](#).

5. If you want to verify the digital signature on the inbound document, select the **Verify signature certificate on inbound document** check box. Then, to the right of the **Certificate to verify signature** box, click **Browse**.

The **Select Certificate to Verify Signature** dialog box appears.

6. Select a signature certificate.

For more information, see [Select a certificate to verify inbound document signature](#).

7. If you want to track fields in the inbound document, select the **Track inbound document** check box and click **Tracking**.

The **Tracking for Inbound Document** dialog box appears.

8. Set the tracking properties.

For more information, see [Set Tracking for Inbound Document Properties](#).

9. If you want to create a [channel filtering](#) expression for the inbound document, select the **Filter inbound document** check box and click **Filtering**.

The **Channel Filtering Expressions** dialog box appears.

10. Set the filtering properties.

For more information, see [Set Channel Filtering Properties](#).

If you are creating a new channel, click **Next**. For instructions about completing the next step, go to [Create channels](#).

If you are editing an existing channel, click **Next**. For instructions about completing the next step, go to [Edit channels](#). If you have completed your changes, click **Finish**.

## Notes

- When you create a [receipt channel](#), both the inbound and outbound document definitions default to the BizTalk Canonical Receipt and cannot be transformed by using a [map](#). To transform the outbound receipt to a different format, you must create and select in the receipt channel an inbound document definition that refers to the canonical receipt [specification](#) in the [WebDAV repository](#). You also must create and select in the receipt channel an outbound document definition that refers to a specification with the format that you want for the outbound receipt, and specify a map in the receipt channel to transform the formats. For more information, see [Understanding Receipts](#).
- When you create a receipt channel that uses the default BizTalk Canonical Receipt for the inbound document definition, the tracking and filtering properties are unavailable.
- When you create a channel for an [open messaging port](#), and the destination information is provided in the document, the inbound document definition for that channel must reference a specification that is properly configured. For more information about how to configure a document specification to process documents for an open messaging port, see [Set dictionary properties](#).

## Related Topics

[Create channels](#)

[Edit channels](#)

[Set Channel Properties](#)

# Set outbound document properties

1. On the **Outbound Document** page of the Channel Wizard, to the right of the **Outbound document definition name** box, click **Browse**.

The **Select a Document Definition** dialog box appears.

2. Click a [document definition](#) and click **OK**.

For more information, see [Select an outbound document definition](#).

3. If you want to specify a [map](#), select the **Map inbound document to outbound document** check box. Then, to the right of the **Map reference** box, click **Browse**.

The **Select a Map from the WebDAV Repository** dialog box appears.

4. Select a map specification.

For more information, see [Select a map](#).

5. If you want to digitally sign the outbound document, select the **Sign outbound document** check box. Then, to the right of the **Signature certificate** box, click **Browse**.

If you are creating a channel for a messaging port for which the **Signature** property on the **Security Information** page is set to S/MIME, the **Sign outbound document** check box is automatically selected.

The **Select a Signature Certificate** dialog box appears.

6. Select a signature certificate.

For more information, see [Select a certificate for outbound signature](#).

If you are creating a new channel, click **Next**. For instructions about completing the next step, go to [Create channels](#).

If you are editing an existing channel, click **Next**. For instructions about completing the next step, go to [Edit channels](#). If you have completed your changes, click **Finish**.

## ◆ Important

- The format of an envelope that you specify in a messaging port must agree with the format of the document or documents that it contains. The document format is determined by the [specification](#) referred to in the outbound document definition of an associated channel. For example, if you choose an envelope with an X12 format for a messaging port, you must select an outbound document definition for the channel that points to an X12 specification.
- When you declare a messaging port as an [open messaging port](#), you should not create channels for the messaging port that have an outbound document definition with an [X12](#) or [EDIFACT](#) specification. To build an X12 or EDIFACT envelope, the server must have a source and a destination organization identifier. An open messaging port does not specify a destination organization identifier. In addition, the documents for an open messaging port must have the destination address within the document, but X12 and EDIFACT documents do not contain this information.
- The first time that you open any [WebDAV repository](#) dialog box, the WebDAV repository on the local server is selected, even if your BizTalk Messaging Manager is connected to a database on a remote server. If you browse to a WebDAV repository on a remote server, the default changes to that server until you select a new WebDAV repository. The default server for all WebDAV repository dialog boxes is the last server to which a connection was made.

## 📌 Notes

- When you create a [receipt channel](#), both the inbound and outbound document definitions default to the BizTalk Canonical Receipt and cannot be transformed by using a map. To use a different format for an outbound receipt, you must create and select an inbound document definition that refers to the canonical receipt specification in the WebDAV repository. You also must create an outbound document definition that refers to a specification with the format that you want for the outbound receipt, as well as a map that transforms the format of the receipt. For more information about receipts, see [Understanding Receipts](#).
- A map is used to transform the inbound document format into the outbound document format. If the specification reference of the inbound document matches that of the outbound document, no map is required. By default, the **Map inbound**

**document to outbound document** check box is not selected. Maps can be created using [BizTalk Mapper](#). For more information about maps, see [Mapping Data](#).

## Related Topics

[Create channels](#)

[Edit channels](#)

[Set Channel Properties](#)

[Understanding Receipts](#)

# Set document logging properties

1. On the **Document Logging** page of the Channel Wizard, in the **Log inbound document** area, select the appropriate check boxes:

- **In native format.** Stores inbound documents for the channel in the original format. This is the default setting.
- **In XML format.** Stores inbound documents for the channel in XML format.

2. In the **Log outbound document** area, select the appropriate check boxes:

- **In native format.** Stores outbound documents for the channel in the original format.
- **In XML format.** Stores outbound documents for the channel in XML format.

If you are creating a new channel, click **Next**. For instructions about completing the next step, go to [Create channels](#).

If you are editing an existing channel, click **Next**. For instructions about completing the next step, go to [Edit channels](#). If you have completed your changes, click **Finish**.

## Notes

- There is size limit for documents that use logging, which if exceeded will greatly affect the performance of BizTalk Server. For more information about the size limit, see [Interchange and document size limit](#).
- BizTalk Server 2000 translates non-XML inbound documents from their original, native format into an XML format for processing, and outbound documents from an XML format into the required, native format of the destination.

## Related Topics

[Create channels](#)

[Edit channels](#)

[Set Channel Properties](#)

# Set advanced configuration properties

1. On the **Advanced Configuration** page of the Channel Wizard, if you are creating a channel for a [messaging port](#) that specifies an [X12](#) or [EDIFACT envelope format](#), in the **Group control number** box type a non-zero value.
2. In the **Retry options** area, in the **Number of retries** box, enter the number of times that you want the server to resend the document if a receipt has not been received and, in the **Interval** box, enter the number of minutes between retries.

For more information about receipts, see [Understanding Receipts](#).

3. If you want to override the transport or envelope component settings for a messaging port or [distribution list](#), click **Advanced**.
  - If you are creating or editing a channel for a messaging port, the **Override Messaging Port Defaults** dialog box appears. For more information, see [Override messaging port defaults](#).
  - If you are creating or editing a channel for a distribution list, the **Override Distribution List Defaults** dialog box appears. For more information, see [Override distribution list defaults](#).

If you are creating a new channel, click **Next**. For instructions about completing the next step, go to [Create channels](#).

If you are editing an existing channel, click **Next**. For instructions about completing the next step, go to [Edit channels](#). If you have completed your changes, click **Finish**.

## Related Topics

[Create channels](#)

[Edit channels](#)

[Retry queue](#)

[Set Channel Properties](#)

[Understanding Receipts](#)

# Select a source organization

1. On the **Source Organization** page of the Channel Wizard, to the right of the **Name** box, click **Browse**.

The **Select an Organization** dialog box appears.

2. In the **Available organizations** list, click an organization and click **OK**.

To continue setting source organization properties, go to [Set source organization properties](#).

## Related Topics

[Create channels](#)

[Edit channels](#)

[Set Channel Properties](#)

[Set source organization properties](#)

# Select a receipt channel

1. On the **Source Application** or **Source Organization** page of the Channel Wizard, select the **Generate receipt** check box and click **Browse**.

The **Select a Receipt Channel** dialog box appears.

2. In the **Available receipt channels** list, click a [receipt channel](#) and click **OK**.

To continue setting source organization properties, go to [Set source organization properties](#).

To continue setting source application properties, go to [Set source application properties](#).

## Note

- The **Available receipt channels** list displays only receipt channels that are associated with [messaging ports](#) for which the destination is identical to the source for the [channel](#) that you are creating. When BizTalk Server 2000 invokes a channel with a receipt channel specified, the server returns a receipt to the original source of that document by using the receipt channel specified. For more information about receipts, see [Understanding Receipts](#).

## Related Topics

[Create channels](#)

[Edit channels](#)

[Set Channel Properties](#)

[Set source application properties](#)

[Set source organization properties](#)

[Understanding Receipts](#)

# Select an inbound document definition

1. On the **Inbound Document** page of the Channel Wizard, to the right of the **Inbound document definition name** box, click **Browse**.

The **Select a Document Definition** dialog box appears.

2. In the **Available document definitions** list, click a [document definition](#) and click **OK**.

To continue setting inbound document properties, go to [Set inbound document properties](#).

## Note

- When you create a [receipt channel](#), both the inbound and outbound document definitions default to the BizTalk Canonical Receipt and cannot be transformed by using a [map](#). To use a different format for an outbound receipt, you must create and select an inbound document definition that refers to the canonical receipt [specification](#) in the [WebDAV repository](#). You also must create an outbound document definition that refers to a specification with the format that you want for the outbound receipt, as well as a map that transforms the format of the receipt. For more information about receipts, see [Understanding Receipts](#).

## Related Topics

[Create channels](#)

[Create document definitions](#)

[Edit channels](#)

[Set Channel Properties](#)

[Set inbound document properties](#)

[Understanding Receipts](#)

# Select a certificate to verify inbound document decryption

1. On the **Inbound Document** page of the Channel Wizard, select the **Verify decryption on inbound document** check box.
2. To the right of the **Certificate to verify decryption** box, click **Browse**.  
The **Select a Certificate to Verify Decryption** dialog box appears.
3. In the **Certificate name** list, click a certificate name and click **OK**.

To continue setting inbound document properties, go to [Set inbound document properties](#).

## Notes

- All certificates are stored in the local computer store. To configure certificates for the S/MIME components by using BizTalk Messaging Manager, you must belong to a user account in the Windows 2000 Administrators group, and [BizTalk Messaging Services](#) must be running as a local system account or as a user account in the Windows 2000 Administrators group.
- Documents are decrypted when BizTalk Server 2000 receives them so that the server can obtain the data it needs to identify the appropriate channel. The certificate that you specify in the [channel](#) verifies that the decryption was done correctly.
- All certificates must be named uniquely. If more than one certificate has the same name, only one of the certificates can be selected. Once one of the certificates is selected, other certificates with the same name no longer appear in the list.

For more information about certificates, see [Certificates Overview](#).

## Related Topics

[Create channels](#)

[Edit channels](#)

[Set Channel Properties](#)

[Set inbound document properties](#)

# Select a certificate to verify inbound document signature

1. On the **Inbound Document** page of the Channel Wizard, select the **Verify signature on inbound document** check box.
2. To the right of the **Certificate for signature verification** box, click **Browse**.  
The **Select a Certificate to Verify Signature** dialog box appears.
3. In the **Certificate name** list, click a certificate name and click **OK**.

To continue setting inbound document properties, go to [Set inbound document properties](#).

## Notes

- All certificates are stored in the local computer store. To configure certificates for the S/MIME components by using BizTalk Messaging Manager, you must belong to a user account in the Windows 2000 Administrators group, and [BizTalk Messaging Services](#) must be running as a local system account or as a user account in the Windows 2000 Administrators group.
- All certificates must be named uniquely. If more than one certificate has the same name, only one of the certificates can be selected. Once one of the certificates is selected, other certificates with the same name no longer appear in the list.

For more information about certificates, see [Certificates Overview](#).

## Related Topics

[Create channels](#)

[Edit channels](#)

[Set Channel Properties](#)

[Set inbound document properties](#)

# Select an outbound document definition

1. On the **Outbound Document** page of the Channel Wizard, to the right of the **Outbound document definition name** box, click **Browse**.

The **Select a Document Definition** dialog box appears.

2. In the **Available document definitions** list, click a [document definition](#) and click **OK**.

To continue setting outbound document properties, go to [Set outbound document properties](#).

## Note

- When you create a [receipt channel](#), both the inbound and outbound document definitions default to the BizTalk Canonical Receipt and cannot be transformed by using a [map](#). To use a different format for an outbound receipt, you must create and select an inbound document definition that refers to the canonical receipt [specification](#) in the [WebDAV repository](#). You also must create an outbound document definition that refers to a specification with the format that you want for the outbound receipt, as well as a map that transforms the format of the receipt. For more information about receipts, see [Understanding Receipts](#).

## Related Topics

[Create channels](#)

[Create document definitions](#)

[Edit channels](#)

[Set Channel Properties](#)

[Set outbound document properties](#)

[Understanding Receipts](#)

# Select a map

1. On the **Outbound Document** page of the Channel Wizard, select the **Map inbound document to outbound document** check box and, to the right of the **Map reference** box, click **Browse**.

The **Select a Map from the WebDAV Repository** dialog box appears.

2. In the **Server** box, do one of the following if you want to change the server:
  - Click a server in the list.
  - Type the name of a server and press ENTER.
3. Double-click the folder that contains the **map** that you want, click the map, and then click **Open**.

To continue setting outbound document properties, go to [Set outbound document properties](#).

## ◆ Important

- The first time that you open any [WebDAV repository](#) dialog box, the WebDAV repository on the local server is selected, even if your BizTalk Messaging Manager is connected to a database on a remote server. If you browse to a WebDAV repository on a remote server, the default changes to that server until you select a new WebDAV repository. The default server for all WebDAV repository dialog boxes is the last server to which a connection was made.

## 📝 Notes

- If you select <http://localhost> as the server, BizTalk Messaging Manager automatically converts it to the local computer name.
- When you save a [channel](#) that references a map that is outside of your local domain, you might receive an error. If you receive an error, download and configure the WinHTTP proxy utility. To download the utility, go to the Microsoft MSDN Web site ([msdn.microsoft.com/downloads/default.asp](https://msdn.microsoft.com/downloads/default.asp)), and browse to the WinHTTP Proxy Configuration Utility page, which is located in the XML chapter of the Web Development book.

## Related Topics

[Create channels](#)

[Edit channels](#)

[Mapping Data](#)

[Set Channel Properties](#)

[Set outbound document properties](#)

# Select a certificate for outbound signature

1. On the **Outbound Document** page of the Channel Wizard, select the **Sign outbound document** check box and, to the right of the **Signature certificate** box, click **Browse**.

The **Select a Signature Certificate** dialog box appears.

2. In the **Certificate name** list, click a certificate name and click **OK**.

To continue setting outbound document properties, go to [Set outbound document properties](#).

## Notes

- All certificates are stored in the local computer store. To configure certificates for the S/MIME components by using BizTalk Messaging Manager, you must belong to a user account in the Windows 2000 Administrators group, and [BizTalk Messaging Services](#) must be running as a local system account or as a user account in the Windows 2000 Administrators group.
- All certificates must be named uniquely. If more than one certificate has the same name, only one of the certificates can be selected. Once one of the certificates is selected, other certificates with the same name no longer appear in the list.

For more information about certificates, see [Certificates Overview](#).

## Related Topics

[Create channels](#)

[Edit channels](#)

[Set Channel Properties](#)

[Set outbound document properties](#)

# Override messaging port defaults

1. On the **Advanced Configuration** page of the Channel Wizard, click **Advanced**.

If you are creating or editing a [channel](#) for a [messaging port](#), the **Override Messaging Port Defaults** dialog box appears.

2. On the **Primary Transport** tab, click **Properties**.

The **BizTalk Component Properties** dialog box appears.

3. Change the transport component properties that you want to override and click **OK**.

4. If the messaging port has an [envelope](#) and you want to override its settings, click the **Envelope** tab and click **Properties**.

The **BizTalk Component Properties** dialog box appears.

5. Change the envelope component properties that you want to override and click **OK**.

To continue setting advanced properties, go to [Set advanced configuration properties](#).

## ◆ Important

- Overriding the transport and envelope properties for a messaging port is an advanced feature. If you do not thoroughly understand the transport or envelope component properties in these dialog boxes, you should not change them.
- If you specified an envelope with a custom format in the messaging port, you must configure the custom serializer component by using the advanced configuration properties.

## 📝 Notes

- When you override messaging port properties in a channel, the overrides only apply to that channel.
- You cannot override the transport address that was set in a messaging port.
- The default setting for the HTTP transport component is to use the HTTP proxy server. This is the correct setting to transport data to Web sites outside your business's firewall. To transport data to Web sites that are inside your business's firewall (that is, within your intranet), use this procedure to override the default setting.
- For the HTTPS transport component, you should use only certificates that are specified for client authentication. Certificates that are specified for all purposes do not appear in the list.
- The default setting for the file transport component is to append files. If you choose the file transport type with its default settings in a messaging port and use antivirus software on the server on which BizTalk Server 2000 is installed, and you send multiple files that have exactly the same name to the same file location, at the same time, BizTalk Server 2000 might stop responding and must be restarted. You can eliminate this problem by changing the default setting for the file transport component from **Append to file** to **Overwrite file** in the **BizTalk SendLocalFile Properties** dialog box. You also can eliminate this problem by creating a unique file for each document instance processed by using the file path format in the messaging port: file://C:\dir\file%tracking\_id%.xml. For more information, see [Specify a transport address](#).
- The default setting for the file transport component is to append files. If you choose the file transport type with its default settings and select an envelope with a reliable envelope format in a messaging port, and then send multiple files to the same file location, at the same time, you might have unexpected parsing results. You can eliminate this problem by changing the default setting for the file transport component from **Append to file** to **Overwrite file** in the **BizTalk SendLocalFile Properties** dialog box.
- If the envelope specified in the messaging port has a custom format, and you have created and registered a custom serializer component, you can configure the properties of the custom serializer component by using this procedure.
- The default syntax identifier for an EDIFACT envelope is UNOA (uppercase Latin alphabet). If your data requires a different syntax, select a different syntax identifier by using this procedure.

- If you use EDIFACT release indicators, you should not include release indicator characters in your data. Doing so might cause the data to exceed the physical character size limits for fields.

## **Related Topics**

[Create channels](#)

[Edit channels](#)

[Set advanced configuration properties](#)

[Set Channel Properties](#)

# Override distribution list defaults

1. On the **Advanced Configuration** page of the Channel Wizard, click **Advanced**.

If you are creating or editing a [channel](#) for a [distribution list](#), the **Override Distribution List Defaults** dialog box appears.

2. In the **Select Messaging Port** list, select a messaging port that you want to override and click **Override**.

The **Override Messaging Port Defaults** dialog box appears.

3. Override the transport and envelope component properties for the selected messaging port.

For more information, see [Override messaging port defaults](#).

4. When you have changed the messaging ports that you want to override, click **Close**.

To continue setting advanced properties, go to [Set advanced configuration properties](#).

## Related Topics

[Create channels](#)

[Edit channels](#)

[Override messaging port defaults](#)

[Set advanced configuration properties](#)

[Set Channel Properties](#)

# Set Tracking for Inbound Document Properties

The **Tracking for Inbound Document** dialog box lists the [specification](#) fields for the inbound document, as well as any [global tracking fields](#) selected in the [document definition](#).

If you select any specification fields by using this dialog box, those fields override the global tracking fields for this [channel](#) only. For each [document instance](#) that is processed, the fields that you select in the channel are logged to the [Tracking database](#), rather than to the global tracking fields.

This section describes how to select or remove specification fields of the inbound document in a channel.

The following procedures are covered in this section:

- [Select specification fields in a channel](#)
- [Remove specification fields in a channel](#)

## Related Topics

[Create channels](#)

[Edit channels](#)

[Set Channel Properties](#)

[Set Global Tracking Properties](#)

[Set inbound document properties](#)

# Select specification fields in a channel

1. On the **Inbound Document** page of the Channel Wizard, select the **Track inbound document** check box and click **Tracking**.

The **Tracking for Inbound Document** dialog box appears.

2. In the **Specification fields** tree, double-click any record to expand the view.
3. Select a **specification** field that you want to add to the **Fields to track** list and complete one of the following procedures:

To add the field as	Follow this procedure
<b>Integer</b>	Click <b>Integer</b> . You can add two fields as integers.
<b>Real</b>	Click <b>Real</b> . You can add two fields as real numbers.
<b>Date</b>	Click <b>Date</b> . You can add two fields as dates.
<b>Text</b>	Click <b>Text</b> . You can add two fields as text.
<b>Custom</b>	Click <b>Custom</b> . You can add unlimited fields as a custom type. The fields are stored as an XML concatenated string with tags for each field.

To continue setting inbound document properties, go to [Set inbound document properties](#).

## ◆ Important

- If you select any specification fields by using this dialog box, those fields override the [global tracking fields](#) for this [channel](#) only. For each [document instance](#) that is processed, the fields that you select in the channel are logged to the Tracking database, rather than to the global tracking fields.

## 📝 Notes

- To select a specification field to track as an integer, real, or date data type, the field must have that data type assigned in the specification. For more information about assigning a data type to a specification field, see [Set declaration properties](#).
- Specification fields without a data type assigned in the specification can be tracked only as a text or custom data type.
- If a specification field that you want to track has a character data type, you can track that field only as a custom data type.
- You can select only two specification fields of a specific data type. You can select an unlimited number of fields as a custom data type.

## Related Topics

[Create channels](#)

[Edit channels](#)

[Remove specification fields in a channel](#)

[Set Channel Properties](#)

[Set Global Tracking Properties](#)

[Set Tracking for Inbound Document Properties](#)

[Tracking Document Data Fields](#)

# Remove specification fields in a channel

1. On the **Inbound Document** page of the Channel Wizard, select the **Track inbound document** check box and click **Tracking**.

The **Tracking for Inbound Document** dialog box appears.

2. In the **Fields to track** list, click the [specification](#) field or fields that you want to remove and click **Remove**.

To continue setting inbound document properties, go to [Set inbound document properties](#).

## **Note**

- When you remove a field from the list of fields to track, it is removed only from the list in this [channel](#); it is not removed from the specification.

## **Related Topics**

[Create channels](#)

[Edit channels](#)

[Select specification fields in a channel](#)

[Set Channel Properties](#)

[Set Global Tracking Properties](#)

[Set Tracking for Inbound Document Properties](#)

[Tracking Document Data Fields](#)

# Set Channel Filtering Properties

A [channel filtering](#) expression is an [XPath](#) expression that can be used to determine if a [channel](#) is invoked based upon the value of a specified field or fields within the document. When Microsoft BizTalk Server 2000 processes a document, the value of the specified field or fields in each document is evaluated against the channel filtering expression. If the expression is found to be true, the channel is invoked. If the expression is found to be false, the channel is not invoked.

The following procedures are covered in this section:

- [Add a channel filtering expression](#)
- [Edit a channel filtering expression](#)
- [Remove a channel filtering expression](#)

## Related Topic

[Set inbound document properties](#)

# Add a channel filtering expression

1. On the **Inbound Document** page of the Channel Wizard, select the **Filter inbound document** check box and click **Filtering**.

The **Channel Filtering Expressions** dialog box appears.

2. In the **Select field** tree, double-click any node to expand the view.
3. Click a **specification** field that you want to use to create a filtering expression and click **Add**.

The **New Expression** dialog box appears.

4. In the **Operator** list, click an operator:

Operator	Symbol
Equal to (Default)	=
Not equal to	!=
Less than	<
Equal to or less than	<=
Greater than	>
Equal to or greater than	>=

5. In the **Value** box, type a value for the expression and click **OK**.

To continue setting inbound document properties, go to [Set inbound document properties](#).

## ◆ Important

- A channel filtering expression must be a valid [XPath](#) expression. The **Add** button can be used to create a clause that contains a specification field, and insert it into an expression; however, it does not generate the correct syntax needed for a valid XPath expression. For more information about XPath expressions, see [Channel Filtering](#), and go to the Microsoft Web site ([msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp)), and search on the keyword "XPath."

## 📝 Notes

- You can type an expression directly into the **Expressions** list.
- To select a specification field for a channel filtering expression, the field must have a data type assigned in the specification. For more information about assigning a data type to a field, see [Set declaration properties](#).
- If the specification field that you are using to create an expression has a Boolean data type, you cannot use the text string "true" or "false" in the expression value. You must use a numerical value instead, "-1" for true and "0" for false.
- If the specification field that you are using to create an expression has a date data type, you must type the value in the following format, including the hyphens: **YYYY-MM-DD**.

## Related Topics

[Create channels](#)

[Edit a channel filtering expression](#)

[Edit channels](#)

[Remove a channel filtering expression](#)

[Set Channel Filtering Properties](#)

[Set Channel Properties](#)

# Edit a channel filtering expression

1. On the **Inbound Document** page of the Channel Wizard, select the **Filter inbound document** check box and click **Filtering**.

The **Channel Filtering Expressions** dialog box appears.

2. In the **Expressions** list, edit the expression click **OK**.

To continue setting inbound document properties, go to [Set inbound document properties](#).

## ◆ Important

- A channel filtering expression must be a valid [XPath](#) expression. For more information about XPath expressions, see [Channel Filtering](#), and go to the Microsoft Web site ([msdn.microsoft.com/library/default.asp](https://msdn.microsoft.com/library/default.asp)), and search on the keyword "XPath."

## Related Topics

[Add a channel filtering expression](#)

[Remove channel filtering expression](#)

[Set Channel Filtering Properties](#)

# Remove a channel filtering expression

- On the **Inbound Document** page of the Channel Wizard, clear the **Filter inbound document** check box.

To continue setting inbound document properties, go to [Set inbound document properties](#).

## Related Topics

[Add a channel filtering expression](#)

[Create channels](#)

[Edit a channel filtering expression](#)

[Edit channels](#)

[Set Channel Filtering Properties](#)

[Set Channel Properties](#)

# Create and Manage Messaging Ports

This section provides task-specific information about how to create and manage [messaging ports](#). It is highly recommended that you review [Understanding Messaging Ports](#) in the Concepts section to fully understand messaging ports.

The following procedures are covered in this section:

- [Create messaging ports](#)
- [Search for messaging ports](#)
- [Edit messaging ports](#)
- [Delete messaging ports](#)
- [Set Messaging Port Properties](#)

# Create messaging ports

1. In BizTalk Messaging Manager, on the **File** menu, point to **New**, point to **Messaging Port**, and then complete one of the following steps:

- To create a messaging port to a [trading partner](#) organization, click **To an Organization**.
- To create a messaging port to an internal application, click **To an Application**.

The New Messaging Port Wizard opens.

2. Set the properties on the **General Information** page and click **Next**.

For more information, see [Set general messaging-port information properties](#).

3. Complete one of the following steps:

- If you are creating a messaging port to a specific organization, set the properties on the **Destination Organization** page and click **Next**. For more information, see [Set destination organization properties](#).

- If you are creating an [open messaging port](#), click **Open destination** and click **Next**.

For an open messaging port, the transport and destination information must be provided either within the document or in a parameter submitted with the document. For more information, see [Submitting](#).

- If you are creating a messaging port to an application, set the properties on the **Destination Application** page and click **Next**. For more information, see [Set destination application properties](#).

4. On the **Envelope Information** page, set the properties and click **Next**.

For more information, see [Set envelope information properties](#).

5. On the **Security Information** page, set the properties.

For more information, see [Set security information properties](#).

6. If you do not want to proceed directly to the Channel Wizard to create a [channel](#), clear the **Create a channel for this messaging port** check box. Otherwise, in the **Channel type** list, click one of the following channel types:

- **From an organization**
- **From an application**

7. After you have set all messaging port properties, on the **Security Information** page, click **Finish** to close the Messaging Port Wizard.

## ◆ Important

- When you declare a messaging port as an open messaging port, do not create channels for the messaging port that have an outbound document definition with an [X12](#) or [EDIFACT](#) specification. To build an X12 or EDIFACT [envelope](#), the server must have a source and a destination [organization identifier](#). An open messaging port does not specify a destination organization identifier. In addition, the documents for an open messaging port must have the destination address within the document, but X12 and EDIFACT documents do not contain this information.

## 📝 Notes

- You cannot name a messaging port using the reserved system name, Reliable Message Acknowledgement Port.
- If you create a messaging port and a channel to use for a [pass-through submission](#) of data, you can use only the service window and the retry count and interval features of the channel, and the transport features of its associated messaging port. You cannot use the verification of decoding or decryption, filtering, document tracking, or mapping features of the channel.

## Related Topics

[Create and Manage Channels](#)

[Delete messaging ports](#)

[Edit messaging ports](#)

[Search for messaging ports](#)

[Set Messaging Port Properties](#)

[Understanding Messaging Ports](#)

# Search for messaging ports

1. In BizTalk Messaging Manager, in the **Search for other items** area, click **Messaging ports**.
2. Do one or more of the following:
  - To search for all [messaging ports](#), clear all search criteria and click **Search Now**.
  - To search for a messaging port with a specific name, in the **Messaging port name** box, type the name of the messaging port that you want to find and click **Search Now**. You can enter an incomplete name and the search returns all possible names that match the incomplete name entry.
  - To search for messaging ports to a specific type of destination, in the **Destination** list, click a destination type and click **Search Now**.

## Notes

- You can set more than one search criteria before clicking **Search Now**.
- If you have a large number of objects for which to search, it might take several minutes to return all the objects. You can narrow the objects returned in a search by using selection criteria.
- The default number of items returned in a search is 500. You can adjust this number. For more information, see [Set server connection options](#).
- To clear the search criteria and search results, click **Clear Search**.
- You can use the following wildcard characters in the search criteria.

Wildcard character	Description	Example
%	Any string of zero or more characters.	The entry '%open%' finds all names with the word 'open' anywhere in the name.
_ (underscore)	Any single character.	The entry '_ean' finds four-letter names that end with ean (Dean, Sean, and so on).
[ ]	Any single character within the specified range ([a-f]) or set ([abcdef]).	The entry '[C-P]arsen' finds names ending with arsen and beginning with any single character between C and P (Carsen, Larsen, and so on).
[^]	Any single character not within the specified range ([^a-f]) or set ([^abcdef]).	The entry 'de[^s]%' finds all names beginning with de and where the following letter is not s.

## Related Topics

[Delete messaging ports](#)

[Edit messaging ports](#)

[Understanding Messaging Ports](#)

# Edit messaging ports

1. In BizTalk Messaging Manager, in the **Messaging Port Name** list, click the messaging port that you want to edit.

For information about searching for [messaging ports](#), see [Search for messaging ports](#).

2. On the **File** menu, click **Edit**.

The Messaging Port Properties Wizard opens.

3. On the **General Information** page, edit the appropriate properties.

For more information, see [Set general messaging-port information properties](#).

After editing the properties on any page, you can click **Finish** to close the Messaging Port Properties Wizard or click **Next** to edit additional messaging port properties.

4. Complete one of the following steps:

- If you are editing a messaging port to an organization, edit the necessary properties on the **Destination Organization** page and click **Next**. For more information, see [Set destination organization properties](#).
- If you are editing a messaging port to an application, edit the appropriate properties on the **Destination Application** page and click **Next**. For more information, see [Set destination application properties](#).

5. On the **Envelope Information** page, edit the appropriate properties and click **Next**.

For more information, see [Set envelope information properties](#).

6. On the **Security Information** page, edit the appropriate properties.

For more information, see [Set security information properties](#).

7. If you do not want to proceed directly to the Channel Wizard to create a [channel](#), clear the **Create a channel for this messaging port** check box; otherwise, in the **Channel type** list, click one of the following channel types:

- **From an organization**
- **From an application**

8. After you have edited all appropriate messaging port properties, you can click **Finish** on any page to close the Messaging Port Wizard.

## Note

- You cannot name a messaging port using the reserved system name, Reliable Message Acknowledgement Port.

## Related Topics

[Create and Manage Channels](#)

[Create messaging ports](#)

[Delete messaging ports](#)

[Set Messaging Port Properties](#)

[Understanding Messaging Ports](#)

# Delete messaging ports

1. In BizTalk Messaging Manager, in the **Messaging Port Name** list, click the messaging port that you want to delete.

For information about searching for messaging ports, see [Search for messaging ports](#).

2. On the **File** menu, click **Delete**.

## Notes

- If you have created [channels](#) for a messaging port, you cannot delete the messaging port until its associated channels have been deleted.
- You can search for channels associated with a messaging port by right-clicking the messaging port and clicking **Find Channels**.

## Related Topics

[Create and Manage Channels](#)

[Create messaging ports](#)

[Edit messaging ports](#)

[Understanding Messaging Ports](#)

# Set Messaging Port Properties

This section provides task-specific information about how to configure the properties of a messaging port. The following procedures are covered in this section:

- [Set general messaging-port information properties](#)
- [Set destination organization properties](#)
- [Set destination application properties](#)
- [Set envelope information properties](#)
- [Set security information properties](#)
- [Select a destination organization](#)
- [Select an encryption certificate](#)
- [Set Transport Properties](#)
- [Set Envelope Delimiters](#)

# Set general messaging-port information properties

1. On the **General Information** page of the Messaging Port Wizard, in the **Name** box, type the name of the messaging port.
2. In the **Comments** box, type any comments that you want for the messaging port and click **Next**.

If you are creating a new messaging port, click **Next**. For instructions about completing the next step, go to [Create messaging ports](#).

If you are editing an existing messaging port, click **Next**. For instructions about completing the next step, go to [Edit messaging ports](#). If you have completed your changes, click **Finish**.

## Related Topics

[Create messaging ports](#)

[Edit messaging ports](#)

[Set Messaging Port Properties](#)

# Set destination organization properties

1. On the **Destination Organization** page of the Messaging Port Wizard, complete one of the following steps:
  - Click **Open destination** to create an [open messaging port](#) and click **Next**.  
For an open messaging port, the transport and destination information must be provided either within the document or in parameters submitted with the document. For more information, see [Submitting](#).
  - Click **Organization** to designate a specific [trading partner](#) organization as the destination and then proceed to step 2.
2. In the **Organization** area, click **Browse**.  
The **Select an Organization** dialog box appears.
3. Click an organization and click **OK**.  
For more information, see [Select a destination organization](#).
4. In the **Primary transport** area, click **Browse**.  
The **Primary Transport** dialog box appears.
5. Set the primary transport properties.  
For more information, see [Set Transport Properties](#).
6. If you want to limit the time when documents can be transported, in the **Primary transport** area, select the **Service window** check box.  
Then, in the **From** and **To** boxes, click the hour and enter a value, or click the up or down arrow to increase or decrease the value.
7. If you want to specify a secondary transport, in the **Backup transport** area, click **Browse**.  
The **Backup Transport** dialog box appears.
8. Set the backup transport properties.  
For more information, see [Set Transport Properties](#).

If you are creating a new messaging port, click **Next**. For instructions about completing the next step, go to [Create messaging ports](#).

If you are editing an existing messaging port, click **Next**. For instructions about completing the next step, go to [Edit messaging ports](#). If you have completed your changes, click **Finish**.

## ◆ Important

- When you declare a messaging port as an [open messaging port](#), do not create [channels](#) for the messaging port that have an outbound document definition with an **X12** or **EDIFACT** specification. To build an X12 or EDIFACT [envelope](#), the server must have a source and a destination [organization identifier](#). An open messaging port does not specify a destination organization identifier. In addition, the documents for an open messaging port must have the destination address within the document, but X12 and EDIFACT documents do not contain this information.

## 📌 Note

- Service window hours are displayed in the coordinated universal time (UTC) format and reflect the time on the server.

## Related Topics

[Create messaging ports](#)

[Edit messaging ports](#)

[Set Messaging Port Properties](#)

# Set destination application properties

1. On the **Destination Application** page of the Messaging Port Wizard, complete one of the following steps:
  - Click **New XLANG schedule** to designate a [port](#) in a new instance of a specified [XLANG schedule](#) as the destination. Then, in the **Schedule moniker** box, type the [moniker](#) of the specified schedule or click **Browse** to set the path. Then, in the **Port name** box, type the name of the specific port in this schedule to which the document is sent.

The syntax for schedule monikers is as follows:

```
sked://[localhost][!GroupManager][/FilePath][PortName]
```

You can only activate XLANG schedules on the local computer.

For more information about monikers, see [Moniker Syntax](#).

- Click **Running XLANG schedule** to designate an active [XLANG schedule instance](#) as the destination. Use this option only to transport a message to an active XLANG schedule when a trading partner returns the message to a specially configured ASP page using an HTTP transport. For more information, see [Integrating BizTalk Services](#).
  - Click **Application** to designate an application of the [home organization](#) as the destination, and then click an application in the **Name** list.
2. If you selected an application as the destination, complete steps 3 through 5. Otherwise, click **Next**.

3. In the **Primary transport** area, click **Browse**.

The **Primary Transport** dialog box appears.

4. Set the primary transport properties.

For more information, see [Set Transport Properties](#).

5. If you want to limit the time when documents can be transported, in the **Primary transport** area, select the **Service window** check box.

Then, in the **From** and **To** boxes, click the hour and enter a value, or click the up or down arrow to increase or decrease the value.

6. If you want to specify a secondary transport, in the **Backup transport** area, click **Browse**.

The **Backup Transport** dialog box appears.

7. Set the backup transport properties.

For more information, see [Set Transport Properties](#).

If you are creating a new messaging port, click **Next**. For instructions about completing the next step, go to [Create messaging ports](#).

If you are editing an existing messaging port, click **Next**. For instructions about completing the next step, go to [Edit messaging ports](#). If you have completed your changes, click **Finish**.

## ◆ Important

- If you choose the **New XLANG schedule** option:
  - The [port](#) that you name must be bound to BizTalk Messaging in the specified schedule, and that binding must be configured to activate a new schedule instance upon message arrival.
  - You should have only one port in a schedule that is configured to activate a new schedule instance upon message arrival, and it should be the first action in the schedule. For more information, see [Implement a port by using BizTalk Messaging](#).

## 📝 Notes

- If you choose an [XLANG schedule](#) as the destination for a messaging port, there is a maximum limit of 2 MB for the documents that you process by using this messaging port.

- [BizTalk Orchestration Designer](#) can be used to create XLANG schedules.
- Service window times are displayed in the coordinated universal time (UTC) format and reflect the time on the server.

## **Related Topics**

[Create messaging ports](#)

[Edit messaging ports](#)

[Set Messaging Port Properties](#)

# Set envelope information properties

1. On the **Envelope Information** page of the Messaging Port Wizard, in the **Envelope information** area, select an [envelope](#) from the list.

If you select an envelope that has an [X12](#) or [EDIFACT](#) format, the following steps are required. If you select an envelope that has a custom format, the following steps are optional.

- a. Click **Delimiters** and set the delimiter properties.

For more information, see [Set Envelope Delimiters](#).

- b. In the **Interchange control number** box, type an interchange control number.

2. If you want to override the default [organization identifier](#) for the destination organization, click another identifier in the **Organization identifier** list.

If you are creating a new messaging port, click **Next**. For instructions about completing the next step, go to [Create messaging ports](#).

If you are editing an existing messaging port, click **Next**. For instructions about completing the next step, go to [Edit messaging ports](#). If you have completed your changes, click **Finish**.

## ◆ Important

- If you choose an envelope with a Reliable format, you also must configure the **Reliable messaging reply-to URL** address in the **BizTalk Server Group Properties** dialog box. For more information, see [Configure general properties for a server group](#).
- The format of an envelope that you specify in a messaging port must agree with the format of the document or documents that it contains. The document format is determined by the [specification](#) referred to in the outbound [document definition](#) of an associated [channel](#). For example, if you choose an envelope with an X12 format for a messaging port, you must select an outbound document definition for the channel that points to an X12 specification.

## 📝 Notes

- When processing envelopes that are compliant with BizTalk Framework 2.0, BizTalk Server 2000 should be considered the endpoint with regard to the expiration time. When BizTalk Framework 2.0–compliant documents are submitted to BizTalk Server 2000, either from an application or a trading partner, the following fields are overwritten if present, or created if absent:
  - In the properties subsection:
    - <prop:identity>
    - <prop:sentAt>
    - <expiresAt>
  - In the receipt information subsection:
    - <sendTo>
    - <address>
    - <sendReceiptBy>
- For a messaging port to an application, the organization identifiers available in the **Organization identifier** list are those of the [home organization](#).
- If you use the Loopback transport type, you cannot choose an envelope with a Reliable format.
- When you select a destination organization identifier for use with X12 envelopes, you should not select the organization identifier named Organization, or any other identifier that has a qualifier that exceeds 2 characters or a value that exceeds 15 characters.
- When you select a destination organization identifier for use with EDIFACT envelopes, you should not select the

organization identifier named Organization, or any other identifier that has a qualifier that exceeds 4 characters or a value that exceeds 35 characters.

- If you select an envelope with an EDIFACT format, the default syntax identifier is UNOA (uppercase Latin alphabet). If your data requires a different syntax, select a different syntax identifier by overriding the messaging port defaults in the Channel Wizard. For more information, see [Override messaging port defaults](#).

## Related Topics

[Create envelopes](#)

[Create messaging ports](#)

[Edit messaging ports](#)

[Set Messaging Port Properties](#)

[Understanding Envelopes](#)

# Set security information properties

1. On the **Security Information** page of the Messaging Port Wizard, in the **Encoding** area, in the **Type** list, click one the following:

- **(None)**. Specifies no encoding. This is the default setting.
- **MIME**. Specifies encoding that uses Multipurpose Internet Mail Extensions.
- **Custom**. Specifies encoding that uses a custom encoding component.

## **Notes**

- You can specify a custom encoding component and configure the class identifier (CSLID) only by using the BizTalk Messaging Configuration object model.
- If you specify an envelope that uses a Reliable format, or an envelope that uses a custom XML format without an envelope specification, and your document has no attachments, your output is not MIME encoded, even if you specify MIME encoding.

2. In the **Encryption** area, in the **Type** list, click one the following:

- **(None)**. Specifies no encryption. This is the default setting.
- **S/MIME**. Specifies encryption that uses Secure Multipurpose Internet Mail Extensions.
- **Custom**. Specifies encoding that uses a custom encryption component.

## **Note**

- You can specify a custom encryption component and configure the class identifier (CSLID) only by using the BizTalk Messaging Configuration object model.

3. If you select S/MIME encryption, in the **Encryption** area, click **Browse**.

The **Select an Encryption Certificate** dialog box appears.

4. Select an encryption certificate.

For more information, see [Select an encryption certificate](#).

5. In the **Signature** area, in the **Type** list, click one the following:

- **(None)**. Specifies no signature. This is the default setting.
- **S/MIME**. Specifies a signature that uses Secure Multipurpose Internet Mail Extensions.
- **Custom**. Specifies encoding that uses a custom signature component.

## **Note**

- You can specify a custom signature component and configure the class identifier (CSLID) only by using the BizTalk Messaging Configuration object model.

6. If you do not want to proceed directly to the Channel Wizard to create a [channel](#), clear the **Create a channel for this messaging port** check box; otherwise, in the **Channel type** list, click one of the following channel types:

- **From an organization**
- **From an application**

If you are creating a new messaging port, click **Next**. For instructions about completing the next step, go to [Create messaging ports](#).

If you are editing an existing messaging port, click **Next**. For instructions about completing the next step, go to [Edit messaging ports](#). If you have completed your changes, click **Finish**.

## Related Topics

[Create channels](#)

[Create messaging ports](#)

[Edit messaging ports](#)

[Set Messaging Port Properties](#)

# Select a destination organization

1. On the **Destination Organization** page of the Messaging Port Wizard, click **Organization** and click **Browse**.

The **Select an Organization** dialog box appears.

2. In the **Available organizations** list, click an [organization](#) and click **OK**.

To continue setting destination organization properties, go to [Set destination organization properties](#).

## Related Topics

[Create messaging ports](#)

[Set destination organization properties](#)

[Set Messaging Port Properties](#)

# Select an encryption certificate

1. On the **Security Information** page of the Messaging Port Wizard, in the **Encryption** area, in the **Type** list, click **S/MIME** and click **Browse**.

The **Select an Encryption Certificate** dialog box appears.

2. In the **Certificate name** list, click a certificate name and click **OK**.

To continue setting security properties, go to [Set security information properties](#).

## Notes

- All certificates must be named uniquely. If more than one certificate has the same name, only one of the certificates can be selected. Once one of the certificates is selected, other certificates with the same name no longer appear in the list.

For more information about certificates, see [Certificates Overview](#).

## Related Topics

[Create messaging ports](#)

[Set Messaging Port Properties](#)

[Set security information](#)

# Set Transport Properties

Transport properties include a transport type. The transport type specifies which [transport service](#) Microsoft BizTalk Server 2000 uses to convey documents to the destination designated in the [messaging port](#). Transport properties can also include a specific address to which the data is sent. The address properties vary based on the transport type selected.

This section describes how to set the primary and backup transport properties for a messaging port. The following procedures are covered:

- [Select a transport type](#)
- [Specify a transport address](#)
- [Select an application integration component](#)

# Select a transport type

1. On the **Destination Application** or **Destination Organization** page of the Messaging Port Wizard, in the **Primary transport** or **Backup transport** area, click **Browse**.

The **Primary Transport** or **Backup Transport** dialog box appears.

2. In the **Transport type** list, click one of the following transport types:
  - **Application Integration Component.** Specifies a transport that uses an application integration component that has been registered with BizTalk Server 2000.
  - **File.** Specifies a transport that uses the **SendLocalFile** component.
  - **HTTP.** Specifies a transport that uses the Hypertext Transfer Protocol.
  - **HTTPS.** Specifies a transport that uses the Secure Hypertext Transfer Protocol.
  - **Loopback.** Specifies a transport that returns the outbound document of a channel to a business application, component, or [XLANG schedule](#) that submitted the inbound document using a synchronous submit call. This transport type is available only for a messaging port that sends documents to an application.
  - **Message Queuing.** Specifies a transport that uses the Message Queuing service.
  - **SMTP.** Specifies a transport that uses the Simple Mail Transfer Protocol.
3. Complete one of the following steps:
  - If you choose the Application Integration Component transport type, see [Select an application integration component](#).
  - If you choose the Loopback transport type, no transport address is required.
  - If you choose any other transport type, see [Specify a transport address](#).

## Notes

- If you choose the Message Queuing transport type and do not use an [envelope](#), there is a maximum size limit of 2 MB for the documents that you process by using this messaging port.
- If you choose the Message Queuing transport type and use an envelope, there is a maximum size limit of 4 MB for the documents that you process by using this messaging port.
- Before you can choose the SMTP transport type, you must configure the SMTP host in BizTalk Administration. For more information, see [Configure general properties for a server group](#).
- The default setting for the HTTP transport component is to use the HTTP proxy server. This is the correct setting to transport data to Web sites outside your business's firewall. To transport data to Web sites that are inside your business's firewall (that is, within your intranet), override the default setting in the channel. For more information, see [Override messaging port defaults](#).
- The Loopback transport type can be used to map an inbound document to a different format, envelope or apply security (encoding, encryption, digital signature) to the document, and then synchronously return the outbound document to the caller as the response document.
- If you choose the Loopback transport type, you cannot use an envelope with a Reliable format.

## Related Topics

[Create messaging ports](#)

Select an application integration component

Set Messaging Port Properties

Set Transport Properties

Specify a transport address

# Specify a transport address

1. On the **Destination Application** or **Destination Organization** page of the Messaging Port Wizard, in the **Primary transport** or **Backup transport** area, click **Browse**.

The **Primary Transport** or **Backup Transport** dialog box appears.

2. In the **Transport type** list, click a transport type other than Loopback or Application Integration Component.

3. In the **Address** box, type an address for the destination.

4. If you selected the SMTP transport type, in the **Return e-mail address** box, type an address.

The server uses this address as the From address in the outbound header and as the destination for return e-mail.

To continue setting destination organization properties, go to [Set destination organization properties](#).

## ◆ Important

- For the File transport type, the default transport-component setting is to append new files to an existing file in the specified directory.
- If you use the File transport to send multiple files with the same name to the same directory, and the files have different document formats or use different code pages, the data in the appended file will be corrupted.
- If you want to create a new file for each document instance, you must use the following file path format:

```
file://C:\dir\file%tracking_id%.xml
```

## 📝 Notes

- For all transport types except Message Queuing, a prefix is automatically created for the address. This prefix is required and must not be deleted.

- For the Message Queuing transport type, the following conditions must be met for a valid address:

- Do not use the queue:// prefix in the address.
- Use a format name, rather than a path. The following are valid format names:

```
DIRECT=Protocol:<ServerName>\<QueueName>
```

```
PUBLIC=QueueGUID
```

```
PRIVATE=MachineGUID\QueueNumber
```

For more information about Message Queuing, go to the Microsoft Web site ([msdn.microsoft.com/library](https://msdn.microsoft.com/library)), and search on the keywords "Message Queuing."

- For the File transport type, the following conditions must be met for a valid address:

- The file path that you specify must exist. The file path is not created automatically, and you do not receive a warning that it does not exist.

- You must specify a file name with an extension.

An example of a valid file path is:

```
file://C:\dir\file.xml
```

- For the File transport type, you can include characters and symbols to dynamically modify the file name. The file name created by the server contains any static characters that you type into the **Address** box, along with the value of the symbol. For example, if you type file://C:\Orders\Invoice\_%tracking\_id%.xml in the **Address** box, the actual file name might appear as C:\Orders\Invoice\_{12345678-90AB-CDEF-1234-567890ABCDEF}.

The following table contains the symbols that you can use with the File transport type.

Symbol	Description	Unique file name
%datetime%	Date and time, in milliseconds, of the file creation. The time is based on Greenwich Mean Time (GMT) rather than local time.	No
%document_name%	Name of the document processed by BizTalk Server.	No
%server%	Host name of the server that processed the document.	No
%tracking_id%	Globally unique tracking number.	Yes
%uid%	Counter that increases over time, represented in milliseconds. This number is reset when the server is restarted.	No

- The default setting for the file transport component is to append files. If you choose the File transport type with its default settings in a messaging port and use antivirus software on the server on which BizTalk Server 2000 is installed, and you send multiple files that have exactly the same name to the same file location, at the same time, BizTalk Server 2000 might stop responding and must be restarted. You can eliminate this problem by changing the default setting for the file transport component from **Append to file** to **Overwrite file** in the **BizTalk SendLocalFile Properties** dialog box. You also can eliminate this problem by creating a unique file for each document instance processed by using the file path format in the messaging port: file://C:\dir\file%tracking\_id%.xml. For more information about overriding the append setting for the file transport component in the advanced properties of the channel, see [Override messaging port defaults](#).
- The default setting for the file transport component is to append files. If you choose the File transport type with its default settings and select an envelope with a Reliable format in a messaging port, and then send multiple files to the same file location, at the same time, you might have unexpected parsing results. You can eliminate this problem by changing the default setting for the file transport component from **Append to file** to **Overwrite file** in the **BizTalk SendLocalFile Properties** dialog box. For more information about overriding the append setting for the file transport component in the advanced properties of the channel, see [Override messaging port defaults](#).

## Related Topics

[Create messaging ports](#)

[Select an application integration component](#)

[Select a transport type](#)

[Set Messaging Port Properties](#)

[Set Transport Properties](#)

# Select an application integration component

1. On the **Destination Application** or **Destination Organization** page of the Messaging Port Wizard, in the **Primary transport** or **Backup transport** area, click **Browse**.

The **Primary Transport** or **Backup Transport** dialog box appears.

2. In the **Transport type** list, click **Application Integration Component**.

3. To the right of the **Component name** box, click **Browse**.

The **Select a Component** dialog box appears.

4. In the **Available components** list, click a component and click **OK**.

To continue setting destination organization properties, go to [Set destination organization properties](#).

## Note

- An application integration component must be registered with BizTalk Server 2000 before it will be available in the **Available components** list. For more information, see [Registering Application Integration Components](#).

## Related Topics

[Create messaging ports](#)

[Select a transport type](#)

[Set Messaging Port Properties](#)

[Set Transport Properties](#)

[Specify a transport address](#)

# Set Envelope Delimiters

Delimiter properties specify which characters are used to separate data within an [envelope](#) and the documents of an [interchange](#). Delimiters are required only for envelopes that use the [X12](#) and [EDIFACT](#) formats. They are optional for envelopes that use a custom format.

Envelope delimiters are set when you select an envelope within a [messaging port](#). The delimiters that are set for a messaging port apply only to that messaging port. Different delimiters can be set for the same envelope when it is used in a different messaging port. This section describes how to set delimiter properties. The following procedures are covered:

- [Set X12 delimiters](#)
- [Set EDIFACT delimiters](#)
- [Set custom delimiters](#)

# Set X12 delimiters

1. On the **Envelope Information** page of the Messaging Port Wizard, in the **Envelope information** area, select an envelope with an X12 format and click **Delimiters**.

The **X12 Delimiters** dialog box appears.

2. Enter delimiter values in either the **Character** or **Hexadecimal** box and click **OK**.

The following table describes the X12 delimiters.

Delimiter	Description
Component element separator	Specifies the character that is used to separate components of data within a composite data field. A composite data field is a field that consists of multiple subfields.
Element separator	Specifies the character that is used to separate data fields within a record.
Segment terminator	Specifies the character that is used to indicate the end of a record.

To continue setting destination organization properties, go to [Set envelope information properties](#).

## Note

- You can type either one character in the **Character** box or two characters in the **Hexadecimal** box for each delimiter. The **Hexadecimal** box can be used to enter nonprinting character delimiters, such as the ENTER key.

## Related Topics

[Create messaging ports](#)

[Set custom delimiters](#)

[Set EDIFACT delimiters](#)

[Set Envelope Delimiters](#)

[Set envelope information properties](#)

[Set Port Properties](#)

# Set EDIFACT delimiters

1. On the **Envelope Information** page of the Messaging Port Wizard, in the **Envelope information** area, select an envelope with an EDIFACT format and click **Delimiters**.

The **EDIFACT Delimiters** dialog box appears.

2. Enter delimiter values in either the **Character** or **Hexadecimal** box and click **OK**.

The following table describes the EDIFACT delimiters.

Delimiter	Description
Component element separator	Specifies the character that is used to separate components of data within a composite data field. A composite data field is a field that consists of multiple subfields.
Element separator	Specifies the character that is used to separate data fields within a record.
Release indicator	Specifies the character that is used to indicate that the following character should not be evaluated as a delimiter.
Segment terminator	Specifies the character that is used to indicate the end of a record.

## Notes

- If you use EDIFACT release indicators, do not include release indicator characters in your data. Doing so might cause the data to exceed the physical character size limits for fields.
- You can type either one character in the **Character** box or two characters in the **Hexadecimal** box for each delimiter. The **Hexadecimal** box can be used to enter nonprinting character delimiters, such as the ENTER key.
- The EDIFACT decimal specification delimiter cannot be used.

To continue setting destination organization properties, go to [Set envelope information properties](#).

## Related Topics

[Create messaging ports](#)

[Set custom delimiters](#)

[Set Envelope Delimiters](#)

[Set envelope information properties](#)

[Set Messaging Port Properties](#)

[Set X12 delimiters](#)

# Set custom delimiters

1. On the **Envelope Information** page of the Messaging Port Wizard, in the **Envelope information** area, select an envelope with a custom format and click **Delimiters**.

The **Custom Delimiters** dialog box appears.

2. Enter delimiter values in either the **Character** or **Hexadecimal** box and click **OK**.

The following table describes the custom delimiters.

Delimiter	Description
Subfield	Specifies the character that is used to separate components of data within a multipart data field.
Field	Specifies the character that is used to separate the data fields within a record.
Escape character	Specifies the character that is used to indicate that the following character should not be evaluated as a delimiter.
Record	Specifies the character that is used to indicate the end of a record.

## Note

- You can type either one character in the **Character** box or two characters in the **Hexadecimal** box for each delimiter. The **Hexadecimal** box can be used to enter nonprinting character delimiters, such as the ENTER key.

To continue setting destination organization properties, go to [Set envelope information properties](#).

## Related Topics

[Create messaging ports](#)

[Set EDIFACT delimiters](#)

[Set Envelope Delimiters](#)

[Set envelope information properties](#)

[Set Messaging Port Properties](#)

[Set X12 delimiters](#)

# Create and Manage Organizations

This section provides task-specific information about how to create and manage organizations. It is highly recommended that you review [Understanding Organizations](#) in the Concepts section to fully understand organizations.

The following procedures are covered in this section:

- [Configure the home organization](#)
- [Create organizations](#)
- [Search for organizations](#)
- [Edit organizations](#)
- [Delete organizations](#)
- [Set Organization Properties](#)

# Configure the home organization

1. In BizTalk Messaging Manager, in the **Search for other items** area, click **Organizations**.
2. In the **Search for organizations** area, select the **Home organization** check box and click **Search Now**.
3. In the **Organization Name** list, double-click **Home Organization**.  
The **Organization Properties** dialog box appears.
4. On the **General** tab, set the general organization properties.  
For more information, see [Set general organization properties](#).
5. Click the **Identifiers** tab and set the organization identifier properties.  
For more information, see [Set Organization Identifier Properties](#).
6. Click the **Applications** tab and set the application properties.  
For more information, see [Set Application Properties](#).
7. After you have set all the necessary home organization properties, click **OK** to close the **Organization Properties** dialog box.

## ◆ Important

- An [organization identifier](#) named Reliable Messaging Acknowledgement SMTP From Address is automatically created for the home organization. This identifier cannot be removed. You should not modify the name or qualifier for this identifier, but you can modify the value. The value specified for this identifier is used as the From address when sending [reliable messaging](#) receipts that use the SMTP transport protocol. For more information about reliable messaging receipts, see [Processing Receipts Using Reliable Messaging](#).
- The value specified for the organization identifier (Reliable Messaging Acknowledgement SMTP From Address) is also used as the From address when the address provided for an [open messaging port](#) is an SMTP address. For more information, see [Openness](#).

## 📝 Notes

- You can rename the home organization at any time to any name that you want.
- In BizTalk Messaging Manager, you can add applications only to the home organization.

## Related Topics

[Edit organizations](#)

[Search for organizations](#)

[Set Application Properties](#)

[Set Organization Properties](#)

[Understanding Organizations](#)

# Create organizations

1. In BizTalk Messaging Manager, on the **File** menu, point to **New** and click **Organization**.

The **New Organization** dialog box appears.

2. On the **General** tab, set the general organization properties.

For more information, see [Set general organization properties](#).

3. Click the **Identifiers** tab and set the organization identifier properties.

For more information, see [Set Organization Identifier Properties](#).

4. After you have set all the necessary properties, click **OK** to close the **New Organization** dialog box.

## Related Topics

[Configure the home organization](#)

[Delete organizations](#)

[Edit organizations](#)

[Search for organizations](#)

[Set Organization Properties](#)

[Understanding Organizations](#)

# Search for organizations

1. In BizTalk Messaging Manager, in the **Search for other items** area, click **Organizations**.
2. Do one or more of the following:
  - To search for all organizations, clear all search criteria and click **Search Now**.
  - To search for organizations with a specific name, in the **Search for organizations** area, in the **Organization name** box, type the name of the organization that you want to find and click **Search Now**. You can enter an incomplete name and the search returns all possible names that match the incomplete name entry.
  - To search for the home organization only, select the **Home organization** check box and click **Search Now**.

## Notes

- To clear the search criteria and search results, click **Clear Search**.
- If you have a large number of objects for which to search, it might take several minutes to return all the objects. You can narrow the objects returned in a search by using selection criteria.
- The default number of items returned in a search is 500. You can adjust this number. For more information, see [Set server connection options](#).
- You can use the following wildcard characters in the search criteria.

Wildcard character	Description	Example
%	Any string of zero or more characters.	The entry '%open%' finds all names with the word 'open' anywhere in the name.
_ (underscore)	Any single character.	The entry '_ean' finds four-letter names that end with ean (Dean, Sean, and so on).
[ ]	Any single character within the specified range ([a-f]) or set ([abcdef]).	The entry '[C-P]arsen' finds names ending with arsen and beginning with any single character between C and P (Carsen, Larsen, and so on).
[^]	Any single character not within the specified range ([^a-f]) or set ([^abcdef]).	The entry 'de[^s]%' finds all names beginning with de and where the following letter is not s.

## Related Topics

[Delete organizations](#)

[Edit organizations](#)

[Understanding Organizations](#)

# Edit organizations

1. In BizTalk Messaging Manager, in the **Organization Name** list, click the organization that you want to edit.  
For information about searching for organizations, see [Search for organizations](#).
2. On the **File** menu, click **Edit**.  
The **Organization Properties** dialog box appears.
3. On the **General** tab, edit any properties that you want to change.  
For more information, see [Set general organization properties](#).
4. Click the **Identifiers** tab and edit any organization identifier properties that you want to change.  
For more information, see [Set Organization Identifier Properties](#).
5. If you are editing the home organization, click the **Applications** tab and edit any application properties that you want to change.  
For more information, see [Set Application Properties](#).
6. After you have edited all the properties that you want to change, click **OK** to close the **Organization Properties** dialog box.

## ◆ Important

- An [organization identifier](#) named Reliable Messaging Acknowledgement SMTP From Address is automatically created for the home organization. This identifier cannot be removed. You should not modify the name or qualifier for this identifier, but you can modify the value. The value specified for this identifier is used as the From address when sending [reliable messaging](#) receipts that use the SMTP transport protocol. For more information about reliable messaging receipts, see [Processing Receipts Using Reliable Messaging](#).
- The value specified for the organization identifier (Reliable Messaging Acknowledgement SMTP From Address) is also used as the From address when the address provided for an [open messaging port](#) is an SMTP address. For more information, see [Openness](#).

## 📝 Note

- In BizTalk Messaging Manager, you can add applications only to the home organization.

## Related Topics

[Create organizations](#)

[Delete organizations](#)

[Search for organizations](#)

[Understanding Organizations](#)

# Delete organizations

1. In BizTalk Messaging Manager, in the **Organization Name** list, click the organization that you want to delete.

For more information about searching for organizations, see [Search for organizations](#).

2. On the **File** menu, click **Delete**.

## Notes

- If an organization is used in a [messaging port](#) or a [channel](#), you cannot delete it. You must first delete all channels and messaging ports that use the organization.
- You cannot delete the [home organization](#).

## Related Topics

[Create organizations](#)

[Edit organizations](#)

[Search for organizations](#)

[Understanding Organizations](#)

# Set Organization Properties

This section provides task-specific information about how to configure the properties of an organization. The following procedures are covered in this section:

- [Set general organization properties](#)
- [Set Organization Identifier Properties](#)
- [Set Application Properties](#)

# Set general organization properties

1. On the **File** menu, point to **New** and click **Organization**, or in the **Organization Name** list, double-click an organization.  
The **Organization** dialog box appears.
2. On the **General** tab, in the **Organization name** box, type a unique name for the organization.
3. In the **Comments** box, type any comments that you want for the organization.

## Related Topics

[Configure the home organization](#)

[Create organizations](#)

[Edit organizations](#)

[Set Organization Properties](#)

# Set Organization Identifier Properties

Organization identifiers are used to uniquely identify [organizations](#). An organization can have more than one organization identifier, but each identifier must be unique for that organization.

When you create a new organization, an organization identifier named Organization is automatically created. The qualifier for this identifier is OrganizationName, and the value is the name that you give the organization. This server uses this organization identifier as the default identifier, unless you create additional identifiers and designate one of them as the default identifier.

The following procedures are covered in this section:

- [Add organization identifiers](#)
- [Edit organization identifiers](#)
- [Remove organization identifiers](#)

## Related Topics

[Configure the home organization](#)

[Create organizations](#)

[Edit organizations](#)

[Organization Identifiers](#)

[Set Organization Properties](#)

# Add organization identifiers

1. On the **File** menu, point to **New** and click **Organization**, or in the **Organization Name** list, double-click an organization.  
The **Organization** dialog box appears.
2. Click the **Identifiers** tab and click **Add**.  
The **New Identifier** dialog box appears.
3. In the **Name** area, complete one of the following steps:
  - Click **Standard** and click a name in the list.
  - Click **Custom** and type a unique name in the box. Then, in the **Qualifier** box, type a qualifier for the identifier.
4. In the **Value** box, type a value for the identifier.
5. If you want to set this identifier as the default identifier for the organization, select the **Set as default** check box; otherwise, make sure that the check box is cleared.
6. Click **OK** to close the **New Identifier** dialog box.

## ◆ Important

- An [organization identifier](#) named Reliable Messaging Acknowledgement SMTP From Address is automatically created for the [home organization](#). This identifier cannot be removed. You should not modify the name or qualifier for this identifier, but you can modify the value. The value specified for this identifier is used as the From address when sending [reliable messaging](#) receipts that use the SMTP transport protocol. For more information, see [Processing Receipts Using Reliable Messaging](#).
- The value specified for the organization identifier (Reliable Messaging Acknowledgement SMTP From Address) is also used as the From address when the address provided for an [open messaging port](#) is an SMTP address. For more information, see [Openness](#).

## 📝 Notes

- Only one identifier can be designated as the default identifier for an organization. The default identifier is used to identify an organization unless you specify another organization identifier in a [channel](#) or [messaging port](#).
- When you create a new organization, an organization identifier named Organization is automatically created. The qualifier for this identifier is OrganizationName, and the value is the name of the organization. You can create additional identifiers, but this identifier cannot be modified or removed.
- If the server encounters an empty qualifier and a non-empty value when processing an inbound document with a format other than EDIFACT, it converts the empty qualifier to OrganizationName.
- If the server encounters an empty qualifier and a non-empty value when processing an inbound document with an EDIFACT format, it converts the empty qualifier to a dash (-). If you want to process an inbound document with an [EDIFACT](#) format that has an empty qualifier, or an outbound [envelope](#) with an empty qualifier, you must create a custom organization identifier that has a single dash as the qualifier. For an outbound EDIFACT document, the server converts the dash to an empty qualifier.
- When you create an organization identifier for use with EDIFACT envelopes, the qualifier must not exceed 4 characters and the value must not exceed 35 characters.
- When you create an organization identifier for use with [X12](#) envelopes, the qualifier must not exceed 2 characters and the value must not exceed 15 characters.

## Related Topics

[Configure the home organization](#)

[Create organizations](#)

[Edit organization identifiers](#)

[Edit organizations](#)

[Organization Identifiers](#)

[Remove organization identifiers](#)

[Set Organization Identifier Properties](#)

# Edit organization identifiers

1. On the **File** menu, point to **New** and click **Organization**, or in the **Organization Name** list, double-click an organization.  
The **Organization** dialog box appears.
2. Click the **Identifiers** tab.
3. In the **Organization identifiers** list, click the organization identifier that you want to edit and click **Edit**.  
The **Identifier Properties** dialog box appears.
4. In the **Name** area, complete one of the following steps:
  - Click **Standard** and click a name in the list.
  - Click **Custom** and type a unique name in the box. Then, in the **Qualifier** box, type a qualifier for the identifier.
5. In the **Value** box, type a value for the identifier.
6. If you want to set this identifier as the default identifier for the organization, select the **Set as default** check box; otherwise, make sure that the check box is cleared.
7. Click **OK** to close the **Identifier Properties** dialog box.

## ◆ Important

- An [organization identifier](#) named Reliable Messaging Acknowledgement SMTP From Address is automatically created for the [home organization](#). You should not modify the name or qualifier for this identifier, but you can modify the value. This identifier cannot be removed. The value for this identifier is used as the From address when sending [reliable messaging](#) receipts that use the SMTP transport protocol. For more information, see [Processing Receipts Using Reliable Messaging](#).
- The value specified for the organization identifier (Reliable Messaging Acknowledgement SMTP From Address) is also used as the From address when the address provided for an [open messaging port](#) is an SMTP address. For more information, see [Openness](#).

## 📝 Notes

- Only one identifier can be designated as the default identifier for an organization. The default identifier is used to identify an organization unless you specify another organization identifier in a [channel](#) or [messaging port](#).
- When you create a new organization, an organization identifier named Organization is automatically created. The qualifier for this identifier is OrganizationName, and the value is the name of the organization. You can create additional identifiers, but this identifier cannot be modified or removed.
- If the server encounters an empty qualifier and a non-empty value when processing an inbound document with a format other than EDIFACT, it converts the empty qualifier to OrganizationName.
- If the server encounters an empty qualifier and a non-empty value when processing an inbound document with an EDIFACT format, it converts the empty qualifier to a dash (-). If you want to process an inbound document with an [EDIFACT](#) format that has an empty qualifier, or an outbound [envelope](#) with an empty qualifier, you must create a custom organization identifier that has a single dash as the qualifier. For an outbound EDIFACT document, the server converts the dash to an empty qualifier.
- When you create an organization identifier for use with EDIFACT envelopes, the qualifier must not exceed 4 characters and the value must not exceed 35 characters.
- When you create an organization identifier for use with [X12](#) envelopes, the qualifier must not exceed 2 characters and the value must not exceed 15 characters.

## Related Topics

[Add organization identifiers](#)

[Configure the home organization](#)

[Create organizations](#)

[Edit organizations](#)

[Organization Identifiers](#)

[Remove organization identifiers](#)

[Set Organization Identifier Properties](#)

# Remove organization identifiers

1. On the **File** menu, point to **New** and click **Organization**, or in the **Organization Name** list, double-click an organization.  
The **Organization** dialog box appears.
2. Click the **Identifiers** tab.
3. In the **Organization identifiers** list, click the identifier that you want to remove and click **Remove**.

## Notes

- The designated default [organization identifier](#) cannot be removed until you have designated another identifier as the default identifier.
- The organization identifier named Organization is automatically created when you create an organization. This organization identifier cannot be removed.

## Related Topics

[Add organization identifiers](#)

[Configure the home organization](#)

[Create organizations](#)

[Edit organization identifiers](#)

[Edit organizations](#)

[Organization Identifiers](#)

[Set Organization Identifier Properties](#)

# Set Application Properties

In BizTalk Messaging Manager, you can add applications only to the [home organization](#). The applications that you create enable you to identify and track the flow of documents between BizTalk Server 2000 and actual internal applications within your business. You can designate an application of the home organization as a [source application](#) in a [channel](#) or a [destination application](#) in a [messaging port](#).

The home organization can have any number of applications. Each application name must be unique. The following procedures are covered in this section:

- [Add applications](#)
- [Edit applications](#)
- [Remove applications](#)

## Related Topics

[Configure the home organization](#)

[Edit organizations](#)

[Set Organization Properties](#)

# Add applications

1. In BizTalk Messaging Manager, in the **Search for other items** area, click **Organizations**.
2. In the **Search for organizations** area, select the **Home organization** check box and click **Search Now**.
3. In the **Organization Name** list, double-click **Home Organization**.  
The **Organization Properties** dialog box appears.
4. On the **Applications** tab, click **Add**.  
The **New Application** dialog box appears.
5. In the **Application name** box, type a unique name for the application and click **OK**.

## Note

- In BizTalk Messaging Manager, you can add, edit, and remove applications only for the [home organization](#).

## Related Topics

[Configure the home organization](#)

[Edit applications](#)

[Edit organizations](#)

[Remove applications](#)

[Set Application Properties](#)

# Edit applications

1. In BizTalk Messaging Manager, in the **Search for other items** area, click **Organizations**.
2. In the **Search for organizations** area, select the **Home organization** check box and click **Search Now**.
3. In the **Organization Name** list, double-click **Home Organization**.  
The **Organization Properties** dialog box appears.
4. On the **Applications** tab, in the **Applications** list, click the application that you want to edit and click **Edit**.  
The **Application Properties** dialog box appears.
5. In the **Application name** box, type a unique name for the application and click **OK**.

## Note

- In BizTalk Messaging Manager, you can add, edit, and remove applications only for the [home organization](#).

## Related Topics

[Add applications](#)

[Configure the home organization](#)

[Edit organizations](#)

[Remove applications](#)

[Set Application Properties](#)

# Remove applications

1. In BizTalk Messaging Manager, in the **Search for other items** area, click **Organizations**.
2. In the **Search for organizations** area, select the **Home organization** check box and click **Search Now**.
3. In the **Organization Name** list, double-click **Home Organization**.  
The **Organization Properties** dialog box appears.
4. On the **Applications** tab, in the **Applications** list, click the application that you want to remove and click **Remove**.

## Note

- In BizTalk Messaging Manager, you can add, edit, and remove applications only for the [home organization](#).

## Related Topics

[Add applications](#)

[Configure the home organization](#)

[Edit organizations](#)

[Set Application Properties](#)

# Create and Manage Document Definitions

This section provides task-specific information about how to create and manage [document definitions](#). It is highly recommended that you review [Understanding Document Definitions](#) in the Concepts section to fully understand document definitions.

The following procedures are covered in this section:

- [Create document definitions](#)
- [Search for document definitions](#)
- [Edit document definitions](#)
- [Delete document definitions](#)
- [Set Document Definition Properties](#)

# Create document definitions

1. In BizTalk Messaging Manager, on the **File** menu, point to **New** and click **Document Definition**.

The **New Document Definition** dialog box appears.

2. On the **General** tab, set the general properties.

For more information, see [Set general document-definition properties](#).

3. Click the **Global Tracking** tab and set the tracking properties.

For more information, see [Set Global Tracking Properties](#).

4. Click the **Selection Criteria** tab and set the selection criteria properties.

For more information, see [Set Selection Criteria Properties](#).

5. After you have set all the properties that you want, click **OK** to close the **New Document Definition** dialog box.

## Notes

- You cannot name a document definition Reliable Message Acknowledgement Channel or BizTalk Canonical Receipt, which are reserved system names.
- You cannot specify [global tracking fields](#) for the document definition unless you select a [specification](#).
- When you select a document definition in a [channel](#), you can override the global tracking fields for that channel by selecting different specification fields to track. For more information, see [Select specification fields in a channel](#).
- When you save a document definition that references a specification that is outside of your local domain, you might receive an error. If you receive an error, download and configure the WinHTTP proxy utility. To download the utility, go to the Microsoft MSDN Web site ([msdn.microsoft.com/downloads/default.asp](http://msdn.microsoft.com/downloads/default.asp)), and browse to the WinHTTP Proxy Configuration Utility page, which is located in the XML chapter of the Web Development book.

## Related Topics

[Delete document definitions](#)

[Edit document definitions](#)

[Search for document definitions](#)

[Understanding Document Definitions](#)

# Search for document definitions

1. In BizTalk Messaging Manager, in the **Search for other items** area, click **Document Definitions**.
2. To search for all document definitions, clear all search criteria and click **Search Now**.

–Or–

To search for a document definition with a specific name, in the **Search for document definitions** area, in the **Document definition name** box, type the name of the document definition that you want to find and click **Search Now**. You can enter an incomplete name and the search returns all possible names that match the incomplete name entry.

## Notes

- To clear the search criteria and search results, click **Clear Search**.
- If you have a large number of objects for which to search, it might take several minutes to return all the objects. You can narrow the objects returned in a search by using selection criteria.
- The default number of items returned in a search is 500. You can adjust this number. For more information, see [Set server connection options](#).
- You can use the following wildcard characters in the search criteria:

Wildcard character	Description	Example
%	Any string of zero or more characters.	The entry '%open%' finds all names with the word 'open' anywhere in the name.
_ (underscore)	Any single character.	The entry '_ean' finds four-letter names that end with ean (Dean, Sean, and so on).
[ ]	Any single character within the specified range ([a-f]) or set ([abcdef]).	The entry '[C-P]arsen' finds names ending with arsen and beginning with any single character between C and P (Carsen, Larsen, and so on).
[^]	Any single character not within the specified range ([^a-f]) or set ([^abcdef]).	The entry 'de[^s]%' finds all names beginning with de and where the following letter is not s.

## Related Topics

[Delete document definitions](#)

[Edit document definitions](#)

[Understanding Document Definitions](#)

# Edit document definitions

1. In BizTalk Messaging Manager, in the **Document Definition Name** list, click the document definition that you want to edit.  
For more information about searching for document definitions, see [Search for document definitions](#).
2. On the **File** menu, click **Edit**.  
The **Document Definition Properties** dialog box appears.
3. On the **General** tab, edit the general properties.  
For more information, see [Set general document-definition properties](#).
4. Click the **Global Tracking** tab and edit the tracking properties.  
For more information, see [Set Global Tracking Properties](#).
5. Click the **Selection Criteria** tab and edit the selection criteria properties.  
For more information, see [Set Selection Criteria Properties](#).
6. After you have edited all the properties that you want to change, click **OK** to close the **Document Definition Properties** dialog box.

## Notes

- You cannot name a document definition Reliable Message Acknowledgement Channel or BizTalk Canonical Receipt, which are reserved system names.
- You cannot specify [global tracking fields](#) for the document definition unless you select a [specification](#).
- When you save a document definition that references a specification that is outside of your local domain, you might receive an error. If you receive an error, download and configure the WinHTTP proxy utility. To download the utility, go to the Microsoft MSDN Web site ([msdn.microsoft.com/downloads/default.asp](http://msdn.microsoft.com/downloads/default.asp)), and browse to the WinHTTP Proxy Configuration Utility page, which is located in the XML chapter of the Web Development book.

## Related Topics

[Create document definitions](#)

[Delete document definitions](#)

[Search for document definitions](#)

[Understanding Document Definitions](#)

# Delete document definitions

1. In BizTalk Messaging Manager, in the **Document Definition Name** list, click the document definition that you want to delete.

For more information about searching for document definitions, see [Search for document definitions](#).

2. On the **File** menu, click **Delete**.

## Note

- If a document definition is used in a [channel](#), you cannot delete it. You must first delete all channels that use the document definition.

## Related Topics

[Create document definitions](#)

[Edit document definitions](#)

[Search for document definitions](#)

[Understanding Document Definitions](#)

# Set Document Definition Properties

This section provides task-specific information about how to configure the properties of a document definition. The following procedures are covered in this section:

- [Set general document-definition properties](#)
- [Select a document specification](#)
- [Set Global Tracking Properties](#)
- [Set Selection Criteria Properties](#)

# Set general document-definition properties

1. In the **New Document Definition** or **Document Definition Properties** dialog box, click the **General** tab.
2. In the **Document definition name** box, type a unique name for the document definition.
3. Select the **Document specification** check box.
4. Click **Browse** to select a document specification.

For more information, see [Select a document specification](#).

## Notes

- A document [specification](#) for a document definition is optional. However, if you do not select a specification, you cannot set [global tracking fields](#), and the data processed using the document definition:
  - Is not translated from its native format into XML.
  - Is not validated against a specification.
  - Cannot be transformed into another structure or format by using a [map](#).
- If you are processing data that you do not want to translate, transform, or validate, such as a binary file, you should not select a document specification.

## Related Topics

[Create document definitions](#)

[Edit document definitions](#)

[Set Document Definition Properties](#)

[Understanding Document Definitions](#)

# Select a document specification

1. In the **New Document Definition** or **Document Definition Properties** dialog box, click the **General** tab.
2. Select the **Document specification** check box and click **Browse**.

The **Select a Document Specification from the WebDAV Repository** dialog box appears.

3. In the **Server** box, do one of the following if you want to change the server:
  - Click a server in the list.
  - Type the name of a server and press ENTER.

4. Double-click the folder that contains the [specification](#) that you want to open, and double-click the file.

## ◆ Important

- The first time that you open any [WebDAV repository](#) dialog box, the WebDAV repository on the local server is selected, even if BizTalk Messaging Manager is connected to a database on a remote server. If you browse to a WebDAV repository on a remote server, the default changes to that server until you select a new WebDAV repository. The default server for all WebDAV repository dialog boxes is the last server to which a connection was made.

## 📝 Notes

- If you select [http://localhost](#) as the server, BizTalk Messaging Manager automatically converts it to the local computer name.
- If a document definition is used as the inbound document definition in a channel for an [open messaging port](#), and the destination information is provided in the document, the document definition must reference a specification that is properly configured. For more information about how to configure a document specification to process documents for an open messaging port, see [Set dictionary properties](#).
- A document [specification](#) is optional; however, in most cases you should select one. If you do not select a specification:
  - The data that you process is not translated into XML on the inbound side or from XML on the outbound side.
  - The data is not validated against a specification to ensure that it does not contain errors.
  - You cannot transform the structure or format of the data by using a [map](#) in a channel.
  - You cannot specify [global tracking fields](#) for the document definition.
- A document specification is not required if you want to use the document definition in a [pass-through submission](#).
- You might experience some delay the first time that you connect to a WebDAV repository on a remote server.
- When you save a document definition that references a specification that is outside of your local domain, you might receive an error. If you receive an error, download and configure the WinHTTP proxy utility. To download the utility, go to the Microsoft MSDN Web site ([msdn.microsoft.com/downloads/default.asp](https://msdn.microsoft.com/downloads/default.asp)), and browse to the WinHTTP Proxy Configuration Utility page, which is located in the XML chapter of the Web Development book.

## Related Topics

[Create document definitions](#)

[Edit document definitions](#)

[Set Document Definition Properties](#)

[Understanding Document Definitions](#)

# Set Global Tracking Properties

On the **Global Tracking** tab, the **Specification fields** list provides a tree view of the [specification](#) that you selected for the [document definition](#). You can expand this list to view the fields in the specification and designate a limited number of fields to log to the [Tracking database](#).

When the document definition is selected as the inbound document definition for a [channel](#), these fields are tracked for each instance of a document that is processed by that channel. These fields are referred to as [global tracking fields](#). When you select a document definition in a channel, you have the option of overriding the global tracking fields by selecting different specification fields to track for each document instance processed by that channel only.

This section describes how to select specification fields for a document definition.

The following procedures are covered in this section:

- [Select specification fields in a document definition](#)
- [Remove specification fields in a document definition](#)

## Related Topics

[Tracking Document Data Fields](#)

[Understanding Document Definitions](#)

# Select specification fields in a document definition

1. In the **New Document Definition** or **Document Definition Properties** dialog box, click the **Global Tracking** tab.
2. In the **Specification fields** list, click the expand indicator (+) next to any record, or double-click the record, to expand the view.
3. Select a **specification** field that you want to add to the **Fields to track** list, and then complete one of the following procedures:

To add the field as	Follow this procedure
<b>Integer</b>	Click <b>Integer</b> . You can add two fields as integers.
<b>Real</b>	Click <b>Real</b> . You can add two fields as real numbers.
<b>Date</b>	Click <b>Date</b> . You can add two fields as dates.
<b>Text</b>	Click <b>Text</b> . You can add two fields as text.
<b>Custom</b>	Click <b>Custom</b> . You can add unlimited fields as a custom type. The fields are stored as an XML concatenated string with tags for each field.

## Notes

- To select a specification field to track as an integer, real, or date data type, the field must have that data type assigned in the specification. For more information about assigning a data type to a specification field, see [Set declaration properties](#).
- Specification fields without a data type assigned in the specification can be tracked only as a text or custom data type.
- If a specification field that you want to track has a character data type, you can only track that field as a custom type.
- When you select a document definition in a channel, you can override the [global tracking fields](#) for that channel by selecting different specification fields to track. For more information, see [Select specification fields in a channel](#).

## Related Topics

[Create document definitions](#)

[Edit document definitions](#)

[Remove specification fields in a document definition](#)

[Set Document Definition Properties](#)

[Set Global Tracking Properties](#)

[Tracking Document Data Fields](#)

[Understanding Document Definitions](#)

# Remove specification fields from a document definition

1. In the **New Document Definition** or **Document Definition Properties** dialog box, click the **Global Tracking** tab.
2. In the **Fields to track** list, select the [specification](#) field or fields that you want to remove and click **Remove**.

## Note

- When you remove a field from the list of fields to track, it is removed only from the list in this document definition; it is not removed from the specification.

## Related Topics

[Create document definitions](#)

[Edit document definitions](#)

[Select specification fields in a document definition](#)

[Set Document Definition Properties](#)

[Set Global Tracking Properties](#)

[Tracking Document Data Fields](#)

[Understanding Document Definitions](#)

# Set Selection Criteria Properties

Selection criteria are a unique set of name-value pairs that BizTalk Server 2000 only uses to process [EDI](#) documents. For inbound [X12](#) or [EDIFACT](#) documents, the server uses selection criteria to uniquely identify and select a [document definition](#) because no document definition name is available within individual EDI documents.

For outbound X12 or EDIFACT documents, selection criteria are used to create the group header information.

The following procedures are covered in this section:

- [Add selection criteria](#)
- [Edit selection criteria](#)
- [Remove selection criteria](#)

## Related Topics

[Understanding Document Definitions](#)

[Understanding Selection Criteria](#)

# Add selection criteria

1. In the **New Document Definition** or **Document Definition Properties** dialog box, click the **Selection Criteria** tab and click **Add**.

The **New Name and Value** dialog box appears.

2. In the **Name** box, type a name for the selection criteria.
3. In the **Value** box, type a value for the selection criteria and click **OK**.

## ◆ Important

- For BizTalk Server 2000 to match the selection criteria values to the corresponding header elements of inbound [interchanges](#), and to insert the values into the correct header elements of outbound interchanges, you must type the selection criteria names exactly as shown in the following tables.

### X12 header elements

Name	Requirement	GS element
functional_identifier	Mandatory	GS01
application_sender_code	Mandatory	GS02
application_receiver_code	Mandatory	GS03
standards_version	Mandatory	GS08

### EDIFACT header elements

Name	Requirement	UNH element	UNG element
functional_identifier	Mandatory	S009, 0065	0038
application_sender_code	Optional	Not used	S006, 0040
application_receiver_code	Optional	Not used	S007, 0044
standards_version_type	Mandatory	S009, 0052	S008, 0052
standards_version_value	Mandatory	S009, 0054	S008, 0054

- For an outbound EDIFACT interchange, a message header (UNH) is always created. If you specify an `application_sender_code` and an `application_receiver_code`, a group header (UNG) is also created.
- The set of selection criteria name-value pairs that you use for each [document definition](#) must be unique across all document definitions.

## Related Topics

[Create document definitions](#)

[Edit document definitions](#)

[Edit selection criteria](#)

[Remove selection criteria](#)

[Set Document Definition Properties](#)

[Set Selection Criteria Properties](#)

[Understanding Document Definitions](#)

[Understanding Selection Criteria](#)

# Edit selection criteria

1. In the **New Document Definition** or **Document Definition Properties** dialog box, click the **Selection Criteria** tab.
2. In the **Selection criteria** list, click the selection criterion that you want to edit and click **Edit**.  
The **Name and Value Properties** dialog box appears.
3. In the **Name** box, type a name for the selection criteria.
4. In the **Value** box, type a value for the selection criteria and click **OK**.

## ◆ Important

- For BizTalk Server 2000 to match the selection criteria values to the corresponding header elements of inbound [interchanges](#), and to insert the values into the correct header elements of outbound interchanges, you must type the selection criteria names exactly as shown in the following tables.

### X12 header elements

Name	Requirement	GS Element
functional_identifier	Mandatory	GS01
application_sender_code	Mandatory	GS02
application_receiver_code	Mandatory	GS03
standards_version	Mandatory	GS08

### EDIFACT header elements

Name	Requirement	UNH element	UNG element
functional_identifier	Mandatory	S009, 0065	0038
application_sender_code	Optional	Not used	S006, 0040
application_receiver_code	Optional	Not used	S007, 0044
standards_version_type	Mandatory	S009, 0052	S008, 0052
standards_version_value	Mandatory	S009, 0054	S008, 0054

- For an outbound EDIFACT interchange, a message header (UNH) is always created. If you specify an `application_sender_code` and an `application_receiver_code`, a group header (UNG) is also created.
- The set of selection criteria name-value pairs that you use for each [document definition](#) must be unique across all document definitions.

## Related Topics

[Add selection criteria](#)

[Remove selection criteria](#)

[Set Selection Criteria Properties](#)

[Understanding Document Definitions](#)

[Understanding Selection Criteria](#)

# Remove selection criteria

1. In the **Document Definition Properties** dialog box, click the **Selection Criteria** tab.
2. In the **Selection criteria** list, click the criterion that you want to remove and click **Remove**.

## Related Topics

[Add selection criteria](#)

[Edit selection criteria](#)

[Set Selection Criteria Properties](#)

[Understanding Document Definitions](#)

[Understanding Selection Criteria](#)

# Create and Manage Envelopes

This section provides task-specific information about how to create and manage [envelopes](#). It is highly recommended that you review [Understanding Envelopes](#) in the Concepts section to fully understand envelopes.

The following procedures are covered in this section:

- [Create envelopes](#)
- [Search for envelopes](#)
- [Edit envelopes](#)
- [Delete envelopes](#)
- [Select an envelope specification](#)

# Create envelopes

1. In BizTalk Messaging Manager, on the **File** menu, point to **New** and click **Envelope**.

The **New Envelope** dialog box appears.

2. In the **Envelope name** box, type a unique name for the envelope.

3. In the **Envelope format** list, click one of the following envelope formats:

- **CUSTOM XML**

To enable Microsoft BizTalk Server 2000 to process inbound [interchanges](#) with a custom XML format, you must create an envelope with a custom XML format and a [specification](#) reference. However, when you submit custom XML interchanges, you do not need to specify the envelope name in the submit call parameters. BizTalk Server 2000 is able to locate the appropriate envelope without a name reference.

- **X12**

You do not need to create an envelope with an [X12](#) format to enable BizTalk Server 2000 to process inbound interchanges with an X12 format, and you do not need to specify the envelope name in the submit call parameters.

- **EDIFACT**

You do not need to create an envelope with an EDIFACT format to enable BizTalk Server 2000 to process inbound interchanges with an X12 format, and you do not need to specify the envelope name in the submit call parameters.

- **FLATFILE**

To enable BizTalk Server 2000 to process inbound interchanges with a flat-file format, you must create an envelope with a flat-file format. When you submit inbound flat-file documents, you must specify the envelope name in the submit call parameters. For more information, see [Submitting](#).

- **CUSTOM**

To enable BizTalk Server 2000 to process inbound interchanges with a custom format, a format not supported directly by BizTalk Server 2000, you must create a custom [parser](#) component. You need to create an envelope only if the custom parser requires one. For more information, see [Using the IBizTalkParserComponent Interface](#).

To enable BizTalk Server 2000 to process outbound interchanges with a custom format, you must create an envelope with a custom format and select the envelope in a [messaging port](#). You also must create and register a custom [serializer](#) component. For more information, see [Using the IBizTalkSerializerComponent Interface](#). You can configure the custom serializer in the [channel](#) on the **Advanced Configuration** page of the Channel Wizard. For more information, see [Set advanced configuration properties](#).

- **RELIABLE**

You do not need to create an envelope with a reliable format to enable BizTalk Server 2000 to process inbound interchanges with a reliable format, and you do not need to specify the envelope name in the submit call parameters.

The reliable format processes envelopes that are compliant with [BizTalk Framework 2.0](#). For more information about BizTalk Framework 2.0, go to the Microsoft BizTalk Web site ([www.microsoft.com/biztalk/](http://www.microsoft.com/biztalk/)).

If you choose the reliable format, you also must configure the **Reliable messaging reply-to URL** address in the **BizTalk Server Group Properties** dialog box. For more information, see [Configure general properties for a server group](#).

4. If you choose the custom XML, flat-file, or custom format, you can select a specification for the envelope. For more information, see [Select an envelope specification](#).

## Notes

- To enable BizTalk Server 2000 to process outbound interchanges in any format, you must create an envelope.
- If you choose the custom XML format and you do not select a specification, the envelope format defaults to the reliable format.

- When processing envelopes that are compliant with BizTalk Framework 2.0, BizTalk Server 2000 should be considered the endpoint with regard to the expiration time. When BizTalk Framework 2.0–compliant documents are submitted to BizTalk Server 2000, either from an application or a trading partner, the following fields are overwritten if present, or created if absent:
  - In the properties subsection:
    - <prop:identity>
    - <prop:sentAt>
    - <expiresAt>
  - In the receipt information subsection:
    - <sendTo>
    - <address>
    - <sendReceiptBy>
- If you change the envelope format and you have selected a specification, you also might need to select a different specification.
- When you save an envelope that references a specification that is outside of your local domain, you might receive an error. If you receive an error, download and configure the WinHTTP proxy utility. To download the utility, go to the Microsoft MSDN Web site ([msdn.microsoft.com/downloads/default.asp](http://msdn.microsoft.com/downloads/default.asp)), and browse to the WinHTTP Proxy Configuration Utility page, which is located in the XML chapter of the Web Development book.

## Related Topics

[Delete envelopes](#)

[Edit envelopes](#)

[Search for envelopes](#)

[Understanding Envelopes](#)

# Search for envelopes

1. In BizTalk Messaging Manager, in the **Search for other items** area, click **Envelopes**.
2. Do one or more of the following:
  - To search for all envelopes, clear all search criteria and click **Search Now**.
  - To search for an envelope with a specific name, in the **Search for envelopes** area, in the **Envelope name** box, type the name of the envelope that you want to find and click **Search Now**. You can enter an incomplete name and the search returns all possible names that match the incomplete name entry.
  - To search for envelopes of a specific format, in the **Format** list, click a format and click **Search Now**.

## Notes

- You can set more than one search criteria before clicking **Search Now**.
- To clear the search criteria and search results, click **Clear Search**.
- If you have a large number of objects for which to search, it might take several minutes to return all the objects. You can narrow the objects returned in a search by using selection criteria.
- The default number of items returned in a search is 500. You can adjust this number. For more information, see [Set server connection options](#).
- You can use the following wildcard characters in the search criteria:

Wildcard character	Description	Example
%	Any string of zero or more characters.	The entry '%open%' finds all names with the word 'open' anywhere in the name.
_ (underscore)	Any single character.	The entry '_ean' finds four-letter names that end with ean (Dean, Sean, and so on).
[ ]	Any single character within the specified range ([a-f]) or set ([abcdef]).	The entry '[C-P]arsen' finds names ending with arsen and beginning with any single character between C and P (Carsen, Larsen, and so on).
[^]	Any single character not within the specified range ([^a-f]) or set ([^abcdef]).	The entry 'de[^s]%' finds all names beginning with de and where the following letter is not s.

## Related Topics

[Delete envelopes](#)

[Edit envelopes](#)

[Understanding Envelopes](#)

# Edit envelopes

1. In BizTalk Messaging Manager, in the **Envelope Name** list, click the envelope that you want to edit.

For information about searching for envelopes, see [Search for envelopes](#).

2. On the **File** menu, click **Edit**.

The **Envelope Properties** dialog box appears.

3. In the **Envelope name** box, type a unique name for the envelope.

4. In the **Envelope format** list, click one of the following envelope formats:

- **CUSTOM XML**

To enable BizTalk Server 2000 to process inbound [interchanges](#) with a custom XML format, you must create an [envelope](#) with a custom XML format and a [specification](#) reference. However, when you submit custom XML interchanges, you do not need to specify the envelope name in the submit call parameters. BizTalk Server 2000 is able to locate the appropriate envelope without a name reference.

- **X12**

You do not need to create an envelope with an [X12](#) format to enable BizTalk Server 2000 to process inbound interchanges with an X12 format, and you do not need to specify the envelope name in the submit call parameters.

- **EDIFACT**

You do not need to create an envelope with an EDIFACT format to enable BizTalk Server 2000 to process inbound interchanges with an X12 format, and you do not need to specify the envelope name in the submit call parameters.

- **FLATFILE**

To enable BizTalk Server 2000 to process inbound interchanges with a flat-file format, you must create an envelope with a flat-file format. When you submit inbound flat-file documents, you must specify the envelope name in the submit call parameters. For more information, see [Submitting](#).

- **CUSTOM**

To enable BizTalk Server 2000 to process inbound interchanges with a custom format, a format not supported directly by BizTalk Server 2000, you might need to create an envelope. However, you must create a custom [parser](#) component to process these interchanges, which might require an envelope. For more information, see [Using the IBizTalkParserComponent Interface](#).

To enable BizTalk Server 2000 to process outbound interchanges with a custom format, you must create an envelope with a custom format and select the envelope in a [messaging port](#). You also must create and register a custom [serializer](#) component. For more information, see [Using the IBizTalkSerializerComponent Interface](#). You can configure the custom serializer in the [channel](#) on the **Advanced Configuration** page of the Channel Wizard. For more information, see [Set advanced configuration properties](#).

- **RELIABLE**

You do not need to create an envelope with a reliable format to enable BizTalk Server 2000 to process inbound interchanges with a reliable format, and you do not need to specify the envelope name in the submit call parameters.

The reliable format processes envelopes that are compliant with [BizTalk Framework 2.0](#). For more information about BizTalk Framework 2.0, go to the Microsoft BizTalk Web site ([www.microsoft.com/biztalk/](http://www.microsoft.com/biztalk/)).

If you choose the reliable format, you also must configure the **Reliable messaging reply-to URL** address in the **BizTalk Server Group Properties** dialog box. For more information, see [Configure general properties for a server group](#).

5. If you choose the custom XML, flat-file, or custom format, you can select a specification for the envelope. For more information, see [Select an envelope specification](#).

## ◆ Important

- If you create an envelope with the reliable format and select that envelope in a messaging port, you also must configure the

**Reliable messaging reply-to URL** address in the **BizTalk Server Group Properties** dialog box. For more information, see [Configure general properties for a server group](#).

## Notes

- To enable BizTalk Server 2000 to process outbound interchanges in any format, you must create an envelope.
- If you choose the custom XML format and you do not select a specification, the envelope format defaults to the reliable format.
- When processing envelopes that are compliant with BizTalk Framework 2.0, BizTalk Server 2000 should be considered the endpoint with regard to the expiration time. When BizTalk Framework 2.0–compliant documents are submitted to BizTalk Server 2000, either from an application or a trading partner, the following fields are overwritten if present, or created if absent:
  - In the properties subsection:
    - <prop:identity>
    - <prop:sentAt>
    - <expiresAt>
  - In the receipt information subsection:
    - <sendTo>
    - <address>
    - <sendReceiptBy>
- If you change the envelope format and you have selected a specification, you also might need to select a different specification.
- When you save an envelope that references a specification that is outside of your local domain, you might receive an error. If you receive an error, download and configure the WinHTTP proxy utility. To download the utility, go to the Microsoft MSDN Web site ([msdn.microsoft.com/downloads/default.asp](http://msdn.microsoft.com/downloads/default.asp)), and browse to the WinHTTP Proxy Configuration Utility page, which is located in the XML chapter of the Web Development book.

## Related Topics

[Create envelopes](#)

[Delete envelopes](#)

[Search for envelopes](#)

[Understanding Envelopes](#)

# Delete envelopes

1. In BizTalk Messaging Manager, in the **Envelope Name** list, click the envelope that you want to delete.

For more information about searching for envelopes, see [Search for envelopes](#).

2. On the **File** menu, click **Delete**.

## Note

- If an envelope is used in a [messaging port](#), you cannot delete it. You must first delete all messaging ports that use the envelope.

## Related Topics

[Create envelopes](#)

[Edit envelopes](#)

[Search for envelopes](#)

[Understanding Envelopes](#)

# Select an envelope specification

1. In the **New Envelope** or **Envelope Properties** dialog box, select the **Envelope specification** check box and click **Browse**.

The **Select an Envelope Specification from the WebDAV Repository** dialog box appears.

2. In the **Server** box, do one of the following if you want to change the server:
  - Click a server in the list.
  - Type the name of a server and press ENTER.
3. Double-click the folder that contains the [specification](#) that you want to open, click the specification, and then click **Open**.

## ◆ Important

- The first time that you open any [WebDAV repository](#) dialog box, the WebDAV repository on the local server is selected, even if your BizTalk Messaging Manager is connected to a database on a remote server. If you browse to a WebDAV repository on a remote server, the default changes to that server until you select a new WebDAV repository. The default server for all WebDAV repository dialog boxes is the last server to which a connection was made.

## 📌 Notes

- If you select <http://localhost> as the server, BizTalk Messaging Manager automatically converts it to the local computer name.
- If you choose the custom XML format, you can select a specification for the [envelope](#). If you do not select a specification, the envelope format defaults to the reliable format that complies with [BizTalk Framework 2.0](#). For more information about BizTalk Framework 2.0, go to the Microsoft BizTalk Web site ([www.microsoft.com/biztalk/](http://www.microsoft.com/biztalk/)).
- If you choose the flat-file format, you can select a specification for the envelope. You must select a specification if the envelope is used for opening inbound interchanges. A specification is not required if the envelope is used for creating outbound interchanges.
- If you choose a custom format, you can select a specification for the envelope. The custom [parser](#) or [serializer](#) that you create determines the need for a specification.

To use the custom format, you also must:

- Create a custom parser component for opening inbound interchanges with this custom format. For more information, see [Using the IBizTalkParserComponent Interface](#).
- Create and configure a custom serializer component for creating outbound interchanges with this custom format. For more information, see [Using the IBizTalkSerializerComponent Interface](#).
- Configure the custom serializer component using the messaging port override properties in the Channel Wizard. For more information, see [Override messaging port defaults](#).
- When you save an envelope that references a specification that is outside of your local domain, you might receive an error. If you receive an error, download and configure the WinHTTP proxy utility. To download the utility, go to the Microsoft MSDN Web site ([msdn.microsoft.com/downloads/default.asp](http://msdn.microsoft.com/downloads/default.asp)), and browse to the WinHTTP Proxy Configuration Utility page, which is located in the XML chapter of the Web Development book.

## Related Topics

[Create envelopes](#)

[Edit envelopes](#)

[Search for envelopes](#)

[Understanding Envelopes](#)

# Use Distribution Lists

This section provides task-specific information about how to use [distribution lists](#). It is highly recommended that you review [Understanding Distribution Lists](#) in the Concepts section to fully understand distribution lists.

The following procedures are covered in this section:

- [Create distribution lists](#)
- [Search for distribution lists](#)
- [Edit distribution lists](#)
- [Delete distribution lists](#)

# Create distribution lists

1. In BizTalk Messaging Manager, on the **File** menu, point to **New** and click **Distribution List**.

The **New Distribution List** dialog box appears.

2. In the **Distribution list name** box, type a unique name for the distribution list.

3. In the **Available messaging ports** list, select the messaging ports that you want to include and click **Add**.

The selected messaging ports are added to the **Selected messaging ports** list.

4. In the **Selected messaging ports** list, select any messaging ports that you do not want to include and click **Remove**.

5. After you have set all the necessary properties, click **OK** to close the **New Distribution List** dialog box.

## Notes

- When you remove a [messaging port](#) from a distribution list, it is removed only from the distribution list; it is not removed from the database.
- A distribution list must contain at least one messaging port.
- [Open messaging ports](#) cannot be added to a distribution list.
- To be functional, a distribution list requires at least one [channel](#). For more information about channels, see [Create and Manage Channels](#).

## Related Topics

[Delete distribution lists](#)

[Edit distribution lists](#)

[Search for distribution lists](#)

[Understanding Distribution Lists](#)

# Search for distribution lists

1. In BizTalk Messaging Manager, in the **Search for other items** area, click **Distribution lists**.
2. Do one or more of the following:
  - To search for all distribution lists, clear all search criteria and click **Search Now**.
  - To search for a distribution list with a specific name, in the **Search for distribution lists** area, in the **Distribution list name** box, type the name of the distribution list that you want to find and click **Search Now**. You can enter an incomplete name and the search returns all possible names that match the incomplete name entry.
  - To search for distribution lists that contain a specific messaging port, in the **Containing messaging port** list, type the name of the messaging port and click **Search Now**.

## Notes

- To clear the search criteria and search results, click **Clear Search**.
- If you have a large number of objects for which to search, it might take several minutes to return all the objects. You can narrow the objects returned in a search by using selection criteria.
- The default number of items returned in a search is 500. You can adjust this number. For more information, see [Set server connection options](#).
- You can use the following wildcard characters in the search criteria:

Wildcard character	Description	Example
%	Any string of zero or more characters.	The entry '%open%' finds all names with the word 'open' anywhere in the name.
_ (underscore)	Any single character.	The entry '_ean' finds four-letter names that end with ean (Dean, Sean, and so on).
[ ]	Any single character within the specified range ([a-f]) or set ([abcdef]).	The entry '[C-P]arsen' finds names ending with arsen and beginning with any single character between C and P (Carsen, Larsen, and so on).
[^]	Any single character not within the specified range ([^a-f]) or set ([^abcdef]).	The entry 'de[^s]%' finds all names beginning with de and where the following letter is not s.

## Related Topics

[Create distribution lists](#)

[Delete distribution lists](#)

[Edit distribution lists](#)

[Understanding Distribution Lists](#)

# Edit distribution lists

1. In BizTalk Messaging Manager, in the **Distribution List Name** list, click the distribution list that you want to edit.  
For information about searching for distribution lists, see [Search for distribution lists](#).
2. On the **File** menu, click **Edit**.  
The **Distribution List Properties** dialog box appears.
3. In the **Distribution list name** box, type a unique name for the distribution list.
4. In the **Available messaging ports** list, select the messaging ports that you want to include and, to add them to the **Selected messaging ports** list, click **Add**.
5. In the **Selected messaging ports** list, select any messaging ports that you do not want to include and click **Remove**.
6. After you have set all the necessary properties, click **OK** to close the **Distribution List Properties** dialog box.

## Notes

- When you remove a [messaging port](#) from a distribution list, it is removed only from the distribution list; it is not removed from the database.
- A distribution list must contain at least one messaging port.
- [Open messaging ports](#) cannot be added to a distribution list.

## Related Topics

[Create distribution lists](#)

[Delete distribution lists](#)

[Search for distribution lists](#)

[Understanding Distribution Lists](#)

# Delete distribution lists

1. In BizTalk Messaging Manager, in the **Distribution List Name** list, click the distribution list that you want to delete.

For more information about searching for distribution lists, see [Search for distribution lists](#).

2. On the **File** menu, click **Delete**.

## Notes

- You cannot delete a distribution list until all [channels](#) that are associated with the distribution list have been deleted.
- You can search for channels associated with a distribution list by right-clicking the distribution list and clicking **Find Channels**.

## Related Topics

[Create distribution lists](#)

[Search for distribution lists](#)

[Understanding Distribution Lists](#)

# Concepts

This section provides detailed conceptual information that is essential to understanding BizTalk Messaging Manager. It provides information about the following topics:

- [BizTalk Messaging Manager Environment](#)
- [Understanding Channels](#)
- [Understanding Messaging Ports](#)
- [Understanding Organizations](#)
- [Understanding Document Definitions](#)
- [Understanding Envelopes](#)
- [Understanding Receipts](#)
- [Understanding Distribution Lists](#)

# BizTalk Messaging Manager Environment

The following topics are covered in this section:

- [Configuring BizTalk Messaging Manager Options](#)
- [BizTalk Messaging Manager User Interface](#)
- [BizTalk Messaging Manager Shortcut Keys](#)
- [Security](#)

## Caution

- You should use BizTalk Messaging Manager to configure [BizTalk Messaging Services](#) prior to processing documents. Accessing and modifying objects that might be in use while Microsoft BizTalk Server 2000 is processing documents can produce unexpected results.

# Configuring BizTalk Messaging Manager Options

This section explains how to modify BizTalk Messaging Manager options. These options include:

- Configuring new [messaging ports](#) or [channels](#).
- Managing previously configured messaging ports or channels.
- Setting the search return value.
- Setting the server connection.
- Setting the server time-out value.

The following procedures are covered in this section:

- [Select a BizTalk Messaging Manager configuration option](#)
- [Set server connection options](#)

## **Note**

- The toolbars in BizTalk Messaging Manager can be repositioned; however, when the application is restarted, the toolbars return to their original positions.

# Select a BizTalk Messaging Manager configuration option

1. On the **Start** menu, point to **Programs**, point to **Microsoft BizTalk Server 2000**, and then click **BizTalk Messaging Manager**.

The **BizTalk Messaging Manager** dialog box appears.

2. In the **Configuration options** area, select one of the following options:
  - If you want to create and configure a new [messaging port](#) to an [organization](#), click **Configure a new messaging port to an organization** and click **OK**.

For more information about creating and configuring a new messaging port to an organization, see [Create messaging ports](#).

- If you want to create and configure a new messaging port to an application, click **Configure a new messaging port to an application** and click **OK**.

For more information about creating and configuring a new messaging port to an application, see [Create messaging ports](#).

- If you want to manage existing messaging ports, click **Manage previously configured messaging ports** and click **OK**.

For more information about managing existing messaging ports, see [Edit messaging ports](#).

- If you want to manage existing [channels](#), click **Manage previously configured channels** and click **OK**.

For more information about creating and configuring existing channels, see [Edit channels](#).

## Note

- If you do not want this dialog box to appear when you open BizTalk Messaging Manager, select the **Don't show this dialog box again** check box. To reset the dialog box to appear, on the **Tools** menu click **Options** and select the **Show startup dialog box** check box.

## Related Topics

[Create messaging ports](#)

[Edit channels](#)

[Edit messaging ports](#)

# Set server connection options

1. In BizTalk Messaging Manager, on the **Tools** menu, click **Options**.

The **Options** dialog box appears.

2. In the **Maximum number of items to return in a search** box, complete one of the following steps:

- Type a value for the number of items to be returned in a search.
- Click the up or down arrow to increase or decrease the value.

3. In the **Name of BizTalk Server to connect to** box, type the name of a server on which BizTalk Server 2000 is installed.

4. In the **Server timeout in seconds** box, complete one of the following steps:

- Type a value for the number of seconds before the server connection times out.
- Click the up or down arrow to increase or decrease the value.

5. To have an opening dialog box appear or not appear when BizTalk Messaging Manager starts, select or clear the **Show startup dialog box** check box.

6. After you have set all properties, click **OK**.

## Notes

- The server to which you connect determines the [BizTalk Messaging Management database](#) for which you search, edit, or create new objects by using BizTalk Messaging Manager. The server connection defaults to the last connection that was made. The server that hosts the [WebDAV repository](#) that you use to store and retrieve [specifications](#) for documents, [maps](#), and [envelopes](#) is set independently from within the dialog boxes that you use to select specifications. The WebDAV connection defaults to the last connection that was made.
- The default number of items returned in a search is 500.
- The default number of seconds before the server connection times out is 20.
- The server to which you are currently connected is displayed at the top of the Search pane located on the left side of BizTalk Messaging Manager.

# BizTalk Messaging Manager User Interface

The [BizTalk Messaging Manager](#) user interface has two main panes.

The left pane displays:

- The name of the server to which BizTalk Messaging Manager is connected.
- A list of objects for which you can search.
- Search criteria that you can use to narrow your search.

You can search for any objects that you create by using BizTalk Messaging Manager. You can choose the type of object for which you want to search by clicking the name in the **Search for other items** area. The search criteria differ according to the object that you select.

The right pane displays:

- The details of the items returned in your most recent search.

The details of the items differ according to the type of object for which you search.

You can sort the items in the search results pane in ascending or descending order by clicking the column headers. You can sort based on only one column at a time.

## Notes

- If you have a large number of a particular type of object for which to search, it might take several minutes to return all the items. You can reduce the number of items returned in a search by using search criteria.
- The default number of items returned in a search is 500. You can adjust this number. For more information, see [Set server connection options](#).

## Related Topics

[BizTalk Messaging Manager Shortcut Keys](#)

[Search for channels](#)

[Search for distribution lists](#)

[Search for document definitions](#)

[Search for envelopes](#)

[Search for messaging ports](#)

[Search for organizations](#)

# BizTalk Messaging Manager Shortcut Keys

You can use shortcut keys to accomplish tasks in BizTalk Messaging Manager. The following table is a quick reference to these shortcut keys.

## Note

- Functionality that is not included in this list can be obtained by using the numeric keypad to move the mouse pointer with MouseKeys. For more information about MouseKeys in Windows 2000 Server and Advanced Server Help, see "Using the keyboard to move the mouse pointer". For more information about MouseKeys in Windows 2000 Professional Help, see "Move the mouse pointer by using MouseKeys".

Press	To
CTRL+A	Select all.
CTRL+C	Copy text.
CTRL+X	Cut text.
CTRL+V	Paste text.
CTRL+Z	Undo text action.
CTRL+R	Create a new messaging port to an organization.
CTRL+SHIFT+R	Create a new messaging port to an application.
CTRL+L	Create a new channel from an organization.
CTRL+SHIFT+L	Create a new channel from an application.
CTRL+T	Create a new distribution list.
CTRL+D	Create a new document definition.
CTRL+G	Create a new organization.
DELETE	Delete the selected item or text.
SHIFT+F10	Display the shortcut menu for the selected item.
SHIFT with any arrow key	Select more than one item in a window or select text.
TAB	In a dialog box, pressing TAB moves the focus through the buttons and fields of the dialog box.
SHIFT+TAB	In a dialog box, pressing TAB moves the focus through the buttons and fields of the dialog box.
CTRL+TAB	Toggle tabs of a dialog box in front-to-back order.
CTRL+SHIFT+TAB	Toggle tabs of a dialog box in back-to-front order.
SPACEBAR	Select or clear a check box. The spacebar also acts like a mouse click when the focus is on a button.
ALT+SPACEBAR	Display the system menu for the active window.
ALT+Underlined letter in a menu name	Display the corresponding menu.
Underlined letter in a command name on an open menu	Carry out the corresponding command.
ALT+ DOWN ARROW	Display the drop-down list for an activated list box.
ENTER	Carry out the command for the active option or button.
ESC	Cancel the current task.
F1	Display online Help.
ALT+F4	Close the active window, or quit the active program.
LEFT ARROW	Move the focus to the tab to the left.
RIGHT ARROW	Move the focus to the tab to the right.

Any arrow key	Highlight a folder or a file in the main window of a dialog box, while the focus is in that window. This functionality occurs in the <b>Select a Document Specification from the WebDAV Repository</b> , the <b>Select an Envelope Specification from the WebDAV Repository</b> , and the <b>Select a Map from the WebDAV Repository</b> dialog boxes. For more information, see <a href="#">Select a document specification</a> , <a href="#">Select an envelope specification</a> , and <a href="#">Select a map</a> .
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## Related Topic

[BizTalk Messaging Manager User Interface](#)

# Security

To access or create objects by using BizTalk Messaging Manager, you must have a user account in the BizTalk Server Administrators group. The BizTalk Server Administrators group is created when BizTalk Server 2000 is installed. Additional users can be added to this group as necessary. For more information about adding a user account, see [Add users to the BizTalk Server Administrators group](#).

# Understanding Channels

A channel is a set of properties that you can use to configure [BizTalk Messaging Services](#) to process a document that it receives. Channels can be created for a [messaging port](#) or a [distribution list](#). Once a channel has processed a document, the document is transported to the destination specified in the associated messaging port or the messaging ports in the associated distribution list. You can create one or more channels for a messaging port or distribution list.

In a channel, you specify the source of the documents, which can be a [source organization](#) or a [source application](#). Before you can designate an application as the source for a channel, you must create an application for the [home organization](#), which represents an actual internal application in your business. You can also designate an [XLANG schedule](#) as the source for a channel. You can create an XLANG schedule by using [BizTalk Orchestration Designer](#). For more information, see [Designing BizTalk Orchestrations](#). For more information about integrating BizTalk Messaging Services with [BizTalk Orchestration Services](#), see [Integrating BizTalk Services](#).

You can also explicitly declare an open source for a channel, which means that the source must be specified either within the document or in a parameter when the document is submitted. This is referred to as an [open channel](#). For more information, see [Submitting](#).

You also specify an inbound [document definition](#), which represents an incoming document from an internal application or a [trading partner](#) organization. And you specify an outbound document definition, which represents a document to be delivered to the specified destination. For more information about document definitions, see [Understanding Document Definitions](#).

If the format or structure of an outbound document is different from the format or structure of the inbound document, you must specify a [map](#) for the channel. A map transforms the format or structure of the original inbound document into the outbound document format or structure that is required by the destination organization or application. For example, if your accounting application generates purchase orders in a delimited flat-file format but your trading partner requires that purchase orders be in an X12 format, you can use a map to transform the document format. For more information about maps, see [Mapping Data](#).

You can create more than one channel for a messaging port or distribution list, each with a different configuration. For example, suppose that you have two internal accounting applications that generate purchase orders in different formats and that you have a trading partner that wants to receive purchase orders from you in still another format. You can create a single messaging port to the trading partner. Then, for that messaging port, you can create a channel from each of the applications. The outbound document definition for both channels would be the same and match the format of your trading partner. However, each channel would have a different map to transform the inbound document formats from the applications. Because you can create different channels connected to a single messaging port, you can send all your purchase orders in the same format.

In addition, you can set other properties within a channel to:

- Designate [specification](#) fields to track for the inbound document definition. Any fields that you designate are logged to a [Tracking database](#) for each [document instance](#) processed using this specific channel, in place of any [global tracking fields](#) designated in the document definition. For more information about global tracking fields, see [Tracking Document Data Fields](#).
- Create a [channel filtering](#) expression, which determines if BizTalk Server 2000 invokes the channel, based on the value of a field or fields within the document being processed.
- Configure receipts. You can request a receipt from the destination for a document that you send, and you can generate a receipt to the source for a document that you receive. For more information about processing receipts, see [Understanding Receipts](#).
- Configure security properties. You can specify that the server verify the encryption and signature for an inbound document, or digitally sign the outbound document.
- Specify document logging options. You can store both the inbound and the outbound documents in their native format, in their intermediate XML format, or both.
- Configure advanced properties. You can specify a group control number for documents with [EDI](#) formats, set the number and time interval that the server uses to resend documents, and override the transport component and envelope properties for the messaging port or distribution list.

You can also create [receipt channels](#) by using BizTalk Messaging Manager. A receipt channel is a special type of channel that you use to return a receipt to the sender of a document that is received by [BizTalk Messaging Services](#). When you create a channel to process an inbound document that requires a receipt, you can specify the receipt channel that the server should use to process

the receipt. Because of this, you should create a messaging port and an associated receipt channel before you create a messaging port and channel to process a document that requires a receipt. For more information about processing receipts, see [Understanding Receipts](#).

When BizTalk Server 2000 receives a document, it locates the appropriate channel, which directs the server in how to process the document. The server then locates the messaging port or distribution list associated with the channel. The messaging port directs the server through the sequence of steps necessary to transport the document to the specified destination. If the channel is associated with a distribution list, the server uses the properties of each of the messaging ports in the distribution list to transport the document to the specified destinations.

The following topics are covered in this section:

- [Channel Elements](#)
- [Valid Channel and Messaging Port Combinations](#)

# Channel Elements

Channels consist of the following elements:

## Source organization or application

When you create a [channel](#), you designate either an application or an [organization](#) as the source for documents. A [source application](#) always represents a business application of your [home organization](#). This could be an accounting application, an order-entry system, or a line-of-business application. You can also designate an [XLANG schedule](#) as the source for documents. You can create an XLANG schedule by using [BizTalk Orchestration Designer](#). A [source organization](#) always represents an external [trading partner](#).

A channel is always created for a [messaging port](#) or a [distribution list](#). The destination for the documents that you receive from the source of a channel is designated in the messaging port, or in the messaging ports of the distribution list, for which the channel is created.

## Inbound and outbound document definitions

[Document definitions](#) in a channel represent the inbound and outbound documents that are processed by BizTalk Server 2000. A document definition provides a pointer to a [specification](#) that defines the document. The specification defines such characteristics as the document structure, type, and version. For more information, see [Understanding Document Definitions](#).

When BizTalk Server 2000 receives a document, it locates the appropriate channel to process it. The server uses the specification of the inbound document definition to translate the incoming document into an intermediate [XML](#) format. The server maps the inbound document format and structure to the outbound format and structure, if necessary. Then, the server uses the specification of the outbound document to translate the outbound document into the format and structure that the destination application or organization can recognize and use.

## Map

The format or structure of an inbound document might be different from the format or structure that is required for the outbound document. If this is the case, a [map](#) can be used to transform the format of the inbound document into the format of the outbound document.

For example, if you have an accounting application that generates invoices in a comma-delimited, flat-file format, but your trading partner needs to receive invoices in an X12 format, you can use a map on the channel to transform the format.

A map can also transform the content and structure of a document that uses the same format. For more information, see [Mapping Data](#).

## Tracking and filtering properties

You can designate specification fields to be logged to a [Tracking database](#) for the inbound document definition of a channel. The specification fields that you designate in a channel are logged to a tracking database for each instance of a document processed using this channel. These fields are logged in place of any [global tracking fields](#) that are designated in the inbound document definition. Any global tracking fields designated for the outbound document definition are ignored. For more information, see [Tracking Document Data Fields](#).

A [channel filtering](#) expression provides an additional way to determine which channels are invoked when BizTalk Server 2000 receives a document. In the case of a channel filtering expression, this determination is based upon the value of a specified field or fields within the [document instance](#).

When the server processes a document, the value of each of the specified fields is evaluated against the value of the channel filtering expression. If the expression is found to be true, the channel is invoked. If the expression is found to be false, the channel is not invoked. For example, if the channel filtering expression is created to check for a purchase order total greater than 1000, and the PO Total field in the document is 1500, the channel is invoked.

## Document logging properties

BizTalk Server 2000 translates non-XML inbound documents from their original, native format into an intermediate Unicode XML format for processing. BizTalk Server 2000 translates outbound documents from an intermediate Unicode XML format into the required format for the specified destination. You can choose to store the data of each inbound and outbound document in either format or in both.

## Related Topics

Create and Manage Channels

Understanding Channels

Valid Channel and Messaging Port Combinations

# Valid Channel and Messaging Port Combinations

You can create only certain [channel](#) (source) and [messaging port](#) (destination) combinations that are valid for use with Microsoft BizTalk Server 2000.

The following valid business scenarios indicate how to configure messaging ports with the correct destination and channels with the correct source designations to correctly route data.

## Scenario 1: Trading partner to an internal application

In this scenario, you create a messaging port with an application of the [home organization](#) as its destination. You then create a channel for this messaging port with the [trading partner](#) organization as its source.

## Scenario 2: Internal application to trading partner

In this scenario, you create a messaging port with a trading partner organization as its destination. You then create a channel for this messaging port with an application of the home organization as its source.

## Scenario 3: Internal application to internal application

In this scenario, you create a messaging port with an application of the home organization as its destination. You then create a channel for this messaging port with a different application of the home organization as its source.

## Scenario 4: Internal application to distribution list

In this scenario, you create a [distribution list](#), which includes a group of existing messaging ports to organizations or applications. You then create a channel for this distribution list with an application of the home organization as its source.

## Scenario 5: Internal application to open destination

In this scenario, you create a messaging port that you specify as an [open messaging port](#). You then create a channel for this messaging port with an application of the home organization as its source.

## Scenario 6: Open source to internal application

In this scenario, you create a messaging port with an application of the home organization as its destination. You then create a channel for this messaging port that you specify as an [open channel](#).

### Note

- A channel that is specified as an open channel cannot be created for a messaging port that is specified as an open messaging port.

## Scenario 7: Trading partner through intermediary to trading partner

In this scenario, one trading partner sends documents to another through your BizTalk Server 2000, with your business serving as an intermediary. You create a messaging port with one trading partner organization as its destination. You then create a channel for this messaging port with a different trading partner as its source.

## Related Topics

[Channel Elements](#)

[Understanding Channels](#)

# Understanding Messaging Ports

A messaging port is a set of properties that you can use to configure [BizTalk Messaging Services](#) to transport documents to a specified destination by using a specified [transport service](#). The documents that a messaging port transports originate from the source that you specify in an associated [channel](#). You can create multiple channels for a single messaging port to send documents from many sources to the same destination.

A messaging port can be configured to send documents to a designated [destination organization](#), an [XLANG schedule](#), or a [destination application](#).

For a messaging port to an organization, you can either designate a specific [trading partner](#) as the destination or declare an open destination, which is referred to as an [open messaging port](#). An open messaging port can be used to transport documents only to trading partner organizations. The destination organization information for an open messaging port must be specified either within the document or in a parameter when the document is submitted to BizTalk Server 2000. For more information about submitting documents, see [Submitting](#). For more information about open messaging ports, see [Openness](#).

When the address specified for an open messaging port is an SMTP address, the server must have a From address for the [home organization](#). To obtain this address, the server uses the value that is specified for a special [organization identifier](#) of the home organization, named Reliable Messaging Acknowledgement SMTP From Address. For more information about how to configure this organization identifier, see [Configure the home organization](#).

For a messaging port to an application, you can designate either an XLANG schedule or an application of the home organization as the destination. For more information about the home organization, see [Understanding Organizations](#).

A messaging port to an XLANG schedule can be configured to activate a new instance of a specified XLANG schedule, and then deliver the document to a specified messaging port of that schedule. In this case, the specified schedule must contain a messaging port that is bound to BizTalk Messaging. When you specify the schedule, you also name the messaging port. You can also configure a messaging port to deliver a document to a running instance of an XLANG schedule. In this case, the document must contain a queue name to which the document should be delivered and that the targeted schedule is monitoring. For more information about integrating [BizTalk Messaging Services](#) with [BizTalk Orchestration Services](#), see [Integrating BizTalk Services](#).

You also use the messaging port properties to designate a specific address to which documents are delivered, the transport type for getting documents to that location, and how the documents are enveloped and secured prior to transport.

When BizTalk Server 2000 receives a document, it locates the appropriate channel to process it. After the channel processes the document, it points the server to its associated messaging port or distribution list, which directs the server through the sequence of steps necessary to envelope, secure, and transport the document to the specified destination.

The following topics are covered in this section:

- [Messaging Port Elements](#)
- [Open Messaging Ports](#)

# Messaging Port Elements

[Messaging ports](#) consist of the following elements:

## Destination

The destination for a messaging port can be a [trading partner](#) organization, an [XLANG schedule](#), or an application of the [home organization](#).

A messaging port to an organization can explicitly designate the [destination organization](#), or a messaging port can be declared as an [open messaging port](#). For open messaging ports, the destination organization is determined at the time the messaging port processes a document. The destination organization information must be specified either in the document or in parameters when the document is submitted. For more information, see [Submitting](#).

A messaging port to an [XLANG schedule](#) can be configured in two ways. You can configure a messaging port to activate a new instance of an XLANG schedule by specifying the path to an XLANG schedule. When the messaging port processes a document, it activates this schedule and then delivers the document to a messaging port in that schedule that you also specify in the messaging port properties. Or you can configure the messaging port to deliver documents to an active XLANG schedule. You use this option only when you send a trading partner a [message](#) and the trading partner returns a message to a specially configured ASP page using an HTTP transport. For more information, see [Integrating BizTalk Services](#). You can create an XLANG schedule by using [BizTalk Orchestration Designer](#). For more information, see [Designing BizTalk Orchestrations](#).

A messaging port can also transport documents to a [destination application](#) of the home organization. Before you can designate an application as the destination for a messaging port, you must add the application to the home organization. For more information, see [Add applications](#).

## Transport properties

The transport properties that you specify for a messaging port determine the [transport service](#) used to convey documents to the [destination organization](#) or [destination application](#), and the specific address to which the documents are sent.

The transport properties that you set for a messaging port apply to all channels associated with that messaging port. After BizTalk Server 2000 invokes a channel to process documents, the server then refers to the properties of the messaging port that is associated with the channel. The server sends the documents to the address specified in the messaging port, using the transport type specified in the messaging port.

You can also specify a service window, which designates a specific time range within which documents can be transported.

## Envelope information

[Envelopes](#) are headers and sometimes footers that are used to prefix or encapsulate documents that are transported. The header of an envelope contains information about the document or documents that it contains and how to route them. An envelope header contains the source organization identifier, destination [organization identifier](#), and information about the type of document or documents that it contains.

BizTalk Server 2000 is capable of receiving and processing [interchanges](#) that contain multiple documents and groups of documents. When transporting documents that use an envelope, BizTalk Server 2000 includes each document in a separate interchange.

Envelopes are optional; however, if you choose to use an envelope, the format of an envelope that you specify in a messaging port must agree with the format of the document or documents that it contains. The document format is determined by the [specification](#) referred to in the outbound [document definition](#) of an associated channel. For example, if you choose an envelope with an X12 format for a messaging port, you must select an outbound document definition for the channel that points to an X12 specification. Conversely, if you select an outbound document definition in a channel, the messaging port that the channel is associated with must have an envelope with a matching format. For example, if you select an outbound document definition that has a specification with an X12 format, you should specify an X12 envelope in the messaging port.

## Security properties

The security properties that you designate for a messaging port apply to all channels associated with that messaging port. For example, if you designate Secure Multipurpose Internet Mail Extensions (S/MIME) encryption for a messaging port, all documents processed by channels associated with that messaging port are encrypted using the specified encryption.

If you have documents that need to be secured using a different encryption or that do not need to be encrypted, you need to create a separate messaging port with the appropriate security properties for those documents.

BizTalk Server 2000 supports Multipurpose Internet Mail Extensions (MIME) encoding.

The MIME message format standard specifies how to format messages so that client programs can decode and display complex message bodies that can contain rich text, multiple character sets, and binary attachments such as pictures, sounds, spreadsheets, and so on. MIME is a richer and more flexible technology than Uuencode and provides generic and flexible mechanisms for including content within messages. With MIME formatting, you can:

- Specify alternate content encoding mechanisms for each body part.
- Relate groups of multiple content parts within a message.
- Use character sets other than US-ASCII character sets in body parts and message header fields.
- Specify the intended disposition of a content part (for example, inline or attachment).

BizTalk Server 2000 supports Secure Multipurpose Internet Mail Extensions (S/MIME) certificate-based public key encryption.

Encryption can be applied to business data that you send to your trading partners. By using an encryption certificate to secure the data, you can ensure that only the intended recipient can access the information.

To encrypt business data, the [source organization](#) must have a copy of the public key for the encryption certificate of the destination organization. The source organization uses this public key certificate to encrypt the business data and then forwards the encrypted data to the destination organization. The destination organization can then use the private key of its encryption certificate to decrypt the business data.

For an [open messaging port](#), the encryption security properties are disabled because the destination organization is unknown.

BizTalk Server 2000 supports Secure Multipurpose Internet Mail Extensions (S/MIME) certificate-based public-key digital signing. For more information about certificates, see [Understanding Certificates](#).

Digital signing can be used to ensure the authenticity of the source of data, to ensure that the data has not been modified, and to prevent the source of the data from repudiating the message.

A signature certificate is used to create digital signatures for authenticating data. Signing data does not alter the data, but it generates a digital signature string that is either bundled with the data or transmitted separately.

To digitally sign a document, the data is processed to create a message digest. The source organization's private key is then used to encrypt the message digest to form the digital signature. The data, along with the digital signature, is transmitted to the recipient.

To verify a digital signature, the recipient must have a copy of the public key from the sender's signature certificate. The recipient decrypts the digital signature by using the public key to form a digest and then calculates a message digest independently. The results of the two digests are compared; if they are identical, the information has not been tampered with.

#### **Note**

- For more information about certificates, see [Certificates Overview](#).

## **Related Topics**

[Create and Manage Messaging Ports](#)

[Open Messaging Ports](#)

[Understanding Messaging Ports](#)

# Open Messaging Ports

An [open messaging port](#) is a messaging port to an organization for which you have not explicitly declared a specific [destination organization](#). An open messaging port cannot have an application as its destination.

For an open messaging port, the destination and transport information must be provided either in the document or in parameters when the document is submitted to Microsoft BizTalk Server 2000. If submission parameters are used, they override any destination and transport information contained in the document. For more information about submitting documents, see [Submitting](#).

When you create a [channel](#) for an open messaging port, and the destination information is provided in the document, the inbound [document definition](#) for that channel must reference a [specification](#) that is properly configured. For more information about how to configure a document specification to process documents for an open messaging port, see [Set dictionary properties](#).

For an open messaging port, the encryption security properties are disabled because the destination organization is unknown. To set the encryption properties, you need to specify a certificate from a specific, known destination organization. An encryption certificate is used to encrypt documents that are transported to the specific destination organization.

You can use an open messaging port to send one or more standardized documents to many different current or future [trading partner](#) organizations without creating a messaging port for each destination. All documents share the same [envelope](#), security, and transport properties that are established in the messaging port.

An open messaging port differs from a [distribution list](#) in the following ways:

- With an open messaging port, each document from a channel results in only one document being delivered to only one destination. With a distribution list, each document from a channel can result in the document being delivered to multiple destinations.
- With an open messaging port, you do not have to change the properties of the messaging port to send information to a different trading partner organization. With a distribution list, you have to add a messaging port to send information to a different trading partner organization.

## ◆ Important

- When you declare a messaging port as an open messaging port, you should not create channels for the messaging port that have an outbound document definition with an X12 or EDIFACT specification. To build an X12 or EDIFACT envelope, the server must have a source and a destination [organization identifier](#). An open messaging port does not specify a destination organization identifier. In addition, the documents for an open messaging port must have the destination address within the document, but X12 and EDIFACT documents do not contain this information.

## Related Topics

[Create and Manage Messaging Ports](#)

[Messaging Port Elements](#)

[Understanding Messaging Ports](#)

# Understanding Organizations

The organizations that you create by using BizTalk Messaging Manager represent the [trading partners](#) with which you exchange documents. A special organization type, called the [home organization](#), represents your business.

## Home organization

BizTalk Messaging Manager creates the home organization for you automatically. When you configure the home organization, you can rename it to make it easier to identify as your business. There is only one home organization, and you cannot delete it.

You cannot designate the home organization as a source or destination for documents in a [messaging port](#) or a [channel](#). Only applications of the home organization can be designated as the source or destination for documents within your business. For example, you might create a messaging port that designates a trading partner organization as the destination for documents that your business sends. Then, when you create a channel for that messaging port, rather than designating your home organization as the source, you would designate a specific internal application within your business where the documents originate. You also can designate one application of the home organization as the source for documents in a channel and another application as the destination in a messaging port.

## Applications of the home organization

The applications that you add to the home organization enable you to identify and track the flow of documents between Microsoft BizTalk Server 2000 and actual internal applications within your business. However, simply creating an application and designating it as a source or destination within BizTalk Messaging Manager does not control or enable the flow of documents to or from an actual internal application. To integrate an internal application with BizTalk Server 2000 and direct the flow of documents to or from the application, you need to further configure the server.

There are a number of ways to transport documents from an originating application to BizTalk Server 2000. The configuration needed to integrate an application to transport documents to the server is performed entirely outside BizTalk Messaging Manager. For more information, see [Submitting](#).

To deliver documents from BizTalk Server 2000 to an internal application can require configuration both within and outside BizTalk Messaging Manager. The transport type and address that you specify in a messaging port can determine a specific location to which documents are delivered. An application or a separate component must then be configured to retrieve documents received at that location for the destination application. Or, within the transport properties of a messaging port, you can specify an application integration component that is capable of delivering documents directly to an application. For more information, see [Understanding Messaging Ports](#).

## Trading partner organizations

All other [organizations](#) that you create with BizTalk Messaging Manager represent external trading partners or business units of a trading partner. You can create any number of organizations. You can designate a trading partner organization either as a source of documents in a channel or a destination for documents in a messaging port.

You also can designate one trading partner as the source of documents in a channel and another as the destination for the documents in a messaging port. In this case, your business serves as a third-party intermediary between the two trading partners.

As with applications, simply creating an organization and designating it as a source or destination within BizTalk Messaging Manager does not enable the flow of documents to or from that organization. To control and direct the flow of documents between your partner organizations and BizTalk Server 2000, you need to further configure the server.

There are a number of ways for an external trading partner as a [source organization](#) to transport documents to your BizTalk Server 2000. The configuration needed to do this is similar to the way that you integrate applications to transport documents to the server, and it is also performed entirely outside BizTalk Messaging Manager. For more information, see [Submitting](#).

To deliver documents from your BizTalk Server 2000 to an external trading partner as a [destination organization](#) can require configuration both within and outside BizTalk Messaging Manager. The transport type and address that you specify in a messaging port determine a specific location to which documents are delivered. The destination organization, which must have access to this location, can then configure its own BizTalk Server, one of its internal applications, or a separate component to process the documents received at that location. For more information about configuring messaging ports, see [Understanding Messaging Ports](#).

The following topic is covered in this section:

- [Organization Identifiers](#)

# Organization Identifiers

Microsoft BizTalk Server 2000 and other [trading partners](#) use [organization identifiers](#) to uniquely identify [organizations](#). An organization can have more than one organization identifier; however, each identifier must be unique to that organization. For example, a telephone number, a URL, or a DUNS number can each uniquely identify an organization, but no two organizations can use the same telephone number as an organization identifier.

An organization identifier consists of three separate elements: a name, a qualifier, and a value. For example, a business might use a telephone number to uniquely identify itself. In this example, the name of the identifier is "telephone number," the qualifier that identifies the identifier as a telephone number is the number 12, and the value of the actual telephone number is (801-555-1079). Each organization identifier name has a unique qualifier that is used in place of the name to indicate the type of identifier. For example, the standard qualifier for a telephone number identifier is 12. When BizTalk Server 2000 processes documents, only the qualifier and the value are used to identify organizations.

Each organization must have at least one identifier. When you create an organization, BizTalk Messaging Manager creates an identifier with the name Organization. The qualifier for this identifier is OrganizationName, and its value is the name that you give to the organization. This identifier is also set as the default identifier, which means that it is used when no other identifier is specified. You can create additional identifiers and designate any identifier as the default identifier. You cannot delete the Organization Name identifier or the designated default identifier. The default identifier is used to identify an organization unless you override it by selecting a different identifier in a [messaging port](#) or [channel](#).

When BizTalk Server 2000 processes and transports a document, it includes the organization identifiers of the [destination organization](#) and the [source organization](#) in the [envelope](#) header. When BizTalk Server 2000 receives documents, it searches the data for the source organization and the destination organization identifiers. The server then uses the identifiers and the document-definition name to determine which channels to use to process the documents.

[Interchanges](#) with an [EDI](#) format have restrictions on organization identifiers. When you use an organization identifier for X12 envelopes, you should not use the organization identifier named Organization, or any other identifier that has a qualifier that exceeds 2 characters or a value that exceeds 15 characters. When you use an organization identifier for EDIFACT envelopes, you should not use the organization identifier named Organization, or any other identifier that has a qualifier that exceeds 4 characters or a value that exceeds 35 characters.

## Related Topics

[Create and Manage Organizations](#)

[Understanding Organizations](#)

# Understanding Document Definitions

A document definition represents a specific type of document that is processed by Microsoft BizTalk Server 2000. A document definition represents the type of inbound or outbound document in a [channel](#) and provides a pointer to a document [specification](#). The document specification defines the document structure, type, and version. The same document specification can be used in any number of document definitions, and the same document definition can be used in any number of channels.

If the format and structure of the inbound and outbound document in a channel are the same, you can use the same specification for both. Otherwise, you must specify a [map](#), which the server uses to transform the format or structure of the inbound document into that of the outbound document.

When BizTalk Server 2000 receives a document, it identifies the appropriate channel or channels that have matching inbound document definitions. The inbound document definition for each channel points to a specification. The server uses the specification to translate a non-XML inbound document from its original format into an intermediate XML format, and to validate the document's structure. The outbound document definition for the channel also points to a specification. The server uses the outbound document specification to validate the data structure of the outbound document. If required, the server also can use the specification to translate the outbound document from an XML format into a format that the [destination organization](#) or [destination application](#) can recognize and use. The destination is designated in the [messaging port](#) with which the channel is associated.

A document specification for a document definition is optional; however, in most cases you should select one. If you do not select a specification:

- The data that you process is not translated into XML on the inbound side or from XML on the outbound side.
- The data is not validated against a specification to ensure that it does not contain errors.
- You cannot transform the structure or format of the data by using a map in a channel.
- You cannot specify [global tracking fields](#) or [selection criteria](#).

A document specification is not required if you want to use the document definition in a [pass-through submission](#) for data that is not in Unicode XML format. An example would be if you want to send binary data through BizTalk Server 2000 to a destination without transforming the data in any way. In this case, you should not select a document specification for either the inbound or the outbound document definition of the channel that is used for the pass-through submission.

The following topics are covered in this section:

- [Tracking Document Data Fields](#)
- [Understanding Selection Criteria](#)

## Related Topics

[Create and Manage Document Definitions](#)

[Creating Specifications](#)

[Mapping Specifications](#)

[Understanding Channels](#)

# Tracking Document Data Fields

In a [document definition](#), you can designate fields contained within the [specification](#) that you want to log to a [Tracking database](#). The fields that you designate in a document definition are tracked for all [document instances](#) processed by [channels](#) that use the document definition as its inbound document definition. Because these fields are tracked for all channels, they are referred to as [global tracking fields](#).

When you select an inbound document definition for a channel, you can designate specification fields from within the channel to be tracked. The specification fields that you designate in a channel are tracked in place of any global tracking fields for documents that are processed by that specific channel.

The fields that you designate for tracking in a document definition or in a channel are logged to a Tracking database only for the inbound document definition of the channel. Any fields that are designated for tracking in the outbound document definition of the channel are not tracked.

With the tracking data from the documents that are processed, you can analyze information about your operation. For example, an invoice-total field can be tracked for every invoice that you send to your [trading partners](#). You can then determine the total dollar amount for invoices sent to all trading partners for a given period of time, or you can determine the total dollar amount of invoices for each individual trading partner.

## Related Topics

[Create and Manage Document Definitions](#)

[Using BizTalk Document Tracking](#)

# Understanding Selection Criteria

Selection criteria are a unique set of name-value pairs that Microsoft BizTalk Server 2000 uses only to process [EDI](#) documents. For inbound [X12](#) or [EDIFACT](#) documents, the server uses selection criteria to uniquely identify and select a document definition because no document definition name is available within individual EDI documents.

For outbound X12 or EDIFACT documents, selection criteria are used to create the functional group header information in the envelope.

The following topics are covered in this section:

- [Using Selection Criteria with Inbound Documents](#)
- [Using Selection Criteria with Outbound Documents](#)

# Using Selection Criteria with Inbound Documents

To process inbound documents, BizTalk Server 2000 must have the name of an inbound [document definition](#). The server usually obtains the name of the inbound document definition from either a field within the incoming document or a parameter that is submitted along with the document. For more information, see [Submitting](#).

For [X12](#) and [EDIFACT](#) inbound [interchanges](#), the documents can be contained within the functional group or interchange headers. BizTalk Server 2000 processes the documents contained in these groups and interchanges individually. Because the document-related information for each document is contained in the functional group or interchange header, the server cannot obtain a document definition name from within the individual documents. Also, since an interchange can contain multiple groups with different types of documents, a single document definition name cannot be provided as a submission parameter for the server for identifying a document definition.

In such cases, BizTalk Server 2000 is able to extract document-related data from the functional group header (the GS header of an X12 interchange and the UNG header of an EDIFACT interchange) or the interchange header in an EDIFACT interchange without functional groups. By matching the values of this data to the values of [selection criteria](#) specified in a document definition, the server can uniquely identify the appropriate document definition.

For BizTalk Server 2000 to match the selection criteria values to the corresponding header elements of an inbound interchange, you must type the selection criteria names exactly as shown in the following tables.

## X12 header elements

Name	Requirement	GS element
functional_identifier	Mandatory	GS01
application_sender_code	Mandatory	GS02
application_receiver_code	Mandatory	GS03
standards_version	Mandatory	GS08

## EDIFACT header elements

Name	Requirement	UNH element	UNG element
functional_identifier	Mandatory	S009, 0065	0038
application_sender_code	Optional	Not used	S006, 0040
application_receiver_code	Optional	Not used	S007, 0044
standards_version_type	Mandatory	S009, 0052	S008, 0052
standards_version_value	Mandatory	S009, 0054	S008, 0054

## Related Topics

[Create and Manage Document Definitions](#)

[Understanding Selection Criteria](#)

[Using Selection Criteria with Outbound Documents](#)

# Using Selection Criteria with Outbound Documents

To process an outbound [X12](#) or [EDIFACT](#) document, BizTalk Server 2000 places each document into a valid [envelope](#) of the appropriate format. To create the envelope, the server inserts the value data of the [selection criteria](#) into the corresponding fields of the group and message headers. To build the headers, the server uses the selection criteria values contained in the outbound [document definition](#) for the [channel](#).

For example, suppose that you create a document definition that has the name-value pair of functional\_identifier/ORDERS as one of its selection criteria. If you then use this as the outbound document definition in a channel, the value of the group header field that corresponds with the selection criteria named functional\_identifier is set to ORDERS in the envelope header.

For BizTalk Server 2000 to insert selection criteria values to the corresponding header elements, you must type the selection criteria names exactly as shown in the following tables.

## X12 header elements

Name	Requirement	GS element
functional_identifier	Mandatory	GS01
application_sender_code	Mandatory	GS02
application_receiver_code	Mandatory	GS03
standards_version	Mandatory	GS08

## EDIFACT header elements

Name	Requirement	UNH element	UNG element
functional_identifier	Mandatory	S009, 0065	0038
application_sender_code	Optional	Not used	S006, 0040
application_receiver_code	Optional	Not used	S007, 0044
standards_version_type	Mandatory	S009, 0052	S008, 0052
standards_version_value	Mandatory	S009, 0054	S008, 0054

## Related Topics

[Create and Manage Document Definitions](#)

[Understanding Selection Criteria](#)

[Using Selection Criteria with Inbound Documents](#)

# Understanding Envelopes

An envelope encapsulates electronic business data for transport. An envelope typically consists of header and footer information, or of header information only. The envelope properties that you specify provide Microsoft BizTalk Server 2000 with information that the server needs to either open inbound [interchanges](#) or create outbound interchanges. When you create an envelope, you specify an [envelope format](#); for certain types of formats, you also can select an envelope [specification](#).

The envelope formats supported by BizTalk Server 2000 are custom XML, ANSI X12, UN/EDIFACT, flat file (delimited and positional), custom, and reliable. The reliable format processes envelopes that are compliant with [BizTalk Framework 2.0](#). For more information about BizTalk Framework 2.0, go to the Microsoft BizTalk Web site ([www.microsoft.com/biztalk/](http://www.microsoft.com/biztalk/)). If you specify a custom envelope format, you must create and register a custom [parser](#) component to process inbound envelopes or a custom [serializer](#) component to process outbound envelopes. For more information, see [Using the IBizTalkParserComponent Interface](#) and [Using the IBizTalkSerializerComponent Interface](#).

To enable BizTalk Server 2000 to process inbound interchanges with a custom XML or flat-file format, you must create envelopes with a matching format. To enable BizTalk Server 2000 to process inbound interchanges with a custom format, you must create and register a custom parser component. BizTalk Server 2000 can process inbound interchanges with ANSI X12, UN/EDIFACT, or reliable formats without using an envelope created by using BizTalk Messaging Manager.

To process outbound documents with any format, you must create an envelope and select it in a [messaging port](#) to create an interchange with the required envelope format and header information. BizTalk Server 2000 places only one document in each outbound interchange.

When you select an envelope with an X12 or EDIFACT format in a messaging port, you must also specify delimiters and an interchange control number. These [EDI](#) properties apply only to the envelopes selected for use with that messaging port. When you select an envelope with a custom format, then delimiters and an interchange control number are optional and depend on the requirements of your custom parser or serializer components. When you create a [channel](#) for a messaging port that uses an X12, EDIFACT, or custom envelope, you can specify a functional group control number that applies only to documents processed by that channel and messaging port combination.

The format of an envelope that you select in a messaging port must agree with the format of the outbound document that it contains. The format of the outbound document is determined by the specification referred to in the outbound [document definition](#) of a channel. For example, if you choose an envelope with an X12 format for a messaging port, when you create a channel for that messaging port you must select an outbound document definition that points to a specification that also has an X12 format.

If you do not specify an envelope when creating a messaging port, the data is sent in XML format without any header.

## Note

- When processing envelopes that are compliant with BizTalk Framework 2.0, BizTalk Server 2000 should be considered the endpoint with regard to the expiration time. When BizTalk Framework 2.0–compliant documents are submitted to BizTalk Server 2000, either from an application or a trading partner, the following fields are overwritten if present, or created if absent:
  - In the properties subsection:
    - <prop:identity>
    - <prop:sentAt>
    - <expiresAt>
  - In the receipt information subsection:
    - <sendTo>
    - <address>
    - <sendReceiptBy>

The following topics are covered in this section:

- [Using Envelopes for Inbound Processing](#)
- [Using Envelopes for Outbound Processing](#)

## Related Topics

Create and Manage Envelopes

Understanding Messaging Ports

# Using Envelopes for Inbound Processing

Microsoft BizTalk Server 2000 can process an inbound [interchange](#) with an [X12](#) or [EDIFACT](#) format without using an [envelope](#) created by using BizTalk Messaging Manager.

For BizTalk Server 2000 to process an inbound interchange with a flat-file format, you must create an envelope by using BizTalk Messaging Manager. That envelope must point to a [specification](#) that the server can use to interpret and open the interchange. The name of the envelope must be provided to the server when the interchange is submitted for processing. For more information, see [Submitting](#).

For BizTalk Server 2000 to process an inbound interchange with a custom XML format, you must create an envelope by using BizTalk Messaging Manager. However, the server is able to locate the custom XML envelope that it needs to interpret and open the interchange without the name of the envelope being provided at submission. You can provide the server with the name of the envelope at submission, but it is not required. For more information, see [Submitting](#).

For BizTalk Server 2000 to process an inbound interchange with a custom format, you must create a custom [parser](#) to open the interchange. For more information, see [Using the IBizTalkParserComponent Interface](#).

The envelopes that you create to process inbound interchanges do not need to be selected in a [messaging port](#) to be used by the server. Only envelopes used for processing outbound interchanges need to be selected in a messaging port.

## Related Topics

[Create and Manage Envelopes](#)

[Understanding Envelopes](#)

[Using Envelopes for Outbound Processing](#)

# Using Envelopes for Outbound Processing

[Messaging ports](#) regulate the outbound flow of data from Microsoft BizTalk Server 2000 to a specified destination. When you create a messaging port, you can select an [envelope](#) for the documents that are processed by that messaging port. If you select an envelope, the [envelope format](#) must match the format of the documents that the envelope contains. The format of the documents is determined by the [specification](#) referred to in the outbound [document definition](#) of a [channel](#). Once you create an envelope by using BizTalk Messaging Manager, you can use it in any number of messaging ports.

When BizTalk Server 2000 processes an outbound document, the server uses the properties of the envelope selected in the messaging port to create an [interchange](#) by encapsulating or prefixing the document. If you do not specify an envelope for a messaging port, the data is sent in XML format without any header or footer. If you specify a custom XML format, but do not select an envelope specification, the data is sent using the reliable format. The reliable format processes envelopes that are compliant with [BizTalk Framework 2.0](#). For more information about BizTalk Framework 2.0, go to the Microsoft BizTalk Web site ([www.microsoft.com/biztalk/](http://www.microsoft.com/biztalk/)).

For BizTalk Server 2000 to process an outbound interchange with a custom format, you must create a custom [serializer](#) to create the interchange. For more information, see [Using the IBizTalkSerializerComponent Interface](#).

When you select an envelope with an [X12](#) or [EDIFACT](#) format, you must specify an interchange control number and delimiters. An interchange control number is used to identify and track documents that are processed using the messaging port. The interchange control number is incremented with each use of the envelope and messaging port. Delimiters indicate the characters that are used to separate the records and fields of the envelope and the documents contained in the envelope. For envelopes with a custom format, an interchange control number and delimiters are optional.

## ◆ Important

- The envelope format for a messaging port must agree with the document type format of the specification that is referred to by the outbound document definition for any associated channel. For example, if you choose an envelope with an X12 format for a messaging port, you must select an outbound document definition for the channel that points to an X12 specification.

## Related Topics

[Create and Manage Envelopes](#)

[Understanding Envelopes](#)

[Using Envelopes for Inbound Processing](#)

# Understanding Receipts

When exchanging documents with a [trading partner](#), your business processes might require you to receive receipts for the documents that you send, or to generate receipts for documents that a trading partner sends to your business.

[BizTalk Messaging Services](#) provides two methods for processing receipts for [interchanges](#). For interchanges that use the [X12](#) or [EDIFACT parser](#), or a custom parser that requires receipts, you can configure BizTalk Messaging Manager to use [channel](#) properties to process receipts. For interchanges that use the XML parser, you have the option of using [reliable messaging](#), which processes receipts automatically to guarantee the reliable delivery of data.

The following topics are covered in this section:

- [Processing Receipts Using Channels](#)
- [Processing Receipts Using Reliable Messaging](#)

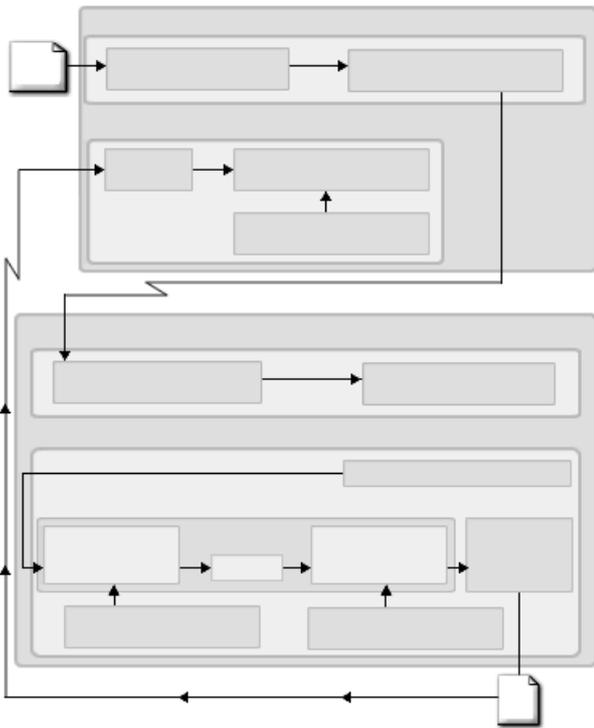
# Processing Receipts Using Channels

This section explains how you can configure [BizTalk Messaging Services](#) to use [channel](#) properties to control the processing of receipts. The destination system is configured to generate (send) receipts to the source system. The source system is configured to expect (receive) receipts from the destination system and correlate them with the original [interchanges](#). This configuration applies only if you process interchanges that use the [X12](#) or [EDIFACT parser](#), or a custom parser that requires receipts. For more information about creating custom parsers, see [Using the IBizTalkParserComponent Interface](#). If you process interchanges that use the XML parser, see [Processing Receipts Using Reliable Messaging](#).

If you use a custom parser and want to correlate receipts with the original interchanges, you must create a custom correlation component.

For the source system to receive receipts, the destination system also must be configured to send receipts. Configuring a channel on the source system to expect a receipt is not sufficient to receive receipts.

This following illustration shows the configuration for both the source and destination systems using channel properties for processing receipts.



- Generate and send receipt
- Receive and correlate receipt
- Receive and process interchange

## Destination System

### Source System

- Messaging port to Destination System
- PO
- Parser
- Messaging port to Source System
- Outbound document definition
- Receipt Document specification
- Document specification
- Inbound

document  
definition  
Map  
Receipt channel  
Canonical receipt  
Messaging port  
to Application  
Channel from  
Source System  
Document  
specification  
Receipt document  
definition  
Channel for PO  
Generate and send interchange

The following topics are covered in this section:

- [Configuring the Source System for Channel Receipts](#)
- [Configuring the Destination System for Channel Receipts](#)

# Configuring the Source System for Channel Receipts

This topic explains how to configure [BizTalk Messaging Services](#) to send an [interchange](#) to a [trading partner](#) and to process a receipt by using [channel](#) properties.

You must create a channel and a [messaging port](#) to process and transport an interchange to the destination system. You do not need to create a channel and messaging port to process the receipt that the destination system returns. However, you must create a [document definition](#) that the server uses to validate the receipt when it is returned.

To configure BizTalk Messaging Services to send an interchange to a destination system and to process a receipt by using channel properties, perform the steps in the following table. References are provided for each procedure, and notes are provided to indicate special configuration considerations. Other property settings needed to complete the configuration vary according to your particular business situation and are not specified here.

Step	References and notes
<p><b>Using BizTalk Editor:</b></p> <ul style="list-style-type: none"> <li>• Create the <a href="#">specifications</a> for the inbound and outbound document definitions for the original document for the interchange. You also must create a specification for the document definition that the server uses to validate the receipt when it is received.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create and Validate Specifications</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>• For the outbound document definition for the channel, you must create a specification that uses the format required by the destination system. For example, X12.</li> </ul> <p>When BizTalk Messaging Services on the destination system processes the interchange, and the <a href="#">parser</a> requires receipts, the parser does the following:</p> <ul style="list-style-type: none"> <li>• Extracts header elements from the interchange.</li> <li>• Generates a canonical receipt.</li> <li>• Inserts the elements into the canonical receipt.</li> </ul> <p>For the source system, the specification for the outbound document definition of the channel used to process the interchange also must contain these fields. And, the specification for the document definition to validate the receipt must contain these fields. The source system uses these elements to correlate the receipt with the original interchange</p> <p>The X12 header elements are:</p> <ul style="list-style-type: none"> <li>• functional_identifier</li> <li>• standards_version</li> </ul> <p>The EDIFACT header elements are:</p> <ul style="list-style-type: none"> <li>• functional_identifier</li> <li>• standards_version_type</li> <li>• standards_version_value</li> </ul>
<p><b>Using BizTalk Messaging Manager:</b></p>	

<ul style="list-style-type: none"> <li>• Create the inbound and outbound document definitions for creating the channel and a document definition for the receipt.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create document definitions</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>• In the document definitions, you must select the specifications that you created previously. For more information, see <a href="#">Select a document specification</a>.</li> <li>• You also must create a document definition for the receipt.</li> </ul>
<ul style="list-style-type: none"> <li>• Create a messaging port for transporting the receipt to the source system.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create messaging ports</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• You must create the messaging port and its associated <a href="#">receipt channel</a> for processing the receipt first. When you create the channel for processing the original interchange, you must specify the receipt channel.</li> </ul>
<ul style="list-style-type: none"> <li>• Create a messaging port for transporting the interchange to the destination system.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create messaging ports</a></li> </ul>
<ul style="list-style-type: none"> <li>• Create a channel to process the original interchange from your trading partner.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create channels</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>• On the <b>Source Application</b> or <b>Source Organization</b> page of the Channel Wizard, select the <b>Expect receipt</b> check box.</li> <li>• In the <b>Expect receipt</b> area, in the <b>Receipt interval in minutes</b> box, set the time that that you want to wait to receive the receipt before resending the original interchange. For more information, see <a href="#">Set source application properties</a> or <a href="#">Set source organization properties</a>.</li> </ul>
<p><b>Using BizTalk Document Tracking:</b></p>	
<ul style="list-style-type: none"> <li>• The original interchange is logged to the <a href="#">Tracking database</a> and the receipt status field is set to "Expect". The receipt status in the Tracking database subsequently changes to reflect the status of the receipt process.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Understanding Document-Instance Record Results</a></li> <li>• <a href="#">Understanding Receipt Results</a></li> </ul>

## Submitting receipts on the source system

Receipts are submitted to BizTalk Messaging Services in the same manner as other documents. Once a receipt is submitted, the X12 and EDIFACT parsers can distinguish a receipt from other documents and direct the server to correlate the receipt with the original interchange.

### Important

- Receipts must be submitted to BizTalk Messaging Services without using any submission parameters.

# Configuring the Destination System for Channel Receipts

This topic explains how to configure [BizTalk Messaging Services](#) to process an [interchange](#) from a [trading partner](#) and to generate a receipt by using [channel](#) properties. To do this, you must create a channel and a [messaging port](#) to process the outbound interchange and transport it to the destination system. You do not need to create a channel or a messaging port to process the receipt that the destination system returns. A [parser](#) processes the receipt by using only a [document definition](#).

To configure BizTalk Messaging Services to process an interchange from the source system and to send a receipt by using channel properties, perform the steps in the following table. References are provided for each procedure, and notes are provided to indicate special configuration considerations. Other property settings needed to complete the configuration vary according to your particular business situation and are not specified here.

Step	References and notes
<b>Using BizTalk Editor:</b>	
<ul style="list-style-type: none"> <li>• Create the <a href="#">specifications</a> for the inbound and outbound document definitions that are used to create the receipt channel.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create and Validate Specifications</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>• For the inbound document definition of the <a href="#">receipt channel</a>, you use the Canonical Receipt specification. This specification is located in the <a href="#">WebDAV repository</a>.</li> <li>• For the outbound document definition of the receipt channel, you must create a specification that uses the format required by your business process.</li> </ul> <p>When BizTalk Messaging Services on the destination system processes an inbound interchange, and the parser requires receipts, the parser does the following:</p> <ul style="list-style-type: none"> <li>• Extracts group header elements.</li> <li>• Generates a canonical receipt</li> <li>• Inserts the header elements into the canonical receipt.</li> </ul> <p>The outbound document specification for the receipt channel must contain fields for these header elements. The source system uses the header elements to correlate the receipt with the original interchange.</p> <p>The X12 header elements are:</p> <ul style="list-style-type: none"> <li>• functional_identifier</li> <li>• standards_version</li> </ul> <p>The EDIFACT header elements are:</p> <ul style="list-style-type: none"> <li>• functional_identifier</li> <li>• standards_version_type</li> <li>• standards_version_value</li> </ul>
<ul style="list-style-type: none"> <li>• Create the specifications for the inbound and outbound document definitions that are used to create the channel to process the original interchange from the source system.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create and Validate Specifications</a></li> </ul>
<b>Using BizTalk Mapper:</b>	

<ul style="list-style-type: none"> <li>• Create a <a href="#">map</a> for the receipt channel.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create new maps</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>• When you create the receipt channel, you must specify a map. The map is used to transform the canonical receipt into the correct <a href="#">document type</a> for the outbound document.</li> <li>• You can use one of the maps that are provided with BizTalk Server 2000, if it matches the document type that is required for your business process. You can retrieve these maps from the WebDAV repository.</li> </ul> <p>–Or–</p> <ul style="list-style-type: none"> <li>• You can create your own map using the Canonical Receipt specification and a specification that matches the document type required for your business process.</li> </ul>
<p><b>Using BizTalk Messaging Manager:</b></p>	
<ul style="list-style-type: none"> <li>• Create the document definitions for the receipt channel and for the channel that you use to process the original interchange.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create document definitions</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>• In the document definitions, you must select the specifications that you created previously. For more information, see <a href="#">Select a document specification</a>.</li> <li>• You also must create the document definitions for the channel that is used to process the original interchange. The configuration for these varies depending on your business process.</li> </ul>
<ul style="list-style-type: none"> <li>• Create a messaging port for transporting the receipt to the source system.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create messaging ports</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• You must create the messaging port and its associated receipt channel for processing the receipt before you create those that are used for the original interchange. When you create the channel for processing the original interchange, you must specify the receipt channel.</li> </ul>
<ul style="list-style-type: none"> <li>• Create a receipt channel from an application for processing the receipt.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create channels</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>• On the <b>General Information</b> page of the Channel Wizard, select the <b>This is a receipt channel</b> check box.</li> <li>• On the <b>Source Application</b> page of the Channel Wizard, in the <b>Name</b> list, select an application.  You can create an application for the <a href="#">home organization</a> that you use to designate receipts that are generated by the parsers.</li> <li>• On the <b>Inbound Document</b> page of the Channel Wizard, click <b>Browse</b> and browse to the document definition that you created earlier and that uses the Canonical Receipt specification.</li> <li>• On the <b>Outbound Document</b> page of the Channel Wizard, click <b>Browse</b> and browse to the document definition that you created earlier and that uses the specification with the document type required for your business process.</li> </ul>

<ul style="list-style-type: none"> <li>• Create a messaging port for transporting the documents contained in the original interchange to their intended destination.</li> </ul>	<p><a href="#">Create messaging ports</a></p> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• This messaging port does not require special configuration for processing receipts.</li> </ul>
<ul style="list-style-type: none"> <li>• Create a channel to process the original interchange from your trading partner.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create channels</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>• On the <b>Source Organization</b> page of the Channel Wizard, select the <b>Generate receipt</b> check box.</li> <li>• In the <b>Generate receipt</b> area, click <b>Browse</b> and select the receipt channel that you created to process the receipt. For more information, see <a href="#">Set source organization properties</a>.</li> <li>• On the <b>Advanced Configuration</b> page of the Channel Wizard, in the <b>Retry options</b> area, you can set the number of retries and the interval. For more information, see <a href="#">Set advanced configuration properties</a>.</li> </ul>
<p><b>Using BizTalk Document Tracking:</b></p>	
<ul style="list-style-type: none"> <li>• The original interchange and the receipt are logged to the <a href="#">Tracking database</a>.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Understanding Document-Instance Record Results</a></li> <li>• <a href="#">Understanding Receipt Results</a></li> </ul>

# Processing Receipts Using Reliable Messaging

This section explains how you can configure [BizTalk Messaging Services](#) to send and receive receipts by using [reliable messaging](#) envelopes, which create [interchanges](#) that are compliant with [BizTalk Framework 2.0](#). Reliable messaging enables receipts to be processed automatically, to ensure the reliable delivery of data. For more information about BizTalk Framework 2.0, go to the Microsoft BizTalk Web site, ([www.microsoft.com/biztalk/](http://www.microsoft.com/biztalk/)). If you send and receive interchanges that use the X12, EDIFACT, or a custom [parser](#), see [Processing Receipts Using Channels](#).

By using BizTalk Messaging Manager, you can configure a [messaging port](#) to use a reliable envelope format for an outbound interchange. Envelopes that use the reliable messaging format must always include a reply-to URL address in the header. The reply-to address is used by the destination system to send a receipt to the interchange sender system.

The following topics are covered in this section:

- [Configuring the Source System for Reliable Messaging Receipts](#)
- [Configuring the Destination System for Reliable Messaging Receipts](#)

# Configuring the Source System for Reliable Messaging Receipts

To configure [BizTalk Messaging Services](#) to send an [interchange](#) to a destination system and to process a receipt by using [reliable messaging](#), perform the steps in the following table. References are provided for each procedure, and notes are provided to indicate special configuration considerations. Other property settings needed to complete the configuration vary according to your particular business situation and are not specified here.

Step	References and notes
<b>Using BizTalk Administration:</b>	
<ul style="list-style-type: none"> <li>Configure the reliable messaging reply-to address property.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Configure general properties for a server group.</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>In <a href="#">BizTalk Server Administration</a>, expand <b>Microsoft BizTalk Server 2000</b>, and then click the <a href="#">server group</a> that you want to configure.</li> <li>On the <b>Action</b> menu, click <b>Properties</b>.</li> <li>In the <b>BizTalk Server Group Properties</b> dialog box, in the <b>Reliable messaging reply-to URL</b> box, type the URL that this server group uses to receive reliable messaging delivery receipts.</li> </ul> <p>When you create an outbound interchange that uses a reliable messaging <a href="#">envelope</a>, the server automatically inserts the <b>Reliable messaging reply-to URL</b> into the header of the outbound interchange. The server also places the original interchange into the <a href="#">Retry queue</a>. The server uses the <b>Retry</b> options specified in the <a href="#">channel</a> to determine the number of times to resend the original interchange until a receipt has been received.</p>
<b>Using BizTalk Messaging Manager:</b>	
<ul style="list-style-type: none"> <li>Create an envelope that uses the reliable envelope format.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Create envelopes</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>In the <b>New Envelope</b> dialog box, in the <b>Envelope format</b> list, click <b>RELIABLE</b>.</li> <li>If you choose the custom XML format and you do not select a specification, the envelope format defaults to the reliable format.</li> </ul>
<ul style="list-style-type: none"> <li>Create a <a href="#">messaging port</a> for transporting the original interchange to the destination system.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Create messaging ports</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>On the <b>Envelope Information</b> page of the New Messaging Port Wizard, in the <b>Envelope information</b> area, select the envelope that you created previously. For more information, see <a href="#">Set envelope information properties</a>.</li> </ul>
<ul style="list-style-type: none"> <li>Create a channel to process the original interchange.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Create channels</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>On the <b>Source Application</b> or <b>Source Organization</b> page of the Channel Wizard, do not set any receipt properties.</li> <li>On the <b>Advanced Configuration</b> page of the Channel Wizard, in the <b>Retry options</b> area, you can set the number of retries and the interval. For more information, see <a href="#">Set advanced configuration properties</a>.</li> </ul>
<b>Using BizTalk Document Tracking:</b>	

- On the source system, the original, outbound interchange is logged to the [Tracking database](#); however, the receipt that is returned is not.

- [Understanding Document-Instance Record Results](#)
- [Understanding Receipt Results](#)

# Configuring the Destination System for Reliable Messaging Receipts

When [BizTalk Messaging Services](#) for the destination system receives an [interchange](#) with a [reliable messaging](#) format, it uses a special [document definition](#), [channel](#), and [messaging port](#) to process and transport a receipt to the source system. These special system objects are not viewable in BizTalk Messaging Manager, and you cannot create similar objects using the reserved system names.

The server uses the reply-to address that is included in the header of the inbound interchange as the destination address for the receipt.

You do not need to further configure [BizTalk Messaging Services](#) for the destination system to return a receipt for an interchange that is sent with a reliable messaging [envelope](#), except when the source system specifies an SMTP address as the reliable messaging reply-to URL address. To send receipts to an SMTP address, your server must be configured to include a From address in the header of the receipt.

When [BizTalk Server 2000](#) is installed, an [organization identifier](#) is created for the [home organization](#). This identifier is named Reliable Messaging Acknowledgement SMTP From Address, and it cannot be removed. When sending a reliable messaging receipt to an SMTP address, the server inserts the value that you specify for this organization identifier into the interchange header as the From address.

To configure [BizTalk Messaging Services](#) to send a receipt to a source system using an SMTP reliable messaging reply-to address, perform the steps in the following table. References are provided for each procedure, and notes are provided to indicate special configuration considerations. Other property settings needed to complete the configuration vary according to your particular business situation and are not specified here.

Step	References and notes
<p><b>Using BizTalk Messaging Manager:</b></p> <ul style="list-style-type: none"> <li>Configure the Reliable Messaging Acknowledgement SMTP From Address <a href="#">organization identifier</a> of the <a href="#">home organization</a>.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Configure the home organization</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>Open the home organization.</li> <li>In the <b>Organization Properties</b> dialog box, click the <b>Identifiers</b> tab.</li> <li>In the <b>Organization identifiers</b> list, click <b>Reliable Messaging Acknowledgement SMTP From Address</b> and click <b>Edit</b>.</li> <li>In the <b>Identifier Properties</b> dialog box, in the <b>Value</b> box, type a value for the identifier. For more information, see <a href="#">Edit organization identifiers</a>.</li> </ul> <p> <b>Important</b></p> <ul style="list-style-type: none"> <li>Do not modify the name or qualifier for this identifier, but only modify the value.</li> </ul>
<ul style="list-style-type: none"> <li>Create a messaging port for transporting the original interchange to its intended destination.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Create messaging ports</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>This messaging port does not require special configuration.</li> </ul>
<ul style="list-style-type: none"> <li>Create a channel to process the original interchange</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Create channels</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>This messaging port does not require special configuration.</li> </ul>

<b>Using BizTalk Document Tracking:</b>	
<ul style="list-style-type: none"><li>• On the destination system, the inbound interchange is logged to the <a href="#">Tracking database</a>, but the receipt is not.</li></ul>	<ul style="list-style-type: none"><li>• <a href="#">Understanding Document-Instance Record Results</a></li><li>• <a href="#">Understanding Receipt Results</a></li></ul>

# Understanding Distribution Lists

A distribution list is a group of [messaging ports](#) with which you can send the same document to several different [trading partner organizations](#) or internal applications.

You can use a distribution list to send the same data to several trading partner organizations or internal applications of your [home organization](#) at the same time. For example, you can send the same catalog, price list, or newsletter to several trading partner organizations by submitting the information only once to Microsoft BizTalk Server 2000.

You must first create a messaging port to each of the trading partner organizations or internal applications that you want to receive the data, and then add the messaging ports to a distribution list. [Open messaging ports](#) cannot be added to a distribution list. You can create new messaging ports to additional trading partner organizations or internal applications, and then add those messaging ports to an existing distribution list. For more information, see [Create messaging ports](#).

You must create at least one [channel](#) for each distribution list, or else the distribution list is not functional. For more information, see [Create channels](#).

When BizTalk Server 2000 invokes a channel related to a distribution list, it invokes only the channel that is associated with the distribution list to process the data. None of the channels that are associated with the individual messaging ports in the distribution list are invoked. The server uses the properties of each messaging port successively to transport the data to the destinations specified in the messaging ports.

A distribution list differs from an open messaging port in the following ways:

- With a distribution list, each document from a channel can result in the document being delivered to multiple destinations. With an open messaging port, each document from a channel results in only one document being delivered to only one destination.
- With a distribution list, you have to add a messaging port to send information to a different trading partner organization. With an open messaging port, you do not have to change the properties of the messaging port to send information to a different trading partner organization.

## Related Topic

[Use Distribution Lists](#)

# Accessing the BizTalk Messaging Configuration Object Model

This section provides information about how to access the BizTalk Messaging Configuration object model programmatically. It shows how to manage trading partner relationships and set up [messaging ports](#) and [channels](#) for the exchange of data, using Microsoft BizTalk Server 2000. This section also shows how to create [document definitions](#) and [envelopes](#), and how to set [organization](#) properties. For additional information, see the following sections:

- For general background information, see [Concepts](#).
- For information about COM interfaces, enumerations, and error messages, see the [Object Model Reference](#).
- For examples of code, see [BizTalk Messaging Services Code Samples](#).

The BizTalk Messaging Configuration object model can also be configured using the BizTalk Messaging Manager graphical user interface. For more information, see [Using BizTalk Messaging Manager](#).

# Concepts

This section provides detailed conceptual information that is important to understanding how to access the BizTalk Messaging Configuration object model. The following topics are covered:

- [BizTalk Messaging Configuration Object Model](#)
- [Channels](#)
- [Messaging Ports](#)
- [Openness](#)
- [Organizations](#)
- [Document Definitions](#)
- [Envelopes](#)

For information about code samples that use the BizTalk Messaging Configuration object model, see [BizTalk Messaging Services Code Samples](#).

# BizTalk Messaging Configuration Object Model

The BizTalk Messaging Configuration object model provides an easy way for applications to set up, maintain, and retrieve [messaging ports](#) and [channels](#) for trading partner relationships and application-to-application integration. The BizTalk Messaging Configuration object model can also create [envelopes](#) and [document definitions](#), and set [organization](#) properties.

The BizTalk Messaging Configuration object model uses a Structured Query Language (SQL) database to store the port configurations and other relational data. ActiveX Data Objects (ADO) recordsets are returned when querying for lists of object instances (for example, messaging ports, organizations, and so on).

The BizTalk Messaging Configuration object model consists of Component Object Model (COM) objects that expose the configuration data required for Microsoft BizTalk Server 2000 to configure the interchange of structured documents between applications and trading partners. The COM objects represent instances of data in memory that can be stored in the database.

All object properties are read/write, except where noted.

## Related Topics

[BizTalk Messaging Configuration Objects](#)

[Referential Integrity](#)

[Security](#)

# BizTalk Messaging Configuration Objects

The following table shows the objects of the BizTalk Messaging Configuration object model.

Object	Description
<a href="#">BizTalkChannel</a>	Contains the configuration related to the source entity and its binding with a <a href="#">BizTalkPort</a> object.
<a href="#">BizTalkConfig</a>	Creates and retrieves other BizTalk objects, such as <a href="#">channels</a> , document <a href="#">specifications</a> , and <a href="#">messaging ports</a> .
<a href="#">BizTalkDocument</a>	Identifies and describes the <a href="#">specification</a> of a document.
<a href="#">BizTalkEnvelope</a>	Identifies the <a href="#">envelope format</a> and/or the envelope schema used for documents. Envelopes are required for documents using the <a href="#">X12</a> or <a href="#">EDIFACT</a> format.
<a href="#">BizTalkOrganization</a>	Identifies the source or destination point for the exchange of electronic data. An <a href="#">organization</a> can represent an external trading partner, your own company, or a business unit of a trading partner or your company. An organization can designate a source application in a channel or a destination application in a port.
<a href="#">BizTalkPort</a>	Defines the destination-related attributes of a document submission.
<a href="#">BizTalkPortGroup</a>	Configures a port group. This is a group of complete <a href="#">BizTalkPort</a> objects for sending the same document, such as a catalog, a price list, or a newsletter, to a group of trading partners.

## ⚠ Caution

- Do not access the database directly. Do not directly call the stored procedures. Make all changes to the database by using the methods and properties of the BizTalk Messaging Configuration object model. Making changes to the database directly bypasses many constraints enforced by the BizTalk Messaging Configuration object model and either causes the server to function incorrectly or corrupts the database.
- The BizTalk Messaging Configuration object model should be accessed only at design time. Accessing objects in use while BizTalk Server is processing documents can produce unexpected results.
- BizTalk Server 2000 treats all variables with a **BSTR** data type as NULL-terminated strings. Any data contained in a **BSTR** after the NULL character is ignored. Documents containing embedded NULL characters must be submitted to BizTalk Server using [pass-through](#) mode.

## Related Topics

[Channels](#)

[Document Definitions](#)

[Envelopes](#)

[Messaging Ports](#)

[Organizations](#)

# Referential Integrity

Referential dependency must be considered when instantiating objects in BizTalk Server 2000. Referential dependency indicates that one object refers to, and is dependent upon, another object. For example, a **BizTalkChannel** object refers to a **BizTalkPort** object.

To maintain referential integrity, an object instance cannot be deleted if it is referred to by another object instance. Referential integrity is maintained when the object referred to exists in the database.

Remove objects in the reverse order from which they are created. If an instance of an object referred to by another instance of an object is removed, a constraint error is returned. Using the example above, a constraint error is returned if a **BizTalkPort** object is removed that is being used by a **BizTalkChannel** object.

The following sequence shows the preferred order for creating objects to maintain the referential integrity of the objects:

1. **BizTalkOrganization**
2. **BizTalkDocument**
3. **BizTalkEnvelope** (if required)
4. **BizTalkPort**
  - The **BizTalkPort** object requires the **BizTalkOrganization** object.
  - The **BizTalkPort** object conditionally uses the **BizTalkEnvelope** object.
5. **BizTalkChannel**
  - The **BizTalkChannel** object requires the **BizTalkPort** object.
  - The **BizTalkChannel** object requires the **BizTalkDocument** object.
  - The **BizTalkChannel** object requires the **BizTalkOrganization** object.
  - The **BizTalkChannel** object conditionally uses the **BizTalkPortGroup** object if the channel is created for port groups.
6. **BizTalkPortGroup** (if used)
  - The **BizTalkPortGroup** object requires the **BizTalkPort** object.

# Security

When accessing or creating objects in the BizTalk Messaging Configuration object model, the script or application must be run in the context of a user account in the BizTalk Server Administrators group. The BizTalk Server Administrators group is created when BizTalk Server 2000 is installed. Additional users can be added to this group as necessary. For additional information, see [Add users to the BizTalk Server Administrators group](#).

# Channels

The **BizTalkChannel** object contains the configuration information related to the source entity and its binding with a **BizTalkPort** object. When BizTalk Server 2000 receives a document, a specific **BizTalkChannel** object, along with the properties configured in its associated **BizTalkPort** object or an associated **BizTalkPort** object within a **BizTalkPortGroup**, directs the server through the steps necessary to process that document. Note that multiple channels might be bound to the same **BizTalkPort** object. This represents multiple source entities that exchange documents with the same destination.

The **BizTalkChannel** object identifies the [map](#) used for document transformation if the type of the input **BizTalkDocument** object is different from the type of the output **BizTalkDocument** object. It also points to the specification that contains fields for document tracking and selects the type of logging desired.

## Related Topics

[Channel Filtering](#)

[Configuring](#)

[Document Processing](#)

[Document Storage](#)

[Document Tracking](#)

[Identification](#)

# Identification

BizTalk Server 2000 determines the appropriate **BizTalkChannel** object for processing the input document by one of the following methods:

- The source **organization** identifier, qualifier, and value, the destination organization identifier, qualifier, and value, and the name of the **BizTalkDocument** object are parameters of the **Submit** or the **SubmitSync** method of the **Interchange** object.
- The source and destination organization identifiers, qualifiers, and values, and the name of the **BizTalkDocument** object are specified in the header fields of the document instance.
- The name of the **BizTalkChannel** object is a parameter of the **Submit** or the **SubmitSync** method call.

When BizTalk Server 2000 receives a document, it first identifies all **BizTalkChannel** objects that support the specified **BizTalkDocument** object. The server then looks up each **BizTalkPort** object and determines if the **SourceOrganization** and **DestinationOrganization** properties identify the source and destination **BizTalkOrganization** objects specified by the **organization identifiers** in the document or in the parameters of **Submit** when the document is submitted. This includes any open **messaging ports** that match either the specified source organization or the destination organization.

This identification process can be bypassed by specifying the name of a **BizTalkChannel** object to be used as a parameter of **Submit** or **SubmitSync**.

## Related Topic

[Submitting](#)

# Document Processing

When BizTalk Server 2000 identifies a **BizTalkChannel** object, the server processes this object, which directs the server in the steps to process the **document**. To direct the server, the **BizTalkChannel** object follows its own rules and the rules of its associated **BizTalkPort** object.

An input **BizTalkDocument** object is related to an output **BizTalkDocument** object by a **BizTalkChannel** object. The **BizTalkPort** object must be created before an associated **BizTalkChannel** object can be created.

When BizTalk Server 2000 processes a **BizTalkChannel** object, the server calls upon each associated **BizTalkPort** object to provide the document-processing rules needed by the server. The rules set by the properties of the **BizTalkChannel** object direct the server in the initial steps of document processing, such as determining which input and output **BizTalkDocument** object to use, which **map** file to use, and what fields to track. Once a document is in its final output format, the properties of the **BizTalkPort** object direct the server in the steps to prepare and transport the document according to the rules agreed to by the source and destination **organizations**.

When a document is submitted, the server can identify multiple **BizTalkPort** and **BizTalkChannel** objects that match the source organization, the destination organization, and the specified **BizTalkDocument** object. Therefore, it is possible for one input document to generate multiple output documents. It is also possible for each output document to be transmitted to a different location by using different transport properties in the matching **BizTalkPort** objects, and for each output document instance to include a different subset of data from the original input document by using different map files.

# Configuring

A **BizTalkChannel** object consists of the internal document processing data for the specified input and output **BizTalkDocument** objects. To be fully configured, a **BizTalkChannel** object must have one complete **BizTalkPort** object identified by its **Port** property. Input and output **BizTalkDocument** objects must be specified. After the **InputDocument** and **OutputDocument** properties are selected for use in this **BizTalkChannel** object, a **BizTalkPort** object or a **BizTalkPortGroup** object must be selected.

The name of a **BizTalkChannel** object must be unique across the database for all objects of its type.

The following properties are required before a **BizTalkChannel** object can be saved:

- **InputDocument**
- **Port** (or **PortGroup**)
- **OutputDocument**
- **Name**

Once a **BizTalkChannel** object has been created or saved, only the following properties can be changed:

- **Comments**
- **ControlNumberValue**
- **MapReference**
- **Name**
- **TrackFields**

# Channel Filtering

Channel filtering enables the user to build a filtering expression to select a **BizTalkChannel** object for processing a **document instance**. The server uses these expressions to select the correct **BizTalkChannel** object. The **Expression** property contains an **XPath** expression that evaluates to a Boolean value. If the expression evaluates to true, the channel is used to process the document. Otherwise, the channel is not invoked to process the document.

XPath expressions can be used to obtain the value of a specific element, attribute, or collection of these items within an XML document. Consider the following XML document:

```
<INVOICE>
  <DATE>12/31/2000</DATE>
  <BILLTO>Vigor Airlines</BILLTO>
  <SUMMARY>
    <ITEM PARTNUMBER="10001" QUANTITY="10"/>
    <ITEM PARTNUMBER="20002" QUANTITY="20"/>
    <TOTAL VALUE="550"/>
  </SUMMARY>
</INVOICE>
```

Based on this document, the following XPath expression can be created to ensure that this channel only processes invoices that exceed \$500:

```
myChannel.Expression = "/INVOICE/SUMMARY/TOTAL[@VALUE>""500""]"
```

In this example, the channel would process the XML document instance because the total is greater than \$500. For more information about XPath expressions, go to the Microsoft Web site ([msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp)) and search for XPath.

## Note

- You can use BizTalk Messaging Manager to generate XPath channel filtering expressions. For more information, see [Add a channel filtering expression](#).

# Document Storage

You can choose how to log the activity of a [document instance](#) using the [BizTalkLoggingInfo](#) object. The default is to log the document in its native form.

For document storage, you have the options shown in the following table.

Property	Description
All properties empty	Store no copies of the document.
<a href="#">LogNativeInputDocument</a>	Store input native format (default setting).
<a href="#">LogNativeOutputDocument</a>	Store output native format.
<a href="#">LogXMLInputDocument</a>	Store input XML format.
<a href="#">LogXMLOutputDocument</a>	Store output interim (XML) format.
Any combination of these choices	Store the options as described above.

## Note

- There is a size limit for [interchanges](#) and documents that use logging, which if exceeded greatly affects the performance of BizTalk Server. For more information about the size limit, see [Interchange and document size limit](#).

# Document Tracking

A **BizTalkChannel** object points to the [specification](#) that contains fields to track the instance of the [document](#). The designated fields are logged to the [Tracking database](#) for each instance of a document that is processed. When you assign an input **BizTalkDocument** object for a **BizTalkChannel** object, you can designate fields to track within the document on this [channel](#).

When BizTalk Server 2000 runs a **BizTalkChannel** object, it uses the input **BizTalkDocument** object to process an input document. The fields that you have designated for tracking are captured and logged for each instance of that document. Any fields designated for tracking in the output **BizTalkDocument** object of the associated **BizTalkChannel** object are ignored. To retrieve the information that is tracked during document processing, use the methods of the **BTSDocTracking** object.

By logging important data from the input documents that are processed, you can track and analyze detailed information about your operation. For example, an invoice-total field can be logged for every invoice that is sent to your trading partners. You can then determine the total dollar amount of invoices sent to all trading partners over time or determine the total dollar amount of invoices to each individual trading partner.

For additional information about document tracking, see [Understanding the Tracking Database Schema](#).

# Messaging Ports

Conceptually, a messaging port is a set of rules that trading partner [organizations](#) accept for sending documents to one another. It includes information regarding the destination, [transport](#) type, security, and [envelope](#). It identifies the source and destination [BizTalkOrganization](#) objects and the source and destination aliases. It also identifies any [applications](#) associated with the organization, if applicable.

A **BizTalkPort** object identifies a specific destination organization unless it is designated as an [open messaging port](#), in which case the destination organization is not specified. For open messaging ports, the **BizTalkPort** object is valid only if the associated document or the parameters on the [Submit](#) or the [SubmitSync](#) method of the [Interchange](#) object contain the destination transport and address information.

The **BizTalkPort** object also identifies delimiter definitions and the [EDI](#) interchange control number. Delimiters are used to separate the records and fields of the envelope and the documents within the envelope. An interchange control number is used to identify and track documents that are sent using the envelope. The interchange control number is incremented with each use of the envelope at run time.

A **BizTalkPort** object also identifies the encoding, encryption, and signature type, if required.

## Note

- Once a **BizTalkPort** object has been created and saved, the destination organization and the openness associated with the endpoint cannot be changed.

## Related Topics

[Openness](#)

[Port Groups](#)

# Port Groups

The **BizTalkPortGroup** object configures a group of complete **BizTalkPort** objects for sending the same **document** to a group of trading partners. For example, you can use this when you want to send a document, such as a catalog, a price list, or a newsletter, that contains identical data to a group of trading partners. One document is sent to a list of partners by calling a single **Submit** method on the **Interchange** object.

There must be at least one **BizTalkPort** object contained by the **BizTalkPortGroup** object. You can add or remove **BizTalkPort** objects to or from a **BizTalkPortGroup** by calling the **AddPort** or the **RemovePort** method.

A **BizTalkPortGroup** object must be associated with at least one **BizTalkChannel** object. After the port group has been created, associate a **channel** with the port group by using the **PortGroup** property available on the **BizTalkChannel** object. When BizTalk Server 2000 invokes a channel related to a port group, it invokes only the channel that is associated with the port group to process the data. None of the channels that are associated with the individual ports in the port group are invoked. The server uses the properties of each port successively to transport the data to the destinations specified in the ports.

## Notes

- Open messaging ports cannot be added to a port group.
- BizTalk Messaging Manager refers to port groups as distribution lists.

## Related Topic

[Submitting](#)

# Openness

The **Openness** property of the **BizTalkEndPoint** object determines whether the **messaging port** or **channel** is open. An open **BizTalkPort** object is a messaging port without a specified destination. An open **BizTalkChannel** object is a channel without a specified source. The missing information for an open messaging port or channel must be supplied by the associated document or by the parameters on the **Submit** or the **SubmitSync** method of the **Interchange** object.

If an open channel is specified using **BIZTALK\_OPENNESS\_TYPE\_EX\_SOURCE** or an open messaging port is specified using **BIZTALK\_OPENNESS\_TYPE\_EX\_DESTINATION**, the **Type**, **Reference**, and **Store** properties cannot be specified on the **BizTalkEndPoint** object.

## Note

- If an open messaging port is used with the SMTP transport type, the value specified for the **BizTalkOrganization** identifier Reliable Messaging Acknowledgement SMTP From Address is used as the From address.

## Related Topic

[Submitting](#)

# Organizations

**BizTalkOrganization** objects serve as the source or destination for the exchange of electronic data. An organization can represent an external trading partner, your own company, or a business unit of a trading partner or your company. The home organization can designate a source application in a channel or a destination application in a [messaging port](#).

Applications are properties of the home organization. Applications can be designated as a source application in a **BizTalkChannel** object or as a destination application in a **BizTalkPort** object.

## Aliases

An alias is an [organization identifier](#) for the **BizTalkOrganization** object. There must always be one and only one default alias for a **BizTalkOrganization** object, but it can have multiple aliases. An alias is autogenerated for each **BizTalkOrganization** object. The default and the autogenerated alias cannot be removed.

For more information, see [Create and Manage Organizations](#).

# Document Definitions

The **BizTalkDocument** object describes and identifies the document specification used to describe the **document** sent or received. The document specification defines the structure of a document, as well as any validation rules and descriptions for the individual elements of the document specification. The **BizTalkDocument** object includes the version and type of the specification and, optionally, a reference to the Web Distributed Authoring and Versioning (WebDAV) location of the specification. For more information about document specifications, see [Create and Validate Specifications](#).

## Notes

- The document **Content** and **Namespace** properties are not valid until you set the **Reference** property.
- When creating a new **BizTalkDocument** object that uses a namespace that is already registered with BizTalk Server, the new document inherits the **Reference** property of that namespace. The namespace must be unique (case insensitive) for a new **Reference** to be created.

The **BizTalkDocument** object also contains the [electronic data interchange \(EDI\)](#) selection criteria by which BizTalk Server 2000 extracts information from the functional group header of the document to identify this object when the name of the **BizTalkDocument** object is not available.

A **BizTalkDocument** object points to the specification that contains fields to track the instance of the document. The designated fields are logged to the [Tracking database](#) for each document that is processed.

## Selection criteria

For some EDI input [interchanges](#), documents are contained within functional group [envelopes](#). When BizTalk Server 2000 processes such documents, it cannot obtain the name of the **BizTalkDocument** object from a field within each document. Also, because there are multiple types of documents involved, a single name cannot be specified as a parameter of the **Submit** method of the **Interchange** object. In such cases, the server can locate document-related data within the functional group header (for example, in the GS header of an X12 interchange). By comparing this data to matching [selection criteria](#) specified in the **PropertySet** property on the **BizTalkDocument** object, the server can uniquely identify a **BizTalkDocument** object. Once the **BizTalkDocument** object is identified, the server can obtain the name and then identify and instantiate the appropriate **BizTalkChannel** object.

Selection criteria also help BizTalk Server 2000 create the header of the EDI document when it is output.

## Global tracking

A **BizTalkDocument** object points to the specification from which fields can be selected for tracking. The designated fields in the input document specification are tracked for each document that is processed using that specification. Any fields designated for tracking in the output document specification are ignored. If a **BizTalkChannel** object that specifies tracking fields is used with an input document specification containing fields designated for tracking, only the fields specified by the [channel](#) are used for tracking.

By logging important data from the input documents that are processed, you can track and analyze detailed information about your operation. For example, an invoice-total field can be logged for every invoice that is sent to your trading partners. You can then determine the total dollar amount of invoices sent to all trading partners over time or determine the total dollar amount of invoices to each individual trading partner.

## Related Topics

[Document Storage](#)

[Document Tracking](#)

# Envelopes

The **BizTalkEnvelope** object consists of two pieces of information:

- The type of envelope is specified in the **Format** property. The document **Type** should match the envelope **Format** for "flatfile", "custom xml", "x12", "edifact", and "reliable" document types.
- The actual envelope file used is specified in the **Reference** property.

## Input document envelopes

An **envelope** is required if the input document **Type** is "flatfile" because the envelope contains information about how to parse the document into XML and which **parser** should process the document. Input "flatfile" documents without an envelope fail to be processed. For all other input document types, an envelope is optional.

## Output document envelopes

Envelopes are used to wrap an output document instance that has been transformed into the native format. The envelope used with an output document is specified on the **BizTalkPort** object. An envelope is required if the output document **Type** is "x12" or "edifact". However, the **Reference** property is ignored for these format types because indicating that the documents are X12 or EDIFACT is sufficient to serialize the document. For output documents with a **Type** of "custom xml", the **Reference** property is used if specified. If the **Reference** property is not specified, "custom xml" documents are submitted for processing in the transformed XML format.

### Notes

- Multiple **BizTalkPort** objects can refer to an envelope.
- The envelope **Content** and **Namespace** properties are not valid until you set the **Reference** property.
- When creating a new **BizTalkEnvelope** object that uses a namespace that is already registered with BizTalk Server, the new document inherits the **Reference** property of that namespace. The namespace must be unique (case insensitive) for a new **Reference** to be created.

# Creating Specifications and Mapping Data

Microsoft [BizTalk Server 2000](#) provides tools with which you can define the structure of a document and map data from one format to another. These tools are based on [Extensible Markup Language \(XML\)](#) and standards, and they provide the essential data translation necessary for an application-integration server.

Using [BizTalk Editor](#), you can create [specifications](#) that are based on industry standards and common [schemas](#), or you can create specifications that are unique to your organization.

Using [BizTalk Mapper](#), you can create a map between the records and fields of two different specifications. The server uses the map to process and translate data into formats that can be shared within your own organization or with your partner organizations.

The following topics are covered in this section:

- [Creating Specifications](#)
- [Mapping Data](#)
- [Troubleshooting BizTalk Editor and BizTalk Mapper](#)

# Creating Specifications

BizTalk Editor is a tool with which you can create, edit, and manage [specifications](#). BizTalk Editor uses [Extensible Markup Language \(XML\)](#), which provides a common vocabulary to handle overlaps between syntactic, database, and conceptual [schemas](#).

BizTalk Editor creates specifications by interpreting the properties of records and fields that are contained in a file. Specifications represent the structured data as XML, regardless of the original format. In addition, specifications that you create or modify in BizTalk Editor provide common data descriptions that [BizTalk Mapper](#) can use to transform data across dissimilar formats. The specifications provide data portability across business processes. A specification created using BizTalk Editor can be based on any of the following:

- [Well-formed XML](#).
- XML-based document templates.
- [XML-Data Reduced \(XDR\)](#) schemas.
- [Document type definitions \(DTDs\)](#).
- ActiveX Data Objects (ADO) recordsets stored as XML.
- [Electronic data interchange \(EDI\) \(X12 and EDIFACT\)](#).
- Flat files, including delimited and positional files (for example, SAP IDOCs). A flat file can also be both delimited and positional.
- Structured document formats.

In BizTalk Editor you can open a blank specification, which contains no structure, or you can import an existing schema or specification. For example, you can import a DTD, which is a structured file that denotes elements and attributes as well as any constraints on the order, frequency, and content of the elements and attributes. Standard specifications, such as XML, X12, or EDIFACT, can also be used to create new specifications.

When an instance of a document is imported, BizTalk Editor translates the structure of the document and produces a specification that is an XML representation of the document. You can edit any necessary records and fields that appear in the BizTalk Editor specification tree, and then save the structure as a specification. You can import the following file types:

- XDR schemas
- Well-formed XML
- DTDs

Each specification describes the structure of the file, given a specific set of tags. BizTalk Editor also provides several templates that can be used as starting points for creating specifications for common documents, such as purchase orders, invoices, and advance shipping notices.

When [BizTalk Server](#) processes documents, the server uses a [map](#), which you create by using BizTalk Mapper, to translate incoming and outgoing data from one specification format to another.

- For help with specific tasks, see [How To](#).
- For general background information, see [Concepts](#).
- For additional resources, see [Resources](#).
- For problem-solving instructions, see [Troubleshooting BizTalk Editor and BizTalk Mapper](#).

# How To...

This section provides task-specific information about how to create a [specification](#). It is highly recommended that you review the [Concepts](#) section to understand fully the relationship between records and fields and how to specify properties for the type of specification that you want to create.

The following topics are covered in this section:

- [Change BizTalk Editor Options](#)
- [Create and Validate Specifications](#)
- [Open Specifications](#)
- [Save, Export, Convert, and Close Specifications](#)
- [Manage Records and Fields](#)
- [Specify Properties for Records and Fields](#)
- [Edit Notes and Syntax Rules](#)
- [Manage Document Instances](#)
- [Manage Invalid Character Maps](#)
- [Manage Views](#)

# Change BizTalk Editor Options

1. To view or change options in the **BizTalk Editor Options** dialog box, on the **Tools** menu, click **Options**.
2. On the **General** tab, you can select the **Create a new field as an element** check box. For information about this option, see [Create a new field as an element](#).

## Related Topic

[Create a new field as an element](#)

# Create and Validate Specifications

The following procedures are covered in this section:

- [Create a specification based on a standard](#)
- [Create a specification based on a flat file](#)
- [Create a specification based on an empty template](#)
- [Create a specification based on an existing specification](#)
- [Create a specification based on an imported file](#)
- [Validate a specification](#)

# Create a specification based on a standard

1. On the **File** menu, click **New**.
2. In the **New Document Specification** dialog box, click **XML**, **X12**, or **EDIFACT**, and then click **OK**.  
If you select **EDIFACT** or **X12**, you must also select a version. Click the folder for the version that you want and click **OK**.
3. Click the specification type and click **OK**.
4. [Delete records](#), if necessary.
5. [Delete fields](#), if necessary.
6. [Clear codes](#), if necessary.
7. [Save the new specification](#).

## Related Topics

[Manage Records and Fields](#)

[Specify Properties for Records and Fields](#)

[Understanding Specifications](#)

# Create a specification based on a flat file

1. On the **File** menu, click **New**.
2. In the **New Document Specification** dialog box, click **Blank Specification** and click **OK**.
3. Highlight the root node and click the **Reference** tab.
4. Double-click the Value field in the Standard row.
5. In the **Standard** list, click **Custom**.
6. Press ENTER.
7. Click **Yes** to confirm the change.
8. [Add new records to the root node.](#)
9. [Add new records to existing records.](#)
10. [Add new fields to the root node.](#)
11. [Add new fields to records.](#)
12. [Specify Properties for Records and Fields.](#)
13. [Save the new specification.](#)

## Note

- On the **Parse** tab, you must set the **Structure** property of the root node to **Delimited** if your flat file is both delimited and positional. Additional record properties are set to either **Delimited** or **Positional**, as required.
- Flat files based on the UTF-8 code page are not supported by BizTalk Editor.

## Related Topics

[Manage Records and Fields](#)

[Specify Properties for Records and Fields](#)

[Understanding Specifications](#)

# Create a specification based on an empty template

1. On the **File** menu, click **New**.
2. In the **New Document Specification** dialog box, click **Blank Specification** and click **OK**.
3. [Add new records to the root node.](#)
4. [Add new records to existing records.](#)
5. [Add new fields to the root node.](#)
6. [Add new fields to records.](#)
7. [Specify Properties for Records and Fields.](#)
8. [Save the new specification.](#)

## Related Topics

[Manage Records and Fields](#)

[Specify Properties for Records and Fields](#)

[Understanding Specifications](#)

# Create a specification based on an existing specification

1. On the **File** menu, click **Open**.
2. In the **Open Document Specification** dialog box, browse to a folder that contains an existing specification.
3. Click a file from the list and click **Open**.
4. Modify the specification as needed.
5. On the **File** menu, click **Save As**.
6. In the **Save Document Specification As** dialog box, in the **File Name** box, type a name for the specification.
7. In the **Encoding** list, click either **UTF-8** or **Unicode** and click **Save**.

If you want to create a specification associated with ASCII characters, click **UTF-8** in the **Encoding** list. For specifications associated with double-byte characters, click **UTF-8** or **Unicode** in the **Encoding** list.

8. [Manage Records and Fields](#).
9. [Save the new specification](#).

## Related Topics

[Code List Values and Descriptions](#)

[Manage Records and Fields](#)

# Create a specification based on an imported file

1. On the **Tools** menu, click **Import**.
2. In the **Select Import Module** dialog box, click **Well-Formed XML Instance**, **Document Type Definition**, or **XDR Schema**, and then click **OK**.

If you are importing an [XML-Data Reduced \(XDR\)](#) file, click **XDR Schema**.

3. In the **Import** dialog box, browse to the folder that contains the file that you want to import.
4. Click the file that you want to import and click **Open**.

BizTalk Editor creates a specification based on the structure of the imported file. You must assign all record and field property values.

5. [Add new records to the root node](#).
6. [Add new records to existing records](#).
7. [Add new fields to the root node](#).
8. [Add new fields to records](#).
9. [Specify Properties for Records and Fields](#).
10. [Save the new specification](#).

## ◆ Important

- BizTalk Editor does not support the import of [document type definitions \(DTDs\)](#) that contain comments within elements. To import these DTDs successfully, you must edit the affected files to remove any comments within elements.
- If the file that you import has an element that has content, is repeated in the instance data, and has no children, BizTalk Editor creates it as a field, rather than a record, when it imports the structure.
- If BizTalk Editor cannot determine which element should be the root node, it displays the **Select Root Element** dialog box. Select the element that is the root node and click **OK**.
- BizTalk Editor cannot import a DTD and/or an XDR schema that contains a cyclical reference involving the root node. BizTalk Editor can import a well-formed XML document that contains a cyclical reference involving the root node, although it displays a warning indicating that cyclical references cannot involve the root node of a document. For more information, see [Cyclical References](#).
- If you import a [well-formed XML](#) file that contains a namespace on the root node, the namespace becomes the target namespace and is ignored elsewhere in the specification. For more information about target namespaces, see [Set reference properties](#).
- If you import a file that contains an element with mixed content (text information as well as subelements), the text information in that element is ignored on import.
- The following table shows what happens when you try to import XDR files or DTDs that contain certain data types. The columns represent the data types.

	"entity" and "entities"	"nmtoken" and "nmtokens"	"notation"
<b>X D R</b>	The file cannot be imported.	The file can be imported. The data types are removed.	The file cannot be imported.

<b>D</b>	The file can be imported. The data	The file can be imported. The data	The file can be imported. The data type is imported
<b>T</b>	types are removed.	types are removed.	as an enumeration type.
<b>D</b>			

## Related Topics

[Importing Files](#)

[Manage Records and Fields](#)

[Specify Properties for Records and Fields](#)

# Validate a specification

1. Open a specification or import a schema.

For more information, see [Open Specifications](#) or [Create a specification based on an imported file](#).

2. On the **Tools** menu, click **Validate Specification**.

The **Warnings** tab displays warnings indicating any problems that might exist with the specification's structure. You can double-click a warning and the record or field, and the associated property, are displayed in red in the panes above.

## Related Topics

[Create a specification based on an imported file](#)

[Open Specifications](#)

# Open Specifications

The following procedures are covered in this section:

- [Open existing specifications from a local drive](#)
- [Open existing specifications from WebDAV](#)

# Open existing specifications from a local drive

1. On the **File** menu, click **Open**.
2. In the **Open Document Specification** dialog box, browse to the folder that contains the specification that you want to open.
3. Click a file from the list and click **Open**.

## Related Topic

[Open existing specifications from WebDAV](#)

# Open existing specifications from WebDAV

1. On the **File** menu, click **Retrieve From WebDAV**.
2. In the **Retrieve from WebDAV** dialog box, in the **Server** list, type the server name and press ENTER.  
You also can select a server name from the list.
3. Browse to the folder that contains the specification that you want to open, click the specification, and then click **Open**.

## **Note**

- You might experience a delay the first time you connect to a remote [WebDAV](#) server during a session.

## **Related Topics**

[Open existing specifications from a local drive](#)

[Troubleshooting BizTalk Editor and BizTalk Mapper](#)

# Save, Export, Convert, and Close Specifications

The following procedures are covered in this section:

- [Save new specifications](#)
- [Save existing specifications](#)
- [Store specifications](#)
- [Export XDR schemas](#)
- [Convert an XDR schema to an XSD schema](#)
- [Close specifications](#)

# Save new specifications

1. On the **File** menu, click **Save As**.
2. In the **Save Document Specification As** dialog box, in the **File Name** box, type a name for the file.
3. In the **Encoding** list, click either **UTF-8** or **Unicode** and click **Save**.

If you want to save a specification associated with ASCII characters, in the **Encoding** list, click **UTF-8**. For specifications associated with double-byte characters, in the **Encoding** list, click **UTF-8** or **Unicode**.

# Save existing specifications

- On the **File** menu, click **Save**.

## **Note**

- When you save a file, BizTalk Editor stores the file on your hard disk. To save a file to [WebDAV](#), you must have permission to store the file on the server.

## **Related Topic**

[Store specifications](#)

# Store specifications

1. On the **File** menu, click **Store to WebDAV**.
2. In the **Store to WebDAV** dialog box, in the **Server** list, type the server name and press ENTER.  
You also can select a server name from the list.
3. Browse to the folder in which you want to store your specification.
4. In the **File Name** box, type the name of the file.
5. In the **Encoding** list, click either **UTF-8** or **Unicode** and click **Save**.

If you want to store a specification associated with ASCII characters, click **UTF-8** in the **Encoding** list. For specifications associated with double-byte characters, click **UTF-8** or **Unicode** in the **Encoding** list.

## ◆ Important

- You cannot store files with double-byte character set file names if you have an incorrect locale setting. To correct this problem, see [???.xml appears in the WebDAV dialog box](#).

## 📝 Notes

- You might experience a delay the first time you connect to a remote [WebDAV](#) server.
- When you store a file to WebDAV, BizTalk Editor stores the file on a server. To save a file to your hard disk, on the **File** menu, click **Save As**.

## Related Topics

[Save existing specifications](#)

[Save new specifications](#)

[Troubleshooting BizTalk Editor and BizTalk Mapper](#)

# Export XDR schemas

1. On the **Tools** menu, click **Export XDR Schema**.
2. In the **Export XDR schema as** dialog box, browse to the location to which you want to export the [XML-Data Reduced \(XDR\)](#) file.
3. In the **File name** box, type a name for the file.
4. In the **Encoding** list, click either **UTF-8** or **Unicode** and click **Save**.

If you want to export a specification associated with ASCII characters, in the **Encoding** list, click **UTF-8**. For specifications associated with double-byte characters, in the **Encoding** list, click **UTF-8** or **Unicode**.

## Notes

- You can export new and existing specifications only while they are open in BizTalk Editor.
- When you export a [specification](#), the unique specification information is removed from the structure, and the resulting structure is saved as a general schema that can be used by other applications.

## Related Topics

[Open Specifications](#)

[Convert an XDR schema to an XSD schema](#)

# Convert an XDR schema to an XSD schema

1. Create a folder on your local drive called **Convert**.
2. Copy the contents of **\Program Files\Microsoft BizTalk Server\SDK\Messaging Samples\XSDConverter** to **Convert**.
3. Copy the XDR schema to be converted to **Convert**.
4. Open a command prompt.
5. Change to the **Convert** directory.
6. At the command prompt, type

```
wscript convert.js xdrfilename.xml xsdfilename.xsd
```

The converted XSD schema, named *xsdfilename.xsd*, appears in the Convert folder.

## **Note**

- If you do not type a file name for the XSD schema, the script gives the XSD schema the name of the original XDR schema with `.xsd` appended to it. For example, if the XDR schema were named `xdrfilename.xml`, the converted XSD schema would be named `xdrfilename.xml.xsd`.

## **Related Topic**

[Export XDR schemas](#)

# Close specifications

- On the **File** menu, click **Close**.

# Manage Records and Fields

The following procedures are covered in this section:

- [Add new records to the root node](#)
- [Add new fields to the root node](#)
- [Add new records to existing records](#)
- [Add new fields to records](#)
- [Insert records](#)
- [Insert fields](#)
- [Create a new field as an element](#)
- [Change fields from attributes to elements](#)
- [Change fields from elements to attributes](#)
- [Move records within a specification](#)
- [Move fields within a specification](#)
- [Move records from one specification to another](#)
- [Move fields from one specification to another](#)
- [Copy records within a specification](#)
- [Copy fields within a specification](#)
- [Copy records from one specification to another](#)
- [Copy fields from one specification to another](#)
- [Rename a single record](#)
- [Rename a single field](#)
- [Rename all records that have the same name](#)
- [Delete records](#)
- [Delete fields](#)
- [Create cyclical references](#)
- [Create a new instance of an existing record](#)
- [Create a new instance of an existing element field](#)

# Add new records to the root node

1. Click the root node.
2. On the **Edit** menu, click **New Record**.  
A child record is inserted after the last node in the specification tree.
3. Type a name for the record and press ENTER.

## Notes

- For a non-XML file such as a flat file, you can type a **Source Tag Identifier** property to identify the tag in the non-XML source file.
- Sibling records cannot have the same name.

## Related Topic

[Specify Properties for Records and Fields](#)

# Add new fields to the root node

1. Click the root node.
2. On the **Edit** menu, click **New Field**.  
A child field is inserted after the last node in the specification tree.
3. Type a name for the field and press ENTER.

## **Note**

- Sibling fields cannot have the same name unless one field has its **Type** property set to **Attribute** and the other has its **Type** property set to **Element**.

## **Related Topics**

[Change fields from elements to attributes](#)

[Create a new field as an element](#)

[Specify Properties for Records and Fields](#)

# Add new records to existing records

1. Click a record.
2. On the **Edit** menu, click **New Record**.

A child record is inserted directly after the selected record or after the last child node of the selected record.

3. Type a name for the record and press ENTER.

## Notes

- For a non-XML file such as a flat file, you can type a **Source Tag Identifier** property to identify the tag in the non-XML source file.
- Sibling records cannot have the same name.

## Related Topic

[Specify Properties for Records and Fields](#)

# Add new fields to records

1. Click a record.
2. On the **Edit** menu, click **New Field**.

A child field is inserted directly after the selected record or after the last child node of the selected record.

3. Type a name for the field and press ENTER.

## **Note**

- Sibling fields cannot have the same name unless one field has its **Type** property set to **Attribute** and the other has its **Type** property set to **Element**.

## **Related Topics**

[Change fields from elements to attributes](#)

[Create a new field as an element](#)

[Specify Properties for Records and Fields](#)

# Insert records

1. Click a record.
2. On the **Edit** menu, click **Insert Record**.  
A sibling record is inserted directly after the selected record or after the last child node of the selected record.
3. Type a name for the record and press ENTER.

## **Note**

- Sibling records cannot have the same name.

## **Related Topic**

[Specify Properties for Records and Fields](#)

# Insert fields

1. Click the record or field after which you want to insert a field.
2. On the **Edit** menu, click **Insert Field**.  
A sibling field is inserted directly after the selected record or after the last child node of the selected record.
3. Type a name for the field and press ENTER.

## Note

- Sibling fields cannot have the same name unless one field has its **Type** property set to **Attribute** and the other has its **Type** property set to **Element**.

## Related Topics

[Change fields from elements to attributes](#)

[Create a new field as an element](#)

[Specify Properties for Records and Fields](#)

# Create a new field as an element

1. On the **Tools** menu, click **Options**.
2. In the **BizTalk Editor Options** dialog box, select the **Create a new field as an element** check box and click **OK**.

## Note

- While this check box is cleared, fields are created as attributes. However, if you select the **Create a new field as an element** check box, all new fields are created as elements.
- Sibling fields cannot have the same name unless one field has its **Type** property set to **Attribute** and the other has its **Type** property set to **Element**.

## Related Topic

[Change fields from elements to attributes](#)

# Change fields from attributes to elements

1. Click a field in the specification tree.
2. On the **Declaration** tab, double-click the Value field in the Type row. The current setting is **Attribute**.
3. In the **Type** list, click **Element** and press ENTER.
4. Click **Yes** to confirm the change.

## Note

- Sibling fields cannot have the same name unless one field has its **Type** property set to **Attribute** and the other has its **Type** property set to **Element**.

## Related Topics

[Change fields from elements to attributes](#)

[Create a new field as an element](#)

# Change fields from elements to attributes

1. Click a field in the specification tree.
2. On the **Declaration** tab, double-click the Value field in the Type row. The current setting is **Element**.
3. In the **Type** list, click **Attribute** and press ENTER.
4. Click **Yes** to confirm the change.

## Note

- Sibling fields cannot have the same name unless one field has its **Type** property set to **Attribute** and the other has its **Type** property set to **Element**.

## Related Topic

[Change fields from attributes to elements](#)

# Move records within a specification

1. Click the root node.
2. On the **View** menu, click **Expand Tree Items**.
3. Click the record that you want to move and drag it to another node in the tree.

When you release the mouse button, if the mouse pointer is in the upper half of the highlighted node text, the record is inserted above the node as a sibling. If the mouse pointer is in the lower half of the highlighted node text, the record is inserted below the node as a sibling. If the mouse pointer is to the right of highlighted node text, the record is inserted below the highlighted record as a child.

## Related Topics

[Copy records from one specification to another](#)

[Copy records within a specification](#)

[Move records from one specification to another](#)

# Move fields within a specification

1. Click the root node.
2. On the **View** menu, click **Expand Tree Items**.
3. Click the field that you want to move and drag it to another node in the tree.

When you release the mouse button, if the mouse pointer is in the upper half of the highlighted node text, the record is inserted above the node as a sibling. If the mouse pointer is in the lower half of the highlighted node text, the record is inserted below the node as a sibling. If the mouse pointer is to the right of highlighted node text, the field is inserted below the record as a child.

## Related Topics

[Copy fields from one specification to another](#)

[Copy fields within a specification](#)

[Move fields from one specification to another](#)

# Move records from one specification to another

1. Click the root node in the [specification](#) that contains the record that you want to move.
2. On the **View** menu, click **Expand Tree Items**.
3. Click the record that you want to move and, on the **Edit** menu, click **Cut**.
4. Click **Start**, point to **Programs**, point to **Microsoft BizTalk Server 2000**, and then click **BizTalk Editor**.  
You must open a second instance of BizTalk Editor to open a different specification.
5. On the **File** menu, click **Open**.
6. In the **Open Document Specification** dialog box, browse to the folder that contains the specification to which you want to move the record.
7. Click the file in the list and click **Open**.
8. Click the root node in the specification.
9. On the **View** menu, click **Expand Tree Items**.
10. Click the root node, a record, or a field after which you want to insert the record.
11. On the **Edit** menu, click **Paste**.

## Note

- If you move a record that has the same name as an existing record, BizTalk Editor automatically adds a number to the end of the record's name.

## Related Topics

[Copy records from one specification to another](#)

[Copy records within a specification](#)

[Move records within a specification](#)

# Move fields from one specification to another

1. Click the root node in the specification that contains the field that you want to move.
2. On the **View** menu, click **Expand Tree Items**.
3. Click the field that you want to move and, on the **Edit** menu, click **Cut**.
4. Click **Start**, point to **Programs**, point to **Microsoft BizTalk Server 2000**, and then click **BizTalk Editor**.  
You must open a second instance of BizTalk Editor to open a different specification.
5. On the **File** menu, click **Open**.
6. In the **Open Document Specification** dialog box, browse to the folder that contains the specification to which you want to move the record.
7. Click the file in the list and click **Open**.
8. Click the root node in the specification in which you want to move the field.
9. On the **View** menu, click **Expand Tree Items**.
10. Click the root node, a record, or a field after which you want to insert the field.
11. On the **Edit** menu, click **Paste**.

## Note

- If you move a field that has the same name as an existing field, BizTalk Editor automatically adds a number to the end of the field's name.

## Related Topics

[Copy fields from one specification to another](#)

[Copy fields within a specification](#)

[Move fields within a specification](#)

# Copy records within a specification

1. Click the root node.
2. On the **View** menu, click **Expand Tree Items**.
3. Click the record that you want to copy and, on the **Edit** menu, click **Copy**.
4. Click the node after which you want to insert the record and, on the **Edit** menu, click **Paste**.

If the selected node is a record, a child record is inserted directly after the selected node. If the selected node is a field, a sibling record is inserted directly after the selected node.

## Related Topics

[Copy records from one specification to another](#)

[Move records from one specification to another](#)

[Move records within a specification](#)

# Copy fields within a specification

1. Click the root node.
2. On the **View** menu, click **Expand Tree Items**.
3. Click the field that you want to copy and, on the **Edit** menu, click **Copy**.
4. Click a node after which you want to insert the field and, on the **Edit** menu, click **Paste**.

If the selected node is a record, a child field is inserted directly after the selected node. If the selected node is a field, a sibling field is inserted directly after the selected node.

## Related Topics

[Copy fields from one specification to another](#)

[Move fields from one specification to another](#)

[Move fields within a specification](#)

# Copy records from one specification to another

1. Click the root node in the [specification](#) that contains the record that you want to copy.
2. On the **View** menu, click **Expand Tree Items**.
3. Click the record that you want to copy and, on the **Edit** menu, click **Copy**.
4. Click **Start**, point to **Programs**, point to **Microsoft BizTalk Server 2000**, and then click **BizTalk Editor**.  
You must open a second instance of BizTalk Editor to open a different specification.
5. On the **File** menu, click **Open**.
6. In the **Open Document Specification** dialog box, browse to the folder that contains the specification to which you want to move the record.
7. Click the file in the list and click **Open**.
8. Click the root node in the specification in which you want to copy the record.
9. On the **View** menu, click **Expand Tree Items**.
10. Click the root node, record, or field after which you want to insert the record and, on the **Edit** menu, click **Paste**.  
If the selected node is a record, a child record is inserted directly after the selected node. If the selected node is a field, a sibling record is inserted directly after the selected node.

## Note

- If you copy a record that has the same name as an existing record, BizTalk Editor automatically adds a number to the end of the record's name.

## Related Topics

[Copy records within a specification](#)

[Move records from one specification to another](#)

[Move records within a specification](#)

# Copy fields from one specification to another

1. Click the root node in the [specification](#) that contains the field that you want to copy.
2. On the **View** menu, click **Expand Tree Items**.
3. Click the field that you want to copy and, on the **Edit** menu, click **Copy**.
4. Click **Start**, point to **Programs**, point to **Microsoft BizTalk Server 2000**, and then click **BizTalk Editor**.  
You must open a second instance of BizTalk Editor to open a different specification.
5. On the **File** menu, click **Open**.
6. In the **Open Document Specification** dialog box, browse to the folder that contains the specification to which you want to move the field.
7. Click the file in the list and click **Open**.
8. Click the root node in the specification to which you want to copy the field.
9. On the **View** menu, click **Expand Tree Items**.
10. Click the root node, a record, or a field after which you want to paste the record and, on the **Edit** menu, click **Paste**.  
If the selected node is a record, a child field is inserted directly after the selected node. If the selected node is a field, a sibling field is inserted directly after the selected node.

## Note

- If you copy a field that has the same name as an existing field, BizTalk Editor automatically adds a number to the end of the field's name.

## Related Topics

[Copy fields within a specification](#)

[Move fields from one specification to another](#)

[Move fields within a specification](#)

# Rename a single record

1. Click the record that you want to rename.
2. On the **Edit** menu, click **Rename**.
3. Type a new name for the record and press ENTER.

## Related Topics

[Rename all records that have the same name](#)

[Rename a single field](#)

# Rename a single field

1. Click the field that you want to rename.
2. On the **Edit** menu, click **Rename**.
3. Type a new name for the field and press ENTER.

## **Note**

- Fields that are elements cannot have the same name as an existing record.

## **Related Topics**

[Rename all records that have the same name](#)

[Rename a single record](#)

# Rename all records that have the same name

1. Click any record that has the name that you want to change.
2. On the **Edit** menu, click **Rename All *record name***.
3. Type a new name for the records.  
All records that have the same name are renamed.

## **Note**

- This command is unavailable on the **Edit** menu unless there are at least two records with the same name.

## **Related Topics**

[Rename a single field](#)

[Rename a single record](#)

# Delete records

1. Click the record that you want to delete.
2. On the **Edit** menu, click **Delete**.
3. Click **Yes** in the confirmation dialog box.

## ⚠ Caution

- When you delete a record, all child records and fields are deleted.

## Related Topic

[Delete fields](#)

# Delete fields

1. Click the field that you want to delete.
2. On the **Edit** menu, click **Delete**.
3. Click **Yes** in the confirmation dialog box.

## Related Topic

[Delete records](#)

# Create cyclical references

1. Select a record below which you want to create a cyclical reference.

This is the base record.

2. On the **Edit** menu, click **New Record**.

3. Name the new record the same name as the base record and press ENTER.

A cyclical reference  is created.

4. On the **Declaration** tab, double-click the Value field in the Cycle Count row.

5. Type a number from 1 to 7 and press ENTER.

## ◆ Important

- The **Minimum Occurrences** property on the **Reference** tab for the cyclical reference node must be set to **0**. Setting it to **1** will cause an infinite loop.

## 📝 Note

- You cannot use cyclic references in non-XML specifications. Make sure that you use an XML-based specification.

## Related Topic

[Cyclical References](#)

# Create a new instance of an existing record

1. Click a node where you want to create a new instance of an existing record.
2. On the **Edit** menu, click **New Record** or **Insert Record**.

## **Note**

- If you selected a field in step 1, **New Record** is unavailable on the **Edit** menu.
3. Name the new record the same name as the existing record and press ENTER.

You have created two instances of the same record.

## **Important**

- You cannot name a new record instance the same name as a sibling record.
- If you name a new record the same name as an ancestor record, you create a cyclical reference, not a new instance of the existing record. For more information, see [Cyclical References](#).

## **Notes**

- If you click **New Record**, the new record instance is inserted as a descendant of the record that you selected.
- If you click **Insert Record**, the new record instance is inserted as a sibling of the record or field that you selected.
- The node structure below instances of a record is identical; if you remove or add a node to one instance of a record, that change is automatically reflected in all other instances of the record. Some properties of record instances are identical, and other properties can be set independently for each instance. For more information about which properties are identical across record instances and which are not, see [Property Scope](#).
- You cannot name an existing record the same name as another existing record.
- An alternative way to create a new instance of an existing record is to press the CTRL key and drag an existing record to the right of the node below which you want to insert the new record instance.

## **Related Topics**

[Cyclical References](#)

[Property Scope](#)

# Create a new instance of an existing element field

1. Select a node where you want to create a new instance of an element field.

## Note

- You can create multiple instances of fields only of type **Element** (on the **Declaration** tab). You cannot create multiple instances of fields of type **Attribute**. If you create two or more attribute fields with the same name, the fields remain completely independent of each other.

2. On the **Edit** menu, click **New Field** or **Insert Field**.

## Note

- If you selected a field in step 1, **New Field** is unavailable on the **Edit** menu.

3. Name the new field the same name as the existing field and press ENTER.

You have created two instances of the same field.

## Important

- You cannot name a new element field instance the same name as a sibling element field instance.

## Notes

- If you click **New Field**, the new field instance is inserted as a descendant of the record that you selected.
- If you click **Insert Field**, the new field instance is inserted as a sibling of the record or field that you selected.
- Some properties of field instances are identical, and other properties can be set independently for each instance. For more information about which properties are identical across field instances and which are not, see [Property Scope](#).
- You cannot name an existing field the same name as another existing field, unless one field has its **Type** property set to **Attribute** and the other field has its **Type** property set to **Element**.
- An alternative way to create a new instance of an existing element field is to press the CTRL key and drag an existing element field to the right of the node below which you want to insert the new field instance.

## Related Topics

[Cyclical References](#)

[Property Scope](#)

# Specify Properties for Records and Fields

This section includes information about the following topics:

- [Set declaration properties](#)
- [Set reference properties](#)
- [Set parse properties](#)
- [Declare namespaces](#)
- [Add custom annotations](#)
- [Edit custom annotations](#)
- [Delete custom annotations](#)
- [Set dictionary properties](#)
- [Add a custom dictionary property](#)
- [Rename a custom dictionary property](#)
- [Clear a dictionary property](#)
- [Delete a custom dictionary property](#)
- [Select codes](#)
- [Clear codes](#)
- [Clear a property for any field in the Value column](#)
- [Automatically calculate field positions](#)

# Set declaration properties

1. In the [specification](#) tree, click the root node, a record, or a field for which you want to set a property, and then click the **Declaration** tab.
2. Double-click the field in the Values column that is associated with the property that you want to set.
3. Type data in the field or click the down arrow to select from a list of available options.
4. Press ENTER to accept your changes.

The **Declaration** tab contains the properties shown in the following tables. The properties that you select are set for the root node, a record, or a field, depending on which node you have selected.

## Declaration Tab: Root Node Properties

<b>P</b> r o p e r t y	<b>Value</b>
<b>N</b> a m e	<p>The name of the root node.</p> <p> <b>Note</b></p> <p>If you change the <b>Name</b> value on the <b>Declaration</b> tab, the name of the root node in the specification tree automatically changes to match it. In a newly created specification, changing the <b>Name</b> value on the <b>Declaration</b> tab also changes the <b>Schema Name</b> value on the <b>Reference</b> tab. However, since it is possible to have a schema name that is different from the root node name, changing the <b>Schema Name</b> value has no effect on the <b>Name</b> value or the root node name in the specification tree. Once the <b>Schema Name</b> value has been edited, however, changing the <b>Name</b> value or the root node name has no effect on the <b>Schema Name</b> value.</p>
<b>D</b> e s c r i p t i o n	The description of the specification.
<b>T</b> y p e	The type of record.
<b>M</b> o d e l	<p><b>Closed.</b> Indicates that the data contained in the document instance and the specification structure match.</p> <p><b>Open.</b> Indicates that the data in the document instance does not totally adhere to the structure of the specification.</p> <ul style="list-style-type: none"> <li>• If this property value is left blank, the default value is <b>Open</b>.</li> </ul>
<b>C</b> o n t e n t	<p><b>Element Only.</b> Indicates that the root node can contain only elements. This is the automatic default when the root contains a child record.</p> <p><b>Empty.</b> Indicates that the root node cannot contain subelements.</p> <p><b>Text Only.</b> Indicates that the root node can contain text and not subelements.</p> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• BizTalk Editor does not support elements that contain mixed content (text information as well as subelements).</li> </ul>

<b>Order</b>	<p>Select one of the following values:</p> <ul style="list-style-type: none"> <li>• <b>One.</b> Indicates that one and only one of the constituent elements can appear.</li> <li>• <b>Sequence.</b> Indicates that the constituent elements must appear in the order specified.</li> <li>• <b>Many.</b> Indicates that zero or more of the constituent elements can appear, in any order or combination.</li> </ul>
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### Declaration Tab: Record Properties

Property	Value
<b>Name</b>	The name of the record.
<b>Description</b>	The description of the record.
<b>Type</b>	The type of record.
<b>Model</b>	<p><b>Closed.</b> Indicates that the data contained in the document instance and the specification structure match.</p> <p><b>Open.</b> Indicates that the data in the document instance and the specification structure do not match.</p> <ul style="list-style-type: none"> <li>• If this property value is left blank, the default value is <b>Open</b>.</li> </ul>
<b>Content</b>	<p><b>Element Only.</b> Indicates that the record can contain only elements. This is the automatic default for any record that contains a child record.</p> <p><b>Empty.</b> Indicates that the record cannot contain subelements.</p> <p><b>Text Only.</b> Indicates that the record can contain text and not subelements.</p> <p> <b>Note</b></p> <p>BizTalk Editor does not support elements that contain mixed content (text information as well as subelements).</p>
<b>Order</b>	<p>Select one of the following values:</p> <ul style="list-style-type: none"> <li>• <b>One.</b> Indicates that one and only one of the constituent elements can appear.</li> <li>• <b>Sequence.</b> Indicates that the constituent elements must appear in the order specified.</li> <li>• <b>Many.</b> Indicates that zero or more of the constituent elements can appear, in any order or combination.</li> </ul>
<b>Cycle Count</b>	<p>Type the number of cycles you want to be available below the base record. For more information, see <a href="#">Cyclical References</a>.</p> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• This property field appears only if you have created a cyclical reference.</li> </ul>

### Declaration Tab: Field Properties

Property	Value
<b>Name</b>	The name of the field.
<b>Description</b>	The description of the field.

<b>Type</b>	<p>Select one of the following values:</p> <ul style="list-style-type: none"> <li>• <b>Element</b></li> <li>• <b>Attribute</b></li> </ul>
<b>Model</b>	<p><b>Closed.</b> Indicates that the data contained in the document instance and the specification structure match.</p> <p><b>Open.</b> Indicates that the data in the document instance and the specification structure do not match.</p> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• If this property value is left blank, the default value is <b>Open</b>.</li> <li>• The <b>Model</b> property is available only for a field with its Type value set to <b>Element</b>.</li> </ul>
<b>Content</b>	<p><b>Text Only.</b> Indicates that the record can contain text and not subelements.</p> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• The <b>Content</b> property is available only for a field with its Type value set to <b>Element</b>.</li> <li>• <b>Text Only</b> is the only value available for the <b>Content</b> property of a field.</li> </ul>
<b>Data Type</b>	<p>A valid data type. For a list and description of all valid data types, see <a href="#">Summary of Data Type and Data Type Values</a>.</p> <p> <b>Important</b></p> <ul style="list-style-type: none"> <li>• If the <b>Standard</b> property value on the <b>Reference</b> tab is set to <b>X12</b>, <b>EDIFACT</b>, or <b>Custom</b>, you can assign a <b>Custom Data Type</b> value on the <b>Parse</b> tab. If you specify a <b>Custom Data Type</b> value, the value in the <b>Data Type</b> field is automatically changed to match the selection that you specified for the <b>Custom Data Type</b> value. If you already have a value specified in the <b>Custom Data Type</b> field and then specify a value in the <b>Data Type</b> field on the <b>Declaration</b> tab, the value specified in the <b>Custom Data Type</b> field is cleared.</li> <li>• In a specification, if you create a field with the <b>Data Type</b> property set to <b>IDREF</b> or <b>IDREFS</b>, you must create another field in that specification with the <b>Data Type</b> set to <b>ID</b>.</li> <li>• To select a field for tracking or for use in a channel filtering expression in BizTalk Messaging Manager, you must assign a data type to that field in the specification.</li> </ul>
<b>Data Type Values</b>	<p>If you select <b>Enumeration</b> in the <b>Data Type</b> list, the data type values "a b c" appear by default in the <b>Data Type Values</b> box. You can replace the default values with custom values separated by spaces.</p> <p>If you working with an <a href="#">X12</a> or <a href="#">EDIFACT</a> document and include codes associated with a particular field, those codes automatically appear in the <b>Data Type Values</b> box, and <b>Enumeration</b> automatically appears in the <b>Data Type</b> box.</p>
<b>Minimum Length</b>	<p>The minimum number of characters that the field can contain.</p> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• The <b>Minimum Length</b> property can be set only for fields with the following <b>Data Type</b> values: <b>String</b>, <b>Number</b>, <b>Binary (base64)</b>, and <b>Binary (hex)</b>.</li> </ul>
<b>Maximum Length</b>	<p>The maximum number of characters that the field can contain.</p> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• The <b>Maximum Length</b> property can be set only for fields with the following <b>Data Type</b> values: <b>String</b>, <b>Number</b>, <b>Binary (base64)</b>, and <b>Binary (hex)</b>.</li> </ul>

<b>Default Value</b>	<p>The value that is provided if the incoming document instance does not contain the field. For more information, see <a href="#">Default Value Integration</a>.</p> <p><b>Note</b></p> <ul style="list-style-type: none"><li>The <b>Default Value</b> property appears only in specifications when the <b>Standard</b> property (on the <b>Reference</b> tab for the root node) is set to <b>XML</b>, and the <b>Type</b> property (on the <b>Declaration</b> tab for the field) is set to <b>Attribute</b>.</li></ul>
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## Related Topics

[Add channel filtering expressions](#)

[Cyclical References](#)

[Default Value Integration](#)

[Select specification fields in a channel](#)

[Select specification fields in a document definition](#)

[Summary of Data Type and Data Type Values](#)

# Set reference properties

1. In the [specification](#) tree, click the root node, a record, or a field for which you want to set a property, and then click the **Reference** tab.
2. Double-click the field in the **Value** column that is associated with the property that you want to set.
3. Type data in the **Value** column field or click the down arrow to select from a list of available options.

The **Reference** tab contains the properties described in the following tables. The properties that you select are set for the root node, a record, or a field, depending on which node you have selected.

## Reference Tab: Root Node Properties

Property	Value
<b>Specification Name</b>	The name of the specification. This name corresponds to the value of the <code>&lt;Schema&gt;</code> tag in the specification.
<b>Standards</b>	Select one of the following values: <ul style="list-style-type: none"> <li>• <b>XML</b> for creating a specification based on <a href="#">Extensible Markup Language (XML)</a>.</li> <li>• <b>X12</b> for creating a specification based on <a href="#">X12</a>.</li> <li>• <b>EDIFACT</b> for creating a specification based on <a href="#">EDIFACT</a>.</li> <li>• <b>Custom</b> for creating a specification based on flat file, or for creating a custom specification to be parsed with a custom parser.</li> </ul>
<b>Standards Version</b>	The standards version, such as X12 <a href="#">version</a> 4010, on which the specification is based.
<b>Document Type</b>	The document type, such as 850, on which the specification is based.
<b>Version</b>	The version number of the <a href="#">document standard</a> on which the specification is based.
<b>Default Record Delimiter</b>	Type or select a character to be used as the delimiter within any node for which the Delimiter Type on the <b>Parse</b> tab is set to Default Record Delimiter. <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• This property field displays only if the Standard field on the <b>Reference</b> tab (for the root node) is set to Custom.</li> </ul>
<b>Default Field Delimiter</b>	Type or select a character to be used as the delimiter within any node for which the Delimiter Type on the <b>Parse</b> tab is set to Default Field Delimiter. <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• This property field displays only if the Standard field on the <b>Reference</b> tab (for the root node) is set to Custom.</li> </ul>
<b>Default Subfield Delimiter</b>	Type or select a character that will be used as the delimiter within any node for which the Delimiter Type on the <b>Parse</b> tab is set to Default Subfield Delimiter. <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• This property field displays only if the Standard field on the <b>Reference</b> tab (for the root node) is set to Custom.</li> </ul>
<b>Default Escape Character</b>	Type or select a character that will be used as the escape character within any node for which the Escape Type on the <b>Parse</b> tab is set to Default Escape Delimiter. <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• This property field displays only if the Standard field on the <b>Reference</b> tab (for the root node) is set to Custom.</li> </ul>

<b>Code Page</b>	<p>Choose one of the following values:</p> <ul style="list-style-type: none"> <li>● Arabic (1256)</li> <li>● Baltic (1257)</li> <li>● Central-European (1250)</li> <li>● Cyrillic (1251)</li> <li>● Greek (1253)</li> <li>● Hebrew (1255)</li> <li>● Japanese-Shift-JIS (932)</li> <li>● Korean (949)</li> <li>● Little-Endian-UTF16 (1200)</li> <li>● Simplified-Chinese-GBK (936)</li> <li>● Thai (874)</li> <li>● Traditional-Chinese-Big5 (950)</li> <li>● Turkish (1254)</li> <li>● Vietnamese (1258)</li> <li>● Western-European (1252)</li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>● This property field displays only if the Standard field on the <b>Reference</b> tab (for the root node) is set to Custom.</li> <li>● UTF7 (65000) and UTF8 (65001) are not supported by BizTalk Server.</li> <li>● If the <b>Code Page</b> value is left blank, the default value is <b>Western-European (1252)</b>.</li> </ul>
<b>Receipt</b>	<p>Choose one of the following options:</p> <ul style="list-style-type: none"> <li>● <b>Yes.</b> Indicates that the specification is to be used as an inbound receipt document. A correlator component (X12, EDIFACT, or CUSTOM) is expected to correlate the receipt document to the outbound document that it acknowledges (in other words, something previously sent to the sender of the receipt).</li> <li>● <b>No.</b> Indicates that the specification is not to be used as an inbound receipt document.</li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>● If the receipt value is left blank, the default value is <b>No</b>.</li> <li>● For specifications based on the CanonicalReceipt and for specifications to which the CanonicalReceipt is mapped (both are used in the scenario of generating an outbound receipt), the <b>Receipt</b> property should be set to <b>No</b>.</li> </ul>

<b>Envelope</b>	<p>Choose one of the following options:</p> <ul style="list-style-type: none"> <li>• <b>Yes.</b> Indicates that the specification is an interchange specification.</li> <li>• <b>No.</b> Indicates that the specification is not an interchange specification.</li> </ul>
<b>Target Namespace</b>	<p>If you have a <a href="#">BizTalk Framework</a> instance and have specified a namespace in the instance, you must enter the corresponding namespace used in the instance.</p> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• If you use "x-schema" in the target namespace value of an instance you might cause a test failure when you test the instance in <a href="#">BizTalk Mapper</a>.</li> </ul>

### Reference Tab: Record Properties

Property	Value
<b>Minimum Occurrences</b>	<p>The minimum number of times a record can occur in its position within the node hierarchy. Possible values are <b>0</b> or <b>1</b>.</p> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• If this property value is left blank, the default value is <b>1</b>.</li> </ul>
<b>Maximum Occurrences</b>	<p>The maximum number of times a record can occur in its position within the node hierarchy. Possible values are <b>1</b> and <b>*</b>.</p> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• If you type an asterisk (*), the record is considered to be a looping record. If this specification is used in BizTalk Mapper, it <a href="#">compiles</a> this record as a loop. If you type <b>1</b>, BizTalk Mapper does not consider this record to be a looping record.</li> <li>• If this property value is left blank, the default value is <b>1</b>.</li> </ul>

### Reference Tab: Field Properties

Property	Value
<b>Required</b>	<p>Choose one of the following options:</p> <ul style="list-style-type: none"> <li>• <b>Yes.</b> Indicates that the field is required.</li> <li>• <b>No.</b> Indicates that the field is not required.</li> <li>• If this property value is left blank, the default value is <b>No</b>.</li> </ul>
<b>Start Position</b>	<p>A number that indicates the starting position of the field in the record.</p> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• This property field displays only if the structure of the parent record is positional.</li> </ul>
<b>End Position</b>	<p>A number that indicates the ending position of the field in the record.</p> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• This property field displays only if the structure of the parent record is positional.</li> </ul>

### Related Topic

Calculating Field Positions

Understanding Receipts

# Set parse properties

1. In the [specification](#) tree, click the root node, a record, or a field for which you want to set a property, and then click the **Parse** tab.
2. Double-click the field in the **Value** column that is associated with the property that you want to set.
3. Type data in the field or click the down arrow to select from a list of available options.

The **Parse** tab contains the properties described in the following tables. The available properties depend on the standard ([X12](#), [EDIFACT](#), or Custom) and on the structure property that you use. By default, new specifications based on a blank specification have a standard property of [Extensible Markup Language \(XML\)](#). For each property, enter a value as needed. The properties that you select are set for the root node, a record, or a field, depending on which node you have selected.

## Standard: XML

### Parse Tab: Root Node, Record, and Field Properties.

These properties do not display.

## Standard: X12 or EDIFACT

### ◆ Important

- The **Wrap**, **Pad**, **Escape**, and **Delimiter** values for a record and its child fields should be mutually exclusive.
- It is highly recommended that you ensure that the wrap character is different from the escape character.

### Parse Tab: Root Node or Record Properties

Property	Value
<b>Structure</b>	<p>This value automatically defaults to <b>Delimited</b> for the root node.</p> <p> <b>Note</b></p> <ul style="list-style-type: none"><li>• If the <b>Standard</b> property value is set to <b>X12</b> or <b>EDIFACT</b> on the <b>Reference</b> tab for the root node of a specification, you cannot edit the <b>Structure</b> property value on the <b>Parse</b> tab for the root node or any record. If you want to edit the <b>Structure</b> property value, you must change the standard to <b>CUSTOM</b>.</li></ul>
<b>Source Tag Identifier</b>	<p>The name of the source tag identifier. This is the tag name that is used to match the record with the data.</p> <p> <b>Note</b></p> <ul style="list-style-type: none"><li>• For a non-XML file such as a flat file, you can type a <b>Source Tag Identifier</b> property to identify any tag that might exist in the original file.</li><li>• The <b>Source Tag Identifier</b> property is case sensitive.</li></ul>
<b>Field Order</b>	<p>Select one of the following options:</p> <ul style="list-style-type: none"><li>• <b>Prefix.</b> A prefix delimiter appears before each component, and each member of a component in a series. For example, where * is the delimiter: *a*a*b*c.</li><li>• <b>Postfix.</b> A postfix delimiter appears after each component, and each member or a component in a series. For example, where * is the delimiter: a*a*b*c*.</li><li>• <b>Infix.</b> An infix delimiter appears between components, and members of components in a series. For example, where * is the delimiter: a*a*b*c. This is the inherent field order for all EDI documents.</li></ul> <p> <b>Note</b></p> <ul style="list-style-type: none"><li>• If the <b>Field Order</b> value is left blank, the default value is <b>Prefix</b>.</li></ul>

<b>Delimiter Type</b>	<p>Select one of the following options to choose a delimiter for the child nodes directly below the current node:</p> <ul style="list-style-type: none"> <li>• <b>Default Record Delimiter.</b> Indicates that the delimiter is the value of the <b>Default Record Delimiter</b> property, which is defined in the document instance.</li> <li>• <b>Default Field Delimiter.</b> Indicates that the delimiter is the value of the <b>Default Field Delimiter</b> property, which is defined in the document instance</li> <li>• <b>Default Subfield Delimiter.</b> Indicates that the delimiter is the value of the <b>Default Subfield Delimiter</b> property, which is defined in the document instance</li> </ul>
<b>Escape Type</b>  (Also known as a release character)	<p>Select the following option to indicate that you want an escape character for the child nodes directly below the current node:</p> <ul style="list-style-type: none"> <li>• <b>Default Escape Character.</b> Indicates that the escape character is a value defined in the document instance.</li> </ul> <p>An escape character is useful if you have a character in your field data that is also used as the delimiter character for the field's parent node. For example, if your field data is</p> <p><i>Browne,Peter,1231,yes</i></p> <p>and you have chosen a comma as the delimiter value of the node that contains the field, BizTalk Editor interprets the comma after "Browne" to be a delimiter, even if you intend for it to be part of the field data. A solution for this is to place an escape character directly preceding the delimiter character that you want to include in the field data. For example, if your escape character is specified as a backslash, you can place a backslash directly preceding a delimiter character as in the following example:</p> <p><i>Browne\Peter,1231,yes</i></p> <p>The comma after the backslash is interpreted by BizTalk Editor as field data rather than a delimiter character.</p> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• The <b>Escape Type</b> property is not available for <b>X12</b> specifications.</li> </ul>
<b>Append New Line</b>	<p>Select one of the following options:</p> <ul style="list-style-type: none"> <li>• <b>Yes.</b> Indicates that when the <b>serializer</b> reaches the record delimiter, the serializer automatically appends a new line (LF,0x0A).</li> <li>• <b>No.</b> Indicates that when the serializer reaches the record delimiter, the serializer continues on the same line for the following record.</li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• If the <b>Append New Line</b> value is left blank, the default value is <b>No</b>.</li> </ul>
<b>Skip Carriage Return</b>	<p>Select one of the following options:</p> <ul style="list-style-type: none"> <li>• <b>Yes.</b> Tells the <b>parser</b> to skip the carriage return (CR) value after a delimiter.</li> <li>• <b>No.</b> Tells the parser not to skip the CR value after a delimiter.</li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• If the <b>Skip Carriage Return</b> value is left blank, the default value is <b>Yes</b>.</li> </ul>

<b>Skip Line Feed</b>	<p>Select one of the following options:</p> <ul style="list-style-type: none"> <li>• <b>Yes.</b> Tells the parser to skip the line feed (LF) value after a delimiter.</li> <li>• <b>No.</b> Tells the parser not to skip the LF value after a delimiter.</li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• If the Skip Line Feed value is left blank, the default value is <b>Yes</b>.</li> </ul>
<b>Ignore Record Count</b>	<p>Select one of the following options:</p> <ul style="list-style-type: none"> <li>• <b>Yes.</b> Tells the parser or the serializer not to count this record when counting the total number of records in the specification.</li> <li>• <b>No.</b> Tells the parser or the serializer to count this record when counting the total number of records in the specification.</li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>• When a document instance is submitted to <a href="#">BizTalk Server</a>, if the number of records in the document instance does not match the calculated number of records in the specification, a parsing failure results. For more information, see <a href="#">Parsing errors</a>.</li> <li>• If the <b>Ignore Record Count</b> value is left blank, the default value is <b>Yes</b>.</li> </ul>

**Parse Tab: Field Properties**

Property	Value
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<b>Custom Data Type</b>	<p>Select one of the following options:</p> <ul style="list-style-type: none"> <li>• <b>String (AN)</b>. AN is for alphanumeric fields.</li> <li>• <b>Binary Hexadecimal (B)</b>. B is for binary fields.</li> <li>• <b>Date (CY)</b>. CY is for four-digit date fields.</li> <li>• <b>Number (D0-D4)</b>. D0 through D4 (inclusive) are for decimal fields. The single-digit number represents the number of digits to the right of the decimal.</li> <li>• <b>Date (DT)</b>. DT is for date fields.</li> <li>• <b>String (ID)</b>. ID is for identification fields.</li> <li>• <b>Number (N)</b>. N is for integer fields.</li> <li>• <b>Number (N0-9)</b>. N0 through N9 (inclusive) are for implied decimal fields (the decimal character does not appear in the data). The single-digit number represents the number of digits to the right of the decimal.</li> <li>• <b>Number (R)</b>. R is for real number fields.</li> <li>• <b>Number (R0-R9)</b>. R0 through R9 (inclusive) are for real number fields. The single-digit number represents the number of digits to the right of the decimal.</li> <li>• <b>Time (TM)</b>. TM is for time fields.</li> </ul> <p>◆ <b>Important</b></p> <ul style="list-style-type: none"> <li>• If you specify a <b>Custom Data Type</b> value, the value in the <b>Data Type</b> field on the <b>Declaration</b> tab is automatically changed to match the selection that you specified for the <b>Custom Data Type</b> value. For example, if you change the <b>Custom Data Type</b> on the <b>Parse</b> tab to <b>Date (CY)</b>, the <b>Data Type</b> value on the <b>Declaration</b> tab automatically changes to <b>Date</b>. If you specify a value in the <b>Data Type</b> field on the <b>Declaration</b> tab, the value specified in the <b>Custom Data Type</b> field is cleared.</li> </ul> <p>📝 <b>Notes</b></p> <ul style="list-style-type: none"> <li>• If you specify <b>Date (DT)</b>, <b>Date (CY)</b>, or <b>Time (TM)</b> for the <b>Custom Data Type</b> property, you must also set a value for the <b>Custom Date/Time Format</b> property.</li> <li>• All of these custom data type values are supported in specifications with the <b>Standard</b> property set to <b>X12</b>. For specifications with the <b>Standard</b> property set to <b>EDIFACT</b>, the supported custom data type values are <b>String (AN)</b> and <b>Number (N)</b>.</li> </ul>
<b>Custom Date/Time Format</b>	<p>If you set <b>Date (DT)</b>, <b>Date (CY)</b>, or <b>Time (TM)</b> as the <b>Custom Data Type</b> property, click an option in the list.</p> <p>📝 <b>Note</b></p> <ul style="list-style-type: none"> <li>• This property field is available only if the <b>Custom Data Type</b> is set to <b>Date (DT)</b>, <b>Date (CY)</b>, or <b>Time (TM)</b>.</li> </ul>
<b>Justification</b>	<p>Select one of the following options:</p> <ul style="list-style-type: none"> <li>• <b>Left</b>. Aligns data to the left in <a href="#">positional files</a> when the data is less than the maximum field length. Also aligns data to the left in delimited files when the amount of data is less than the minimum length requirement.</li> <li>• <b>Right</b>. Aligns data to the right in positional files.</li> </ul> <p>📝 <b>Note</b></p> <ul style="list-style-type: none"> <li>• If the <b>Justification</b> value is left blank, the default value is <b>Left</b>.</li> </ul>

<b>Pad Character</b>	Type a character to pad the field. You can choose any character for a pad character, including a space or a zero. For more information, see <a href="#">Pad Characters</a> .
<b>Wrap Character</b>	<p>Type a character to enclose field data. This property is useful if you have a character in your field data that is also used as the delimiter value for the field's parent node. For example, if your field data is</p> <p><i>Browne,Peter,1231,yes</i></p> <p>and you have chosen a comma as the delimiter value of the node that contains the field, BizTalk Editor interprets the comma after "Browne" to be a delimiter, even if you intend for it to be part of the field data. A solution for this is to define a value for the wrap character property and then enclose the field data in the wrap character. For example, you can set the wrap character property to double quotation marks for the first field and then type your field data as in the following example:</p> <p><i>"Browne,Peter",1231,yes</i></p> <p>The comma between the double quotation marks is interpreted by BizTalk Editor to be field data rather than a delimiter value.</p> <p><b>Notes</b></p> <ul style="list-style-type: none"> <li>If your field data includes characters that are also used as the wrap character, you must enclose those characters in another set of wrap characters.</li> </ul> <p>For example, with the wrap character value set to double quotation marks,</p> <p><i>"Browne,Peter ""Pete"""</i></p> <p>is parsed by BizTalk Editor to appear as</p> <p><i>Browne,Peter "Pete"</i></p> <ul style="list-style-type: none"> <li>If the field data in an input document instance includes the line feed character followed directly by the carriage return character, the corresponding field data in the output document instance includes only the line feed character, even if both are enclosed in a set of wrap characters.</li> </ul>
<b>Minimum Length with Pad Character</b>	<p>The minimum length of a field in an output document instance, including pad characters. For more information about pad characters, see <a href="#">Pad Characters</a>.</p> <p><b>Notes</b></p> <ul style="list-style-type: none"> <li>This property is available only if the pad character is set for that field.</li> <li>If the <b>Minimum Length</b> property on the <b>Declaration</b> tab is set for the field, the <b>Minimum Length with Pad Character</b> property must be greater than or equal to the value of the <b>Minimum Length</b> property. If the <b>Minimum Length</b> property is not set, the <b>Minimum Length with Pad Character</b> property must be greater than or equal to one.</li> </ul>

**Standard: Custom**

**Structure Property: Delimited**

**Important**

- The **Wrap**, **Pad**, **Escape**, and **Delimiter** values for a record and its child fields should be mutually exclusive.

- It is highly recommended that you ensure that the wrap character is different from the escape character.

### Parse Tab: Root Node or Record Properties

Property	Value
<b>Structure</b>	<p>Select the following option for the <b>Root Node</b> property:</p> <ul style="list-style-type: none"> <li>• <b>Delimited.</b> Indicates that the root node is based on a delimited file structure. Records can be individually based on delimited or positional file structures.</li> </ul> <p>Select one of the following options for <b>Record</b> properties:</p> <ul style="list-style-type: none"> <li>• <b>Delimited.</b> Indicates that the record is based on a delimited file structure. Descendant records can be individually based on delimited or positional file structures.</li> <li>• <b>Positional.</b> Indicates that the record is based on a positional file structure. Positional records cannot have child records.</li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>• For a document to be both delimited and positional, the root node must have its <b>Structure</b> property set to <b>Delimited</b>. You can then set the <b>Structure</b> property for individual records to <b>Positional</b> or <b>Delimited</b>, as necessary.</li> <li>• If you change from one structure to another, a message box appears. Click <b>Yes</b> to confirm the structure change. Some new properties might appear, and some existing properties might be removed.</li> <li>• If you right-click the <b>Structure</b> property value field of a positional record and click <b>Clear Property</b>, BizTalk Editor interprets the structure of the record as delimited. Some new properties might appear, and some existing properties might be removed.</li> <li>• When the <b>Standard</b> property for a document is set to <b>Custom</b>, by default the <b>Structure</b> property for the root node and all records is blank. If you leave the <b>Structure</b> property blank, its value is <b>Delimited</b>.</li> </ul>
<b>Source Tag Identifier</b>	<p>The name of the source tag identifier. This is the tag name that is used to match the record with the data.</p> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• For a non-XML file, such as a flat file, you can type a <b>Source Tag Identifier</b> property to identify any tag that might exist in the original file.</li> <li>• The <b>Source Tag Identifier</b> property is case sensitive.</li> </ul>
<b>Field Order</b>	<p>Select one of the following options:</p> <ul style="list-style-type: none"> <li>• <b>Prefix.</b> A prefix delimiter appears before each component, and each member of a component, in a series. For example, where * is the delimiter: *a*a*b*c.</li> <li>• <b>Postfix.</b> A postfix delimiter appears after each component, and each member of a component, in a series. For example, where * is the delimiter: a*a*b*c*.</li> <li>• <b>Infix.</b> An infix delimiter appears between components, and members of components, in a series. For example, where * is the delimiter: a*a*b*c. This is the inherent field order for all <a href="#">electronic data interchange (EDI)</a> documents.</li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• If the field order value is left blank, the default value is <b>Prefix</b>.</li> </ul>

<b>Delimiter Type</b>	<p>Select one of the following options to choose a delimiter for the child nodes directly below the current node:</p> <ul style="list-style-type: none"> <li>• <b>Character.</b> Allows you to designate a delimiter value on the <b>Parse</b> tab. If you select <b>Character</b>, you must specify a delimiter value.</li> <li>• <b>Default Record Delimiter.</b> Indicates that the delimiter is the value of the <b>Default Record Delimiter</b> property, on the <b>Reference</b> tab for the root node.</li> <li>• <b>Default Field Delimiter.</b> Indicates that the delimiter is the value of the <b>Default Field Delimiter</b> property, on the <b>Reference</b> tab for the root node.</li> <li>• <b>Default Subfield Delimiter.</b> Indicates that the delimiter is the value of the <b>Default Subfield Delimiter</b> property, on the <b>Reference</b> tab for the root node.</li> </ul>
<b>Delimiter Value</b>	<p>Type or select a character value for the delimiter. To specify a delimiter value, you must first set the <b>Delimiter Type</b> to <b>Character</b> on the <b>Parse</b> tab.</p>
<b>Escape Type</b> (Also known as a release character)	<p>Select one of the following options to choose an escape character for the child nodes directly below the current node:</p> <ul style="list-style-type: none"> <li>• <b>Character.</b> Allows you to designate an escape character value on the <b>Parse</b> tab. If you select <b>Character</b>, you must specify an escape value.</li> <li>• <b>Default Escape Character.</b> Indicates that the escape character is the value of the <b>Default Escape Delimiter</b> property, on the <b>Reference</b> tab for the root node.</li> </ul> <p>An escape character is useful if you have a character in your field data that is also used as the delimiter character for the field's parent node. For example, if your field data is</p> <p><i>Browne,Peter,1231,yes</i></p> <p>and you have chosen a comma as the delimiter value of the node that contains the field, BizTalk Editor interprets the comma after "Browne" to be a delimiter, even if you intend for it to be part of the field data. A solution for this is to place an escape character directly preceding the delimiter character that you want to include in the field data. For example, if your escape character is specified as a backslash, you can place a backslash directly preceding a delimiter character as in the following example:</p> <p><i>Browne\Peter,1231,yes</i></p> <p>The comma after the backslash is interpreted by BizTalk Editor as field data rather than a delimiter character.</p>
<b>Escape Value</b>	<p>Type or select a character value for the escape character. To specify an escape character value, you must first set the <b>Escape Type</b> to <b>Character</b> on the <b>Parse</b> tab.</p>
<b>Append New Line</b>	<p>Select one of the following options:</p> <ul style="list-style-type: none"> <li>• <b>Yes.</b> Indicates that when the parser reaches the record delimiter, the parser must move to the next line and begin with the following record on that line.</li> <li>• <b>No.</b> Indicates that when the parser reaches the record delimiter, the parser must continue on the same line for the following record.</li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• If the <b>Append New Line</b> value is left blank, the default value is <b>No</b>.</li> </ul>
<b>Skip Carriage Return</b>	<p>Select one of the following options:</p> <ul style="list-style-type: none"> <li>• <b>Yes.</b> Tells the parser to skip the carriage return (CR) value after a delimiter.</li> <li>• <b>No.</b> Tells the parser not to skip the CR value after a delimiter.</li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• If the <b>Skip Carriage Return</b> value is left blank, the default value is <b>Yes</b>.</li> </ul>

<b>Skip Line Feed</b>	<p>Select one of the following options:</p> <ul style="list-style-type: none"> <li>• <b>Yes.</b> Tells the parser to skip the line feed (LF) value after a delimiter.</li> <li>• <b>No.</b> Tells the parser not to skip the LF value after a delimiter.</li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• If the <b>Skip Line Feed</b> value is left blank, the default value is <b>Yes</b>.</li> </ul>
<b>Ignore Record Count</b>	<p>Select one of the following options:</p> <ul style="list-style-type: none"> <li>• <b>Yes.</b> Tells the parser or the <a href="#">serializer</a> not to count this record when counting the total number of records in the <a href="#">specification</a>.</li> <li>• <b>No.</b> Tells the parser or the serializer to count this record when counting the total number of records in the specification.</li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>• When a <a href="#">document instance</a> is submitted to <a href="#">BizTalk Server</a>, if the number of records in the document instance does not match the calculated number of records in the specification, a parsing failure results. For more information, see <a href="#">Parsing errors</a>.</li> <li>• If the <b>Ignore Record Count</b> value is left blank, the default value is <b>Yes</b>.</li> </ul>

**Parse Tab: Field Properties**

Property	Value

<b>Custom Data Type</b>	<p>Select one of the following options:</p> <ul style="list-style-type: none"> <li>• <b>String (AN)</b>. AN is for alphanumeric fields.</li> <li>• <b>Binary Hexadecimal (B)</b>. B is for binary fields.</li> <li>• <b>Date (CY)</b>. CY is for four-digit date fields.</li> <li>• <b>Number (D0-D4)</b>. D0 through D4 (inclusive) are for decimal fields. The single-digit number represents the number of digits to the right of the decimal.</li> <li>• <b>Date (DT)</b>. DT is for date fields.</li> <li>• <b>String (ID)</b>. ID is for identification fields.</li> <li>• <b>Number (N)</b>. N is for integer fields.</li> <li>• <b>Number (N0-9)</b>. N0 through N9 (inclusive) are for implied decimal fields (the decimal character does not appear in the data). The single-digit number represents the number of digits to the right of the decimal.</li> <li>• <b>Number (R)</b>. R is for real number fields.</li> <li>• <b>Number (R0-R9)</b>. R0 through R9 (inclusive) are for real number fields. The single-digit number represents the number of digits to the right of the decimal.</li> <li>• <b>Time (TM)</b>. TM is for time fields.</li> </ul> <p>◆ <b>Important</b></p> <ul style="list-style-type: none"> <li>• If you specify a <b>Custom Data Type</b> value, the value in the <b>Data Type</b> field on the <b>Declaration</b> tab is automatically changed to match the selection that you specified for the <b>Custom Data Type</b> value. For example, if you change the <b>Custom Data Type</b> on the <b>Parse</b> tab to <b>Date (CY)</b>, the <b>Data Type</b> value on the <b>Declaration</b> tab automatically changes to <b>Date</b>. If you specify a value in the <b>Data Type</b> field on the <b>Declaration</b> tab, the value specified in the <b>Custom Data Type</b> field is cleared.</li> </ul> <p>📝 <b>Notes</b></p> <ul style="list-style-type: none"> <li>• If you specify <b>Date (DT)</b>, <b>Date (CY)</b>, or <b>Time (TM)</b> for the <b>Custom Data Type</b> property, you must also set a value for the <b>Custom Date/Time Format</b> property.</li> </ul>
<b>Custom Date/Time Format</b>	<p>If you set <b>Date (DT)</b>, <b>Date (CY)</b>, or <b>Time (TM)</b> as the <b>Custom Data Type</b> property, click an option in the list.</p> <p>📝 <b>Note</b></p> <ul style="list-style-type: none"> <li>• This property field is available only if the <b>Custom Data Type</b> is set to <b>Date (DT)</b>, <b>Date (CY)</b>, or <b>Time (TM)</b>.</li> </ul>
<b>Justification</b>	<p>Select one of the following options:</p> <ul style="list-style-type: none"> <li>• <b>Left</b>. Aligns data to the left in <a href="#">positional files</a> when the data is less than the maximum field length. This also aligns data to the left in delimited files when the amount of data is less than the minimum length requirement.</li> <li>• <b>Right</b>. Aligns data to the right in positional files.</li> </ul> <p>📝 <b>Note</b></p> <ul style="list-style-type: none"> <li>• If no value is selected for the <b>Justification</b> property, data is aligned to the left by default.</li> <li>• If the <b>Justification</b> value is left blank, the default value is <b>Left</b>.</li> </ul>
<b>Pad Character</b>	<p>Type or select a character to pad the field. You can choose any character for a pad character, including a space or a zero. For more information, see <a href="#">Pad Characters</a>.</p>

<b>Wrap Character</b>	<p>Type a character to enclose field data. This property is useful if you have a character in your field data that is also used as the delimiter value for the field's parent node. For example, if your field data is</p> <p><i>Browne,Peter,1231,yes</i></p> <p>and you have chosen a comma as the delimiter value of the node that contains the field, BizTalk Editor interprets the comma after "Browne" to be a delimiter, even if you intend for it to be part of the field data. The solution to this is to define a value for the wrap character property and then enclose the field data in the wrap character. For example, you can set the wrap character property to double quotation marks for the first field and then type your field data as in the following example:</p> <p><i>"Browne,Peter",1231,yes</i></p> <p>The comma between the double quotation marks is interpreted by BizTalk Editor to be field data rather than a delimiter value.</p> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• If you have characters in your field data that are also used as the wrap character, you must enclose those characters in another set of wrap characters.</li> </ul> <p>For example, with the wrap character value set to double quotation marks,</p> <p><i>"Browne,Peter ""Pete"""</i></p> <p>is parsed by BizTalk Editor to appear as</p> <p><i>Browne,Peter "Pete".</i></p> <ul style="list-style-type: none"> <li>• If the field data in an input document instance includes the line feed character followed directly by the carriage return character, the corresponding field data in the output document instance includes only the line feed character, even if both are enclosed in a set of wrap characters.</li> </ul>
<b>Minimum Length with Pad Character</b>	<p>The minimum length of a field in an output document instance, including pad characters. For more information, see <a href="#">Pad Characters</a>.</p> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>• This property can be set for a field only if the pad character is set for that field.</li> <li>• If the <b>Minimum Length</b> property on the <b>Declaration</b> tab is set for the field, the <b>Minimum Length with Pad Character</b> property must be greater than or equal to the value of the <b>Minimum Length</b> property. If the <b>Minimum Length</b> property is not set, the <b>Minimum Length with Pad Character</b> property must be greater than or equal to one.</li> </ul>

**Standard: Custom**

**Structure Property: Positional**

**Parse Tab: Root Node Properties or Record Properties**

Property	Value
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<b>Structure</b>	<p>Select the following option for the <b>Root Node</b> property:</p> <ul style="list-style-type: none"> <li>● <b>Positional.</b> Indicates that the root node is based on a <a href="#">positional file</a> structure.</li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>● A document with a positional root node can have no records.</li> <li>● If you right-click the <b>Structure</b> property value field of a positional root node and click <b>Clear Property</b>, BizTalk Editor interprets the structure of the root node as delimited. Some new properties might appear, and some existing properties might be removed.</li> <li>● When the <b>Standard</b> property for a document is set to <b>Custom</b>, by default the <b>Structure</b> property for the root node and all records is blank. If you leave the <b>Structure</b> property blank, its value is <b>Delimited</b>.</li> </ul>
<b>Source Tag Identifier</b>	<p>The name of the source tag identifier. This is the tag name that is used to match the record with the data.</p> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>● For a non-XML file, such as a flat file, you can type a <b>Source Tag Identifier</b> property to identify any tag that might exist in the original file.</li> <li>● The <b>Source Tag Identifier</b> property is case sensitive.</li> </ul>
<b>Source Tag Position</b>	<p>A number that refers to the position of the beginning of the tag in a positional record.</p>
<b>Append Newline</b>	<p>Select one of the following options:</p> <ul style="list-style-type: none"> <li>● <b>Yes.</b> Indicates that when the <a href="#">parser</a> reaches the record delimiter, the parser must move to the next line and begin with the following record on that line.</li> <li>● <b>No.</b> Indicates that when the parser reaches the record delimiter, the parser must continue on the same line for the following record.</li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>● If the <b>Append New Line</b> value is left blank, the default value is <b>No</b>.</li> </ul>
<b>Skip Carriage Return</b>	<p>Select one of the following options:</p> <ul style="list-style-type: none"> <li>● <b>Yes.</b> Tells the parser to skip the carriage return (CR) value after a delimiter.</li> <li>● <b>No.</b> Tells the parser not to skip the CR value after a delimiter.</li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>● If the <b>Skip Carriage Return</b> value is left blank, the default value is <b>Yes</b>.</li> </ul>
<b>Skip Line Feed</b>	<p>Select one of the following options:</p> <ul style="list-style-type: none"> <li>● <b>Yes.</b> Tells the parser to skip the line feed (LF) value after a delimiter.</li> <li>● <b>No.</b> Tells the parser not to skip the LF value after a delimiter.</li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>● If the Skip Line Feed value is left blank, the default value is <b>Yes</b>.</li> </ul>

<b>Ignore Record Count</b>	<p>Select one of the following options:</p> <ul style="list-style-type: none"> <li>• <b>Yes.</b> Tells the parser or the <a href="#">serializer</a> not to count this record when counting the total number of records in the specification.</li> <li>• <b>No.</b> Tells the parser or the serializer to count this record when counting the total number of records in the specification.</li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>• When a <a href="#">document instance</a> is submitted to <a href="#">BizTalk Server</a>, if the number of records in the document instance does not match the calculated number of records in the specification, a parsing failure results. For more information, see <a href="#">Parsing errors</a>.</li> <li>• If the <b>Ignore Record Count</b> value is left blank, the default value is <b>Yes</b>.</li> </ul>
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**Parse Tab: Field Properties**

Property	Value
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<b>Custom Data Type</b>	<p>Select one of the following options:</p> <ul style="list-style-type: none"> <li>• <b>String (AN)</b>. AN is for alphanumeric fields.</li> <li>• <b>Binary Hexadecimal (B)</b>. B is for binary fields.</li> <li>• <b>Date (CY)</b>. CY is for four-digit date fields.</li> <li>• <b>Number (D0-D4)</b>. D0 through D4 (inclusive) are for decimal fields. The single-digit number represents the number of digits to the right of the decimal.</li> <li>• <b>Date (DT)</b>. DT is for date fields.</li> <li>• <b>String (ID)</b>. ID is for identification fields.</li> <li>• <b>Number (N)</b>. N is for integer fields.</li> <li>• <b>Number (N0-9)</b>. N0 through N9 (inclusive) are for implied decimal fields (the decimal character does not appear in the data). The single-digit number represents the number of digits to the right of the decimal.</li> <li>• <b>Number (R)</b>. R is for real number fields.</li> <li>• <b>Number (R0-R9)</b>. R0 through R9 (inclusive) are for real number fields. The single-digit number represents the number of digits to the right of the decimal.</li> <li>• <b>Time (TM)</b>. TM is for time fields.</li> </ul> <p>◆ <b>Important</b></p> <ul style="list-style-type: none"> <li>• If you specify a <b>Custom Data Type</b> value, the value in the <b>Data Type</b> field on the <b>Declaration</b> tab is automatically changed to match the selection that you specified for the <b>Custom Data Type</b> value. For example, if you change the <b>Custom Data Type</b> on the <b>Parse</b> tab to <b>Date (CY)</b>, the <b>Data Type</b> value on the <b>Declaration</b> tab automatically changes to <b>Date</b>. If you specify a value in the <b>Data Type</b> field on the <b>Declaration</b> tab, the value specified in the <b>Custom Data Type</b> field is cleared.</li> </ul> <p>📌 <b>Notes</b></p> <ul style="list-style-type: none"> <li>• If you specify <b>Date (DT)</b>, <b>Date (CY)</b>, or <b>Time (TM)</b> for the <b>Custom Data Type</b> property, you must also set a value for the <b>Custom Date/Time Format</b> property.</li> </ul>
<b>Custom Date/Time Format</b>	<p>If you set <b>Date (DT)</b>, <b>Date (CY)</b>, or <b>Time (TM)</b> as the <b>Custom Data Type</b> property, click an option in the list.</p> <p>📌 <b>Note</b></p> <ul style="list-style-type: none"> <li>• This property field is active only if the <b>Custom Data Type</b> is set to <b>Date (DT)</b>, <b>Date (CY)</b>, or <b>Time (TM)</b>.</li> </ul>
<b>Justification</b>	<p>Select one of the following options:</p> <ul style="list-style-type: none"> <li>• <b>Left</b>. Aligns data to the left in <a href="#">positional files</a> when the data is less than the maximum field length. Also aligns data to the left in <a href="#">delimited files</a> when the amount of data is less than the minimum length requirement.</li> <li>• <b>Right</b>. Aligns data to the right in positional files.</li> </ul> <p>📌 <b>Note</b></p> <ul style="list-style-type: none"> <li>• If the <b>Justification</b> value is left blank, the default value is <b>Left</b>.</li> </ul>
<b>Pad Character</b>	<p>Type a character to be used to pad the field. You can choose any character for a pad character, including a space or a zero. For more information, see <a href="#">Pad Characters</a>.</p>

## Related Topic

[Pad Characters](#)

# Declare namespaces

1. Click any node in the [specification](#) tree.
2. Click the **Namespace** tab.
3. Right-click the first blank field in the Prefix column and click **Add**.
4. Type a namespace prefix and press ENTER.
5. Double-click the blank field directly to the right, in the Uniform Resource Name column.
6. Type a Uniform Resource Name and press ENTER.

## ◆ Important

- BizTalk Editor does not validate the Uniform Resource Name that you enter for a namespace.

For more information about namespaces, see [Namespace Declarations](#).

## Related Topics

[Add custom annotations](#)

[Delete custom annotations](#)

[Edit custom annotations](#)

[Namespace Declarations](#)

# Add custom annotations

1. In the [specification](#) tree, click the root node, a record, or a field for which you want to add a custom annotation.

## Note

- On the **Reference** tab, you cannot add a custom annotation for the root node.
2. Click the **Declaration** tab or the **Reference** tab, depending on where you want to add the custom annotation.
3. Right-click the first blank field in the Property column and click **Add**.  
Edit mode is activated in the **Property** box.
4. Type a prefix-name pair (separated by a colon) and press ENTER.  
-Or-  
Click one of the custom annotations in the list and press ENTER.
5. Double-click the blank field directly to the right, in the Value column.
6. Type the value of the custom annotation and press ENTER.

## Important

- For the specification to [compile](#) successfully, the namespace prefix used in step 4 must be declared in the specification. For more information, see [Declare namespaces](#).

## Related Topics

[Adding SQL Annotations](#)

[Declare namespaces](#)

[Delete custom annotations](#)

[Edit custom annotations](#)

[Namespace Declarations](#)

# Edit custom annotations

1. In the [specification](#) tree, click the node that contains the custom annotation that you want to edit.
2. Click the tab (**Declaration** or **Reference**) that references the custom annotation that you want to edit.
3. Double-click the Property field of the custom annotation, edit the field, and then press ENTER.
4. Double-click the Value field of the custom annotation, edit the field, and then press ENTER.

## Related Topics

[Adding SQL Annotations](#)

[Declare namespaces](#)

[Namespace Declarations](#)

# Delete custom annotations

1. In the [specification](#) tree, click the node that contains the custom annotation that you want to delete.
2. Click the tab (**Declaration** or **Reference**) that references the custom annotation that you want to delete.
3. Right-click the custom annotation and click **Delete**.
4. Click **Yes** to confirm the change.

## Related Topics

[Add custom annotations](#)

[Adding SQL Annotations](#)

[Declare namespaces.](#)

[Edit custom annotations](#)

[Namespace Declarations](#)

# Set dictionary properties

1. In the [specification](#) tree, click the root node, a record, or a field for which you want to specify a property, and then click the **Dictionary** tab.
2. In the Property column, select the check box for the value that you want to associate with the field.

The **Dictionary** tab contains the properties shown in the following tables. [dictionary](#) properties can be set only for specifications with the **Standard** property on the **Reference** tab set to XML or CUSTOM.

## Dictionary Tab: Root Node or Record Properties

Property	Node path
<b>Document Container Node</b>	In an envelope <a href="#">schema</a> , the document node indicates the record that contains the document.

### Note

- In a flat file specification (with its **Standard** property on the **Reference** tab set to CUSTOM) that is parsed by BizTalk Server's flat file [parser](#), selecting or clearing the **Document Container Node** dictionary property check box has no effect. This dictionary property is made available, however, in case you need to create a custom specification and a custom parser that use the "Document Container Node" dictionary property.

## Dictionary Tab: Field Properties

Property	Node path
<b>Document Name</b>	Displays the path to the field of a <a href="#">document instance</a> that contains the document name.
<b>Source Type</b>	Displays the path to the field of a document instance that contains the source type.
<b>Source Value</b>	Displays the path to the field of a document instance that contains the source value.
<b>Destination Type</b>	Displays the path to the field of a document instance that contains the destination type.
<b>Destination Value</b>	Displays the path to the field of a document instance that contains the destination value.

### Notes

- When parsing a specification, the parser uses information on the **Dictionary** tab to locate a [channel](#). You can create a channel by using [BizTalk Messaging Manager](#). For more information about channels and BizTalk Messaging Manager, see [Understanding Channels](#).
- If you use a specification to define documents that are submitted to an open [messaging port](#), you must select the destination value on the **Dictionary** tab for the field that contains the destination and transport information. The destination information in a document is overwritten if you use submission parameters. For more information about submitting documents, see [Submitting](#).
- You can also set **Dictionary** properties by right-clicking a field in the Property column and clicking **Set Routing Information**.

## Related Topics

[Add a custom dictionary property](#)

[Clear a dictionary property](#)

[Delete a custom dictionary property](#)

[Rename a custom dictionary property](#)

[Submitting](#)

[Understanding Messaging Ports](#)

# Add a custom dictionary property

1. In the [specification](#) tree, click the field for which you want to add a custom [dictionary](#) property.
2. Click the **Dictionary** tab.
3. Double-click the first blank field in the Property column.
4. Type a name for the property and press ENTER.

## Notes

- Use a unique name for each custom property that you create.
- The **Standard** property (for the root node) must not be set for X12 or EDIFACT.

## Related Topics

[Clear a dictionary property](#)

[Delete a custom dictionary property](#)

[Rename a custom dictionary property](#)

[Set dictionary properties](#)

# Rename a custom dictionary property

1. Click the **Dictionary** tab.
2. Right-click the custom property that you want to rename and click **Rename**.
3. Type a name for the property and press ENTER.

## **Note**

- Use a unique name for each custom property that you create.

## **Related Topics**

[Add a custom dictionary property](#)

[Clear a dictionary property](#)

[Delete a custom dictionary property](#)

[Set dictionary properties](#)

# Clear a dictionary property

1. In the [specification](#) tree, click the node for which you want clear a [dictionary](#) property, and click the **Dictionary** tab.
2. In the Property column, clear the check box for the value that you want to disassociate from the field.

## Notes

- You can also clear a **Dictionary** property value by right-clicking a field in the Property column and clicking **Clear Routing Information**.
- By clearing a dictionary property in a node, you remove the routing information.

## Related Topics

[Add a custom dictionary property](#)

[Delete a custom dictionary property](#)

[Rename a custom dictionary property](#)

[Set declaration properties](#)

# Delete a custom dictionary property

1. Click the **Dictionary** tab.
2. Right-click the custom property that you want to delete and click **Delete**.
3. Click **Yes** to confirm the change.

## Related Topics

[Add a custom dictionary property](#)

[Clear a dictionary property](#)

[Rename a custom dictionary property](#)

[Set dictionary properties](#)

# Select codes

1. Click a field in a specification tree.
2. Click the **Code List** tab.
3. In the Value column, select the check box next to the code that you want to use.

## Notes

- [Code lists](#) are available only for [specifications](#) based on [X12](#) or [EDIFACT](#). However, not all fields in a specification based on X12 or EDIFACT have codes associated with them. A complete list of available codes for a specific field appears on the **Code List** tab. Codes are associated with a field if the check box in the **Value** field next to the code is selected. A description of the code appears in the **Description** field.
- When you associate a code with a field on the **Code List** tab, that association is also shown on the **Declaration** tab. The **Data Type** field on the **Declaration** tab is automatically set to **Enumeration**, and the **Data Type Values** field shows the code list numbers you selected on the **Code List** tab. If you clear the **Data Type** field on the **Declaration** tab, there will be no codes selected on the **Code List** tab. For more information, see [Clear a property for any field in the Value column](#).
- To select a range of codes, select the check box next to a code, press SHIFT, and then select the check box next to a second code. All codes between the first code and the second code are selected.
- Occasionally, duplicate code values appear on the **Code List** tab. These duplicate code values have varying descriptions, depending on the type of document with which the code value is associated. In the context of validating a [document instance](#), it is never necessary to select more than one code value. However, it is possible to inadvertently select more than one code value. The following list summarizes the selection behavior of duplicate code lists:
  - If you select the top code value in a set of duplicate code values, only that code value is selected.
  - If you select any code value other than the top code value in a set of duplicate code values, that code value is selected and the top code value is automatically selected, too.
  - The top code value in a set of duplicate code values cannot be cleared while any other code values in the set are selected.

## Related Topics

[Clear a property for any field in the Value column](#)

[Clear codes](#)

[Code List Values and Descriptions](#)

# Clear codes

1. Click a field in the specification tree.
2. Click the **Code List** tab.
3. In the Value column, clear the check box that is next to the code that you want to clear.

## Note

- [Code lists](#) are available only for [specifications](#) based on [X12](#) or [EDIFACT](#). However, not all fields in a specification based on X12 or EDIFACT have codes associated with them. A complete list of available codes for a specific field appears on the **Code List** tab. Codes are associated with a field if the check box in the Value field next to the code is selected. A description of the code appears in the Description field.
- Occasionally, duplicate code values appear on the **Code List** tab. These duplicate code values have varying descriptions, depending on the type of document with which the code value is associated. In the context of validating a [document instance](#), it is never necessary to select more than one code value. However, it is possible to inadvertently select more than one code value. The following list summarizes the selection behavior of duplicate code lists:
  - If you select the top code value in a set of duplicate code values, only that code value is selected.
  - If you select any code value other than the top code value in a set of duplicate code values, that code value is selected and the top code value is automatically selected, too.
  - The top code value in a set of duplicate code values cannot be cleared while any other code values in the set are selected.

## Related Topics

[Code List Values and Descriptions](#)

[Select codes](#)

# Clear a property for any field in the Value column

1. Click the tab that contains the property that you want to clear.
2. Right-click the field in the Value column and click **Clear Property**.

# Automatically calculate field positions

1. Select a field in a positional record.
2. Double-click the Value field in the Data Type row.
3. In the **Data Type** list, click a value.

## **Note**

- To specify a **Maximum Length** value (steps 4 and 5), you must select one of the following **Data Type** values: **String**, **Number**, **Binary (base64)**, or **Binary (hex)**.
4. Double-click the Value field in the Maximum Length row.
  5. Type a number into the Maximum Length Value field and press ENTER.
  6. Repeat steps 1-5 for each field in the record.
  7. Right-click the record and click **Calculate Field Positions**.

The following warning appears:

This operation will modify the **Start** and **End Position** properties for the fields in the selected record. Do you want to continue?

8. Click **Yes**.

The start and end positions are calculated for the fields in the record. For more information, see [Calculating Field Positions](#).

## **Related Topic**

[Calculating Field Positions](#)

# Edit Notes and Syntax Rules

In the **Node Properties** dialog box, you can:

- Read and edit notes for fields and records.
- Read syntax rules for records.

To view the **Node Properties** dialog box, follow these steps:

1. In the [specification](#) tree, right-click a record or field and click **Properties**.  
The **Note** tab appears by default.
2. To view syntax rules for a record, click the **Syntax Rules** tab.

## **Note**

- Syntax rules apply only to records.

For information about how to use this dialog box, see the following topics:

- [Enter Record Notes](#)
- [View Syntax Rules](#)
- [Enter Field Notes](#)

# Enter Record Notes

For information about how to open the **Node Properties** dialog box, see [Edit Notes and Syntax Rules](#).

You can use notes to record any information relevant to the record with which they are associated. For example, the purpose of the record or the reason why it was created.

- To record a note, type some text in the **Node Properties** dialog box and click **OK**.

## Notes

- You cannot add a note to the root node.
- You cannot type unprintable characters in notes.

## Related Topics

[Enter Field Notes](#)

[View Syntax Rules](#)

# View Syntax Rules

For information about how to open the **Node Properties** dialog box, see [Edit Notes and Syntax Rules](#).

Syntax rules provide information about how the [specification](#) tree must be organized. Syntax rules are found only in specifications based on the [X12](#) standard.

## Note

- Syntax rules apply only to records.

## Related Topics

[Enter Field Notes](#)

[Enter Record Notes](#)

# Enter Field Notes

For information about how to open the **Node Properties** dialog box, see [Edit Notes and Syntax Rules](#).

You can use notes to record any information relevant to the field with which they are associated; for example, the purpose of the field or the reason why it was created.

- To record a note, type some text in the **Node Properties** dialog box and click **OK**.

## **Note**

- You cannot type unprintable characters in notes.

## **Related Topics**

[Enter Record Notes](#)

[View Syntax Rules](#)

# Manage Document Instances

In [BizTalk Mapper](#) you can create a document instance based on a [specification](#) and you can validate a document instance against a specification.

The following procedures are covered in this section:

- [Create a document instance](#)
- [Validate a document instance](#)

# Create a document instance

1. Open a [specification](#) on which you want to base a [document instance](#).
2. On the **Tools** menu, click **Create XML Instance**.
3. In the **Create Document Instance as** dialog box, browse to the folder in which you want to create a document instance.
4. In the **File Name** box, type a name for the document instance and click **Save**.

The new document instance is displayed in the **Output** tab.

## Note

- The only format available for creating a document instance is Unicode.

## Related Topic

[Validate a document instance](#)

# Validate a document instance

1. Open a [specification](#) against which you want to validate a [document instance](#).

For more information, see [Open Specifications](#).

2. On the **Tools** menu, click **Validate Instance**.

3. In the **Validate Document Instance** dialog box, browse to the document instance you want to validate and click **Open**.

When you validate a document instance against a specification based on either the [X12](#) or [EDIFACT](#) standard, the **Document Delimiters** dialog box appears. Do one of the following:

- **X12-based specifications.** Select the delimiters appropriate for the document you want to validate and click **OK**.
- **EDIFACT-based specifications.** Select the delimiters and the escape character appropriate for the document you want to validate and click **OK**.

The **Warning** tab displays the message "The document instance validation succeeded" if the document instance is validated against the specification. If the document instance is not validated against the specification, the **Warning** tab indicates this and displays errors that indicate why the document instance was not validated. If you validate a non-XML document instance against a non-XML specification, if the document instance is validated you can view an [Extensible Markup Language \(XML\)](#) version of the document on the **Output** tab.

## ◆ Important

- It is strongly recommended that before you use a document instance in a production environment you validate the instance against its [source specification](#) and correct any problems displayed on the **Warnings** tab.

## 📌 Notes

- BizTalk Editor will not validate a document instance that contains multiple documents.
- A document instance that contains a field with a blank attribute value ("") can be validated successfully against a specification regardless of the value that is set for the **Minimum Length** property for that field. For example, if a specification has a field with a **Minimum Length** property value set to 4, and you attempt to validate a document instance that has a corresponding field with a blank attribute value, the validation will not fail because of this mismatch. The reason for this is that the MSXML parser that underlies the validation engine treats an attribute with a blank value as though the attribute is not specified. This issue will be corrected for the next release of [BizTalk Server](#).
- Instance validation does not work properly against [electronic data interchange \(EDI\)](#) instances (both X12 and EDIFACT standards) unless you remove interchange, group, and document envelopes (both headers and trailers). For X12 documents, you must remove the ISA, GS, ST, SE, GE, and IEA segments, and for EDIFACT documents you must remove the UNA (if present), UNB, UNG, UNH, UNT, UNE, and UNZ segments.
- A [well-formed XML](#) document instance that contains elements typed as [XML-Data Reduced \(XDR\)](#) data types might not validate against its corresponding specification. To make such a document instance validate against its corresponding specification, ensure that all elements typed as XDR data types have their **Model** properties set to **Open**. For more information about the **Model** property, see [Set declaration properties](#).
- Non-XML document instances saved in Unicode will not validate correctly unless you remove the byte order marker at the beginning of the file.
- When validating a document instance against a specification with the Standard set to X12, EDIFACT, or Custom, the document instance must have a document structure that conforms to the standard of the specification. For example, you can validate an X12 document instance only against an X12 specification.
- A document instance that contains an "x-schema" schema reference is always validated using that schema reference, regardless of the schema that is loaded in BizTalk Editor.
- An invalid character map is not a criterion of instance validation. For example, if an instance contains data contained within

the start range and end range in the **Invalid Character Map** dialog box, validation might still succeed.

## Related Topic

[Create a document instance](#)

# Manage Invalid Character Maps

The following procedures are covered in this section:

- [Add invalid character ranges](#)
- [Edit invalid character ranges](#)
- [Delete invalid character ranges](#)

# Add invalid character ranges

1. On the **View** menu, click **Invalid Character Map**.
2. In the **Invalid Character Ranges** dialog box, click the **New Character Range** button .
3. In the **Enter Invalid Character Range** dialog box, select a value from the **Invalid start range** list and press TAB.
4. Click a value in the **Invalid end range** list and click **OK**.
5. Repeat steps 2 through 4 to add additional invalid character ranges.

## ◆ Important

- You can set invalid character ranges only for non-XML documents.
- The correct hexadecimal value for a question mark symbol (?) is **(0x3f)**. The default setting in the **Invalid start range** list and **Invalid end range** list is **? (0x0)**. Do not use this to represent a question mark symbol. To specify a question mark symbol, select the **? (0x3f)** value from the list.

## 📝 Note

- The values that appear in the **Invalid start range** and **Invalid end range** lists are hexadecimal values. If you view the [specification](#) as an [Extensible Markup Language \(XML\)](#) source file by using an application such as Microsoft Internet Explorer 5 or later, the values appear as decimal values. For example, if you type a semicolon (;) in the **Invalid start range** and **Invalid end range** boxes, the value that appears is ; **(0x3b)**. Viewed by using a browser, this value appears as **59**.
- To enter an invalid character range, you can also highlight the value in the **Invalid start range** list, type a numeric or alphabetic character, and then press TAB to move to the **Invalid start range** list.

## Related Topics

[Delete invalid character ranges](#)

[Edit invalid character ranges](#)

# Edit invalid character ranges

1. On the **View** menu, click **Invalid Character Map**.
2. In the **Invalid Character Ranges** dialog box, select the character range that you want to modify and click the **Change Character Range** button .
3. In the **Enter Invalid Character Range** dialog box:
  - In the **Invalid start range** list, select a value.  
–Or–
  - In the **Invalid end range** list, select a value.
4. Click **OK**.
5. Repeat steps 2 through 4 to modify additional invalid character ranges.

## ◆ Important

- You can set invalid character ranges only for non-XML documents.
- The correct hexadecimal value for a question mark symbol (?) is **(0x3f)**. The default setting in the **Invalid start range** list and **Invalid end range** list is **? (0x0)**. Do not use this to represent a question mark symbol. To specify a question mark symbol, click the **? (0x3f)** value in the list.

## 📝 Notes

- The values that appear in the **Invalid start range** and **Invalid end range** lists are hexadecimal values. If you view the specification as an XML source file by using an application such as Microsoft Internet Explorer 5 or later, the values appear as decimal values. For example, if you type a semicolon (;) in the **Invalid start range** and **Invalid end range** boxes, the value that appears is **; (0x3b)**. Viewed by using a browser, this value appears as **59**.
- To enter a character range, you can also highlight the value in the **Invalid start range** list, type a numeric or alphabetic character, and then press TAB to move to the **Invalid end range** list.

## Related Topics

[Add invalid character ranges](#)

[Delete invalid character ranges](#)

# Delete invalid character ranges

## ◆ Important

- You can set invalid character ranges only for non-XML documents.

1. On the **View** menu, click **Invalid Character Map**.

In the **Invalid Character Ranges** dialog box, click the character range that you want to delete and click the **Delete Character Range** button .

2. Click **Yes** to confirm the change.

## Related Topics

[Add invalid character ranges](#)

[Edit invalid character ranges](#)

# Manage Views

The following procedures are covered in this section:

- [Expand tree items](#)
- [Collapse tree items](#)
- [View property values](#)
- [Change text sizes](#)

# Expand tree items

- Click the root node or record that you want to expand and, on the **View** menu, click **Expand Tree Items**.

## **Note**

- To expand the entire tree, you must click the root node. If you click a record, you expand only the child records and fields within the record.

## **Related Topic**

[Collapse tree items](#)

# Collapse tree items

- Click the root node or record that you want to collapse and, on the **View** menu, click **Collapse Tree Items**.

## Note

- To collapse the entire tree, you must click the root node. If you click a record, you collapse only the child records and fields within the record.

## Related Topic

[Expand tree items](#)

# View property values

- On the **View** menu, click one of the following properties:
  - **Declaration**
  - **Reference**
  - **Parse**
  - **Namespace**
  - **Dictionary**
  - **Code List**

# Change text sizes

- On the **View** menu, point to **Text Size** and click the size that you want.

# Concepts

This section provides detailed conceptual information that is essential to understanding BizTalk Editor.

The following topics are covered in this section:

- [Understanding Specifications](#)
- [Importing Files](#)
- [BizTalk Editor Environment](#)
- [Records, Fields, and Properties](#)
- [Namespace Support](#)
- [Adding SQL Annotations](#)

# Understanding Specifications

Specifications are BizTalk Server-specific Extensible Markup Language (XML) [schemas](#) that are created by BizTalk Editor. You can create specifications that are based on [industry standards](#) (such as [XML](#), [EDIFACT](#), or [X12](#)) or non-industry standards (such as [delimited flat files](#), [positional flat files](#), delimited and positional flat files, blank specifications, or existing files).

## Industry standards

Industry standards provide uniform ways for businesses to exchange data electronically. The use of a common business language enables computers to communicate within an organization or from one business to another. Industry standards specify the format and data content of electronic business transactions. A specification that is based on an industry standard is considered a subset of the standard. To create a specification that meets your needs, you can begin with an industry-standard specification as a baseline and then delete any records and fields you do not need. In addition, you might need to modify properties for the remaining records and fields.

## Non-industry standards

In specifications that are based on non-industry standards, you must define the structure of the document in BizTalk Editor. You can use BizTalk Editor for various types of non-industry standards: positional flat files, delimited flat files, or combined positional and delimited flat files.

### Note

- On the **Parse** tab, you must set the **Structure** property of the root node to **Delimited** if your flat file is both delimited and positional. Additional record properties are set to either **Delimited** or **Positional**, depending on their attributes.

## Blank specifications

A blank specification contains only the root-node element. If you start from a blank specification, you must build the entire specification structure. Rename the root element and then modify the root-element property values you want to change, such as the heading information for the specification. You can then add records and fields and their properties as required for your business processes.

## Existing files

You can reuse existing files to take advantage of the investment you have made in developing documents that meet the specific needs of your business. To reuse an existing file, you must first import the file into BizTalk Editor and then save it as a specification. Then you must open the saved specification in [BizTalk Mapper](#) and [map](#) it to whatever format your trading partners require.

The following topics are covered in this section:

- [Specification Structure](#)
- [Supporting Standards](#)
- [Supporting Other File Formats](#)
- [Invalid XML Name Characters](#)
- [Invalid Character Ranges](#)

## Related Topics

[Create a specification based on a flat file](#)

[Create a specification based on an empty template](#)

[Create a specification based on an existing specification](#)

[Create a specification based on a standard](#)

[Records, Fields, and Properties](#)

# Specification Structure

Specifications created by BizTalk Editor are [well-formed XML](#). Specification structures vary depending on the type of file you choose as the basis for building your specification. Regardless of the type, each specification contains the same basic structure. For example, all specifications start with the `<?xml version=""?>` tag and continue with header information such as the name of the file and namespace data. Then the remaining structure is built based on the records and fields contained within your specification and the attributes associated with the records and fields. You can view the underlying code of a specification by opening it in Microsoft Internet Explorer 5 or later.

You can create an [XML-Data Reduced \(XDR\) schema](#) from a specification by using the **Export XDR Schema** command from the **Tools** menu. For more information, see [Export XDR schemas](#).

You can create an XSD schema from an XDR schema with a conversion script provided with a complete installation of BizTalk Server. For more information about converting an XDR schema to an XSD schema, see [Convert an XDR schema to an XSD schema](#).

## Related Topics

[Export XDR schemas](#)

[Convert an XDR schema to an XSD schema](#)

# Supporting Standards

[Electronic data interchange \(EDI\)](#) standards, such as [EDIFACT](#) and [X12](#), define a great number of the possible segments and elements that make up the file structure needed in business documents. Using BizTalk Editor, you can start with these structures as the basis for your [specification](#) and then remove the segments and elements you do not need. The final structure is a subset of the standard that you and your trading partner(s), or someone else in your organization, agree to use for business data exchange.

If you create or move nodes in an EDIFACT or X12 document, it is strongly recommended that you set the document standard to **Custom**. In addition, you should also set the **Delimiter Type** property to make the altered structure compatible with the rest of the document. Note that if you set the document standard from **Custom** back to EDIFACT or X12, all **Delimiter Type** settings will be lost. For more information about setting the **Custom** property, see [Set reference properties](#). For more information about setting the **Delimiter Type** property, see [Set parse properties](#).

BizTalk Editor also supports X12 syntax rules, which are relational conditions that exist among two or more data elements for a record. If the specification contains syntax rules, they are enforced during the server run-time process when the specification is validated.

There are five types of rules:

- **All**

If TXI08 exists, all of the following nodes must exist:

- TXI03

- **Grouped**

If any of the following nodes exist, all must exist:

- TXI04

- TXI05

- **Any**

At least one of the following nodes must exist:

- TXI02

- TXI03

- TXI06

- **One**

At most one of the following nodes must exist:

- TXI02

- TXI03

- TXI06

- **Any(conditional)**

If PO413 exists, at least one of the following nodes must exist:

- PO410

- PO411

- PO412

## Related Topics

[Set reference properties](#)

[Summary List of Supported EDI-based Documents](#)

# Supporting Other File Formats

BizTalk Editor is designed to make it easy to create [specifications](#) with positional, delimited, and combined positional and delimited file structure. The following sections provide specific details about each of these file structures.

## Positional flat files

A positional flat file is made up of fields that are the same fixed length and records that have a common end-of-record terminator. The structure of an incoming file must be represented in the records and fields of the source specification so the positional nature of the incoming file is preserved. Therefore, before defining the document structure of a [source specification](#), obtain a layout of the necessary records and fields.

The following table shows an example of a fixed format.

Name	Address	City	Phone
XXXXXXXXXX	Aaaaaaaaaa	CCCCCCCCCCCC	xxx-xxx-xxxx
YYYYYYYYYY	Bbbbbbbbbb	Dddddddddd	xxx-xxx-xxxx

The Name field is fixed at a maximum of 10 characters, the Address field maximum is 10 characters, the City field maximum is 15 characters, and the Phone field maximum is 12 characters. The end-of-record terminator is a carriage return and/or line feed character or characters.

You can use BizTalk Editor to create consecutive records and fields. You can create multiple record types and assign different delimiters for parent records. For structures that contain multiple record types, the specification of the types and record terminators must also be specified in the order in which they appear in the document. Fields must be specified by start position, length, and data type.

### ◆ Important

- A positional record must always be a child of a delimited record. The delimiter character specified for the parent delimited record must not appear in the data of the child positional record. There is no way to escape the delimiter character of the parent delimited record in the data of the child positional field. For more information about delimiters and escape characters, see [Set parse properties](#).

### 📝 Notes

- On the **Parse** tab, you must set the **Structure** property of the root node to **Delimited** if your flat file is both delimited and positional. Additional record properties are set to either **Delimited** or **Positional**, depending on their attributes.
- If a specification is positional and you change the structure to delimited, the [compiled](#) specification includes the original start position and end position specified on the **Reference** tab. However, when [BizTalk Server](#) parses a specification the parser ignores this information and processes the specification as a delimited file.

## Delimited flat files

A delimited flat file contains one or more records separated by a delimiter. BizTalk Editor does not read delimiters as part of the data. However, if the delimiter character does appear as data, the data can be formatted so the data and the delimiter are distinguishable. For example, the field in which a delimiter character appears can be enclosed in quotation marks to indicate that the delimiter character is to be treated as data and not as a delimiter.

Using BizTalk Editor, you can select specific fields and the delimiters that are associated with them. You can also specify end-of-record delimiters. To enable the use of delimited flat files, BizTalk Editor supports:

- Structures that consist of multiple groups of records.
- Multiple record types that are defined by record-type tags.
- End-of-record delimiters.
- Wrap and escape characters, to distinguish between field data and delimiter values.
- Field start, length, and type values.

- Field content tags and descriptions.
- The ability to transform flat files into specifications that can be used by BizTalk Mapper.

 **Note**

- On the **Parse** tab, you must set the **Structure** property of the root node to **Delimited** if your flat file is both delimited and positional. Additional record properties are set to either **Delimited** or **Positional**, depending on their attributes.

# Invalid XML Name Characters

Unicode characters that range from xF900 to xFFFE are not valid in [Extensible Markup Language \(XML\)](#) names. If you use an invalid Unicode character in an XML name, that character is translated into an escaped numeric entity when you view it in the specification tree. The escaped numeric entity is encoded as `_xHHHH_`, where `HHHH` stands for the four-digit hexadecimal Unicode code. For example, the name *Ship To* in a purchase order [specification](#) contains a space character, and appears in a specification tree as *Ship\_x0020\_To*. If you move the mouse pointer over a node that contains an encoded Unicode character, a ToolTip appears that displays the node name with the unencoded Unicode character.

## Note

- This occurs when you view a specification tree in BizTalk Editor or in [BizTalk Mapper](#).

# Invalid Character Ranges

You can block a character or a range of characters from being output by [BizTalk Server](#). To do this, in BizTalk Editor, open a [specification](#) that is to be used as an [destination specification](#). Open the Invalid Character Ranges dialog box and enter the characters or the character ranges that you want to prevent being output by BizTalk Server. Whenever BizTalk Server attempts to process a character specified in the Invalid Character Ranges dialog box of an output specification, processing stops and an error message appears.

## Note

- Character ranges can only be blocked for non-XML documents.

## Related Topics

[Add invalid character ranges](#)

[Delete invalid character ranges](#)

[Edit invalid character ranges](#)

[Mapping Data](#)

# Importing Files

You can import three types of files into BizTalk Editor: [well-formed XML](#) instances, [document type definitions \(DTDs\)](#), and [XML-Data Reduced \(XDR\) schemas](#). The following sections provide more information about importing files in BizTalk Editor.

## Note

- If BizTalk Editor cannot determine which element should be the root node, the **Select Root Element** dialog box appears. Select the element that should be the root node and click **OK**.

After importing a well-formed XML instance, a DTD, or an XDR schema, BizTalk Editor creates a structure that is based on the imported file and displays a set of records and fields. After you save the file in BizTalk Editor, the file becomes a [specification](#). This specification has the appropriate header information, and it adheres to a specified structure.

## Important

- The following table explains which XDR files and DTDs can be imported when they contain certain data types, and whether the data type can be imported. The columns represent the data types.

	"entity" and "entities"	"nmtoken" and "nmtokens"	"notation"
<b>X D R</b>	The file cannot be imported.	The file can be imported, but the data types are removed.	The file cannot be imported.
<b>D T D</b>	The file can be imported, but the data types are removed.	The file can be imported, but the data types are removed.	The file can be imported, but the data type is imported as an enumeration type.

- When the last line of a DTD is an entity reference (for example, "%xx"), the DTD cannot be imported into BizTalk Editor. Creating a new line at the end of the DTD that contains an end-of-line character will enable the DTD to be imported into BizTalk Editor.
- If you try to import a file that contains an external reference to another file, the import will not succeed.
- If BizTalk Editor displays warnings related to cyclical references after importing a well-formed [Extensible Markup Language \(XML\)](#) file, it is highly recommended that you fix the warnings and save the specification before continuing.
- When importing well-formed XML or DTDs, BizTalk Editor cannot interpret data type or field length parameters.

## Related Topic

[Create a specification based on an imported file](#)

# BizTalk Editor Environment

The following topics are covered in this section:

- [BizTalk Editor User Interface](#)
- [BizTalk Editor Menus](#)
- [BizTalk Editor Toolbar Buttons](#)
- [BizTalk Editor Shortcut Keys](#)

# BizTalk Editor User Interface

The BizTalk Editor user interface has three main panes. The left pane displays the [specification](#) tree, which is a graphical representation of a specification. The top node in the specification tree is the root node; it is represented by a document icon with horizontal green lines . Records and fields fall below the root node in the specification hierarchy. Records share the same icon with the root node. Fields are represented by a document icon with vertical blue lines . You can expand or collapse a node in the specification tree by clicking the plus or minus icon to the left of the node.

The right pane contains six tabs: **Declaration**, **Reference**, **Parse**, **Namespace**, **Dictionary**, and **Code List**. Use these tabs to set property values, namespaces, [dictionary](#) properties, and [code lists](#) for nodes in a specification. For more information about these tabs, see [Specify Properties for Records and Fields](#).

The bottom pane contains two tabs: **Output** and **Warning**. The **Output** tab displays an [Extensible Markup Language \(XML\) document instance](#) created when using the "Create XML Instance" feature of BizTalk Editor. For more information about creating an XML document instance from a specification, see [Create a document instance](#). The **Warning** tab indicates whether an attempt to validate a document instance against a specification was successful, and displays warnings related to an unsuccessful document validation attempt. For more information, see [Validate a document instance](#).

## Related Topics

[Create a document instance](#)

[Specify Properties for Records and Fields](#)

[Validate a document instance](#)

# BizTalk Editor Menus

BizTalk Editor menus logically group commands together, making it easy to perform a specific task. For example, you can use the commands on the **View** menu to view or to collapse all the records and fields in the specification tree.

The BizTalk Editor menus are as follows:

- **File.** Use this menu to create, open, save, or close a [specification](#).
- **Edit.** Use this menu to cut, copy, paste, insert, rename, or delete records or fields in a specification.
- **View.** Use this menu to select views in the right pane of the user interface, to select views in the bottom pane of the user interface, to select a text size for the BizTalk Editor display, to display the **Invalid Character Map** dialog box, to expand or collapse the specification tree, or to highlight the next warning on the **Warnings** tab.
- **Tools.** Use this menu to validate a specification, to validate a [document instance](#) against a specification, to create an [Extensible Markup Language \(XML\)](#) document instance from a specification, to import files, to export [XML-Data Reduced \(XDR\) schemas](#), or to view BizTalk Editor options.
- **Help.** Use this menu to get how-to and conceptual information about using BizTalk Editor.

## Related Topic

[Accessing BizTalk Mapper Menus](#)

# BizTalk Editor Toolbar Buttons

BizTalk Editor provides a toolbar to complement the menu bar. All of the toolbar buttons display graphic representations of the tasks they perform. They appear in the following order from left to right:

- **New**
- **Open**
- **Save**
- **Retrieve from WebDAV**
- **Store to WebDAV**
- **Cut Specification Node**
- **Copy Specification Node**
- **Paste Specification Node**
- **Delete**
- **New Record**
- **New Field**
- **Insert Record**
- **Insert Field**
- **Collapse**
- **Expand**

# BizTalk Editor Shortcut Keys

You can use shortcut keys to accomplish tasks in BizTalk Editor. The following table is a quick reference to these shortcut keys.

## Note

- Functionality that is not included in this list can be obtained by using the numeric keypad to move the mouse pointer with MouseKeys. For more information about MouseKeys in Windows 2000 Server and Advanced Server Help, see "Using the keyboard to move the mouse pointer". For more information about MouseKeys in Windows 2000 Professional Help, see "Move the mouse pointer by using MouseKeys".

Press	To
CTRL+N	Open a new specification.
CTRL+O	Open an existing specification.
CTRL+S	Save a specification.
SHIFT+R	Insert a record.
CTRL+R	Add a new record to a record.
SHIFT+F	Insert a field.
CTRL+F	Add a new field to a record.
DEL	Delete a record or a field.
F4	Highlight the next warning.
F5	Validate a schema.
CTRL+C	Copy an object.
CTRL+X	Cut an object.
CTRL+V	Paste an object.
F6	Move the focus clockwise from pane to pane.
SHIFT+F6	Move the focus counterclockwise from pane to pane.
TAB	Toggle the focus from the tab in the right pane to the data sheet below. In a dialog box, pressing TAB moves the focus through the buttons and fields of the dialog box.
SPACEBAR	Select or clear a check box. The spacebar also acts like a mouse click when the focus is on a button.
F2	Activate edit mode for a highlighted node in the specification tree. Activate edit mode for a highlighted row in the data sheet of the right pane.
SHIFT+F2	Activate edit mode for the following fields: <ul style="list-style-type: none"> <li>• The Property column of a highlighted custom annotation row on the <b>Declaration</b> or <b>Reference</b> tab.</li> <li>• The Prefix column of a highlighted custom annotation row on the <b>Namespace</b> tab.</li> <li>• The property column of a highlighted custom dictionary row on the <b>Dictionary</b> tab.</li> </ul>
ALT+ DOWN ARROW	Display the list for an activated list box.
SHIFT++	Add a new custom annotation when the focus is on the namespace data sheet in the right pane.
ENTER	Confirm edits to nodes and values.
ESC	Cancel edits to nodes and values.
F1	View the online Help.
ALT+F4	Exit from the program.
LEFT ARROW	Activate the tab to the left.
RIGHT ARROW	Activate the tab to the right.
Any arrow key	Highlight a folder or a file in the main pane of a dialog box, while the focus is on that pane. This functionality occurs in the <b>New Document Specification</b> , the <b>Store to WebDAV</b> , and the <b>Retrieve from WebDAV</b> dialog boxes. For more information about the <b>New Document Specification</b> dialog box, see <a href="#">Create and Validate Specifications</a> . For more information about WebDAV, see <a href="#">Open existing specifications from WebDAV</a> .

The Application key and click <b>Add</b> on the shortcut menu	Insert a custom property in a specification. This functionality occurs on the <b>Declaration, Reference, Namespace,</b> and <b>Dictionary</b> tabs while a property is highlighted.
---	---

## Related Topic

[BizTalk Editor User Interface](#)

# Records, Fields, and Properties

BizTalk Editor presents a [specification](#) as a tree view of records and fields in a given order. Within this structure, you can create parent-to-child relationships by using records and fields. Records can contain other records or fields, but fields cannot contain other fields or records. A record is always an element, but a field can be either an element or an attribute. The specification tree, which presents the records and fields as nodes, provides you with an easy way to view, create, edit, and delete all the records and fields in a specification. Each node in the specification tree has a set of property definitions, which are represented on six tabs in the main window of BizTalk Editor: **Declaration**, **Reference**, **Parse**, **Namespace**, **Dictionary**, and **Code List**. The data on these tabs is necessary for BizTalk Editor to translate a document from its original format to XML. The information defines the structure of the document, whether the document is positional or delimited, the order and length of the data, and the format of the data.

The following topics are covered in this section:

- [Records and Their Properties](#)
- [Fields and Their Properties](#)
- [Calculating Field Positions](#)
- [Character Length Limits](#)
- [Code List Values and Descriptions](#)
- [Pad Characters](#)
- [Property Scope](#)
- [Cyclical References](#)
- [Default Value Integration](#)

# Records and Their Properties

Depending on the type of [specification](#) you are building, you might need to add and/or remove records. After adding records to any specification, you must specify properties. If you remove a record, its properties are also removed, along with all child records and fields.

If your specification is based on [X12](#) or [EDIFACT](#), you can add only the type of records that exist in that standard, but you can remove any or all records. If you are building a specification that is based on a blank specification, you must add records. In some cases, such as when you are building a new specification that is based on an existing specification, you might need to add and remove records.

When you add or insert a record, you can immediately begin typing to rename the record. You can edit the name of an existing record and its properties by selecting the record and editing as appropriate.

If you paste into a specification a record with a name that is the same as an existing record, a number is appended to the end of the name of the record you are pasting.

For information about creating a new instance of an existing record, see [Create a new instance of an existing record](#). For information about creating a cyclical reference, see [Create cyclical references](#).

## Related Topics

[Create a new instance of an existing record](#)

[Create cyclical references](#)

[Property Scope](#)

[Specify Properties for Records and Fields](#)

# Fields and Their Properties

Depending on the type of [specification](#) you are building, you might need to add and/or remove records. Fields correspond to [electronic data interchange \(EDI\)](#) elements. After adding fields to any specification, including EDI documents, you must specify property values.

If your specification is based on [X12](#) or [EDIFACT](#), you can add only the type of fields that exist in that standard, but you can remove any or all fields. If you are building a specification that is based on a blank specification, you must add fields. Regardless of the document type, you can change the properties of any field.

When you add or insert a new field in a specification, the **Type** property, located on the **Declaration** tab, is set to **Attribute** by default. You can manually change this value to **Element** for any field. For information about creating new fields with the **Type** property set to **Element** by default, see [Create a new field as an element](#).

When you add or insert a field, you can immediately begin typing to rename the field. You can edit the name of an existing field and its properties by selecting the field and editing as appropriate.

If you paste into a specification an element field with a name that is the same as an existing element field, a number is appended to the end of the name of the field you are pasting. If you paste into a specification a field with the same name as an existing sibling field (and both fields have the same **Type** value), a number is appended to the end of the name of the field you are pasting. For more information about **Type** values, see [Set declaration properties](#). For information about creating a new instance of an existing element field, see [Create a new instance of an existing element field](#)

## Related Topics

[Create a new field as an element](#)

[Create a new instance of an existing element field](#)

[Property Scope](#)

[Set declaration properties](#)

[Specify Properties for Records and Fields](#)

# Calculating Field Positions

BizTalk Editor can automatically calculate the start and end positions for all the fields in a positional record. First set a **Data Type** value and a **Maximum Length** value in the **Declaration** tab for each field in the positional record. Then right-click the positional record, and on the shortcut menu, click **Calculate Field Positions**. The start and end positions for the fields in that record are automatically calculated. For more information, see [Automatically calculate field positions](#).

The following list explains this feature in greater detail:

- If there are start and end positions specified for the fields in a positional record, all but the start position of the first field are overwritten when you calculate field positions.
- When you calculate field positions, the **Start Position** of the first field of a positional record is set to 1, unless a **Start Position** value was set previously for that field. If a **Start Position** value has already been set for the first field of a positional record, calculations begin from that value.
- Field position calculation takes the **Source Tag Identifier** into account when calculating field positions. For example, consider a positional record with the following properties: the **Source Tag Identifier** is "TAG"; the **Source Tag Position** is 10; there are four fields with **Maximum Length** values of 2, 5, 8, and 6; and there is no **Start Position** value set for the first field. The start and end positions for the four fields are: Field 1 = 1, 2; Field 2 = 3, 7; unused = 8, 9; TAG = 10, 12; Field 3 = 13, 20; and Field 4 = 21, 26. If the **Source Tag Position** had been 1, TAG would have had start and end position values of 1 and 3, and the field count would have started at position 4.
- The field positions of a record are calculated from the first field in the record sequentially to the last field. When calculating field positions, if a field is encountered that does not have a value set for the **Maximum Length** property, the start and end positions for that field and all subsequent fields of the record are not calculated.
- If a sibling record is encountered when calculating field positions, the start and end positions for all fields after the sibling record are not calculated.
- The start and end positions of a field with a **Maximum Length** value of 1 are equal.
- When calculating field positions for a positional record, the positions of fields contained by all descendent records are also calculated. The positions of sibling fields that occur before a record are calculated, but positions of sibling fields that occur after a record are not calculated.

## Related Topics

[Automatically calculate field positions](#)

# Character Length Limits

There are limits to the number of characters that you can use in names and property values. The following table shows the character limits in BizTalk Editor.

Name or property value	Maximum number of characters
Node name (the name of a root node, a record, or a field)	255
Namespace prefix	64
String property value	1024
LONG property value	11
ULONG property value	10
CHAR property value	1
<a href="#">Electronic data interchange (EDI)</a> format property value (the value of an EDI-specific format property, such as the <b>Custom Date/Time Format</b> property value on the <b>Parse</b> tab for a field in an EDI-based specification)	15
Target Namespace+Specification name	255

# Code List Values and Descriptions

The information contained on the **Code List** tab specifies [X12](#) or [EDIFACT](#) code values and their descriptions. The descriptions define the meaning of each code. For example, the code value ST in the Address Qualifier Code field of many standard document [specifications](#) means that the information given is for a Ship To address. The codes in the list cannot be modified or deleted. You can only choose whether or not to associate a code with a field.

Only specifications that are based on an X12 or EDIFACT standard have [code lists](#). However, not all fields in a specification that is based on X12 or EDIFACT have codes associated with them. A complete list of available codes for a specific field appears on the **Code List** tab if that field has a code list reference. Codes are valid for a field if the check box in the Value column next to the code is selected. A description of the code appears in the Description column.

You can include or exclude codes associated with a field by selecting or clearing the check boxes in the Value column next to the code listed on the **Code List** tab. Codes are listed by numeric value or alphabetic value, or by a combination of numeric and alphabetic values. The value represents a specific description. You can associate a code value to any field in the specification tree. For example, in the BEG02 field of an X12 850 purchase order, you can select the code OS, which adds an attribute to the BEG02 field that indicates that the field contains special order information.

Code list values and descriptions for the EDI-based specification templates that are provided by [BizTalk Server](#) can be found in the Microsoft Access database file at \Program Files\Microsoft BizTalk Server\XML Tools\Databases\CodeLists\CodeListsX12a.mdb. If you create new tables in this database for new specification templates, the format for the table name is *standard\_version*. For example, for a D99A EDIFACT specification template, the corresponding table name would be EDIFACT\_D99A.

## ◆ Important

- If you create a new table in the CodeListsX12a.mdb database, do not put invalid [Extensible Markup Language \(XML\)](#) characters (Unicode characters from F900 to FFFE) into the Value column of the table. If you save a specification that contains a field with a selected code list value that is associated with a value in a table with an invalid XML character, you will be unable to open the specification.

If you associate a code with a field, the **Type** value on the **Declaration** tab must be set to **Attribute**.

## 📌 Note

- Code lists are available only for specifications based on X12 or EDIFACT. For this reason, you might find that if you change the structure of an X12-based or EDIFACT-based specification to CUSTOM, and then change it back again to X12 or EDIFACT, the code list for a particular field might no longer be available on the **Code List** tab. If this happens, save the specification and then reopen it. The code list will reappear on the **Code List** tab for the appropriate field.

## Related Topics

[Specify Properties for Records and Fields](#)

# Pad Characters

BizTalk Editor allows you to manage pad characters in delimited documents to ensure that you get the output that you expect. Because every delimited document that is processed by [BizTalk Server](#) must be translated into [Extensible Markup Language \(XML\)](#) before [mapping](#) takes place, you must make sure that your document [specification](#) tells BizTalk Server how to handle pad characters in delimited [document instances](#). For example, you might have a field in a delimited document instance that looks like this:

*Green\*\*\*\*\**

The data content of the field is *Green*, the field is left justified, there are five pad characters to the right of the data content, and the pad character is an asterisk.

If you do not define the pad character for the field in the specification that corresponds to the field in the document instance, BizTalk Server interprets the five asterisks to be part of the data content of the field. To ensure that BizTalk Server correctly handles the pad characters in this field, you need to make sure the properties on the **Parse** tab for this field are set as in the following table.

Property	Value
<b>Justification</b>	Left
<b>Pad Character</b>	*
<b>Minimum Length with Pad Character</b>	Set this property value if you want the length of the field in your output document instance to be greater than or equal to a certain length. BizTalk Server inserts pad characters into the field to achieve the correct minimum field length in the output document instance.

You can use the **Pad Character** property to ensure that pad characters in a field are removed from a document instance submitted to BizTalk Server. The **Minimum Length with Pad Character** property value ensures that BizTalk Server inserts pad characters into a field in the output document instance, if this is desired. The **Justification** property indicates on which side of the field data content the pad characters are removed (from the input document instance) or inserted (into the output document instance). Trailing pad characters are added to or removed from a field that is left justified, and leading pad characters are added to or removed from a field that is right justified. If the **Pad Character** property for a field is not set, no pad characters are added to or removed from that field.

# Property Scope

If you have two or more instances of a record in a [specification](#), the values of certain properties for these instances must be identical. In other words, the scope of these properties is global. The scope of certain field properties can also be global, but only if the **Type** property for the field is set to **Element**.

For example, all the properties on the **Declaration** and **Parse** tabs are identical for multiple instances of a record or a field. If you change a declaration or parse property for one instance of a record or a field, that property automatically changes for all other instances of that record or field. The properties on the **Reference** and **Dictionary** tabs are not global in scope, however, so the values for these properties can be set independently for each instance of a record or a field. Code lists apply only to fields, and they are not global in scope.

## Notes

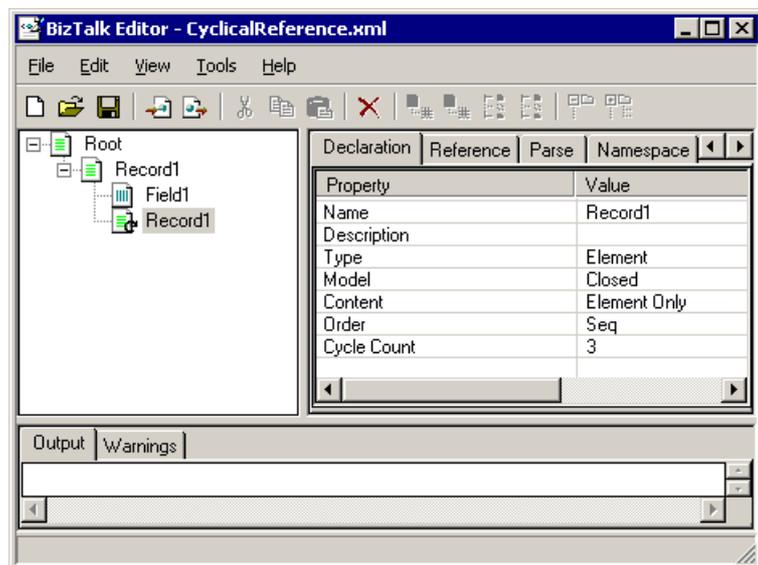
- The scope of a field can be global only if the **Type** property is set to **Element**.
- The scope of a field with the **Type** property set to **Attribute** is always local.
- In BizTalk Editor, only **ElementType** declarations are global in scope. If you import a schema into BizTalk Editor that contains **AttributeType** declarations that are global in scope, and then save the schema as a specification, the **AttributeType** declarations are automatically made local in scope within the appropriate **ElementType** declaration or declarations.

# Cyclical References

A cyclical reference in a [specification](#) occurs when a record is created as a descendant to itself. A cyclical reference can occur only when the **Standard** property value is set to **XML** on the **Reference** tab. BizTalk Editor represents a cyclical reference with an icon  that appears as a record with a curved arrow through it.

The following illustration shows how a cyclical reference appears in BizTalk Editor.

Click the illustration to enlarge or reduce.



The **Cycle Count** property appears on the **Declaration** tab and applies only to a cyclical node. The default value is 1; the maximum value is 7. The cycle count indicates how many cycles are available below the base record. For example, in the previous illustration there are a total of four levels for Record1: three from the cycle count of 3 and one from the base record. If you open this specification in [BizTalk Mapper](#), all four levels of Record1 appear. A Record2 and Field1 also appear for every Record1. You can connect links to nodes on any level of the cycle.

It is not possible to set [dictionary](#) property values for fields that descend from a cyclical node. For example, in the previous illustration, you can set dictionary property values for Root/Record1/Field1, but you cannot set dictionary property values for any of the three Field1 references that cycle below Root/Record1/Record1.

Cyclical references are subject to the following restrictions:

- Nodes on a cycle path (the nodes that occur between the first record and the last record in a cyclical reference) cannot appear anywhere else in the specification.
- Elements on a cycle path cannot be the source or target of any drag-and-drop or cut-and-paste operation.
- Cycles cannot overlap.
- The base record of a cyclical reference cannot be the root node of the specification.

## ◆ Important

- The **Minimum Occurrences** property on the **Reference** tab for the cyclical reference node must be set to **0**. Setting it to **1** causes an infinite loop.

## 📌 Note

- If you import a [schema](#) that contains a cyclical reference, BizTalk Editor does not automatically check to ensure that the cyclical reference is valid.

## Related Topics

[Create cyclical references](#)



# Default Value Integration

If a [source specification](#) contains a field of type **Attribute**, and an incoming [document instance](#) that is based on the source specification does not include that field, you might want the [specification](#) to provide a default value for the field. To set the default value for a field in a specification, highlight the field in the specification tree, and on the **Declaration** tab, type a numeric value into the Value field for the **Default Value** property. The **Default Value** property appears only if the **Type** property is set to **Attribute**. If an incoming document instance does not contain the field, the default value for the field is provided. If an incoming document instance contains the field, the default value is ignored.

# Namespace Support

The following topics are covered in this section:

- [Namespace Declarations](#)
- [Preserving Namespaces in Imported Files](#)

# Namespace Declarations

Namespaces that are declared in a [specification](#) are displayed on the **Namespace** tab of BizTalk Editor. The following table shows the prefixes and namespaces that appear on the **Namespace** tab by default when you open a specification in BizTalk Editor. You cannot edit these prefixes and namespaces.

Prefix	Namespace
(default)	urn:schemas-microsoft-com:xml-data
b	urn:schemas-microsoft-com: BizTalkServer
d	urn:schemas-microsoft-com: datatypes

## Notes

- The following namespace is not supported by [BizTalk Server](#):

SOAP-ENC="http://schemas.xmlsoap.org/soap/encoding/"

You can declare custom namespaces in a specification by typing a namespace prefix in the Prefix column and a namespace in the Uniform Resource Name column of the **Namespace** tab. BizTalk Editor does not validate the Uniform Resource Name that you enter for a namespace.

You can also add a custom annotation to any record and field. A custom annotation consists of a prefix-name pair and related value. The syntax for a prefix-name pair is shown in the following example:

*prefix:name*

On either the **Declaration** or **Reference** tab, type a prefix-name pair in the Property column and type a value in the Value column. Property values entered on the **Declaration** tab are global in scope, and property values entered on the **Reference** tab are local in scope. For more information about global and local scope, see [Property Scope](#). For more information about adding custom annotations, see [Add custom annotations](#).

## Related Topics

[Add custom annotations](#)

[Declare namespaces](#)

[Preserving Namespaces in Imported Files](#)

[Property Scope](#)

# Preserving Namespaces in Imported Files

You can import three types of files into BizTalk Editor: [XML-Data Reduced \(XDR\) schemas](#), [well-formed XML instances](#), and [document type definitions \(DTDs\)](#). BizTalk Editor handles existing namespaces and prefix-name pairs differently for each type of document.

## Importing an XDR schema

When you import an XDR schema, existing namespaces are handled in the following manner:

- Namespace declarations are preserved as custom namespaces and appear on the **Namespace** tab below the default namespaces.
- Custom namespace prefixes (with the exception of those associated with the **Name** and **Type** properties) are preserved only if the associated namespace is declared.

### Note

- BizTalk Editor cannot import an XDR schema with a namespace prefix associated with the **Name** or **Type** property.

## Importing a well-formed XML instance

When you import a well-formed XML [document instance](#), namespace declarations are removed from the document, and the prefix-name separator symbol is changed from a colon (:) to an underscore (\_) so that the original intention of the namespace prefix is not lost. For example:

*prefix\_name*

### Important

- If you import a well-formed XML document instance that contains a namespace prefix/name pair, then save the imported instance as a specification, then try to validate the original document instance against the new specification, instance validation fails. In the new specification, delete the node that contains the prefix/name pair, then for the parent record of that node, (on **Declaration** tab) select the **Open** value for the **Model** property. Save the specification. You can validate the document instance against this specification.

### Note

- BizTalk Editor cannot import any document that contains a namespace prefix if the associated namespace has not been declared in the document.

## Importing a DTD

When you import a DTD that contains a prefix-name pair, the separator symbol is changed from a colon (:) to an underscore (\_). This is so that in terms of placement within the overall structure, the original intention of the prefix is not lost even though the prefix notation itself is not supported. For example:

*prefix\_name*

## Related Topic

[Namespace Declarations](#)

# Adding SQL Annotations

You can specify an SQL annotation for any node in a [specification](#). Specifying an SQL annotation on the **Declaration** tab creates an annotation that is global in scope. The annotation is saved within the **ElementType** or **AttributeType** declaration in the specification. Specifying an SQL annotation on the **Reference** tab creates an annotation that is local in scope. The annotation is saved within the **Element** or **Attribute** reference in the specification.

You can select an SQL annotation in the list that appears when you double-click an empty field in the Property column of either the **Declaration** tab or the **Reference** tab for a node in a specification. Enter a value for the SQL annotation in the corresponding field in the Value column. For all SQL annotations except "sql:relationship" and "sql:xpath-query", the value is ordinary string data. For more information about adding SQL annotations and other custom annotations, see [Add custom annotations](#).

The following list shows all the possible SQL annotations in BizTalk Editor:

- sql:datatype
- sql:field
- sql:id
- sql:id-prefix
- sql:is-constant
- sql:key-fields
- sql:limit-field
- sql:limit-value
- sql:map-field
- sql:is-mapping-schema
- sql:overflow-field
- sql:relation
- sql:relationship
- sql:target-namespace
- sql:url-encode
- sql:use-cdata
- sql:xpath-query

The value of "sql:relationship" is one or more name-value pairs, and the name in each name-value pair must be one of four names: **key**, **key-relation**, **foreign-key**, or **foreign-relation**. The value of "sql:xpath-query" contains two parts: the first part is one or more name-value pairs that comprise an attribute or attributes, and the second part is the content of the "sql:xpath-query", represented as "content=#". These two parts are separated by the pound character (#).

The following table shows valid examples of the "sql:relationship" and "sql:xpath-query" SQL annotations.

SQL annotation	Example values
sql:relationship	key="CustomerID"
sql:relationship	key-relation="Cust"
sql:relationship	foreign-key="CustomerID"

sql:relationship	foreign-relation="Orders"
sql:xpath-query	mapping-schema="Schema.xml" #content=Employees

## Notes

- BizTalk Editor does not limit the selection of SQL annotations to only those that are appropriate in the current context. For example, "sql:relationship" and "xpath-query" are available on the **Declaration** tab, even though their use must be restricted to the **Reference** tab.
- When you specify an SQL annotation, a namespace with an "sql" prefix and the corresponding URN value is automatically declared on the **Namespace** tab.
- When you copy or cut a node with SQL annotations specified on its **Reference** tab and then paste that node to a different location in the specification, the SQL annotations are not present in the new node.

## Related Topics

[Add custom annotations](#)

[Namespace Declarations](#)

[Property Scope](#)

# Resources

This section includes information about the following topics:

- [Summary of Data Types and Data Type Values](#)
- [Summary List of Included EDI-based Documents](#)

# Summary of Data Types and Data Type Values

The following list provides details and examples to help you specify a value for the **Data Type** property on the **Declaration** tab. After you select one of the following options from the **Data Type** list, you might need to specify a value in the **Data Type Values** box.

## Data type

### Character

Contains a string, one character long.

### String

Contains any text.

### Number

Contains a number of digits and can have a leading sign, fractional digits, and an exponent. This follows standard English punctuation; for example, 15, 3.14, -123.456E+10.

### Integer (int)

Contains a number and can include an optional sign. It cannot contain a fraction or exponent; for example, 1, 58502, -13.

### Float

Contains a number, with no limit on digits; it can potentially have a leading sign, fractional digits, or an exponent.

### Fixed Point (14.4)

The same as **Number**, but can contain no more than 14 digits to the left of the decimal point and no more than 4 to the right; for example, 12.0044. This data type can be used for currency values.

### Boolean

Contains an expression that is evaluated as either **TRUE** (1) or **FALSE** (0).

### Date

Contains a date in a subset ISO 8601 format, with no time information; for example, 1988-04-07.

### Date Time

Contains a date in a subset of ISO 8601 format, with optional time and no optional zone information. Fractional seconds can be as precise as nanoseconds; for example, 1988-04-07T18:39:09.

### Date Time.tz

Contains a date in a subset ISO 8601 format, with optional time and optional zone information. Fractional seconds can be as precise as nanoseconds; for example, 1988-04-07T18:39:09-08:00.

### Time

Contains a time in a subset ISO 8601 format, with no date and no time zone information; for example, 08:15:27.

### Time.tz

Contains a time in a subset ISO 8601 format, with no date information but with optional time zone information; for example, 08:15:27-05:00.

### Byte (i1)

Contains a number and can contain an optional sign, such as a minus (-) sign. It cannot contain a fraction or an exponent; for example, 1, 127, -128.

### Word (i2)

Contains a number and can contain an optional sign, such as a minus (-) sign. It cannot contain a fraction or an exponent; for example, 1, 703, -32768.

### Integer (i4)

Contains a number and can contain an optional sign, such as a minus (-) sign. It cannot contain a fraction or an exponent; for

example, 1, 703, -32768, 148343, -1000000000.

### **Double Integer (i8)**

Contains a number and can contain an optional sign, such as a minus (-) sign. It cannot contain a fraction or an exponent; for example, 1, 703, -32768, 148343, -1000000000.

### **Unsigned Byte (ui1)**

Contains a number. It cannot contain a sign, fraction, or exponent; for example, 1, 255.

### **Unsigned Word (ui2)**

Contains a number. It cannot contain a sign, fraction, or exponent; for example, 1, 255, 65535.

### **Unsigned Integer (ui4)**

Contains a number. It cannot contain a sign, fraction, or exponent; for example, 1, 703, 3000000000.

### **Unsigned Double Integer (ui8)**

Contains a number. It cannot contain a sign, fraction, or exponent; for example, 1, 703, 3000000000.

### **Real (r4)**

Contains a number that has a minimum value of 1.17549435E-38F and a maximum value of 3.40282347E+38F; for example, 3.14285718E+2.

### **Double Real (r8)**

Contains a number that has a minimum value of 2.2250738585072014E308 and a maximum value of 1.7976931348623157E+308; for example, .314159265358979E+1.

### **Universal Unique Identifier (uuid)**

Contains hexadecimal digits representing octets, with optional embedded hyphens that can be ignored; for example, 333C7BC4-460F-11D0-BC04-0080C7055A83.

### **Uniform Resource Identifier (uri)**

Contains a Uniform Resource Identifier (URI).

### **Binary (base64)**

Contains binary encoding of binary text into characters; for example, conversion of a Graphic Interchange Format (GIF) image into a text representation.

### **Binary (hex)**

Contains a binary hexadecimal digit that represents octets; for example, 0x0ffaa.

### **ID**

Specifies the field as the ID.

### **IDREF**

Specifies that the field is referenced to the field containing the ID value.

### **IDREFS**

Specifies that the field holds a list of IDs, each separated by a space.

### **Enumeration**

Assigns an ordinal sequence to a series of values; for example, Monday, Tuesday, Wednesday might be enumerated as 1 2 3.

### **Note**

- The **Fixed Point (14.4)** data type can be used for currency values.

### **Related Topic**

[Set Declaration Properties](#)

# Summary List of Included EDI-Based Documents

BizTalk Editor supports all EDI-based documents. The following table lists the standard [specifications](#), versions, and document standards for EDI-based documents available when you create a new specification based on a standard. For more information, see [Create a specification based on a standard](#).

Standard	Version	Document standards
X12	<ul style="list-style-type: none"><li>• 2040</li><li>• 3010</li><li>• 3060</li><li>• 4010</li></ul>	<ul style="list-style-type: none"><li>• 810</li><li>• 832</li><li>• 846</li><li>• 850</li><li>• 852 (available in all versions except 2040)</li><li>• 855</li><li>• 856</li><li>• 861</li><li>• 864</li><li>• 867</li><li>• 940 (available only with 3060 and 4010 versions)</li><li>• 944 (available only with 3060 and 4010 versions)</li><li>• 997</li></ul>

EDIFACT	<ul style="list-style-type: none"> <li>• D93A</li> <li>• D95A</li> <li>• D95B</li> <li>• D97B</li> <li>• D98A</li> <li>• D98B</li> </ul>	<ul style="list-style-type: none"> <li>• APERAK (available in all versions except D93A)</li> <li>• CONTRL (available only with D98A and D98B versions)</li> <li>• DESADV</li> <li>• INVOIC</li> <li>• INVRPT</li> <li>• ORDERS</li> <li>• ORDRSP</li> <li>• PARTIN</li> <li>• PAYEXT</li> <li>• PRICAT</li> <li>• PRODAT (available only with D97B, D98A, and D98B versions)</li> <li>• RECADV (available only with D97B, D98A, and D98B versions)</li> <li>• SLSRPT</li> </ul>
XML	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	<ul style="list-style-type: none"> <li>• CommonAdvancedShipNotice</li> <li>• CommonInventoryAdvice</li> <li>• CommonInvoice</li> <li>• CommonPartnerProfile</li> <li>• CommonPO</li> <li>• CommonPOAcknowledgment</li> <li>• CommonPriceCatalog</li> <li>• CommonShippingAdvice</li> <li>• CommonShippingOrder</li> <li>• CanonicalReceipt</li> <li>• Simple SOAP Envelope</li> <li>• BTF1 Envelope</li> </ul>

**Related Topic**

[Create a specification based on a standard](#)

# Mapping Data

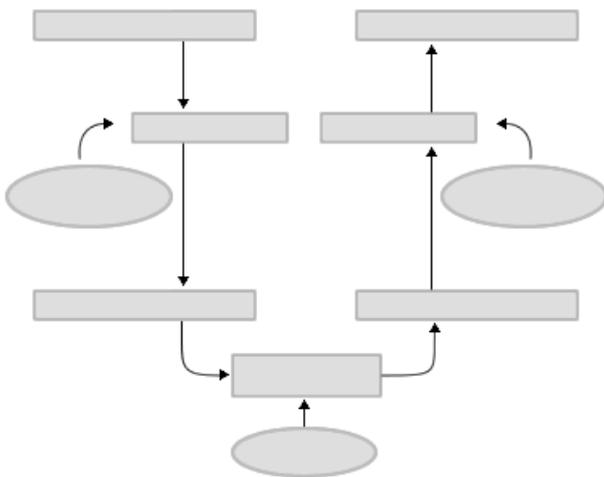
BizTalk Mapper is a translation design tool that enables you to create a correspondence between the records and fields in two different [specification](#) formats. BizTalk Mapper uses [links](#) and [functoids](#) to accomplish this translation. Functoids perform operations that range from simple calculations to elaborate script functionality. You can use BizTalk Mapper to graphically represent the structural transformation relationship between source-specification data elements and destination-specification data elements. This cross-reference and data-manipulation functionality creates a [map](#) that provides a set of instructions that defines the relationship between two different specification formats. The specification formats are defined by using [BizTalk Editor](#).

A map represents data transformations between a [source specification](#) and a [destination specification](#). Microsoft [BizTalk Server 2000](#) and the [Extensible Stylesheet Language \(XSL\)](#) component of the Microsoft XML Parser version 3.0 use the run-time data-transformation information that a map provides. When you create a map, the transformation information can be viewed on the **Output** tab of BizTalk Mapper.

BizTalk Mapper enables the open exchange of specifications in an [Extensible Markup Language \(XML\)](#) data format. BizTalk Mapper can open only specifications that have been saved in BizTalk Editor. BizTalk Mapper cannot open generic XML files or non-XML files. If you need to translate two generic XML files, you must first import them into BizTalk Editor and save them as specifications.

BizTalk Mapper supports a variety of [mapping](#) scenarios that range from simple, parent-child tree relationships to detailed, complex looping of records and hierarchies. When the mapping process is complete, a [serializer](#) component uses the specification to create a file format that can be recognized by your trading partner or internal application. BizTalk Mapper also includes a style-sheet compiler component that takes the visual representation of the map and creates an XSL style sheet.

The following illustration shows the process of mapping a source specification to a destination specification. The source file is an EDI-based document, and the destination file is a flat-file document. In this example, the [electronic data interchange \(EDI\)](#) document structure is converted to an intermediate XML format, the structure of which is represented by an [XML-Data Reduced \(XDR\)](#) specification. The final format of the data is a flat file. A data-driven [parser](#) (that uses the XDR specification) creates an XML version of the source EDI specification. The XSL engine then transforms this source XML representation to an XML representation of the destination file format. The destination specification is later serialized to the native format of the destination file, which is a flat file in this example.



XDR  
specification  
XDR  
specification  
XSLT map  
XSL engine  
**EDI to Flat File**  
Serializer  
Data parser  
XML document  
EDI document  
XML document  
Flat-file document

- For help with specific tasks, see [How To](#).

- For general background information, see [Concepts](#).
- For additional resources, see [Resources](#).
- For problem-solving instructions, see [Troubleshooting BizTalk Editor and BizTalk Mapper](#).

## **Related Topic**

[BizTalk Mapper User Interface](#)

# How To...

This section provides task-specific information about how to map data from one [specification](#) to another. It is highly recommended that you review the [Concepts](#) section to fully understand [links](#) and [functoids](#), as well as other [mapping](#) properties and functionality.

The following topics are covered in this section:

- [Change BizTalk Mapper Options](#)
- [Create new maps](#)
- [Open Maps](#)
- [Save, Store, and Close Maps](#)
- [Replace Specifications](#)
- [Manage Functoids](#)
- [Manage Links](#)
- [Create and Manage Compiled Maps](#)
- [Test Maps](#)
- [Manage Views](#)
- [Customize the User Interface](#)

# Change BizTalk Mapper Options

In the **BizTalk Mapper Options** dialog box, you can set general options and choose colors for the mapping grid.

- To view the **BizTalk Mapper Options** dialog box, on the **Tools** menu, click **Options**. The **General** tab appears by default.

For information about how to use the **BizTalk Mapper Options** dialog box, see the following procedures:

- [BizTalk Mapper Options: General Tab](#)
- [BizTalk Mapper Options: Colors Tab](#)

# BizTalk Mapper Options: General Tab

For information about how to access the **BizTalk Mapper Options** dialog box, see [Change BizTalk Mapper Options](#).

The **General** tab provides six options that enable you to customize the behavior of [BizTalk Mapper](#):

- **Warnings for simple linking errors** (selected by default). You receive a warning when you attempt to create a link between nodes whose data types do not match.
- **View compiler links** (selected by default). Compiler links appear on a map after compiling.
- **Clear compiler links after user action** (cleared by default). Compiler links disappear after taking any action in BizTalk Mapper.
- **Allow record content links** (cleared by default). Content links from records to [functoids](#) can be created.

## Note

- Certain functoids have input and/or output that does not use record content and is therefore unaffected by **Allow record content links**. This input and output consists of the logical functoids (output), the **Count** functoid (input), the **Iteration** functoid (input), and the **Looping** functoid (input and output).
- **Allow multiple inputs to destination tree nodes** (cleared by default). Two or more links can be made to a node in the [Destination Specification](#) tree.
- **Prompt to save before testing the map** (selected by default). After you click **Test Map** on the **Tools** menu, BizTalk Mapper displays a dialog box that asks if you want to save changes in your map file.

## Related Topic

[BizTalk Mapper Options: Colors Tab](#)

# BizTalk Mapper Options: Colors Tab

For information about how to access the **BizTalk Mapper Options** dialog box, see [Change BizTalk Mapper Options](#).

The **Colors** tab provides options that enable you to customize the colors on the mapping grid. For information about these options, see the following procedures:

- [Change mapping grid colors](#)
- [Change the color of links](#)
- [Change the color of selected objects](#)
- [Change the color of compiler warnings](#)
- [Restore default colors](#)

## Related Topic

[BizTalk Mapper Options: General Tab](#)

# Create new maps

1. On the **File** menu, click **New**.

The **Select Source Specification Type** dialog box appears.

2. Double-click one of the following:

- **Local Files**, and go to step 3.
- **Templates**, and go to step 4.
- **WebDAV Files**, and go to step 3.

3. Browse to the folder that contains the [source specification](#) that you want to open and go to step 5.

4. Click **EDIFACT**, **X12**, or **XML** and click **OK**.

If you select [EDIFACT](#) or [X12](#), you must also select the version you want to use. Click the folder for the version you want to use, click **OK**, and then go to step 5.

5. Select the source specification and click **Open** or **OK** as appropriate.

The **Select Destination Specification Type** dialog box appears.

6. Double-click one of the following:

- **Local Files**, and go to step 7.
- **Templates**, and go to step 8.
- **WebDAV Files**, and go to step 7.

7. Browse to the folder that contains the [destination specification](#) that you want to open and go to step 9.

8. Click **EDIFACT**, **X12**, or **XML** and click **OK**.

If you select [EDIFACT](#) or [X12](#), you must also select the version you want to use. Click the folder for the version you want to use, click **OK**, and then go to step 9.

9. Select the destination specification and click **Open** or **OK** as appropriate.

## Note

- To create a map, you must specify both a source specification and a destination specification.

## Related Topics

[Replace destination specifications](#)

[Replace source specifications](#)

# Open Maps

The following procedures are covered in this section:

- [Open maps from a local hard drive](#)
- [Retrieve maps from WebDAV](#)

# Open maps from a local hard drive

1. On the **File** menu, click **Open**.

The **Open Map Source** dialog box appears.

2. Browse to the folder that contains a map you want to open.

3. Click a map in the list and click **Open**.

## Related Topic

[Retrieve maps from WebDAV](#)

# Retrieve maps from WebDAV

1. On the **File** menu, click **Retrieve from WebDAV**.

The **Retrieve from WebDAV** dialog box appears.

2. In the **Server** list, click a server name.
3. Browse to the folder that contains the map you want to retrieve, click the map, and then click **Open**.

## Notes

- You might experience a delay the first time you connect to a remote [WebDAV](#) server.
- To retrieve a map in WebDAV, you must have permission to retrieve files on the server.

## Related Topics

[Open maps from a local hard drive](#)

[Troubleshooting BizTalk Editor and BizTalk Mapper](#)

# Save, Store, and Close Maps

The following procedures are covered in this section:

- [Save new maps](#)
- [Save existing maps](#)
- [Save compiled maps](#)
- [Store maps](#)
- [Close maps](#)

# Save new maps

1. On the **File** menu, click **Save As**.

The **Save Map Source As** dialog box appears.

2. In the **File name** box, type a name for the map.

3. In the **Encoding** list, click either **UTF-8** or **Unicode** and click **Save**.

If you want to use a specification associated with ASCII characters, click **UTF-8**. For specifications associated with double-byte character sets, click **Unicode**.

## Notes

- When you save a map, [BizTalk Mapper](#) automatically compiles it. You can view the results of the compiled map in the **Output** tab.
- When you save a map, BizTalk Mapper saves the map on your hard disk. To store a map in [WebDAV](#), you must have permission to store files on the server.

## Related Topic

[Store maps](#)

# Save existing maps

- On the **File** menu, click **Save**.

## Notes

- When you save a map, [BizTalk Mapper](#) automatically compiles it. You can view the results of the compiled map in the **Output** tab.
- When you save a map, BizTalk Mapper saves the map on your hard disk. To store a map in [WebDAV](#), you must have permission to store files on the server.

## Related Topic

[Store maps](#)

# Save compiled maps

1. On the **File** menu, click **Save Compiled Map As**.

The **Save Compiled Map As** dialog box appears.

2. In the **File name** box, type a name for the file and click **Save**.

## Related Topic

[Store maps](#)

# Store maps

1. On the **File** menu, click **Store to WebDAV**.

The **Store to WebDAV** dialog box appears.

2. In the **Server** list, click a server name.

3. Browse to the folder you want to use to store your map and, in the **File name** box, type the name of the file.

4. In the **Encoding** list, click either **UTF-8** or **Unicode** and click **Save**.

If you want to use a [specification](#) associated with ASCII characters, click **UTF-8**. For specifications associated with double-byte character sets, click **Unicode**.

## ◆ Important

- You cannot store files with double-byte character set (DBCS) file names if your locale setting is incorrect. For more information, see [???xml appears in the WebDAV dialog box](#).

## ✍ Notes

- You might experience a delay the first time you connect to a remote [WebDAV](#) server during.
- To store a map in WebDAV, you must have permission to store files on the server.

## Related Topic

[Troubleshooting BizTalk Editor and BizTalk Mapper](#)

# Close maps

- On the **File** menu, click **Close**.

# Replace Specifications

The following procedures are covered in this section:

- [Replace source specifications](#)
- [Replace destination specifications](#)

# Replace source specifications

1. On the **Edit** menu, click **Replace Source Specification**.

If you have not saved your [map](#), you are prompted to save changes to the map source.

The **Select Source Specification Type** dialog box appears.

2. Double-click one of the following:

- **Local Files**, and go to step 3.
- **Templates**, and go to step 4.
- **WebDAV Files**, and go to step 3.

3. Browse to the folder that contains the [source specification](#) and go to step 5.

4. Click **EDIFACT**, **X12**, or **XML** and click **OK**.

If you select [EDIFACT](#) or [X12](#), you must also select the version you want to use. Click the folder for the version you want, click **OK**, and then go to step 5.

5. Select the source specification and click **Open** or **OK** as appropriate.

## Notes

- Source test values are preserved when you replace a source specification, provided that the fields associated with these values exist in the new specification. For more information about source test values, see [Test links](#).
- The **Warnings** tab lists all warnings related to links that might break as a result of replacing the source specification.
- You also can right-click any record or field in the Source Specification tree and click **Replace Specification**.

## Related Topics

[Replace destination specifications](#)

[Test links](#)

# Replace destination specifications

1. On the **Edit** menu, click **Replace Destination Specification**.

If you have not saved your [map](#), you are prompted to save changes to the map source.

The **Select Destination Specification Type** dialog box appears.

2. Double-click one of the following:

- **Local Files**, and go to step 3.
- **Templates**, and go to step 4.
- **WebDAV Files**, and go to step 3.

3. Browse to the folder that contains the [destination specification](#) and go to step 5.

4. Click **EDIFACT**, **X12**, or **XML** and click **OK**.

If you select [EDIFACT](#) or [X12](#), you must also select the version you want to use. Click the folder for the version you want, click **OK**, and then go to step 5.

5. Select the destination specification and click **Open** or **OK** as appropriate.

## Notes

- Destination constant values are preserved when you replace a destination specification, provided that the fields associated with these values exist in the new [specification](#). For more information about destination constant values, see [Add constant values](#).
- The **Warnings** tab lists all warnings related to links that might break as a result of replacing the destination specification.
- You also can right-click any record or field in the Destination Specification tree and click **Replace Specification**.

## Related Topics

[Add constant values](#)

[Replace source specifications](#)

# Manage Functoids

The following topics are covered in this section:

- [Work with the Functoid Palette](#)
- [Edit Functoid Properties](#)

# Work with the Functoid Palette

The functoid palette contains the functoids available in [BizTalk Mapper](#). You can find the [functoid](#) that you want in the functoid palette and drag it to the mapping grid. The various types of functoids are organized in tabs. You might need to click the right arrow or left arrow to see tabs that are hidden from view.

The following procedures are covered in this section:

- [Add string functoids](#)
- [Add mathematical functoids](#)
- [Add logical functoids](#)
- [Add date and time functoids](#)
- [Add conversion functoids](#)
- [Add scientific functoids](#)
- [Add cumulative functoids](#)
- [Add database functoids](#)
- [Add the Scripting functoid](#)
- [Add the Record Count functoid](#)
- [Add the Index functoid](#)
- [Add the Iteration functoid](#)
- [Add the Value Mapping functoid](#)
- [Add the Value Mapping \(Flattening\) functoid](#)
- [Add the Looping functoid](#)
- [Delete functoids](#)

## Related Topics

[BizTalk Mapper Functoid Palette](#)

[Understanding Functoids](#)

# Add string functoids

1. On the **View** menu, click **Functoid Palette**.
2. On the **Functoid Palette**, click the **String** tab.
3. Drag a string functoid from the **Functoid Palette** to the mapping grid.  
For detailed information about specific string functoids, see [String Functoids](#).
4. Drag a record or field from the [Source Specification](#) tree to the functoid in the mapping grid, and then drag the functoid to a record or field in the [Destination Specification](#) tree.

## ◆ Important

- To create a link between a functoid and a record, you must enable the **Allow record content links** property. To do this, on the **Tools** menu, click **Options**. In the **BizTalk Mapper Options** dialog box, on the **General** tab, select the **Allow record content links** check box and click **OK**.

## 📌 Note

- You might need to expand the specification trees to see the records or fields that you want to map. For more information, see [Expand tree items](#).

## Related Topics

[Allow record content links](#)

[Create links between fields and functoids](#)

[Create links between records and functoids](#)

[String Functoids](#)

[Understanding Functoids](#)

# Add mathematical functoids

1. On the **View** menu, click **Functoid Palette**.
2. On the **Functoid Palette**, click the **Mathematical** tab.
3. Drag a mathematical functoid from the **Functoid Palette** to the mapping grid.

For detailed information about specific mathematical functoids, see [Mathematical Functoids](#).

4. Drag a record or field from the [Source Specification](#) tree to the functoid in the mapping grid, and then drag the functoid to a record or field in the [Destination Specification](#) tree.

## ◆ Important

- To create a link between a functoid and a record, you must enable the **Allow record content links** property. To do this, on the **Tools** menu, click **Options**. In the **BizTalk Mapper Options** dialog box, on the **General** tab, select the **Allow record content links** check box and click **OK**.

## 📌 Note

- You might need to expand the specification trees to see the records or fields that you want to map. For more information, see [Expand tree items](#).

## Related Topics

[Allow record content links](#)

[Create links between fields and functoids](#)

[Create links between records and functoids](#)

[Mathematical Functoids](#)

[Understanding Functoids](#)

# Add logical functoids

1. On the **View** menu, click **Functoid Palette**.
2. On the **Functoid Palette**, click the **Logical** tab.
3. Drag a logical functoid from the **Functoid Palette** to the mapping grid.  
For detailed information about specific logical functoids, see [Logical Functoids](#).
4. Drag a record or field from the [Source Specification](#) tree to the functoid in the mapping grid, and then drag the functoid to a record in the [Destination Specification](#) tree.

## ◆ Important

- To create a link between a functoid and a record, you must enable the **Allow record content links** property. To do this, on the **Tools** menu, click **Options**. In the **BizTalk Mapper Options** dialog box, on the **General** tab, select the **Allow record content links** check box and click **OK**.

## 📝 Notes

- Logical functoids are case sensitive when comparing two strings. For example, "Abc" and "abc" are not equal. The exception to this rule is when logical functoids compare strings that represent the Boolean values **TRUE** and **FALSE**. For example, "True" and "true" are equal.
- You might need to expand the specification trees to see the records or fields that you want to map. For more information, see [Expand tree items](#).

## Related Topics

[Allow record content links](#)

[Create links between fields and functoids](#)

[Create links between records and functoids](#)

[Logical Functoids](#)

[Understanding Functoids](#)

# Add date and time functoids

1. On the **View** menu, click **Functoid Palette**.
2. On the **Functoid Palette**, click the **Date/Time** tab.
3. Drag a date and time functoid from the **Functoid Palette** to the mapping grid.

For detailed information about specific date and time functoids, see [Date and Time Functoids](#).

4. Drag a record or field from the [Source Specification](#) tree to the functoid in the mapping grid, and then drag the functoid to a record or field in the [Destination Specification](#) tree.

## ◆ Important

- To create a link between a functoid and a record, you must enable the **Allow record content links** property. To do this, on the **Tools** menu, click **Options**. In the **BizTalk Mapper Options** dialog box, on the **General** tab, select the **Allow record content links** check box and click **OK**.

## 📝 Notes

- The **Date**, **Time**, and **Date and Time** functoids require only a link to a field or a record in the Destination Specification tree.
- You might need to expand the specification trees to see the records or fields that you want to map. For more information, see [Expand tree items](#).

## Related Topics

[Allow record content links](#)

[Create links between fields and functoids](#)

[Create links between records and functoids](#)

[Date and Time Functoids](#)

[Understanding Functoids](#)

# Add conversion functoids

1. On the **View** menu, click **Functoid Palette**.
2. On the **Functoid Palette**, click the **Conversion** tab.  
You might need to click the right arrow on the **Functoid Palette** to view the tab.
3. Drag a conversion functoid from the **Functoid Palette** to the mapping grid.  
For detailed information about specific conversion functoids, see [Conversion Functoids](#).
4. Drag a record or field from the [Source Specification](#) tree to the functoid in the mapping grid, and then drag the functoid to a record or field in the [Destination Specification](#) tree.

## ◆ Important

- To create a link between a functoid and a record, you must enable the **Allow record content links** property. To do this, on the **Tools** menu, click **Options**. In the **BizTalk Mapper Options** dialog box, on the **General** tab, select the **Allow record content links** check box and click **OK**.

## 📌 Note

- You might need to expand the specification trees to see the records or fields that you want to map. For more information, see [Expand tree items](#).

## Related Topics

[Allow record content links](#)

[Conversion Functoids](#)

[Create links between fields and functoids](#)

[Create links between records and functoids](#)

[Understanding Functoids](#)

# Add scientific functoids

1. On the **View** menu, click **Functoid Palette**.
2. On the **Functoid Palette**, click the **Scientific** tab.  
You might need to click the right arrow on the **Functoid Palette** to view the tab.
3. Drag a scientific functoid from the **Functoid Palette** to the mapping grid.  
For detailed information about specific scientific functoids, see [Scientific Functoids](#).
4. Drag a record or field from the [Source Specification](#) tree to the functoid in the mapping grid, and then drag the functoid to a record or field in the [Destination Specification](#) tree.

## ◆ Important

- To create a link between a functoid and a record, you must enable the **Allow record content links** property. To do this, on the **Tools** menu, click **Options**. In the **BizTalk Mapper Options** dialog box, on the **General** tab, select the **Allow record content links** check box and click **OK**.

## 📝 Note

- You might need to expand the specification trees to see the records or fields that you want to map. For more information, see [Expand tree items](#).

## Related Topics

[Allow record content links](#)

[Create links between fields and functoids](#)

[Create links between records and functoids](#)

[Scientific Functoids](#)

[Understanding Functoids](#)

# Add cumulative functoids

1. On the **View** menu, click **Functoid Palette**.

2. On the **Functoid Palette**, click the **Cumulative** tab.

You might need to click the right arrow on the **Functoid Palette** to view the tab.

3. Drag a cumulative functoid from the **Functoid Palette** to the mapping grid.

For detailed information about specific cumulative functoids, see [Cumulative Functoids](#).

4. Drag a field (with a parent record that is looping) from the [Source Specification](#) tree to the functoid in the mapping grid, and then drag the functoid to a record or field in the [Destination Specification](#) tree.

For more information about looping records, see [Using Cumulative Functoids](#).

## ◆ Important

- For information about the context of this procedure, see [Using Cumulative Functoids](#).
- To create a link between a functoid and a record, you must enable the **Allow record content links** property. To do this, on the **Tools** menu, click **Options**. In the **BizTalk Mapper Options** dialog box, on the **General** tab, select the **Allow record content links** check box and click **OK**.

## ✍ Note

- You might need to expand the specification trees to see the records or fields that you want to map. For more information, see [Expand tree items](#).

## Related Topics

[Allow record content links](#)

[Create links between fields and functoids](#)

[Create links between records and functoids](#)

[Cumulative Functoids](#)

[Understanding Functoids](#)

# Add database functoids

1. On the **View** menu, click **Functoid Palette**.
2. On the **Functoid Palette**, click the **Database** tab.  
You might need to click the right arrow on the **Functoid Palette** to view the tab.
3. Drag a database functoid from the **Functoid Palette** to the mapping grid.  
For detailed information about database functoids, see [Database Functoids](#).

## ◆ Important

- For information about how to use database functoids to extract information from a database, see [Using Database Functoids](#).
- To create a link between a functoid and a record, you must enable the **Allow record content links** property. To do this, on the **Tools** menu, click **Options**. In the **BizTalk Mapper Options** dialog box, on the **General** tab, select the **Allow record content links** check box and click **OK**.

## ✍ Note

- You might need to expand the specification trees to see the records or fields that you want to map. For more information, see [Expand tree items](#).

## Related Topics

[Allow record content links](#)

[Create links between fields and functoids](#)

[Create links between records and functoids](#)

[Database Functoids](#)

[Understanding Functoids](#)

# Add the Scripting functoid

1. On the **View** menu, click **Functoid Palette**.
2. On the **Functoid Palette**, click the **Advanced** tab.  
You might need to click the right arrow on the **Functoid Palette** to view the tab.
3. Drag the **Scripting** functoid  to the mapping grid.  
For detailed information about the **Scripting** functoid, see [Advanced Functoids](#).
4. Double-click the **Scripting** functoid.
5. In the **Functoid Properties** dialog box, click the **Script** tab, type the script that you want, and then click **OK**.
6. Drag a record or field from the [Source Specification](#) tree to the **Scripting** functoid in the mapping grid, and then drag the **Scripting** functoid to the record or field in the [Destination Specification](#) tree.

## ◆ Important

- If there are multiple functions within a **Scripting** functoid, the first function is the main or primary function. This function must have parameters set if there are links into the functoid.
- To create a link between a functoid and a record, you must enable the **Allow record content links** property. To do this, on the **Tools** menu, click **Options**. In the **BizTalk Mapper Options** dialog box, on the **General** tab, select the **Allow record content links** check box and click **OK**.

## 📝 Note

- You might need to expand the specification trees to see the records or fields that you want to map. For more information, see [Expand tree items](#).

## Related Topics

[Advanced Functoids](#)

[Allow record content links](#)

[Create links between fields and functoids](#)

[Create links between records and functoids](#)

[Manage Views](#)

# Add the Record Count functoid

1. On the **View** menu, click **Functoid Palette**.

2. On the **Functoid Palette**, click the **Advanced** tab.

You might need to click the right arrow on the **Functoid Palette** to view the tab.

3. Drag the **Record Count** functoid  from the **Functoid Palette** to the mapping grid.

For detailed information about the **Record Count** functoid, see [Advanced Functoids](#).

4. Drag a looping record from the [Source Specification](#) tree to the **Record Count** functoid in the mapping grid, and then drag the **Record Count** functoid to a field in the [Destination Specification](#) tree.

For more information about looping records, see [Using the Record Count Functoid](#).

## ◆ Important

- For information about the context of this procedure, see [Using the Record Count Functoid](#).
- To create a link between a functoid and a record, you must enable the **Allow record content links** property. To do this, on the **Tools** menu, click **Options**. In the **BizTalk Mapper Options** dialog box, on the **General** tab, select the **Allow record content links** check box and click **OK**.

## Note

- You might need to expand the specification trees to see the records or fields that you want to map. For more information, see [Expand tree items](#).

## Related Topics

[Advanced Functoids](#)

[Allow record content links](#)

[Create links between fields and functoids](#)

[Create links between records and functoids](#)

[Understanding Functoids](#)

# Add the Index functoid

1. On the **View** menu, click **Functoid Palette**.
2. On the **Functoid Palette**, click the **Advanced** tab.  
You might need to click the right arrow on the **Functoid Palette** to view the tab.
3. Drag the **Index** functoid  from the **Functoid Palette** to the mapping grid.  
For detailed information about the **Index** functoid, see [Advanced Functoids](#).
4. Drag a field (with a parent record that is looping) from the [Source Specification](#) tree to the **Index** functoid in the mapping grid, and then drag the **Index** functoid to a field in the [Destination Specification](#) tree.  
For more information about looping records, see [Using the Index Functoid](#).
5. Double-click the **Index** functoid to display its property sheet.
6. Click the **Insert New Parameter** button , type the index value, and then press ENTER.
7. Repeat step 6 as necessary.
8. Click **OK**.

## ◆ Important

- For information about the context of this procedure, see [Using the Index Functoid](#).
- To create a link between a functoid and a record, you must enable the **Allow record content links** property. To do this, on the **Tools** menu, click **Options**. In the **BizTalk Mapper Options** dialog box, on the **General** tab, select the **Allow record content links** check box and click **OK**.

## 📝 Note

- You might need to expand the specification trees to see the records or fields that you want to map. For more information, see [Expand tree items](#).

## Related Topics

[Advanced Functoids](#)

[Allow record content links](#)

[Create links between fields and functoids](#)

[Create links between records and functoids](#)

[Understanding Functoids](#)

# Add the Iteration functoid

1. On the **View** menu, click **Functoid Palette**.
2. On the **Functoid Palette**, click the **Advanced** tab.  
You might need to click the right arrow on the **Functoid Palette** to view the tab.
3. Drag the **Iteration** functoid  from the **Functoid Palette** to the mapping grid.  
For detailed information about the **Iteration** functoid, see [Advanced Functoids](#).

## ◆ Important

- For information about how to use the **Iteration** functoid, see [Using the Iteration Functoid](#).
- To create a link between a functoid and a record, you must enable the **Allow record content links** property. To do this, on the **Tools** menu, click **Options**. In the **BizTalk Mapper Options** dialog box, on the **General** tab, select the **Allow record content links** check box and click **OK**.

## ✍ Note

- You might need to expand the specification trees to see the records or fields that you want to map. For more information, see [Expand tree items](#).

## Related Topics

[Advanced Functoids](#)

[Allow record content links](#)

[Create links between fields and functoids](#)

[Create links between records and functoids](#)

[Understanding Functoids](#)

# Add the Value Mapping functoid

1. On the **View** menu, click **Functoid Palette**.
2. On the **Functoid Palette**, click the **Advanced** tab.  
You might need to click the right arrow on the **Functoid Palette** to view the tab.
3. Drag the **Value Mapping** functoid  from the **Functoid Palette** to the mapping grid.  
For detailed information about the **Value Mapping** functoid, see [Advanced Functoids](#).

## ◆ Important

- For information about how to use the **Value Mapping** functoid, see [Using the Value Mapping Functoid](#).
- To create a link between a functoid and a record, you must enable the **Allow record content links** property. To do this, on the **Tools** menu, click **Options**. In the **BizTalk Mapper Options** dialog box, on the **General** tab, select the **Allow record content links** check box and click **OK**.

## 📝 Note

- You might need to expand the specification trees to see the records or fields that you want to map. For more information, see [Expand tree items](#).

## Related Topics

[Add the Value Mapping \(Flattening\) functoid](#)

[Advanced Functoids](#)

[Allow record content links](#)

[Create links between fields and functoids](#)

[Create links between records and functoids](#)

[Understanding Functoids](#)

# Add the Value Mapping (Flattening) functoid

1. On the **View** menu, click **Functoid Palette**.
2. On the **Functoid Palette**, click the **Advanced** tab.  
You might need to click the right arrow on the **Functoid Palette** to view the tab.
3. Drag the **Value Mapping (Flattening)** functoid  from the **Functoid Palette** to the mapping grid.  
For detailed information about the **Value Mapping (Flattening)** functoid, see [Advanced Functoids](#).

## ◆ Important

- For information about how to use the **Value Mapping (Flattening)** functoid, see [Using the Value Mapping \(Flattening\) Functoid](#).
- To create a link between a functoid and a record, you must enable the **Allow record content links** property. To do this, on the **Tools** menu, click **Options**. In the **BizTalk Mapper Options** dialog box, on the **General** tab, select the **Allow record content links** check box and click **OK**.

## 📝 Note

- You might need to expand the specification trees to see the records or fields that you want to map. For more information, see [Expand tree items](#).

## Related Topics

[Add the Value Mapping functoid](#)

[Advanced Functoids](#)

[Allow record content links](#)

[Create links between fields and functoids](#)

[Create links between records and functoids](#)

[Understanding Functoids](#)

# Add the Looping functoid

1. On the **View** menu, click **Functoid Palette**.
2. On the **Functoid Palette**, click the **Advanced** tab.  
You might need to click the right arrow on the **Functoid Palette** to view the tab.
3. Drag the **Looping** functoid  from the **Functoid Palette** to the mapping grid.  
For detailed information about the **Looping** functoid, see [Advanced Functoids](#).

## ◆ Important

- For information about how to use the **Looping** functoid, see [Using the Looping Functoid](#).
- To create a link between a functoid and a record, you must enable the **Allow record content links** property. To do this, on the **Tools** menu, click **Options**. In the **BizTalk Mapper Options** dialog box, on the **General** tab, select the **Allow record content links** check box and click **OK**.

## ✍ Note

- You might need to expand the specification trees to see the records or fields that you want to map. For more information, see [Expand tree items](#).

## Related Topics

[Advanced Functoids](#)

[Allow record content links](#)

[Create links between fields and functoids](#)

[Create links between records and functoids](#)

[Understanding Functoids](#)

# Delete functoids

1. Right-click the functoid you want to remove and click **Delete**.
2. Click **Yes** in the confirmation dialog box.

# Edit Functoid Properties

- To view the **Functoid Properties** dialog box, right-click a functoid in the mapping grid and click **Properties**.

## Notes

- You also can double-click a functoid to view its properties.
- The **General** tab displays input-parameter information. The **Script** tab displays script information.

For information about how to use this dialog box, see the following topics:

- [Input Parameters](#)
- [Functoid Scripts](#)

# Input Parameters

For information about how to access the **Functoid Properties** dialog box, see [Edit Functoid Properties](#).

Input parameters for many [functoids](#) can be added, deleted, and moved up and down on the **General** tab of the **Functoid Properties** dialog box. For more information, see the following procedures:

- [Insert input parameters](#)
- [Delete input parameters](#)
- [Move input parameters](#)
- [Rename input parameters](#)

## Note

- Some functoids have limits on the number of parameters they can have. Information about how many parameters a particular functoid can have can be found beneath the **Input parameters** area on the **General** tab of the **Functoid Properties** dialog box for that functoid.

# Insert input parameters

1. Double-click a functoid in the mapping grid.

The **Functoid Properties** dialog box appears.

2. On the **General** tab, click the **Insert New Parameter** button , type the information for the new parameter, and then press ENTER.

## **Note**

- If the **Insert New Parameter** button in step 2 is unavailable, the functoid does not accept or require input parameters.

3. Repeat step 2 to add additional parameters, if necessary.

4. Click **OK**.

## **Important**

- Double quotation marks are not supported within a constant value for an input parameter.

## **Related Topics**

[Delete input parameters](#)

[Move input parameters](#)

[Rename input parameters](#)

# Delete input parameters

1. Double-click a functoid in the mapping grid.
2. On the **General** tab, in the **Input parameters** area, click the input parameter you want to delete.
3. Click the **Delete Selected Parameter** button  and click **OK**.

## Related Topics

[Insert input parameters](#)

[Move input parameters](#)

[Rename input parameters](#)

# Move input parameters

1. Double-click a functoid in the mapping grid.
2. On the **General** tab, in the **Input parameters** area, click the input parameter you want to move.
3. Click the **Move Up Selected Parameter** button  to move the parameter up, or click the **Move Down Selected Parameter** button  to move the parameter down, and click **OK**.

## Related Topics

[Delete input parameters](#)

[Insert input parameters](#)

# Rename input parameters

1. Double-click a functoid in the mapping grid.
2. On the **General** tab, in the **Input parameters** area, right-click the input parameter you want to rename and click **Change Value**.
3. Type a new parameter name and click **OK**.

## Related Topics

[Delete input parameters](#)

[Insert input parameters](#)

[Move input parameters](#)

# Functoid Scripts

For information about how to access the **Functoid Properties** dialog box, see [Editing Functoid Properties](#).

You can view or edit scripts on the **Script** tab of the **Functoid Properties** dialog box.

## Note

- You can view the script for any functoid, but you can edit only the script of a **Scripting** functoid.

## Related Topic

[Input Parameters](#)

# Manage Links

The following topics are covered in this section:

- [Create links between fields](#)
- [Create links between fields and functors](#)
- [Create links between records and fields](#)
- [Create links between records and functors](#)
- [Create links between functors](#)
- [Allow record content links](#)
- [Redirect links](#)
- [Delete links](#)

# Create links between fields

- Drag a field from the [Source Specification](#) tree to a field in the [Destination Specification](#) tree.

## ◆ Important

- The data type of a field in the source specification should match the data type of a field to which it is linked in the destination specification.

## 📝 Notes

- You cannot link to a node in a destination specification that has a destination constant value associated with it.
- You cannot link to a required field in a destination specification that has a default value associated with it. For more information about making a field required, see [Set reference properties](#). For more information about setting the default value of a field, see [Set declaration properties](#).
- You might need to expand the specification trees to view the fields that you want to map. For more information, see [Expand tree items](#).

## Related Topics

[Add constant values](#)

[Manage Views](#)

[Set declaration properties](#)

[Set reference properties](#)

[Summary of Data Types and Data Type Values](#)

# Create links between fields and functors

- Drag a field from the [Source Specification](#) tree or the [Destination Specification](#) tree to a functor in the mapping grid.
- Or-
- Drag the functor from the mapping grid to a field in the Source Specification tree or Destination Specification tree.

## ◆ Important

- A field with a certain data type property in the Destination Specification of a map should not be linked to a functor that produces output of a different data type.

## Notes

- You must first add a functor to the mapping grid before you can add a link from a field to the functor. For more information about adding a functor to the mapping grid, see [Work with the Functor Palette](#).
- You cannot link to a node (in a destination specification) that has a destination constant value associated with it.
- You cannot link to a required field (in a destination specification) that has a default value associated with it. For more information about making a field required, see [Set reference properties](#). For more information about setting the default value of a field, see [Set declaration properties](#).

## Related Topics

[Add constant values](#)

[Manage Views](#)

[Set declaration properties](#)

[Set reference properties](#)

[Work with the Functor Palette](#)

# Create links between records and fields

1. On the **Tools** menu, click **Options**.
2. In the **BizTalk Mapper Options** dialog box, select the **Allow record content links** check box and click **OK**.
3. Drag a record from the [Source Specification](#) tree to a field in the [Destination Specification](#) tree.

—Or—

Drag a record from the Destination Specification tree to a field in the Source Specification tree.

## Notes

- You cannot link to a node in a destination specification that has a destination constant value associated with it.
- You cannot link to a required field in a destination specification that has a default value associated with it. For more information about making a field required, see [Set reference properties](#). For more information about setting the default value of a field, see [Set declaration properties](#).
- You might need to expand the specification trees to see the records and fields that you want to map. For more information, see [Expand tree items](#).

## Related Topics

[Add constant values](#)

[Manage Views](#)

[Set declaration properties](#)

[Set reference properties](#)

# Create links between records and functoids

1. On the **Tools** menu, click **Options**.

The **BizTalk Mapper Options** dialog box appears.

2. Select the **Allow record content links** check box and click **OK**.

3. Drag a record from the [Source Specification](#) tree or the [Destination Specification](#) tree to a functoid in the mapping grid.

-Or-

Drag the functoid from the mapping grid to a record in the Source Specification tree or Destination Specification tree.

## **Notes**

- You must first add a functoid to the mapping grid before you can add a link from a record to the functoid.
- You cannot link to a node in a destination specification that has a destination constant value associated with it. For more information about destination constant values, see [BizTalk Mapper User Interface](#).

## **Related Topic**

[Add constant values](#)

[Manage Views](#)

# Create links between functors

- Drag one functor to another functor in the mapping grid.

## Note

- Links are processed left to right in the mapping grid. You cannot make a link from one functor to another functor directly above or below it.

## Related Topics

[Create links between fields and functors](#)

[Create links between records and functors](#)

# Allow record content links

1. On the **Tools** menu, click **Options**.

The **BizTalk Mapper Options** dialog box appears.

2. Select the **Allow record content links** check box and click **OK**.
3. Drag a record from the [Source Specification](#) tree to a record in the [Destination Specification](#) tree.

# Redirect links

1. In the mapping grid, click a link to highlight it.

The endpoints of the links are highlighted with small blue boxes.

2. Drag either endpoint to the functoid or node to which you want to connect.

As you drag an endpoint, the pointer becomes a crosshair. If you point to an object to which a link cannot be made, the pointer becomes a circle with a line through it.

## ◆ Important

- If you have two or more source links connected to a functoid and you redirect one or more of those source links to different nodes in the [source specification](#), the order of the functoid's input parameters might not be preserved. Double-click the functoid to view its input parameters and ensure that they are in the correct order.

# Delete links

1. Right-click the link you want to delete and click **Delete**.
2. Click **Yes** in the confirmation dialog box.

# View Grid Links and Functoids

The following topics are covered in this section:

- [View links and functoids in the mapping grid](#)
- [View links and functoids by using the grid preview](#)

# View links and functoids in the mapping grid

1. Move the cursor into the mapping grid, near the edge, in the direction that you want to scroll.

The cursor changes from a pointer or pipe (|) to a large arrow.

2. Click and hold the left mouse button to scroll in the direction that the arrow points.

## Note

- You can also scroll by clicking in the mapping grid background and then using the arrow keys to scroll in all four directions.

## Related Topics

[BizTalk Mapper User Interface](#)

[View links and functoids by using the grid preview](#)

# View links and functoids by using the grid preview

1. On the **View** menu, click **Grid Preview**.

The **Grid Preview** window opens to display a representation of where the functoids are located on the mapping grid.

2. Drag the green locator bar to a new location on the **Grid Preview** dialog box.

As you move the green locator bar, links and functoids in the mapping grid also move.

## **Note**

The grid preview is useful for navigating the mapping grid when you have many functoids spread out over the mapping grid.

## **Related Topics**

[BizTalk Mapper User Interface](#)

[View links and functoids in the mapping grid](#)

# Edit Link Properties

- To view the **Link Properties** dialog box, right-click a link in the mapping grid and click **Properties**.

The **General** tab appears by default.

For information about how to use this dialog box, see the following topics:

- [View Link Properties: General Tab](#)
- [View Link Properties: Compiler Tab](#)

## **Note**

- You also can double-click a link to view its properties.

## **Related Topics**

[Compiling Maps](#)

[Manage Links](#)

# View Link Properties: General Tab

For information about how to access the **Link Properties** dialog box, see [Edit Link Properties](#).

The **General** tab displays information about the source and destination of a link. The **Source** area displays the record path, field path, or **functoid** name for the link source, depending on whether the link source is a record, a field, or a functoid. The **Destination** area displays the record path, field path, or functoid name for the link destination, depending on whether the link destination is a record, a field, or a functoid.

## Related Topic

[View Link Properties: Compiler Tab](#)

# View Link Properties: Compiler Tab

For information about how to access the **Link Properties** dialog box, see [Edit Link Properties](#).

The **Compiler** tab displays an area for setting compiler properties for source-specification links and an area for setting compiler properties for destination-specification links. For information about changing these settings, see the following topics:

- [Select compiler properties for source-specification links](#)
- [Select compiler properties for destination-specification links](#)

## Related Topic

[View Link Properties: General Tab](#)

# Select compiler properties for source-specification links

1. Right-click a link in the mapping grid that is connected to a node in the [source specification](#) and click **Properties**.
2. Click the **Compiler** tab and click one of the following options in the **Source specification links** area:
  - **Copy value (default)**. Copies the value of the node in the incoming [document instance](#).
  - **Copy name**. Copies the name of the node in the incoming document instance.
3. Click **OK**.

## Related Topic

[Select compiler properties for destination-specification links](#)

# Select compiler properties for destination-specification links

1. Right-click a link in the mapping grid that is connected to a node in the [destination specification](#) and click **Properties**.
2. Click the **Compiler** tab and select one of the following options in the **Destination specification links** area:
  - **Flatten links (default)**. This mode means that the source and destination specifications match and that a one-to-one link is created for each record and field.
  - **Match links top-down**. This mode matches level to level from the top down.
  - **Match links bottom-up**. This mode matches level to level from the bottom up.
3. Click **OK**.

## Notes

- If you use a flatten compiler directive, a top-down compiler directive, and a bottom-up compiler directive for links from fields in the source specification to fields in the destination specification that share the same parent record, BizTalk Mapper treats all the links as if they were set to the flatten compiler directive.
- If you use one or more flatten compiler directives and a top-down compiler directive for links from fields in the source specification to fields in the destination specification that share the same parent record, BizTalk Mapper treats all the links as if they were set to the top-down compiler directive.
- If you use one or more flatten compiler directives and a bottom-up compiler directive for links from fields in the source specification to fields in the destination specification that share the same parent record, BizTalk Mapper treats all the links as if they were set to the bottom-up compiler directive.
- If you use one or more top-down compiler directives and one or more bottom-up compiler directives for links from fields in the source specification to fields in the destination specification that share the same parent record, BizTalk Mapper treats all the links as if they were set to the flatten compiler directive.

## Related Topics

[Matching Node-Hierarchy Levels](#)

[Select compiler properties for source-specification links](#)

# Create and Manage Compiled Maps

The following procedures are covered in this section:

- [Compile maps](#)
- [Resolve warnings and errors after compiling a map](#)
- [Add constant values](#)

# Compile maps

- On the **Tools** menu, click **Compile Map**.

## **Caution**

- [BizTalk Mapper](#) generates a warning on the **Warnings** tab when the compiler encounters a situation that yields incorrect results. A map must generate no warnings before it can be considered ready for a production environment.

## **Related Topic**

[Resolve warnings and errors after compiling a map](#)

# Resolve warnings and errors after compiling a map

1. Double-click a warning in the **Warnings** tab.

The [link](#) or [functoid](#) that relates to the warning or error is highlighted in the mapping grid.

2. Modify the link or functoid as needed.

3. Repeat steps 1-2 for each warning.

4. On the **Tools** menu, click **Compile Map**.

## Related Topics

[Compile maps](#)

# Add constant values

1. Select a record or field in the Destination Specification tree and click the **Values** tab.
2. In the **Destination constant value** box, type a value that you want associated with the record or field.

## Note

- You cannot create a [link](#) to a record or field that has a constant value associated with it.
- You can only associate a constant value with a record with its **Content** property set to Text Only. For more information about the **Content** property, see [Set declaration properties](#).

## Related Topic

[Set declaration properties](#)

# Test Maps

The following procedures are covered in this section:

- [Test record and field properties that have links](#)
- [Test links](#)
- [Test functors](#)

# Test record and field properties that have links

## ◆ Important

- Always compile a [map](#) prior to testing it so you can resolve warnings and errors. For more information, see [Compile maps](#).

1. Click a field in the [Source Specification](#) tree that is connected to a link.
2. Click the **Values** tab.
3. Type a value in the **Source test value** box.
4. On the **Tools** menu, click **Test Map**.

## ◆ Important

- Before the test begins you are prompted to save your file. Save your file prior to testing it as a precautionary measure to preserve your data in case any problems are accidentally introduced into the map.
5. Click **Yes** to save the map.
  6. Verify the results on the **Output** tab.

## 📌 Note

- If the **Maximum Occurrences** property for a record is an asterisk (\*), this indicates that it is a looping record. The incoming document instance that [BizTalk Mapper](#) generates to test the map contains two occurrences of the record.

## Related Topics

[Compile maps](#)

[Testing Maps](#)

# Test links

## ◆ Important

- Always compile a [map](#) prior to testing it so you can resolve warnings and errors. For more information, see [Compile maps](#).

1. Click a field in the [Source Specification](#) tree that is connected to a link.
2. Click the **Values** tab.
3. Type a value in the **Source test value** box.
4. On the **Tools** menu, click **Test Map**.

## ◆ Important

- Before the test begins you are prompted to save your file. Save your file prior to testing it as a precautionary measure to preserve your data in case any problems are accidentally introduced into the map.
5. Click **Yes** to save the map.
  6. Verify the results on the **Output** tab.

## Related Topics

[Compile maps](#)

[Testing Maps](#)

# Test functors

## ◆ Important

- Always compile a [map](#) prior to testing it so you can resolve warnings and errors. For more information, see [Compile maps](#).
1. On the **Tools** menu, click **Test Map**.

## ◆ Important

- Before the test begins you are prompted to save your file. Save your file prior to testing it as a precautionary measure to preserve your data in case any problems are accidentally introduced into the map.
2. Click **Yes** to save the map.
  3. Verify the results on the **Output** tab.

## Related Topics

[Compile maps](#)

[Testing Maps](#)

# Manage Views

The following procedures are covered in this section:

- [Expand tree items](#)
- [Collapse tree items](#)
- [View record and field properties](#)
- [View namespaces](#)
- [Adjust the pane size for the Source Specification tree](#)
- [Adjust the pane size for the Destination Specification tree](#)
- [Adjust the size of the lower pane](#)

# Expand tree items

- Click the root node or a record in the specification tree that you want to expand and, on the **View** menu, click **Expand Tree Items**.

—Or—

Right-click the root node or a record in a tree and click **Expand Tree Items**.

## Related Topic

[Collapse tree items](#)

# Collapse tree items

- Click the root node or a record in the specification tree that you want to collapse and, on the **View** menu, click **Collapse Tree Items**.

## Note

- You also can right-click the root node or a record in a tree and click **Collapse Tree Items**.

## Related Topic

[Expand tree items](#)

# View record and field properties

- Click a record or field in either the [Source Specification](#) tree or the [Destination Specification](#) tree and, on the **View** menu, click **Properties**.

—Or—

Click a record or field in either tree and click the **Properties** tab.

## **Note**

- You might need to drag the scroll bar on the **Properties** tab to view a specific property and its associated value.

# View namespaces

You can view the namespaces in a [map](#) by viewing the map in Microsoft Internet Explorer 5 or later.

1. Start Internet Explorer and browse to the map file that you want to open.
2. Scroll to the first <schema> tag (directly following the <srctree> tag) to view namespace information for the [source specification](#).
3. Scroll to the second <schema> tag (directly following the <sinktree> tag) to view namespace information for the [destination specification](#).

## Related Topic

[Namespace Support](#)

# Adjust the pane size for the Source Specification tree

1. Place the cursor on the right border of the [Source Specification](#) tree pane until the cursor becomes a two-headed arrow.
2. Drag the border to the right to increase the pane size or to the left to decrease the pane size.

## Note

- Double-click the border to restore it to its default position.

## Related Topics

[Adjust the pane size for the Destination Specification tree](#)

[Adjust the size of the lower pane](#)

# Adjust the pane size for the Destination Specification tree

1. Place the cursor on the left border of the [Destination Specification](#) tree pane until the cursor becomes a two-headed arrow.
2. Drag the border to the left to increase the pane size or to the right to decrease the pane size.

## Note

- Double-click the border to restore it to its default position.

## Related Topics

[Adjust the pane size for the Source Specification tree](#)

[Adjust the size of the lower pane](#)

# Adjust the size of the lower pane

1. Place the cursor on the top border of the lower pane until the cursor becomes a two-headed arrow.
2. Drag the pane upward to increase the pane size or downward to decrease the pane size.

## Note

- Double-click the border to restore it to its default position.

## Related Topics

[Adjust the pane size for the Destination Specification tree](#)

[Adjust the pane size for the Source Specification tree](#)

# Customize the User Interface

The following procedures are covered in this section:

- [Change mapping grid colors](#)
- [Change the color of links](#)
- [Change the color of selected objects](#)
- [Change the color of compiler warnings](#)
- [Restore default colors](#)
- [Change text size](#)

# Change mapping grid colors

1. On the **Tools** menu, click **Options**.

The **BizTalk Mapper Options** dialog box appears.

2. Click the **Colors** tab.

3. Click the box next to **Grid foreground**, which represents the dashed lines in the mapping grid, and, in the color palette, select a new color.

–Or–

Click the box next to **Grid background**, which represents the background color of the mapping grid, and, in the color palette, select a new color.

4. Click **OK**.

## Related Topics

[Change the color of compiler warnings](#)

[Change the color of links](#)

[Change the color of selected objects](#)

[Restore default colors](#)

# Change the color of links

1. On the **Tools** menu, click **Options**.

The **BizTalk Mapper Options** dialog box appears.

2. Click the **Colors** tab.

3. Click the box next to one of the following:

- **Fixed links.** Fixed links are simple value-copy links in the mapping grid.
- **Elastic links.** Elastic links are simple value-copy links that are dragged from the [Source Specification](#) tree to the [Destination Specification](#) tree. Once the link is made, the color of the link changes to the predefined fixed links color.
- **Partial links.** Partial links are links that exist for a field or record whose parent record is collapsed.
- **Compiler links.** Compiler links are the compiler directive links. They are links that are automatically created when a link is set from a field in the Source Specification tree to a field in the Destination Specification tree and the hierarchy of the two trees does not match.

4. In the color palette, select a new color.

5. Repeat step 3 change other colors, if necessary.

6. Click **OK**.

## Related Topics

[Change mapping grid colors](#)

[Change the color of compiler warnings](#)

[Change the color of selected objects](#)

[Restore default colors](#)

# Change the color of selected objects

1. On the **Tools** menu, click **Options**.
2. In the **BizTalk Mapper Options** dialog box, click the **Colors** tab.
3. Click the box next to **Selected objects** and, in the color palette, select a new color.
4. Click **OK**.

## Related Topics

[Change mapping grid colors](#)

[Change the color of compiler warnings](#)

[Change the color of links](#)

[Restore default colors](#)

# Change the color of compiler warnings

1. On the **Tools** menu, click **Options**.

The **BizTalk Mapper Options** dialog box appears.

2. Click the **Colors** tab.
3. Click the box next to **Compiler warnings** and, in the color palette, select a new color.
4. Click **OK**.

## Related Topics

[Change mapping grid colors](#)

[Change the color of links](#)

[Change the color of selected objects](#)

[Restore default colors](#)

# Restore default colors

1. On the **Tools** menu, click **Options**.

The **BizTalk Mapper Options** dialog box appears.

2. Click the **Colors** tab.
3. Click **Restore Default Colors** and click **OK**.

## Related Topics

[Change mapping grid colors](#)

[Change the color of compiler warnings](#)

[Change the color of links](#)

[Change the color of selected objects](#)

## Change text size

- On the **View** menu, point to **Text Size** and click the size that you want.

# Concepts

This section provides detailed conceptual information that is essential to understanding BizTalk Mapper.

The following topics are covered in this section:

- [Mapping Specifications](#)
- [Mapping Scenarios](#)
- [BizTalk Mapper Environment](#)
- [Creating Links](#)
- [Matching Node-Hierarchy Levels](#)
- [Viewing Record, Field, Link, and Functoid Properties](#)
- [Understanding Functoids](#)
- [Compiling Maps](#)
- [Testing Maps](#)

# Mapping Specifications

A [map](#) identifies how data in one format is to be rendered in another format. A map requires two [specifications](#): one is the source, and the other is the destination. Mapping data is a data-translation process in which you define the correspondences between the records and fields in the [source specification](#) and the records and fields in the [destination specification](#).

There are two types of mapping: the first is a specific map that is designed to meet the individual needs of one trading partner; the second is a generic map designed to meet the needs of several trading partners. When you map a trading partner's specific record and field requirements, you create a map that is unique and specific to that trading partner only. In generic mapping, you group the requirements of multiple trading partners in one map. Because multiple organizations can be interconnected, and you can use the same map with multiple trading partners, this feature saves you valuable resources and time.

BizTalk Mapper shows a graphical representation of a map that can include simple value-copy translations, referred to as [links](#), and complex structural manipulations, referred to as [functoids](#). By combining these elements, you can easily map data between a source specification and a destination specification.

# Mapping Scenarios

The following topics are covered in this section:

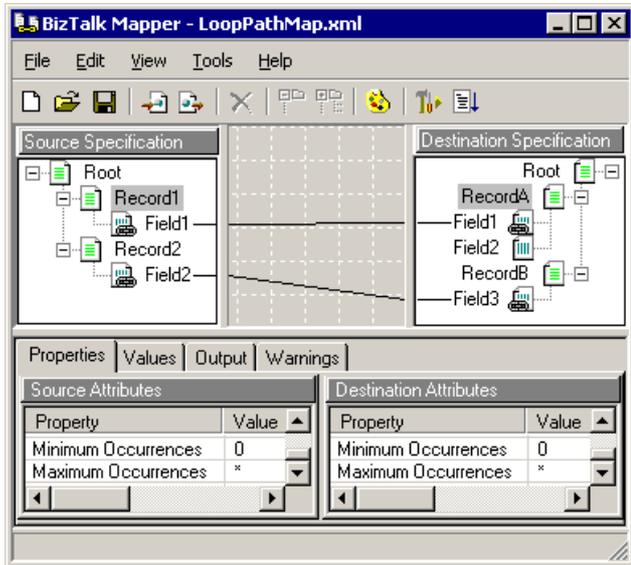
- [Loop Paths](#)
- [Ordering of Records and Fields](#)

# Loop Paths

A record in a [specification](#) is looping if the **Maximum Occurrences** property on the **Reference** tab for that record is set to \*. For more information about the **Maximum Occurrences** property, see [Set reference properties](#).

A loop path occurs in a [map](#) when a field contained by a looping record in the [source specification](#) is linked to a field contained by a looping record in the [destination specification](#). The following illustration shows two loop paths, one from Root\Record1\Field1 to Root\RecordA\Field1, and the other from Root\Record2\Field2 to \Root\RecordB\Field3.

Click the illustration to enlarge or reduce.



The **Properties** tab shows Record1 and RecordA to be looping. Record2 and RecordB are also looping.

The following code is a sample input document.

```
<Root>
<Record1 Field1=Red>
<Record1 Field1=Green>
<Record1 Field1=Blue>
<Record2 Field2=50>
<Record2 Field2=100>
</Root>
```

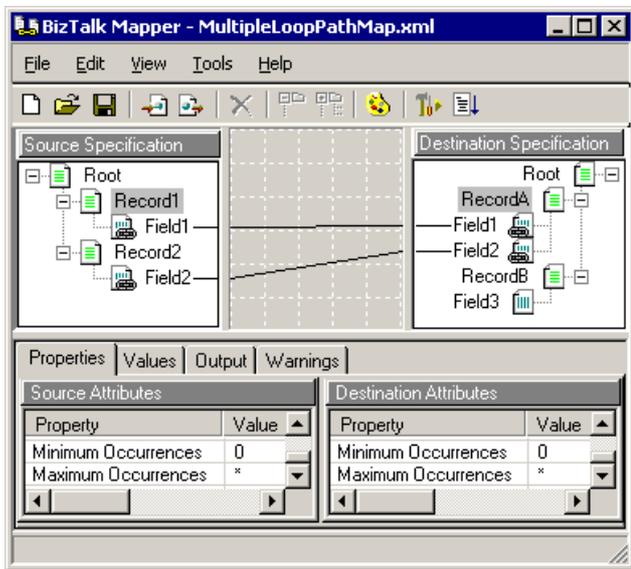
Using the previous map, this input document would map to the following output document.

```
<Root>
<RecordA Field1=Red>
<RecordA Field1=Green>
<RecordA Field1=Blue>
<RecordB Field3=50>
<RecordB Field3=100>
</Root>
```

A multiple loop path occurs in a map when fields contained by two or more looping records in the source specification are linked to fields contained by a single looping record in the destination specification.

The following illustration shows an example of a multiple loop path.

Click the illustration to enlarge or reduce.



Multiple loop paths are not supported in BizTalk Mapper. If you attempt to [compile](#) a map that contains a multiple loop path, the **Warnings** tab indicates that the destination node has multiple source loop paths.

## Related Topics

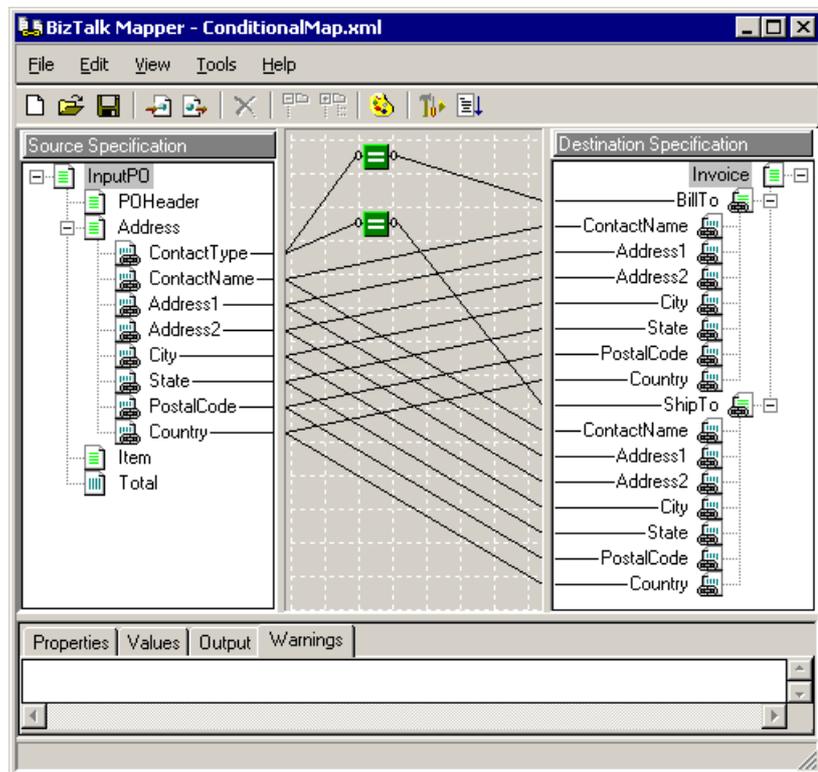
[Set reference properties](#)

# Ordering of Records and Fields

Implied order of output records and fields is not guaranteed in [Extensible Stylesheet Language \(XSL\)](#). This is because BizTalk Mapper generates XSL by walking the [destination specification](#) structure and then propagating back through the mapping grid to extract values from the [source specification](#) structure. For example, if you want to create an output file that has BillTo Address records listed first, followed by ShipTo Address records, you must ensure that the BillTo Address precedes the ShipTo Address record in the destination specification.

The following illustration shows this structure.

Click the illustration to enlarge or reduce.



The ContactType field contains two valid codes (BT and ST) that identify the address as either a BillTo address or a ShipTo address. To create the desired output, **Equal** functoids are added to the mapping grid and linked from fields in the source specification to records in the destination specification.

In the map, the first functoid checks for the following condition:

Is ContactType equal to BT?

If this condition is satisfied, an output record, BillToAddresses, is created and the required fields are mapped to it. If the condition is not met, BizTalk Mapper must reiterate all the input address records.

## ◆ Important

- The order in which records and fields appear in an output [document instance](#) is dependent on the order of the records and fields of the corresponding output specification.

# BizTalk Mapper Environment

The following topics are covered in this section:

- [BizTalk Mapper User Interface](#)
- [BizTalk Mapper Menus](#)
- [BizTalk Mapper Toolbar Buttons](#)
- [BizTalk Mapper Functoid Palette](#)
- [BizTalk Mapper Shortcut Keys](#)

# BizTalk Mapper User Interface

The two [specifications](#) that are used to create a [map](#) appear as tree views in the main window of BizTalk Mapper. The [source specification](#) from which the data is mapped is on the left, and the [destination specification](#) to which the data is mapped is on the right. The mapping grid between the two specifications graphically displays the structural data transformation between the two specifications. [Links](#) and [functoids](#) appear in the mapping grid. You can easily move up, down, left, or right in the mapping grid by moving the pointer to the borders of the mapping grid.

You can use the **Grid Preview** dialog box to move quickly from one location in the mapping grid to another. By dragging the green locator bar, you can move up, down, left, or right. A functoid in the mapping grid appears in the preview grid as a red box that is surrounded by a black outline. If there are two or more functoids in the mapping grid, the graphic appears as two red boxes attached to one another, surrounded by a black outline.

Beneath the tree views and mapping grid is the lower pane. This area has four tabs:

- **Properties.** When you select a node in the source specification tree or the destination specification tree, the **Properties** tab displays the properties and property values for that node.
- **Values.** This tab has two text boxes: **Source test value** and **Destination constant value**. You can select a field and then type a value in the **Source test value** box. This allows you to test maps with actual values assigned to fields. In the **Destination constant value** box, you can specify a value to assign to a field. You cannot create a link from a functoid or from a node in the source specification to a field with a constant value assigned to it.
- **Output.** This tab displays a [compiled Extensible Stylesheet Language \(XSL\)](#) style sheet when you compile a map, and it displays test map output when you test a map.
- **Warnings.** This tab displays compiler warnings after you compile a map.

## Related Topics

[Compiling Maps](#)

[Testing Maps](#)

[View links and functoids by using the grid preview](#)

# BizTalk Mapper Menus

BizTalk Mapper menus logically group commands together, making it easy to perform a specific task. For example, you can use the commands on the **View** menu to view all the records and fields in the source specification tree or to collapse all the records and fields in the destination specification tree.

The BizTalk Mapper menus are as follows:

- **File.** Use this menu to create, open, save, or close a map.
- **Edit.** Use this menu to replace the source or destination specification, or to delete an object in the mapping grid.
- **View.** Use this menu to view the functoid palette, the functoid properties, and the grid preview, as well as to select a text size for the BizTalk Mapper display, to activate tabs in the lower pane, to expand or collapse the specification trees, or to highlight the next warning on the **Warnings** tab.
- **Tools.** Use this menu to compile and test your maps, and to view BizTalk Mapper options.
- **Help.** Use this menu to get how-to and conceptual information about using BizTalk Mapper.

## Related Topic

[Accessing BizTalk Editor Menus](#)

# BizTalk Mapper Toolbar Buttons

BizTalk Mapper provides a toolbar to complement the menu bar. All of the toolbar buttons display graphical representations of the tasks they perform. They appear in the following order from left to right:

- **New**
- **Open**
- **Save**
- **Retrieve from WebDAV**
- **Store to WebDAV**
- **Delete**
- **Collapse**
- **Expand**
- **View Functoid Palette**
- **Compile Map**
- **Test Map**

# BizTalk Mapper Functoid Palette

The functoid palette contains all the [functoids](#) available in BizTalk Mapper. A functoid contains code that takes data from a record or field in the [source specification](#), or from another functoid (such as a **Date** functoid), processes the data independently, and then returns a new value that is placed in a record or field in the [destination specification](#). For more information about the functoid palette, see [Understanding Functoids](#).

## Related Topics

[Understanding Functoids](#)

[Work with the Functoid Palette](#)

# BizTalk Mapper Shortcut Keys

You can use shortcut keys to accomplish tasks in BizTalk Mapper. The following table is a quick reference to these shortcut keys.

## Note

- Functionality that is not included in this list can be obtained by using the numeric keypad to move the mouse pointer with MouseKeys. For more information about MouseKeys in Windows 2000 Server and Advanced Server Help, see "Using the keyboard to move the mouse pointer". For more information about MouseKeys in Windows 2000 Professional Help, see "Move the mouse pointer by using MouseKeys".

Press	To
CTRL+N	Open a new specification.
CTRL+O	Open an existing map.
CTRL+S	Save a map.
CTRL+F5	Test a map.
F4	Highlight the next warning.
F5	Compile a map.
DEL	Delete an object in the mapping grid.
F6	Move the focus clockwise from pane to pane.
SHIFT+F6	Move the focus counterclockwise from pane to pane. Pressing SHIFT+F6 after opening the functoid palette moves the focus to the <b>String</b> tab, allowing you to use the left and right arrow keys to view the other tabs.
TAB	Move the focus clockwise in the lower pane from the tab to the panes or fields below. In a dialog box, pressing TAB moves the focus through the buttons and fields of the dialog box.
SHIFT+TAB	Move the focus counterclockwise in the lower pane from the tab to the panes or fields below.
SPACEBAR	Select or clear a check box. The spacebar also acts like a mouse click when the focus is on a button.
F1	View online Help.
ALT+F4	Exit from the program.
LEFT ARROW	Activate the tab to the left.
RIGHT ARROW	Activate the tab to the right.
Any arrow key	Highlight a folder or a file in the main pane of a dialog box, while the focus is on that pane. This functionality occurs in the <b>Store to WebDAV</b> dialog box and the <b>Retrieve from WebDAV</b> dialog box. For more information, see <a href="#">Retrieve maps from WebDAV</a> .

# Creating Links

Links perform the basic function of copying data from the [source specification](#) tree records and fields to the [destination specification](#) tree records and fields. BizTalk Mapper supports one-to-one links and one-to-many links. For example, a link can join a single record or field from the source specification tree to a single record or field in the destination specification tree. A link can also join a single record or field from the source specification tree to multiple records or fields in the destination specification tree. Links can also join multiple records or fields from the source specification tree to a [functoid](#), which then joins to a single record or field in the destination specification tree. Multiple records or fields from the source specification tree can join to a single record or field in the destination specification tree.

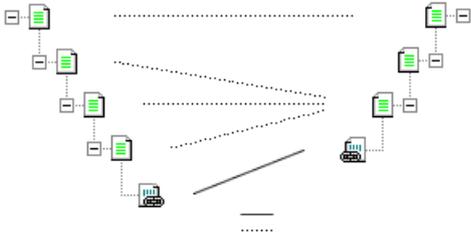
## Related Topic

[Manage Links](#)

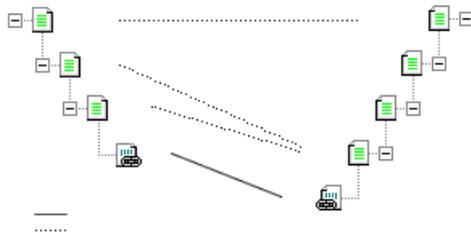
# Matching Node-Hierarchy Levels

BizTalk Mapper includes compiler directives. Using these directives, you can set the level of matching between the hierarchy of the [source specification](#) tree and the hierarchy of the [destination specification](#) tree. When you create a [link](#) from one field in the source specification tree to a field in the destination specification tree, BizTalk Mapper automatically adds compiler links based on the choices you make in the **Destination Specification Links** area on the **Compiler** tab of the **Link Properties** dialog box. For more information, see [Select compiler properties for destination-specification links](#). The following illustrations show the node-hierarchy level matches that are possible:

- Flatten link (default mode).** This mode means that the parent record for the [link](#) has a one-to-one link to each record in the other tree. In the first case, the source specification is more complex than the destination specification. In the second case, the destination specification is more complex.

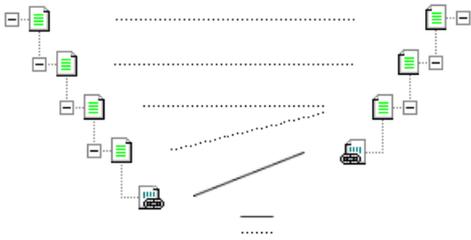


F2  
 R5  
 R4  
 Root2  
 F1  
 R3  
 R2  
 R1  
 Root1  
 User drawn links  
 Compiler links

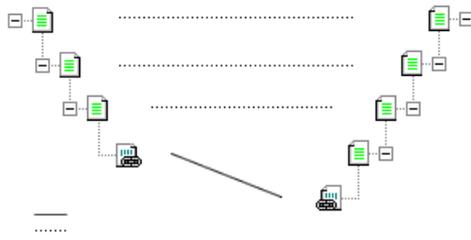


R5  
 R4  
 R3  
 Root2  
 F2  
 F1  
 R2  
 R1  
 Root1  
 User drawn links  
 Compiler links

- Match links top-down.** This mode matches level to level from the top down. In the first case, the source specification is more complex than the destination specification. In the second case, the destination specification is more complex.

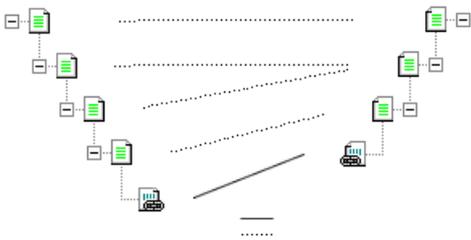


F2  
 R5  
 R4  
 Root2  
 F1  
 R3  
 R2  
 R1  
 Root1  
 User drawn links  
 Compiler links



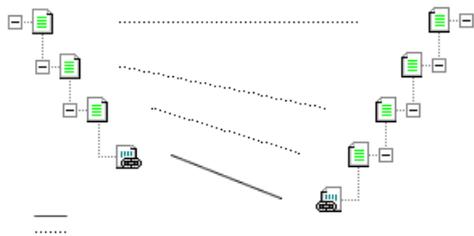
R5  
 R4  
 R3  
 Root2  
 F2  
 F1  
 R2  
 R1  
 Root1  
 User drawn links  
 Compiler links

- **Match links bottom-up.** This mode matches level to level from the bottom up. In the first case, the source specification is more complex than the destination specification. In the second case, the destination specification is more complex.



F2  
 R5  
 R4  
 Root2  
 F1  
 R3  
 R2  
 R1  
 Root1

User drawn links  
Compiler links



R5  
R4  
R3  
Root2  
F2  
F1  
R2  
R1  
Root1  
User drawn links  
Compiler links

#### Notes

- If you use a flatten compiler directive, a top-down compiler directive, and a bottom-up compiler directive for links from fields in the source specification to fields in the destination specification that share the same parent record, BizTalk Mapper treats all the links as if they were set to the flatten compiler directive.
- If you use one or more flatten compiler directives and a top-down compiler directive for links from fields in the source specification to fields in the destination specification that share the same parent record, BizTalk Mapper treats all the links as if they were set to the top-down compiler directive.
- If you use one or more flatten compiler directives and a bottom-up compiler directive for links from fields in the source specification to fields in the destination specification that share the same parent record, BizTalk Mapper treats all the links as if they were set to the bottom-up compiler directive.
- If you use one or more top-down compiler directives and one or more bottom-up compiler directives for links from fields in the source specification to fields in the destination specification that share the same parent record, BizTalk Mapper treats all the links as if they were set to the flatten compiler directive.

#### Related Topic

[Compiling Maps](#)

# Viewing Record, Field, Link, and Functoid Properties

The [source specification](#) and [destination specification](#) display the records and fields associated with a [specification](#). You can build these specifications using [BizTalk Editor](#), or you can import them into BizTalk Editor as [well-formed XML](#). The source specification appears on the left of the mapping grid, and the destination specification appears on the right of the mapping grid.

## Record and field properties and values

The properties and values for records and fields appear on the **Properties** tab, which is located below the main pane. When you select a record or field, the key properties and values from the property tabs of BizTalk Editor appear.

## Link and functoid properties

The mapping grid of BizTalk Mapper graphically depicts the structure of the data transformation. [Links](#) appear as a single line that connects a record or field in the source specification tree to a record or field in the destination specification tree. Links are also used to connect a record or field to a [functoid](#). Functoids appear as icons. Properties for links include source and destination data and compiler directive information. Properties for functoids include input parameter and script information.

## Related Topics

[Records, Fields, and Properties](#)

[Understanding Functoids](#)

# Understanding Functoids

BizTalk Mapper supports complex structural transformations from records and fields in the [source specification](#) tree to records and fields in the [destination specification](#) tree. Functoids perform calculations by using predefined formulas and specific values, called arguments. These calculations are executed based on the designated order of the records and fields. By selecting a functoid from the [functoid palette](#), dragging it to the mapping grid, and [linking](#) it to elements in the source specification and destination specification trees, data can be added together, date or time information can be modified, data can be concatenated, or other operations can be performed. For example, the **Addition** functoid adds values.

The **Functoid Palette** includes the following tabs:

- **String.** These functoids manipulate data strings by using string functions. For example, the **String Find** functoid finds one text string within another text string, and returns the position of the first character of the found string.
- **Mathematical.** These functoids perform calculations by using specific values, called arguments, in a particular order, or structure. For example, the **Addition** functoid adds the values of the designated fields or records.
- **Logical.** These functoids perform specific logical tests. If a logical functoid is connected to a record in the destination specification and returns the value "true", the corresponding record in the output document is generated. If a logical functoid is connected to a record in the destination specification and returns the value "false", the corresponding record in the output document is not generated. The output of a logical functoid can also be accepted as input for other functoids in a map.
- **Date/Time.** These functoids manipulate date and time data or add current date, time, or date and time data to a record or field in the destination specification.
- **Conversion.** These functoids closely match engineering functions such as **DEC2HEX**, which returns a hexadecimal value given a decimal value. They can also be used to convert a character to its ASCII value or a value to the corresponding ASCII character.
- **Scientific.** These functoids convert a numeric value to a scientific value. For example, the **Cosine** functoid takes a value from a field or record and returns the angle, in radians, for which you want the cosine.
- **Cumulative.** These functoids return the sum, average, or minimum or maximum input of a looping record.
- **Database.** These functoids extract data from a database.
- **Advanced.** This tab has a functoid that can use custom Microsoft Visual Basic script, functoids for value mapping, and functoids for managing and extracting information from record loops.

You can also create your own custom functoids. For a sample of a custom functoid, go to the Program Files\Microsoft BizTalk Server\SDK\Messaging Samples\SampleFunctoid folder on a computer with a complete installation of BizTalk Server or a custom installation of BizTalk Server that includes Messaging samples.

The following topics are covered in this section:

- [Using Cascading Functoids](#)
- [Using Cumulative Functoids](#)
- [Using Database Functoids](#)
- [Using the Record Count Functoid](#)
- [Using the Index Functoid](#)
- [Using the Iteration Functoid](#)
- [Using the Value Mapping Functoid](#)

- Using the Value Mapping (Flattening) Functoid
- Using the Looping Functoid

## Using Cascading Functoids

Cascading functoids enable you to create [maps](#) for which you must [link](#) fields or records to multiple functoids to produce the necessary output in a field or record in the [destination specification](#). Cascading functoids make it easy to create multiple, consecutive transformations in the mapping grid. Functoids are cascaded when one functoid is linked to another functoid before it is linked to a record or field in the destination specification. For example, you can create cascading functoids in which two concatenated strings are used to produce a third string that is fed into a field in the destination specification. There is no limit to the number of functoids you can cascade together in the mapping grid; however, complex cascading scenarios might result in poor performance.

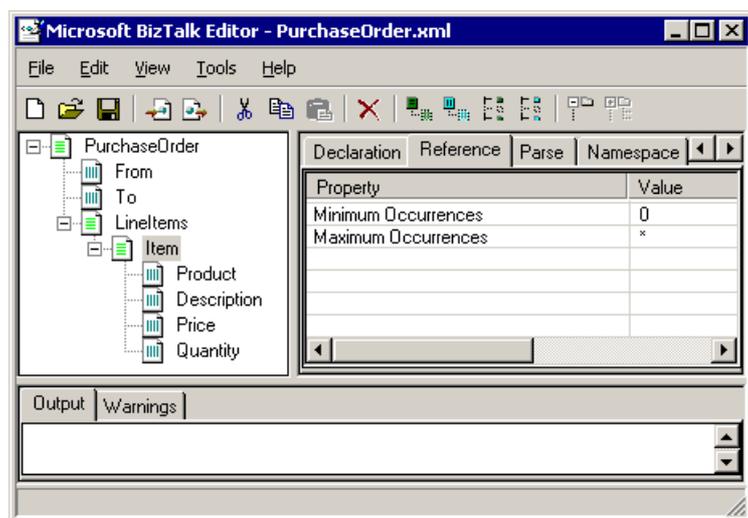
# Using Cumulative Functoids

Cumulative functoids operate within the context of the record level in the [source specification](#). Certain records typically occur many times in an input file. For example, in a purchase order, the item section might occur many times. The item section might include products, descriptions, prices, and quantities. The following code is an example of a purchase order:

```
<PurchaseOrder>
  <From>Kevin F. Browne</From>
  <To>Bits, Bytes, & Chips</To>
<LineItems>
  <Item>
    <Product>TravelLight 400</Product>
    <Description>laptop computer</Description>
    <Price>2000</Price>
    <Quantity>1</Quantity>
  </Item>
  <Item>
    <Product>TravelTuff Case</Product>
    <Description>laptop computer case</Description>
    <Price>50</Price>
    <Quantity>2</Quantity>
  </Item>
  <Item>
    <Product>ScreenClean</Product>
    <Description>computer monitor cleaner</Description>
    <Price>2</Price>
    <Quantity>100</Quantity>
  </Item>
</LineItems>
</PurchaseOrder>
```

The following illustration shows this purchase order displayed in [BizTalk Editor](#).

Click the illustration to enlarge or reduce.

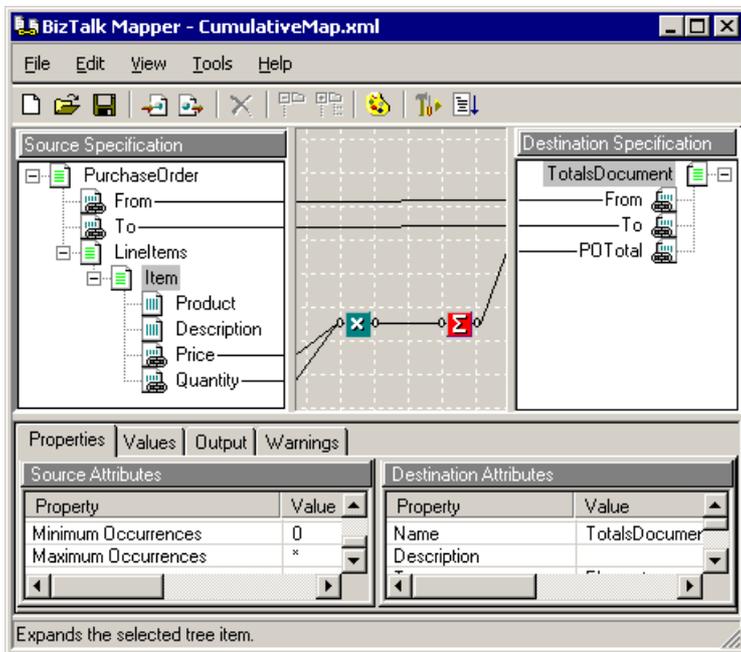


Note that the **Maximum Occurrences** property on the **Reference** tab for the Item record is set at \*. This indicates that the item record loops, and BizTalk Mapper compiles this record as a loop.

You might want to find the sum total of all the line items in the purchase order and map the cumulative total into a field in an output document. To do this, you must first calculate the extended price for each item record in the purchase order and then aggregate the individual item record totals as the mapping progresses through all the item records in the purchase order.

The following illustration shows a **Multiplication** functoid and a **Cumulative Sum** functoid used to aggregate item records from an incoming purchase order and output the results in the POTotal field of a TotalsDocument document.

Click the illustration to enlarge or reduce.



In this example, all the Item records that exist under the Lineltems record of an incoming purchase order participate in the cumulative operation. The Price and Quantity fields are sent to a **Multiplication** functoid. The output of the **Multiplication** functoid becomes the input of the **Cumulative Sum** functoid. The output of the **Cumulative Sum** functoid is the accumulated value as the Item records are traversed in the input purchase order. This value is sent to the POTotal field of the TotalsDocument document and is the sum of each of the individual products of price and quantity:  $(2000 \times 1) + (50 \times 2) + (2 \times 100) = 2300$ .

#### Notes

- The cumulative aggregation of a particular input takes place over the parent record from which the input link originates. This also applies to functoid outputs that are fed as input to a cumulative functoid.
- Cumulative functoids ignore non-numeric input. For example, an input value of "three" is ignored.

The **Cumulative Average**, **Cumulative Minimum**, and **Cumulative Maximum** functoids behave similarly to the **Cumulative Sum** functoid. The **Cumulative String** functoid behaves differently from the rest of the cumulative functoids in that it concatenates strings rather than aggregating numeric values.

## Related Topics

[Add cumulative functoids](#)

[Cumulative Functoids](#)

# Using Database Functoids

Database functoids extract data from a database. To understand how database functoids are used, consider a large retail manufacturer with many stores spread over a large geographical area. Each store is designated by a numeric code, and an address list is distributed to all partners. The address list might contain the following structure:

StoreID: 123

Name: A. Datum Corporation

Address: 1234 Main Street

City: Denver, Colorado

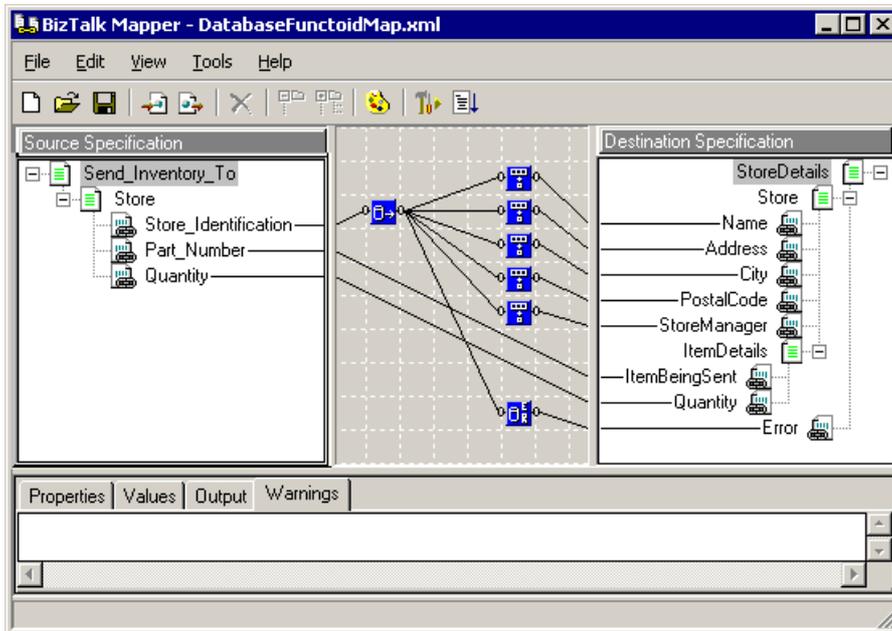
PostalCode: 97402

PhoneNumber: 801-555-0179

StoreManager: Anthony Chor

In subsequent transactions, only the numeric code that represents the store is sent in a purchase order. BizTalk Mapper uses that code to extract the address information from a database. The following illustration shows such a scenario.

Click the illustration to enlarge or reduce.



In this illustration, the [source specification](#) represents an incoming purchase order, and the [destination specification](#) represents an invoice. The **Database Lookup** functoid  performs a database lookup to find the appropriate record from the appropriate table. The output of the **Database Lookup** functoid can be connected only to **Value Extractor** functoids . The **Value Extractor** functoids extract the appropriate column name from the lookup record. The **Error Return** functoid  outputs a string containing error information if there are errors (such as connection failures) at run time.

The **Database Lookup** functoid requires four input parameters, in the following order:

- The lookup value
- The database connection string
- The table name
- The column name for the lookup value

For information about inserting, deleting, and moving input parameters, see [Input Parameters](#).

In the previous example, the first input parameter is taken from the StoreID field of the incoming purchase order, and the remaining three input parameters are constants on the **General** tab of the **Functoid Properties** dialog box for the **Database**

**Lookup** functoid. It is possible to create links from the source specification tree to supply values for all four input parameters. For more information about inserting, deleting, and moving input parameters, see [Input Parameters](#).

The **Value Extractor** functoid requires the following two input parameters, in the following order:

- A link to the **Database Lookup** functoid
- The column name

The **Error Return** functoid requires exactly one input parameter: a link to the **Database Lookup** functoid.

#### **Notes**

- Some SQL Server data types, such as **text**, **ntext**, and **image**, cannot be used as lookup values for the **Database Lookup** functoid.
- If there is more than one record that matches the input parameters of the **Database Lookup** functoid, the **Value Extractor** functoid extracts only the first record in the table.

## **Related Topics**

[Database Functoids](#)

[Input Parameters](#)

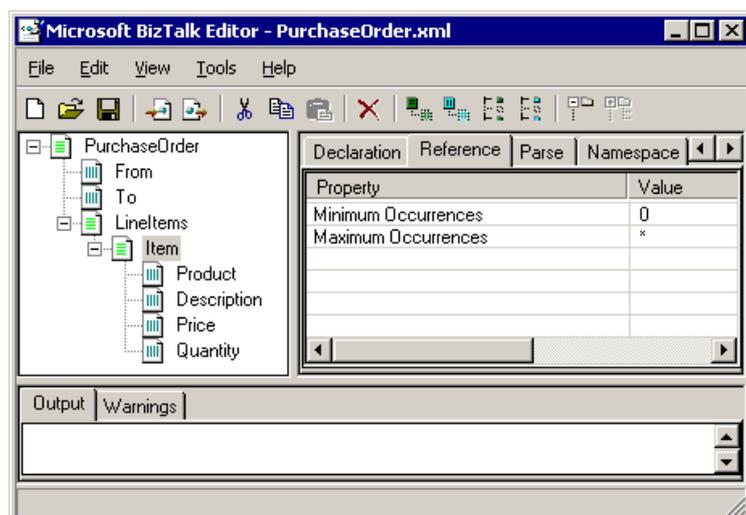
# Using the Record Count Functoid

The **Record Count** functoid operates within the context of the record level in the [source specification](#). Certain records typically occur many times in an input file. For example, in a purchase order, the Item section might occur many times. The Item section might include products, descriptions, prices, and quantities. The following code is an example of a purchase order:

```
<PurchaseOrder>
  <From>Kevin F. Browne</From>
  <To>Bits, Bytes, & Chips</To>
<LineItems>
  <Item>
    <Product>TravelLight 400</Product>
    <Description>laptop computer</Description>
    <Price>2000</Price>
    <Quantity>1</Quantity>
  </Item>
  <Item>
    <Product>TravelTuff Case</Product>
    <Description>laptop computer case</Description>
    <Price>50</Price>
    <Quantity>2</Quantity>
  </Item>
  <Item>
    <Product>ScreenClean</Product>
    <Description>computer monitor cleaner</Description>
    <Price>2</Price>
    <Quantity>100</Quantity>
  </Item>
</LineItems>
</PurchaseOrder>
```

The following illustration shows this purchase order displayed in [BizTalk Editor](#).

Click the illustration to enlarge or reduce.



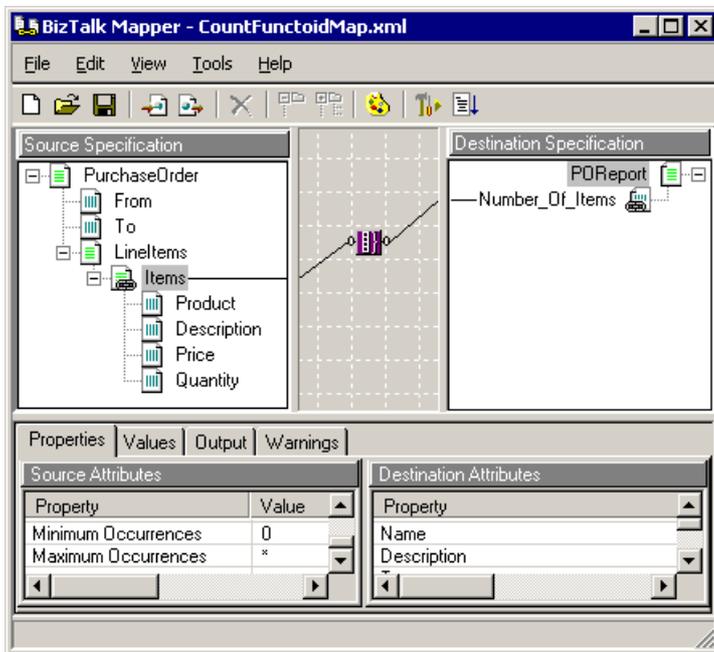
Note that the **Maximum Occurrences** property on the **Reference** tab for the Item record is set at \*. This indicates that the Item record loops, and BizTalk Mapper compiles this record as a loop.

You might want to find the total number of line items in the purchase order and map that value into a field in an output document. This scenario is a bit different from the conventional mapping scenario in which content from the source document is mapped to the output document. In this case, the **Record Count** functoid generates the value that is mapped to the output document.

The **Record Count** functoid has one input and one output. The input is a link from a looping record in the source specification. This record appears many times in the original input document. The output of the **Record Count** functoid is a link to a field in the [destination specification](#).

The following illustration shows a **Record Count** functoid that counts the number of items that exist in an incoming purchase order and outputs that value to the Number\_Of\_Items field in the POReport document.

Click the illustration to enlarge or reduce.



Because, in this example, there were three items in the incoming purchase order, the value of the Number\_Of\_Items field is 3.

## Related Topic

[Advanced Functoids](#)

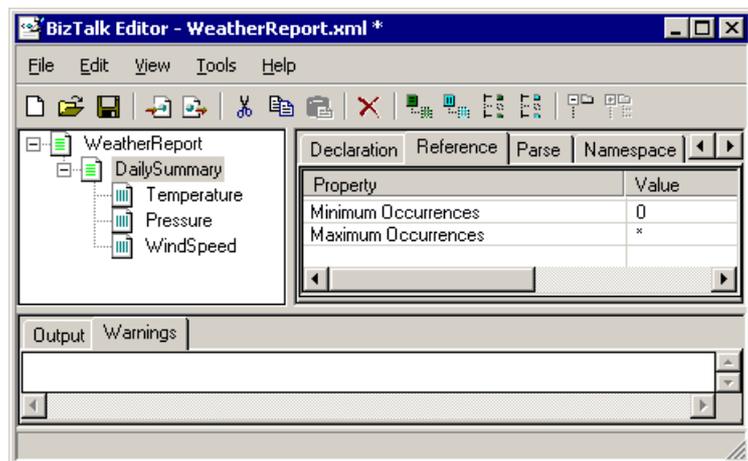
# Using the Index Functoid

The **Index** functoid operates within the context of the record level of the [source specification](#). Certain records typically occur many times in an input file. For example, in a weather report, the DailySummary section might occur many times. The DailySummary section might include the temperature, the barometric pressure, and the wind speed. The following code is an example of a weather report:

```
<WeatherReport>
  <DailySummary>
    <Temperature>20</Temperature>
    <Pressure>80</Pressure>
    <WindSpeed>10</WindSpeed>
  </DailySummary>
  <DailySummary>
    <Temperature>23</Temperature>
    <Pressure>78</Pressure>
    <WindSpeed>20</WindSpeed>
  </DailySummary>
  <DailySummary>
    <Temperature>24</Temperature>
    <Pressure>77</Pressure>
    <WindSpeed>16</WindSpeed>
  </DailySummary>
</WeatherReport>
```

The following illustration shows this weather report displayed in [BizTalk Editor](#).

Click the illustration to enlarge or reduce.

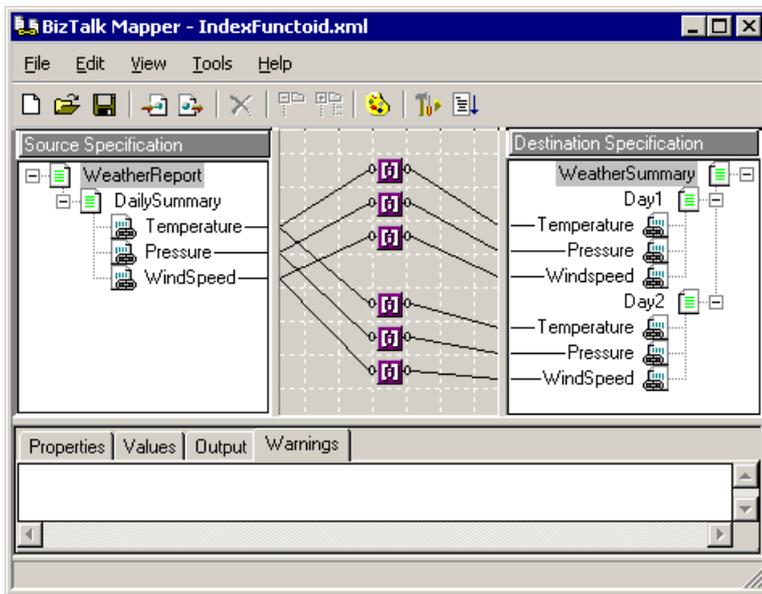


Note that the **Maximum Occurrences** property on the **Reference** tab for the DailySummary record is set at \*. This indicates that the DailySummary record loops, and BizTalk Mapper compiles this record as a loop.

You might want to collect weather information for the first two DailySummary records of the weather report. In BizTalk Mapper, each field from the DailySummary record of the incoming source specification can be connected to an **Index** functoid, and each **Index** functoid can specify from which DailySummary record to draw the information: the first and the second. The **Index** functoids can then be connected to the appropriate fields of a destination specification. Note that **Index** functoids operate only between fields that exist below a single parent in the source specification to fields that exist below a single parent in the [destination specification](#).

The following illustration shows **Index** functoids used in this way.

Click the illustration to enlarge or reduce.

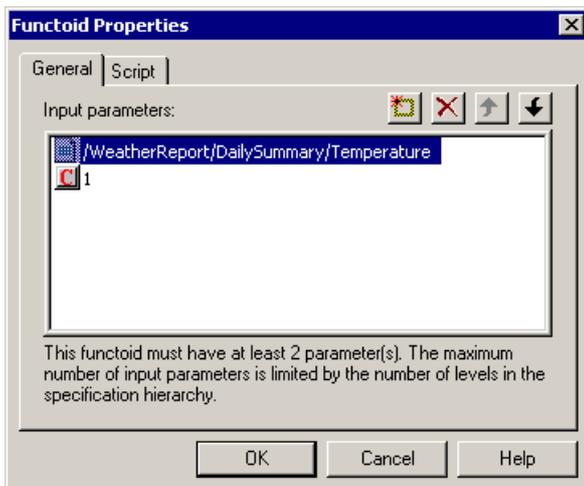


To get the daily summary information for the first day, the top three **Index** functoids must have an index value of 1. To get the daily summary information for the second day, the last three **Index** functoids must have an index value of 2.

Index sequence inputs are set as input parameters on the **General** tab of an **Index** functoid's property sheet. Double-click an **Index** functoid to display its property sheet. The first input parameter identifies the field in the source specification that links into the **Index** functoid. The succeeding input parameter or parameters indicate index values.

The following illustration shows the property sheet for the top **Index** functoid in the previous map.

Click the illustration to enlarge or reduce.



## Notes

- An **Index** functoid input parameter assigned any non-numeric constant value is interpreted by BizTalk Mapper to have a value of 1. For example, in the previous illustration, if the second input parameter were replaced with an input parameter with a value of "anystring", the mapping result would be unchanged.
- Although index sequence input is typically a constant value on the **General** tab of the **Functoid Properties** dialog box, it is possible to use a link from a node in the source specification for the input sequence value. If this link comes from a looping record that is not a parent of the first input parameter, the index sequence input value comes from the first instance of the node in the incoming document.
- The value of the index sequence input is always in relation to the current context in the source document.

If you had multiple weather reports in the same input file, and each weather report had multiple daily summaries, you might need to specify more than one index value. The following code is an example of an input file with multiple weather reports:

```
<WeatherReports>
  <WeatherReport1>
    <DailySummary>
      <Temperature>20</Temperature>
      <Pressure>80</Pressure>
      <WindSpeed>10</WindSpeed>
    </DailySummary>
    <DailySummary>
      <Temperature>23</Temperature>
      <Pressure>78</Pressure>
      <WindSpeed>20</WindSpeed>
    </DailySummary>
  </WeatherReport1>
  <WeatherReport2>
    <DailySummary>
      <Temperature>24</Temperature>
      <Pressure>77</Pressure>
      <WindSpeed>16</WindSpeed>
    </DailySummary>
    <DailySummary>
      <Temperature>22</Temperature>
      <Pressure>79</Pressure>
      <WindSpeed>21</WindSpeed>
    </DailySummary>
  </WeatherReport2>
</WeatherReports>
```

An **Index** functoid with two index values, the first set at 1 and the second set at 2, gets a field value from the first daily summary of the second weather report.

#### ◆ Important

- An index functoid must have as many index values as there are parent nodes from the field level to the first level below the root node. For example, in the multiple weather report sample document, two index values are required. In the single weather report sample document, only one index value is required. Failure to set the required number of index values of an index functoid creates output based on the first node in the source document that matches the first input parameter of the index functoid.

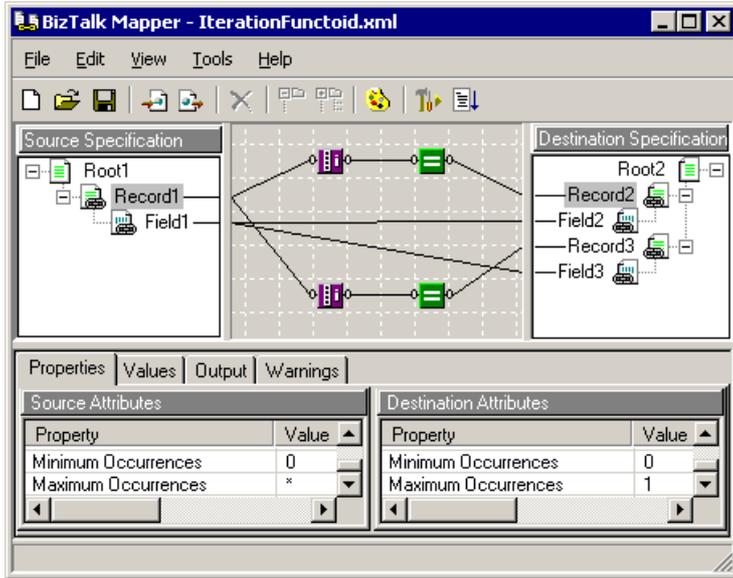
## Related Topic

[Advanced Functoids](#)

# Using the Iteration Functoid

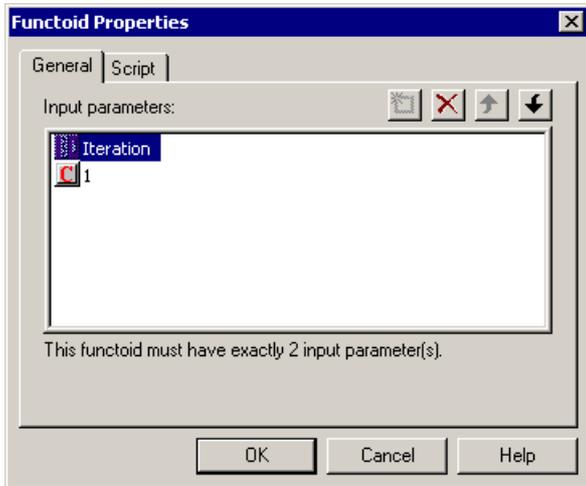
The **Iteration** functoid identifies which sequence number in a looping record is being **mapped** at any given time. The following illustration shows the **Iteration** functoid used in conjunction with an **Equal** functoid.

Click the illustration to enlarge or reduce.



There is a pair of functoids (the **Iteration** functoid  and the **Equal** functoid ) for each of the two records in the **destination specification**. The following illustration shows the property sheet for the top **Equal** functoid.

Click the illustration to enlarge or reduce.



The following code is an example of an incoming **document instance** that conforms to the structure of the source specification:

```
<Root>  
<Record1 Field1="A"/>  
<Record1 Field1="B"/>  
</Root>
```

As the source specification loops through the incoming document instance, the **Iteration** functoid returns the value 1 while the first record is being mapped and the value 2 while the second record is being mapped. The **Equal** functoid returns the value "true" when its two input parameters are equal. Therefore, the top functoid pair returns the value "true" while the first record of the incoming document instance is being mapped. The value "true" is passed to Record2 of the destination specification, and Record2 is written to the output document. If the second input parameter of the bottom **Equal** functoid has a value of 2, the bottom functoid pair behaves in a manner similar to the top functoid pair. In other words, when the second record of the incoming document instance is mapped, Record3 of the destination specification is written to the output document instance. The following code shows the output document instance:

```
<Root2>  
<Record2 Field2="A"/>  
<Record3 Field3="B"/>  
</Root2>
```

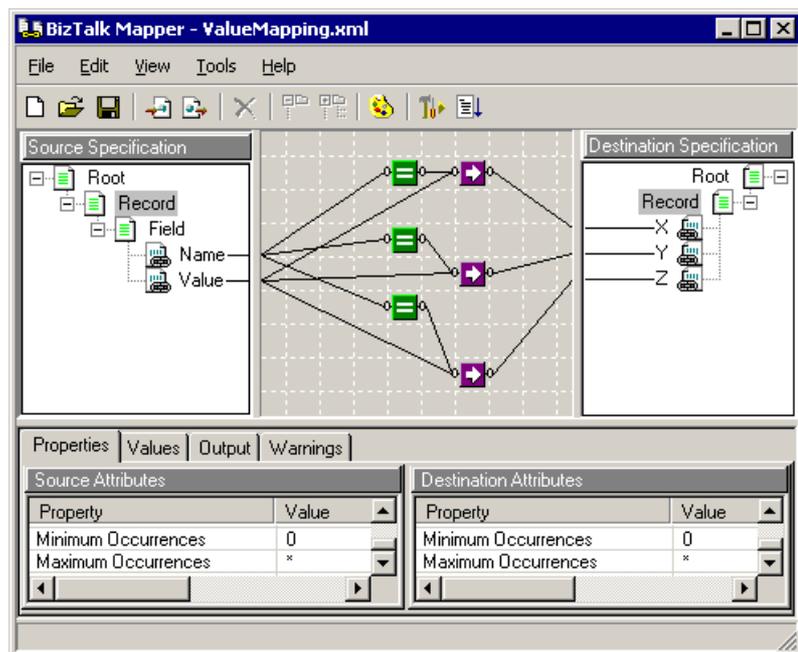
## Related Topic

[Advanced Functors](#)

# Using the Value Mapping Functoid

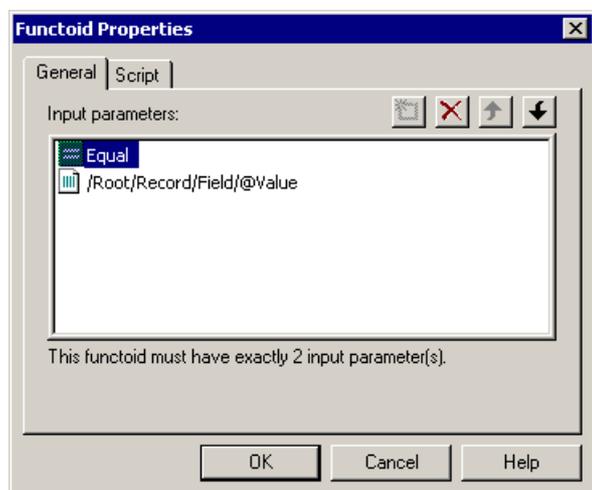
The **Value Mapping** functoid  requires two input parameters, and returns the value of the second input parameter if the value of the first parameter is "true". The following illustration shows a map with the **Value Mapping** functoid used in this way.

Click the illustration to enlarge or reduce.



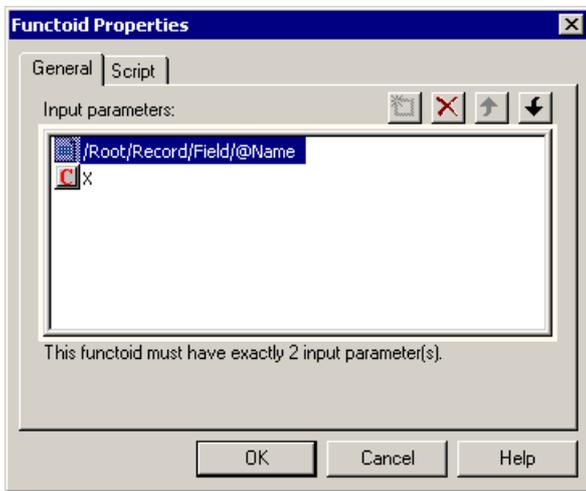
To complete the map, you must set the input parameters for each functoid. The following illustration shows the property sheet for each of the three **Value Mapping** functoids.

Click the illustration to enlarge or reduce.



The following illustration shows the property sheet for the top **Equal** functoid.

Click the illustration to enlarge or reduce.



The middle **Equal** funcioid property sheet is similar, but its second input parameter has a constant value of **Y**. The bottom **Equal** funcioid property sheet is also similar, but its second input parameter has a constant value of **Z**.

You might have a source [document instance](#) that contains the following element.

```
<Field Name="X" Value="1"/>
```

A Name value of X makes the top **Equal** funcioid of the map return a value of "true". The "true" value returned by the **Equal** funcioid makes the **Attribute Value** funcioid that it is linked to return a value of 1.

The following code is an example of document instance that corresponds to the [source specification](#) of the map.

```
<Root>
  <Record>
    <Field Name="X" Value="1"/>
    <Field Name="Y" Value="2"/>
    <Field Name="Z" Value="3"/>
  </Record>
  <Record>
    <Field Name="X" Value="4"/>
    <Field Name="Y" Value="5"/>
    <Field Name="Z" Value="6"/>
  </Record>
  <Record>
    <Field Name="X" Value="7"/>
    <Field Name="Y" Value="8"/>
    <Field Name="Z" Value="9"/>
  </Record>
</Root>
```

Using this map and this source document instance, [BizTalk Server](#) outputs the following document instance.

```
<Root>
<Record X="1"/>
<Record Y="2"/>
<Record Z="3"/>
<Record X="4"/>
<Record Y="5"/>
<Record Z="6"/>
<Record X="7"/>
<Record Y="8"/>
<Record Z="9"/>
</Root>
```

#### ◆ Important

- The **Value Mapping** funcioid accepts Boolean input only in the form of the lowercase strings "true" and "false". For example, if a field in an incoming document instance has a value of "True" and is linked directly to the top input parameter of a **Value Mapping** funcioid, the value of the second input parameter of the **Value Mapping** funcioid is not passed to the output document.

## Related Topics

[Advanced Funcioids](#)

## Using the Value Mapping (Flattening) Functoid

# Using the Value Mapping (Flattening) Functoid

A common scenario for users of Microsoft Commerce Server is to map from a Commerce Server catalog to a flat [schema](#). The **Value Mapping (Flattening)** functoid makes this type of map possible. The following code is an example of a Commerce Server catalog:

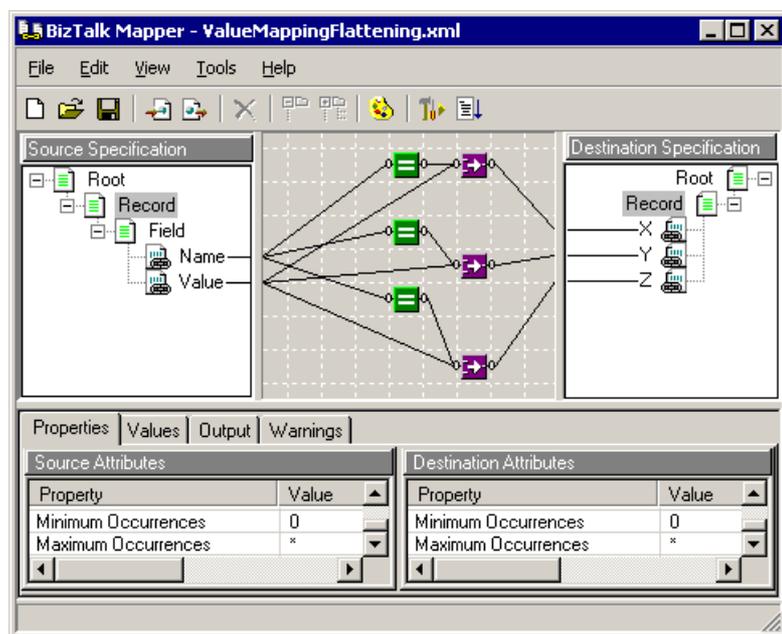
```
<Root>
  <Record>
    <Field Name="X" Value="1"/>
    <Field Name="Y" Value="2"/>
    <Field Name="Z" Value="3"/>
  </Record>
  <Record>
    <Field Name="X" Value="4"/>
    <Field Name="Y" Value="5"/>
    <Field Name="Z" Value="6"/>
  </Record>
  <Record>
    <Field Name="X" Value="7"/>
    <Field Name="Y" Value="8"/>
    <Field Name="Z" Value="9"/>
  </Record>
</Root>
```

The following code is an example of a flat schema:

```
<Root>
  <Record X="1" Y="2" Z="3"/>
  <Record X="4" Y="5" Z="6"/>
  <Record X="7" Y="8" Z="9"/>
</Root>
```

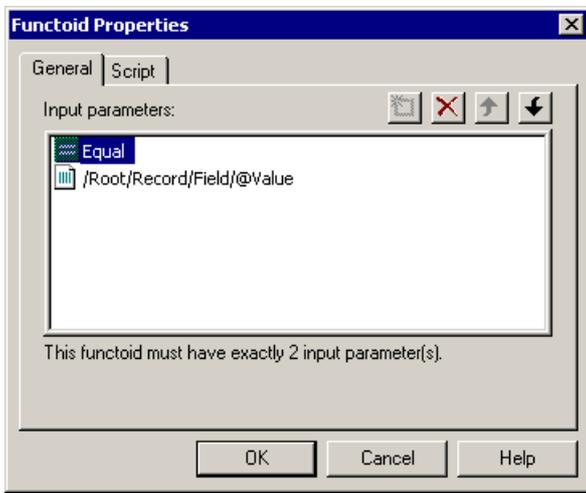
In this [mapping](#) scenario it is important to maintain the one-to-one correspondence between the three records in the catalog and the three records in the flat schema. The following illustration shows a map that maintains this correspondence.

Click the illustration to enlarge or reduce.



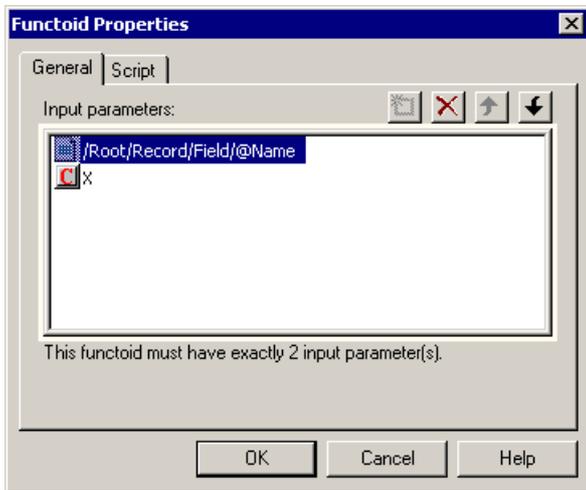
In this [map](#), the [source specification](#) represents the structure of the incoming catalog, and the [destination specification](#) represents the structure of the outgoing flat schema. There is a pair of functoids (the **Equal** functoid  and the **Value Mapping (Flattening)** functoid ) for each of the three records. The following illustration shows the property sheet for each of the three **Value Mapping (Flattening)** functoids.

Click the illustration to enlarge or reduce.



The following illustration shows the property sheet for the top **Equal** functoid.

Click the illustration to enlarge or reduce.



The middle **Equal** functoid property sheet is similar, but its second input parameter has a constant value of **Y**. The bottom **Equal** functoid property sheet is also similar, but its second input parameter has a constant value of **Z**.

The top functoid pair works together to ensure that the value of X is passed from each of the three records in the catalog to each of the three records in the flat schema. The **Value Mapping (Flattening)** functoid returns the value of the second parameter of its property sheet only if the value of the first parameter is "true". For this reason, the top **Value Mapping (Flattening)** functoid returns the value of /Root/Record/Field/@Value only if the **Equal** functoid it is linked to returns a value of "true". The **Equal** functoid to which it is linked returns a value of "true" only for fields in the incoming catalog with Name values of X.

The **Equal** functoid of the middle functoid pair returns a value of "true" only for fields in the incoming specification with Name values of Y, so this pair of functoids ensures that the value of Y is passed from each of the three records in the catalog to each of the three records in the flat schema. The third functoid pair handles the value of Z in a similar manner.

#### ◆ Important

- The **Value Mapping (Flattening)** functoid accepts Boolean input only in the form of the lowercase strings "true" and "false". For example, if a field in an incoming document instance has the value "True" and is linked directly to the top input parameter of a **Value Mapping (Flattening)** functoid, the value of the second input parameter of the **Value Mapping (Flattening)** functoid is not passed to the output document.

#### 📌 Note

- If a record in an incoming catalog document instance has more than one field with an attribute that matches the second input parameter of one of the **Equal** functoids in this mapping scenario, only the last record with this match is mapped to the output document. For example, in the previous example of a Commerce Server catalog, if there were three Field elements in the first Record element that had Name attributes with values of X, only the last Field element would map.

For information about mapping from a flat schema to a Commerce Server catalog (mapping in the opposite direction from the previous mapping scenario), see [Using the Looping functoid](#)

## **Related Topics**

[Advanced Functoids](#)

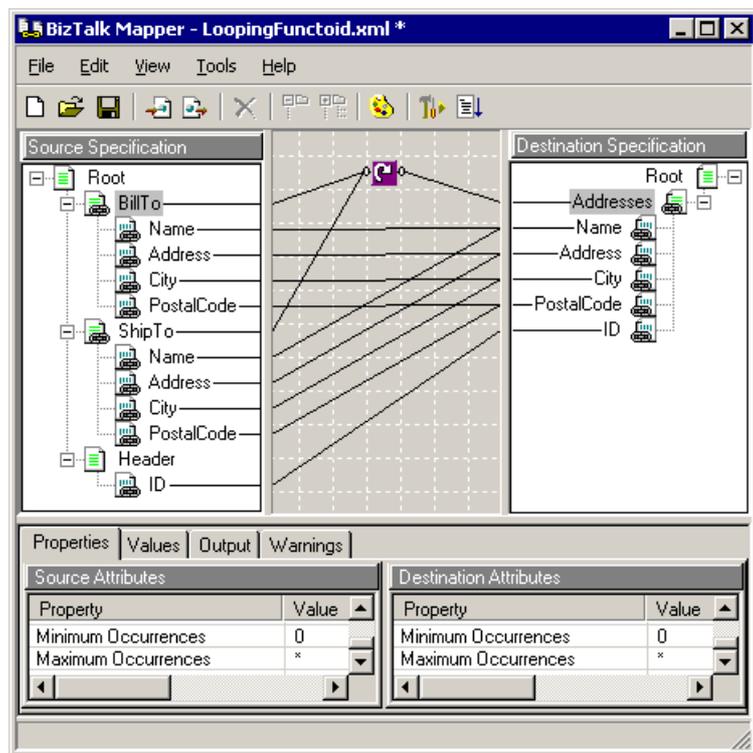
[Using the Looping Functoid](#)

[Using the Value Mapping Functoid](#)

# Using the Looping Functoid

The **Looping** functoid  is used to combine multiple records and/or fields in the [source specification](#) into a single record in the [destination specification](#). The following illustration shows the **Looping** functoid used in this way.

Click the illustration to enlarge or reduce.



The BillTo record of the Source Specification and the Addresses record of the Destination Specification loop, as indicated by the **Maximum Occurrences** setting of \* on the **Source Attributes** and **Destination Attributes** sections of the **Properties** tab. In this example, the ShipTo and Header records of the Source Specification also loop. If an incoming [document instance](#) had three BillTo records and two ShipTo records, the **Looping** functoid would combine these to create five Addresses records in the outgoing document.

The following code is a sample incoming document instance:

```
<Root>
<BillTo Name="Kim Yoshida" Address="345 North 63rd Street"
City="Boston" PostalCode="07458"></BillTo>
<BillTo Name="Michelle Votava" Address="7890 Broadway"
City="Columbus" PostalCode="46290"></BillTo>
<BillTo Name="Tanya Van Dam" Address="1234 Main Street"
City="Denver" PostalCode="97402"></BillTo>
<ShipTo Name="Patricia Esack" Address="456 First Avenue"
City="Miami" PostalCode="81406"></ShipTo>
<ShipTo Name="Peter Kress" Address="567 2nd Avenue"
City="Seattle" PostalCode="98103"></ShipTo>
<Header ID="01"></Header>
<Header ID="02"></Header>
<Header ID="03"></Header>
</Root>
```

This incoming document instance would produce the following outgoing document instance when processed by the [map](#) shown in the previous illustration:

```
<Root>
<Addresses Name="Kim Yoshida" Address="345 North 63rd Street"
City="Boston" PostalCode="07458" ID="01" />
<Addresses Name="Michelle Votava" Address="7890 Broadway"
City="Columbus" PostalCode="46290" ID="01" />
<Addresses Name="Tanya Van Dam" Address="1234 Main Street"
City="Denver" PostalCode="97402" ID="01" />
<Addresses Name="Patricia Esack" Address="456 First Avenue"
City="Miami" PostalCode="81406" ID="01" />
<Addresses Name="Peter Kress" Address="567 2nd Avenue"
```

```
City="Seattle" PostalCode="98103" ID="01" />
</Root>
```

Notice that in each Addresses record created in the outgoing document instance, the value of the ID field is "01". This is because the Header record is not connected to the **Looping** functoid. The first ID field value of the incoming document instance is passed to each record created in the outgoing document instance.

#### ◆ Important

- Under certain conditions some functoids might not behave as expected when they are used in a map with a **Looping** functoid. If a functoid meets the following conditions it does not produce the expected results:
  - The functoid has more than one source specification [link](#).
  - Two or more of the functoid's source specification links are linked to child fields of the **Looping** functoid's input records. The child fields are not siblings.
  - The functoid has a destination specification link that is linked to a child field of the **Looping** functoid's output record.

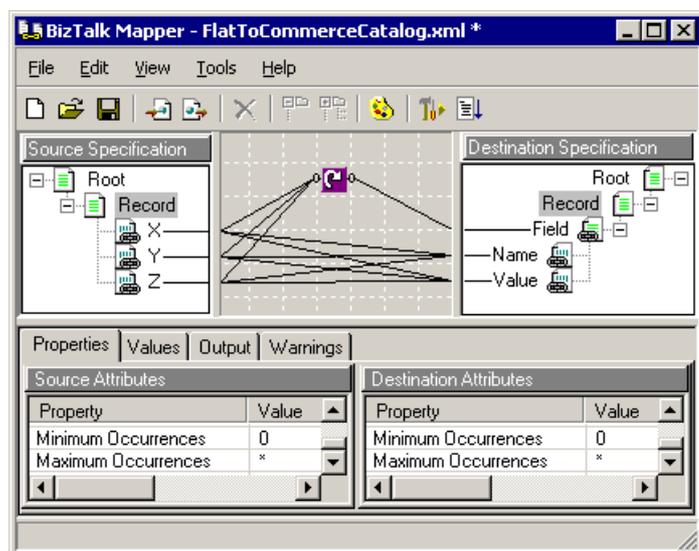
If you were to add a functoid that met these conditions to the previous map, the functoid might have one source specification link connected to the Name field under the BillTo record, another source specification link connected to the Name field under the ShipTo record, and a destination specification link connected to the Name field under the Addresses record.

## Flat schema to Commerce Server catalog

You can use the **Looping** functoid to map a flat [schema](#) to a Microsoft Commerce Server catalog. For more information about flat schemas and Commerce Server catalogs, see [Using the Value Mapping \(Flattening\) Functoid](#).

The following illustration shows a flat schema mapped to a Commerce Server catalog.

Click the illustration to enlarge or reduce.



#### ◆ Important

- For this map to work correctly, you must do the following:
  - For each link that connects to the Name field in the destination specification, set the source-specification link properties to copy the name. For more information, see [Select compiler properties for source-specification links](#).
  - For each link that connects to the Value field in the destination specification, set the source-specification link properties to copy the value. For more information, see [Select compiler properties for source-specification links](#).
  - For the link that connects the **Looping** functoid to the record named Field in the destination specification, set destination-specification link properties to match links top-down. For more information, see [Select compiler properties for destination-specification links](#).

- Insure that **Allow multiple inputs to destination tree nodes** is selected in the **BizTalk Mapper Options** dialog box. For more information, see [BizTalk Mapper Options: General Tab](#).

## Related Topics

[BizTalk Mapper Options: General Tab](#)

[Select compiler properties for destination-specification links](#)

[Select compiler properties for source-specification links](#)

[Using the Value Mapping \(Flattening\) Functoid](#)

# Compiling Maps

When you compile [maps](#), a visual representation of the transformations is created by the BizTalk Mapper compiler component. This component also generates the run-time [Extensible Stylesheet Language \(XSL\)](#) style sheet. This process creates a map. Compiling a map enforces the structural rules and transformations that are specified in the mapping grid. Transformations, such as [links](#), are processed in the same order that records and fields appear in the instance of the source structure. For example, when BizTalk Mapper reaches a source record or field that has a link associated with it, BizTalk Mapper compiles the properties of the link. The action might be a simple copy value that populates a record or field in the [destination specification](#), or the action might calculate values from one or more records and fields from the source to one or more records and fields in the destination, based on the properties of a [functoid](#). The execution of each link is independent of the execution of other links.

BizTalk Mapper generates a warning on the **Warnings** tab when the compiler encounters a situation that yields incorrect output. For example, if a functoid that requires one input parameter has no input parameters, BizTalk Mapper generates a warning on the **Warnings** tab when the map is compiled. A map must generate no warnings before it is ready for a production environment.

The compiling process stores all information about the source and destination specifications, including all content and functionality of links and objects. The compiled map is used by BizTalk Server to perform the actual translation of an input instance to an output instance.

## Related Topic

[Matching Node-Hierarchy Levels](#)

# Testing Maps

As you create a [map](#), you can use BizTalk Mapper to verify that the map you designed produces the correct output. The Test Map feature automatically generates a test instance of the source document from the [specification](#). This feature verifies information, such as the number of occurrences of records, data types of fields, and so on, from the specification and generates the test instance. You can specify unique values for any record or field in the **Source test value** box on the **Values** tab and test the results of that data.

When you test a map, BizTalk Mapper automatically [compiles](#) it. However, it is best to first compile a map and resolve any warnings or errors prior to testing it. Before the test begins you are prompted to save your file. Saving your file prior to testing it is a precautionary measure to preserve your data in case any problems are accidentally introduced into the map.

After you test a map, the results appear on the **Output** tab. The test data corresponds to the destination specification.

## Note

- The BizTalk Mapper map test functionality is limited to testing a map against an automatically generated test document instance. The test document instance is generated by BizTalk Mapper and is based on the source specification. In other words, using BizTalk Mapper you cannot test a map with an actual instance of a business document of your own choosing. However, a sample map test script is included with BizTalk Server that enables you to test a map against a document instance of your choosing. For more information, see `\Program Files\Microsoft BizTalk Server\SDK\Messaging Samples\MapTest\Readme.txt`.

## Related Topics

[Test functoids](#)

[Test links](#)

[Test record and field properties that have links](#)

# Resources

The following topics are covered in this section:

- [Customizing Your Display](#)
- [String Functoids](#)
- [Mathematical Functoids](#)
- [Logical Functoids](#)
- [Date and Time Functoids](#)
- [Conversion Functoids](#)
- [Scientific Functoids](#)
- [Cumulative Functoids](#)
- [Database Functoids](#)
- [Advanced Functoids](#)
- [Maps for Integrating BizTalk Services](#)

# Customizing Your Display

You can customize the look of the BizTalk Mapper in several ways. For example, you can change the background mapping grid colors, specify new colors for links and selected objects, change the color of compiler warnings, and modify the size of text. The following items can be customized:

- **Grid foreground.** The dashed lines in the mapping grid.
- **Grid background.** The background color of the mapping grid.
- **Fixed links.** Value-copy links in the mapping grid.
- **Elastic links.** Value-copy links that are dragged from the source specification tree to the destination specification tree.
- **Partial links.** Links for a field or record whose parent-record node is collapsed.
- **Compiler links.** Compiler directive links, which are automatically created when a link is set from a field in the source specification tree to a field in the destination specification tree.

These features are available on the **Options** dialog box, which is accessible through the **Tools** menu. You can also make changes to text size from the **View** menu.

## Related Topic

[BizTalk Mapper Options: Colors Tab](#)

# String Functoids

Functoid	Parameters
 <b>String Find</b> Returns the position in a string at which another specified string begins.	This functoid requires two input parameters. The first field that you link to the functoid is the string that determines the position of the second string.
 <b>String Left</b> Returns a specified number of characters from a text item, starting with the leftmost character.	This functoid requires two input parameters. The first field that you link to the functoid is the string that determines the output string. The second field that you link to the functoid determines the number of characters returned as the output value. The result of the output is a string that is a subset of the first field that you linked to the functoid.
 <b>Lowercase</b> Converts a text item to lowercase characters.	This functoid requires one input parameter.
 <b>String Right</b> Extracts a specified number of characters from a text item, starting with the rightmost character.	This functoid requires two input parameters. The first field that you link to the functoid is the string that determines the output string. The second field that you link to the functoid determines the number of characters returned as the output value. The result of the output is a string that is a subset of the first field that you linked to the functoid.
 <b>String Length</b> Returns, as an integer, the size of an object, exclusive of any pad characters.	This functoid requires one input parameter. The output value indicates the size, in characters, of the data contained in the input field.
 <b>String Extract</b> Extracts a string specified by the start and end positions of a super string.	This functoid requires three input parameters, one of which must be a string.  The order in which you link the fields to the functoid must adhere to the following criteria: <ol style="list-style-type: none"> <li>1. String field</li> <li>2. Start position field</li> <li>3. End position field</li> </ol>
 <b>Concatenate</b> Concatenates a series of input strings.	This functoid can receive multiple input parameters.
 <b>String Left Trim</b> Removes leading spaces from a text item.	This functoid requires one input parameter.
 <b>String Right Trim</b> Removes trailing spaces from a text item.	This functoid requires one input parameter.
 <b>Uppercase</b> Converts a text item to uppercase characters.	This functoid requires one input parameter.

# Mathematical Functoids

Functoid	Parameters
 <b>Absolute Value</b> Returns the absolute value of a number.	This functoid requires one input parameter. The final value is always positive, regardless of the actual input value.
 <b>Integer</b> Returns the integer portion of a number.	This functoid requires one input parameter. This functoid removes the decimal point of a number and any digits to the right of the decimal point.
 <b>Maximum Value</b> Returns the maximum value from a series of numeric values.	This functoid requires one or more input parameters.
 <b>Minimum Value</b> Returns the minimum value from a series of numeric values.	This functoid requires one or more input parameters.
 <b>Modulo</b> Returns the remainder after the number is divided by an integer.	This functoid requires two input parameters. This functoid returns the remainder of an integer division. This functoid is useful for determining less-than-load type calculations, such as shipping quantities.
 <b>Round</b> Rounds a number to a specified number of decimal places or to a whole number if no decimal places are specified.	This functoid requires two input parameters. The first input linked to the functoid represents the value; the second input linked to the functoid represents the number of decimal places by which you want the number to be rounded. The functoid rounds up or down based on standard calculating rules.
 <b>Square Root</b> Returns the square root of a number.	This functoid requires one input parameter.
 <b>Addition</b> Calculates the sum of a series of numbers.	This functoid requires one or more input parameters.
 <b>Subtraction</b> Subtracts one number from another number.	This functoid requires one or more input parameters.
 <b>Multiplication</b> Multiplies one number by another number.	This functoid requires one or more input parameters.
 <b>Division</b> Divides one number by another number.	This functoid requires two input parameters. You can use this functoid with real numbers and integers.

# Logical Functoids

Functoid	Parameters
 <b>Greater Than</b> Returns "true" if the first parameter is greater than the second parameter.	This functoid requires two input parameters.
 <b>Greater Than or Equal To</b> Returns "true" if the first parameter is greater than or equal to the second parameter.	This functoid requires two input parameters.
 <b>Less Than</b> Returns "true" if the first parameter is less than the second parameter.	This functoid requires two input parameters.
 <b>Less Than or Equal To</b> Returns "true" if the first parameter is less than or equal to the second parameter.	This functoid requires two input parameters.
 <b>Equal</b> Returns "true" if the first parameter is equal to the second parameter.	This functoid requires two input parameters.
 <b>Not Equal</b> Returns "true" if the first parameter is not equal to the second parameter.	This functoid requires two input parameters.
 <b>Logical String</b> Returns "true" if the parameter is a string value.	This functoid requires one input parameter.
 <b>Logical Date</b> Returns "true" if the parameter is a date value.	This functoid requires one input parameter.
 <b>Logical Numeric</b> Returns "true" if the parameter is a numeric value.	This functoid requires one input parameter.
 <b>Logical OR</b> Returns the logical OR of parameters.	This functoid requires one or more input parameters.
 <b>Logical AND</b> Returns the logical AND of parameters.	This functoid requires one or more input parameters.

# Date and Time Functoids

Functoid	Parameters
 <b>Add Days</b> Adds a specified number of days to a date.	This functoid requires two input parameters. The first <a href="#">link</a> must have date information as the input. The second link determines the number of days to add to the date.
 <b>Date</b> Returns the current date.	This functoid does not require any input parameters. The output format is YYYY-MM-DD.
 <b>Time</b> Returns the current time.	This functoid does not require any input parameters. The output format is HH:MM:SS.
 <b>Date and Time</b> Returns the date and time.	This functoid does not require any input parameters. The output format is YYYY-MM-DDTHH:MM:SS.

# Conversion Functoids

Functoid	Parameters
<b> ASCII from Character</b> Returns an ASCII value when given a character.	This functoid requires one input parameter. This functoid converts an underlying ASCII value code. For example: A=97
<b> Character from ASCII</b> Returns a character when given an ASCII value.	This functoid requires one input parameter. This functoid converts a value to its underlying ASCII value code. For example: 98=B
<b> Hexadecimal</b> Returns a hexadecimal value when given a decimal number.	This functoid requires one input parameter. This functoid converts decimal to hexadecimal. For example, 10=A.
<b> Octal</b> Returns an octal value when given a decimal number.	This functoid requires one input parameter. This functoid converts decimal to octal. For example: (Octal 0-7), 8=10, and 10=12

# Scientific Functoids

Functoid	Parameters
 <b>Arc Tangent</b> Returns the arc tangent of a number.	This functoid requires one input parameter. The input value must be in radians.
 <b>Cosine</b> Returns the cosine of a number.	This functoid requires one input parameter. The input value must be in radians.
 <b>Sine</b> Returns the sine of a number.	This functoid requires one input parameter. The input value must be in radians.
 <b>Tangent</b> Returns the tangent of a number.	This functoid requires one input parameter. The input value must be in radians.
 <b>Natural Exponential Function</b> Returns e raised to a specified power.	This functoid requires one input parameter.
 <b>Natural Logarithm</b> Returns the logarithm (base e) of a value.	This functoid requires one input parameter.
 <b>10^X</b> Returns 10 raised to a specified power.	This functoid requires one input parameter.
 <b>Common Logarithm</b> Returns the logarithm (base 10) of a value.	This functoid requires one input parameter.
 <b>X^Y</b> Returns a value raised to a specified power.	This functoid requires two input parameters.
 <b>Base-Specified Logarithm</b> Returns the logarithm (base-specified) of a value.	This functoid requires two input parameters.

# Cumulative Functoids

Functoid	Parameters
 <b>Cumulative Sum</b> Sums all values for the connected field by iterating over its parent record.	This functoid requires one input parameter.
 <b>Cumulative Average</b> Calculates the average of all values for the connected field by iterating over its parent record.	This functoid requires one input parameter.
 <b>Cumulative Minimum</b> Returns the minimum of input spanning over the parent record.	This functoid requires one input parameter.
 <b>Cumulative Maximum</b> Returns the maximum of input spanning over the parent record.	This functoid requires one input parameter.
 <b>Cumulative String</b> Returns the concatenated string of the string values for the connected field by iterating over its parent record.	This functoid requires one input parameter.

# Database Functoids

Functoid	Parameters
 <b>Database Lookup</b> Searches a database for a specific value, retrieves the record that contains the value, and stores it as an ADO record set.	This functoid must have exactly four input parameters.
 <b>Value Extractor</b> Returns a value from a specific column in an ADO record set that has been retrieved by the <b>Database Lookup</b> functoid.	This functoid must have exactly two input parameters.
 <b>Error Return</b> Returns the error string, if any, returned by ODBC when using the <b>Database Lookup</b> functoid.	This functoid must have exactly one input parameter.

# Advanced Functoids

Functoid	Parameters
 <b>Scripting</b> Custom Visual Basic script.	The number of input parameters for this functoid is configurable, based on a custom script.
 <b>Record Count</b> Returns a total count of the records found in the instance .	This functoid must have one input parameter.
 <b>Index</b> Returns the value of a record or a field at a specified index.	This functoid must have at least two input parameters. The maximum number of input parameters is limited by the number of levels in the <a href="#">specification</a> hierarchy.
 <b>Iteration</b> Returns the iteration number (in a loop) of the source record.	This functoid must have one input parameter.
 <b>Value Mapping</b> Returns the value of the second parameter if the value of the first parameter is "true".	This functoid must have two input parameters.
 <b>Value Mapping (Flattening)</b> Returns the value of the second parameter if the value of the first parameter is "true", and flattens the source document hierarchy.	This functoid must have two input parameters.
 <b>Looping</b> Creates multiple output records by iterating over each input record.	This functoid must have at least one input parameter. There is no maximum limit on the number of input parameters.

# Maps for Integrating BizTalk Services

When you integrate [BizTalk Orchestration Services](#) and [BizTalk Messaging Services](#) using a non-HTTP transport, you might need to create a [map](#) to convert a path name to a format name. For more information, see [Integrating BizTalk Services](#).

## Converting a path name to a format name

The following code is an example of a messaging queue path name:

```
private$\sourcechannel2{9e0016bf-be1f-48fe-82de-b27077ab5e73}
```

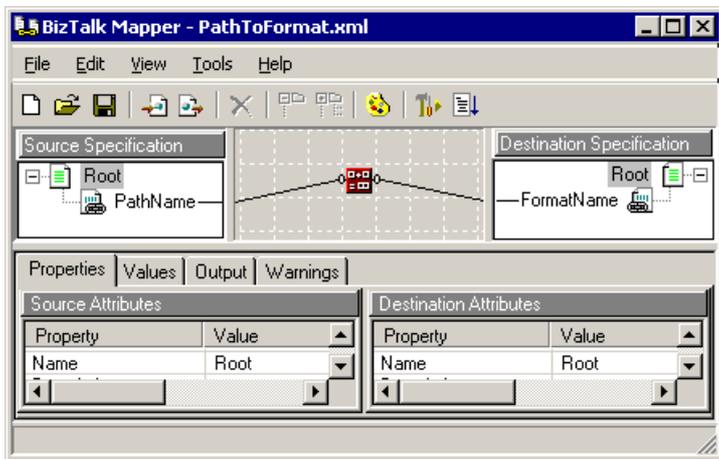
To convert this path name to a format name, you need to add the following string to the beginning of the path name:

```
queue://Direct=OS:
```

You can easily do this with the **Concatenate** functoid.

The following illustration shows a map that uses the **Concatenate** functoid, which concatenates two or more strings. For more information about the **Concatenate** functoid, see [String Functoids](#).

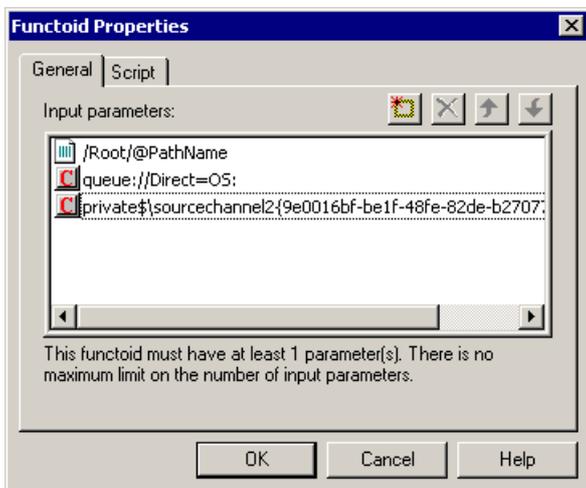
Click the illustration to enlarge or reduce.



Double-clicking the **Concatenate** functoid displays its properties. The following illustration shows how the properties should look for a **Concatenate** functoid in a map that adds the `queue://Direct=OS:` prefix to the `private$\sourcechannel2{9e0016bf-be1f-48fe-82de-b27077ab5e73}` path name.

For more information, see [Edit Functoid Properties](#).

Click the illustration to enlarge or reduce.



# Troubleshooting BizTalk Editor and BizTalk Mapper

This section includes information about the following topics:

- [Password required when trying to connect to a remote WebDAV server](#)
- [Failure to connect to WebDAV or to store files to WebDAV](#)
- [????.xml appears in the WebDAV dialog box](#)
- [BizTalkServerRepositoryMaps folder appears in Retrieve from WebDAV dialog box](#)
- [Retrieve from WebDAV dialog box or Store to WebDAV dialog box is empty](#)
- [Failure to connect to http://localhost](#)
- [Flat file not completely parsed when submitted to BizTalk Server](#)
- [White space not preserved in flat file submitted to BizTalk Server](#)
- [Test map fails](#)
- [DTD Import Fails](#)
- [Instance validation fails when using the Date or Time field](#)

# Password required when trying to connect to a remote WebDAV server

**Cause:** User might not have access to the BizTalkServerRepository folder.

**Solution:** Provide user with access to the BizTalkServerRepository folder. To do this:

1. Click **Start**, point to **Programs**, point to **Administrative Tools**, and then click **Internet Services Manager**.
2. In the console tree, expand the name of the computer.
3. Expand **Default Web Site**.
4. Right-click **BizTalkServerRepository** and click **Properties**.
5. Click the **Directory Security** tab.
6. In the **Anonymous access and authentication control** area, click **Edit**.
7. Select the **Anonymous Access** check box and click **OK** twice.

# Failure to connect to WebDAV or to store files to WebDAV

**Cause One:** If you attempt to retrieve a [map](#) or a [specification](#) from [WebDAV](#), or store a map or specification to WebDAV, you might see one of the following messages:

The file cannot be stored in the WebDAV repository. The server may not be available at this time.

No key matching the described characteristics could be found within the current range.

This occurs when the anonymous setting for the user account on the Web server does not have write privileges on the Microsoft Windows 2000 directory that hosts the repository.

**Solution:** Give user access to the repository. To do this:

1. Click **Start**, point to **Programs**, point to **Accessories**, and then click **Windows Explorer**.
2. Navigate to the location in which you installed Microsoft [BizTalk Server 2000](#).
3. Expand the **Microsoft BizTalk Server** directory, right-click **BizTalkServerRepository**, and then click **Properties**.
4. Click the **Security** tab.
5. Click **Add** and type the domain name and the user name for the person you want to have permission to the repository in the following format: **domain name\user name**.
6. Click **OK** twice.

**Cause Two:** If you attempt to retrieve a map or a specification from WebDAV, or store a map or specification to WebDAV, you might see the following message:

No BizTalk Server repository was found on <http://localhost/BizTalkServerRepository/DocSpecs>. Enter another server name to retry the WebDAV connection.

This occurs when FrontPage Server Extensions are enabled on the Web Server.

**Solution:** Disable FrontPage Server Extensions. If the World Wide Web Publishing service is running, stop and restart this service.

## Note

- This problem can occur even if the World Wide Web Publishing Service is not running on the computer hosting the WebDAV repository.

## To disable FrontPage Server Extensions

1. Click **Start**, point to **Programs**, point to **Administrative Tools**, and then click **Internet Services Manager**.
2. In the details pane, double-click *<name of the computer>*, right-click **Default Web Site**, and then click **Properties**.  
The **Default Web Site Properties** dialog box appears.
3. On the **Server Extensions** tab, clear the **Enable authoring** check box, and click **OK**.

## To stop and restart the World Wide Web Publishing Service

1. Click **Start**, point to **Programs**, point to **Administrative Tools**, and then click **Component Services**.
2. In the console tree, click **Services (local)**.
3. In the details pane, right-click **World Wide Web Publishing Service**, and click **Stop**.
4. Right-click **World Wide Web Publishing Service**, and click **Start**.

# ???.xml appears in the WebDAV dialog box

**Cause:** The set of characters that is displayed for your computer is dependent on the locale setting specified in [BizTalk Server](#).

**Solution:** Specify the same character set for your computer as for the locale setting specified in BizTalk Server. To do this:

1. Click **Start**, point to **Settings**, and then click **Control Panel**.
2. Double-click **Regional Options**.
3. On the **General** tab, in the **Language settings for the system** area, select the check box for the desired language and click **Set Default**.

The **Select System Locale** dialog box appears.

4. Click the desired locale in the list and click **OK** twice.

The **Change Regional Options** dialog box appears.

5. Click **Yes** to accept the changes and restart your computer.

## **Note**

- After restarting your computer, the selected language in the **Regional Options** dialog box displays the following information: **Language (default)**.

## **Related Topics**

[Store maps](#)

[Store specifications](#)

# BizTalkServerRepositoryMaps folder appears in Retrieve from WebDAV dialog box

**Cause:** There is a trailing backslash in the **Local Path** box of the **BizTalkServerRepository Properties** dialog box.

**Solution:** Remove the trailing backslash in the **Local Path** edit box of the **BizTalkServerRepository Properties** dialog box. To do this:

1. On the **Start** menu, point to **Programs**, point to **Administrative Tools**, and then click **Computer Management**.
2. In the **Computer Management** console, expand **Services and Applications**, expand **Internet Information Services**, and then expand **Default Web Site**.
3. Right-click **BizTalkServerRepository** and click **Properties**.
4. In the **Local Path** edit box of the **BizTalkServerRepository Properties** dialog box, remove the trailing backslash and click **OK**.

Completing this procedure removes the **BizTalkServerRepositoryMaps** folder from the **Retrieve from WebDAV** dialog box. This folder is unusable, so it is recommended that you remove it.

# Retrieve from WebDAV dialog box or Store to WebDAV dialog box is empty

**Cause:** Directory browsing is disabled in the **BizTalkServerRepository Properties** dialog box.

**Solution:** Enable directory browsing in the **BizTalkServerRepository Properties** dialog box. To do this:

1. Click **Start**, point to **Programs**, point to **Administrative Tools**, and then click **Internet Services Manager**.
2. Expand the computer that you are troubleshooting.
3. Expand **Default Web Site**.
4. Right-click **BizTalkServerRepository** and click **Properties**.
5. On the **Virtual Directory** tab, select **Directory browsing**.
6. Ensure that **Read** and **Write** are also selected and click **OK**.

# Failure to connect to http://localhost

**Cause:** The **Use a proxy server** check box is selected, but the **Bypass proxy server for local addresses** check box is not selected.

**Solution:** Keep the **Use a proxy server** setting on, and turn on the **Bypass proxy server for local addresses** setting. To do this:

1. Click **Start**, point to **Programs**, and then click **Internet Explorer**.
2. On the **Tools** menu, click **Internet Options**.
3. Click the **Connections** tab and click **LAN Settings**.
4. In the **Local Area Network (LAN) Setting** dialog box, in the **Proxy Server** area, select the **Bypass proxy server for local addresses** check box.
5. Click **OK** twice.

## **Note**

- This failure will not occur if you connect to **http://<name of the computer>**.

# Flat file not completely parsed when submitted to BizTalk Server

**Cause:** A [delimited flat file](#) might have a parsing error when submitted to [BizTalk Server](#) if the file has the following characteristics:

- The **Field Order** property for the root node set to **Prefix** or **Postfix**.
- The name of the root node is a sub string of the name of another node in the file.

**Solution:** Rename the root node so that its name is not a sub string of the name of any other node in the specification.

# White space not preserved in flat file submitted to BizTalk Server

**Cause:** When a flat file is submitted to [BizTalk Server](#), white space in fields might be trimmed. This is because by default the underlying MSXML parser does not preserve white space in a field with its **Type** property (on the **Declaration** tab) set to **Element**.

**Solution:** If it is important to preserve white space in a field contained in a flat file, in [BizTalk Editor](#) be sure to set the **Type** property on the **Declaration** tab of the field in the [source specification](#) to **Attribute**.

## Related Topic

[Set declaration properties](#)

# Test map fails

**Cause:** When you test a [map](#), BizTalk Mapper compiles the map before testing it. If a warning occurs during the compile, the test map might not succeed. The following error message appears:

The Extensible Stylesheet Language (XSL) transformation using the test instance document of the source specification failed.

**Solution:** Resolve all compiler warnings and then recompile the map. To resolve a compiler warning, complete the following:

1. Double-click the word **Warning** on the **Output** tab. This highlights the link or [functoid](#) associated with the warning message.
2. Resolve the warning as needed.

To recompile the map:

- On the **Tools** menu, click **Compile Map**.

## Related Topic

[Testing Maps](#)

# DTD Import Fails

**Cause:** If you try to import a [document type definition \(DTD\)](#) that contains an external reference to another file, you might see the following message:

Invalid character found in DTD.

**Solution:** Remove any external references in a DTD before attempting to import it.

# Instance validation fails when using the Date or Time field

**Cause:** While [BizTalk Server](#) is processing an incoming document instance, if there is a [link](#) from a [functoid](#) or source field to a destination node with its **Data Type** property set to Date, Date Time, Date Time.tz, Time, or Time.tz, instance validation fails if the data coming into the destination node is in any format other than ISO 8601.

**Solution:** When you link to a field in a [destination specification](#) with its **Data Type** property set to Date, Date Time, Date Time.tz, Time, or Time.tz, make sure the data that links to that field (whether from a functoid or from a node in an incoming document instance) is in ISO 8601 format. The following table shows the correct ISO 8601 format for each of the possible **Data Type** property values.

<b>Data Type property</b>	<b>ISO 8601 format</b>
Date	YYYY-MM-DD (1988-04-07)
Date Time	YYYY-MM-DDTHH:MM:SS (1988-04-07T18:39:09)
Date Time.tz	YYYY-MM-DDTHH:MM:SS-TZH:TZM (1988-04-07T18:39:09-08:00)
Time	HH:MM:SS (08:15:27)
Time.tz	HH:MM:SS-TZH:TZM (08:15:27-05:00)

# Integrating BizTalk Services

Integrating [BizTalk Orchestration Services](#) and [BizTalk Messaging Services](#) allows you to control the exchange of documents and messages between your [trading partners](#) and internal applications using multiple [transport services](#). It also provides:

- Control over complex, [long-running transactions](#) and business processes.
- Reliable delivery of documents and messages.
- Data validation by verifying each [document instance](#) against a [specification](#).
- Data mapping by using [maps](#) to transform document structure and format.
- Data security and integrity by using encryption and digital signature certificates.
- Support for receipt generation and correlation.

While there are many ways to integrate BizTalk Orchestration Services and BizTalk Messaging Services, this section presents a common scenario.

In this scenario, you configure an [XLANG schedule instance](#) on the source system to initiate and send a message to a destination system of a trading partner, wait to receive a return message from that partner, and then deliver that return message to the same XLANG schedule instance that sent the initial message. One example of a common business process where you might apply this configuration is for sending a purchase order and waiting to receive a purchase order acknowledgment before continuing the process.

The topics in this section explain the configuration steps required for exchanging messages between your business and a trading partner by using an HTTP transport and a non-HTTP transport. However, you can use a similar configuration to control the exchange of messages between applications within your business.

Because [BizTalk Server 2000](#) can serve either as the source system, which sends the initial message, or the destination system, which sends the return message, this section provides the configuration steps required for both. This also allows you to see the entire configuration that is required.

For samples of XLANG schedules that reflect these configurations and other related files, browse to the `\Program Files\Microsoft BizTalk Server\SDK\XLANG Samples\Integrating BizTalk Services` folder.

## Notes

- The term [messaging port](#), which is used in BizTalk Messaging Services, and the term [port](#), which is used in BizTalk Orchestration Services, have entirely different meanings.
  - A messaging port is a set of properties that directs BizTalk Messaging Services to transport documents to a specified destination by using a specified [transport service](#).
  - A port is a named location that uses a specific implementation. In an XLANG schedule, ports facilitate [synchronous](#) and [asynchronous](#) communications and are used to pass messages into or out of the schedule.
- Action events related to messages processed by an XLANG schedule that are either sent to or received from BizTalk Messaging Services can be tracked in the Tracking database. For more information, see [Tracking XLANG schedule events in the Tracking database](#).

The following topics are covered in this section:

- [Using an HTTP Transport](#)
- [Using a Non-HTTP Transport](#)

## Related Topics

[BizTalk Services](#)

[Instance Management](#)

# Using an HTTP Transport

This section explains how to integrate and configure [BizTalk Orchestration Services](#) and [BizTalk Messaging Services](#) for both the source system and destination system so that:

- The source system generates and sends a [message](#) to the destination system of a [trading partner](#) by using a specific [XLANG schedule instance](#).
- The destination system sends a return message by using an HTTP transport.
- The source system receives the return message, and routes it to the same XLANG schedule instance that generated and sent the initial message.

To configure both systems so that the destination system can use a non-HTTP transport to send return messages, see [Using a non-HTTP Transport](#).

The following topics are covered in this section:

- [Configuring the Source System to Use an HTTP Transport](#)
- [Configuring the Destination System to Use an HTTP Transport](#)

# Configuring the Source System to Use an HTTP Transport

The steps in this topic explain how to configure the source system to generate and send a [message](#) that contains an HTTP URL reply-to address. The destination system of the [trading partner](#) uses the reply-to address contained in the initial message to send a return message to an ASP page on the Web site of the source system by using an HTTP transport. If you want to configure the source system so that the destination system can use a non-HTTP transport to send return messages, see [Configuring the Source System to Use a Non-HTTP Transport](#). The configuration steps required for using a secure HTTPS transport are discussed later in this topic.

The HTTP URL that is used as the reply-to address in this configuration is generated by the XLANG schedule based on data from the port properties. It is comprised of the following elements:

- The address of an ASP page on the Web site of the source system to which a return message is sent.
- A query string that contains the name of the [channel](#) in BizTalk Messaging Services for the source system that is used to process the return message, and a fully qualified path of a [per-instance queue](#) that the XLANG schedule instance creates and to which the return message is delivered.

The following is an example of an HTTP URL reply-to address.

```
http://hostname/receiverresponse.asp?channel=ChannelForReply&qpath=hostname.domain.corp.vigorair-18.com\private$\sendingchannel2{9e0016bf-be1f-48fe-82de-b27077ab5e73}
```

When the ASP page on the source system receives the return message, it contains script that performs the following steps.

- Extracts the channel name and queue path information from the query string.
- Converts the queue path from a path name to a format name, and inserts a queue:// prefix, which is required by BizTalk Messaging Services.
- Submits the return message to BizTalk Messaging Services for the source system using the channel name and queue path information as submission parameters. For more information about submitting documents, see [Submitting](#).

BizTalk Messaging Services for the source system uses the specified channel to process the return message and uses the associated [messaging port](#), which uses the queue path to transport the return message to the same running XLANG schedule instance that generated the initial message.

For this source system configuration to work correctly, the destination system of the trading partner also must be correctly configured. For information about configuring the destination system, see [Configuring the Destination System to Use an HTTP Transport](#).

To configure the source system to use an HTTP transport, complete the steps in the following table. References are provided for each procedure, and notes are provided to indicate special configuration considerations. Other property settings needed to complete the configuration vary according to your particular business situation and are not specified here.

Step	References and notes
<b>Using BizTalk Editor:</b>	
<ul style="list-style-type: none"> <li>• Create the <a href="#">specifications</a> that are needed for the inbound and outbound <a href="#">document definitions</a> of the channel that will process the initial message.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create and Validate Specifications</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>• You must add a field in each of these specifications for the reply-to address. This field can be added at any level; however, the location must be agreed upon with the trading partner and match the specifications on the destination system of your trading partner. For more information, see <a href="#">Manage Records and Fields</a>.</li> </ul>
<ul style="list-style-type: none"> <li>• Create the specifications that are needed for the inbound and outbound document definitions of the channel that will process the return message.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create and Validate Specifications</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• These specifications do not require special configuration.</li> </ul>

<b>Using BizTalk Messaging Manager:</b>	
<ul style="list-style-type: none"> <li>• Create an <a href="#">organization</a> to represent the trading partner and the destination system.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create organizations</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• This organization does not require special configuration.</li> </ul>
<ul style="list-style-type: none"> <li>• Create the document definitions needed to create the channel that you use to process the initial message.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create document definitions</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• In the document definitions, select the specifications that have the reply-to field. For more information, see <a href="#">Select a document specification</a>.</li> </ul>
<ul style="list-style-type: none"> <li>• Create the document definitions needed to create the channel that you use to process the return message.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create document definitions</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• These document definitions do not require special configuration.</li> </ul>
<ul style="list-style-type: none"> <li>• Create a <a href="#">messaging port</a> to an organization to transport the initial message to the destination system.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create messaging ports</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• This messaging port cannot be an <a href="#">open messaging port</a>.</li> </ul>
<ul style="list-style-type: none"> <li>• Create a channel from an application to process the outbound message from the <a href="#">XLANG schedule</a>.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create channels</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>• On the <b>Source Application</b> page of the Channel Wizard, click <b>XLANG schedule</b>. For more information, see <a href="#">Set source application properties</a>.</li> <li>• Make a note of the channel name and the inbound document definition name. These names are used to configure BizTalk Orchestration Services.</li> </ul>
<ul style="list-style-type: none"> <li>• Create a messaging port to an application to transport the return message to the active <a href="#">XLANG schedule instance</a> that generated the outbound message.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create messaging ports</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• On the <b>Destination Application</b> page of the Messaging Port Wizard, click <b>Running XLANG schedule</b>. For more information, see <a href="#">Set destination application properties</a>.</li> </ul>
<ul style="list-style-type: none"> <li>• Create a channel from an organization to process the return message from the destination system.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create channels</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• Make a note of the channel name and the outbound document definition name that you use. These names are used to configure BizTalk Orchestration Services.</li> </ul>
<b>Using BizTalk Orchestration Designer:</b>	
<ul style="list-style-type: none"> <li>• Use a BizTalk Messaging shape to implement a <a href="#">port</a> to send the initial message.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Implement a port by using BizTalk Messaging</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• On the <b>Static or Dynamic Channel Information</b> page of the BizTalk Messaging Binding Wizard, click <b>Static channel</b>, and in the <b>Enter the name of a known, pre-existing channel</b> box, type the name of the channel in <a href="#">BizTalk Messaging Manager</a> that you use to process the initial message.</li> </ul>

<ul style="list-style-type: none"> <li>Establish the communication flow between an <b>Action</b> shape and the port that sends the initial message.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Send or receive asynchronous messages</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>On the <b>Message Information</b> page of the XML Communication Wizard, click <b>Create a new message</b>, and in the <b>Message name</b> box, type a name for the message. You can use any name; however, using the name of the inbound document definition for the channel makes it more apparent which message you are sending.</li> <li>On the <b>Message Type Information</b> page, in the <b>Message type</b> box, type the name of the inbound document definition for the channel that you use to process the message.</li> <li>On the <b>Message Specification Information</b> page, click <b>Browse</b>, and browse to the specification that you use for the inbound document definition of the channel that you use to process the initial message.</li> <li>On the <b>Message Specification Information</b> page, in the <b>Message fields</b> area, click <b>Add</b>, and add the field in the specification that was created to contain the reply-to address in the initial message.</li> </ul>
<ul style="list-style-type: none"> <li>Use a BizTalk Messaging shape to implement a port where you receive a return message.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Implement a port by using BizTalk Messaging</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>On the <b>XLANG Schedule Activation Information</b> page of the BizTalk Messaging Binding Wizard, click <b>No</b>.</li> <li>On the <b>Channel Information</b> page, in the <b>Channel name</b> box, type the name of the channel in BizTalk Messaging Manager that you use to process the return message. BizTalk Orchestration Designer uses the channel name and a GUID to create and name a per-instance queue to which the return message is delivered.</li> <li>On the <b>Channel Information</b> page, in the <b>http URL address where the BizTalk Messaging Service receives documents</b> box, type the address of the ASP page where the trading partner can send a return message. BizTalk Orchestration Designer uses the address and the channel name that you entered previously to create an HTTP URL address with a query string that includes the channel name and the queue path of the per-instance queue.</li> </ul>
<ul style="list-style-type: none"> <li>Establish the communication flow between an <b>Action</b> shape and the port where you receive a return message.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Send or receive asynchronous messages</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>On the <b>Message Information</b> page of the XML Communication Wizard, click <b>Create a new message</b>, and in the <b>Message name</b> box, type a name for the message. You can use any name; however, using the name of the outbound document definition for the channel makes it more apparent which message you are receiving.</li> <li>On the <b>Message Type Information</b> page, in the <b>Message type</b> box, type the name of the outbound document definition for the channel that you use to process the return message. All messages delivered from BizTalk Messaging Services to an XLANG schedule instance are sent to a message queue. The message label given to these messages is the name of the outbound document definition of the channel.</li> </ul>

<ul style="list-style-type: none"> <li>Establish the data flow for passing the <a href="#">port reference</a> data to the reply-to address field.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Draw the flow between messages</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>Click the <b>Data</b> tab.</li> <li>On the <b>Data</b> page, in the <b>Port References</b> message, click the port reference for the port that will receive the return message. Then, drag its control handle to the connection point of the reply-to address field in the initial message.</li> </ul> <p>This passes the port reference data into the reply-to address field of the outbound initial message. The port reference is an HTTP URL address of an ASP page, which includes a query string with a channel name and the queue path of the per-instance queue for the port.</p>
<p><b>Using the ASP page:</b></p>	
<ul style="list-style-type: none"> <li>You can use the sample ASP page that is provided with BizTalk Server 2000, or configure an ASP page that uses the same script as the sample page.</li> </ul>	<p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>To use the sample ASP page, browse to \Program Files\Microsoft BizTalk Server\SDK\Messaging Samples\ReceiveScripts on the installation drive to locate the <b>ReceiveResponse.asp</b> sample. Then, place this file in the appropriate directory for the Web site of the source system.</li> <li>When the sample ASP page receives a return message, its script extracts the channel name and queue path from the query string in the address of the HTTP header. The ASP page also converts the queue path from a path name to a format name, and inserts a queue:// prefix. The page then uses this data as parameters to submit the return message to BizTalk Messaging Services for the source system. For more information about submitting documents, see <a href="#">Submitting</a>.</li> </ul>

## Using a secure HTTPS transport

If your business process requires a secure transport for exchanging messages with a trading partner, you must use an HTTPS transport.

The only change that you need to make in the source system configuration to use an HTTPS transport is to modify the URL address for the [port](#) where you receive the return message.

When you implement the port that receives the return message, the URL that you enter for the reply-to address must use an HTTPS prefix, rather than an HTTP prefix.

The following is an example of a reply-to address that uses HTTPS.

```
https://hostname/receiveresponse.asp?channel=ChannelForReply&qpath=hostname.domain.corp.vigorair-18.com\private$\sendingchannel2{9e0016bf-be1f-48fe-82de-b27077ab5e73}
```

The destination system does not require any additional configuration changes.

## Related Topics

[Configuring the Destination System to Integrate BizTalk Services](#)

[Integrating BizTalk Services](#)

# Configuring the Destination System to Use an HTTP Transport

The steps in this topic explain how to configure the destination system to receive a [message](#) that contains an HTTP URL reply-to address and send a return message to the source system by using an HTTP transport. If you want to configure the destination system to use a non-HTTP transport to send return messages, see [Configuring the Destination System to Use a Non-HTTP Transport](#). The configuration considerations for using a secure HTTP/S transport are discussed later in this topic.

When [BizTalk Messaging Services](#) for the destination system receives the initial message, it is configured to activate a new instance of a specified [XLANG schedule](#) and send the message to a specified [port](#) in that [XLANG schedule instance](#).

The XLANG schedule is configured to pass the reply-to address data that is contained in a field of the initial message to the [port reference](#) field for the port that is used to send the return message. The XLANG schedule then submits the return message to BizTalk Messaging Services using the dynamic channel option.

For the dynamic channel option, specific port data is passed as submission parameters when the message is submitted to BizTalk Messaging Services. The port reference data, in this case the reply-to address, is passed as the destination identifier parameter, and the **Message type** for the port is passed as the document definition name parameter. For more information about submission parameters, see [Submitting](#). The submission parameters enable BizTalk Messaging Services to identify a specific [channel](#) to process the return message. For more information, see [Identification](#).

When you use the dynamic channel option, the channel in BizTalk Messaging Services must be associated with an [open messaging port](#). The open messaging port transports the return message to the source system of the [trading partner](#) by using the reply-to address, which is passed as the destination identifier parameter. Because this is the HTTP URL of an ASP page on the source system, the HTTP transport is used. For more information about open messaging ports, see [Open Messaging Ports](#).

For this destination system configuration to work correctly, the source system of the trading partner also must be correctly configured. For information about configuring the source system, see [Configuring the Source System to Use an HTTP Transport](#).

To configure the destination system to use an HTTP transport, complete the steps in the following table. References are provided for each procedure, and notes are provided to indicate special configuration considerations. Other property settings needed to complete the configuration vary according to your particular business situation and are not specified here.

Step	References and notes
<b>Using BizTalk Editor:</b>	
<ul style="list-style-type: none"> <li>Create the <a href="#">specifications</a> for the inbound and outbound <a href="#">document definitions</a> of the channel that you use to process the initial message.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Create and Validate Specifications</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>You must add a field in each of these specifications for the reply-to address. This field can be added at any level; however, the location must be agreed upon with the trading partner and match the specifications on the source system of your trading partner. For more information, see <a href="#">Manage Records and Fields</a>.</li> </ul>
<ul style="list-style-type: none"> <li>Create the specifications that are needed for the inbound and outbound document definitions of the channel that will process the return message.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Create and Validate Specifications</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>These specifications do not require special configuration.</li> </ul>
<b>Using BizTalk Messaging Manager:</b>	
<ul style="list-style-type: none"> <li>Create an <a href="#">organization</a> to represent the trading partner with the source system.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Create organizations</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>This organization does not require special configuration.</li> </ul>
<ul style="list-style-type: none"> <li>Create the document definitions needed for creating a channel to process the initial message and a channel to process the return message.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Create document definitions</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>In the document definitions, select the previously created specifications. For more information, see <a href="#">Select a document specification</a>.</li> </ul>

<ul style="list-style-type: none"> <li>• Create a <a href="#">messaging port</a> to an application to activate a new XLANG schedule instance, and transport the initial message to a port in that XLANG schedule instance.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create messaging ports</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>• On the <b>Destination Application</b> page of the Messaging Port Wizard, click <b>New XLANG schedule</b>.</li> <li>• In the <b>Schedule moniker</b> box, type the <a href="#">moniker</a> of the specified schedule or click <b>Browse</b> to set the path.</li> <li>• In the <b>Port name</b> box, type the name of the specific port in this schedule to which the document is sent.</li> </ul> <p>For more information, see <a href="#">Set destination application properties</a>.</p>
<ul style="list-style-type: none"> <li>• Create a channel from an organization to process the initial message from the trading partner.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create channels</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• Make a note of the channel name and the outbound document definition name that you use. These names are used to configure BizTalk Orchestration Services.</li> </ul>
<ul style="list-style-type: none"> <li>• Create an open messaging port to an organization to transport the return message to the source system.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create messaging ports</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• On the <b>Destination Organization</b> page of the Messaging Port Wizard, click <b>Open organization</b>. For more information, see <a href="#">Set destination application properties</a>.</li> </ul> <p>An open messaging port requires that the destination information be contained in the document or provided by submission parameters. When the XLANG schedule submits the return message to BizTalk Messaging Services, it passes the reply-to address data, which was contained in the initial message, as the destination identifier submission parameter.</p>
<ul style="list-style-type: none"> <li>• Create a channel from an application to process the return message from the XLANG schedule.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create channels</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• On the <b>Source Application</b> page of the Channel Wizard, click <b>XLANG schedule</b>. For more information, see <a href="#">Set source application properties</a>.</li> </ul>
<p><b>Using BizTalk Orchestration Designer:</b></p>	
<ul style="list-style-type: none"> <li>• Use a BizTalk Messaging shape to implement a port to receive the initial message.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Implement a port by using BizTalk Messaging</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>• On the <b>Communication Direction</b> page of the BizTalk Messaging Binding Wizard, click <b>Receive</b>.</li> <li>• On the <b>XLANG Schedule Activation Information</b> page of the BizTalk Messaging Binding Wizard, click <b>Yes</b>.</li> </ul> <p><b>◆ Important</b></p> <ul style="list-style-type: none"> <li>• Choosing <b>Yes</b> configures the port to activate a new schedule instance when a message arrives. For important information about using this option, see the topic referenced for this step.</li> </ul>

<ul style="list-style-type: none"> <li>Establish the communication flow between an <b>Action</b> shape and the port that receives the initial message.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Send or receive asynchronous messages</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>On the <b>Message Information</b> page of the XML Communication Wizard, click <b>Create a new message</b>, and in the <b>Message name</b> box, type a name for the message.</li> </ul> <p>You can use any name; however, using the name of the outbound <a href="#">document definition</a> for the channel makes it more apparent which message you are sending.</p> <ul style="list-style-type: none"> <li>On the <b>Message Type Information</b> page, in the <b>Message type</b> box, type the name of the outbound document definition for the channel that you use to process the return message.</li> </ul> <p>All messages passed from BizTalk Messaging to an XLANG schedule use a message queue. The label for these messages is the name of the outbound document definition of the channel.</p>
<ul style="list-style-type: none"> <li>Use a BizTalk Messaging shape to implement a port to send the return message with a dynamic channel.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Implement a port by using BizTalk Messaging</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>On the <b>Static or Dynamic Channel Information</b> page of the BizTalk Messaging Binding Wizard, click <b>Dynamic channel</b>.</li> <li>When you create a port that uses a dynamic channel, the channel that BizTalk Messaging Services uses to process the message is determined by port data passed as submission parameters. This is described later in this table.</li> </ul>
<ul style="list-style-type: none"> <li>Establish the communication flow between an <b>Action</b> shape and the port that is used to send the return message.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Send or receive asynchronous messages</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>On the <b>Message Information</b> page of the XML Communication Wizard, click <b>Create a new message</b>, and in the <b>Message name</b> box, type a name for the message.</li> </ul> <p>You can use any name; however, using the name of the inbound document definition for the channel makes it more apparent which message you are sending.</p> <ul style="list-style-type: none"> <li>On the <b>Message Type Information</b> page, in the <b>Message type</b> box, you must type the name of the inbound document definition for the channel that you use to process the message.</li> </ul> <p>The inbound document definition data is passed as a submission parameter to BizTalk Messaging Services. This is described later in this table.</p>

- Establish the data flow to pass the reply-to address field to the port reference of the port that sends the return message.

- [Draw the flow between messages](#)

#### Notes

- Click the **Data** tab.
- On the **Data** page, in the initial message, click the reply-to address field. Then, drag its control handle to the left connection point of the port reference in the **Port References** message for the port that is used to send the return message.

#### Important

- You must connect the reply-to address field to the left connection point of the port reference. A left connection point on a port reference is available only when a port is configured to use a dynamic channel to send messages.

For a port that uses a dynamic channel, the data for the port reference must be passed from a field in a previously received message.

In this scenario, the reply-to address data from the initial message is passed to the port reference field for the port that is used to send the return message. The reply-to address is the HTTP URL to where the return message is sent.

When a port that uses a dynamic channel passes a message to BizTalk Messaging Services, the port reference data is passed as the destination identifier parameter and the message type data is passed as the document definition parameter. The parameters enable BizTalk Messaging Services to identify which channel to invoke to process the message. For more information, see [Identification](#) and [Submitting](#).

When a port is configured to use a dynamic channel, the destination information is passed as a parameter in an open destination submission. Therefore, any channel that is invoked by a port that uses a dynamic channel must be associated with an [open messaging port](#).

## Using a secure HTTPS transport

Because the messaging port that you use to transport return messages is an open messaging port, you cannot use an encryption certificate to encrypt documents.

If your business process requires a secure transport for exchanging messages with a trading partner, the source system must include an HTTPS URL as the reply-to address in the initial messages that are sent to you, rather than an HTTP URL.

For more information, see [Configuring the Source System to Use an HTTP Transport](#).

# Using a non-HTTP Transport

This section explains how to integrate and configure [BizTalk Orchestration Services](#) and [BizTalk Messaging Services](#) for both the source system and destination system so that:

- The source system generates and sends a [message](#) to the destination system of a [trading partner](#) by using a specific [XLANG schedule instance](#).
- The destination system receives the initial message, activates an XLANG schedule instance that generates a return message, and then sends the return message to the source system using a non-HTTP transport.

To configure both systems so that the destination system can use an HTTP transport to send return messages, see [Using an HTTP Transport](#).

The following topics are covered in this section:

- [Configuring the Source System to Use a Non-HTTP Transport](#)
- [Configuring the Destination System to Use a Non-HTTP Transport](#)

# Configuring the Source System to Use a Non-HTTP Transport

The steps in this topic explain how to configure the source system to generate and send a [message](#) that contains the path of a [static queue](#). The destination system of the [trading partner](#) is configured to pass the queue path contained in the message into a field of a return message, and send it to the source system by using a non-HTTP transport. If you want to configure the source system so that the destination system can use an HTTP transport to send return messages, see [Configuring the Source System to Use an HTTP Transport](#).

When the source system receives the return message, it submits the message to [BizTalk Messaging Services](#). BizTalk Messaging Services transports the return message to the queue that is specified by the queue path contained in the document field. This queue is monitored by the same [XLANG schedule instance](#) that generated the initial message, and the schedule retrieves the return message from that queue.

For this source system configuration to work correctly, the destination system of the trading partner also must be correctly configured. For information about configuring the destination system, see [Configuring the Destination System to Use a Non-HTTP Transport](#).

To configure the source system to use a non-HTTP transport, complete the steps in the following table. References are provided for each procedure, and notes are provided to indicate special configuration considerations. Other property settings needed to complete the configuration vary according to your particular business situation and are not specified here.

Step	References and notes
<b>Using BizTalk Editor:</b>	
<ul style="list-style-type: none"> <li>• Create the <a href="#">specifications</a> for the inbound and outbound <a href="#">document definitions</a> of the <a href="#">channel</a> that you use to process the initial message.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create and Validate Specifications</a></li> </ul> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>• You must add a field in each of these specifications for the queue path. This field can be added at any level; however, the location must be agreed upon with the trading partner and match the specifications on the destination system of your trading partner. For more information, see <a href="#">Manage Records and Fields</a>.</li> </ul>
<ul style="list-style-type: none"> <li>• Create the specifications for the inbound and outbound document definitions of the channel that you use to process the return message.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create and Validate Specifications</a></li> </ul> <p><b>Notes</b></p> <ul style="list-style-type: none"> <li>• You must add a field to the inbound specification for the queue path. This field can be added at any level; however, the location must be agreed upon with the trading partner and match the specifications on the destination system of your trading partner. For more information, see <a href="#">Manage Records and Fields</a>.</li> <li>• The queue path field in the inbound specification must be set as the destination value in the dictionary properties. For more information, see <a href="#">Set dictionary properties</a>.</li> </ul> <p>When the return message is received and submitted to BizTalk Messaging Services on the source system, the queue path field is recognized and treated as the destination identifier parameter. For more information, see <a href="#">Submitting</a>. The messaging port transports the return message to the queue specified by this queue path. The XLANG schedule monitors this queue and retrieves the return message.</p>
<b>Using BizTalk Mapper:</b>	
<ul style="list-style-type: none"> <li>• Create a <a href="#">map</a> to be used in the channel that processes the initial message.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create new maps</a></li> </ul> <p><b>Important</b></p> <ul style="list-style-type: none"> <li>• The syntax for the queue path name that the <a href="#">XLANG schedule</a> generates must be changed from a path name to a format name, and have the queue:// prefix added. For the HTTP transport scenario, the script in the ASP page makes this change. To make this change for the non-HTTP transport scenario, you must use a <b>Concatenate</b> functoid in a map. For more information, see <a href="#">Maps for Integrating BizTalk Services</a>.</li> </ul>

<p><b>Using BizTalk Messaging Manager:</b></p>	
<ul style="list-style-type: none"> <li>• Create an <a href="#">organization</a> to represent the trading partner with the destination system.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create organizations</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• This organization does not require special configuration.</li> </ul>
<ul style="list-style-type: none"> <li>• Create the document definitions needed to create a channel to process the initial message and a channel to process the return message.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create document definitions</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• In the document definitions, select the previously created specifications. For more information, see <a href="#">Select a document specification</a>.</li> </ul>
<ul style="list-style-type: none"> <li>• Create a <a href="#">messaging port</a> to an organization to transport the initial message to the destination system.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create messaging ports</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• This messaging port does not require special configuration.</li> </ul>
<ul style="list-style-type: none"> <li>• Create a channel from an application to process the initial message from the XLANG schedule.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create channels</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>• On the <b>Source Application</b> page of the Channel Wizard, click <b>XLANG schedule</b>. For more information, see <a href="#">Set source application properties</a>.</li> <li>• On the <b>Outbound Document</b> page, select the <b>Map inbound document to outbound document</b> check box, and to the right of the Map reference box, click <b>Browse</b>. Then, browse to the map that you created previously and click <b>Open</b>.</li> <li>• Make a note of the channel name and the inbound document definition name that you use. These names are used to configure <a href="#">BizTalk Orchestration Services</a>.</li> </ul>
<ul style="list-style-type: none"> <li>• Create an <a href="#">open messaging port</a> to an organization to transport the return message to the active XLANG schedule instance that generated the initial message.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create messaging ports</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>• On the <b>Destination Organization</b> page of the Messaging Port Wizard, click <b>Open Destination</b>. For more information, see <a href="#">Set destination organization properties</a>.</li> <li>• For this scenario, you create a messaging port to an organization, even though you send the return message to an application, an XLANG schedule.</li> </ul> <p>This allows you to use an open messaging port to submit the return message using the queue path information as a submission parameter. For more information, see <a href="#">Submitting</a>.</p> <p>The open messaging port transports the return message to the <a href="#">static queue</a> that is specified in the queue path, where the XLANG schedule is configured to retrieve it.</p>
<ul style="list-style-type: none"> <li>• Create a channel from an organization to process the return message from the destination system.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create channels</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>• The inbound document definition for this channel must use the document definition that uses the previously created specification in which you designated the queue path field as the destination value in the dictionary properties.</li> <li>• Make a note of the channel name and the inbound document definition name that you use. These names are used to configure BizTalk Orchestration Services.</li> </ul>

<b>Using BizTalk Orchestration Designer:</b>	
<ul style="list-style-type: none"> <li>Use a BizTalk Messaging shape to implement a port to send the initial message.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Implement a port by using BizTalk Messaging</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>On the <b>Static or Dynamic Channel Information</b> page of the BizTalk Messaging Binding Wizard, click <b>Static channel</b>, and in the <b>Enter the name of a known, pre-existing channel</b> box, type the name of the channel in <a href="#">BizTalk Messaging Manager</a> that you use to process the initial message.</li> </ul>
<ul style="list-style-type: none"> <li>Establish the communication flow between an <b>Action</b> shape and the port that sends the initial message.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Send or receive asynchronous messages</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>On the <b>Message Information</b> page of the XML Communication Wizard, click <b>Create a new message</b>, and in the <b>Message name</b> box, type a name for the message.  You can use any name; however, using the name of the inbound document definition for the channel makes it more apparent which message you are sending.</li> <li>On the <b>Message Type Information</b> page, in the <b>Message type</b> box, type the name of the inbound document definition for the channel that you use to process the message.</li> <li>On the <b>Message Specification Information</b> page, click <b>Browse</b>, and browse to the specification that you use for the inbound document definition of the channel for the initial message.</li> <li>On the <b>Message Specification Information</b> page, in the <b>Message fields</b> area, click <b>Add</b>, and add the field in the specification that was created to contain the queue path.</li> </ul>
<ul style="list-style-type: none"> <li>Use a Message Queuing shape to implement a port where you receive a return message.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Implement a port by using Message Queuing</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>In this scenario, you use a Message Queuing port binding, even though you are receiving a message from BizTalk Messaging Services.</li> <li>On the <b>Static or Dynamic Queue Information</b> page of the Message Queuing Binding Wizard, click <b>Static queue</b>.</li> <li>On the <b>Queue Information</b> page, click <b>Use a known queue for all instances</b>, and in the <b>Enter the queue name</b> box, type the name of the static queue that you use to process the return message.</li> </ul>

<ul style="list-style-type: none"> <li>Establish the communication flow between an <b>Action</b> shape and the port where you receive a return message.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Send or receive asynchronous messages</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>On the <b>Welcome to the XML Communication Wizard</b> page of the XML Communication Wizard, click <b>Receive</b>.</li> <li>On the <b>Message Information</b> page, click <b>Create a new message</b>, and in the <b>Message name</b> box, type a name for the message.  You can use any name; however, using the name of the outbound document definition for the channel makes it more apparent which message you are receiving.</li> <li>On the <b>Message Type Information</b> page, in the <b>Message type</b> box, type the name of the outbound document definition for the channel that you use to process the return message.  All messages passed from BizTalk Messaging to an XLANG schedule use a message queue. The label for these messages is the name of the outbound document definition of the channel.</li> </ul>
<ul style="list-style-type: none"> <li>Establish the data flow from the receiving <a href="#">port reference</a> to the queue path field.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Draw the flow between messages</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>Click the <b>Data</b> tab.</li> <li>On the <b>Data</b> page, in the <b>Port References</b> message, click the field for the port that receives the return message. Then, drag its control handle to the connection point of the queue path field in the initial message.  This inserts the port reference data into the queue path field of the initial message. The port reference is the queue path of the static queue for the port that you use to receive a return message.</li> </ul>

# Configuring the Destination System to Use a Non-HTTP Transport

The steps in this topic explain how to configure the destination system to receive a [message](#) that contains a queue path and to send a return message that contains the same queue path to the source system by using a non-HTTP transport. If you want to configure the destination system to use an HTTP transport to send return messages, see [Configuring the Destination System to Use an HTTP Transport](#).

When [BizTalk Messaging Services](#) for the destination system receives the initial message, it is configured to activate a new instance of a specified [XLANG schedule](#) and pass the message to a specified [port](#) in that [XLANG schedule instance](#).

The XLANG schedule is configured to pass the data contained in the queue path field of the initial message into a matching field of the return message, and then submit the return message to a [channel](#) in BizTalk Messaging Services.

BizTalk Messaging Services uses the specified channel to process the return message and pass it to a [messaging port](#). This messaging port is configured to transport the return message to an address that is agreed upon with the [trading partner](#) with the source system. This messaging port cannot be an [open messaging port](#).

For this destination system configuration to work correctly, the source system of the trading partner also must be correctly configured. For information about configuring the source system, see [Configuring the Source System to Use a Non-HTTP Transport](#).

To configure the destination system to use a non-HTTP transport, complete the steps in the following table. References are provided for each procedure, and notes are provided to indicate special configuration considerations. Other property settings needed to complete the configuration vary according to your particular business situation and are not specified here.

Step	References and notes
<b>Using BizTalk Editor:</b>	
<ul style="list-style-type: none"> <li>• Create the <a href="#">specifications</a> for the inbound and outbound <a href="#">document definitions</a> of the channel that you use to process the initial message.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create and Validate Specifications</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>• You must add a field in each of these specifications for the queue path. This field can be added at any level; however, the location must be agreed upon with the trading partner and match the specifications on the source system of your trading partner. For more information, see <a href="#">Manage Records and Fields</a>.</li> </ul>
<ul style="list-style-type: none"> <li>• Create the specifications for the inbound and outbound document definitions of the channel that you use to process the return message.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create and Validate Specifications</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>• You must add a field in each of these specifications for the queue path. This field can be added at any level; however, the location must be agreed upon with the trading partner and match the specifications on the source system of your trading partner. For more information, see <a href="#">Manage Records and Fields</a>.</li> </ul>
<b>Using BizTalk Messaging Manager:</b>	
<ul style="list-style-type: none"> <li>• Create an <a href="#">organization</a> to represent the trading partner with the source system.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create organizations</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• This organization does not require special configuration.</li> </ul>
<ul style="list-style-type: none"> <li>• Create the document definitions needed for creating a <a href="#">channel</a> to process the initial message.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create document definitions</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• In the document definitions, select the previously created specifications. For more information, see <a href="#">Select a document specification</a>.</li> </ul>

<ul style="list-style-type: none"> <li>• Create the document definitions needed for creating a channel to process the return message.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create document definitions</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• In the document definitions, select the previously created specifications. For more information, see <a href="#">Select a document specification</a>.</li> </ul>
<ul style="list-style-type: none"> <li>• Create a <a href="#">messaging port</a> to an application to activate a new <a href="#">XLANG schedule instance</a>, and transport the initial message to a <a href="#">port</a> in that XLANG schedule instance.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create messaging ports</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>• On the <b>Destination Application</b> page of the Messaging Port Wizard, click <b>New XLANG schedule</b>.</li> <li>• In the <b>Schedule moniker</b> box, type the <a href="#">moniker</a> of the specified schedule or click <b>Browse</b> to set the path.</li> <li>• In the <b>Port name</b> box, type the name of the specific port in this schedule to which the document is sent.</li> </ul> <p>For more information, see <a href="#">Set destination application properties</a>.</p> <p>To complete this step, you need the path of an XLANG schedule and the name of the port in that schedule to which the initial message is delivered. Therefore, you must first create the XLANG schedule and configure its port, as described later in this table.</p>
<ul style="list-style-type: none"> <li>• Create a channel from an organization to process the initial message from the trading partner.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create channels</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• Make a note of the channel name and the outbound document definition name that you use. These names are used to configure <a href="#">BizTalk Orchestration Services</a>.</li> </ul>
<ul style="list-style-type: none"> <li>• Create a messaging port to an organization to transport the return message to the source system.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create messaging ports</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>• On the <b>Destination Organization</b> page of the Messaging Port Wizard, click <b>Organization</b>. To the right of the <b>Name</b> box, click <b>Browse</b>.</li> <li>• In the <b>Select an Organization</b> dialog box, select the organization that you created previously to represent the trading partner with the source system. For more information, see <a href="#">Select a destination organization</a>.</li> <li>• On the <b>Destination Organization</b> page of the Messaging Port Wizard, in the <b>Primary Transport</b> area, click <b>Browse</b>.</li> <li>• In the <b>Primary Transport</b> dialog box, in the <b>Transport type</b> list, select the transport type, and in the <b>Address</b> box, type an address.</li> </ul> <p>The transport type and address must be agreed upon with the trading partner and match the specifications on the source system of your trading partner.</p> <ul style="list-style-type: none"> <li>• You cannot use an <a href="#">open messaging port</a> to send the return message.</li> </ul>

<ul style="list-style-type: none"> <li>• Create a channel from an application to process the return message from the XLANG schedule.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Create channels</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>• On the <b>Source Application</b> page of the Channel Wizard, click <b>XLANG schedule</b>. For more information, see <a href="#">Set source application properties</a>.</li> <li>• Make a note of the channel name and the inbound document definition name that you use. These names are used to configure BizTalk Orchestration Services.</li> </ul>
<p><b>Using BizTalk Orchestration Designer:</b></p>	
<ul style="list-style-type: none"> <li>• Use a BizTalk Messaging shape to implement a port to receive the initial message.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Implement a port by using BizTalk Messaging</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>• On the <b>Communication Direction</b> page of the BizTalk Messaging Binding Wizard, click <b>Receive</b>.</li> <li>• On the <b>XLANG Schedule Activation Information</b> page of the BizTalk Messaging Binding Wizard, click <b>Yes</b>.</li> </ul> <p> <b>Important</b></p> <ul style="list-style-type: none"> <li>• Choosing <b>Yes</b> configures the port to activate a new schedule instance when a message arrives. For important information about using this option, see the topic referenced for this step.</li> </ul> <p>Make a note of the name that you give to this port and the location to which you save the compiled XLANG schedule. You need this information to configure a messaging port in BizTalk Messaging Services, as described previously in this table.</p>
<ul style="list-style-type: none"> <li>• Establish the communication flow between an <b>Action</b> shape and the port that receives the initial message.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Send or receive asynchronous messages</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>• On the <b>Message Information</b> page of the XML Communication Wizard, click <b>Create a new message</b>, and in the <b>Message name</b> box, type a name for the message.</li> </ul> <p>You can use any name; however, using the name of the outbound document definition for the channel makes it more apparent which message you are sending.</p> <ul style="list-style-type: none"> <li>• On the <b>Message Type Information</b> page, in the <b>Message type</b> box, type the name of the outbound document definition for the channel that you use to process the return message.</li> </ul> <p>All messages passed from BizTalk Messaging to an XLANG schedule use a message queue. The label for these messages is the name of the outbound document definition of the channel.</p> <ul style="list-style-type: none"> <li>• On the <b>Message Specification Information</b> page, click <b>Browse</b>, and browse to the specification that you use for the outbound document definition of the channel for the initial message.</li> <li>• In the <b>Message fields</b> area, click <b>Add</b>, and add the field in the specification that was created to contain the queue path address for the initial message.</li> </ul>

<ul style="list-style-type: none"> <li>Use a BizTalk Messaging shape to implement a port to send the return message.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Implement a port by using BizTalk Messaging</a></li> </ul> <p> <b>Note</b></p> <ul style="list-style-type: none"> <li>On the <b>Static or Dynamic Channel Information</b> page of the BizTalk Messaging Binding Wizard, click <b>Static channel</b>, and in the <b>Enter the name of a known, pre-existing channel</b> box, type the name of the channel in <a href="#">BizTalk Messaging Manager</a> that you use to process the return message.</li> <li>Because this port uses a static channel, an open destination submission call to BizTalk Messaging is not made. Therefore, the channel that is specified cannot be associated with an open messaging port.</li> </ul>
<ul style="list-style-type: none"> <li>Establish the communication flow between an <b>Action</b> shape and the port that sends the return message.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Send or receive asynchronous messages</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>On the <b>Message Information</b> page of the XML Communication Wizard, click <b>Create a new message</b>, and in the <b>Message name</b> box, type a name for the message.  You can use any name; however, using the name of the inbound document definition for the channel makes it more apparent which message you are sending.</li> <li>On the <b>Message Type Information</b> page, in the <b>Message type</b> box, type the name of the inbound document definition for the channel that you use to process the message.</li> <li>On the <b>Message Specification Information</b> page, click <b>Browse</b>, and browse to the specification that you use for the inbound document definition of the channel that you use to process the return message.</li> <li>In the <b>Message fields</b> area, click <b>Add</b>, and add the field in the specification that was created to contain the queue path address for the return message.</li> </ul>
<ul style="list-style-type: none"> <li>Establish the data flow for the queue path field in the initial message to the queue path field in the return message.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Draw the flow between messages</a></li> </ul> <p> <b>Notes</b></p> <ul style="list-style-type: none"> <li>Click the <b>Data</b> tab.</li> <li>On the <b>Data</b> page, click the queue path field in the initial message. Then, drag its control handle to the connection point of the queue path field in the return message.  This passes the queue path data from the initial message into the return message.</li> </ul>

# BizTalk Server 2000 Interface Reference

You can programmatically integrate applications with Microsoft BizTalk Server 2000 by using the BizTalk Messaging Configuration object model, or by extending and customizing the functionality of the server to suit your business and information-exchange needs. The interface reference provides all the information necessary for programmers of the Microsoft Visual Basic and Visual C++ programming languages to use or extend BizTalk Server 2000. This section also includes a complete list of interfaces, objects, enumerations, code samples, and possible error messages.

BizTalk Server 2000 supports programmatic application integration by accessing the BizTalk Messaging Configuration object model and submitting documents by calling the methods of the **Interchange** interface. BizTalk Server 2000 also supports the use of extensible application integration components (AICs), including a lightweight integration model and support for the pipeline-component model available in Microsoft Site Server, Commerce Edition 3.0.

The interface reference is divided into the following parts:

## Using the BizTalk Messaging Configuration Object Model

This section provides information about how to access the BizTalk Messaging Configuration object model, including all the reference pages for the supported interfaces. This information is provided for both Microsoft Visual C++ and Visual Basic developers. For more information, see [Using the BizTalk Messaging Configuration Object Model](#).

## Submitting Documents

This section covers submitting documents to BizTalk Server 2000, using the synchronous and asynchronous methods of the **Interchange** interface. It shows how to move a document once the trading partner relationships are set up, and how to track documents moving through BizTalk Server 2000. For more information, see [Submitting Documents](#).

## Creating Custom Components

This section covers BizTalk Server 2000 support for extensible application integration components (AICs), including a lightweight integration model and support for the pipeline-component model available in Microsoft Site Server, Commerce Edition 3.0.

This allows developers to do the following:

- Enable business applications to receive business documents, using AICs.
- Extend the functionality of BizTalk Server 2000 by developing components to perform digital signatures and verification, encryption and decryption, parsing, and transport.

For more information, see [Creating Custom Components](#).

## Administering XLANG Schedules

This section provides information about the interfaces that can be used to access a running instance of a specific XLANG schedule, or to perform system-wide administrative tasks in the XLANG Scheduler run-time environment. This information is provided for both Microsoft Visual C++ and Visual Basic developers. For more information, see [Administering XLANG Schedules](#).

# BizTalk Server 2000 Interface Reference

You can programmatically integrate applications with Microsoft BizTalk Server 2000 by using the BizTalk Messaging Configuration object model, or by extending and customizing the functionality of the server to suit your business and information-exchange needs. The interface reference provides all the information necessary for programmers of the Microsoft Visual Basic and Visual C++ programming languages to use or extend BizTalk Server 2000. This section also includes a complete list of interfaces, objects, enumerations, code samples, and possible error messages.

BizTalk Server 2000 supports programmatic application integration by accessing the BizTalk Messaging Configuration object model and submitting documents by calling the methods of the **Interchange** interface. BizTalk Server 2000 also supports the use of extensible application integration components (AICs), including a lightweight integration model and support for the pipeline-component model available in Microsoft Site Server, Commerce Edition 3.0.

The interface reference is divided into the following parts:

## Using the BizTalk Messaging Configuration Object Model

This section provides information about how to access the BizTalk Messaging Configuration object model, including all the reference pages for the supported interfaces. This information is provided for both Microsoft Visual C++ and Visual Basic developers. For more information, see [Using the BizTalk Messaging Configuration Object Model](#).

## Submitting Documents

This section covers submitting documents to BizTalk Server 2000, using the synchronous and asynchronous methods of the **Interchange** interface. It shows how to move a document once the trading partner relationships are set up, and how to track documents moving through BizTalk Server 2000. For more information, see [Submitting Documents](#).

## Creating Custom Components

This section covers BizTalk Server 2000 support for extensible application integration components (AICs), including a lightweight integration model and support for the pipeline-component model available in Microsoft Site Server, Commerce Edition 3.0.

This allows developers to do the following:

- Enable business applications to receive business documents, using AICs.
- Extend the functionality of BizTalk Server 2000 by developing components to perform digital signatures and verification, encryption and decryption, parsing, and transport.

For more information, see [Creating Custom Components](#).

## Administering XLANG Schedules

This section provides information about the interfaces that can be used to access a running instance of a specific XLANG schedule, or to perform system-wide administrative tasks in the XLANG Scheduler run-time environment. This information is provided for both Microsoft Visual C++ and Visual Basic developers. For more information, see [Administering XLANG Schedules](#).

# Using the BizTalk Messaging Configuration Object Model

This section provides information about how to use the BizTalk Messaging Configuration object model programmatically. For additional information, see the following sections:

- For general background information, see [Concepts](#).
- For information about COM interfaces, enumerations, and error messages, see the [Object Model Reference](#).
- For examples of code, see [BizTalk Messaging Services Code Samples](#).

The BizTalk Messaging Configuration object model can also be configured using the BizTalk Messaging Manager graphical user interface. For more information, see [Using BizTalk Messaging Manager](#).

# Object Model Reference

This section provides reference information about interfaces used by Microsoft BizTalk Server 2000 for both Microsoft Visual C++ and Visual Basic programming. Reference information is provided for all interfaces, objects, methods, properties, and enumerations exposed for accessing the BizTalk Messaging Configuration object model. In addition, a complete list of [Error Messages](#) is provided.

The following COM interfaces and enumerations are documented in this reference:

- [IBizTalkBase](#)
- [IBizTalkCertificateInfo](#)
- [IBizTalkChannel](#)
- [IBizTalkConfig](#)
- [IBizTalkDocument](#)
- [IBizTalkEndPoint](#)
- [IBizTalkEnvelope](#)
- [IBizTalkLoggingInfo](#)
- [IBizTalkOrganization](#)
- [IBizTalkPort](#)
- [IBizTalkPortGroup](#)
- [IBizTalkServiceWindowInfo](#)
- [IBizTalkTransportInfo](#)
- [IDictionary](#)
- [ISimpleList](#)
- [Object Model Enumerations](#)

# IBizTalkBase Interface

## IBizTalkBase Interface [C++]

## IBizTalkBase Object [Visual Basic]

In C++, the **IBizTalkBase** interface defines common methods and properties that are inherited by the following objects. In Microsoft Visual Basic, the **IBizTalkBase** class defines common methods and properties that are implemented by the following objects.

- [BizTalkChannel](#)
- [BizTalkDocument](#)
- [BizTalkEnvelope](#)
- [BizTalkOrganization](#)
- [BizTalkPort](#)
- [BizTalkPortGroup](#)

### Note

The methods and properties of this object are always invoked on the objects listed above, rather than by creating an actual **BizTalkBase** object.

The properties of the **BizTalkBase** object are shown in the following table.

Property	Type	Description
<a href="#">DateModified</a>	<b>BSTR</b>	Date and time at which the information in the object was created or last modified. This is a read-only property.
<a href="#">Handle</a>	<b>long</b>	Handle to the object. This is a read-only property.
<a href="#">Name</a>	<b>BSTR</b>	Name of the object.

The methods of the **BizTalkBase** object are shown in the following table.

Method	Description
<a href="#">Clear</a>	Clears the object in memory. All the member variables of the object in memory are initialized to their default values.
<a href="#">Create</a>	Creates a new object in the database.
<a href="#">Load</a>	Loads a specified object in memory.
<a href="#">LoadByName</a>	Loads a specified object by name in memory.
<a href="#">Remove</a>	Removes the object from the database.
<a href="#">Save</a>	Saves the object in the database.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkBase::Clear Method

## IBizTalkBase::Clear Method [C++]

## IBizTalkBase.Clear Method [Visual Basic]

The **Clear** method clears the object in memory. All member variables of the object in memory are initialized to their default values.

### Syntax

[C++]

```
HRESULT Clear();
```

[Visual Basic]

```
object.Clear()
```

### Parameters

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Applies To

This method is supported by the following objects:

- [BizTalkChannel](#)
- [BizTalkDocument](#)
- [BizTalkEnvelope](#)
- [BizTalkOrganization](#)
- [BizTalkPort](#)
- [BizTalkPortGroup](#)

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkBase::Create Method

## IBizTalkBase::Create Method [C++]

## IBizTalkBase.Create Method [Visual Basic]

The **Create** method creates a new object in the database.

### Syntax

[C++]

```
HRESULT Create(  
    long* pIBiztalkObjectHandle  
);
```

[Visual Basic]

```
object.Create()
```

### Parameters

[C++]

*pIBiztalkObjectHandle*

[out, retval] Pointer to a **long** that contains the handle to the object.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This method returns a **Long** that contains the handle to the object.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Applies To

This method is supported by the following objects:

- [BizTalkChannel](#)
- [BizTalkDocument](#)
- [BizTalkEnvelope](#)
- [BizTalkOrganization](#)
- [BizTalkPort](#)
- [BizTalkPortGroup](#)

### Remarks

The **Name** property must be set before calling this method. **Name** must be unique across the database for each object type. **Create** updates the **DateModified** property.

When creating any object that refers to an XML document specification or map located outside your local domain, you might receive an error. If an error occurs, download and configure the WinHTTP proxy utility. To download this utility, go to the Microsoft MSDN Web site at [msdn.microsoft.com/downloads/default.asp](http://msdn.microsoft.com/downloads/default.asp), and browse to the WinHTTP Proxy Configuration Utility page, which is located in the XML chapter of the Web Development book.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkBase::DateModified Property

## IBizTalkBase::DateModified Property [C++]

## IBizTalkBase.DateModified Property [Visual Basic]

The **DateModified** property contains the date and time at which the information in the object was created or last modified.

### Syntax

[C++]

Get method:

```
HRESULT get_DateModified(  
    BSTR* pstrModified  
);
```

[Visual Basic]

*object*.DateModified

### Parameters

[C++]

*pstrModified*

[out, retval] Pointer to a **BSTR** that contains the date modified.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the date modified.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Applies To

This property is supported by the following objects:

- [BizTalkChannel](#)
- [BizTalkDocument](#)
- [BizTalkEnvelope](#)
- [BizTalkOrganization](#)
- [BizTalkPort](#)
- [BizTalkPortGroup](#)

## Remarks

This is a read-only property. The format for the *strModified* string is *yyyy-mm-dd hh:mm:ss*. The time is in coordinated universal time (UTC). The server sets this property when the **Create** or the **Save** method is called for the object.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkBase::Handle Property

## IBizTalkBase::Handle Property [C++]

## IBizTalkBase.Handle Property [Visual Basic]

The **Handle** property contains the handle to the object.

### Syntax

[C++]

Get method:

```
HRESULT get_Handle(  
    long* pIBiztalkObjectHandle  
);
```

[Visual Basic]

*object*.**Handle**

### Parameters

[C++]

*pIBiztalkObjectHandle*

[out, retval] Pointer to a **long** that contains the handle to the object.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Long** that contains the handle to the object.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Applies To

This property is supported by the following objects:

- [BizTalkChannel](#)
- [BizTalkDocument](#)
- [BizTalkEnvelope](#)
- [BizTalkOrganization](#)
- [BizTalkPort](#)
- [BizTalkPortGroup](#)

## Remarks

This is a read-only property.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkBase::Load Method

## IBizTalkBase::Load Method [C++]

## IBizTalkBase.Load Method [Visual Basic]

The **Load** method loads an object in memory.

### Syntax

[C++]

```
HRESULT Load(  
    long lBiztalkObjectHandle  
);
```

[Visual Basic]

```
object.Load(lBiztalkObjectHandle As Long)
```

### Parameters

[C++]

*lBiztalkObjectHandle*

[in] **Long** that contains the handle to the object to load.

[Visual Basic]

*lBiztalkObjectHandle*

**Long** that contains the handle to the object to load.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Applies To

This method is supported by the following objects:

- [BizTalkChannel](#)
- [BizTalkDocument](#)
- [BizTalkEnvelope](#)
- [BizTalkOrganization](#)
- [BizTalkPort](#)
- [BizTalkPortGroup](#)

## Remarks

**Load** calls the **Clear** method internally before loading the object.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkBase::LoadByName Method

## IBizTalkBase::LoadByName Method [C++]

## IBizTalkBase.LoadByName Method [Visual Basic]

The **LoadByName** method loads an object by name in memory.

### Syntax

[C++]

```
HRESULT LoadByName (  
    BSTR strName  
);
```

[Visual Basic]

```
object.LoadByName (strName As String)
```

### Parameters

[C++]

*strName*

[in] **BSTR** that contains the name.

[Visual Basic]

*strName*

**String** that contains the name.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Applies To

This method is supported by the following objects:

- [BizTalkChannel](#)
- [BizTalkDocument](#)
- [BizTalkEnvelope](#)
- [BizTalkOrganization](#)
- [BizTalkPort](#)
- [BizTalkPortGroup](#)

## Remarks

**LoadByName** calls the **Clear** method internally before loading the object.

Names have a maximum length of 64 characters.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkBase::Name Property

## IBizTalkBase::Name Property [C++]

## IBizTalkBase.Name Property [Visual Basic]

The **Name** property contains the name of the object.

### Syntax

[C++]

Get method:

```
HRESULT get_Name (  
    BSTR* pstrName  
);
```

Put method:

```
HRESULT put_Name (  
    BSTR strName  
);
```

[Visual Basic]

*object*.Name

### Parameters

[C++]

Get method:

*pstrName*

[out, retval] Pointer to a **BSTR** that contains the name of the object.

Put method:

*strName*

[in] **BSTR** that contains the name of the object.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the name.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Applies To

This property is supported by the following objects:

- [BizTalkChannel](#)

- [BizTalkDocument](#)
- [BizTalkEnvelope](#)
- [BizTalkOrganization](#)
- [BizTalkPort](#)
- [BizTalkPortGroup](#)

## Remarks

The server requires the **Name** property. It must be set before calling the [Create](#) or the [Save](#) method for the object. **Name** must be unique across a database for each object type and must be at least one character long. Names have a maximum length of 64 characters.

The following table lists names reserved for use by BizTalk Server:

Name	Object type
Reliable Message Acknowledgement Port	<a href="#">IBizTalkPort</a>
Reliable Message Acknowledgement Channel	<a href="#">IBizTalkChannel</a>
BizTalk Canonical Receipt	<a href="#">IBizTalkDocument</a>
Reliable Messaging Acknowledgement	<a href="#">IBizTalkDocument</a>
Reliable Messaging Acknowledgement SMTP From Address	<a href="#">IBizTalkOrganization</a> alias
Home Organization	<a href="#">IBizTalkOrganization</a>

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkBase::Remove Method

## IBizTalkBase::Remove Method [C++]

## IBizTalkBase.Remove Method [Visual Basic]

The **Remove** method removes the object from the database.

### Syntax

[C++]

```
HRESULT Remove ();
```

[Visual Basic]

```
object.Remove ()
```

### Parameters

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Applies To

This method is supported by the following objects:

- [BizTalkChannel](#)
- [BizTalkDocument](#)
- [BizTalkEnvelope](#)
- [BizTalkOrganization](#)
- [BizTalkPort](#)
- [BizTalkPortGroup](#)

### Remarks

The object cannot be removed if any other object refers to it.

A **BizTalkOrganization** object cannot be removed if it is the default organization. Before it can be removed, the **IsDefault** property must be set to False, and another organization must have the **IsDefault** property set to True.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

## **Related Topic**

[Referential Integrity](#)

# IBizTalkBase::Save Method

## IBizTalkBase::Save Method [C++]

## IBizTalkBase.Save Method [Visual Basic]

The **Save** method saves the object in the database.

### Syntax

[C++]

```
HRESULT Save ();
```

[Visual Basic]

```
object.Save ()
```

### Parameters

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Applies To

This method is supported by the following objects:

- [BizTalkChannel](#)
- [BizTalkDocument](#)
- [BizTalkEnvelope](#)
- [BizTalkOrganization](#)
- [BizTalkPort](#)
- [BizTalkPortGroup](#)

### Remarks

The **Save** method updates the **DateModified** property.

When saving any object that refers to an XML document specification or map located outside your local domain, you might receive an error. If an error occurs, download and configure the WinHTTP proxy utility. To download this utility, go to the Microsoft MSDN Web site at [msdn.microsoft.com/downloads/default.asp](http://msdn.microsoft.com/downloads/default.asp), and browse to the WinHTTP Proxy Configuration Utility page, which is located in the XML chapter of the Web Development book.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkCertificateInfo Interface

## IBizTalkCertificateInfo Interface [C++]

## BizTalkCertificateInfo Object [Visual Basic]

Use this object to configure a certificate associated with a [BizTalkPort](#) or a [BizTalkChannel](#) object.

In C++, use the **IBizTalkCertificateInfo** interface to access the methods of the **BizTalkCertificateInfo** object.

The properties of the **BizTalkCertificateInfo** object are shown in the following table.

Property	Type	Description
<a href="#">Name</a>	BSTR	Name of the certificate. This is a read-only property.
<a href="#">Reference</a>	BSTR	Reference to the certificate in the certificate store.
<a href="#">Store</a>	BIZTALK_STORE_TYPE	Store type of the certificate.
<a href="#">Usage</a>	BIZTALK_USAGE_TYPE	Type of use for the certificate. This is a read-only property.

### Remarks

This object is automatically created when a **BizTalkPort** or a **BizTalkChannel** object is instantiated with the [CreatePort](#) or the [CreateChannel](#) method of the [BizTalkConfig](#) object.

For output documents, access the **BizTalkCertificateInfo** object by using the [EncryptionCertificateInfo](#) property of the **BizTalkPort** object. For input documents, access the **BizTalkCertificateInfo** object by using the [SignatureCertificateInfo](#), [VerifySignatureCertificateInfo](#), or [DecryptionCertificateInfo](#) property of the **BizTalkChannel** object. To obtain the set of all existing **BizTalkCertificateInfo** objects, use the [Certificates](#) property of the [BizTalkConfig](#) object.

### Note

- All certificates are stored in the local computer store. To configure certificates for the S/MIME components, the script or application accessing the object model must be run in the context of a user account in the BizTalk Server Administrators group.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkCertificateInfo::Name Property

## IBizTalkCertificateInfo::Name Property [C++]

## BizTalkCertificateInfo.Name Property [Visual Basic]

The **Name** property contains the name of the certificate.

### Syntax

[C++]

Get method:

```
HRESULT get_Name (  
    BSTR* pstrName  
);
```

[Visual Basic]

*object*.Name

### Parameters

[C++]

*pstrName*

[out, retval] Pointer to a **BSTR** that contains the name.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the name.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkCertificateInfo::Reference Property

## IBizTalkCertificateInfo::Reference Property [C++]

## BizTalkCertificateInfo.Reference Property [Visual Basic]

The **Reference** property contains a reference to the certificate in the certificate store.

### Syntax

[C++]

Get method:

```
HRESULT get_Reference(  
    BSTR* pstrReference  
);
```

Put method:

```
HRESULT put_Reference(  
    BSTR strReference  
);
```

[Visual Basic]

*object*.**Reference**

### Parameters

[C++]

Get method:

*pstrReference*

[out, retval] Pointer to a **BSTR** that contains the certificate reference.

Put method:

*strReference*

[in] **BSTR** that contains the certificate reference.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

### Note

- In addition to the HRESULT values listed on the error messages page, the put method returns CryptoAPI errors. Additional information about CryptoAPI is available on the Microsoft Developer Network at [msdn.microsoft.com/library/default.asp](https://msdn.microsoft.com/library/default.asp).

[Visual Basic]

This property returns a **String** that contains the certificate reference.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

A reference to a certificate should be obtained by using the **Certificates** property on the **BizTalkConfig** object.

## **Requirements**

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkCertificateInfo::Store Property

## IBizTalkCertificateInfo::Store Property [C++]

## BizTalkCertificateInfo.Store Property [Visual Basic]

The **Store** property contains the store type for the certificate.

### Syntax

[C++]

Get method:

```
HRESULT get_Store(  
    BIZTALK_STORE_TYPE* pStoreType  
);
```

Put method:

```
HRESULT put_Store(  
    BIZTALK_STORE_TYPE eStoreType  
);
```

[Visual Basic]

*object*.Store

### Parameters

[C++]

Get method:

*pStoreType*

[out, retval] Pointer to an enumeration value that contains the certificate store type. Valid values are from the **BIZTALK\_STORE\_TYPE** enumeration.

Put method:

*eStoreType*

[in] Enumeration value that contains the certificate store type. Valid values are from the **BIZTALK\_STORE\_TYPE** enumeration.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns an enumeration value. Valid values are from the **BIZTALK\_STORE\_TYPE** enumeration.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

The store, which contains the certificate, is determined by the use of the certificate as follows:

Certificate type	Store
------------------	-------

Decryption	MY
Encryption	BIZTALK
Signature	MY
Verify signature	BIZTALK

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkCertificateInfo::Usage Property

## IBizTalkCertificateInfo::Usage Property [C++]

## BizTalkCertificateInfo.Usage Property [Visual Basic]

The **Usage** property contains the type of use for the certificate.

### Syntax

[C++]

Get method:

```
HRESULT get_Usage (  
    BIZTALK_USAGE_TYPE* pUsageType  
);
```

[Visual Basic]

*object*.Usage

### Parameters

[C++]

*pUsageType*

[out, retval] Pointer to an enumeration value. Valid values are from the [BIZTALK\\_USAGE\\_TYPE](#) enumeration.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns an enumeration value. Valid values are from the [BIZTALK\\_USAGE\\_TYPE](#) enumeration.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkChannel Interface

## IBizTalkChannel Interface [C++]

## BizTalkChannel Object [Visual Basic]

Use the methods and properties of the **BizTalkChannel** object to configure a channel for processing documents.

In C++, use the **IBizTalkChannel** interface to access the methods of the **BizTalkChannel** object.

The properties of the **BizTalkChannel** object are shown in the following table.

Property	Type	Description
<b>Comments</b>	<b>BS TR</b>	User comments for the object.
<b>ControlNumberValue</b>	<b>BS TR</b>	Value of the group control number.
<b>DateModified</b>	<b>BS TR</b>	Date and time at which the information in the object was created or last modified. This is a read-only property obtained from the <b>BizTalkBase</b> object.
<b>DecryptionCertificateInfo</b>	<b>IDi spa tch</b>	Information about the certificate that decrypts the input document.
<b>ExpectReceiptTimeout</b>	<b>lon g</b>	Time, in minutes, in which to expect the receipt for the current document before treating the document as expired.
<b>Expression</b>	<b>BS TR</b>	Complete set of equations that filter the selection of the object.
<b>Handle</b>	<b>lon g</b>	Identifier of the object. This is a read-only property obtained from the <b>BizTalkBase</b> object.
<b>InputDocument</b>	<b>lon g</b>	Handle to the input <b>BizTalkDocument</b> object. This is a required property.
<b>IsReceiptChannel</b>	<b>VA RIA NT _B OO L</b>	Flag that indicates whether the object is a receipt channel.
<b>LoggingInfo</b>	<b>IDi spa tch</b>	Information about logging.
<b>MapContent</b>	<b>BS TR</b>	Contents of the map that provide instructions on how the input document in the format used by the source organization is to be rendered in the format used by the destination organization, if different. This is a read-only property.
<b>MapReference</b>	<b>BS TR</b>	Full Web Distributed Authoring and Versioning (WebDAV) URL of the map that provides instructions on how the input document in the format used by the source organization is to be rendered in the format used by the destination organization, if different. This is a required property if the <b>InputDocument</b> property is different from the <b>OutputDocument</b> property.
<b>Name</b>	<b>BS TR</b>	Name of the object. This is a required property obtained from the <b>BizTalkBase</b> object.
<b>OutputDocument</b>	<b>lon g</b>	Handle to the output <b>BizTalkDocument</b> object. This is a required property.
<b>Port</b>	<b>lon g</b>	Associated <b>BizTalkPort</b> object. Either the <b>Port</b> or the <b>PortGroup</b> property must be specified.
<b>PortGroup</b>	<b>lon g</b>	Associated <b>BizTalkPortGroup</b> object. Either the <b>Port</b> or the <b>PortGroup</b> property must be specified.

<b>ReceiptChannel</b>	<b>long</b>	Handle to the receipt channel for this object.
<b>RetryCount</b>	<b>long</b>	Number of times to retry submitting a document when there is a failure to connect to the destination.
<b>RetryInterval</b>	<b>long</b>	Interval between attempts to resubmit a document when there is a failure to connect to the destination. This value is specified in minutes.
<b>SignatureCertificateInfo</b>	<b>IDispatch</b>	Information about the certificate that signs the output document.
<b>SourceEndpoint</b>	<b>IDispatch</b>	Information about the source.
<b>TrackFields</b>	<b>IDictionary</b>	<b>Dictionary</b> object that stores additional custom tracking fields used to track interchange data for the <b>BizTalkDocument</b> object for the associated <b>BizTalkChannel</b> object.
<b>VerifySignatureCertificateInfo</b>	<b>IDispatch</b>	Information about the certificate that verifies the signature of the input document.

The methods of the **BizTalkChannel** object are shown in the following table.

Method	Description
<b>Clear</b>	Clears the object in memory. All member variables of the object in memory are initialized to their default values. This method is obtained from the <b>BizTalkBase</b> object.
<b>Create</b>	Creates a new object in the database. This method is obtained from the <b>BizTalkBase</b> object.
<b>GetConfigComponent</b>	Reads the CLSID of the component associated with the <b>BizTalkPort</b> object.
<b>GetConfigData</b>	Gets the configuration associated with the specified <b>BizTalkPort</b> object.
<b>Load</b>	Loads an object in memory. This method is obtained from the <b>BizTalkBase</b> object.
<b>LoadByName</b>	Loads an object by name in memory. This method is obtained from the <b>BizTalkBase</b> object.
<b>Remove</b>	Removes the object. This method is obtained from the <b>BizTalkBase</b> object.
<b>Save</b>	Saves the object to the database. This method is obtained from the <b>BizTalkBase</b> object.
<b>SetConfigComponent</b>	Sets the CLSID of the component associated with the <b>BizTalkPort</b> object.
<b>SetConfigData</b>	Sets the configuration information for the associated <b>BizTalkPort</b> object.

## Remarks

A **BizTalkChannel** object requires an associated complete **BizTalkPort** object. One or more **BizTalkChannel** objects can be associated with a **BizTalkPort** object. A **BizTalkChannel** object can be associated with only one input **BizTalkDocument** object and one output **BizTalkDocument** object; however, a **BizTalkDocument** object can be associated with more than one **BizTalkChannel** object.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

## Related Topics

[Channels](#)

[Document Processing](#)

# IBizTalkChannel::Comments Property

## IBizTalkChannel::Comments Property [C++]

## BizTalkChannel.Comments Property [Visual Basic]

The **Comments** property contains the user comments for the object.

### Syntax

[C++]

Get method:

```
HRESULT get_Comments(  
    BSTR* pstrComments  
);
```

Put method:

```
HRESULT put_Comments(  
    BSTR strComments  
);
```

[Visual Basic]

*object*.Comments

### Parameters

[C++]

Get method:

*pstrComments*

[out, retval] Pointer to a **BSTR** that contains the comments.

Put method:

*strComments*

[in] **BSTR** that contains the comments.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the comments.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkChannel::ControlNumberValue Property

## IBizTalkChannel::ControlNumberValue Property [C++]

## BizTalkChannel.ControlNumberValue Property [Visual Basic]

The **ControlNumberValue** property contains the value of the group control number.

### Syntax

[C++]

Get method:

```
HRESULT get_ControlNumberValue(  
    BSTR* pstrControlNumberValue  
);
```

Put method:

```
HRESULT put_ControlNumberValue(  
    BSTR strControlNumberValue  
);
```

[Visual Basic]

```
object.ControlNumberValue
```

### Parameters

[C++]

Get method:

*pstrControlNumberValue*

[out, retval] Pointer to a **BSTR** that contains the control number.

Put method:

*strControlNumberValue*

[in] **BSTR** that contains the control number.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This method returns a **String** that contains the control number.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

The **ControlNumberValue** property must contain a value between 1 and 999999999.

If the **Format** property of the **BizTalkEnvelope** object for the associated **BizTalkPort** object is set to X12, EDIFACT, or Custom, this property is required.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkChannel::DecryptionCertificateInfo Property

## IBizTalkChannel::DecryptionCertificateInfo Property [C++]

## BizTalkChannel.DecryptionCertificateInfo Property [Visual Basic]

The **DecryptionCertificateInfo** property contains information about the certificate that decrypts the input document. This information includes the **Name**, **Reference**, **Store**, and **Usage** properties and is created and stored in memory in the **BizTalkCertificateInfo** object.

### Syntax

[C++]

Get method:

```
HRESULT get_DecryptionCertificateInfo(  
    IDispatch** ppDecryptionCertificateInfoDisp  
);
```

Putref method:

```
HRESULT putref_DecryptionCertificateInfo(  
    IDispatch* pDecryptionCertificateInfoDisp  
);
```

[Visual Basic]

*object*.DecryptionCertificateInfo

### Parameters

[C++]

Get method:

*ppDecryptionCertificateInfoDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains the certificate information.

Putref method:

*pDecryptionCertificateInfoDisp*

[in] Pointer to an **IDispatch** interface that contains the certificate information.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns an **Object** that contains the certificate information.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkChannel::ExpectReceiptTimeout Property

## IBizTalkChannel::ExpectReceiptTimeout Property [C++]

## BizTalkChannel.ExpectReceiptTimeout Property [Visual Basic]

The **ExpectReceiptTimeout** property contains the value of the time, in minutes, in which to expect the receipt for the current document before treating the document as expired.

### Syntax

[C++]

Get method:

```
HRESULT get_ExpectReceiptTimeout(  
    long* pMinutes  
);
```

Put method:

```
HRESULT put_ExpectReceiptTimeout(  
    long lMinutes  
);
```

[Visual Basic]

*object*.**ExpectReceiptTimeout**

### Parameters

[C++]

Get method:

*pMinutes*

[out, retval] Pointer to a **long** that contains the minutes.

Put method:

*lMinutes*

[in] **Long** that contains the minutes.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Long** that contains the minutes.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)



# IBizTalkChannel::Expression Property

## IBizTalkChannel::Expression Property [C++]

## BizTalkChannel.Expression Property [Visual Basic]

The **Expression** property contains an expression that filters the selection of the **BizTalkChannel** object. If the expression evaluates to true, the server selects the channel for processing the document.

### Syntax

[C++]

Get method:

```
HRESULT get_Expression(  
    BSTR* pstrExpression  
);
```

Put method:

```
HRESULT put_Expression(  
    BSTR strExpression  
);
```

[Visual Basic]

*object*.**Expression**

### Parameters

[C++]

Get method:

*pstrExpression*

[out, retval] Pointer to a **BSTR** that contains the XPath expression.

Put method:

*strExpression*

[in] **BSTR** that contains the XPath expression.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This method returns a **String** that contains the expression.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

The XPath expression must be based on the input document specification set in the **InputDocument** property.

 **Note**

- If the specification field that you are using to create an expression has a Boolean data type, you cannot use the text strings "true" or "false" as the expression value. You must use a numerical value instead: "-1" for true and "0" for false. For example, to filter a channel so it processes only approved purchase orders, your expression might look like this:

```
Channel1.Expression = "/PORequest/Total[IsApproved = -1]"
```

This sample assumes that the input document specification contains a Total subelement with a Boolean IsApproved field.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

## Related Topic

[Channel Filtering](#)

# IBizTalkChannel::GetConfigComponent Method

## IBizTalkChannel::GetConfigComponent Method [C++]

## BizTalkChannel.GetConfigComponent Method [Visual Basic]

The **GetConfigComponent** method retrieves the CLSID of the component associated with the **BizTalkPort** object.

### Syntax

[C++]

```
HRESULT GetConfigComponent(  
    BIZTALK_CONFIGDATA_TYPE eConfigType,  
    long lPortHandle,  
    BSTR* pstrCLSID  
);
```

[Visual Basic]

```
object.GetConfigComponent( _  
    eConfigType As BIZTALK_CONFIGDATA_TYPE, _  
    lPortHandle As Long _  
)
```

### Parameters

[C++]

*eConfigType*

[in] Enumeration value. Valid values are from the **BIZTALK\_CONFIGDATA\_TYPE** enumeration.

*lPortHandle*

[in] **Long** that contains the handle to the **BizTalkPort** object.

*pstrCLSID*

[out, retval] Pointer to a **BSTR** that contains the CLSID of the component.

[Visual Basic]

*eConfigType*

Enumeration value. Valid values are from the **BIZTALK\_CONFIGDATA\_TYPE** enumeration.

*lPortHandle*

**Long** that contains the handle.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

#### Note

In addition to the HRESULT values listed on the error messages page, this method returns OLEDB provider errors. Additional information about OLEDB is available on the Microsoft Developer Network at [msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp).

[Visual Basic]

This method returns a **String** that contains the CLSID of the component.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

## Remarks

If the *eConfigType* parameter is set to **BIZTALK\_CONFIGDATA\_TYPE\_SIGNATURE** and the associated **BizTalkPort** object has both the **EncryptionType** and **SignatureType** properties set to S/MIME, this method returns an empty string ("").

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkChannel::GetConfigData Method

## IBizTalkChannel::GetConfigData Method [C++]

## BizTalkChannel.GetConfigData Method [Visual Basic]

The **GetConfigData** method gets the configuration associated with the specified **BizTalkPort** object.

### Syntax

[C++]

```
HRESULT GetConfigData(  
    BIZTALK_CONFIGDATA_TYPE eConfigType,  
    long lPortHandle,  
    VARIANT* pvarType,  
    VARIANT* pvarDictionary  
);
```

[Visual Basic]

```
object.GetConfigData(  
    eConfigType As BIZTALK_CONFIGDATA_TYPE, _  
    lPortHandle As Long, _  
    pvarType As Variant _  
)
```

### Parameters

[C++]

*eConfigType*

[in] Enumeration value. Valid values are from the **BIZTALK\_CONFIGDATA\_TYPE** enumeration.

*lPortHandle*

[in] **Long** that identifies the handle to the associated **BizTalkPort** object.

*pvarType*

[in, out] Pointer to a **VARIANT** that contains the transport type.

*pvarDictionary*

[in, out] Pointer to a **VARIANT** that contains a pointer to the **IDictionary** interface of an object that contains the primary transport configuration information.

[Visual Basic]

*eConfigType*

[in] Enumeration value. Valid values are from the **BIZTALK\_CONFIGDATA\_TYPE** enumeration.

*lPortHandle*

**Long** that identifies the handle to the associated **BizTalkPort** object.

*pvarType*

**Variant** that contains the transport type.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

### Note

In addition to the HRESULT values listed on the error messages page, this method returns OLEDB provider errors. Additional

information about OLEDB is available on the Microsoft Developer Network at [msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp).

[Visual Basic]

This method returns a **CDictionary** object that contains the primary transport configuration information.

## Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

## Remarks

The **Dictionary** object returned by this method has specific string qualifiers used for EDIFACT and X12. The following tables describe these strings.

### EDIFACT

Qualifier string	Description
SerializerEdifact_SenderIntID	Interchange sender internal identification
SerializerEdifact_SenderIntSubID	Interchange sender internal subidentification
SerializerEdifact_RecipientIntID	Interchange recipient internal identification
SerializerEdifact_RecipientIntSubID	Interchange recipient internal subidentification
SerializerEdifact_RecipientRefPwd	Recipient reference/password
SerializerEdifact_RecipientRefPwdQual	Recipient reference/password qualifier
SerializerEdifact_ApplicationRef	Application reference
SerializerEdifact_ProcPriCode	Processing priority code
SerializerEdifact_AckRequest	Acknowledgment request
SerializerEdifact_AgreementID	Interchange agreement identifier
SerializerEdifact_TestInd	Test indicator
SerializerEdifact_UNACtrl	"Send UNA Always" or "Send UNA Only When Required"
SerializerEdifact_SyntaxID	Syntax identifier

### X12

Qualifier string	Description
SerializerX12_AuthInfoQual	Authorization information qualifier
SerializerX12_AuthInfo	Authorization information
SerializerX12_SecInfoQual	Security information qualifier
SerializerX12_SecInfo	Security information
SerializerX12_CtrlStdID	Interchange control standards identifier
SerializerX12_CtrlVerNum	Interchange control version number
SerializerX12_AckRequired	Acknowledgment required
SerializerX12_UseInd	Usage indicator

### Note

- For more information about the EDIFACT standard, see the United Nations Economic Commission for Europe Web site ([www.unece.org](http://www.unece.org)).
- For more information about the X12 standard, see the Data Interchange Standards Association Web site ([www.disa.org](http://www.disa.org)).

If you override the transport properties of a **BizTalkPort** object with this method and then change the transport properties in that **BizTalkPort** object, you must call this method again.

If the *eConfigType* parameter is set to **BIZTALK\_CONFIGDATA\_TYPE\_SIGNATURE** and the associated **BizTalkPort** object has both the **EncryptionType** and **SignatureType** properties set to S/MIME, this method returns an empty **Dictionary** object.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkChannel::InputDocument Property

## IBizTalkChannel::InputDocument Property [C++]

## BizTalkChannel.InputDocument Property [Visual Basic]

The **InputDocument** property contains the handle to the **BizTalkDocument** object that describes the input document specification.

### Syntax

[C++]

Get method:

```
HRESULT get_InputDocument(  
    long* pInDocHandle  
);
```

Put method:

```
HRESULT put_InputDocument(  
    long lInDocHandle  
);
```

[Visual Basic]

*object*.InputDocument

### Parameters

[C++]

Get method:

*pInDocHandle*

[out, retval] Pointer to a **long** that contains the handle to the input **BizTalkDocument** object.

Put method:

*lInDocHandle*

[in] **Long** that contains the handle to the input **BizTalkDocument** object.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Long** that contains the handle to the input **BizTalkDocument** object.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a required property.

This property cannot be changed after the **Create** or the **Save** method is called.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

## Related Topics

[Configuring](#)

[Document Definitions](#)

[Document Processing](#)

# IBizTalkChannel::IsReceiptChannel Property

## IBizTalkChannel::IsReceiptChannel Property [C++]

## BizTalkChannel.IsReceiptChannel Property [Visual Basic]

The **IsReceiptChannel** property contains a flag that indicates whether the object is a receipt channel.

### Syntax

[C++]

Get method:

```
HRESULT get_IsReceiptChannel(  
    VARIANT_BOOL* pbIsReceiptChannel  
);
```

Put method:

```
HRESULT put_IsReceiptChannel(  
    VARIANT_BOOL bIsReceiptChannel  
);
```

[Visual Basic]

```
object.IsReceiptChannel
```

### Parameters

[C++]

Get method:

*pbIsReceiptChannel*

[out, retval] Pointer to a **VARIANT\_BOOL** that contains the flag. A value of VARIANT\_TRUE indicates that this channel is used as a receipt channel. A value of VARIANT\_FALSE indicates that this channel is not used as a receipt channel.

Put method:

*bIsReceiptChannel*

[in] **VARIANT\_BOOL** that contains the flag. A value of VARIANT\_TRUE indicates that this channel is used as a receipt channel. A value of VARIANT\_FALSE indicates that this channel is not used as a receipt channel.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **VARIANT** that indicates whether the channel is used as a receipt channel.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

## **Related Topic**

[ReceiptChannel](#)

# IBizTalkChannel::LoggingInfo Property

## IBizTalkChannel::LoggingInfo Property [C++]

## BizTalkChannel.LoggingInfo Property [Visual Basic]

The **LoggingInfo** property contains information about logging the document. This information includes the **LogNativeInputDocument**, **LogNativeOutputDocument**, **LogXMLInputDocument**, and **LogXMLOutputDocument** properties and is created and stored in memory in the **BizTalkLoggingInfo** object.

### Syntax

[C++]

Get method:

```
HRESULT get_LoggingInfo(  
    IDispatch** ppLoggingInfoDisp  
);
```

Putref method:

```
HRESULT putref_LoggingInfo(  
    IDispatch* pLoggingInfoDisp  
);
```

[Visual Basic]

*object*.LoggingInfo

### Parameters

[C++]

Get method:

*ppLoggingInfoDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains the logging fields.

Putref method:

*pLoggingInfoDisp*

[in] Pointer to an **IDispatch** interface that contains the logging fields.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns an **Object** that contains the logging fields.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

## **Related Topic**

[Document Storage](#)

# IBizTalkChannel::MapContent Property

## IBizTalkChannel::MapContent Property [C++]

## BizTalkChannel.MapContent Property [Visual Basic]

The **MapContent** property contains the contents of the map that provide instructions on how the input document in the format used by the source organization is to be rendered in the format used by the destination organization, if different.

### Syntax

[C++]

Get method:

```
HRESULT get_MapContent (  
    BSTR* pstrMapContent  
);
```

[Visual Basic]

*object*.MapContent

### Parameters

[C++]

*pstrMapContent*

[in] **BSTR** that contains the map contents.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the map contents.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property. The **Create** and **Save** methods copy the text of the map specified by the **MapReference** property to this string, if empty.

Once you have created or saved a **BizTalkChannel** object with **MapReference** set to a map, any changes you make to the content of the referenced map are not automatically updated on the referring **BizTalkChannel** object. To update the **BizTalkChannel** object that refers to the revised map, you must save the map, reset the **MapReference** property of the **BizTalkChannel** object to its current value, and then call **Save** on the referring **BizTalkChannel** object.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkChannel::MapReference Property

## IBizTalkChannel::MapReference Property [C++]

## BizTalkChannel.MapReference Property [Visual Basic]

The **MapReference** property contains the full Web Distributed Authoring and Versioning (WebDAV) URL of the map that provides instructions on how the input document in the format used by the source organization is to be rendered in the format used by the destination organization, if different.

### Syntax

[C++]

Get method:

```
HRESULT get_MapReference(  
    BSTR* pstrReference  
);
```

Put method:

```
HRESULT put_MapReference(  
    BSTR strReference  
);
```

[Visual Basic]

*object*.**MapReference**

### Parameters

[C++]

Get method:

*pstrReference*

[out, retval] Pointer to a **BSTR** that contains the map name.

Put method:

*strReference*

[in] **BSTR** that contains the map name.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the map name.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a required property if the **InputDocument** property refers to a different document specification than the **OutputDocument** property.

Once you have created or saved a **BizTalkChannel** object with **MapReference** set to a map, any changes you make to the content of the referenced map are not automatically updated on the referring **BizTalkChannel** object. To update the **BizTalkChannel** object that refers to the revised map, you must save the map, reset the **MapReference** property of the **BizTalkChannel** object to its current value, and then call **Save** on the referring **BizTalkChannel** object.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkChannel::OutputDocument Property

## IBizTalkChannel::OutputDocument Property [C++]

## BizTalkChannel.OutputDocument Property [Visual Basic]

The **OutputDocument** property contains the handle to the **BizTalkDocument** object that describes the output document specification.

### Syntax

[C++]

Get method:

```
HRESULT get_OutputDocument(  
    long* pOutDocHandle  
);
```

Put method:

```
HRESULT put_OutputDocument(  
    long lOutDocHandle  
);
```

[Visual Basic]

*object*.OutputDocument

### Parameters

[C++]

Get method:

*pOutDocHandle*

[out, retval] Pointer to a **long** that contains the handle to the output **BizTalkDocument** object.

Put method:

*lOutDocHandle*

[in] **Long** that contains the handle to the output **BizTalkDocument** object.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Long** that contains the handle to the output **BizTalkDocument** object.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a required property. This property cannot be changed after the **Create** or the **Save** method is called.

If the **Openness** property of the associated **BizTalkEndPoint** object is set to **BIZTALK\_OPENNESS\_TYPE\_SOURCE**,

the **InputDocument** property can identify an input **BizTalkDocument** object that has an X12 or an EDIFACT specification. If it does, however, **OutputDocument** must not identify a **BizTalkDocument** object that has an X12 or an EDIFACT specification.

If the **Openness** property of the associated **BizTalkEndPoint** object is set to **BIZTALK\_OPENNESS\_TYPE\_DESTINATION**, the **OutputDocument** property for this **BizTalkChannel** object must not identify an output **BizTalkDocument** object that has an X12 or an EDIFACT specification.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

## Related Topic

[Document Definitions](#)

# IBizTalkChannel::Port Property

## IBizTalkChannel::Port Property [C++]

## BizTalkChannel.Port Property [Visual Basic]

The **Port** property contains the handle to the associated **BizTalkPort** object.

### Syntax

[C++]

Get method:

```
HRESULT get_Port(  
    long* pPortHandle  
);
```

Put method:

```
HRESULT put_Port(  
    long lPortHandle  
);
```

[Visual Basic]

*object*.Port

### Parameters

[C++]

Get method:

*pPortHandle*

[out, retval] Pointer to a **long** that contains the handle to the **BizTalkPort** object.

Put method:

*lPortHandle*

[in] **Long** that contains the handle to the **BizTalkPort** object.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Long** that contains the handle to the **BizTalkPort** object.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

The following constraints are enforced:

- Either the **Port** or the **PortGroup** property must be specified for a channel.

- This property cannot be changed after the [Create](#) or the [Save](#) method is called.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

## Related Topic

[Messaging Ports](#)

# IBizTalkChannel::PortGroup Property

## IBizTalkChannel::PortGroup Property [C++]

## BizTalkChannel.PortGroup Property [Visual Basic]

The **PortGroup** property contains the handle to the associated [BizTalkPortGroup](#) object.

### Syntax

[C++]

Get method:

```
HRESULT get_PortGroup(  
    long* plPortGroupHandle  
);
```

Put method:

```
HRESULT put_PortGroup(  
    long lPortGroupHandle  
);
```

[Visual Basic]

*object*.PortGroup

### Parameters

[C++]

Get method:

*plPortGroupHandle*

[out, retval] Pointer to a **long** that contains the handle to the associated **BizTalkPortGroup** object.

Put method:

*lPortGroupHandle*

[in] **Long** that contains the handle to the associated **BizTalkPortGroup** object.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Long** that contains the handle to the associated **BizTalkPortGroup** object.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

The following constraints are enforced:

- Either the **Port** property or **PortGroup** must be specified for a channel.

- This property cannot be changed after the [Create](#) or the [Save](#) method is called.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

## Related Topic

[Port Groups](#)

# IBizTalkChannel::ReceiptChannel Property

## IBizTalkChannel::ReceiptChannel Property [C++]

## BizTalkChannel.ReceiptChannel Property [Visual Basic]

The **ReceiptChannel** property contains the handle to the receipt channel for this object.

### Syntax

[C++]

Get method:

```
HRESULT get_ReceiptChannel(  
    long* pIReceiptChannelHandle  
);
```

Put method:

```
HRESULT put_ReceiptChannel(  
    long IReceiptChannelHandle  
);
```

[Visual Basic]

*object*.**ReceiptChannel**

### Parameters

[C++]

Get method:

*pIReceiptChannelHandle*

[out, retval] Pointer to a **long** that contains the handle.

Put method:

*IReceiptChannelHandle*

[in] **Long** that contains the handle.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Long** that contains the handle to the receipt channel.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

A **BizTalkChannel** object can specify a receipt channel only if it is not a receipt channel itself. The channel specified as the receipt channel must have the **IsReceiptChannel** property set to TRUE. In addition, the receipt channel must use a messaging port with a **DestinationEndpoint** that is the same as the **SourceEndpoint** on the channel using the receipt channel. This allows the receipt channel to send a receipt to the original source of the document.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkChannel::RetryCount Property

## IBizTalkChannel::RetryCount Property [C++]

## BizTalkChannel.RetryCount Property [Visual Basic]

The **RetryCount** property specifies the number of times to retry submitting a document when a destination connection failure occurs.

### Syntax

[C++]

Get method:

```
HRESULT get_RetryCount(  
    long* pICount  
);
```

Put method:

```
HRESULT put_RetryCount(  
    long ICount  
);
```

[Visual Basic]

*object*.**RetryCount**

### Parameters

[C++]

Get method:

*pICount*

[out, retval] Pointer to a **long** that contains the number of retries.

Put method:

*ICount*

[in] **Long** that contains the number of retries.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Long** that contains the number of retries.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

The **RetryCount** property must contain a value between 0 and 999. The default value is 3 retries.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkChannel::RetryInterval Property

## IBizTalkChannel::RetryInterval Property [C++]

## BizTalkChannel.RetryInterval Property [Visual Basic]

The **RetryInterval** property specifies the amount of time, in minutes, between retry attempts when a destination connection failure occurs during document submission.

### Syntax

[C++]

Get method:

```
HRESULT get_RetryInterval(  
    long* pInterval  
);
```

Put method:

```
HRESULT put_RetryInterval(  
    long lInterval  
);
```

[Visual Basic]

```
object.RetryInterval
```

### Parameters

[C++]

Get method:

*pInterval*

[out, retval] Pointer to a **long** that contains the retry interval, in minutes.

Put method:

*lInterval*

[in] **Long** that contains the retry interval, in minutes.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Long** that contains the retry interval, in minutes.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

The **RetryInterval** property must contain a value between 1 and 63999. The default value is 5 minutes.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkChannel::SetConfigComponent Method

## IBizTalkChannel::SetConfigComponent Method [C++]

## BizTalkChannel.SetConfigComponent Method [Visual Basic]

The **SetConfigComponent** method sets the CLSID of the component associated with the **BizTalkPort** object.

### Syntax

[C++]

```
HRESULT SetConfigComponent(  
    BIZTALK_CONFIGDATA_TYPE eConfigType,  
    long lPortHandle,  
    BSTR strCLSID  
);
```

[Visual Basic]

```
object.SetConfigComponent( _  
    eConfigType As BIZTALK_CONFIGDATA_TYPE, _  
    lPortHandle As Long, _  
    strCLSID As String _  
)
```

### Parameters

[C++]

*eConfigType*

[in] Enumeration value. Valid values are from the **BIZTALK\_CONFIGDATA\_TYPE** enumeration. The **BIZTALK\_CONFIGDATA\_TYPE\_PRIMARYTRANSPORT** and **BIZTALK\_CONFIGDATA\_TYPE\_SECONDARYTRANSPORT** enumeration values cannot be used with this method.

*lPortHandle*

[in] **Long** that contains the handle.

*strCLSID*

[in] **BSTR** that contains the CLSID of the component.

[Visual Basic]

*eConfigType*

Enumeration value. Valid values are from the **BIZTALK\_CONFIGDATA\_TYPE** enumeration. The **BIZTALK\_CONFIGDATA\_TYPE\_PRIMARYTRANSPORT** and **BIZTALK\_CONFIGDATA\_TYPE\_SECONDARYTRANSPORT** enumeration values cannot be used with this method.

*lPortHandle*

**Long** that contains the handle.

*strCLSID*

**String** that contains the CLSID of the component.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None

## Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkChannel::SetConfigData Method

## IBizTalkChannel::SetConfigData Method [C++]

## BizTalkChannel.SetConfigData Method [Visual Basic]

The **SetConfigData** method sets the configuration information for the **BizTalkPort** object.

### Syntax

[C++]

```
HRESULT SetConfigData(  
    BIZTALK_CONFIGDATA_TYPE eConfigType,  
    long lConfigDataHandle,  
    IDispatch* pConfigDataDisp  
);
```

[Visual Basic]

```
object.SetConfigData( _  
    eConfigType As BIZTALK_CONFIGDATA_TYPE, _  
    lConfigDataHandle As Long, _  
    pConfigDataDisp As Object _  
)
```

### Parameters

[C++]

*eConfigType*

[in] Enumeration value. Valid values are from the **BIZTALK\_CONFIGDATA\_TYPE** enumeration.

*lConfigDataHandle*

[in] **Long** that identifies the handle to the associated **BizTalkPort** object.

*pConfigDataDisp*

[in] Pointer to the **IDictionary** interface of an object that contains information about the component specified in the *eConfigType* parameter.

[Visual Basic]

*eConfigType*

Enumeration value. Valid values are from the **BIZTALK\_CONFIGDATA\_TYPE** enumeration.

*lConfigDataHandle*

**Long** that identifies the handle to the associated **BizTalkPort** object.

*pConfigDataDisp*

**CDictionary** object that contains information about the component specified in the *eConfigType* parameter.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

## Remarks

The **Dictionary** object passed to this method has specific string qualifiers used for EDIFACT and X12. For a description of these qualifiers, see the [GetConfigData Method](#).

When using the **BIZTALK\_CONFIGDATA\_TYPE\_PRIMARYTRANSPORT** or **BIZTALK\_CONFIGDATA\_TYPE\_SECONDARYTRANSPORT** enumeration value, the content of the transport dictionary varies according to the transport protocol used. The following tables list the transport dictionary fields for each protocol.

### HTTP and HTTPS

Field name	Data type	Required	Description
URL	String	Yes	URL of the document destination.
ContentType	String	No	Value for the Content-Type HTTP/HTTPS property that appears in HTTP headers during transmission. The default value is an empty string ("").
ClientCertificate	String	No	Reference to the certificate used with SSL connections using HTTPS. The default value is an empty string ("").
ProxyName	String	No	URL of the proxy server used when sending documents outside a firewall.
ProxyPort	Integer	No	Port number used by the proxy server.
UseProxy	Boolean	No	Value that indicates whether the proxy server is used. The default value is True.

### Local File

Field name	Data type	Required	Description
Filename	String	Yes	Name and path of the file to be created.
Copy Mode	Integer	No	Value that indicates how the file should be written. Use a value of 0 for overwrite mode, a value of 1 for append mode, and a value of 2 to create a new file. The default value is append mode (1).
UserName	String	No	Windows NT username needed to access a file share. The default value is an empty string ("").
Password	String	No	Windows NT password needed to access a file share. The default value is an empty string ("").

### Message Queuing

Field name	Data type	Required	Description
QueueName	String	Yes	Name of the Messaging Queue to which the document is sent.
MessageLabel	String	Yes	Value specified in the message label field on the queue.
Priority	Integer	No	Priority of the message placed in the queue. This must be a value between 0 and 7, where a higher value indicates a higher priority. The default value is 3.
AuthLevel	Integer	No	Value indicating whether the message needs to be authenticated using a digital signature. Use a value of 0 to bypass authentication. A value of 1 indicates that authentication will be used. The default value is 0.
Delivery	Integer	No	Value indicating how a message is delivered to a queue. Use a value of 1 to indicate that the message should be backed up until it is delivered to the queue. A value of 0 indicates that the message is only resident in memory. The default value is 0.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkChannel::SignatureCertificateInfo Property

## IBizTalkChannel::SignatureCertificateInfo Property [C++]

## BizTalkChannel.SignatureCertificateInfo Property [Visual Basic]

The **SignatureCertificateInfo** property contains information about the certificate that signs the output document. This information includes the **Name**, **Reference**, **Store**, and **Usage** properties and is created and stored in memory in the **BizTalkCertificateInfo** object.

### Syntax

[C++]

Get method:

```
HRESULT get_SignatureCertificateInfo(  
    IDispatch** ppSignatureCertificateInfoDisp  
);
```

Putref method:

```
HRESULT putref_SignatureCertificateInfo(  
    IDispatch* pSignatureCertificateInfoDisp  
);
```

[Visual Basic]

*object*.SignatureCertificateInfo

### Parameters

[C++]

Get method:

*ppSignatureCertificateInfoDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains the certificate information.

Putref method:

*pSignatureCertificateInfoDisp*

[in] Pointer to an **IDispatch** interface that contains the certificate information.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **BizTalkCertificateInfo** object that contains the certificate information.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkChannel::SourceEndpoint Property

## IBizTalkChannel::SourceEndpoint Property [C++]

## BizTalkChannel.SourceEndpoint Property [Visual Basic]

The **SourceEndpoint** property contains information about the source. This information includes the **Alias**, **Application**, and **Organization** properties and is created and stored in memory in the **BizTalkEndPoint** object.

### Syntax

[C++]

Get method:

```
HRESULT get_SourceEndpoint(  
    IDispatch** ppSrcEndpointDisp  
);
```

Putref method:

```
HRESULT putref_SourceEndpoint(  
    IDispatch* pSrcEndpointDisp  
);
```

[Visual Basic]

*object*.SourceEndpoint

### Parameters

[C++]

Get method:

*ppSrcEndpointDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains information about the source.

Putref method:

*pSrcEndpointDisp*

[in] Pointer to an **IDispatch** interface that contains information about the source.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns an **Object** that contains information about the source.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)



# IBizTalkChannel::TrackFields Property

## IBizTalkChannel::TrackFields Property [C++]

## BizTalkChannel.TrackFields Property [Visual Basic]

The **TrackFields** property identifies the **Dictionary** object that points to the specification that contains fields to track interchange data on input documents for this **BizTalkChannel** object. These tracking fields override the fields set in the **TrackFields** property on the **BizTalkDocument** object.

### Syntax

[C++]

Get method:

```
HRESULT get_TrackFields(  
    IDispatch** ppTrackFieldsDisp  
);
```

Putref method:

```
HRESULT putref_TrackFields(  
    IDispatch* pTrackFieldsDisp  
);
```

[Visual Basic]

*object*.TrackFields

### Parameters

[C++]

Get method:

*ppTrackFieldsDisp*

[out, retval] Address of a pointer to the **IDictionary** interface of an object that contains the custom tracking fields.

Putref method:

*pTrackFieldsDisp*

[in] Pointer to the **IDictionary** interface of an object that contains the custom tracking fields.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **CDictionary** object that contains the custom tracking fields.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

The fields in the **Dictionary** object must contain an XPath value that identifies the field to be tracked in a document. By default, the **Dictionary** object provides eight predefined fields for tracking data in a document. These predefined fields consist of two

fields for each of the following data types: integer, real, date, and string. If additional fields are required for tracking, you can use the `x_custom_search` field in the **Dictionary** object, and set the value to a **SimpleList** object. The **SimpleList** object contains a list of XPath expressions pointing to the additional tracking fields. XPath values can be added to and deleted from this list using the **Add** and **Delete** methods.

The following table shows the field names in the **Dictionary** object for **TrackFields**:

Field Name	Field type
<code>i_value1</code>	Integer value
<code>i_value2</code>	Integer value
<code>r_value1</code>	Real value
<code>r_value2</code>	Real value
<code>d_value1</code>	Date value
<code>d_value2</code>	Date value
<code>s_value1</code>	String value
<code>s_value2</code>	String value
<code>x_custom_search</code>	A list to return one or more additional data items

For more information about XPath expressions, go to the Microsoft Web site ([msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp)) and search for XPath.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include `BizTalkObjectModel.h`

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (`BizTalkObjectModel.dll`)

## Related Topic

[Document Tracking](#)

# IBizTalkChannel::VerifySignatureCertificateInfo Property

## IBizTalkChannel::VerifySignatureCertificateInfo Property [C++]

## BizTalkChannel.VerifySignatureCertificateInfo Property [Visual Basic]

The **VerifySignatureCertificateInfo** property contains information about the certificate that verifies the signature of the input document. This information includes the **Name**, **Reference**, **Store**, and **Usage** properties and is created and stored in memory in the **BizTalkCertificateInfo** object.

### Syntax

[C++]

Get method:

```
HRESULT get_VerifySignatureCertificateInfo(  
    IDispatch** ppVerifySignatureCertificateInfoDisp  
);
```

Putref method:

```
HRESULT putref_VerifySignatureCertificateInfo(  
    IDispatch* pVerifySignatureCertificateInfoDisp  
);
```

[Visual Basic]

*object*.VerifySignatureCertificateInfo

### Parameters

[C++]

Get method:

*ppVerifySignatureCertificateInfoDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains the certificate information.

Put method:

*pVerifySignatureCertificateInfoDisp*

[in] Pointer to an **IDispatch** interface that contains the certificate information.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **BizTalkCertificateInfo** object that contains the certificate information.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkConfig Interface

## IBizTalkConfig Interface [C++]

## BizTalkConfig Object [Visual Basic]

Use the **BizTalkConfig** object to create channels, document specifications, envelopes, organizations, ports, and port groups.

In C++, use the **IBizTalkConfig** interface to access the methods of the **BizTalkConfig** object.

The properties of the **BizTalkConfig** object are shown in the following table.

Property	Data type	Description
<a href="#">Certificates</a>	<b>Object</b>	Returns an ADO recordset that contains all specified certificates. This is a read-only property.
<a href="#">Channels</a>	<b>Object</b>	Returns an ADO recordset that contains all <a href="#">BizTalkChannel</a> objects. This is a read-only property.
<a href="#">Documents</a>	<b>Object</b>	Returns an ADO recordset that contains all <a href="#">BizTalkDocument</a> objects. This is a read-only property.
<a href="#">Envelopes</a>	<b>Object</b>	Returns an ADO recordset that contains all <a href="#">BizTalkEnvelope</a> objects.
<a href="#">Organizations</a>	<b>Object</b>	Returns an ADO recordset that contains all <a href="#">BizTalkOrganization</a> objects. This is a read-only property.
<a href="#">PortGroups</a>	<b>Object</b>	Returns an ADO recordset that contains all <a href="#">BizTalkPortGroup</a> objects. This is a read-only property.
<a href="#">Ports</a>	<b>Object</b>	Returns an ADO recordset that contains all <a href="#">BizTalkPort</a> objects. This is a read-only property.

The methods of the **BizTalkConfig** object are shown in the following table.

Method	Description
<a href="#">CreateChannel</a>	Returns the address of a pointer to a new <a href="#">BizTalkChannel</a> object.
<a href="#">CreateDocument</a>	Returns the address of a pointer to a new <a href="#">BizTalkDocument</a> object.
<a href="#">CreateEnvelope</a>	Returns the address of a pointer to a new <a href="#">BizTalkEnvelope</a> object.
<a href="#">CreateOrganization</a>	Returns the address of a pointer to a new <a href="#">BizTalkOrganization</a> object.
<a href="#">CreatePort</a>	Returns the address of a pointer to a new <a href="#">BizTalkPort</a> object.
<a href="#">CreatePortGroup</a>	Returns the address of a pointer to a new <a href="#">BizTalkPortGroup</a> object.

### Remarks

In C++, each object created by using one of the methods of this interface inherits the following common methods from the [IBizTalkBase](#) interface. In Microsoft Visual Basic, each object created by using the methods of this class implements the following common properties and methods from the [IBizTalkBase](#) class.

- [DateModified](#)
- [Handle](#)
- [Name](#)
- [Clear](#)
- [Create](#)
- [Load](#)
- [LoadByName](#)
- [Remove](#)
- [Save](#)

When **BizTalkPort** and **BizTalkChannel** objects are created, BizTalk Server automatically creates some associated subobjects. You can access these subobjects by using properties of the **BizTalkPort** and **BizTalkChannel** objects.

The relationship between objects, their subobjects, and the properties used to obtain the subobjects is shown in the following table.

Subobject	Associated object	Property to set
<b>BizTalkEndPoint</b>	<b>BizTalkPort</b>	<b>DestinationEndpoint</b>
<b>BizTalkEndPoint</b>	<b>BizTalkChannel</b>	<b>SourceEndpoint</b>
<b>BizTalkLoggingInfo</b>	<b>BizTalkChannel</b>	<b>LoggingInfo</b>
<b>BizTalkTransportInfo</b>	<b>BizTalkPort</b>	<b>PrimaryTransport, SecondaryTransport</b>
<b>BizTalkServiceWindowInfo</b>	<b>BizTalkPort</b>	<b>ServiceWindowInfo</b>
<b>BizTalkCertificateInfo</b>	<b>BizTalkPort</b>	<b>EncryptionCertificateInfo</b>
<b>BizTalkCertificateInfo</b>	<b>BizTalkChannel</b>	<b>SignatureCertificateInfo, VerifySignatureCertificateInfo,</b> or <b>DecryptionCertificateInfo</b>

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkConfig::Certificates Property

## IBizTalkConfig::Certificates Property [C++]

## BizTalkConfig.Certificates Property [Visual Basic]

The **Certificates** property returns an ADO recordset that contains all specified certificates.

### Syntax

[C++]

Get method:

```
HRESULT get_Certificates(  
    BIZTALK_STORE_TYPE StoreType,  
    BIZTALK_USAGE_TYPE UsageType,  
    BSTR NamePrefix,  
    IDispatch** ppCertsDisp  
);
```

[Visual Basic]

```
object.Certificates( _  
    StoreType As BIZTALK_STORE_TYPE, _  
    UsageType As BIZTALK_USAGE_TYPE, _  
    NamePrefix As String, _  
)
```

### Parameters

[C++]

*StoreType*

[in] Enumeration value. Valid values are from the [BIZTALK\\_STORE\\_TYPE](#) enumeration.

*UsageType*

[in] Enumeration value. Valid values are from the [BIZTALK\\_USAGE\\_TYPE](#) enumeration.

*NamePrefix*

[in] **BSTR** that contains a prefix used as the selection criteria for certificate names. Any certificate **Name** starting with this value is returned in the recordset. This value is case sensitive.

*ppCertsDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains all specified certificates.

[Visual Basic]

*StoreType*

Enumeration value. Valid values are from the [BIZTALK\\_STORE\\_TYPE](#) enumeration.

*UsageType*

Enumeration value. Valid values are from the [BIZTALK\\_USAGE\\_TYPE](#) enumeration.

*NamePrefix*

**String** that contains a prefix used as the selection criteria for certificate names. Any certificate **Name** starting with this value is returned in the recordset. This value is case sensitive.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

#### **Note**

- In addition to the HRESULT values listed on the error messages page, this method returns OLEDB provider errors. Additional information about OLEDB is available on the Microsoft Developer Network at [msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp).

This property returns an **Object** that contains all specified certificates.

### **Error Value [Visual Basic]**

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### **Remarks**

This is a read-only property.

Each record in the ADO recordset returned by this property contains information about an existing **BizTalkCertificateInfo** object in the database. The fields in each record contain the following information, listed in order:

- **Name**
- **Reference**
- **Store**
- **Usage**

Additional information about Microsoft ActiveX Data Objects is available on the Microsoft Developer Network at [msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp).

### **Requirements**

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkConfig::Channels Property

## IBizTalkConfig::Channels Property [C++]

## BizTalkConfig.Channels Property [Visual Basic]

The **Channels** property returns an ADO recordset that contains all **BizTalkChannel** objects.

### Syntax

[C++]

Get method:

```
HRESULT Channels(  
    IDispatch** ppChannelsDisp  
);
```

[Visual Basic]

*object*.Channels

### Parameters

[C++]

*ppChannelsDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains all **BizTalkChannel** objects.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

### Note

- In addition to the HRESULT values listed on the error messages page, this method returns OLEDB provider errors. Additional information about OLEDB is available on the Microsoft Developer Network at [msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp).

[Visual Basic]

This property returns an **Object** that contains all **BizTalkChannel** objects.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

Each record in the ADO recordset returned by this property contains information about an existing **BizTalkChannel** object in the database. The fields in each record contain the following information, listed in order:

- **Handle**
- **Name**
- **DateModified**

Additional information about Microsoft ActiveX Data Objects is available on the Microsoft Developer Network at [msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp).

## **Requirements**

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkConfig::CreateChannel Method

## IBizTalkConfig::CreateChannel Method [C++]

## BizTalkConfig.CreateChannel Method [Visual Basic]

[C++]

The **CreateChannel** method returns the address of a pointer to a new **BizTalkChannel** object.

[Visual Basic]

The **CreateChannel** method returns a new **BizTalkChannel** object.

### Syntax

[C++]

```
HRESULT CreateChannel (  
    IDispatch** ppChannelDisp  
);
```

[Visual Basic]

```
object.CreateChannel ()
```

### Parameters

[C++]

*ppChannelDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains a new **BizTalkChannel** object.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This method returns a new **BizTalkChannel** object.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkConfig::CreateDocument Method

## IBizTalkConfig::CreateDocument Method [C++]

## BizTalkConfig.CreateDocument Method [Visual Basic]

[C++]

The **CreateDocument** method returns the address of a pointer to a new **BizTalkDocument** object.

[Visual Basic]

The **CreateDocument** method returns a new **BizTalkDocument** object.

### Syntax

[C++]

```
HRESULT CreateDocument(  
    IDispatch** ppDocumentDisp  
);
```

[Visual Basic]

```
object.CreateDocument()
```

### Parameters

[C++]

*ppDocumentDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains a new **BizTalkDocument** object.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This method returns a new **BizTalkDocument** object.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkConfig::CreateEnvelope Method

## IBizTalkConfig::CreateEnvelope Method [C++]

## BizTalkConfig.CreateEnvelope Method [Visual Basic]

[C++]

The **CreateEnvelope** method returns the address of a pointer to a new **BizTalkEnvelope** object.

[Visual Basic]

The **CreateEnvelope** method returns a new **BizTalkEnvelope** object.

### Syntax

[C++]

```
HRESULT CreateEnvelope (  
    IDispatch** ppEnvelopeDisp  
);
```

[Visual Basic]

```
object.CreateEnvelope ()
```

### Parameters

[C++]

*ppEnvelopeDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains a new **BizTalkEnvelope** object.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This method returns a new **BizTalkEnvelope** object.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkConfig::CreateOrganization Method

## IBizTalkConfig::CreateOrganization Method [C++]

## BizTalkConfig.CreateOrganization Method [Visual Basic]

[C++]

The **CreateOrganization** method returns the address of a pointer to a new **BizTalkOrganization** object.

[Visual Basic]

The **CreateOrganization** method returns a new **BizTalkOrganization** object.

### Syntax

[C++]

```
HRESULT CreateOrganization(  
    IDispatch** ppOrganizationDisp  
);
```

[Visual Basic]

```
object.CreateOrganization()
```

### Parameters

[C++]

*ppOrganizationDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains a new **BizTalkOrganization** object.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This method returns a new **BizTalkOrganization** object.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkConfig::CreatePort Method

## IBizTalkConfig::CreatePort Method [C++]

## BizTalkConfig.CreatePort Method [Visual Basic]

[C++]

The **CreatePort** method returns the address of a pointer to a new **BizTalkPort** object.

[Visual Basic]

The **CreatePort** method returns a new **BizTalkPort** object.

### Syntax

[C++]

```
HRESULT CreatePort(  
    IDispatch** ppPortDisp  
);
```

[Visual Basic]

```
object.CreatePort()
```

### Parameters

[C++]

*ppPortDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains a new **BizTalkPort** object.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This method returns a new **BizTalkPort** object.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkConfig::CreatePortGroup Method

## IBizTalkConfig::CreatePortGroup Method [C++]

## BizTalkConfig.CreatePortGroup Method [Visual Basic]

[C++]

The **CreatePortGroup** method returns the address of a pointer to a new **BizTalkPortGroup** object.

[Visual Basic]

The **CreatePortGroup** method returns a new **BizTalkPortGroup** object.

### Syntax

[C++]

```
HRESULT CreatePortGroup(  
    IDispatch** ppPortGroupDisp  
);
```

[Visual Basic]

```
object.CreatePortGroup()
```

### Parameters

[C++]

*ppPortGroupDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains a new **BizTalkPortGroup** object.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This method returns a new **BizTalkPortGroup** object.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkConfig::Documents Property

## IBizTalkConfig::Documents Property [C++]

## BizTalkConfig.Documents Property [Visual Basic]

The **Documents** property returns an ADO recordset that contains all **BizTalkDocument** objects.

### Syntax

[C++]

Get method:

```
HRESULT Documents (  
    IDispatch** ppDocumentsDisp  
);
```

[Visual Basic]

*object*.Documents

### Parameters

[C++]

*ppDocumentsDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains all **BizTalkDocument** objects.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

### Note

- In addition to the HRESULT values listed on the error messages page, this method returns OLEDB provider errors. Additional information about OLEDB is available on the Microsoft Developer Network at [msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp).

[Visual Basic]

This property returns an **Object** that contains all **BizTalkDocument** objects.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

Each record in the ADO recordset returned by this property contains information about an existing **BizTalkDocument** object in the database. The fields in each record contain the following information, listed in order:

- **Handle**
- **Name**
- **DateModified**

Additional information about Microsoft ActiveX Data Objects is available on the Microsoft Developer Network at [msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp).

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkConfig::Envelopes Property

## IBizTalkConfig::Envelopes Property [C++]

## BizTalkConfig.Envelopes Property [Visual Basic]

The **Envelopes** property returns an ADO recordset that contains all **BizTalkEnvelope** objects.

### Syntax

[C++]

Get method:

```
HRESULT Envelopes (  
    IDispatch** ppEnvelopesDisp  
);
```

[Visual Basic]

*object*.**Envelopes**

### Parameters

[C++]

*ppEnvelopesDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains all **BizTalkEnvelope** objects.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

### Note

- In addition to the HRESULT values listed on the error messages page, this method returns OLEDB provider errors. Additional information about OLEDB is available on the Microsoft Developer Network at [msdn.microsoft.com/library/default.asp](https://msdn.microsoft.com/library/default.asp).

[Visual Basic]

This property returns an **Object** that contains all **BizTalkEnvelope** objects.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

Each record in the ADO recordset returned by this property contains information about an existing **BizTalkEnvelope** object in the database. The fields in each record contain the following information, listed in order:

- **Handle**
- **Name**
- **DateModified**

- **Format**

Additional information about Microsoft ActiveX Data Objects is available on the Microsoft Developer Network at [msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp).

## **Requirements**

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkConfig::Organizations Property

## IBizTalkConfig::Organizations Property [C++]

## BizTalkConfig.Organizations Property [Visual Basic]

The **Organizations** property returns an ADO recordset that contains all **BizTalkOrganization** objects.

### Syntax

[C++]

Get method:

```
HRESULT Organizations (  
    IDispatch** ppOrganizationsDisp  
);
```

[Visual Basic]

*object*.Organizations

### Parameters

[C++]

*ppOrganizationsDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains all **BizTalkOrganization** objects.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

### Note

- In addition to the HRESULT values listed on the error messages page, this method returns OLEDB provider errors. Additional information about OLEDB is available on the Microsoft Developer Network at [msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp).

[Visual Basic]

This property returns an **Object** that contains all **BizTalkOrganization** objects.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

Each record in the ADO recordset returned by this property contains information about an existing **BizTalkOrganization** object in the database. The fields in each record contain the following information, listed in order:

- **Handle**
- **Name**
- **DateModified**

- **IsDefault**

Additional information about Microsoft ActiveX Data Objects is available on the Microsoft Developer Network at [msdn.microsoft.com/library/default.asp](https://msdn.microsoft.com/library/default.asp).

## **Requirements**

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkConfig::PortGroups Property

## IBizTalkConfig::PortGroups Property [C++]

## BizTalkConfig.PortGroups Property [Visual Basic]

The **PortGroups** property returns an ADO recordset that contains all **BizTalkPortGroup** objects.

### Syntax

[C++]

```
HRESULT PortGroups (  
    IDispatch** ppPortGroupsDisp  
);
```

[Visual Basic]

*object*.PortGroups

### Parameters

[C++]

*ppPortGroupsDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains all **BizTalkPortGroup** objects.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

### Note

- In addition to the HRESULT values listed on the error messages page, this method returns OLEDB provider errors. Additional information about OLEDB is available on the Microsoft Developer Network at [msdn.microsoft.com/library/default.asp](https://msdn.microsoft.com/library/default.asp).

[Visual Basic]

This property returns an **Object** that contains all **BizTalkPortGroup** objects.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

Each record in the ADO recordset returned by this property contains information about an existing **BizTalkPortGroup** object in the database. The fields in each record contain the following information, listed in order:

- **Handle**
- **Name**
- **DateModified**

Additional information about Microsoft ActiveX Data Objects is available on the Microsoft Developer Network at

[msdn.microsoft.com/library/default.asp](https://msdn.microsoft.com/library/default.asp).

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkConfig::Ports Property

## IBizTalkConfig::Ports Property [C++]

## BizTalkConfig.Ports Property [Visual Basic]

The **Ports** property returns an ADO recordset that contains all **BizTalkPort** objects.

### Syntax

[C++]

Get method:

```
HRESULT Ports(  
    IDispatch** ppPortsDisp  
);
```

[Visual Basic]

*object*.Ports

### Parameters

[C++]

*ppPortsDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains all **BizTalkPort** objects.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

### Note

- In addition to the HRESULT values listed on the error messages page, this method returns OLEDB provider errors. Additional information about OLEDB is available on the Microsoft Developer Network at [msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp).

[Visual Basic]

This property returns an **Object** that contains all **BizTalkPort** objects.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

Each record in the ADO recordset returned by this property contains information about an existing **BizTalkPort** object in the database. The fields in each record contain the following information, listed in order:

- **Handle**
- **Name**
- **DateModified**

Additional information about Microsoft ActiveX Data Objects is available on the Microsoft Developer Network at [msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp).

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkDocument Interface

## IBizTalkDocument Interface [C++]

## BizTalkDocument Object [Visual Basic]

Use the **BizTalkDocument** object to identify and describe the document specification of a document.

In C++, use the **IBizTalkDocument** interface to access the methods of the **BizTalkDocument** object.

The properties of the **BizTalkDocument** object are shown in the following table.

Property	Type	Description
<b>Content</b>	B S T R	Content of the document specification described by the object. This is a read-only property.
<b>DateModified</b>	B S T R	Date and time at which the information in the object was created or last modified. This is a read-only property obtained from the <b>BizTalkBase</b> object.
<b>Handle</b>	l o n g	Handle to the object. This is a read-only property obtained from the <b>BizTalkBase</b> object.
<b>Name</b>	B S T R	Name of the object. This is a required property obtained from the <b>BizTalkBase</b> object.
<b>NameSpace</b>	B S T R	String that resolves naming conflicts between elements in a document. This is a read-only property.
<b>PropertySet</b>	ID i s p a t c h	<b>Dictionary</b> object that contains the electronic data interchange (EDI) selection criteria (name/value pairs) by which the server extracts information from the functional group header of the EDI document to identify the object when the document is input. It helps the server create the header of the EDI document when it is output. This is a required property if the document is an EDI document.
<b>Reference</b>	B S T R	Full Web Distributed Authoring and Versioning (WebDAV) URL for the document specification referred to by this <b>BizTalkDocument</b> object. This is a required property when the <b>TrackFields</b> property is set.
<b>TrackFields</b>	ID i s p a t c h	<b>Dictionary</b> object that stores the custom fields that Tracking uses to track all documents processed by the server, based on this document instance. The <b>Reference</b> property must contain a WebDAV URL when this property is set.
<b>Type</b>	B S T R	Type of document specification. This is a read-only property.
<b>Version</b>	B S T R	Version of the document standard. This is a read-only property.

The methods of the **BizTalkDocument** object are shown in the following table.

Method	Description
<b>Clear</b>	Clears the object in memory. All member variables of the object in memory are initialized to their default values. This method is obtained from the <b>BizTalkBase</b> object.
<b>Create</b>	Creates a new object in the database. This method is obtained from the <b>BizTalkBase</b> object.
<b>Load</b>	Loads the object in memory. This method is obtained from the <b>BizTalkBase</b> object.

<b>LoadByName</b>	Loads the object by name in memory. This method is obtained from the <b>BizTalkBase</b> object.
<b>LoadByPropertySet</b>	Loads the document object by its <b>PropertySet</b> object.
<b>Remove</b>	Removes the object from the database. This method is obtained from the <b>BizTalkBase</b> object.
<b>Save</b>	Saves the object in the database. This method is obtained from the <b>BizTalkBase</b> object.

## Remarks

Each **BizTalkDocument** object must have at least one associated **BizTalkChannel** object. More than one **BizTalkDocument** object can refer to the same document specification.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

## Related Topic

[Document Definitions](#)

# IBizTalkDocument::Content Property

## IBizTalkDocument::Content Property [C++]

## BizTalkDocument.Content Property [Visual Basic]

The **Content** property contains the content of the document specification described by the object.

### Syntax

[C++]

Get method:

```
HRESULT get_Content(  
    BSTR* pstrContent  
);
```

[Visual Basic]

*object*.Content

### Parameters

[C++]

*pstrContent*

[out, retval] Pointer to a **BSTR** that contains the content.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the content.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

The **Reference** property is checked when the **Create** or the **Save** method is called. If this string is not empty when **Create** is called, **Content** is set to the contents of the document specification and the **Namespace** property is changed to the value found in the document specification.

Once you have created or saved an object with **Reference** set to a document specification, any changes you make to the **Content** or **Namespace** of the referenced document specification are not automatically updated on the referring object. To update the object that refers to the revised document specification, you must save the document specification, reset the **Reference** property of the object to its current value, and then call **Save** on the referring object.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)



# IBizTalkDocument::LoadByPropertySet Method

## IBizTalkDocument::LoadByPropertySet Method [C++]

## BizTalkDocument.LoadByPropertySet Method [Visual Basic]

The **LoadByPropertySet** method loads the document object by its **PropertySet**.

### Syntax

[C++]

```
HRESULT LoadByPropertySet(  
    IDispatch** pPropSetDictionaryDisp  
);
```

[Visual Basic]

```
object.LoadByPropertySet( _  
    pPropSetDictionaryDisp As Object _  
)
```

### Parameters

[C++]

*pPropSetDictionaryDisp*

[in] Address of a pointer to an **IDispatch** interface that contains the **PropertySet**.

[Visual Basic]

*pPropSetDictionaryDisp*

Object that contains the **PropertySet**.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkDocument::NameSpace Property

## IBizTalkDocument::NameSpace Property [C++]

## BizTalkDocument.NameSpace Property [Visual Basic]

The **NameSpace** property contains the string that resolves naming conflicts between elements in a document.

### Syntax

[C++]

Get method:

```
HRESULT get_NameSpace (  
    BSTR* pstrNameSpace  
);
```

[Visual Basic]

*object*.NameSpace

### Parameters

[C++]

*pstrNameSpace*

[out, retval] Pointer to a **BSTR** that contains the namespace.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the namespace.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property. The **Reference** property is checked when the **Create** or the **Save** method is called. If this string is not empty when **Create** is called, **Content** is set to the contents of the document specification and **NameSpace** is changed to the value found in the document specification.

Once you have created or saved an object with **Reference** set to a document specification, any changes you make to the **Content** or **NameSpace** of the referenced document specification are not automatically updated on the referring object. To update the object that refers to the revised document specification, you must save the document specification, reset the **Reference** property of the object to its current value, and then call **Save** on the referring object.

### Note

- When creating a document, the number of characters in the **NameSpace** combined with the number of characters in the specification name cannot exceed 255.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkDocument::PropertySet Property

## IBizTalkDocument::PropertySet Property [C++]

## BizTalkDocument.PropertySet Property [Visual Basic]

The **PropertySet** property contains a **Dictionary** object that contains the electronic data interchange (EDI) selection criteria (name/value pairs) by which the server extracts information from the functional group header of the EDI document to identify the object when the document is input. It helps the server create the header of the EDI document when it is output.

### Syntax

[C++]

Get method:

```
HRESULT get_PropertySet(  
    IDispatch** ppPropSetDisp  
);
```

Putref method:

```
HRESULT putref_PropertySet(  
    IDispatch* pPropSetDisp  
);
```

[Visual Basic]

*object*.PropertySet

### Parameters

[C++]

Get method:

*ppPropSetDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains the selection criteria.

Putref method

*pPropSetDisp*

[in] Pointer to an **IDispatch** interface that contains the selection criteria.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns an **Object** that contains the selection criteria.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a required property if the document is an EDI document. The **Delimiters** property of the associated **BizTalkPort** object must also be defined.

The following table shows whether names are required in the **Dictionary** object for **PropertySet**.

Selection criteria	X12	EDIFACT
application_sender_code	Yes	Yes
application_receiver_code	Yes	Yes
functional_identifier	Yes	Yes
standards_version	Yes	No
standards_version_type	No	Yes
standards_version_value	No	Yes

#### **Note**

- The name/value pairs contained in the **Dictionary** object cannot exceed a total of 450 bytes.

**PropertySet** can be set only if the **Reference** property is set.

#### **Requirements**

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

#### **Related Topic**

[Document Definitions](#)

# IBizTalkDocument::Reference Property

## IBizTalkDocument::Reference Property [C++]

## BizTalkDocument.Reference Property [Visual Basic]

The **Reference** property contains the full Web Distributed Authoring and Versioning (WebDAV) URL for the document specification referred to by the object.

### Syntax

[C++]

Get method:

```
HRESULT get_Reference(  
    BSTR* pstrReference  
);
```

Put method:

```
HRESULT put_Reference(  
    BSTR strReference  
);
```

[Visual Basic]

*object*.**Reference**

### Parameters

[C++]

Get method:

*pstrReference*

[out, retval] Pointer to a **BSTR** that contains the reference.

Put method:

*strReference*

[in] **BSTR** that contains the reference.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the reference.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

**Reference** is checked when the **Create** or the **Save** method is called. If this string is not empty when **Create** is called, **Content** is set to the contents of the document specification and the **NameSpace** property is changed to the value found in the document specification.

Once you have created or saved an object with **Reference** set to a document specification, any changes you make to the **Content** or **NameSpace** of the referenced document specification are not automatically updated on the referring object. To update the object that refers to the revised document specification, you must save the document specification, reset the **Reference** property of the object to its current value, and then call **Save** on the referring object.

If **Reference** is not set, the **PropertySet** and **TrackFields** properties must not be set.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkDocument::TrackFields Property

## IBizTalkDocument::TrackFields Property [C++]

## BizTalkDocument.TrackFields Property [Visual Basic]

The **TrackFields** property identifies the **Dictionary** object that stores the custom fields used to track the document. A **BizTalkDocument** object points to the specification that contains fields to track the document. The designated fields are logged to the Tracking database for each instance of a document that is processed. Tracking fields on the **BizTalkDocument** object are global. The **TrackFields** property on the **BizTalkChannel** object overrides the values specified by this property.

### Syntax

[C++]

Get method:

```
HRESULT get_TrackFields(  
    IDispatch** ppTrackFieldsDisp  
);
```

Putref method:

```
HRESULT putref_TrackFields(  
    IDispatch* pTrackFieldsDisp  
);
```

[Visual Basic]

*object*.TrackFields

### Parameters

[C++]

Get method:

*ppTrackFieldsDisp*

[out, retval] Address of a pointer to the **IDictionary** interface of the object that contains the custom tracking fields.

Putref method:

*pTrackFieldsDisp*

[in] Pointer to the **IDictionary** interface of the object that contains the custom tracking fields.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **CDictionary** object that contains the custom tracking fields.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

**TrackFields** can be set only if the **Reference** property is set. Tracking fields specified for an output **BizTalkDocument** object are

ignored.

The fields in the **Dictionary** object must contain an XPath value that identifies the field to be tracked in a document. By default, the **Dictionary** object provides eight predefined fields for tracking data in a document. These predefined fields consist of two fields for each of the following data types: integer, real, date, and string. If additional fields are required for tracking, you can use the `x_custom_search` field in the **Dictionary** object and set the value to a **SimpleList** object. The **SimpleList** object contains a list of XPaths pointing to the additional tracking fields. XPath values can be added to and deleted from this list using the **Add** and **Delete** methods.

The following table shows the field names in the **Dictionary** object for **TrackFields**:

Field Name	Field type
i_value1	Integer value
i_value2	Integer value
r_value1	Real value
r_value2	Real value
d_value1	Date value
d_value2	Date value
s_value1	String value
s_value2	String value
x_custom_search	A list to return one or more additional data items

For more information about XPath expressions, go to the Microsoft Web site ([msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp)) and search for XPath.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

## Related Topics

[Document Definitions](#)

[Document Tracking](#)

# IBizTalkDocument::Type Property

## IBizTalkDocument::Type Property [C++]

## BizTalkDocument.Type Property [Visual Basic]

The **Type** property contains the type of document specification.

### Syntax

[C++]

```
HRESULT get_Type (  
    BSTR* pstrType  
);
```

[Visual Basic]

*object*.**Type**

### Parameters

[C++]

*pstrType*

[out, retval] Pointer to a **BSTR** that contains the document type.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the document type.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property. All document instances must have the same document type as the associated envelope. For example, if the **Format** property of the **BizTalkEnvelope** object is set to X12, **Type** must also be X12.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkDocument::Version Property

## IBizTalkDocument::Version Property [C++]

## BizTalkDocument.Version Property [Visual Basic]

The **Version** property contains the version of the document standard.

### Syntax

[C++]

```
HRESULT get_Version(  
    BSTR* pstrVersion  
);
```

[Visual Basic]

*object*.**Version**

### Parameters

[C++]

*pstrVersion*

[out, retval] Pointer to a **BSTR** that contains the version.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the version.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkEndPoint Interface

## IBizTalkEndPoint Interface [C++]

## BizTalkEndPoint Object [Visual Basic]

Use the **BizTalkEndPoint** object to configure source information for a **BizTalkChannel** object and destination information for a **BizTalkPort** object.

In C++, use the **IBizTalkEndPoint** interface to access the methods of the **BizTalkEndPoint** object.

The properties of the **BizTalkEndPoint** object are shown in the following table.

Property	Type	Description
<b>Alias</b>	<b>long</b>	Handle to the organization identifier type/value pair for the destination <b>BizTalkOrganization</b> object or the associated <b>BizTalkPort</b> object.
<b>Application</b>	<b>long</b>	Handle to the associated application for the destination <b>BizTalkOrganization</b> object for this <b>BizTalkPort</b> object.
<b>Openness</b>	<b>BIZTALK_OPENNES S_ TYPE_EX</b>	Enumeration value that indicates whether the object is open.
<b>Organization</b>	<b>long</b>	Handle to the destination <b>BizTalkOrganization</b> object for this <b>BizTalkPort</b> object. This is a required property for this object to be complete unless the <b>Openness</b> property is set to <b>BIZTALK_OPENNESS_ TYPE_EX_DESTINATION</b> .

### Remarks

The **BizTalkEndPoint** object is automatically created when a **BizTalkPort** object or a **BizTalkChannel** object is instantiated with the **CreatePort** or the **CreateChannel** method of the **BizTalkConfig** object.

For destination endpoints, access the **BizTalkEndPoint** object by using the **DestinationEndpoint** property of the **BizTalkPort** object. For source endpoints, access the **BizTalkEndPoint** object by using the **SourceEndpoint** property of the **BizTalkChannel** object.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkEndPoint::Alias Property

## IBizTalkEndPoint::Alias Property [C++]

## BizTalkEndPoint.Alias Property [Visual Basic]

The **Alias** property contains the handle to the alias.

### Syntax

[C++]

Get method:

```
HRESULT get_Alias(  
    long* pAliasHandle  
);
```

Put method:

```
HRESULT put_Alias(  
    long lAliasHandle  
);
```

[Visual Basic]

*object*.**Alias**

### Parameters

[C++]

Get method:

*pAliasHandle*

[out, retval] Pointer to a **long** that contains the handle to the alias.

Put method:

*lAliasHandle*

[in] **Long** that contains the handle to the alias.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Long** that contains the handle to the alias.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkEndPoint::Application Property

## IBizTalkEndPoint::Application Property [C++]

## BizTalkEndPoint.Application Property [Visual Basic]

The **Application** property contains the handle to the application.

### Syntax

[C++]

Get method:

```
HRESULT get_Application(  
    long* pAppHandle  
);
```

Put method:

```
HRESULT put_Application(  
    long lAppHandle  
);
```

[Visual Basic]

*object*.**Application**

### Parameters

[C++]

Get method:

*pAppHandle*

[out, retval] Pointer to a **long** that contains the handle to the application.

Put method:

*lAppHandle*

[in] **Long** that contains the handle to the application.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Long** that contains the handle to the application.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkEndPoint::Openness Property

## IBizTalkEndPoint::Openness Property [C++]

## BizTalkEndPoint.Openness Property [Visual Basic]

The **Openness** property contains an enumeration value that indicates whether the object has an open destination or source, or neither.

### Syntax

[C++]

Get method:

```
HRESULT get_Openness (  
    BIZTALK_OPENNESS_TYPE_EX* pOpennessType  
);
```

Put method:

```
HRESULT put_Openness (  
    BIZTALK_OPENNESS_TYPE_EX OpennessType  
);
```

[Visual Basic]

*object*.Openness

### Parameters

[C++]

Get method:

*pOpennessType*

[out, retval] Pointer to an enumeration value. Valid values are from the [BIZTALK\\_OPENNESS\\_TYPE\\_EX](#) enumeration.

Put Method:

*OpennessType*

[in] Enumeration value. Valid values are from the [BIZTALK\\_OPENNESS\\_TYPE\\_EX](#) enumeration.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns an enumeration value. Valid values are from the [BIZTALK\\_OPENNESS\\_TYPE\\_EX](#) enumeration.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

The **BizTalkPort** object is valid only if the associated document or the parameters on the [Submit](#) or the [SubmitSync](#) method of the [IInterchange](#) interface identify the missing information.

If **Openness** is set to **BIZTALK\_OPENNESS\_TYPE\_EX\_SOURCE** for a **BizTalkEndPoint** object associated with a channel, the following constraints apply:

- The **SignatureType** property must not be set.
- The **BizTalkPort** object cannot be included in a port group.

If **Openness** is set to **BIZTALK\_OPENNESS\_TYPE\_EX\_FROMWORKFLOW** on a channel, the associated **BizTalkOrganization** object must be the default organization.

If **Openness** on the object is set to **BIZTALK\_OPENNESS\_TYPE\_EX\_DESTINATION** for a **BizTalkEndPoint** object associated with a messaging port, the following constraints apply:

- The **PrimaryTransportType** property must be set to **BIZTALK\_TRANSPORT\_TYPE\_OPENDESTINATION**.
- The **EncryptionType** property must not be set.
- The document or the parameters on **Submit** or **SubmitSync** must specify the destination, transport type, and address.
- The **BizTalkPort** object cannot be included in a port group.

#### **Note**

- This property cannot be changed on an existing port.

## **Requirements**

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

## **Related Topic**

[Openness](#)

# IBizTalkEndPoint::Organization Property

## IBizTalkEndPoint::Organization Property [C++]

## BizTalkEndPoint.Organization Property [Visual Basic]

The **Organization** property contains the handle to the organization.

### Syntax

[C++]

Get method:

```
HRESULT get_Organization(  
    long* pOrganizationHandle  
);
```

Put method:

```
HRESULT put_Organization(  
    long lOrganizationHandle  
);
```

[Visual Basic]

*object*.**Organization**

### Parameters

[C++]

Get method:

*pOrganizationHandle*

[out, retval] Pointer to a **long** that contains the handle to the organization.

Put method:

*lOrganizationHandle*

[in] **Long** that contains the handle to the organization.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Long** that contains the handle to the organization.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkEnvelope Interface

## IBizTalkEnvelope Interface [C++]

## BizTalkEnvelope Object [Visual Basic]

Use the **BizTalkEnvelope** object to configure the envelope format used with documents processed by BizTalk Server. An envelope is the header information for an interchange.

In C++, use the **IBizTalkEnvelope** interface to access the methods of the **BizTalkEnvelope** object.

The properties of the **BizTalkEnvelope** object are shown in the following table.

Property	Type	Description
<b>Content</b>	<b>BS</b> <b>TR</b>	Contents of the selected envelope format specification. This is a read-only property.
<b>DateModified</b>	<b>BS</b> <b>TR</b>	Date and time at which the information in the object was created or last modified. This is a read-only property obtained from the <b>BizTalkBase</b> object.
<b>Format</b>	<b>BS</b> <b>TR</b>	String that identifies the type of envelope.
<b>Handle</b>	<b>long</b>	Handle to the object. This is a read-only property obtained from the <b>BizTalkBase</b> object.
<b>Name</b>	<b>BS</b> <b>TR</b>	Name of the object. This is a required property obtained from the <b>BizTalkBase</b> object.
<b>NameSpace</b>	<b>BS</b> <b>TR</b>	String that resolves naming conflicts between elements in an envelope specification. This is a read-only property.
<b>Reference</b>	<b>BS</b> <b>TR</b>	Full Web Distributed Authoring and Versioning (WebDAV) URL name of the envelope format specification file. This is a required property if the <b>Format</b> property is set to "custom".
<b>Version</b>	<b>BS</b> <b>TR</b>	Version of the envelope format specification. This is a read-only property.

The methods of the **BizTalkEnvelope** object are shown in the following table.

Method	Description
<b>Clear</b>	Clears the object in memory. All member variables of the object in memory are initialized to their default values. This method is obtained from the <b>BizTalkBase</b> object.
<b>Create</b>	Creates a new object in the database. This method is obtained from the <b>BizTalkBase</b> object.
<b>Load</b>	Loads the object in memory. This method is obtained from the <b>BizTalkBase</b> object.
<b>LoadByName</b>	Loads the object by name in memory. This method is obtained from the <b>BizTalkBase</b> object.
<b>Remove</b>	Removes the object from the database. This method is obtained from the <b>BizTalkBase</b> object.
<b>Save</b>	Saves the object in the database. This method is obtained from the <b>BizTalkBase</b> object.

### Remarks

All document instances in an electronic data interchange (EDI) functional group must have the same format. All document instances must have the same document type as the associated envelope. For example, if **Format** is set to X12, the **Type** property of the **BizTalkDocument** objects for the associated **BizTalkPort** object must also be X12.

If you use an envelope with an EDIFACT format and you want to use a null value for the empty qualifier in the header for the source or the destination, create a custom identifier with a single dash (-) as the qualifier. To do this, use the **CreateAlias** method on the **BizTalkOrganization** object. When an empty qualifier is encountered on an input EDIFACT envelope, the server converts the empty qualifier to a dash. For an output EDIFACT envelope, the server converts the dash to an empty qualifier.

The **BizTalkEnvelope** object is required for input documents if the **Type** property of the **BizTalkDocument** object is set to "flatfile" or "custom xml".

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

## **Related Topic**

[Envelopes](#)

# IBizTalkEnvelope::Content Property

## IBizTalkEnvelope::Content Property [C++]

## BizTalkEnvelope.Content Property [Visual Basic]

The **Content** property contains the contents of the selected envelope format specification.

### Syntax

[C++]

```
HRESULT get_Content(  
    BSTR* pstrContent  
);
```

[Visual Basic]

*object*.**Content**

### Parameters

[C++]

*pstrContent*

[out, retval] Pointer to a **BSTR** that contains the content.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the content.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

The **Reference** property is checked when the **Create** or the **Save** method is called. If this string is not empty when **Create** is called, **Content** is set to the contents of the envelope specification, and the **NameSpace** property is changed to the value found in the envelope specification.

Once you have created or saved an object with **Reference** set to an envelope specification, any changes you make to the **Content** or **NameSpace** of the referenced envelope specification are not automatically updated on the referring object. To update the object that refers to the revised envelope specification, you must save the envelope specification, reset the **Reference** property of the object to its current value, and then call **Save** on the referring object.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkEnvelope::Format Property

## IBizTalkEnvelope::Format Property [C++]

## BizTalkEnvelope.Format Property [Visual Basic]

The **Format** property contains the string that identifies the type of envelope.

### Syntax

[C++]

Get method:

```
HRESULT get_Format(  
    BSTR* pstrFormat  
);
```

Put method:

```
HRESULT put_Format(  
    BSTR Format  
);
```

[Visual Basic]

*object*.**Format**

### Parameters

[C++]

Get method:

*pstrFormat*

[out, retval] Pointer to a **BSTR** that contains the envelope format.

Put method:

*Format*

[in] **BSTR** that contains the envelope format. The **BSTR** must be one of the values listed in the Remarks section below.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the envelope format.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

The format value must be one of the following strings:

- x12

- edifact
- custom xml (default)
- custom
- flatfile
- reliable

#### **Note**

- Any string other than the ones listed here will cause an error at run time.

If this property is set to "custom", the **Reference** property is required. Also, a custom parser component has to be registered with the server for input documents with this property set to "custom". For more information about custom parser components, see [Using the IBizTalkParserComponent Interface](#).

All document instances must have the same document type as the associated envelope. For example, if **Format** is set to "x12", the **Type** property of the **BizTalkDocument** objects must also be "x12".

If **Format** is set to X12, edifact, or reliable, the **Reference** property should not be set.

For more information about envelope formats, see [Create envelopes](#).

## **Requirements**

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

## **Related Topic**

[Envelopes](#)

# IBizTalkEnvelope::NameSpace Property

## IBizTalkEnvelope::NameSpace Property [C++]

## BizTalkEnvelope.NameSpace Property [Visual Basic]

The **NameSpace** property contains the string that resolves naming conflicts between elements in an envelope specification.

### Syntax

[C++]

Get method:

```
HRESULT get_NameSpace (  
    BSTR* pstrNameSpace  
);
```

[Visual Basic]

*object*.NameSpace

### Parameters

[C++]

*pstrNameSpace*

[out, retval] Pointer to a **BSTR** that contains the namespace.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the namespace.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property. The **Reference** property is checked when the **Create** or the **Save** method is called. If this string is not empty when **Create** is called, the **Content** property is set to the contents of the envelope specification, and **NameSpace** is changed to the value found in the envelope specification.

Once you have created or saved an object with **Reference** set to an envelope specification, any changes you make to the **Content** or **NameSpace** of the referenced envelope specification are not automatically updated on the referring object. To update the object that refers to the revised envelope specification, you must save the envelope specification, reset the **Reference** property of the object to its current value, and then call **Save** on the referring object.

### Note

- When creating an envelope, the number of characters in the **NameSpace** combined with the number of characters in the specification name cannot exceed 255.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkEnvelope::Reference Property

## IBizTalkEnvelope::Reference Property [C++]

## BizTalkEnvelope.Reference Property [Visual Basic]

The **Reference** property contains the full Web Distributed Authoring and Versioning (WebDAV) URL of the envelope format specification file.

### Syntax

[C++]

Get method:

```
HRESULT get_Reference(  
    BSTR* pReference  
);
```

Put method:

```
HRESULT put_Reference(  
    BSTR Reference  
);
```

[Visual Basic]

*object*.**Reference**

### Parameters

[C++]

Get method:

*pReference*

[out, retval] Pointer to a **BSTR** that contains the reference.

Put method:

*Reference*

[in] **BSTR** that contains the reference.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the reference.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a required property if the **Format** property is set to "custom". **Reference** is checked when the **Create** or the **Save** method is called. If this string is not empty when **Create** is called, the **Content** property is set to the contents of the envelope specification, and the **NameSpace** property is changed to the value found in the envelope specification.

Once you have created or saved an object with **Reference** set to an envelope specification, any changes you make to the **Content** or **NameSpace** of the referenced envelope specification are not automatically updated on the referring object. To update the object that refers to the revised envelope specification, you must save the envelope specification, reset the **Reference** property of the object to its current value, and then call **Save** on the referring object.

## **Requirements**

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkEnvelope::Version Property

## IBizTalkEnvelope::Version Property [C++]

## BizTalkEnvelope.Version Property [Visual Basic]

The **Version** property contains the version of the envelope format specification.

### Syntax

[C++]

Get method:

```
HRESULT get_Version(  
    BSTR* pstrVersion  
);
```

[Visual Basic]

*object*.Version

### Parameters

[C++]

*pstrVersion*

[out, retval] Pointer to a **BSTR** that contains the version.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the version.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkLoggingInfo Interface

## IBizTalkLoggingInfo Interface [C++]

## BizTalkLoggingInfo Object [Visual Basic]

Use the **BizTalkLoggingInfo** object to configure the document-logging information for an associated **BizTalkChannel** object.

In C++, use the **IBizTalkLoggingInfo** interface to access the methods of the **BizTalkLoggingInfo** object.

The **IBizTalkLoggingInfo** interface defines the following properties:

Property	Type	Description
<a href="#">LogNativeInputDocument</a>	VARIANT_BOOL	Flag that indicates whether the input document instance is saved and logged in its native format.
<a href="#">LogNativeOutputDocument</a>	VARIANT_BOOL	Flag that indicates whether the output document instance is saved and logged in its native format.
<a href="#">LogXMLInputDocument</a>	VARIANT_BOOL	Flag that indicates whether the XML input document is saved and logged.
<a href="#">LogXMLOutputDocument</a>	VARIANT_BOOL	Flag that indicates whether the XML output document is saved and logged.

### Remarks

The **BizTalkLoggingInfo** object is automatically created when a **BizTalkChannel** object is instantiated with the **CreateChannel** method of the **BizTalkConfig** object. You can access the **BizTalkLoggingInfo** object by using the **LoggingInfo** property of the **BizTalkChannel** object.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

### Related Topic

[Document Storage](#)

# IBizTalkLoggingInfo::LogNativeInputDocument Property

## IBizTalkLoggingInfo::LogNativeInputDocument Property [C++]

## BizTalkLoggingInfo.LogNativeInputDocument Property [Visual Basic]

The **LogNativeInputDocument** property contains the flag that indicates whether the input document instance is saved and logged in its native format.

### Syntax

[C++]

Get method:

```
HRESULT get_LogNativeInputDocument(  
    VARIANT_BOOL* pbLogNativeInDoc  
);
```

Put method:

```
HRESULT put_LogNativeInputDocument(  
    VARIANT_BOOL bLogNativeInDoc  
);
```

[Visual Basic]

```
object.LogNativeInputDocument
```

### Parameters

[C++]

Get method:

*pbLogNativeInDoc*

[out, retval] Pointer to a **VARIANT\_BOOL** type that contains the flag. A value of VARIANT\_TRUE indicates that input documents will be saved and logged in their native format. A value of VARIANT\_FALSE indicates that input documents will not be saved and logged in their native format.

Put method:

*bLogNativeInDoc*

[in] **VARIANT\_BOOL** type that contains the flag. A value of VARIANT\_TRUE indicates that documents will be saved and logged in their native format. A value of VARIANT\_FALSE indicates that documents will not be saved and logged in their native format.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Variant** that contains the flag. A value of **True** indicates that input documents will be saved and logged in their native format. A value of **False** indicates that input documents will not be saved and logged in their native format.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

## Related Topic

[Document Storage](#)

# IBizTalkLoggingInfo::LogNativeOutputDocument Property

## IBizTalkLoggingInfo::LogNativeOutputDocument Property [C++]

## BizTalkLoggingInfo.LogNativeOutputDocument Property [Visual Basic]

The **LogNativeOutputDocument** property contains the flag that indicates whether the output document instance is saved and logged in its native format.

### Syntax

[C++]

Get method:

```
HRESULT get_LogNativeOutputDocument(  
    VARIANT_BOOL* pbLogNativeOutDoc  
);
```

Put method:

```
HRESULT put_LogNativeOutputDocument(  
    VARIANT_BOOL bLogNativeOutDoc  
);
```

[Visual Basic]

*object*.LogNativeOutputDocument

### Parameters

[C++]

Get method:

*pbLogNativeOutDoc*

[out, retval] Pointer to a **VARIANT\_BOOL** type that contains the flag. A value of VARIANT\_TRUE indicates that output documents will be saved and logged in their native format. A value of VARIANT\_FALSE indicates that output documents will not be saved and logged in their native format.

Put method:

*bLogNativeOutDoc*

[in] **VARIANT\_BOOL** type that contains the flag. A value of VARIANT\_TRUE indicates that output documents will be saved and logged in their native format. A value of VARIANT\_FALSE indicates that output documents will not be saved and logged in their native format.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Variant** that contains the flag. A value of **True** indicates that output documents will be saved and logged in their native format. A value of **False** indicates that output documents will not be saved and logged in their native format.

## Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

### Related Topic

[Document Storage](#)

# IBizTalkLoggingInfo::LogXMLInputDocument Property

## IBizTalkLoggingInfo::LogXMLInputDocument Property [C++]

## BizTalkLoggingInfo.LogXMLInputDocument Property [Visual Basic]

The **LogXMLInputDocument** property contains the flag that indicates whether the XML input document instance is saved and logged.

### Syntax

[C++]

Get method:

```
HRESULT get_LogXMLInputDocument(  
    VARIANT_BOOL* pbLogXMLInDoc  
);
```

Put method:

```
HRESULT put_LogXMLInputDocument(  
    VARIANT_BOOL bLogXMLInDoc  
);
```

[Visual Basic]

*object*.LogXMLInputDocument

[C++]

Get method:

*pbLogXMLInDoc*

[out, retval] Pointer to a **VARIANT\_BOOL** type that contains the flag. A value of VARIANT\_TRUE indicates that input documents will be saved and logged in XML format. A value of VARIANT\_FALSE indicates that input documents will not be saved and logged in XML format.

Put method:

*bLogXMLInDoc*

[in] **VARIANT\_BOOL** type that contains the flag. A value of VARIANT\_TRUE indicates that input documents will be saved and logged in XML format. A value of VARIANT\_FALSE indicates that input documents will not be saved and logged in XML format.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Variant** that contains the flag. A value of **True** indicates that input documents will be saved and logged in XML format. A value of **False** indicates that input documents will not be saved and logged in XML format.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

## Related Topic

[Document Storage](#)

# IBizTalkLoggingInfo::LogXMLOutputDocument Property

## IBizTalkLoggingInfo::LogXMLOutputDocument Property [C++]

## BizTalkLoggingInfo.LogXMLOutputDocument Property [Visual Basic]

The **LogXMLOutputDocument** property contains a flag that indicates whether the XML output document instance is saved and logged.

### Syntax

[C++]

Get method:

```
HRESULT get_LogXMLOutputDocument(  
    VARIANT_BOOL* pbLogXMLOutDoc  
);
```

Put method:

```
HRESULT put_LogXMLOutputDocument(  
    VARIANT_BOOL bLogXMLOutDoc  
);
```

[Visual Basic]

*object*.LogXMLOutputDocument

[C++]

Get method:

*pbLogXMLOutDoc*

[out, retval] Pointer to a **VARIANT\_BOOL** type that contains the flag. A value of VARIANT\_TRUE indicates that output documents will be saved and logged in XML format. A value of VARIANT\_FALSE indicates that output documents will not be saved and logged in XML format.

Put method:

*bLogXMLOutDoc*

[in] When putting the property, a **VARIANT\_BOOL** type that contains the flag. A value of VARIANT\_TRUE indicates that output documents will be saved and logged in XML format. A value of VARIANT\_FALSE indicates that output documents will not be saved and logged in XML format.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Variant** that contains the flag. A value of **True** indicates that output documents will be saved and logged in XML format. A value of **False** indicates that output documents will not be saved and logged in XML format.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

## Related Topic

[Document Storage](#)

# IBizTalkOrganization Interface

## IBizTalkOrganization Interface [C++]

## BizTalkOrganization Object [Visual Basic]

Use the **BizTalkOrganization** object to configure organizations, its organization identifiers (aliases), and the applications within the organization that send and/or receive documents. The application indicates the ultimate source or destination of the document.

In C++, use the **IBizTalkOrganization** interface to access the methods of the **BizTalkOrganization** object.

The properties of the **BizTalkOrganization** object are shown in the following table.

Property	Type	Description
<a href="#">Aliases</a>	IDispatch	ADO recordset of aliases that refer to the object. The alias for an object is the organization identifier type/value pair.
<a href="#">Applications</a>	IDispatch	ADO recordset of applications that refer to the object.
<a href="#">Comments</a>	BSTR	User comments for the object.
<a href="#">DateModified</a>	BSTR	Date and time at which the information in the object was created or last modified. This is a read-only property obtained from the <a href="#">BizTalkBase</a> object.
<a href="#">Handle</a>	long	Identifier for the object. This is a read-only property obtained from the <a href="#">BizTalkBase</a> object.
<a href="#">IsDefault</a>	VARIANT_BOOL	Flag that indicates whether the object is the default organization.
<a href="#">Name</a>	BSTR	Name of the object. This is a required property that is obtained from the <a href="#">BizTalkBase</a> object.

The methods of the **BizTalkOrganization** object are shown in the following table.

Method	Description
<a href="#">Clear</a>	Clears the object in memory. All member variables of the object in memory are initialized to their default values. This method is obtained from the <a href="#">BizTalkBase</a> object.
<a href="#">Create</a>	Creates a new object in the database. This method is obtained from the <a href="#">BizTalkBase</a> object.
<a href="#">CreateAlias</a>	Creates an alias for the object. The alias is the organization identifier type/value pair.
<a href="#">CreateApplication</a>	Creates a new application.
<a href="#">GetDefaultAlias</a>	Gets the default alias for the object.
<a href="#">Load</a>	Loads an object in memory. This method is obtained from the <a href="#">BizTalkBase</a> object.
<a href="#">LoadAlias</a>	Loads an existing alias for the object in memory.
<a href="#">LoadApplication</a>	Loads an application in memory.
<a href="#">LoadByName</a>	Loads an object by name in memory. This method is obtained from the <a href="#">BizTalkBase</a> object.
<a href="#">Remove</a>	Removes the object from the database. This method is obtained from the <a href="#">BizTalkBase</a> object.
<a href="#">RemoveAlias</a>	Removes an alias.
<a href="#">RemoveApplication</a>	Removes an application.
<a href="#">Save</a>	Saves the object to the database. This method is obtained from the <a href="#">BizTalkBase</a> object.
<a href="#">SaveAlias</a>	Saves this alias.
<a href="#">SaveApplication</a>	Saves this application.

### Remarks

A **BizTalkOrganization** object can have more than one application, but each application name must be unique for that object.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

## Related Topic

[Organizations](#)

# IBizTalkOrganization::Aliases Property

## IBizTalkOrganization::Aliases Property [C++]

## BizTalkOrganization.Aliases Property [Visual Basic]

The **Aliases** property returns an ADO recordset that contains information about all aliases that refer to the object. The alias for an object is the organization qualifier/value pair.

### Syntax

[C++]

Get method:

```
HRESULT get_Aliases(  
    IDispatch** ppAliasesDisp  
);
```

[Visual Basic]

*object*.**Aliases**

### Parameters

[C++]

*ppAliasesDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains all aliases that refer to the object.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns an **Object** that contains all aliases that refer to the object.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

BizTalk Messaging Manager refers to aliases as identifiers.

Each record in the ADO recordset returned by this property contains information about the aliases of an existing **BizTalkOrganization** object in the database. The fields in each record contain the following information, listed in order:

- **Handle** assigned to the alias.
- Name specified in the **CreateAlias** method.
- Boolean specified in the **CreateAlias** method.
- Qualifier specified in the **CreateAlias** method.

- Value specified in the **CreateAlias** method.

Additional information about Microsoft ActiveX Data Objects is available on the Microsoft Developer Network at [msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp).

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

## Related Topic

[Organizations](#)

# IBizTalkOrganization::Applications Property

## IBizTalkOrganization::Applications Property [C++]

## BizTalkOrganization.Applications Property [Visual Basic]

The **Applications** property returns an ADO recordset that contains information about all applications that refer to the **Organization** object.

### Syntax

[C++]

Get method:

```
HRESULT get_Applications(  
    IDispatch** ppApplicationsDisp  
);
```

[Visual Basic]

*object*.**Applications**

### Parameters

[C++]

*ppApplicationsDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains all applications that refer to the object.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

### Note

- In addition to the HRESULT values listed on the error messages page, this method returns OLEDB provider errors. Additional information about OLEDB is available on the Microsoft Developer Network at [msdn.microsoft.com/library/default.asp](https://msdn.microsoft.com/library/default.asp).

[Visual Basic]

This property returns an **Object** that contains all applications that refer to the object.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

Each record in the ADO recordset returned by this property contains information about the applications of an existing **BizTalkOrganization** object in the database. The fields in each record contain the following information, listed in order:

- **Handle** assigned to the application.
- Name specified in the **CreateApplication** method.

Additional information about Microsoft ActiveX Data Objects is available on the Microsoft Developer Network at [msdn.microsoft.com/library/default.asp](https://msdn.microsoft.com/library/default.asp).

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkOrganization::Comments Property

## IBizTalkOrganization::Comments Property [C++]

## BizTalkOrganization.Comments Property [Visual Basic]

The **Comments** property contains the user comments for the object.

### Syntax

[C++]

Get method:

```
HRESULT get_Comments(  
    BSTR* pstrComments  
);
```

Put method:

```
HRESULT put_Comments(  
    BSTR strComments  
);
```

[Visual Basic]

*object*.Comments

### Parameters

[C++]

Get method:

*pstrComments*

[out, retval] Pointer to a **BSTR** that contains the comments.

Put method:

*strComments*

[in] When putting the property, a **BSTR** that contains the comments.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the comments.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkOrganization::CreateAlias Method

## IBizTalkOrganization::CreateAlias Method [C++]

## BizTalkOrganization.CreateAlias Method [Visual Basic]

The **CreateAlias** method creates a new alias for this **Organization** object. The alias for an object is the organization identifier that contains a name and a qualifier/value pair.

### Syntax

[C++]

```
HRESULT CreateAlias(  
    BSTR strName,  
    VARIANT_BOOL bDefault,  
    BSTR strQualifier,  
    BSTR strValue  
);
```

[Visual Basic]

```
object.CreateAlias( _  
    strName As String, _  
    bDefault As Boolean, _  
    strQualifier As String, _  
    strValue As String _  
)
```

### Parameters

[C++]

*strName*

[in] **BSTR** that contains the name of the alias.

*bDefault*

[in] **VARIANT\_BOOL** type that contains the flag. This default alias overrides the previous default alias when set to **VARIANT\_TRUE**. A value of **VARIANT\_FALSE** indicates that this alias should not override the previous default alias. If no alias is specified as the default, one is assigned when the **Create** method is called.

*strQualifier*

[in] **BSTR** that contains the qualifier. This parameter cannot be set to "group".

*strValue*

[in] **BSTR** that contains the value.

[Visual Basic]

*strName*

**String** that contains the name of the alias.

*bDefault*

**Boolean** that contains the flag. This default alias overrides the previous default alias when set to **True**. If no alias is specified as the default, one is assigned when the **Create** method is called.

*strQualifier*

**String** that contains the qualifier. This parameter cannot be set to "group".

*strValue*

**String** that contains the value.

## Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None

## Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

## Remarks

More than one alias can be created for a **BizTalkOrganization** object. The organization alias must contain a name that is unique for the specified **BizTalkOrganization** object, and a qualifier/value pair that is unique across all **BizTalkOrganization** objects. One of these aliases must be specified as the default alias for the object.

The server automatically creates an alias named *Organization* with a default identifier of *OrganizationName* and the value set to the organization's name for new organizations. If the organization name is changed, the value is automatically updated with the new name. This alias cannot be removed.

### Note

- When using envelopes with an EDIFACT format and you want to use a null value for the empty qualifier in the header for the source or the destination, create a custom identifier with a single dash (-) as the qualifier.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

## Related Topic

[Organizations](#)

# IBizTalkOrganization::CreateApplication Method

## IBizTalkOrganization::CreateApplication Method [C++]

## BizTalkOrganization.CreateApplication Method [Visual Basic]

The **CreateApplication** method creates a new application.

### Syntax

[C++]

```
HRESULT CreateApplication(  
    BSTR strName  
);
```

[Visual Basic]

```
object.CreateApplication( _  
    strName As String _  
)
```

### Parameters

[C++]

*strName*

[in] **BSTR** that contains the name of the application.

[Visual Basic]

*strName*

**String** that contains the name of the application.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

If a **BizTalkOrganization** object is associated with more than one application, each application name must be unique.

### Notes

- BizTalk Messaging Manager refers to the default organization as the home organization.
- BizTalk Messaging Manager allows applications to be created for the home organization only. The BizTalk Messaging Configuration object model does not enforce this restriction. Therefore, if you create an application for an organization other than the default (home) organization, you cannot modify it using BizTalk Messaging Manager.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

## **Related Topic**

[Organizations](#)

# IBizTalkOrganization::GetDefaultAlias Method

## IBizTalkOrganization::GetDefaultAlias Method [C++]

## BizTalkOrganization.GetDefaultAlias Method [Visual Basic]

The **GetDefaultAlias** method returns the handle to the default alias for the object. The default alias for an object is the default organization identifier type/value pair.

### Syntax

[C++]

```
HRESULT GetDefaultAlias(  
    long* pAliasHandle  
);
```

[Visual Basic]

```
object.GetDefaultAlias()
```

### Parameters

[C++]

*pAliasHandle*

[out, retval] Pointer to a **long** that contains the handle.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This method returns a **Long** that contains the handle.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

### Related Topic

[Organizations](#)

# IBizTalkOrganization::IsDefault Property

## IBizTalkOrganization::IsDefault Property [C++]

## BizTalkOrganization.IsDefault Property [Visual Basic]

The **IsDefault** property contains the flag that indicates whether the object is the default organization.

### Syntax

[C++]

Get method:

```
HRESULT get_IsDefault(  
    VARIANT_BOOL* pbIsDefault  
);
```

[Visual Basic]

*object*.IsDefault

### Parameters

[C++]

Get method:

*pbIsDefault*

[out, retval] Pointer to a **VARIANT\_BOOL** type that indicates whether this organization is the default organization. A value of VARIANT\_TRUE indicates that this organization is the default organization. A value of VARIANT\_FALSE indicates that this organization is not the default organization.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Boolean** that contains the flag. If **True**, this organization is the default organization.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property. There must be one and only one default organization at any time.

#### Note

- BizTalk Messaging Manager refers to the default organization as the home organization.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkOrganization::LoadAlias Method

## IBizTalkOrganization::LoadAlias Method [C++]

## BizTalkOrganization.LoadAlias Method [Visual Basic]

The **LoadAlias** method loads an associated alias for the object in memory. The alias for an object is the organization qualifier/value pair.

### Syntax

[C++]

```
HRESULT LoadAlias(  
    long lAliasHandle,  
    VARIANT* pvarName,  
    VARIANT* pvarDefault,  
    VARIANT* pvarQualifier,  
    VARIANT* pvarValue  
);
```

[Visual Basic]

```
object.LoadAlias( _  
    lAliasHandle As Long, _  
    pvarName As Variant, _  
    pvarDefault As Variant, _  
    pvarQualifier As Variant, _  
    pvarValue As Variant _  
)
```

### Parameters

[C++]

*lAliasHandle*

[in] **Long** that contains the handle to the alias.

*pvarName*

[in, out] Pointer to a **VARIANT** that contains the name of the organization identifier.

*pvarDefault*

[in, out] Pointer to a **VARIANT** that contains the default flag.

*pvarQualifier*

[in, out] Pointer to a **VARIANT** that contains the qualifier of the organization identifier.

*pvarValue*

[in, out] Pointer to a **VARIANT** that contains the value of the organization identifier.

[Visual Basic]

*lAliasHandle*

**Long** that contains the handle to the alias.

*pvarName*

**Variant** that contains the name of the organization identifier.

*pvarDefault*

**Variant** that contains the default flag.

*pvarQualifier*

**Variants** that contains the qualifier of the organization identifier.

*pvarValue*

**Variants** that contains the value of the organization identifier.

## Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None

## Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

## Remarks

The values used with the parameters of this method can be obtained from the [Aliases](#) property.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

## Related Topic

[Organizations](#)

# IBizTalkOrganization::LoadApplication Method

## IBizTalkOrganization::LoadApplication Method [C++]

## BizTalkOrganization.LoadApplication Method [Visual Basic]

The **LoadApplication** method loads an associated application for the object in memory.

### Syntax

[C++]

```
HRESULT LoadApplication(  
    long lApplicationHandle,  
    VARIANT* pvarName  
);
```

[Visual Basic]

```
object.LoadApplication( _  
    lApplicationHandle As Long, _  
    pvarName As Variant _  
)
```

### Parameters

[C++]

*lApplicationHandle*

[in] **Long** that contains the application handle.

*pvarName*

[in, out] Pointer to a **VARIANT** that contains the name of the application.

[Visual Basic]

*lApplicationHandle*

**Long** that contains the application handle.

*pvarName*

**VARIANT** that contains the name of the application.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

The values used with the parameters of this method can be obtained from the [Applications](#) property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkOrganization::RemoveAlias Method

## IBizTalkOrganization::RemoveAlias Method [C++]

## BizTalkOrganization.RemoveAlias Method [Visual Basic]

The **RemoveAlias** method removes an alias. The alias for an object is the organization identifier type/value pair.

### Syntax

[C++]

```
HRESULT RemoveAlias(  
    long lAliasHandle  
);
```

[Visual Basic]

```
object.RemoveAlias( _  
    lAliasHandle As Long _  
)
```

### Parameters

[C++]

*lAliasHandle*

[in] **Long** that contains the handle to the alias.

[Visual Basic]

*lAliasHandle*

**Long** that contains the handle to the alias.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This record cannot be removed if any of the following conditions apply:

- A [BizTalkPort](#) or a [BizTalkChannel](#) object refers to it.
- It has been designated the default organization identifier.
- This alias was autogenerated.

The alias handle can be obtained from the [Aliases](#) property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

## **Related Topic**

[Organizations](#)

# IBizTalkOrganization::RemoveApplication Method

## IBizTalkOrganization::RemoveApplication Method [C++]

## BizTalkOrganization.RemoveApplication Method [Visual Basic]

The **RemoveApplication** method removes an application from the default organization.

### Syntax

[C++]

```
HRESULT RemoveApplication(  
    long lApplicationHandle  
);
```

[Visual Basic]

```
object.RemoveApplication( _  
    lApplicationHandle As Long _  
)
```

### Parameters

[C++]

*lApplicationHandle*

[in] **Long** that contains the handle.

[Visual Basic]

*lApplicationHandle*

**Long** that contains the handle.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This record cannot be removed if a [BizTalkPort](#) or a [BizTalkChannel](#) object refers to it.

The application handle can be obtained from the [Applications](#) property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkOrganization::SaveAlias Method

## IBizTalkOrganization::SaveAlias Method [C++]

## BizTalkOrganization.SaveAlias Method [Visual Basic]

The **SaveAlias** method saves an alias for the object. The alias for an object is the organization identifier type/value pair.

### Syntax

[C++]

```
HRESULT SaveAlias(  
    long lAliasHandle,  
    BSTR strName,  
    VARIANT_BOOL bDefault,  
    BSTR strQualifier,  
    BSTR strValue  
);
```

[Visual Basic]

```
object.SaveAlias( _  
    lAliasHandle As Long, _  
    strName As String, _  
    bDefault As Boolean, _  
    strQualifier As String, _  
    strValue As String _  
)
```

### Parameters

[C++]

*lAliasHandle*

[in] **Long** that contains the handle to the alias.

*strName*

[in] **BSTR** that contains the name of the organization identifier. This parameter cannot be changed if this alias was autogenerated.

*bDefault*

[in] **VARIANT\_BOOL** type that contains the default flag. A value of VARIANT\_TRUE indicates that this is the default alias for the organization. A value of VARIANT\_FALSE indicates that this is not the default alias for the organization.

*strQualifier*

[in] **BSTR** that contains the qualifier of the organization identifier. This parameter cannot be changed if this alias was autogenerated. This parameter cannot be set to "group".

*strValue*

[in] **BSTR** that contains the value of the organization identifier. This parameter cannot be changed if this alias was autogenerated.

[Visual Basic]

*lAliasHandle*

**Long** that contains the handle to the alias.

*strName*

**String** that contains the name of the organization identifier. This parameter cannot be changed if this alias was autogenerated.

*bDefault*

**Variant** that contains the default flag. A value of **True** indicates that this is the default alias for the organization. A value of **False** indicates that this is not the default alias for the organization.

*strQualifier*

**String** that contains the qualifier of the organization identifier. This parameter cannot be changed if this alias was autogenerated. This parameter cannot be set to "group".

*strValue*

**String** that contains the value of the organization identifier. This parameter cannot be changed if this alias was autogenerated.

## Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None

## Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

## Related Topic

[Organizations](#)

# IBizTalkOrganization::SaveApplication Method

## IBizTalkOrganization::SaveApplication Method [C++]

## BizTalkOrganization.SaveApplication Method [Visual Basic]

The **SaveApplication** method saves this application for the default organization object.

### Syntax

[C++]

```
HRESULT SaveApplication(  
    long lApplicationHandle,  
    BSTR strName  
);
```

[Visual Basic]

```
object.SaveApplication( _  
    lApplicationHandle As Long, _  
    strName As String _  
)
```

### Parameters

[C++]

*lApplicationHandle*

[in] **Long** that contains the handle to the application.

*strName*

[in] **BSTR** that contains the name of the application.

[Visual Basic]

*lApplicationHandle*

**Long** that contains the handle to the application.

*strName*

**String** that contains the name of the application.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkPort Interface

## IBizTalkPort Interface [C++]

## BizTalkPort Object [Visual Basic]

The **BizTalkPort** object configures a one-way transfer of a document between organizations and applications. It identifies the source organization and/or application, the destination organization and/or application, the primary transport type, and, if selected, the associated envelope for transmission.

In C++, use the **IBizTalkPort** interface to access the methods of the **BizTalkPort** object.

The properties of the **BizTalkPort** object are shown in the following table.

Property	Type	Description
<b>Channels</b>	<b>IDispatch</b>	ADO recordset that contains information about all <b>BizTalkChannel</b> objects that refer to the object. This is a read-only property.
<b>Comments</b>	<b>BSTR</b>	User comments for the <b>Port</b> object.
<b>ControlNumberValue</b>	<b>BSTR</b>	Value of the interchange control number. This is a required property if the <b>Format</b> property of the associated <b>BizTalkEnvelope</b> object is set to "x12", "edifact", or "custom". This constraint is not enforced for this release, but the server fails if it is not adhered to.
<b>DateModified</b>	<b>BSTR</b>	Date and time at which the information in the object was created or last modified. This is a read-only property obtained from the <b>BizTalkBase</b> object.
<b>Delimiters</b>	<b>IDispatch</b>	<b>Dictionary</b> object that contains all delimiters used in the document specification. This is a required property if the <b>Format</b> property of the associated <b>BizTalkEnvelope</b> object is set to "x12", "edifact", or "custom".
<b>DestinationEndpoint</b>	<b>IDispatch</b>	Information about the destination.
<b>EncodingType</b>	<b>BIZTALK_ENCODING_TYPE</b>	Enumeration value that indicates the type of document encoding.
<b>EncryptionCertificateInfo</b>	<b>IDispatch</b>	Information about the certificate that encrypts the document.
<b>EncryptionType</b>	<b>BIZTALK_ENCRYPTION_TYPE</b>	Enumeration value that indicates the type of document encryption.
<b>Envelope</b>	<b>long</b>	Handle to the <b>BizTalkEnvelope</b> object associated with this <b>BizTalkPort</b> object.
<b>Handle</b>	<b>long</b>	Handle to the object. This is a read-only property obtained from the <b>BizTalkBase</b> object.
<b>Name</b>	<b>BSTR</b>	Name of the object. This is a required property obtained from the <b>BizTalkBase</b> object.
<b>PrimaryTransport</b>	<b>IDispatch</b>	Primary transport component information.
<b>SecondaryTransport</b>	<b>IDispatch</b>	Secondary transport component information.
<b>ServiceWindowInfo</b>	<b>IDispatch</b>	Service window information.
<b>SignatureType</b>	<b>BIZTALK_SIGNATURE_TYPE</b>	Enumeration value that indicates the type of digital signing and verification.

The methods of the **BizTalkPort** object are shown in the following table.

Method	Description
--------	-------------

<b>Clear</b>	Clears the object in memory. All the member variables of the object in memory are initialized to their default values. This method is obtained from the <b>BizTalkBase</b> object.
<b>Create</b>	Creates a new object in the database. This method is obtained from the <b>BizTalkBase</b> object.
<b>Load</b>	Loads the object in memory. This method is obtained from the <b>BizTalkBase</b> object.
<b>LoadByName</b>	Loads the object by name in memory. This method is obtained from the <b>BizTalkBase</b> object.
<b>Remove</b>	Removes the object from the database. This method is obtained from the <b>BizTalkBase</b> object.
<b>Save</b>	Saves the object in the database. This method is obtained from the <b>BizTalkBase</b> object.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

## Related Topics

[Document Processing](#)

[Messaging Ports](#)

# IBizTalkPort::Channels Property

## IBizTalkPort::Channels Property [C++]

## BizTalkPort.Channels Property [Visual Basic]

The **Channels** property contains an ADO recordset that contains information about all **BizTalkChannel** objects that refer to the object.

### Syntax

[C++]

Get method:

```
HRESULT get_Channels(  
    IDispatch** ppChannelsDisp  
);
```

[Visual Basic]

*object*.Channels

### Parameters

[C++]

*ppChannelsDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains the **BizTalkChannel** objects that refer to the object.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns an **Object** that contains the **BizTalkChannel** objects that refer to the object.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

Each record in the ADO recordset returned by this property contains information about the **BizTalkChannel** objects in the database that are associated with this **BizTalkPort** object. The fields in each record contain the following information, listed in order:

- **Handle**
- **Name**
- A unique channel identifier, in GUID format.

Additional information about Microsoft ActiveX Data Objects is available on the Microsoft Developer Network at [msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp).

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkPort::Comments Property

## IBizTalkPort::Comments Property [C++]

## BizTalkPort.Comments Property [Visual Basic]

The **Comments** property contains the user comments for the **Port** object.

### Syntax

[C++]

Get method:

```
HRESULT get_Comments(  
    BSTR* pstrComments  
);
```

Put method:

```
HRESULT put_Comments(  
    BSTR strComments  
);
```

[Visual Basic]

*object*.Comments

### Parameters

[C++]

Get method:

*pstrComments*

[out, retval] Pointer to a **BSTR** that contains the comments.

Put method:

*strComments*

[in] **BSTR** that contains the comments.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the comments.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkPort::ControlNumberValue Property

## IBizTalkPort::ControlNumberValue Property [C++]

## BizTalkPort.ControlNumberValue Property [Visual Basic]

The **ControlNumberValue** property contains the value of the interchange control number.

### Syntax

[C++]

```
HRESULT get_ControlNumberValue(  
    BSTR* pstrControlNumberValue  
);
```

Put method:

```
HRESULT put_ControlNumberValue(  
    BSTR strControlNumberValue  
);
```

[Visual Basic]

*object*.ControlNumberValue

### Parameters

[C++]

Get method:

*pstrControlNumberValue*

[out, retval] Pointer to a **BSTR** that contains the interchange control number.

Put method:

*strControlNumberValue*

[in] **BSTR** that contains the interchange control number.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the interchange control number.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

The **ControlNumberValue** property must contain a value between 1 and 999999999.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkPort::Delimiters Property

## IBizTalkPort::Delimiters Property [C++]

## BizTalkPort.Delimiters Property [Visual Basic]

The **Delimiters** property contains a **Dictionary** object that contains all delimiters used in the document specification. **Delimiters** specifies which characters to use to separate data within the envelope and the documents that are sent using this envelope.

### Syntax

[C++]

Get method:

```
HRESULT get_Delimiters(  
    IDispatch** ppDelimitersDisp  
);
```

Putref method:

```
HRESULT putref_Delimiters(  
    IDispatch* pDelimitersDisp  
);
```

[Visual Basic]

*object*.Delimiters

### Parameters

[C++]

Get method:

*ppDelimitersDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains the delimiters.

Putref method:

*pDelimitersDisp*

[in] Pointer to an **IDispatch** interface that contains the delimiters.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns an **Object** that contains the delimiters.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a required property for the object to be complete if the **Format** property of the associated **BizTalkEnvelope** object is set to "x12", "edifact", or "custom". The **PropertySet** property of the associated **BizTalkDocument** object must also be defined. The following table shows which names are required for the delimiters of the **Dictionary** object for various formats:

<b>Delimiter</b>	<b>X12</b>	<b>EDIFACT</b>
Record_delim	Yes	Yes
Field_delim	Yes	Yes
Subfield_delim	Yes	Yes
Escape_char	No	Yes

## **Requirements**

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkPort::DestinationEndpoint Property

## IBizTalkPort::DestinationEndpoint Property [C++]

## BizTalkPort.DestinationEndpoint Property [Visual Basic]

The **DestinationEndpoint** property contains information about the destination. This information includes the **Alias**, **Application**, and **Organization** properties and is created and stored in memory in the **BizTalkEndPoint** object.

### Syntax

[C++]

Get method:

```
HRESULT get_DestinationEndpoint(  
    IDispatch** ppDestEndpointDisp  
);
```

Putref method:

```
HRESULT putref_DestinationEndpoint(  
    IDispatch* pDestEndpointDisp  
);
```

[Visual Basic]

*object*.DestinationEndpoint

### Parameters

[C++]

Get method:

*ppDestEndpointDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains information about the destination.

Putref method:

*pDestEndpointDisp*

[in] Pointer to an **IDispatch** interface that contains information about the destination.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns an **Object** that contains information about the destination.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

Once a **BizTalkPort** object has been created, the destination **BizTalkOrganization** object cannot be changed.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkPort::EncodingType Property

## IBizTalkPort::EncodingType Property [C++]

## BizTalkPort.EncodingType Property [Visual Basic]

The **EncodingType** property contains the enumeration value that indicates the type of document encoding.

### Syntax

[C++]

Get method:

```
HRESULT get_EncodingType(  
    BIZTALK_ENCODING_TYPE* pEncodingType  
);
```

Put method:

```
HRESULT put_EncodingType(  
    BIZTALK_ENCODING_TYPE EncodingType  
);
```

[Visual Basic]

*object*.**EncodingType**

### Parameters

[C++]

Get method:

*pEncodingType*

[out, retval] Pointer to an enumeration value. Valid values are from the [BIZTALK\\_ENCODING\\_TYPE](#) enumeration.

Put method:

*EncodingType*

[in] When putting the property, an enumeration value. Valid values are from the **BIZTALK\_ENCODING\_TYPE** enumeration.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns an enumeration value. Valid values are from the [BIZTALK\\_ENCODING\\_TYPE](#) enumeration.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

The [Clear](#) method sets **EncodingType** to **BIZTALK\_ENCODING\_TYPE\_NONE**.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkPort::EncryptionCertificateInfo Property

## IBizTalkPort::EncryptionCertificateInfo Property [C++]

## BizTalkPort.EncryptionCertificateInfo Property [Visual Basic]

The **EncryptionCertificateInfo** property contains information about the certificate that encrypts the document. This information includes the **Name**, **Reference**, **Store**, and **Usage** properties and is created and stored in memory in the **BizTalkCertificateInfo** object.

### Syntax

[C++]

Get method:

```
HRESULT get_EncryptionCertificateInfo(  
    IDispatch** ppEncryptionCertificateInfoDisp  
);
```

Putref method:

```
HRESULT putref_EncryptionCertificateInfo(  
    IDispatch* pEncryptionCertificateInfoDisp  
);
```

[Visual Basic]

*object*.**EncryptionCertificateInfo**

### Parameters

[C++]

Get method:

*ppEncryptionCertificateInfoDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains the certificate information.

Putref method:

*pEncryptionCertificateInfoDisp*

[in] Pointer to an **IDispatch** interface that contains the certificate information.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns an **Object** that contains the certificate information.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkPort::EncryptionType Property

## IBizTalkPort::EncryptionType Property [C++]

## BizTalkPort.EncryptionType Property [Visual Basic]

The **EncryptionType** property contains the enumeration value that indicates the type of document encryption.

### Syntax

[C++]

Get method:

```
HRESULT get_EncryptionType(  
    BIZTALK_ENCRYPTION_TYPE* pEncryptionType  
);
```

Put method:

```
HRESULT put_EncryptionType(  
    BIZTALK_ENCRYPTION_TYPE EncryptionType  
);
```

[Visual Basic]

*object*.**EncryptionType**

### Parameters

[C++]

Get method:

*pEncryptionType*

[out, retval] Pointer to an enumeration value. Valid values are from the **BIZTALK\_ENCRYPTION\_TYPE** enumeration.

Put method:

*EncryptionType*

[in] Enumeration value. Valid values are from the **BIZTALK\_ENCRYPTION\_TYPE** enumeration.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns an enumeration value. Valid values are from the **BIZTALK\_ENCRYPTION\_TYPE** enumeration.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

The **Clear** method sets **EncryptionType** to **BIZTALK\_ENCRYPTION\_TYPE\_NONE**.

If the **EncryptionType** is set to **BIZTALK\_ENCRYPTION\_TYPE\_SMIME**, then the **EncryptionCertificateInfo** property must be set.

For open messaging ports, **EncryptionType** must be set to **BIZTALK\_ENCRYPTION\_TYPE\_NONE**.

## **Requirements**

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkPort::Envelope Property

## IBizTalkPort::Envelope Property [C++]

## BizTalkPort.Envelope Property [Visual Basic]

The **Envelope** property contains the handle to the associated [BizTalkEnvelope](#) object.

### Syntax

[C++]

Get method:

```
HRESULT get_Envelope(  
    long* plEnvelopeHandle  
);
```

Put method:

```
HRESULT put_Envelope(  
    long lEnvelopeHandle  
);
```

[Visual Basic]

*object*.**Envelope**

### Parameters

[C++]

Get method:

*plEnvelopeHandle*

[out, retval] Pointer to a **long** that contains the handle to the object.

Put method:

*lEnvelopeHandle*

[in] **Long** that contains the handle to the object.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Long** that contains the handle to the object.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

## Related Topic

[Envelopes](#)

# IBizTalkPort::PrimaryTransport Property

## IBizTalkPort::PrimaryTransport Property [C++]

## BizTalkPort.PrimaryTransport Property [Visual Basic]

The **PrimaryTransport** property contains the primary transport component information, including the [Address](#), [Parameter](#), and [Type](#) properties of the [BizTalkTransportInfo](#) object.

### Syntax

[C++]

Get method:

```
HRESULT get_PrimaryTransport(  
    IDispatch** ppTransportInfoDisp  
);
```

Putref method:

```
HRESULT putref_PrimaryTransport(  
    IDispatch* pTransportInfoDisp  
);
```

[Visual Basic]

*object*.PrimaryTransport

### Parameters

[C++]

Get method:

*ppTransportInfoDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains the primary transport component information.

Putref method:

*pTransportInfoDisp*

[in] Pointer to an **IDispatch** interface that contains the primary transport component information.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns an **Object** that contains the primary transport component information.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a required property for the object.

The following constraints are enforced:

- If the **Openness** property of the associated **BizTalkEndPoint** object is set to **BIZTALK\_OPENNESS\_TYPE\_EX\_DESTINATION**, the **Address** property cannot be set, and **PrimaryTransport** must be set to **BIZTALK\_TRANSPORT\_TYPE\_OPENDESTINATION**. The **BizTalkServiceWindowInfo** object cannot be used with open destination ports.
- Once a **BizTalkPort** object has been created, the **Openness** property of the associated **BizTalkEndPoint** object cannot be changed.
- The **Openness** property cannot be set to **BIZTALK\_OPENNESS\_TYPE\_EX\_SOURCE** or **BIZTALK\_OPENNESS\_TYPE\_EX\_FROMWORKFLOW**.
- When using a **Type** of **BIZTALK\_TRANSPORT\_TYPE\_LOOPBACK**, the primary and secondary transport **Address** property cannot be set, and the **BizTalkServiceWindowInfo** object cannot be used.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkPort::SecondaryTransport Property

## IBizTalkPort::SecondaryTransport Property [C++]

## BizTalkPort.SecondaryTransport Property [Visual Basic]

The **SecondaryTransport** property contains the secondary transport component information, including the **Address**, **Parameter**, and **Type** properties, and is created and stored in memory in the **BizTalkTransportInfo** object.

### Syntax

[C++]

Get method:

```
HRESULT get_SecondaryTransport(  
    IDispatch** ppTransportInfoDisp  
);
```

Putref method:

```
HRESULT putref_SecondaryTransport(  
    IDispatch* pTransportInfoDisp  
);
```

[Visual Basic]

*object*.SecondaryTransport

### Parameters

[C++]

Get method:

*ppTransportInfoDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains the secondary transport component information.

Putref method:

*pTransportInfoDisp*

[in] Pointer to an **IDispatch** interface that contains the secondary transport component information.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This method returns an **Object** that contains the secondary transport component information.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a required property for the object to be complete.

The following constraints are enforced:

- If the **Openness** property of the associated **BizTalkEndPoint** object is set to **BIZTALK\_OPENNESS\_TYPE\_EX\_DESTINATION**, the **Address** property cannot be set, and **SecondaryTransport** must be set to **BIZTALK\_TRANSPORT\_TYPE\_OPENDESTINATION**.
- Once a **BizTalkPort** object has been created, the **Openness** property of the associated **BizTalkEndPoint** object cannot be changed.
- The **Openness** property cannot be set to **BIZTALK\_OPENNESS\_TYPE\_EX\_SOURCE** or **BIZTALK\_OPENNESS\_TYPE\_EX\_FROMWORKFLOW**.
- The **Type** property cannot be set to **BIZTALK\_TRANSPORT\_TYPE\_LOOPBACK**.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkPort::ServiceWindowInfo Property

## IBizTalkPort::ServiceWindowInfo Property [C++]

## BizTalkPort.ServiceWindowInfo Property [Visual Basic]

The **ServiceWindowInfo** property contains information about the service window. This information includes the **FromTime**, **IsEnabled**, and **ToTime** properties and is created and stored in memory in the **BizTalkServiceWindowInfo** object.

### Syntax

[C++]

Get method:

```
HRESULT get_ServiceWindowInfo(  
    IDispatch** ppServiceWindowInfoDisp  
);
```

Putref method:

```
HRESULT putref_ServiceWindowInfo(  
    IDispatch* pServiceWindowInfoDisp  
);
```

[Visual Basic]

*object*.ServiceWindowInfo

### Parameters

[C++]

Get method:

*ppServiceWindowInfoDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains the service window.

Putref method:

*pServiceWindowInfoDisp*

[in] Pointer to an **IDispatch** interface that contains the service window.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This method returns an **Object** that contains information about the service window.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

If this property is used, the **BizTalkServiceWindowInfo** object must specify a valid time range by using the **FromTime** and **ToTime** properties.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkPort::SignatureType Property

## IBizTalkPort::SignatureType Property [C++]

## BizTalkPort.SignatureType Property [Visual Basic]

The **SignatureType** property contains the enumeration value that indicates the type of digital signing and verification.

### Syntax

[C++]

Get method:

```
HRESULT get_SignatureType(  
    BIZTALK_SIGNATURE_TYPE* pSignatureType  
);
```

Put method:

```
HRESULT put_SignatureType(  
    BIZTALK_SIGNATURE_TYPE SignatureType  
);
```

[Visual Basic]

*object*.SignatureType

### Parameters

[C++]

Get method:

*pSignatureType*

[out, retval] Pointer to an enumeration value. Valid values are from the **BIZTALK\_SIGNATURE\_TYPE** enumeration.

Put method:

*SignatureType*

[in] Enumeration value. Valid values are from the **BIZTALK\_SIGNATURE\_TYPE** enumeration.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns an enumeration value. Valid values are from the **BIZTALK\_SIGNATURE\_TYPE** enumeration.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

The **Clear** method sets **SignatureType** to **BIZTALK\_SIGNATURE\_TYPE\_NONE**.

**BizTalkPort** objects associated with open channels cannot have a **SignatureType**.

If the **SignatureType** on a **BizTalkPort** object is changed from **BIZTALK\_SIGNATURE\_TYPE\_NONE** to **BIZTALK\_SIGNATURE\_TYPE\_SMIME**, all channels associated with this **BizTalkPort** object must have already been saved with a **SignatureCertificateInfo** object. Also, if a **BizTalkChannel** contains a **SignatureCertificateInfo** object and the **SignatureType** of the **BizTalkPort** is set to **BIZTALK\_SIGNATURE\_TYPE\_NONE**, the signature will be ignored.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkPortGroup Interface

## IBizTalkPortGroup Interface [C++]

## BizTalkPortGroup Object [Visual Basic]

Use the **BizTalkPortGroup** object to configure port groups that are used to distribute the same document to many organizations.

In C++, use the **IBizTalkPortGroup** interface to access the methods of the **BizTalkPortGroup** object.

The properties of the **BizTalkPortGroup** object are shown in the following table.

Property	Type	Description
<b>Channels</b>	<b>IDispatch</b>	ADO recordset that contains information about all <b>BizTalkChannel</b> objects that refer to this object.
<b>DateModified</b>	<b>BSTR</b>	Date and time at which the information in the object was created or last modified. This is a read-only property obtained from the <b>BizTalkBase</b> object.
<b>Handle</b>	<b>long</b>	Handle to the object. This is a read-only property obtained from the <b>BizTalkBase</b> object.
<b>Name</b>	<b>BSTR</b>	Name of the object. This is a required property obtained from the <b>BizTalkBase</b> object.
<b>Ports</b>	<b>IDispatch</b>	ADO recordset that contains information about all <b>BizTalkPort</b> objects that refer to this object.

The methods of the **BizTalkPortGroup** object are shown in the following table.

Method	Description
<b>AddPort</b>	Adds a <b>BizTalkPort</b> object to this port group. There must be at least one <b>BizTalkPort</b> object in the port group.
<b>Clear</b>	Clears the object in memory. All member variables of the object in memory are initialized to their default values. This method is obtained from the <b>BizTalkBase</b> object.
<b>Create</b>	Creates a new object in the database. This method is obtained from the <b>BizTalkBase</b> object.
<b>Load</b>	Loads the object in memory. This method is obtained from the <b>BizTalkBase</b> object.
<b>LoadByName</b>	Loads the object by name in memory. This method is obtained from the <b>BizTalkBase</b> object.
<b>Remove</b>	Removes the <b>BizTalkPortGroup</b> object from the database. This method is obtained from the <b>BizTalkBase</b> object.
<b>RemovePort</b>	Removes a <b>BizTalkPort</b> object from the port group. There must be at least one <b>BizTalkPort</b> object in the port group.
<b>Save</b>	Saves the object in the database. This method is obtained from the <b>BizTalkBase</b> object.

### Remarks

There must always be at least one **BizTalkPort** object and one **BizTalkChannel** object associated with a **BizTalkPortGroup** object. The **BizTalkChannel** object is associated with the **BizTalkPortGroup** object, not the **BizTalkPort** object within the group. Each **BizTalkPort** object within the group has another **BizTalkChannel** object or objects associated with it, but these are ignored when the port group channel is invoked.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

### Related Topic

[Port Groups](#)

# IBizTalkPortGroup::AddPort Method

## IBizTalkPortGroup::AddPort Method [C++]

## BizTalkPortGroup.AddPort Method [Visual Basic]

The **AddPort** method adds a **BizTalkPort** object to this port group.

### Syntax

[C++]

```
HRESULT AddPort(  
    long lPortHandle  
);
```

[Visual Basic]

```
object.AddPort( _  
    lPortHandle As Long _  
)
```

### Parameters

[C++]

*lPortHandle*

[in] **Long** that contains the handle to the object.

[Visual Basic]

*lPortHandle*

**Long** that contains the handle to the object.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

The following constraints apply to this method:

- There must be at least one **BizTalkPort** in this **BizTalkPortGroup** object.
- The **Openness** property of the associated **BizTalkEndPoint** object to be added must be set to **BIZTALK\_OPENNESS\_TYPE\_NOTOPEN**.
- The port group specified by this object cannot contain any duplicate **BizTalkPort** objects.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkPortGroup::Channels Property

## IBizTalkPortGroup::Channels Property [C++]

## BizTalkPortGroup.Channels Property [Visual Basic]

The **Channels** property contains an ADO recordset that contains information about all **BizTalkChannel** objects that refer to the object.

### Syntax

[C++]

Get method:

```
HRESULT get_Channels(  
    IDispatch** ppChannelsDisp  
);
```

[Visual Basic]

*object*.Channels

### Parameters

[C++]

*ppChannelsDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains an ADO recordset that contains all **BizTalkChannel** objects that refer to the object.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

### Note

- In addition to the HRESULT values listed on the error messages page, this method returns OLEDB provider errors. Additional information about OLEDB is available on the Microsoft Developer Network at [msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp).

[Visual Basic]

This property returns an **Object** that contains all **BizTalkChannel** objects that refer to the object.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

Each record in the ADO recordset returned by this property contains information about the **BizTalkChannel** objects in the database that are associated with this **BizTalkPortGroup** object. The fields in each record contain the following information, listed in order:

- **Handle**
- **Name**

Additional information about Microsoft ActiveX Data Objects is available on the Microsoft Developer Network at [msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp).

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkPortGroup::Ports Property

## IBizTalkPortGroup::Ports Property [C++]

## BizTalkPortGroup.Ports Property [Visual Basic]

The **Ports** property contains an ADO recordset that contains information about all **BizTalkPort** objects that refer to the object.

### Syntax

[C++]

Get method:

```
HRESULT Ports(  
    IDispatch** ppPortsDisp  
);
```

[Visual Basic]

*object*.Ports

### Parameters

[C++]

*ppPortsDisp*

[out, retval] Address of a pointer to an **IDispatch** interface that contains an ADO recordset that contains all **BizTalkPort** objects that refer to the object.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

### Note

- In addition to the HRESULT values listed on the error messages page, this method returns OLEDB provider errors. Additional information about OLEDB is available on the Microsoft Developer Network at [msdn.microsoft.com/library/default.asp](https://msdn.microsoft.com/library/default.asp).

[Visual Basic]

This property returns an **Object** that contains all **BizTalkPort** objects that refer to the object.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

Each record in the ADO recordset returned by this property contains information about the **BizTalkPort** objects in the database that are associated with this **BizTalkPortGroup** object. The fields in each record contain the following information, listed in order:

- **Handle**
- **Name**

Additional information about Microsoft ActiveX Data Objects is available on the Microsoft Developer Network at [msdn.microsoft.com/library/default.asp](https://msdn.microsoft.com/library/default.asp).

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkPortGroup::RemovePort Method

## IBizTalkPortGroup::RemovePort Method [C++]

## BizTalkPortGroup.RemovePort Method [Visual Basic]

The **RemovePort** method removes a **BizTalkPort** object from this port group.

### Syntax

[C++]

```
HRESULT RemovePort(  
    long lPortHandle  
);
```

[Visual Basic]

```
object.RemovePort (   
    lPortHandle As Long _  
 )
```

### Parameters

[C++]

*lPortHandle*

[in] **Long** that contains the handle to the object to remove.

[Visual Basic]

*lPortHandle*

**Long** that contains the handle to the object to remove.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

### Note

- In addition to the HRESULT values listed on the error messages page, this method returns OLEDB provider errors. Additional information about OLEDB is available on the Microsoft Developer Network at [msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

The last **BizTalkPort** object associated with the object cannot be removed. A **BizTalkPort** object cannot be removed if a **BizTalkChannel** object refers to it.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)



# IBizTalkServiceWindowInfo Interface

## IBizTalkServiceWindowInfo Interface [C++]

## BizTalkServiceWindowInfo Object [Visual Basic]

Use the **BizTalkServiceWindowInfo** object to configure the service window for an associated **BizTalkPort** object. The service window indicates a valid time range for transmitting documents.

In C++, use the **IBizTalkServiceWindowInfo** interface to access the methods of the **BizTalkServiceWindowInfo** object.

The properties of the **BizTalkServiceWindowInfo** object are shown in the following table.

Property	Type	Description
<b>FromTime</b>	<b>BSTR</b>	Earliest time that the interchange can be transmitted.
<b>IsEnabled</b>	<b>VARIANT_BOOL</b>	Flag that indicates whether the service window is enabled.
<b>ToTime</b>	<b>BSTR</b>	Latest time that the interchange can be transmitted.

### Remarks

The **BizTalkServiceWindowInfo** object is automatically created when a **BizTalkPort** object is instantiated with the **CreatePort** method of the **BizTalkConfig** object. Access the properties of the **BizTalkServiceWindowInfo** object by using the **ServiceWindowInfo** property of the **BizTalkPort** object.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkServiceWindowInfo::FromTime Property

## IBizTalkServiceWindowInfo::FromTime Property [C++]

## BizTalkServiceWindowInfo.FromTime Property [Visual Basic]

The **FromTime** property indicates the earliest hour of any day that the interchange can be transmitted.

### Syntax

[C++]

Get method:

```
HRESULT get_FromTime(  
    BSTR* pstrFromTime  
);
```

Put method:

```
HRESULT put_FromTime(  
    BSTR strFromTime  
);
```

[Visual Basic]

*object*.FromTime

### Parameters

[C++]

Get method:

*pstrFromTime*

[out, retval] Pointer to a **BSTR** that contains the earliest time that the interchange can be transmitted.

Put method:

*strFromTime*

[in] **BSTR** that contains the earliest time that the interchange can be transmitted.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the earliest time that the interchange can be transmitted.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

The **FromTime** property must contain an integer value between 0 and 23. Fractional values and minutes cannot be specified.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkServiceWindowInfo::IsEnabled Property

## IBizTalkServiceWindowInfo::IsEnabled Property [C++]

## BizTalkServiceWindowInfo.IsEnabled Property [Visual Basic]

The **IsEnabled** property indicates whether a service window is enabled.

### Syntax

[C++]

Get method:

```
HRESULT get_IsEnabled(  
    VARIANT_BOOL* pbIsEnabled  
);
```

Put method:

```
HRESULT put_IsEnabled(  
    VARIANT_BOOL bIsEnabled  
);
```

[Visual Basic]

*object*.IsEnabled

### Parameters

[C++]

Get method:

*pbIsEnabled*

[out, retval] Pointer to a **VARIANT\_BOOL** type that indicates whether a service window is enabled. A value of VARIANT\_TRUE indicates that the service window is enabled. A value of VARIANT\_FALSE indicates that the service window is not enabled.

Put method:

*bIsEnabled*

[in] **VARIANT\_BOOL** type that indicates whether a service window is enabled. A value of VARIANT\_TRUE indicates that the service window is enabled. A value of VARIANT\_FALSE indicates that the service window is not enabled.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that indicates whether a service window is enabled. A value of **True** indicates that the service window is enabled. A value of **False** indicates that the service window is not enabled.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkServiceWindowInfo::ToTime Property

## IBizTalkServiceWindowInfo::ToTime Property [C++]

## BizTalkServiceWindowInfo.ToTime Property [Visual Basic]

The **ToTime** property contains the latest hour of any day that the interchange can be transmitted.

### Syntax

[C++]

Get method:

```
HRESULT get_ToTime(  
    BSTR* pstrToTime  
);
```

Put method:

```
HRESULT put_ToTime(  
    BSTR strToTime  
);
```

[Visual Basic]

*object*.**ToTime**

### Parameters

[C++]

Get method:

*pstrToTime*

[out, retval] Pointer to a **BSTR** that contains the latest time that the interchange can be transmitted.

Put method:

*strToTime*

[in] **BSTR** that contains the latest time that the interchange can be transmitted.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the latest time that the interchange can be transmitted.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

The **ToTime** property must contain an integer value between 0 and 23. Fractional values and minutes cannot be specified.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkTransportInfo Interface

## IBizTalkTransportInfo Interface [C++]

## BizTalkTransportInfo Object [Visual Basic]

Use the **BizTalkTransportInfo** object to configure the transport service for an associated **BizTalkPort** object.

In C++, use the **IBizTalkTransportInfo** interface to access methods of the **BizTalkTransportInfo** object.

The properties of the **BizTalkTransportInfo** object are shown in the following table.

Property	Type	Description
<b>Address</b>	<b>BSTR</b>	Destination address of the primary transport component.
<b>Parameter</b>	<b>BSTR</b>	Required return e-mail address for the associated source <b>BizTalkOrganization</b> object if the <b>Type</b> property is <b>BIZTALK_TRANSPORT_TYPE_SMTP</b> .
<b>Type</b>	<b>BIZTALK_TRANSPORT_TYPE</b>	Enumeration value that indicates the type of transport component to be used for the primary transport.

### Remarks

The **BizTalkTransportInfo** object is automatically created when a **BizTalkPort** object is instantiated with the **CreatePort** method of the **BizTalkConfig** object. Access the **BizTalkTransportInfo** object by using the **PrimaryTransport** or **SecondaryTransport** property of the **BizTalkPort** object.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkTransportInfo::Address Property

## IBizTalkTransportInfo::Address Property [C++]

## BizTalkTransportInfo.Address Property [Visual Basic]

The **Address** property contains the destination address.

### Syntax

[C++]

Get method:

```
HRESULT get_Address(  
    BSTR* pstrTransportAddress  
);
```

Put method:

```
HRESULT put_Address(  
    BSTR strTransportAddress  
);
```

[Visual Basic]

*object*.**Address**

### Parameters

[C++]

Get method:

*pstrTransportAddress*

[out, retval] Pointer to a **BSTR** that contains the address.

Put method:

*strTransportAddress*

[in] **BSTR** that contains the address.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the address.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on [the Error Messages](#) page.

### Remarks

If the **Openness** property of the associated **BizTalkEndPoint** object is set to **BIZTALK\_OPENNESS\_TYPE\_DESTINATION**, **Address** cannot be set, and the **Type** property must be set to **BIZTALK\_TRANSPORT\_TYPE\_OPENDESTINATION**.

**Address** must have one of the following prefixes, according to the **Type** property:

Transport type	Prefix	Example Address value
APPINTEGRATION	Not applicable	{11111111-1111-1111-1111-111111111111}
FILE	file://	file://C:\Test\MyFile.xml
HTTP	http://	http://www.vigorair-18.com/repository/bts.asp
HTTPS	https://	https://www.vigorair-18.com/secure/btss.asp
LOOPBACK	Not applicable	Not applicable
MSMQ	Not applicable	DIRECT=OS:\private\$\myqueue
NONE	Not applicable	Not applicable
OPENDESTINATION	Not applicable	Not applicable
ORCHESTRATIONACTIVATION	Not applicable	C:\XLANG\Schedules\mysched.skx
SMTP	mailto:	mailto:patricia@vigorair-18.com

## Notes

- The queue:// prefix must be used with an open messaging port when a Message Queue is specified as the destination address. For open messaging ports, the address is specified either in the document instance or as a parameter when submitting the document. For more information, see [Routing](#).
- When using the Orchestration Activation Component transport type, the **Address** property must contain the full path of the XLANG schedule on the local computer. The file:// prefix cannot be used when specifying the path of the XLANG schedule (.skx) file.
- When using the HTTP or HTTPS transport types, BizTalk Server sends the data using a proxy server by default. This is the correct setting to transport data to computers outside of your company's firewall. However, when sending data within your company's intranet, you can bypass the use of a proxy server. To do this, you must set the **UseProxy** field to False in the transport dictionary. For more information, see [SetConfigData](#).

When using the file:// transport type, you can include symbols to modify the file name. The file name created by the server contains any static characters you specified in the **Address** property, along with the actual value of the symbol. For example, if the **Address** property is set to "file://C:\Orders\Invoice\_%tracking\_id%.xml", the actual file name would use a format similar to: C:\Orders\Invoice\_{12345678-90AB-CDEF-1234-567890ABCDEF}. The following table contains the symbols that can be used with the file:// transport type:

Symbol	Description	Unique file name
%datetime%	Date and time, in milliseconds, of the file creation. The time is based on Greenwich Mean Time (GMT) rather than local time.	No
%document_name%	Name of the document processed by BizTalk Server.	No
%server%	Host name of the server that processed the document.	No
%tracking_id%	Globally unique tracking number.	Yes
%uid%	Counter that increases over time, represented in milliseconds. This number is reset when the server is rebooted.	No

When sending reliable messaging receipts that use the SMTP transport protocol, the value specified in the identifier named Reliable Messaging Acknowledgement SMTP From Address is used as the From address. This identifier is automatically created for the default **BizTalkOrganization** object. This identifier cannot be removed. You should not modify the name or qualifier for this identifier, but you can modify the value. For more information, see [Processing Receipts Using Reliable Messaging](#).

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IBizTalkTransportInfo::Parameter Property

## IBizTalkTransportInfo::Parameter Property [C++]

## BizTalkTransportInfo.Parameter Property [Visual Basic]

The **Parameter** property contains the required return e-mail address of the associated source **BizTalkOrganization** object if the **Type** property is set to **BIZTALK\_TRANSPORT\_TYPE\_SMTP**.

### Syntax

[C++]

Get method:

```
HRESULT get_Parameter(  
    BSTR* pstrPrimaryTransportParameter  
);
```

Put method:

```
HRESULT put_Parameter(  
    BSTR strPrimaryTransportParameter  
);
```

[Visual Basic]

*object*.Parameter

### Parameters

[C++]

Get method:

*pstrPrimaryTransportParameter*

[out, retval] Pointer to a **BSTR** that contains the address.

Put method:

*strPrimaryTransportParameter*

[in] **BSTR** that contains the address.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the address.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on [the Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)



# IBizTalkTransportInfo::Type Property

## IBizTalkTransportInfo::Type Property [C++]

## BizTalkTransportInfo.Type Property [Visual Basic]

The **Type** property contains the enumeration value that indicates the type of transport component.

### Syntax

[C++]

Get method:

```
HRESULT get_Type(  
    BIZTALK_TRANSPORT_TYPE* pTransportType  
);
```

Put method:

```
HRESULT put_Type(  
    BIZTALK_TRANSPORT_TYPE TransportType  
);
```

[Visual Basic]

*object*.**Type**

### Parameters

[C++]

Get method:

*pTransportType*

[out, retval] Pointer to an enumeration value. Valid values are from the [BIZTALK\\_TRANSPORT\\_TYPE](#) enumeration.

Put method:

*TransportType*

[in] Enumeration value. Valid values are from the [BIZTALK\\_TRANSPORT\\_TYPE](#) enumeration.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns an enumeration value. Valid values are from the [BIZTALK\\_TRANSPORT\\_TYPE](#) enumeration.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on [the Error Messages](#) page.

### Remarks

The following constraints are enforced:

- If the **Openness** property of the associated **BizTalkEndPoint** object is set to **BIZTALK\_OPENNESS\_TYPE\_DESTINATION**, the **Address** property cannot be set, and **Type** must be set to **BIZTALK\_TRANSPORT\_TYPE\_OPENDESTINATION**.

When using the Message Queuing transport type (**BIZTALK\_TRANSPORT\_TYPE\_MSMQ**), the following restrictions apply:

- When using an envelope, the maximum size of a document submitted to BizTalk Server is 4MB.
- When an envelope is not used, the maximum size of a document submitted to BizTalk Server is 2MB.
- When using the **BIZTALK\_TRANSPORT\_TYPE\_SMTP**, the **Parameter** property must be set to the reply-to SMTP address.
- The transport **Type** of **BIZTALK\_TRANSPORT\_TYPE\_ORCHESTRATIONACTIVATION** is supported only when the **Openness** property of the associated **BizTalkEndPoint** object is set to **BIZTALK\_OPENNESS\_TYPE\_TOWORKFLOW**.
- When using the Orchestration activation component type (**BIZTALK\_TRANSPORT\_TYPE\_ORCHESTRATIONACTIVATION**), the maximum size of a document sent to the port on the XLANG schedule is 2MB.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BizTalkObjectModel.h

**Library:** Use Microsoft BizTalk Server Configuration Objects 1.0 Type Library (BizTalkObjectModel.dll)

# IDictionary Interface

## IDictionary Interface [C++]

## CDictionary Object [Visual Basic]

The **Dictionary** object is a collection object that supports the creation, storage, and retrieval of name/value pairs in memory. This object is used by several methods in the BizTalk Messaging Configuration object model.

In C++, use the **IDictionary** interface to access the methods of the **Dictionary** object. In Microsoft Visual Basic, the **CDictionary** class defines the methods and properties of a **Dictionary** object.

The properties of the **Dictionary** object are shown in the following table.

Property	Type	Description
<b>Count</b>	<b>long</b>	Number of entries in the <b>Dictionary</b> object. This is a read-only property.
<b>NewEnum</b>	<b>IUnknown</b>	Returns the <b>IUnknown</b> interface pointer for the <b>Dictionary</b> object. The caller can use this interface pointer to call <b>QueryInterface</b> for the enumerator for this object. This is a read-only property.
<b>Prefix</b>	<b>BSTR</b>	Filter that excludes all entries with a specific prefix when the contents of the <b>Dictionary</b> object are saved.
<b>Value</b>	<b>VARIANT</b>	Value associated with an entry name.

The methods of the **Dictionary** object are shown in the following table.

Method	Description
<b>GetMultiple</b>	Returns the values of multiple entries from the <b>Dictionary</b> object.
<b>PutMultiple</b>	Adds specified entries to the <b>Dictionary</b> object or changes them.

### Remarks

A **Dictionary** object is designed to be a general-purpose collection. Therefore, it can be used for anything that is supported by its internal structure. Every value in a **Dictionary** object is a **Variant**. This means that a **Dictionary** object can be created that consists of almost any kind of value (including other **Dictionary** objects).

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include commerce.h

**Library:** Use Microsoft Commerce 2000 Core Components Type Library (MscsCore.dll)

# IDictionary::Count Property

## IDictionary::Count Property [C++]

## CDictionary.Count Property [Visual Basic]

The **Count** property returns the number of elements in the **Dictionary** object.

### Syntax

[C++]

```
HRESULT get_Count(  
    long* Count  
);
```

[Visual Basic]

*object*.**Count**

### Parameters

[C++]

*Count*

[out, retval] **Long** used to return the count.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Long** that contains the count.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This property is read-only.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include commerce.h

**Library:** Use Microsoft Commerce 2000 Core Components Type Library (MscsCore.dll)

# IDictionary::GetMultiple Method

## IDictionary::GetMultiple Method [C++]

## CDictionary.GetMultiple Method [Visual Basic]

The **GetMultiple** method returns multiple entries from the **Dictionary** object.

### Syntax

[C++]

```
HRESULT GetMultiple(  
    long cb,  
    const LPOLESTR rgolestr[],  
    VARIANT rgvar[]  
);
```

[Visual Basic]

```
object.GetMultiple( _  
    cb As Long, _  
    rgolestr As String, _  
    rgvar As Variant _  
)
```

### Parameters

[C++]

*cb*

[in] **Long** that specifies the number of values to retrieve.

*rgolestr*

[in, size\_is(cb)] Array of string values that identifies the **Dictionary** object entries for which the values should be retrieved.

*rgvar*

[out, size\_is(cb)] Array of **VARIANT**s. When **GetMultiple** returns, this array contains the values associated with the **Dictionary** object entries identified by the *rgolestr* array.

[Visual Basic]

*cb*

**Long** that specifies the number of values to retrieve.

*rgolestr*

Array of string values that identifies the **CDictionary** object entries for which the values should be retrieved.

*rgvar*

Array of **Variants**. When **GetMultiple** returns, this array contains the values associated with the **CDictionary** object entries identified by the *rgolestr* array.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

If you call **PutMultiple** or **GetMultiple** from Microsoft Visual Basic Scripting Edition (VBScript), these methods fail because they require data types that VBScript does not support.

# IDictionary::NewEnum Property

## IDictionary::NewEnum Property [C++]

## CDictionary.NewEnum Property [Visual Basic]

[C++]

The **NewEnum** property retrieves an **Enumerator** object that implements the **IEnumVariant** interface of the **Dictionary** object.

[Visual Basic]

This property is not available in Microsoft Visual Basic.

### Syntax

[C++]

Get method:

```
HRESULT get_NewEnum(  
    IUnknown** _NewEnum  
);
```

[Visual Basic]

Not applicable

### Parameters

[C++]

*\_NewEnum*

[out, retval] Address of a pointer to an **IUnknown** interface for an object that implements the **IEnumVariant** of this collection. You can call **QueryInterface** through the returned pointer to retrieve a pointer to the **IEnumVariant** for this object. To retrieve the values associated with these elements, you can retrieve the elements in turn, using the **Next** method of the **IEnumVariant** interface, and call the **Value** method on those elements.

[Visual Basic]

Not applicable

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

Not applicable

### Error Value [Visual Basic]

[Visual Basic]

Not applicable

### Remarks

[C++]

This property is read-only.

[Visual Basic]

Not applicable

## Requirements

[C++]

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include commerce.h

[Visual Basic]

Not applicable

# IDictionary::Prefix Property

## IDictionary::Prefix Property [C++]

## CDictionary.Prefix Property [Visual Basic]

The **Prefix** property contains a filter that excludes entries with a specific prefix when the contents of the **Dictionary** object are saved.

### Syntax

[C++]

Get method:

```
HRESULT get_Prefix(  
    BSTR* Prefix  
);
```

Put method:

```
HRESULT put_Prefix(  
    BSTR Prefix  
);
```

[Visual Basic]

*object*.**Prefix**

### Parameters

[C++]

Get method:

*Prefix*

[out, retval] Pointer to a **BSTR** that contains the prefix.

Put method:

*Prefix*

[in] **BSTR** that contains the prefix.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the prefix.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

Any name/value pair with a name beginning with the specified prefix is not saved to the database. The prefix default is an underscore (\_). Therefore, any keywords that begin with an underscore are not saved unless the prefix is changed.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include commerce.h

**Library:** Use Microsoft Commerce 2000 Core Components Type Library (MscsCore.dll)

# IDictionary::PutMultiple Method

## IDictionary::PutMultiple Method [C++]

## CDictionary.PutMultiple Method [Visual Basic]

The **PutMultiple** method adds specified entries to the **Dictionary** object or changes them.

### Syntax

[C++]

```
HRESULT PutMultiple(  
    long cb,  
    const LPOLESTR rgolestr[],  
    const VARIANT rgvar[]  
);
```

[Visual Basic]

```
object.PutMultiple( _  
    cb As Long, _  
    rgolestr As String, _  
    rgvar As Variant _  
)
```

### Parameters

[C++]

*cb*

[in] **Long** that identifies the number of elements in the *rgolestr* and *rgvar* arrays.

*rgolestr*

[in, size\_is(cb)] Array of strings that contains the names to add to the **Dictionary** object.

*rgvar*

[in, size\_is(cb)] Array of **VARIANT**s that contains the values to add to the **Dictionary** object.

[Visual Basic]

*cb*

**Long** that identifies the number of elements in the *rgolestr* and *rgvar* arrays.

*rgolestr*

Array of **Strings** that contains the names to add to the **CDictionary** object.

*rgvar*

Array of **Variants** that contains the values to add to the **CDictionary** object.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

## Remarks

A one-to-one mapping exists between the elements of the *rgolestr* and *rgvar* arrays. This means that *rgolestr[n]* is added to the **Dictionary** object and is initialized to *rgvar[n]*. If the element specified by *rgolestr[n]* is already in the **Dictionary** object, the value associated with the element is overwritten with the value stored in *rgvar[n]*.

[Visual Basic]

If you call **PutMultiple** or **GetMultiple** from Microsoft Visual Basic Scripting Edition (VBScript), these methods fail because they require data types that VBScript does not support.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include commerce.h

**Library:** Use Microsoft Commerce 2000 Core Components Type Library (MscsCore.dll)

# IDictionary::Value Property

## IDictionary::Value Property [C++]

## CDictionary.Value Property [Visual Basic]

The **Value** property returns or sets the value associated with an entry name.

### Syntax

[C++]

Get method:

```
HRESULT get_Value(  
    BSTR bstrName,  
    VARIANT* Value  
);
```

Put method:

```
HRESULT put_Value(  
    BSTR bstrName,  
    VARIANT Value  
);
```

[Visual Basic]

```
object.Value( _  
    bstrName As String _  
)
```

### Parameters

[C++]

Get method:

*bstrName*

[in] **BSTR** that contains the name.

*Value*

[out, retval] Pointer to a **VARIANT** used to return the value.

Put method:

*bstrName*

[in] **BSTR** that contains the name.

*Value*

[in] When putting the property, a **VARIANT** that contains the value.

[Visual Basic]

*bstrName*

**String** that contains the name.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property optionally returns a **Variant** that contains the value.

## Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

The value of a **Dictionary** object can be read or written to without explicitly using the **Value** method by treating the named entry as a property of the **Dictionary** object.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include commerce.h

**Library:** Use Microsoft Commerce 2000 Core Components Type Library (MscsCore.dll)

# ISimpleList Interface

## ISimpleList Interface [C++]

## CSimpleList Object [Visual Basic]

Use the **SimpleList** object to create an array of variants that supports enumeration.

In C++, use the **ISimpleList** interface to access methods of the **SimpleList** object. In Microsoft Visual Basic, the **CSimpleList** class defines the methods and properties of a **SimpleList** object.

The properties of the **SimpleList** object are shown in the following table.

Property	Type	Description
<b>Count</b>	<b>long</b>	Number of elements in the <b>SimpleList</b> object. This is a read-only property.
<b>Item</b>	<b>VARIANT</b>	Container for an element of the <b>SimpleList</b> object.

The methods of the **SimpleList** object are shown in the following table.

Method	Description
<b>Add</b>	Adds the specified item to the <b>SimpleList</b> object.
<b>Delete</b>	Deletes the specified item from the <b>SimpleList</b> object.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include commerce.h

**Library:** Use Microsoft Commerce 2000 Core Components Type Library (MscsCore.dll)

# ISimpleList::Add Method

## ISimpleList::Add Method [C++]

## CSimpleList.Add Method [Visual Basic]

The **Add** method adds the specified item to the **SimpleList** object.

### Syntax

[C++]

```
HRESULT Add(  
    VARIANT* pVar  
);
```

[Visual Basic]

```
object.Add( _  
    pVar As Variant _  
)
```

### Parameters

[C++]

*pVar*

[in] Pointer to the **VARIANT** to add to the **SimpleList** object.

[Visual Basic]

*pVar*

**Variant** to add to the **CSimpleList** object.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include commerce.h

**Library:** Use Microsoft Commerce 2000 Core Components Type Library (MscsCore.dll)

# ISimpleList::Count Property

## ISimpleList::Count Property [C++]

## CSimpleList.Count Property [Visual Basic]

The **Count** property returns the number of elements in the **SimpleList** object.

### Syntax

[C++]

Get method:

```
HRESULT get_Count(  
    long* Count  
);
```

[Visual Basic]

*object*.Count

### Parameters

[C++]

*Count*

[out, retval] Pointer to a **long** used to return the number of items in the **SimpleList** object.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Long** that contains the number of items in the **CSimpleList** object.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This property is read-only.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include commerce.h

**Library:** Use Microsoft Commerce 2000 Core Components Type Library (MscsCore.dll)

# ISimpleList::Delete Method

## ISimpleList::Delete Method [C++]

## CSimpleList.Delete Method [Visual Basic]

The **Delete** method deletes the specified item from the **SimpleList** object.

### Syntax

[C++]

```
HRESULT Delete(  
    long Index  
);
```

[Visual Basic]

```
object.Delete( _  
    Index As Long _  
)
```

### Parameters

[C++]

*Index*

[in] **Long** that contains the index value of the item to delete.

[Visual Basic]

*Index*

**Long** that contains the index value of the item to delete.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include commerce.h

**Library:** Use Microsoft Commerce 2000 Core Components Type Library (MscsCore.dll)

# ISimpleList::Item Property

## ISimpleList::Item Property [C++]

## CSimpleList.Item Property [Visual Basic]

The **Item** property is a read/write **Variant** that contains an element of the **SimpleList** object. An initialized **Variant** is stored at a specified array index. If an item is already stored at the specified index, that item is overwritten by the put method.

### Syntax

[C++]

Get method:

```
HRESULT get_Item(  
    long Index  
    VARIANT* Item  
);
```

Put method:

```
HRESULT put_Item(  
    long Index,  
    VARIANT Item  
);
```

Putref method:

```
HRESULT putref_Item(  
    long Index,  
    VARIANT Item  
);
```

[Visual Basic]

```
object.Item( _  
    Index As Long _  
)
```

### Parameters

[C++]

Get method:

*Index*

[in] **Long** that contains the index of the item.

*Item*

[out, retval] Pointer to a **VARIANT** used to return the item.

Put and Putref methods:

*Index*

[in] **Long** that contains the index of the item.

*Item*

[in] **VARIANT** that contains the new item.

[Visual Basic]

*Index*

**Long** that contains the index of the item.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Variant** that contains the new item.

### **Error Value [Visual Basic]**

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### **Remarks**

When putting a value, use the **putref\_Item** method if you are setting an object reference; use the **put\_Item** method if you are setting a scalar value.

### **Requirements**

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include commerce.h

**Library:** Use Microsoft Commerce 2000 Core Components Type Library (MscsCore.dll)

# Object Model Enumerations

The following enumerations provide possible values of properties and parameters:

- [BIZTALK\\_ENCODING\\_TYPE](#)
- [BIZTALK\\_ENCRYPTION\\_TYPE](#)
- [BIZTALK\\_OPENNESS\\_TYPE](#)
- [BIZTALK\\_OPENNESS\\_TYPE\\_EX](#)
- [BIZTALK\\_SIGNATURE\\_TYPE](#)
- [BIZTALK\\_STORE\\_TYPE](#)
- [BIZTALK\\_TRANSPORT\\_TYPE](#)
- [BIZTALK\\_USAGE\\_TYPE](#)
- [BIZTALK\\_CONFIGDATA\\_TYPE](#)

# BIZTALK\_ENCODING\_TYPE

The **BIZTALK\_ENCODING\_TYPE** enumeration has one of the following values:

<b>Name</b>	<b>Value</b>	<b>Description</b>
<b>BIZTALK_ENCODING_TYPE_NONE</b>	1	Specifies that encoding is not used.
<b>BIZTALK_ENCODING_TYPE_MIME</b>	2	Specifies Multipurpose Internet Mail Extensions (MIME) encoding.
<b>BIZTALK_ENCODING_TYPE_CUSTOM</b>	3	Specifies custom encoding.

# BIZTALK\_ENCRYPTION\_TYPE

The **BIZTALK\_ENCRYPTION\_TYPE** enumeration has one of the following values:

<b>Name</b>	<b>Value</b>	<b>Description</b>
<b>BIZTALK_ENCRYPTION_TYPE_NONE</b>	1	Specifies that encryption is not used.
<b>BIZTALK_ENCRYPTION_TYPE_CUSTOM</b>	2	Specifies custom encryption.
<b>BIZTALK_ENCRYPTION_TYPE_SMIME</b>	4	Specifies Secure Multipurpose Internet Mail Extensions (S/MIME) encryption.

# BIZTALK\_OPENNESS\_TYPE

The **BIZTALK\_OPENNESS\_TYPE** enumeration has one of the following values:

Name	Value	Description
<b>BIZTALK_OPENNESS_TYPE_NOTOPEN</b>	1	Specifies that this instance of the object is not open.
<b>BIZTALK_OPENNESS_TYPE_SOURCE</b>	2	Specifies that the source organization of this instance of the object is open.
<b>BIZTALK_OPENNESS_TYPE_DESTINATION</b>	4	Specifies that the destination organization of this instance of the object is open.

# BIZTALK\_OPENNESS\_TYPE\_EX

The **BIZTALK\_OPENNESS\_TYPE\_EX** enumeration has one of the following values:

Name	Value	Description
<b>BIZTALK_OPENNESS_TYPE_EX_NOTOPEN</b>	1	Specifies that this instance of the object is not open.
<b>BIZTALK_OPENNESS_TYPE_EX_SOURCE</b>	2	Specifies that the source organization of this instance of the object is open.
<b>BIZTALK_OPENNESS_TYPE_EX_DESTINATION</b>	4	Specifies that the destination organization of this instance of the object is open.
<b>BIZTALK_OPENNESS_TYPE_EX_FROMWORKFLOW</b>	8	Specifies that BizTalk Server is receiving a document from an XLANG schedule instance.
<b>BIZTALK_OPENNESS_TYPE_EX_TOWORKFLOW</b>	16	Specifies that BizTalk Server is sending a document to an XLANG schedule instance.

# BIZTALK\_SIGNATURE\_TYPE

The **BIZTALK\_SIGNATURE\_TYPE** enumeration has one of the following values:

<b>Name</b>	<b>Value</b>	<b>Description</b>
<b>BIZTALK_SIGNATURE_TYPE_NONE</b>	1	Specifies that there is no signature.
<b>BIZTALK_SIGNATURE_TYPE_CUSTOM</b>	2	Specifies the custom signature of the document.
<b>BIZTALK_SIGNATURE_TYPE_SMIME</b>	4	Specifies the S/MIME signature of the document.

# BIZTALK\_STORE\_TYPE

The **BIZTALK\_STORE\_TYPE** enumeration has one of the following values:

Name	Value	Description
<b>BIZTALK_STORE_TYPE_MY</b>	1	Specifies that the certificate store is type MY. This store contains certificates authorized only by your organization.
<b>BIZTALK_STORE_TYPE_BIZTALK</b>	2	Specifies that the certificate is stored in the dedicated BizTalk Server 2000 store.

# BIZTALK\_TRANSPORT\_TYPE

The **BIZTALK\_TRANSPORT\_TYPE** enumeration has one of the following values:

Name	Value	Description
<b>BIZTALK_TRANSPORT_TYPE_NONE</b>	1	Specifies that this instance of the object does not select a transport component.
<b>BIZTALK_TRANSPORT_TYPE_HTTP</b>	4	Specifies that this instance of the object selects a Hypertext Transport Protocol (HTTP) transport component.
<b>BIZTALK_TRANSPORT_TYPE_SMTP</b>	8	Specifies that this instance of the object selects a Simple Mail Transfer Protocol (SMTP) transport component.
<b>BIZTALK_TRANSPORT_TYPE_APPINTEGRATION</b>	32	Specifies that this instance of the object selects an application integration component (AIC) transport component.
<b>BIZTALK_TRANSPORT_TYPE_MSMQ</b>	128	Specifies that this instance of the object selects a Microsoft Message Queuing transport component.
<b>BIZTALK_TRANSPORT_TYPE_FILE</b>	256	Specifies that this instance of the object selects a file as a transport component.
<b>BIZTALK_TRANSPORT_TYPE_HTTPS</b>	1024	Specifies that this instance of the object selects a Secure Hypertext Transfer Protocol (HTTPS) transport component.
<b>BIZTALK_TRANSPORT_TYPE_OPENDESTINATION</b>	2048	Specifies that the messaging port is an open destination.
<b>BIZTALK_TRANSPORT_TYPE_LOOPBACK</b>	4096	Specifies that the document submitted to the server with the <a href="#">SubmitSync</a> method will be processed and then returned back as the response document of the method.
<b>BIZTALK_TRANSPORT_TYPE_ORCHESTRATIONACTIVATION</b>	8192	Specifies that the <a href="#">Address</a> property contains the path of an XLANG schedule to be executed.

# BIZTALK\_USAGE\_TYPE

The **BIZTALK\_USAGE\_TYPE** enumeration has one of the following values:

<b>Name</b>	<b>Value</b>	<b>Description</b>
<b>BIZTALK_USAGE_TYPE_ENCRYPTION</b>	1	Specifies that this is an encryption certificate.
<b>BIZTALK_USAGE_TYPE_SIGNATURE</b>	2	Specifies that this is a signature certificate.
<b>BIZTALK_USAGE_TYPE_BOTH</b>	4	Specifies that this certificate is used for both encryption and signature.

# BIZTALK\_CONFIGDATA\_TYPE

The **BIZTALK\_CONFIGDATA\_TYPE** enumeration has one of the following values:

<b>Name</b>	<b>Value</b>	<b>Description</b>
<b>BIZTALK_CONFIGDATA_TYPE_PRIMARYTRANSPORT</b>	0	Configures the primary transport on the messaging port.
<b>BIZTALK_CONFIGDATA_TYPE_SECONDARYTRANSPORT</b>	1	Configures the secondary transport on the messaging port.
<b>BIZTALK_CONFIGDATA_TYPE_ENCRYPTION</b>	2	Configures the encryption certificate on the messaging port.
<b>BIZTALK_CONFIGDATA_TYPE_ENCODING</b>	3	Configures the encoding type on the messaging port.
<b>BIZTALK_CONFIGDATA_TYPE_SIGNATURE</b>	4	Configures the signature verification on the messaging port.
<b>BIZTALK_CONFIGDATA_TYPE_SERIALIZER</b>	5	Configures the serializer on the messaging port.

# Error Messages

The properties and methods of the BizTalk Messaging Configuration object model use standard Component Object Model (COM) **HRESULT** return values to communicate whether the operation was successful or not.

In C++, these values are the actual return values from the methods themselves (including property **get\_** and **put\_** methods). The program must explicitly perform error checking by examining these return values, or use some variation of structured error handling.

In Microsoft Visual Basic (VB), and in Visual Basic Scripting Edition (VBS), these values are placed in the **Number** property of the global **Err** object. Error handling is either handled automatically, displaying a standard error dialog box, or explicitly by the program, checking the value of the **Number** property of the global **Err** object. The **On Error Resume Next** command disables automatic error handling, thereby enabling explicit error handling.

For additional information about error message values, see the following sections:

- [Standard COM Errors](#)
- [BizTalk Server 2000 Error Messages](#)

# Standard COM Errors

The following table shows the most common standard COM errors returned by the properties and methods of the BizTalk Server objects.

Constant	Value (32-bit)	Description
S_OK	00000000	The standard return value used to communicate successful completion.
S_FALSE	00000001	An alternate success value, typically used to communicate successful, but non-standard completion. The precise meaning depends on the method or property in question.
E_UNEXPECTED	8000FFFF	Catastrophic failure error.
E_NOTIMPLEMENTED	80004001	Not implemented error.
E_OUTOFMEMORY	8007000E	Out of memory error.
E_INVALIDARGUMENT	80070007	One or more arguments are not valid error.
E_NOINTERFACE	80004002	Interface not supported error.
E_POINTER	80004003	Pointer not valid error.
E_HANDLE	80070006	Handle not valid error.
E_ABORT	80004004	Operation aborted error.
E_FAIL	80004005	Unspecified error.
E_ACCESSDENIED	80070005	General access denied error.
MK_E_NOOBJECT	800401E5	The object identified by this moniker could not be found.

Additional information may be available using the global **Err** object. In Visual Basic, the **Description** property of the **Err** object may contain a text description of the error.

In C++, call the OLE DB method **GetErrorInfo** on the **IErrorRecords** interface to retrieve the most recently set **IErrorInfo** pointer in the current logical thread. The **GetDescription** method of the **IErrorInfo** interface may return a text description of the error. For more information about the **GetErrorInfo** method, go to the MSDN Online Library Web site ([msdn.microsoft.com/library/default.asp](https://msdn.microsoft.com/library/default.asp)) and browse to OLE DB Interfaces in the Platform SDK.

# BizTalk Server 2000 Error Messages

The BizTalk Messaging Configuration object model error messages defined by BizTalk Server can be used in your application by including the `bts_config_errors.h` file located in the BizTalk Server installation directory at `\Program Files\Microsoft BizTalk Server\SDK\Include`. These error messages, returned during design time by the methods and properties of the object model, contain a `BTS_` prefix in the message name. All other errors occur during run time, while BizTalk Server is processing a document.

The following table contains both design time and run time errors.

Message name	Value	Description
CIS_E_OBJECT_NOT_FOUND	0x0100	The object was not found.
CIS_E_STATE_NOT_FOUND	0x0101	The state engine state was not found in the messaging port definition.
CIS_E_STATE_TRANSITION	0x0103	The state table contains a bad engine state transition.
CIS_E_BAD_ENGINE_CONFIG_FILE	0x0105	The string that describes the input state configuration is not valid.
CIS_E_CANNOT_ADD_STATE	0x0106	BizTalk Server could not add the user-defined state to the system.
CIS_E_NO_COMPONENT_FOUND	0x0107	There is no component in the state definition or the ProgID is wrong.
CIS_E_PIPECOMP_ADMIN_REQUIRED	0x0108	The required <code>IPipelineComponentAdmin</code> interface was not found on the component.

CIS_E_BAD_COMPONENT_TYPE	0 x 0 1 0 9	The component type specified for the state engine is not recognized.
CIS_E_BAD_STATE_CONFIG	0 x 0 1 0 A	The state configuration is not valid.
CIS_E_BAD_STATE_TYPE	0 x 0 1 0 B	The specified state type is not recognized.
CIS_E_BAD_COMPONENT_CONFIG	0 x 0 1 0 C	The component configuration is not valid.
CIS_E_INTERNAL_FAILURE	0 x 0 1 0 F	An internal server failure occurred due to an unknown cause.
CIS_E_CREATE_SCHEDULER_FAILED	0 x 0 1 1 1	The Queue Scheduler for the service could not be created.
CIS_E_AGREEMENT_SELECT_FAILED	0 x 0 1 1 2	No channels matched the input criteria. Verify that a messaging port and a channel exist, and that they match the following fields: Source qualifier: "%1" Source identifier value: "%2" Source document name: "%3" Destination qualifier: "%4" Destination identifier value: "%5" Also verify that any expressions specified for the channels are compatible with this document.
CIS_E_ERROR	0 x 0 1 1 3	An error occurred in BizTalk Server.%n %n Details:%n -----%n %1
CIS_E_SERVICE_INITIALIZATION_FAILURE	0 x 0 1 1 4	The service failed to start. Verify that this server is enlisted in a BizTalk Server group.
CIS_E_SCHEDULER_FAILED	0 x 0 1 1 5	The Queue Scheduler failed and has exited.

CIS_E_WORKER_THREAD_FAILED	0 x 0 1 1 6	A worker thread failed and has exited.
CIS_E_SHARED_QUEUE_DATABASE_FAILED	0 x 0 1 1 7	Execution against the Shared Queue database has failed.
CIS_E_CANT_READ_WORK_ITEM	0 x 0 1 1 9	A work item in the Shared Queue database cannot be read.
CIS_E_CHECKPOINT_FAILED	0 x 0 1 1 c	Checkpointing the work item failed.
CIS_E_CREATE_DEAD_WORK_ITEM_FAILED	0 x 0 1 1 e	A new work item in the Suspended queue cannot be created.
CIS_E_GET_SNAPSHOT_FAILED	0 x 0 1 2 2	A snapshot of the Shared Queue database cannot be taken.
CIS_E_FREE_INTERCHANGES_FAILED	0 x 0 1 2 4	The specified interchanges cannot be freed.
CIS_E_DELETE_INTERCHANGE_FAILED	0 x 0 1 2 5	The specified interchange cannot be deleted.
CIS_E_RECEIVING_INTERCHANGE_FAILED	0 x 0 1 2 7	The specified interchange was not received.
CIS_E_GETTING_NEXT_SCHEDULED_WORK_ITEM_FAILED	0 x 0 1 2 8	The next scheduled work item cannot be obtained for processing.

CIS_E_GET_COUNT_FAILED	0 x 0 1 2 9	The count on the shared queues cannot be obtained.
CIS_E_TRANSMISSION_FAILED	0 x 0 1 2 a	All retry transmissions failed.
CIS_W_TRANSMISSION_ATTEMPT_FAILED	0 x 0 1 2 b	A transmission attempt failed.
CIS_W_TRANSMISSION_XFER_TO_SECONDARY	0 x 0 1 2 c	The primary transport for messaging port "%1" cannot transmit the data. The server will switch to the secondary transport.
CIS_E_RECEIPT_GENERATION_FAILED	0 x 0 1 2 e	After creating the work item, the attempt to generate a receipt failed.
CIS_E_RECEIPT_GENERATION_FAILED_NO_WORK_ITEM	0 x 0 1 2 f	The attempt to generate a receipt failed before the work item was created.
CIS_E_L1_RECEIPT_CORRELATION_FAILED	0 x 0 1 3 0	Receipt correlation failed.
CIS_E_AGREEMENT_LACKING_PARAMS	0 x 0 1 3 3	At least one of the fields necessary to select a channel is missing. Verify that your document and envelopes extract the proper fields for the parser, or specify the necessary fields upon submission. Channel selection fields: Source identifier type: "%1" Source identifier value: "%2" Source document name: "%3" Destination identifier type: "%4" Destination identifier value: "%5"
CIS_E_AGREEMENT_FAILED	0 x 0 1 3 4	The channel cannot be selected.
CIS_E_ORIGINAL_L1_INTERCHANGE_MISSING	0 x 0 1 3 5	When trying to correlate an incoming receipt, the original interchange and related document(s) are no longer present.

CIS_E_UNEXPECTED_DB_BEHAVIOR	0 x 0 1 3 6	An unexpected return occurred. The database may need to be restarted.
CIS_E_AGREEMENT_INVALID_MAP	0 x 0 1 3 7	The map specified by the reference "%1" is not valid. Verify that the reference points to a valid map created by BizTalk Mapper.
CIS_I_SERVICE_MSG	0 x 0 1 3 8	1%
CIS_E_AGREEMENT_MAP_FAILED	0 x 0 1 3 9	The XML document could not be translated. The map specified by reference "%1" failed. Verify that the map is up to date.
CIS_E_XML_ERROR	0 x 0 1 3 A	The XML document could not be parsed on line: %2, position: %3 for the following reason: "%1"
CIS_E_AGREEMENT_PROCESSING_FAILED	0 x 0 1 3 f	The server could not finish processing the document.
CIS_E_AGREEMENT_PROCESSING_FAILED_WITH_NAME	0 x 0 1 4 0	The following channel configuration setting is not valid: "%1"
CIS_E_AGREEMENT_INVALID_QUERY	0 x 0 1 4 1	The "%2" query for the "%1" document tracking field is not a valid XSL pattern. This pattern must be removed or corrected.
CIS_I_SERVICE_START	0 x 0 1 4 2	The service has started.
CIS_I_SERVICE_STOP	0 x 0 1 4 3	The service has stopped.

CIS_E_ERROR_EX	0 x 0 1 4 4	An error occurred in BizTalk Server.%n %n Details:%n -----%n %1 %2 %3 %4 %5 %6 %7 %8 %9 %n
CIS_E_ERROR_EX_HEAD	0 x 0 1 4 5	===== ===== Date: %1 Source: BizTalk Server 2000 Time: %2 Category: BizTalk Server 2000 User: %3 Computer: %4 Description: An error occurred in BizTalk Server. Details: -----
CIS_E_ERROR_EX_FOOT	0 x 0 1 4 6	
CIS_E_INVALID_DATA_FORMAT	0 x 0 1 4 7	The business document that was passed in is not in a recognized format and could not be parsed or decrypted.
CIS_E_CREATE_ENGINE	0 x 0 1 4 8	BizTalk Server was unable to create a new instance of the processing engine to process a work item. This might be due to a failure to create a new COM+ transaction.
CIS_E_MISSING_DESTINATION_DOCUMENT_SPEC	0 x 0 1 4 9	BizTalk Server has detected an incomplete messaging port. The destination specification is missing from the messaging port.
CIS_E_PROCESSING_THREAD_FAILED	0 x 0 1 4 A	The processing thread failed to start. This might be due to a failure to create the state engine.
CIS_E_NOSRCORG	0 x 0 1 4 B	No source organization that corresponds to the ID and Qualifier pair has been specified.
CIS_E_NODESTORG	0 x 0 1 4 C	No destination organization that corresponds to the Identifier and Qualifier pair has been specified.
CIS_E_NODOC	0 x 0 1 4 D	No document that corresponds to the document name has been specified.

CIS_E_NOPIPELINES	0 x 0 1 4 E	No channel that corresponds to the parameters has been specified.
CIS_E_NOT_RESUBMITTABLE	0 x 0 1 4 F	The state of the item in the Suspended queue does not allow resubmission.
CIS_E_PIPESELECT_POLICY_FAILED	0 x 0 1 5 0	No channels matched the certificates that were found with the incoming data. The following certificates accompanied the submitted data: Signature certificate reference: "%1" Encryption certificate reference: "%2"
CIS_E_SUBMIT_INVALIDDOC	0 x 0 1 5 1	The submitted document is not valid. See the following messages for more details.
CIS_E_SUBMITSYNC_TOOMANYDOCS	0 x 0 1 5 2	The SubmitSync method failed because multiple documents were found within the data. Only one document is allowed per synchronous submission. If this is a structured flat-file submission, then the most common cause of failure is extra leading or trailing white space around the data.
CIS_E_SUBMITSYNC_TOOMANYPIPES	0 x 0 1 5 3	The synchronous submission could not be completed because multiple valid channels matched the incoming document. Only one channel is allowed to match the incoming document.
CIS_E_XMIT_NO_TRANSPORTCOMP	0 x 0 1 5 4	This server could not create a component with the class ID "%1" for transport. Verify that this component is properly registered. The following error was returned:
CIS_E_XMIT_EMPTY_DOCUMENT	0 x 0 1 5 5	Messaging port "%1" cannot transmit a zero-byte document.
CIS_E_XMIT_FAILED_WITH_NAME	0 x 0 1 5 6	The server could not finish processing messaging port "%1".
CIS_E_XMIT_NO_INTERFACE	0 x 0 1 5 7	The server could not obtain the "%1" interface from the transport component with CLSID "%2".

CIS_E_XMIT_NO_BTS_AIC_INTERFACES	0 x 0 1 5 8	The server could not obtain either the "%1" or "%2" interfaces from the BizTalk Server application integration component with CLSID "%3".
CIS_E_XMIT_FAILED_W_DETAILS	0 x 0 1 5 9	The server encountered a transport error while processing the messaging port "%1", which uses a transport component with a ProgID of "%2".
CIS_E_NOHDR_ERROR_EX	0 x 0 1 5 A	%1 %2 %3 %4 %5 %6 %7 %8 %9 %n
CIS_W_COMP_NOACK	0 x 0 1 5 B	The correlation component "%1" could not find a document for which to send a receipt. No action will be taken.
CIS_E_CORRELATIONCOMP_FAILED	0 x 0 1 5 C	The correlation component "%1" returned an unexpected failure. The document will be placed in the Suspend queue.
CIS_E_CORRELATION_FAILED	0 x 0 1 5 D	Receipt correlation processing failed.
CIS_E_XML_VALIDATE_ERROR	0 x 0 1 5 E	The XML document has failed validation for the following reason: %1
CIS_E_CHANNEL_ACCESS_DENIED	0 x 0 1 5 F	The submitted document does not have the necessary signature or encryption required by channel "%3". The following certificates accompanied the submitted data: Signature certificate reference: "%1" Encryption certificate reference: "%2"
CIS_I_SERVICE_RESTARTING	0 x 0 1 6 0	The service is restarting.
BTS_E_CONSTRAINT	0 x 1 2 0 1	Constraint Error

BTS_E_NOOBJECT	0 x 1 2 0 2	The object was not found.
BTS_E_INTERNAL_FAILURE	0 x 1 2 0 3	An internal failure occurred.
BTS_E_ENVELOPE_CONTROLNUMBER	0 x 1 2 0 C	If the envelope format is set to X12 or EDIFACT, the control number value must be set to a number greater than or equal to 1.
BTS_E_ENVELOPE_DELIMITER	0 x 1 2 0 D	If the envelope format is set to X12, then delimiters are required and must be set.
BTS_E_ENCRYPTION_CUSTOM_NOCLSID	0 x 1 2 0 E	If the encryption type is Custom, then the class identifier (CLSID) must also be specified.
BTS_E_ENCODING_CUSTOM_NOCLSID	0 x 1 2 0 F	If the encoding type is Custom, then the class identifier (CLSID) must also be specified.
BTS_E_SIGNATURE_CUSTOM_NOCLSID	0 x 1 2 1 0	If the signature type is Custom, then the class identifier (CLSID) must also be specified.
BTS_E_INVALID_CONTROLNUMBER	0 x 1 2 1 2	The control number value must be set to a number greater than or equal to 1.
BTS_E_ENVELOPE_INUSE	0 x 1 2 1 3	The format of the envelope cannot be changed because it is used in a messaging port.
BTS_E_CHANNEL_MISSINGMAPSOURCE	0 x 1 2 1 5	The channel is missing the MapSource node.

BTS_E_INVALID_CERT_USAGE	0 x 1 2 1 6	The certificate is not valid for the current usage. An encryption certificate cannot be used for signing; nor can a signing certificate be used for encryption. Make sure that the correct certificate is selected.
BTS_E_MISSING_SMTPHOST	0 x 1 2 1 8	The SMTP host is missing. The SMTP host can be configured in BizTalk Server Administration.
BTS_E_INVALID_ENCRYPT_STORE	0 x 1 2 1 9	The encryption store type is not valid. The store type must be BIZTALK.
BTS_E_INVALID_SGNTCERT_STORE	0 x 1 2 1 A	The signature store type is not valid. The store type must be MY.
BTS_E_DATA_TOO_LONG	0 x 1 2 1 B	The data length is too long.
BTS_E_INVALID_VERIFY_ENCRYPT_CERT_STORE	0 x 1 2 1 C	The encryption verification store type is not valid. The store type must be MY.
BTS_E_INVALID_VERIFY_SGNT_CERT_STORE	0 x 1 2 1 D	The signature verification store type is not valid. The store type must be BIZTALK.
BTS_E_ORGANIZATION_UNIQUE_ID	0 x 1 2 1 F	The organization identifier must be a unique identifier.
BTS_E_ORGANIZATION_UNIQUE_NAME	0 x 1 2 2 0	The organization name must be a unique name.
BTS_E_OBJECT_ALREADY_EXISTS	0 x 1 2 2 1	The object already exists. You cannot call the Create() method on a BizTalk Messaging Configuration object multiple times without also calling the Clear() or Remove() methods.

BTS_E_ALIAS_UNIQUE_ID	0 x 1 2 2 2	The identifier must be a unique identifier.
BTS_E_ALIAS_UNIQUE_NAME	0 x 1 2 2 3	The identifier name for this organization must be a unique name.
BTS_E_ALIAS_UNIQUE_QUALIFIERVALUE	0 x 1 2 2 5	The identifier must have a unique qualifier-value pair.
BTS_E_ALIAS_FOREIGN_OWNERID	0 x 1 2 2 6	The organization cannot be removed because it is referred to by an identifier.
BTS_E_XMLSHARE_UNIQUE_ID	0 x 1 2 2 7	The primary identifier for the XML Share table in the SQL Server database must be a unique identifier.
BTS_E_XMLSHARE_UNIQUE_REFERENCE	0 x 1 2 2 8	The reference for the XML Share table in the SQL Server database must be a unique reference.
BTS_E_DOCUMENT_UNIQUE_ID	0 x 1 2 2 9	The document identifier must be a unique identifier.
BTS_E_DOCUMENT_UNIQUE_NAME	0 x 1 2 2 A	The document name must be a unique name.
BTS_E_DOCUMENT_FOREIGN_SHAREID	0 x 1 2 2 C	The XML Share table in the SQL Server database cannot be removed because it is referred to by a document.
BTS_E_ENVELOPE_UNIQUE_ID	0 x 1 2 2 D	The envelope identifier must be a unique identifier.

BTS_E_ENVELOPE_UNIQUE_NAME	0 x 1 2 2 E	The envelope name must be a unique name.
BTS_E_ENVELOPE_FOREIGN_SHAREID	0 x 1 2 3 0	The XML Share table in the SQL Server database cannot be removed because it is referred to by an envelope.
BTS_E_CONTROLNUMBER_UNIQUE_ID	0 x 1 2 3 1	The control-number identifier must be a unique identifier.
BTS_E_PORTGROUP_UNIQUE_ID	0 x 1 2 3 2	The distribution list identifier must be a unique identifier.
BTS_E_PORTGROUP_UNIQUE_NAME	0 x 1 2 3 3	The distribution list name must be a unique name.
BTS_E_MISSING_VALUE	0 x 1 2 3 5	The identifier value property must have a value.
BTS_E_MISSING_SRCORGID	0 x 1 2 3 6	The Channel SourceOrganization property must have a value.
BTS_E_APPLICATION_UNIQUE_ID	0 x 1 2 3 7	The application identifier must be a unique identifier.
BTS_E_APPLICATION_FOREIGN_OWNERID	0 x 1 2 3 8	The organization cannot be removed because it is referred to by an application.
BTS_E_APPLICATION_UNIQUE_NAME	0 x 1 2 3 9	For applications within this organization, the application name must be a unique name.

BTS_E_CHANNEL_UNIQUE_ID	0 x 1 2 3 A	The channel identifier must be a unique identifier.
BTS_E_CHANNEL_UNIQUE_NAME	0 x 1 2 3 B	The channel name must be a unique name.
BTS_E_CHANNEL_FOREIGN_INPDOCID	0 x 1 2 3 D	The inbound document cannot be removed because it is used by a channel.
BTS_E_CHANNEL_FOREIGN_OUTDOCID	0 x 1 2 3 E	The output document cannot be removed because it is used by a channel.
BTS_E_CHANNEL_FOREIGN_PORTGROUPID	0 x 1 2 3 F	The distribution list cannot be removed because it is used by a channel.
BTS_E_CHANNEL_FOREIGN_SOURCEORGID	0 x 1 2 4 0	The source organization cannot be removed because it is used by a channel.
BTS_E_ENVELOPE_INVALIDFORMAT	0 x 1 2 4 1	The only valid envelope-format strings are: Custom, Custom XML, EDIFACT, Flatfile, X12, and Reliable. The previously specified format will remain unchanged.
BTS_E_CHANNEL_FOREIGN_CONTROLNUMID	0 x 1 2 4 2	The control number cannot be removed because it is used by an channel.
BTS_E_PORT_UNIQUE_ID	0 x 1 2 4 3	The messaging port identifier must be a unique identifier.
BTS_E_PORT_UNIQUE_NAME	0 x 1 2 4 4	The messaging port name must be a unique name.

BTS_E_CHANNEL_FOREIGN_SRCAPPID	0 x 1 2 4 7	The source application cannot be removed because it is used by a channel.
BTS_E_PORT_FOREIGN_DSTORGID	0 x 1 2 4 8	The destination organization cannot be removed because it is used by a messaging port.
BTS_E_PORT_FOREIGN_DSTALIASID	0 x 1 2 4 9	The destination identifier cannot be removed because it is used by a messaging port.
BTS_E_PORT_FOREIGN_ENVID	0 x 1 2 4 A	The envelope cannot be removed because it is used by a messaging port.
BTS_E_CHANNEL_FOREIGN_SRCALIASID	0 x 1 2 4 B	The source identifier cannot be removed because it is used by a channel.
BTS_E_PORT_FOREIGN_DSTAPPID	0 x 1 2 4 C	The destination application cannot be removed because it is used by a messaging port.
BTS_E_PORT_FOREIGN_CONTROLNUMID	0 x 1 2 4 D	The control number cannot be removed because it is used by a messaging port.
BTS_E_DOCUMENT_MISSING_REFERENCE	0 x 1 2 4 E	The Reference property must have a value if the TrackingFields or PropertySet properties are specified.
BTS_E_DOCUMENT_REFERENCE_CANT_BE_CHANGED	0 x 1 2 4 F	A document reference cannot be modified if it is referred to by a channel.
BTS_E_PORTGROUP_NOTOPENGRP	0 x 1 2 5 1	Messaging ports that are set to an open destination or set to an XLANG schedule (BIZTALK_OPENNESS_TYPE_EX_TOWORKFLOW) cannot be used in distribution lists.

BTS_E_PORTGROUP_DUPLICATEPORT	0 x 1 2 5 2	A duplicate messaging port cannot be added to the distribution list.
BTS_E_OUTPUT_CONFIG_UNIQUE_ID	0 x 1 2 5 5	The output configuration identifier must be a unique identifier.
BTS_E_OUTPUT_CONFIG_FOREIGN_PORTID	0 x 1 2 5 6	The messaging port cannot be removed because it is used by a channel.
BTS_E_OUTPUT_CONFIG_FOREIGN_CHANNEL_ID	0 x 1 2 5 7	The channel cannot be removed because it is used by a messaging port.
BTS_E_PORT_LOOPBACK_RELIABLE	0 x 1 2 5 F	A messaging port with the transport type Loopback cannot be associated with an envelope that uses the Reliable format.
BTS_E_ALIAS_RESERVEDWORD	0 x 1 2 6 2	Group is a reserved word for qualifiers and cannot be used as the qualifier for an identifier.
BTS_E_DOCUMENT_NEEDMAP_REFERENCE	0 x 1 2 6 8	A map reference is required to transform the inbound document to the outbound document if the document specifications are different.
BTS_E_PORT_DEST_ORGANIZATION_SPECIFIED	0 x 1 2 6 C	This messaging port must have a destination organization specified.
BTS_E_PORT_MESSAGING_PRIORITY_TYPE	0 x 1 2 6 D	You must specify a primary transport type for this messaging port. The primary transport cannot be blank, and it cannot be an open destination.
BTS_E_PORT_MESSAGING_PRIMARY_TRANSPORT_ADDRESS	0 x 1 2 6 E	This messaging port must have a primary transport address specified.

BTS_E_PORT_INVALID_SECTRA NSTYPE	0 x 1 2 6 F	The secondary transport type cannot be set to Open, Loopback, or to BizTalk Orchestration Activation.
BTS_E_PORT_MISSING_SECTRA NSADDRESS	0 x 1 2 7 0	The secondary transport address is missing, although the transport type has been defined.
BTS_E_PORT_INVALID_ORG	0 x 1 2 7 1	The organization specified in this messaging port does not exist.
BTS_E_PORT_INVALID_ALIAS	0 x 1 2 7 2	The identifier specified for the organization in this messaging port either does not exist or it does not belong to the organization.
BTS_E_PORT_INVALID_APPLICATION	0 x 1 2 7 3	The application specified for the organization in this messaging port either does not exist or it does not belong to the organization.
BTS_E_PORT_INVALID_ENVELOPE	0 x 1 2 7 4	The envelope specified in this messaging port does not exist.
BTS_E_PORT_OPEN_DESTORG_SPECIFIED	0 x 1 2 7 C	An open-destination messaging port cannot have a destination organization specified.
BTS_E_PORT_OPEN_DESTAPP_SPECIFIED	0 x 1 2 7 E	An open-destination messaging port cannot have a destination application specified.
BTS_E_PORT_OPEN_PRITRANS TYPEOPEN	0 x 1 2 7 F	An open-destination messaging port must specify a primary transport type as an open destination.
BTS_E_PORT_OPEN_PRITRANS ADDRESS	0 x 1 2 8 0	An open-destination messaging port cannot specify a primary transport address.

BTS_E_PORT_O PEN_PRITRANS PARAMETER	0 x 1 2 8 1	An open-destination messaging port cannot specify a primary transport parameter.
BTS_E_PORT_O PEN_SECTRANS TYPE	0 x 1 2 8 2	An open-destination messaging port cannot specify the secondary transport type.
BTS_E_PORT_O PEN_SECTRANS ADDRESS	0 x 1 2 8 3	An open-destination messaging port cannot specify a secondary transport address.
BTS_E_PORT_O PEN_SECTRANS PARAMETER	0 x 1 2 8 4	An open-destination messaging port cannot specify a secondary transport parameter.
BTS_E_PORT_O PEN_ENCRYPTI ONTYPE	0 x 1 2 8 5	An open-destination messaging port cannot specify an encryption type.
BTS_E_PORT_O PEN_ENCRYPTI ONREF	0 x 1 2 8 6	An open-destination messaging port cannot specify an encryption reference.
BTS_E_PORT_SI GNATYPEAND REFERENCE	0 x 1 2 8 7	The signature type is specified; however, the signature reference is missing.
BTS_E_PORT_E NCRYPTIONTYP EANDREFEREN CE	0 x 1 2 8 8	The encryption type is specified; however, the encryption reference is missing.
BTS_E_ALIAS_D EFAULT	0 x 1 2 8 A	One and only one default identifier is required and permitted at all times. The default identifier cannot be missing, nor can it be duplicated.
BTS_E_ALIAS_A UTO	0 x 1 2 8 B	The alias, which uses the name "Organization" and the qualifier "OrganizationName," is a system-created alias. You cannot remove this alias, create another alias that uses the same name and qualifier, or change any fields of this alias.

BTS_E_TRANSPORT_SYNTAXAPPINT	0 x 1 2 8 E	Either the syntax of this address is incorrect for the Application Integration Component transport type property, or the component is not registered, or else the component is not a valid AIC component.
BTS_E_TRANSPORT_SYNTAXFILE	0 x 1 2 8 F	The syntax of this address is incorrect for the File transport type.
BTS_E_TRANSPORT_SYNTAXHTTP	0 x 1 2 9 1	The syntax of this address is incorrect for the HTTP transport type.
BTS_E_TRANSPORT_SYNTAXHTTPS	0 x 1 2 9 2	The syntax of this address is incorrect for the HTTPS transport type.
BTS_E_TRANSPORT_SYNTAXSMTP	0 x 1 2 9 3	The syntax of this address is incorrect for the SMTP transport type.
BTS_E_TRANSPORT_SYNTAXNONE	0 x 1 2 9 4	You cannot specify a transport address or a parameter when the transport type is set to None, or when the source or destination are Open.
BTS_E_TRANSPORT_LOCALHOST	0 x 1 2 9 5	The transport address cannot contain the word "localhost". Replace it with the computer name instead.
BTS_E_PORTGROUP_LASTPORT	0 x 1 2 9 6	The messaging port cannot be removed if it is the last remaining messaging port in a distribution list.
BTS_E_TRANSPORT_MISSING_PRISMTPPARAMETER	0 x 1 2 9 8	A primary transport parameter is required for the SMTP transport type.
BTS_E_TRANSPORT_MISSING_SECONDSMTPPARAMETER	0 x 1 2 9 9	A secondary transport parameter is required for the SMTP transport type.

BTS_E_NAMEREQ	0 x 1 2 9 A	The Name property must always be at least one character long.
BTS_E_INVALIDTIMEFORMAT	0 x 1 2 9 B	The time format is not valid. Enter the time, in hours, in a 24-hour format (from 0 to 23 hours). You can enter only hours, not minutes or seconds.
BTS_E_TIMESTAMP	0 x 1 2 9 C	This object cannot be saved or removed because the timestamp has changed.
BTS_E_PORTGROUP_MISSING_PORT	0 x 1 2 9 D	A distribution list must contain at least one messaging port.
BTS_E_ORGANIZATION_REMOVEDEFAULT	0 x 1 2 9 E	The home organization cannot be removed.
BTS_E_PORT_SERVICEWINDOW_EQUAL	0 x 1 2 9 F	The start time (FromTime) and end time (ToTime) for the service window cannot be equal.
BTS_E_ENVELOPE_REFERENCE_NOTALLOWED	0 x 1 2 A 2	The reference property cannot be set for this envelope format.
BTS_E_ENVELOPEREFERRED	0 x 1 2 A 3	This envelope cannot be removed because it is used in a messaging port or channel.
BTS_E_TRANSPORT_LOOPBACK_SECTYPECONFLICT	0 x 1 2 A 4	The secondary transport type cannot be specified for the messaging port if the primary transport type is set to Loopback.
BTS_E_TRANSPORT_LOOPBACK_SECADDRESS_CONFLICT	0 x 1 2 A 5	The secondary transport address cannot be specified for the messaging port if the transport type is set to Loopback.

BTS_E_PORT_LOOPBACK_SERVICEWINDOW	0 x 1 2 A 6	The service window cannot be specified for the messaging port if the transport type is set to Loopback.
BTS_E_PORT_OPEN_DESTIALS_SPECIFIED	0 x 1 2 A 7	An open-destination messaging port cannot have a destination identifier specified.
BTS_E_PORT_OPEN_SERVICEWINDOW	0 x 1 2 A 8	The service window cannot be specified for the messaging port if the messaging port is an open-destination messaging port.
BTS_E_PORT_SERVICEWINDOWTIMES	0 x 1 2 A A	To use a service window, you must set both the From and To times or else, do not set either time.
BTS_E_TRANSPORT_LOOPBACK_PRIADDRESSCONFLICT	0 x 1 2 A C	A primary transport address cannot be specified for the messaging port if the transport type is Loopback.
BTS_E_PORT_ORGCHANGE	0 x 1 2 A D	The destination-organization identifier cannot be changed after it is created.
BTS_E_PORT_OPENNESSCHANGE	0 x 1 2 A E	The Openness property cannot be changed after it is created.
BTS_E_PORT_SIGNATURE_CHANNEL_CERTREF	0 x 1 2 A F	The signature-certification reference for a channel does not match the signature type for the port.
BTS_E_PORT_SIGNATURE_CHANNEL_OPEN	0 x 1 2 B 0	A messaging port that contains a signature type cannot be connected to an open-source channel. Also, a messaging port that is already connected to an open-source channel cannot have a signature type assigned to it.
BTS_E_CHANNEL_OPEN_SOURCE_ORG	0 x 1 2 B 1	An open-source channel cannot specify a source organization.

BTS_E_PORTGR OUP_LOOPBAC KPORT	0 x 1 2 B 2	A messaging port that uses the Loopback transport type cannot be added to a distribution list. Also, the transport type of a messaging port that is already included in a distribution list cannot be changed to Loopback.
BTS_E_CHANNE L_OPEN_SRCAL IAS	0 x 1 2 B 3	An open-source channel cannot have a source identifier specified.
BTS_E_CHANNE L_OPEN_SRCAP P	0 x 1 2 B 4	An open-source channel cannot specify a source application.
BTS_E_CHANNE L_PORTORPOR TGROUP	0 x 1 2 B 5	Either a messaging port or a distribution list, but not both, must be specified in a channel.
BTS_E_CHANNE L_MISSING_DO CUMENT	0 x 1 2 B 6	Both input and output documents are needed in a channel.
BTS_E_CHANNE L_INVALIDTYPE	0 x 1 2 B 7	A channel cannot be set to an open destination or set to an XLANG schedule (BIZTALK_OPENNESS_TYPE_EX_T OWORKFLOW).
BTS_E_CHANNE L_MISSING_OU TDOCREFEREN CE	0 x 1 2 B 8	If the inbound document definition for a channel has a reference to a specification, the outbound document definition must also have a reference to a specification.
BTS_E_CHANNE L_TRACKFIELDS CANTBESET	0 x 1 2 B 9	If the inbound document definition for a channel does not have a reference to a specification, the tracking fields cannot be set.
BTS_E_CHANNE L_EXPRESSION CANTBESET	0 x 1 2 B A	If the inbound document definition for a channel does not have a reference to a specification, the channel-filtering expressions cannot be set.
BTS_E_CHANNE L_MAPREFCAN TBESET	0 x 1 2 B B	If the inbound document definition for a channel does not have a reference to a specification then a reference to a map cannot be set.

BTS_E_CHANNE L_NOTSAME_IN PDOC_OUTDO C	0 x 1 2 B C	If the inbound document definition for a channel does not have a reference to a specification then the outbound document handle should be the same of inbound document handle.
BTS_E_CHANNE L_OPEN_RECEIP TCONFLICT	0 x 1 2 B D	Channels that are set from an open source or set from an XLANG schedule (BIZTALK_OPENNESS_TYPE_EX_FROMWORKFLOW) cannot be receipt channels.
BTS_E_CHANNE L_RECEIPT_REC EIPPTIMEOUT	0 x 1 2 B E	The Expect Receipt Timeout property cannot be set on a receipt channel.
BTS_E_CHANNE L_RECEIPT_CAN TSETRECEIPTCH ANNEL	0 x 1 2 B F	An identifier cannot be set on a receipt channel.
BTS_E_CHANNE L_RECEIPT_CO NFLICT	0 x 1 2 C 0	In a receipt channel, the source specification from the original channel must be used as the destination specification, and the destination specification from the original channel must be used as the source specification.
BTS_E_CHANNE L_SRCORGDEF AULT	0 x 1 2 C 1	If the channel is set from an XLANG schedule (BIZTALK_OPENNESS_TYPE_EX_FROMWORKFLOW), the source organization must be the home organization.
BTS_E_CHANNE L_PORT_BOTH OPEN	0 x 1 2 C 2	Both the channel and messaging port cannot be set to Open.
BTS_E_CHANNE L_RECEIPT_INV ALID	0 x 1 2 C 3	The Receipt Channel and Expect Receipt Timeout properties cannot be set for an open-source channel. These properties also cannot be set if the messaging port is set to an open destination, set to an XLANG schedule (BIZTALK_OPENNESS_TYPE_EX_TOWORKFLOW), or if the messaging port uses the Loopback transport type.
BTS_E_CHANNE L_RECEIPTMAT CHNOTFOUND	0 x 1 2 C 4	The corresponding receipt channel for this channel could not be found.
BTS_E_CHANNE L_RECEIPT_OPE NPORT	0 x 1 2 C 5	A receipt channel can be connected only to messaging ports that are not open messaging ports.

BTS_E_CHANNEL_RECEIPT_LOOPBACKPORT	0 x 1 2 C 6	A receipt channel cannot be connected to a messaging port that uses the Loopback transport type. Also, the transport type of a messaging port that is already connected to a receipt channel cannot be changed to Loopback.
BTS_E_CHANNEL_CANNOTUPDATE	0 x 1 2 C 8	After a channel is created, the following properties cannot be changed: source organization, openness designation, messaging port, distribution list, and receipt channel designation.
BTS_E_PORT_INVALIDOPENNESS	0 x 1 2 C 9	A messaging port cannot be set to an open source; nor can it be set from an XLANG schedule (BIZTALK_OPENNESS_TYPE_EX_FROMWORKFLOW).
BTS_E_CHANNEL_CONTROLNUMBER_ENVELOPE_FORMAT_MATCH	0 x 1 2 C A	If the envelope format for the messaging port is X12 or EDIFACT, the control-number value on the channel must be set.
BTS_E_PORT_ENVELOPE_SERIALIZER_CLSID	0 x 1 2 C B	If the envelope format for the messaging port is set to Custom, a class identifier (CLSID) for the serializer component must be specified.
BTS_E_CHANNEL_AIC_TRANSPORT_CLSID	0 x 1 2 C D	If the transport type associated with the channel is set to Application Integration Component, a class identifier (CLSID) must be specified for the primary transport.
BTS_E_CHANNEL_RECEIPT_PORT_GROUP	0 x 1 2 C E	If a channel is connected to a distribution list, a receipt channel cannot be specified.
BTS_E_COMPONENT_REQUIRES_AGGREGATE_METHOD	0 x 1 2 C F	To be a valid object in the BizTalk Object Model, this custom component must aggregate the free-threaded marshaller.
BTS_E_CERTIFICATE_NOT_FOUND	0 x 1 2 D 1	Either the certificate reference could not be found in MY or BIZTALK stores or it is not valid.
BTS_E_NODE_DOCUMENT	0 x 1 2 D 2	The Document Definition has been removed from the database. Avoid deleting objects when documents might exist in the queues which reference these objects.

BTS_E_NOENV	0 x 1 2 D 3	The envelope has been removed from the database. Avoid deleting objects when documents might exist in the queues which reference these objects.
BTS_E_NOCHANNEL	0 x 1 2 D 4	The channel has been removed from the database. Avoid deleting objects when documents might exist in the queues which reference these objects.
BTS_E_INVALIDREFERENCE	0 x 1 2 D 5	Either the WebDAV repository reference does not contain a valid HTTP address or it contains the text "localhost." Please provide either a valid HTTP address or replace the text "localhost" with the actual computer name.
BTS_E_CANNOTCONTAINSUBOBJECTS	0 x 1 2 D 6	The property set and delimiter objects cannot contain any subobjects.
BTS_E_INVALIDTRACKFIELDS	0 x 1 2 D 7	The "x_custom_search" field in the tracking field dictionary must be a simple list.
BTS_E_CHANNEL_INVALID_ORG	0 x 1 2 D 8	The organization specified in this channel does not exist.
BTS_E_CHANNEL_INVALID_ALIAS	0 x 1 2 D 9	The identifier specified for the organization in this channel either does not exist or it does not belong to the organization.
BTS_E_CHANNEL_INVALID_APPLICATION	0 x 1 2 D A	The application specified for the organization in this channel either does not exist or it does not belong to the organization.
BTS_E_CHANNEL_INVALID_INPUT_DOCUMENT	0 x 1 2 D B	The input document specified in this channel does not exist.
BTS_E_CHANNEL_INVALID_OUTPUT_DOCUMENT	0 x 1 2 D C	The output document specified in this channel does not exist.

BTS_E_CHANNEL_INVALID_PORTGROUP	0 x 1 2 D D	The distribution list specified in this channel does not exist.
BTS_E_OBJECT_NOT_XMLSERIALIZABLE	0 x 1 2 D E	The given dictionary or simplelist object must implement IPersistXML methods.
BTS_E_CHANNEL_INVALID_PORT	0 x 1 2 E 0	At least one messaging port that is referenced in this channel either does not exist or it is not associated with this channel.
BTS_E_CHANNEL_RECEIPT_VERIFY_SIGN_DECRYPT	0 x 1 2 E 1	The Verify Signature or Decrypt Encryption properties cannot be set on a receipt channel.
BTS_E_INVALID_REQUEST_CHANNEL	0 x 1 2 E 2	A channel that is connected to a distribution list cannot be used as a request channel.
BTS_E_DESTINATION_NOT_FOUND	0 x 1 2 E 3	The destination URL is not specified, and the messaging port is an open destination. Either the destination URL or a destination for the messaging port must be specified.
BTS_E_DESTINATION_CONFLICT	0 x 1 2 E 4	Both a destination URL and a destination for the messaging port cannot be specified. Specify only one of these properties.
BTS_E_ASYNC_TRANSPORT	0 x 1 2 E 5	The transport type for the request channel is not valid. Only the HTTP, HTTPS, and Application Integration Component transport types are valid for a request channel.
BTS_E_INVALID_RESPONSE_CHANNEL	0 x 1 2 E 6	The response channel can be connected only to a messaging port with a transport type set to Loopback.
BTS_E_INVALID_VERSION	0 x 1 2 E 7	The database version is incompatible with the installed version of the server. Try running setup again.

BTS_E_INVALID_SCHEMA	012E8	The document or envelope specification is not valid. Open the specification in BizTalk Editor, and then on the Tools menu, click Validate Specification. Resolve any warnings to ensure that the specification is valid.
BTS_E_CHANNEL_RECEIPTCHANNEL_PORTGROUP	012E9	A receipt channel cannot be connected to a distribution list.
BTS_E_TRANSPORT_ORCHESTRATION_OPENNESS	012EA	A messaging port that uses the BizTalk Orchestration Activation transport type must have the Openness Type property set to an XLANG schedule (BIZTALK_OPENNESS_TYPE_EX_TOWORKFLOW).
BTS_E_TRANSPORT_ORCHESTRATION_ADDRESS_PARAMETER	012EB	Both a primary address and a parameter are required for a messaging port that uses a BizTalk Orchestration Activation transport type.
BTS_E_ORCHESTRATION_INVALID_ORG	012EC	A messaging port that uses a BizTalk Orchestration Activation transport type must have the home organization set as the destination organization.
BTS_E_INVALID_FILTER_EXPRESSION	012ED	The channel filtering expression is not valid. Make sure that the node-path expression is valid.
BTS_E_MULTIPLE_DOCUMENT_DEFINITIONS_FOR_PROPERTY_SET	012EE	Multiple document definitions were found for the given property set. Only a single document definition for a given property set is expected.
BTS_E_INVALID_PROPERTY_SET	012EF	The PropertySet cannot contain non-string element values.
BTS_E_DATABASE_SCHEMA_MISMATCH	01300	The existing Database Schema is not compatible with the current version of the product. You must delete the existing database.
BTS_E_UNEXPECTED_INSTALL	01301	The existing Database Schema is newer than the current version that is installed. Setup will rollback the changes.

CIS_E_DOCSCHEMA_ATTRIBUTING	0 x 1 4 0 0	The "%3" attribute is missing in the "%4" element. Line: %1, Pos: %2.
CIS_E_DOCSCHEMA_INVALID_ATTR_VALUE	0 x 1 4 0 1	The "%3" attribute value "%4" is not valid. Line: %1, Pos: %2.
CIS_E_DOCSCHEMA_EMPTY_ELEMENT	0 x 1 4 0 2	The "%3" element cannot be empty. Line: %1, Pos: %2.
CIS_E_DOCSCHEMA_INVALID_CHILD_ELEMENT	0 x 1 4 0 3	The "%3" element cannot be a child of the "%4" element. Line: %1, Pos: %2.
CIS_E_DOCSCHEMA_MULTIPLE_INFO	0 x 1 4 0 4	Only one record description or one field description is allowed for each element declaration. One of the descriptions must be removed. Line: %1, Pos: %2.
CIS_E_DOCSCHEMA_INVALID_FIELD_DECL	0 x 1 4 0 5	The root node cannot contain a field. The root node of the document must contain a record. Verify that the root node in your document is declared as a record. Line: %1, Pos: %2.
CIS_E_DOCSCHEMA_INVALID_LEN_DECL	0 x 1 4 0 6	The minimum length value must be no greater than the maximum length value. Line: %1, Pos: %2.
CIS_E_DOCSCHEMA_INVALID_POSLEN_DECL	0 x 1 4 0 7	The value of the start position must be no greater than the value of the end position. Line: %1, Pos: %2.
CIS_E_DOCSCHEMA_NO_INFO_YET	0 x 1 4 0 8	A field description or record description must be specified before references to other elements. Line: %1, Pos: %2.
CIS_E_DOCSCHEMA_INVALID_SCHEMA_TYPE_XML	0 x 1 4 0 9	Only non-XML document specifications are allowed for this format. The schema_type attribute has the value "xml". Verify that the specification selected is a non-XML specification. Line: %1, Pos: %2.

CIS_E_DOCSCHEMA_NO_INFO	0 x 1 4 0 A	No record information or field information was found in the "%3" element. Line: %1, Pos: %2.
CIS_E_DOCSCHEMA_INVALID_ATTRIB	0 x 1 4 0 B	The "%3" attribute is not allowed in the "%4" element. Line: %1, Pos: %2.
CIS_E_DOCSCHEMA_MISSING_ELEM_DECL	0 x 1 4 0 C	There is no element with the name "%1" in the document specification.
CIS_E_DOCSCHEMA_MISSING_ATTR_DECL	0 x 1 4 0 D	There is no attribute with the name "%1" in the document specification.
CIS_E_DOCSCHEMA_INVALID_POSITIONAL_DECL	0 x 1 4 0 E	The "%1" record cannot be a child of the "%2" positional record. Only fields can be children of positional records.
CIS_E_DOCSCHEMA_INVALID_RECORD_CHILDREN	0 x 1 4 0 F	The children of the "%1" delimited record must either be all records or all fields. Records with no tag identifier cannot have mixed records and fields as children.
CIS_E_DOCSCHEMA_NO_RECORD_CHILDREN	0 x 1 4 1 0	The "%1" delimited record must have at least one child. Records with no tag identifier must have at least one child, or else the record cannot be found in a non-XML format. Either add a child to the record, give the record a tag identifier, or remove the record from the specification.
CIS_E_DOCSCHEMA_MISSING_RECORD_TAG	0 x 1 4 1 1	The "%1" delimited record is marked to repeat but it does not have a tag identifier. Only the last record in a document specification is allowed to have this property. If this record appears only once in the document, then mark it as a single occurrence. Otherwise, give the record a tag identifier that tells the server where to look for the next record in the specification.
CIS_E_DOCSCHEMA_NO_ROOT_ELEMENT	0 x 1 4 1 2	The root-node name "%3" was not found in the specification. Line: %1, Pos: %2.
CIS_E_DOCSCHEMA_INVALID_ROOT_ELEMENT	0 x 1 4 1 3	The "%3" element cannot be the root node of this document. Only <Schema> is allowed. Line: %1, Pos: %2.

CIS_E_DOCSCHEMA_INVALID_EMPTY_ATTRIBUTE	0 x 1 4 1 4	The "%3" attribute in the "%4" element cannot be empty. Either specify a nonempty value or remove the attribute. Line: %1, Pos: %2.
CIS_E_DOCSCHEMA_INVALID_REFERENCE	0 x 1 4 1 5	The "%1" record has an illegal cyclic path through the "%2" record. The only cyclic reference allowed for a record is if the record has a tag identifier that allows the system to terminate the search. Either remove the cyclic reference or add an appropriate tag identifier to the document specification.
CIS_E_DOCSCHEMA_LOADFAILED	0 x 1 4 1 6	The specification failed to load. See the following messages for details.
CIS_E_DOCSCHEMA_MISSING_NS	0 x 1 4 1 7	Valid BizTalk Server specifications for non-XML documents must have the namespace declarations of "urn:schemas-microsoft-com: BizTalkServer", "urn:schemas-microsoft-com: datatypes", and "urn:schemas-microsoft-com: xml-data" in the root node of the specification.
CIS_E_DOCSCHEMA_INVALID_SCHEMA_USAGE	0 x 1 4 1 8	The specification referenced in the "%1" document is not compatible with the "%2" format. Select a specification that is compatible with this format, or if this is a valid specification for the defined format, assign "%2" to the "standard" property on this specification.
CIS_E_DOCSCHEMA_MISSING_POSLEN_DECL	0 x 1 4 1 9	The "%3" field is missing a start and end position, and is referenced in the "%4" positional record. Specify valid start and end positions for this field. Line: %1, Pos: %2.
CIS_E_DOCSCHEMA_DUPLICATE_NAMESPACE	0 x 1 4 1 A	The duplicate namespace declaration "%3" has been found. Please remove the duplicate reference to same namespace. Line: %1, Pos: %2.
CIS_E_PARSER_EOF	0 x 1 4 3 0	The end of the file was reached prematurely.
CIS_E_PARSER_MISSING_TAG	0 x 1 4 3 1	The required "%1" record was not found in the inbound document.
CIS_E_PARSER_MISSING_FIELD	0 x 1 4 3 2	The required field "%1" in the "%2" record was not found in the inbound document.

CIS_E_PARSER_FAILURE	0 x 1 4 3 3	The parser failed to convert the document due to processing errors. See the following messages for details.
CIS_E_PARSER_INVALIDDATA	0 x 1 4 3 4	The parser cannot match the current position of the data with the specification. Verify that the version of this specification is consistent with the version of the data and that the root parsing tags match.
CIS_E_PARSER_NO_DATA	0 x 1 4 3 5	There is no data that can be parsed on the dictionary. Verify that either the "working_data" field or the "file_path" field contains nonempty data.
CIS_E_PARSER_INVALID_ENVNAME	0 x 1 4 3 6	The envelope name "%1" does not reference a valid envelope for the BizTalk Server parser. Either the envelope name does not exist or there is an envelope specification attached that is not valid.
CIS_E_PARSER_NO_COMPONENTS_FOUND	0 x 1 4 3 9	No parser component recognizes the data. This might be caused by an interchange specification that is missing or not valid, or it might be caused by data that is not valid. Verify that both the interchange specification (if one is specified) and the data match.
CIS_E_PARSER_COMPONENT_FAILED	0 x 1 4 4 0	While trying to process document #%4 during submission "%1", the parser component named "%2" failed on the method "%3" with the error code "%5". Possible causes are: the component found unexpected data in the incoming stream; a document specification could not be found given the data; or an internal component failure occurred. If this problem continues, remove this component from the valid list of parser components or contact your system administrator.
CIS_E_PARSER_DOCUMENT_FAILED	0 x 1 4 4 1	Document #%4 within submission "%1" was returned as a document that was not valid from the parser component named "%2". The most frequent cause is a document specification that is not valid or else the component was unable to determine the necessary routing fields. Verify that the proper specification is defined for this data.
CIS_E_PARSER_INVALID_DATETIME	0 x 1 4 4 2	The "%1" date or time format does not match the format of the "%2" data extracted from the incoming data.
CIS_E_PARSER_INVALID_COMPONENT	0 x 1 4 4 3	Within submission "%1", the parser component named "%2" could not be loaded. Verify that this component can be run in a stand-alone executable and that the server has sufficient permissions to start it.
CIS_W_PARSER_SKIPPED_COMPONENT	0 x 1 4 4 4	The parser was unable to probe the specified component. This component will be skipped.

CIS_E_PARSER_UNUSEABLE_DOCUMENTNAME	0 x 1 4 4 5	The parser cannot use the document "%1" as it has no specification. Please attach a specification to this document or specify a different one.
CIS_E_PARSER_CONTROL_NUMBER_MISMATCH	0 x 1 4 4 6	The control number of segment "%1" (%2) does not match that of segment "%3" (%4).
CIS_E_PARSER_DOCUMENT_COUNT_INCORRECT	0 x 1 4 4 7	The document or segment count contained in tag "%1" (%2) does not match the number of documents or segments processed (%3).
CIS_E_PARSER_X12_ISA_PARSING_FAILED	0 x 1 4 4 8	The parser cannot parse the ISA section of the X12 document. This segment is fixed-width; if fields in this segment do not have correct length, the parsing will fail because the delimiters are picked up from the wrong offsets.
CIS_E_PARSER_MIN_LENGTH	0 x 1 4 4 9	The data contains a field value ("%1") that doesn't meet minimum length requirement for tag "%2" (minimum length is %3).
CIS_E_PARSER_MAX_LENGTH	0 x 1 4 4 A	The data contains a field value ("%1") that doesn't meet maximum length requirement for tag "%2" (maximum length is %3).
CIS_E_PARSER_NO_DATA_CONSUMED	0 x 1 4 4 B	No data was read by the parser. Make sure that the code page is set correctly for the data. If the data is UNICODE, make sure that there is no byte order mark (0xFFFE or 0xFEFF) appears at the beginning of the file.
CIS_E_PARSER_UNSUPPORTED_EDIFACT_SYNTAX	0 x 1 4 4 C	EDIFACT documents with the "UNOX" or the "UNOY" syntax identifier are not supported.
CIS_E_PARSER_DATA_REMAINING	0 x 1 4 4 D	Additional data in the document instance was not parsed. Make sure that the document instance you want to validate contains only one document.
CIS_E_PARSER_MISSING_DELIMITER	0 x 1 4 4 E	While parsing record "%1", the parser cannot find the required delimiter: "%2" (%3).

CIS_E_PARSER_MISSING_LEADING_DELIMITER	0 x 1 4 4 F	While parsing record "%1", the parser cannot find the required leading delimiter: "%2" (%3).
CIS_E_PARSER_MISSING_TRAILING_DELIMITER	0 x 1 4 5 0	While parsing record "%1", the parser cannot find the required trailing delimiter: "%2" (%3).
CIS_E_VALIDATE_GROUP_RULE	0 x 1 4 5 1	In record "%1", if any of the following fields exist, then all must exist: %2
CIS_E_VALIDATE_GROUP_ALL	0 x 1 4 5 2	In record "%1", all of the following fields must exist: %2
CIS_E_VALIDATE_GROUP_ONE	0 x 1 4 5 3	In record "%1", only one of the following fields can exist: %2
CIS_E_PARSER_INVALID_WRAP_CHAR_FOUND	0 x 1 4 5 4	While parsing record "%1", the parser found an occurrence of a wrap character, "%2", that is not valid.
CIS_E_VALIDATE_GROUP_ANY	0 x 1 4 5 5	In record "%1", one or more of the following fields must exist: %2
CIS_E_PARSER_EXTRA_DELIMITER	0 x 1 4 5 6	While parsing record "%1", the parser found the following extra delimiter: "%2".
BTS_E_DOCUMENT_HAS_INVALID_MANIFEST	0 x 1 4 5 7	Error parsing the manifest.
CIS_E_ADMIN_CACHE_PARSER	0 x 1 5 0 4	The latest modification date from the administration parser table could not be loaded.

CIS_E_ADMIN_INIT_CACHE	0 x 1 5 0 5	The configuration data in the global cache could not be initialized.
CIS_E_ADMIN_RELOAD_CACHE	0 x 1 5 0 6	The configuration data from the database could not be reloaded.
CIS_E_ADMIN_PARSER_GETCLSID	0 x 1 5 0 7	The class identifiers (CLSIDs) of the parser records could not be loaded.
CIS_E_ADMIN_CACHE_OBJECT_NOTCREATED	0 x 1 5 0 9	The administration cache cannot be created.
CIS_E_ADMIN_CACHE_INITIAL_LOAD	0 x 1 5 0 A	The configuration cache data from the database could not be loaded.
CIS_E_ADMIN_ADD_SERVER_ACCESS_DENIED	0 x 1 5 0 B	Server "%1" cannot be added because access to the "%2" is denied.
CIS_E_ADMIN_ADD_SERVER_NO_SERVICE	0 x 1 5 0 C	Server "%1" cannot be added because BizTalk Server is not installed on the computer.
CIS_E_ADMIN_DELETE_SERVER_NO_ACCESS	0 x 1 5 0 D	The "%1" server cannot be deleted because access to the "%2" service is denied and the service cannot be stopped.
CIS_E_ADMIN_DELETE_GROUP_SERVER_RUNNING	0 x 1 5 0 E	This server group cannot be deleted because the "%1" server is still running.
CIS_E_ADMIN_DELETE_GROUP_SERVER_ACCESS_DENIED	0 x 1 5 0 F	This server group cannot be deleted because access to the "%1" service on "%2" server is denied.

CIS_E_ADMIN_NOGROUP	0 x 1 5 1 2	The specified administration group does not exist.
CIS_E_ADMIN_NOSERVER	0 x 1 5 1 3	The specified administration server does not exist.
CIS_E_ADMIN_NORECEIVESERVICE	0 x 1 5 1 4	The specified administration receive function does not exist in the database.
CIS_E_ADMIN_UNEXPECTED_REMOVE_RECEIVERESERVICE	0 x 1 5 1 5	An unexpected error occurred while trying to remove the "%1" receive function from the database.
CIS_E_ADMIN_UNEXPECTED_REMOVE_GROUP	0 x 1 5 1 6	An unexpected error occurred while trying to remove the "%1" group from the database.
CIS_E_ADMIN_UNEXPECTED_REMOVE_SERVER	0 x 1 5 1 7	An unexpected error occurred while trying to remove the "%1" server from the database.
CIS_E_ADMIN_NOTIMESTAMP	0 x 1 5 1 A	The specified administration timestamps object does not exist in the database.
CIS_E_ADMIN_REFRESH_THREAD_ERROR	0 x 1 5 1 B	The configuration refresh thread encountered an error while loading the configuration data.
CIS_E_ADMIN_REFRESH_THREAD_EXIT	0 x 1 5 1 C	The configuration refresh thread cannot load the configuration data because of a previous error.
CIS_E_ADMIN_RECSVC_GENERAL	0 x 1 5 1 D	The configuration refresh thread cannot set up one or more receive functions. This might be because SQL Server is not started.

CIS_E_ADMIN_CREATE_GROUP	0 x 1 5 2 9	The server group cannot be created because "%1".
CIS_E_ADMIN_LOAD_GROUP_PROPERTIES	0 x 1 5 2 A	The group properties cannot be loaded because "%1".
CIS_E_ADMIN_SAVE_GROUP_PROPERTIES	0 x 1 5 2 B	The group properties cannot be saved because "%1".
CIS_E_ADMIN_REMOVE_GROUP	0 x 1 5 2 C	The server group cannot be removed from the database because "%1".
CIS_E_ADMIN_GETALLADMIN_GROUPS	0 x 1 5 2 D	All server groups cannot be retrieved from the database.
CIS_E_ADMIN_GETSERVERS	0 x 1 5 2 E	All servers for the "%1" server group cannot be retrieved from the database because "%2".
CIS_E_ADMIN_GETRECEIVERS	0 x 1 5 2 F	All receive functions for the "%1" group cannot be retrieved from database because "%2".
CIS_E_ADMIN_GETPARSER_IN_GROUP	0 x 1 5 3 1	All parsers for the "%1" server group cannot be retrieved from the database because "%2".
CIS_E_ADMIN_GETLOCALSMTP_HOST	0 x 1 5 3 8	The local SMTP host cannot be retrieved because "%1".
CIS_E_ADMIN_CREATE_SERVER	0 x 1 5 3 9	The server cannot be created because "%1".

CIS_E_ADMIN_LOAD_SERVER_PROPS	0 x 1 5 3 A	The server properties cannot be loaded because "%1".
CIS_E_ADMIN_SAVE_SERVER_PROPS	0 x 1 5 3 B	The server properties cannot be saved because "%1".
CIS_E_ADMIN_REMOVE_SERVER	0 x 1 5 3 C	The server cannot be removed from the database because "%1".
CIS_E_ADMIN_GETALLADMIN_SERVERS	0 x 1 5 3 D	All servers cannot be retrieved from the database.
CIS_E_ADMIN_GETSERVERBYNAME	0 x 1 5 3 E	The server properties for "%1" cannot be retrieved because "%2".
CIS_E_ADMIN_DECRYPT_PASSWORD	0 x 1 5 4 0	The "%1" property cannot be retrieved.
CIS_E_ADMIN_EXECUTE_COMMAND_ON_PARSER	0 x 1 5 4 F	The SQL command "%1" on the parser database table cannot be executed because "%2".
CIS_E_ADMIN_CREATE_RECEIVERSERVICE	0 x 1 5 5 D	The receive function cannot be created because "%1".
CIS_E_ADMIN_LOAD_RECEIVERSERVICE_PROPS	0 x 1 5 5 E	The receive function properties cannot be loaded because "%1".
CIS_E_ADMIN_SAVE_RECEIVERSERVICE_PROPS	0 x 1 5 5 F	The receive function properties cannot be saved because "%1".

CIS_E_ADMIN_REMOVE_RECEIVESERVICE	0 x 1 5 6 0	The receive function cannot be removed from the database because "%1".
CIS_E_ADMIN_GETALLRECEIVESERVICES	0 x 1 5 6 1	All receive functions cannot be retrieved from the database because "%1".
CIS_E_ADMIN_GETALLRECEIVESERVICESINSERVER	0 x 1 5 6 2	All receive functions cannot be retrieved for the "%1" server because "%2".
CIS_E_ADMIN_LOAD_TIMESTAMP	0 x 1 5 6 3	All timestamps cannot be retrieved from the database because "%1".
CIS_E_ADMIN_GETSQCONNECT	0 x 1 5 7 0	The Shared Queue database connection string cannot be retrieved from the database.
CIS_E_ADMIN_GETCOMPUTERNAME	0 x 1 5 7 1	The name of the local computer cannot be retrieved. Internally, BizTalk Server is using "localhost" as the computer name.
CIS_E_ADMIN_MIN_CONSTRAINT	0 x 1 5 7 3	The size of the "%1" property is less than the minimum required length for "%2".
CIS_E_ADMIN_MAX_CONSTRAINT	0 x 1 5 7 4	The size of the "%1" property is greater than the maximum length allowed for "%2".
CIS_E_ADMIN_GET_MGMTDB_CONNECT_PROPS	0 x 1 5 7 5	The BizTalk Messaging Management database properties cannot be retrieved.
CIS_E_ADMIN_KEY_EMPTY	0 x 1 5 7 6	The key to the database table, property "%1", is empty.

CIS_E_ADMIN_COCREATE_IN_CREATE	0 x 1 5 7 7	An instance of the "%1" object could not be created while creating a new "%2" object.
CIS_E_ADMIN_ADO_OPEN_CONNECTSTRING	0 x 1 5 7 8	The connection to the BizTalk Messaging Management database could not be opened.
CIS_E_ADMIN_COCREATE_IN_LOAD	0 x 1 5 7 9	An instance of the "%1" object could not be created while loading the "%2" properties.
CIS_E_ADMIN_COCREATE_IN_SAVE	0 x 1 5 8 0	An instance of the "%1" object could not be created while saving the "%2" properties.
CIS_E_ADMIN_COCREATE_IN_REMOVE	0 x 1 5 8 1	An instance of the "%1" object could not be created while trying to remove the "%2" object.
CIS_E_ADMIN_COCREATE_IN_GETALL	0 x 1 5 8 2	An instance of the "%1" object could not be created while trying to get all instances of "%2".
CIS_E_ADMIN_COCREATE_IN_GETALL_INSERT	0 x 1 5 8 3	An instance of the "%1" object could not be created while trying to get all instances of the "%2" object in the "%3" server.
CIS_E_ADMIN_GET_PROP	0 x 1 5 8 4	The "%1" property cannot be retrieved.
CIS_E_ADMIN_CLOSE_ADO_CONNECTION	0 x 1 5 8 5	The ADO connection cannot be closed.
CIS_E_ADMIN_CLOSE_ADO_RECORDSET	0 x 1 5 8 6	The ADO record set cannot be retrieved.

CIS_E_ADMIN_ENCRYPT_PASS WORD	0 x 1 5 8 7	The "%1" property cannot be processed.
CIS_E_ADMIN_COCREATE_IN_GETALLNAMES	0 x 1 5 8 8	An instance of the "%1" object could not be created while trying to get the names of all the "%2" object instances.
CIS_E_ADMIN_COCREATE_IN_GETOTHERS_OF_GROUP	0 x 1 5 8 9	An instance of the "%1" object could not be created while trying to get all instance of the "%2" object in the "%3" group.
CIS_E_ADMIN_COCREATE_IN_GET_SMTPHOST	0 x 1 5 8 A	An instance of the "%1" object could not be created while trying to get "%2" for the local server.
CIS_E_ADMIN_COCREATE_IN_GET_SQL_CONNECTIONSTRING	0 x 1 5 8 B	An instance of the "%1" object could not be created while trying to get the Shared Queue parameters of "%2" in order to connect to the database.
CIS_E_ADMIN_COCREATE_SERVER_BYNAME	0 x 1 5 8 C	An instance of the "%1" object could not be created while trying to get the properties of the "%2" server instance of the "%3" class.
CIS_E_ADMIN_GETSQCONNECTION_IN_OPEN	0 x 1 5 8 D	The Shared Queue database connection string could not be retrieved from the database because "%1".
CIS_E_ADMIN_COCREATE_EXECUTE_SQL_COMMAND_ON_PARSER	0 x 1 5 8 E	An instance of the "%1" object could not be created while trying to execute a SQL command on the "%2" database table.
CIS_E_ADMIN_COCREATE_PARSER_CLSIDS_IN_GROUP	0 x 1 5 8 F	An instance of the "%1" object could not be created while retrieving the class identifiers (CLSIDs) for the parsers that belong to the "%2" group.
CIS_E_ADMIN_INVALID_ARGUMENT	0 x 1 5 9 0	An unexpected internal error occurred. An invalid "%1" argument was used when calling the "%2" method.

CIS_E_ADMIN_MAX_ENUM_CONSTRAINT	0 x 1 5 9 1	The value of the "%1" property is greater than the maximum value allowed for "%2".
CIS_E_ADMIN_MIN_ENUM_CONSTRAINT	0 x 1 5 9 2	The value of the "%1" property is smaller than the minimum value allowed for "%2".
CIS_E_ADMIN_CREATE_CHANNEL_GETTYPE_TO_STRING	0 x 1 5 9 3	The type of the "%1" property could not be changed to a string.
CIS_E_ADMIN_CREATE_CHANNEL_GETTYPE_TO_BOOLEAN	0 x 1 5 9 4	The type of the "%1" property could not be changed to Boolean.
CIS_E_ADMIN_COCREATE_INSTANCES	0 x 1 5 9 5	An instance of the "%1" object could not be created while enumerating instances of the "%2" object.
CIS_E_ADMIN_COCREATE_INSTANCE	0 x 1 5 9 6	An instance of the "%1" object could not be created while setting an instance of the "%2" object.
CIS_E_ADMIN_COCREATE_INSTANCE_GETOBJECT	0 x 1 5 9 7	An instance of the "%1" object could not be created while getting an instance of the "%2" object.
CIS_E_ADMIN_COCREATE_INSTANCE_DELETEINSTANCE	0 x 1 5 9 8	An instance of the "%1" object could not be created while deleting an instance of the "%2" object.
CIS_E_ADMIN_COCREATE_INSTANCE_LOADPROPS	0 x 1 5 9 9	An instance of the "%1" object could not be created while loading properties for an instance of the "%2" object.
CIS_E_ADMIN_COCREATE_INSTANCE_LOADPARSERS	0 x 1 5 9 B	An instance of the "%1" object could not be created while loading parsers from a database for an instance the "%2" object.

CIS_E_ADMIN_COCREATE_IN_SETPARSERSFROM_REGISTRY	0 x 1 5 9 C	An instance of the "%1" object could not be created while setting parsers from the registry for an instance of the "%2" object.
CIS_E_ADMIN_COCREATE_IN_SETPARSERSFROM_CLIENT	0 x 1 5 9 D	An instance of the "%1" object could not be created while setting parsers from the client for an instance of the "%2" object.
CIS_E_ADMIN_COCREATE_IN_REFRESHPARSERLIST	0 x 1 5 9 E	An instance of the "%1" object could not be created while refreshing the parser list for an instance of the "%2" object.
CIS_E_ADMIN_COCREATE_IN_MOVETOSUSPENDED_Q	0 x 1 5 9 F	An instance of the "%1" object could not be created while moving an instance of "%2" to the Suspended queue.
CIS_E_ADMIN_COCREATE_IN_RESUBMIT	0 x 1 5 A 0	An instance of the "%1" object could not be created while resubmitting an instance of "%2".
CIS_E_ADMIN_COCREATE_IN_VIEWDOC	0 x 1 5 A 2	An instance of the "%1" object could not be created while viewing a document instance of "%2".
CIS_E_ADMIN_COCREATE_IN_VIEWERRORDESCRIPTION	0 x 1 5 A 3	An instance of the "%1" object could not be created while viewing the error description of an instance of "%2".
CIS_E_ADMIN_COCREATE_IN_VIEWINTERCHANGES	0 x 1 5 A 4	An instance of the "%1" object could not be created while viewing the interchanges of an instance of "%2".
CIS_E_ADMIN_COCREATE_IN_FREEINTERCHANGES	0 x 1 5 A 5	An instance of the "%1" object could not be created while freeing the interchanges for an instance of a "%2".
CIS_E_ADMIN_COCREATE_IN_STARTSERVER	0 x 1 5 A 6	An instance of the "%1" object could not be created while starting the server for an instance of a "%2".

CIS_E_ADMIN_COCREATE_IN_STOPSERVER	0 x 1 5 A 7	An instance of the "%1" object could not be created while stopping the server for an instance of a "%2".
CIS_E_ADMIN_NO_DELETE_SERVER_IN_RECV_SERVICE	0 x 1 5 A 8	The "%1" server cannot be deleted because it is the processing server for at least one receive function.
CIS_E_ADMIN_UPDATE_GROUP_SERVER_RUNNING	0 x 1 5 A 9	The server group properties cannot be changed because the "%1" server is still running.
CIS_E_ADMIN_UPDATE_GROUP_SERVER_ACCESS_DENIED	0 x 1 5 A A	The server group properties cannot be changed because access to the "%1" service on "%2" server is denied.
CIS_E_ADMIN_UPDATE_SERVER_RUNNING	0 x 1 5 A C	The server properties cannot be changed because the "%1" server is still running.
CIS_E_ADMIN_UPDATE_SERVER_ACCESS_DENIED	0 x 1 5 A D	The server properties cannot be changed because access to the "%1" service on "%2" server is denied.
CIS_E_ADMIN_UPDATE_READ_ONLY_PROP	0 x 1 5 A E	The "%1" property cannot be changed. It is a read only property.
CIS_E_ADMIN_DIFFERENT_ROOT	0 x 1 5 A F	The "%1" server may already belong to a different BizTalk Server installation.
CIS_E_ADMIN_NOT_RESUBMITTABLE	0 x 1 5 B 0	This Suspended queue item cannot be submitted again.
CIS_E_ADMIN_DBCONNECT	0 x 1 5 B 1	BizTalk Server failed to access the "%1" database on the "%2" server with the database connection information.

CIS_E_ADMIN_P URGE_SUSPEN DEDQ	0 x 1 5 B 2	An instance of the "%1" object could not be created while deleting documents from "%2".
CIS_E_ADMIN_ REQ_PROP_MIS SING	0 x 1 5 B 3	%1 cannot be NULL.
CIS_E_ADMIN_ WMI_ERROR_H ANDLING	0 x 1 5 B 4	The BizTalk Server WMI provider error-handling method failed. The original error description for the error that called the error-handling method is: "%1".
CIS_W_ADMIN_ QUERY_FAILED	0 x 1 5 B 5	An attempt to get the Where clause values for a WMI Query failed.
CIS_E_ADMIN_I NVALID_ENUM _CONSTRAINT	0 x 1 5 B 6	The value "%2" of the "%1" property is not valid.
CIS_E_ADMIN_ OPENNESS_CO NSTRANT	0 x 1 5 B 7	The value "%2" of the "%1" property is not permitted when the value of the IsPassThrough property is set to TRUE.
CIS_E_ADMIN_ RECEIVE_INVAL ID_SERVER_GR ROUP	0 x 1 5 B 8	the specified server and/or group is not valid
CIS_E_ADMIN_I NVALID_INSTA NCE_NAME	0 x 1 5 B 9	The specified instance name "%1" contains at least one of the following characters that is not valid: [ ` ~ ! @ # \$ % ^ & * ( ) + = [ ] { }   \ ; " ' < > , . ? ]
BTS_E_ADMIN_ GROUP_UNIQU E_NAME	0 x 1 5 B A	A BizTalk Server group with the same name already exists in the BizTalk Messaging Management database.
BTS_E_ADMIN_ TIMESTAMPS_D ATA_CORRUPTI ON	0 x 1 5 B B	Internal data corruption has been detected in the adm_TimeStamps table of the BizTalk Messaging Management database.

BTS_E_ADMIN_SERVER_UNIQUE_NAME	0x15BC	A BizTalk Server with the same name already exists in the BizTalk Messaging Management database.
BTS_E_ADMIN_SERVER_FOREIGN_GROUPNAME	0x15BD	This BizTalk Server does not reference a valid BizTalk Server group in the BizTalk Messaging Management database.
BTS_E_ADMIN_RECSVC_UNIQUE_NAME	0x15BE	A BizTalk Server receive function with the same name already exists in the BizTalk Messaging Management database.
BTS_E_ADMIN_RECSVC_FOREIGN_GROUPNAME	0x15BF	This BizTalk Server receive function does not reference a valid BizTalk Server group in the BizTalk Messaging Management database.
BTS_E_ADMIN_PARSER_UNIQUE_ID	0x15C1	A BizTalk Server parser with the same CLSID and Group Name already exists in the BizTalk Messaging Management database.
BTS_E_ADMIN_PARSER_FOREIGN_GROUPNAME	0x15C2	This BizTalk Server parser does not reference a valid BizTalk Server group in the BizTalk Messaging Management database.
CIS_E_ADMIN_DB_SPROCVERSION	0x15C3	The "%1" database on the "%2" server does not contain the necessary database schema.
CIS_E_ADMIN_DB_VERSION	0x15C4	The "%1" database on the "%2" server is not compatible with the current version of the product.
CIS_E_DTA_LOG_INTERCHANGE_DETAILS_FAILED	0x1604	The details of an interchange could not be logged.
CIS_E_DTA_LOG_DOCUMENT_DETAILS_FAILED	0x1605	The details of a document could not be logged.

CIS_E_DTA_LOG_GROUP_DETAILS_FAILED	0 x 1 6 0 6	The details of a group could not be logged.
CIS_E_DTA_INIT_FAILED	0 x 1 6 0 A	The DTA object could not be initialized.
CIS_E_DTA_FAILED_TO_GET_ADMIN_PROPERTIES	0 x 1 6 0 E	The administration properties could not be obtained.
CIS_E_DTA_DATABASE_CONNECTION	0 x 1 6 0 F	The server could not establish connection to the Tracking database.
CIS_E_DTA_LOG_DOCUMENT_FAILED	0 x 1 6 1 9	A copy of the document could not be logged.
CIS_E_DTA_LOG_INTERCHANGE_FAILED	0 x 1 6 2 0	A copy of the interchange could not be logged.
CIS_E_DTA_OBJECT_IS_UNINITIALIZED	0 x 1 6 2 3	The DTA initialization method must be explicitly invoked before any DTA method can be invoked.
CIS_E_DTA_FAILED_TO_COMMIT	0 x 1 6 2 5	Changes could not be committed to the database.
CIS_E_DTA_FAILED_TO_LOG_SOURCE_XML	0 x 1 6 2 6	The intermediate source XML could not be logged.
CIS_E_DTA_FAILED_TO_LOG_DEST_XML	0 x 1 6 2 7	The intermediate destination XML could not be logged.

CIS_E_DTA_ACK_NO_ROW_FOUND	0 x 1 6 2 B	Acknowledgment correlation failed. The correlation key(s) given did not match any record in the Tracking data base.
CIS_E_DTA_ACK_MULTIPLE_ROWS_FOUND	0 x 1 6 2 C	Acknowledgment correlation failed. The correlation key(s) given match more than one record in the Tracking database.
CIS_E_DTA_LOG_MIME_FAILED	0 x 1 6 2 D	The MIME data for submission "%1" could not be logged.
CIS_W_DTA_LOG_TRACKING_FIELD_FAILED	0 x 1 6 2 E	The following tracking field for submission "%1" could not be logged: Tracking field: %2 Specification field name: %3 Actual value: %4 Possible causes are either a conversion error or an arithmetic overflow error. Check the tracking field settings in the document or channel configuration.
CIS_W_DTA_LOG_BINARY_TRACKING_FIELD_FAILED	0 x 1 6 2 F	The following tracking field for submission "%1" could not be logged: Tracking field: %2 Specification field name: %3 The submission could not be logged because the corresponding XML element or attribute is set to binary type, which can only be tracked as custom type tracking field. Correct the tracking field settings in the document or channel configuration.
CIS_E_DTA_INIT_TRANSACTIONAL_SESSION	0 x 1 6 3 1	The server could not create a transactional session for the Tracking object.
CIS_W_DTA_RECORD_UPDATE_FAILED	0 x 1 6 3 2	An attempt to update a tracking record has failed. The record was probably deleted prior to the update action.
CIS_E_RESPONSE_DOM_LOAD_FAILED	0 x 1 7 0 1	The XML-DOM could not be loaded from the response data.
CIS_E_RECEIVE_MSMQ_BYOT_CREATE_FAILED	0 x 1 7 0 2	A Message Queuing receive function failed to create an Interchange object using a Bring Your Own Transaction (BYOT) object. This may have been caused by editing the BizTalk Server COM+ application or configuring the BYOT object in its own COM+ application. This BizTalk Message Queuing receive function will be stopped.
CIS_E_RECEIVE_MSMQ_ZERO_BYTE_DOC	0 x 1 7 0 3	A Message Queuing receive function read a zero byte document. This document has been discarded.

CIS_E_RECEIVE_SERVICE_FAILED	0 x 1 7 0 4	There was a failure processing the "%1" receive function. Check your receive function configuration in BizTalk Server Administration.
CIS_E_INITWORKITEM	0 x 1 7 0 5	There was a failure creating the internal work item. Make sure that SQL Server is running.
CIS_E_NOPIPELINE	0 x 1 7 0 6	A channel with the name "%1" cannot be located.
CIS_E_OPENPASSSTHROUGH	0 x 1 7 0 7	The channel and messaging port openness type are not compatible with the submit method call.
CIS_E_DLQ_DETAILS	0 x 1 7 0 8	Details about the Suspended queue could not be retrieved.
CIS_E_INVALID_OPENDEST	0 x 1 7 0 9	The destination specified for the following open-destination messaging port was not valid: %1
CIS_E_SQL_MISSINGROWS	0 x 1 7 0 a	Rows were missing from the record returned by SQL OLEDB provider.
CIS_E_BTF_TIMESTAMP_EXPIRED	0 x 1 7 0 b	The BizTalk Framework document "%1" was received with an expired "%2" timestamp. This message will be discarded.
CIS_E_ACCESS_DENIED	0 x 1 7 0 c	The current process did not have administrative privileges and cannot access the Suspended queue.
CIS_E_BTF_ERROR_FINDING_TAG	0 x 1 7 0 d	The parser could either not find the BizTalk Framework tag "%1", or the tag did not have a value. This document will be moved to the Suspended queue.

CIS_E_INVALID_FORMAT	0 x 1 7 0 e	The "%1" envelope format is not recognized by the server. Specify a valid envelope format.
CIS_E_INVALID_MAP	0 x 1 7 0 f	The server could not load the map that is referenced by this channel.
CIS_E_MALFORMED_EXPR	0 x 1 7 1 0	The expression "%1" is malformed and cannot be interpreted by the server.
CIS_E_DB_SHUTDOWN	0 x 1 7 1 1	The server is shutting down because of a database failure.
CIS_E_SUBMIT_BLOCKED	0 x 1 7 1 2	All submit calls have been blocked due to a database failure. After correcting this problem, please go to Component Services and shut down the 'BizTalk Server Interchange Application', before attempting to call any submit method.
CIS_E_CERT_NOT_FOUND	0 x 1 7 1 3	The required certificate cannot be found in the certificate store.
CIS_E_NODATA	0 x 1 7 1 4	The Submit method call did not contain a document or a file path.
CIS_E_TOO MUCH_DATA	0 x 1 7 1 5	The Submit method call contained both a document and a file path.
CIS_E_INVALID_OPENFLAG	0 x 1 7 1 6	The Submit method call was passed an openness type that is not valid. Refer to the BizTalk Server 2000 Help documentation for the enumeration of these values.
CIS_E_PASSTHROUGH_PARAMS	0 x 1 7 1 7	The Submit method call contained a channel along with source, destination, or document name information. Do not include source, destination, or document name information when passing the channel as a parameter within a Submit method call.

CIS_E_NOSRCID	0 x 1 7 1 8	The Submit method call contained a source qualifier but no source identifier.
CIS_E_NODESTID	0 x 1 7 1 9	The Submit method call contained a destination qualifier but no destination identifier.
MSG_TIMEBOMB_EXPIRED	0 x 1 7 1 A	Thank you for evaluating Microsoft BizTalk Server 2000. The period for this evaluation version has ended. Please contact Microsoft or your software reseller to obtain a licensed version of Microsoft BizTalk Server 2000.
CIS_E_LOOPBACK	0 x 1 7 1 B	An attempt was made to submit a document that uses the Loopback transport type. The Loopback transport type can only be used when calling the SubmitSync method.
CIS_E_DBEXECUTE	0 x 1 7 1 C	The following stored procedure call failed: "%1".
CIS_E_MISSING_SMTPHOST	0 x 1 7 1 D	In order to use the SMTP transport, the SMTP host must be specified. To specify an SMTP host, in BizTalk Server Administration expand Microsoft BizTalk Server 2000, right-click BizTalk Server Group, and then click Properties to open the BizTalk Server Group Properties dialog box. On the General tab, in the SMTP host box, specify the SMTP host that you want to use.
CIS_E_INVALID_HANDLE	0 x 1 7 1 E	This method expected a submission handle or an array of submission handles, but the incoming data was not valid. Verify that the parameters are correct.
CIS_E_DBCONNECT	0 x 1 7 1 F	BizTalk Server failed to initialize a connection to database: "%1" on server: "%2".
CIS_E_PASSTHROUGH_WITH_NOCHANNEL	0 x 1 7 2 0	A valid channel name must be specified as a submission parameter on a Submit or SubmitSync method call when the pass-through flag is set to true.
CIS_W_DBFAILURE	0 x 1 7 2 1	The database call failed and returned the following error string: "%1". If possible, we will attempt to retry this call.

CIS_E_GET_BTMPARAMS	0 x 1 7 2 2	Unable to load connection parameters for BTM database. Please go to the Administration MMC to resolve this problem.
CIS_E_UNABLE_TO_CREATE_CUSTOM_PREPROC	0 x 1 7 2 3	The custom preprocessing component for the receive function "%1" could not be created. This document will be moved to the Suspended queue.
CIS_E_CUSTOM_PREPROC_FAILED	0 x 1 7 2 4	The custom preprocessing component used by the receive function "%1" failed. This document will be moved to the Suspended queue.
CIS_E_CUSTOM_PREPROC_NO_BSTR	0 x 1 7 2 5	The custom preprocessing component used by the File receive function "%1" failed to return a valid BSTR. A valid BSTR is required. This document will be moved to the Suspended queue.
CIS_E_CUSTOM_PREPROC_INVALID_DATA	0 x 1 7 2 6	The custom preprocessing component used by the Message Queue receive function "%1" cannot be called because the message contains data that is not a BSTR or a BYTE array. This document will be moved to the Suspended queue.
CIS_E_CUSTOM_PREPROC_INVALID_CP	0 x 1 7 2 7	The custom preprocessing component used by the Message Queue receive function "%1" failed to return a valid code page. This document will be moved to the Suspended queue.
CIS_E_CUSTOM_PREPROC_INVALID_DATA_OUTPUT	0 x 1 7 2 8	The custom preprocessing component used by the Message Queue receive function "%1" failed to return a valid document, the document must be either a BSTR or a BYTE array. This document will be moved to the Suspended queue.
CIS_E_CUSTOM_FILE_PREPROC_FAIL	0 x 1 7 2 9	The custom preprocessing component used by the file receive function "%1" failed. The document "%2" will be moved to the Suspended queue.
CIS_E_CUSTOM_PREPROC_CONTEXT_SET_CTX	0 x 1 7 2 A	The server was unable to set the context on the custom preprocessing component used by the receive function "%1". This document will be moved to the Suspended queue.
CIS_E_FILERCV_FILE_SHARE_DOWN	0 x 1 7 2 B	The file receive function "%1" was unable to connect to the network share "%2". This receive function will try to connect again.

CIS_E_FILERCX NETWORK_DOWN	0 1 7 2 C	The file receive function "%1" is experiencing network problems and was unable to connect to the network share "%2". This receive function will try to connect again.
CIS_E_RECEIVE_FUNCTION_DISABLED	0 1 7 2 D	The receive function "%1" has experienced problems, it will be shut down and disabled. Once these problems have been corrected, re-enable this receive function in BizTalk Server Administration.
CIS_E_UNRECOVERABLE	0 1 7 2 E	There was a serious error within the BizTalk Server scheduler component. The server is being shut down. Resolve this problem and then restart the server.
CIS_E_RELIABLE_NOACK	0 1 7 2 F	The server has not received a receipt for the reliable message.
CIS_E_DLQ_ID	0 1 7 3 0	Suspended Queue ID: "%1"
CIS_E_CANNOT_FIRE_EVENT	0 1 7 3 1	The server cannot send a WMI event for the Suspended queue item "%1". The most likely cause is that the user configured for this submission has insufficient privileges to access WMI.
CIS_E_SERIALIZER_INVALID_DOCUMENT	0 1 8 0 0	The document with the "%1" tracking identifier is invalid XML. The serializer cannot continue.
CIS_E_BTF_INVALID_ADDRESS_TYPE	0 1 8 0 1	The BizTalk Framework document has a "type" specified that is not valid for the "%1" address field. This document will be moved to the Suspended queue.
CIS_E_RELIABLE_MSG_RECEIPT_REQ_BY	0 1 8 0 2	The BizTalk Framework document "%1" will not be transmitted as it has an expired "receiptRequiredBy" timestamp. This message will be discarded.
CIS_E_CUSTOM_ENVELOPE_ERROR	0 1 8 0 3	The custom envelope:"%1" had the property "%2" specified, but the custom envelope generator could not locate the XML node. This document will be moved to the Suspended queue.

CIS_E_SERIALI Z ER_INVALID_DA TETIME	0 x 1 8 0 4	The "%1" date or time format is not valid. Correct the format specification.
CIS_E_SERIALI Z ER_INVALID_DT DATA	0 x 1 8 0 5	The "%1" date or time field is not a valid ISO8601 format. Make sure that the XML date or time is formatted correctly.
CIS_E_SERIALI Z ER_INVALID_DE LIMITER	0 x 1 8 0 6	The "%1" delimiter is either missing or has a value specified that is not valid. Update the delimiter value.
CIS_E_SERIALI Z ER_MISSING_P ROPSET	0 x 1 8 0 7	The "%1" document is missing the entire property set that is required for this serializer to run.
CIS_E_SERIALI Z ER_MISSING_P ROP	0 x 1 8 0 8	The property set for the "%1" document either is missing or does not contain a valid value for the "%2" property. Add or correct this property.
CIS_E_SERIALI Z ER_INVALIDAR G	0 x 1 8 0 9	Both source and destination qualifiers and values are required for this serializer to run. Specify qualifiers and values in the messaging port for this transaction.
CIS_E_SERIALI Z ER_MISMATCH_ SPEC	0 x 1 8 0 A	The serialization produced no output. Verify that the document specification matches the outbound XML document.
CIS_E_SERIALI Z ER_FAILED	0 x 1 8 0 B	The serializer could not finish processing. See the following messages for details.
CIS_E_SERIALI Z ER_INVALID_SR CQUAL	0 x 1 8 0 C	The "%1" qualifier for the source identifier is too long to be placed in the outbound document header. Update the channel with a shorter qualifier.
CIS_E_SERIALI Z ER_INVALID_SR CID	0 x 1 8 0 D	The "%1" value for the source identifier is too long to be placed in the output header. Update the channel with a shorter value.

CIS_E_SERIALI Z ER_INVALID_DE STQUAL	0 x 1 8 0 E	The "%1" qualifier for the destination identifier is too long to be placed in the output header. Update the port with a shorter qualifier.
CIS_E_SERIALI Z ER_INVALID_DE STID	0 x 1 8 0 F	The "%1" value for the destination identifier is too long to be placed in the output header. Update the port with a shorter identifier.
CIS_E_SERIALI Z ER_INVALID_PO SREC	0 x 1 8 1 0	The "%1" positional record is defined to contain a record length of zero. This happens when there is no tag, and none of the fields in this record specify start and end positions. Update the fields to have valid start and end positions for this record.
CIS_E_SERIALI Z ER_NODELIMS	0 x 1 8 1 1	This serializer component requires delimiters specified in the messaging port. Specify a valid delimiter set for this component.
CIS_E_SERIALI Z ER_INVALID_CH AR	0 x 1 8 1 2	The serializer component has encountered a character, "%1", that is not valid. An entry specified in the InvalidCharacterMap tag of the document specification states that characters between "%2" and "%3" are not valid.
CIS_E_SERIALI Z ER_INVALID_LE NGTH	0 x 1 8 1 3	The length of the "%1" field ("%2") is not valid; it must be between %3 and %4. This document will be rejected.
CIS_E_SERIALI Z ER_SELECT_SIN GLE_NODE_FAI LED	0 x 1 8 1 4	The serializer component cannot find the node using the query "%1". This document will be rejected.
CIS_E_SERIALI Z ER_RELIABLE_U RL_MISSING	0 x 1 8 1 5	The reply-to URL required for reliable messaging was not set. This document will be rejected.
CIS_E_SERIALI Z ER_CONTROL_ NUMBER	0 x 1 8 1 6	The serializer component cannot find a control number for %1 %2 in the BizTalk Management database. This document will be rejected.
CIS_E_CUSTOM _ENV_PARSE_T ABLE_ERROR	0 x 1 8 1 7	The serializer component failed to build the custom envelope ID:"%1", this was due to errors in the XML Schema supplied. This document will be moved to the Suspended queue.

CIS_E_SUBSYN C_RELIABLE_MS G	0 x 1 8 1 8	The BizTalk Framework document that was submitted has "reliability" information specified. This information is not permitted in a synchronous call.
CIS_E_CUSTXM L_BODY_NOT_F OUND	0 x 1 8 1 9	The parser was unable to locate the XML document node by using the query specified in the XML specification: "%1".
CIS_E_BTF_ACK _BAD_MSG_ID	0 x 1 8 1 A	The BizTalk Framework receipt had a <prop:identity> tag that is not valid: "%1". This document will be moved to the Suspended queue.
CIS_E_BTF_MA NIFEST_REF_MI SSING	0 x 1 8 1 B	The BizTalk Framework document has a <manifest> tag without the mandatory <reference> tag. This document will be moved to the Suspended queue.
CIS_E_CUSTOM _ENV_NO_DOC _NODE	0 x 1 8 1 C	The serializer failed to create the custom envelope because the Document Container Node property was not specified in the XML specification. This document will be moved to the Suspended queue.
CIS_E_BTF_INV ALID_XSI_TYPE	0 x 1 8 1 D	The BizTalk Framework document contains an xsi:type attribute "%1" that is not valid. This attribute must not have spaces, and the first character must be alphabetical. This document will be moved to the Suspended queue.
CIS_E_SERIALI ZER_INVALID_SY NTAX_IDENTIFI ER	0 x 1 8 1 E	The EDIFACT Syntax Identifier "%1" is not valid. Update the channel with a correct identifier.
CIS_E_SERIALI ZER_INVALID_U NA_CONTROL	0 x 1 8 1 F	The EDIFACT UNA Control value "%1" is not valid. Update the channel with a correct value.
CIS_E_SERIALI ZER_EXPECT_BST R_VALUE	0 x 1 8 2 0	The configuration data for the field "%1" must be a string. Update the data for this field.
BTS_E_XMLSERI ALIZER_MISSIN G_DEST	0 x 1 8 2 1	The BizTalk Framework header could not be generated because no destination identifier was specified.

BTS_E_XMLSERIALIZER_MISSING_SRC	0x1822	The BizTalk Framework header could not be generated because no source identifier was specified.
CIS_E_BTF_IDENTITY_MISSING	0x1904	The parser could not find the mandatory BizTalk Framework tag "identity". This document will be moved to the Suspended queue.
CIS_E_BTF_EXPIRESAT_MISSING	0x1905	The parser could not find the mandatory BizTalk Framework tag "expiresAt". This document will be moved to the Suspended queue.
CIS_E_MSMQ_NOT_INSTALLED	0x1906	The Message Queuing receive function could not be started because the Message Queuing service is not installed on the server.
CIS_W_FILE_RECEIVE_RETRY_FAILURE	0x1907	There are file(s) in the "%1" directory that cannot be accessed by the file receive function. The receive service will try again to access the file(s) in "%2" seconds.
CIS_E_FILE_RECEIVE_DELETE_FAILURE	0x1909	The following file could not be deleted after processing: "%1". Make sure that the file attribute is not set to read-only.
CIS_E_LOGON_USER_FAILURE	0x190a	Unable to logon with the account %1. Make sure that %2 has been granted "logon locally" privilege on this server and that the BizTalk Server account has "act as part of the operating system" privilege.
CIS_E_MSMQ_RECEIVE_IMPERSONATION_FAILURE	0x190b	The "%1" Message Queuing receive function could not impersonate the logged on user.
CIS_E_RECEIVE_CANNOT_CREATE_THREAD	0x190c	A receive-function thread cannot be created due to a system error.
CIS_E_MSMQ_RECEIVE_OPENQUEUE_FAILURE	0x190d	The following Message Queuing queue cannot be opened: "%1" (Message Queuing error code: 0x%2=%3). Verify the existence and security setting of the queue.

CIS_E_MSMQ_RECEIVE_PEEKQUEUE_FAILURE	0 x 1 9 0 e	The Message Queuing queue could not be read: "%1" (Message Queuing error code: 0x%2=%3).
CIS_E_MSMQ_RECEIVE_RETRIEVE_FAILURE	0 x 1 9 0 f	A message could not be retrieved from the following Message Queuing queue: '%1' (Message Queuing error: 0x%2=%3).
CIS_E_FILE_RECEIVE_FINDCHANGE_FAILURE	0 x 1 9 1 0	The file-change notification cannot be set up on the following directory: "%1". Make sure that the path is correct.
CIS_E_SET_CURRENT_DIRECTORY_FAILURE	0 x 1 9 1 1	The current directory cannot be set to: "%1". Make sure that the path is correct.
CIS_W_RECEIVE_SUBMIT_FAILURE	0 x 1 9 1 4	A submit request initiated from the "%1" receive function has failed.
CIS_E_READONLY_FILE	0 x 1 9 1 5	The "%1" receive function picked up the following file: '%2'. This file is marked as read-only and cannot be processed.
CIS_E_BAD_RECEIVE_SERVICE	0 x 1 9 1 6	There was a serious failure in the receive function "%1". This receive service will be shut down, please check the event log for additional error messages.
CIS_E_FILE_RECEIVE_IMPERSONATION_FAILURE	0 x 1 9 1 7	The "%1" file receive function could not impersonate the logged on user.
CIS_E_MSMQ_RECEIVE_UNEXPECTED_PASSTHROUGH	0 x 1 9 1 8	The ""%1"" Message Queuing receive function is not configured for a pass-through submission, but it has encountered a document that was submitted previously as a pass-through submission. Change this receive function to accept pass-through submissions or remove the pass-through document from the queue. This receive function will be shut down.
CIS_E_BTS_DOCUMENT_INVALID_NAME	0 x 1 A 0 0	The document named "%1" does not exist. Correct the document name or add the document to the BizTalk Messaging Management database.

CIS_E_BTSDOCUMENT_INVALIDDOCUMENT	0 x 1 A 0 1	The server could not load any documents with the given criteria.
CIS_E_BTSDOCUMENT_AMBIGUOUS_NAMESPACES	0 x 1 A 0 2	The root node "%1" is ambiguous because documents "%2" and "%3" refer to different specifications with that name. Either change the specifications to remove this ambiguity or use the document name explicitly.
CIS_E_BTSDOCUMENT_AMBIGUOUS_PROPERTYSET	0 x 1 A 0 3	The property set is ambiguous because documents "%1" and "%2" refer to the same property set.
CIS_E_BTSDOCUMENT_AMBIGUOUS_PROPERTYSETSHAREID	0 x 1 A 0 4	The property set is ambiguous because documents "%1" and "%2" refer to the same property set and have reference "%3".
CIS_E_BTSDOCUMENT_INVALIDPROPERTYSET	0 x 1 A 0 5	The following property set was specified: %1.
CIS_E_BTSDOCUMENT_EMPTYPROPERTYSET	0 x 1 A 0 6	The property set was empty.
CIS_E_BTSDOCUMENT_LOADFAILED	0 x 1 A 0 7	The document "%1" could not be loaded. Possible causes are using a non-envelope specification, or incorrectly configured tracking details.
CIS_E_BTSENEVELOPE_LOADFAILED	0 x 1 A 2 0	The envelope "%1" could not be loaded. A possible cause is that the specification is not valid. Configure a valid envelope specification.
CIS_E_FAILED_TRANSACTION_JOIN_TRANSACTION	0 x 1 A 2 1	BizTalk Server failed to join a transaction. Ensure both the DTC and the SQL Server database are running.
MSG_COM_CREATE_FAILED	0 x 1 B 0 1	An instance of the %1 class cannot be created: %2.

MSG_CONNEC T_WMI_FAILED	0 x 1 B 0 2	A connection to Windows Management on "%1" cannot be established: %2.
MSG_COSETPR OXY_FAILED	0 x 1 B 0 3	The authentication credential cannot be set for the Windows Management connection: %1.
MSG_WMI_ENU MINST_FAILED	0 x 1 B 0 4	Instances of the BizTalk Server WMI provider class "%1" cannot be enumerated: %2.
MSG_WMI_GET PROP_FAILED	0 x 1 B 0 5	The property value of "%1" cannot be retrieved from the BizTalk Server WMI provider because of an unexpected error: %2.
MSG_WMI_EXE CQUERY_FAILED	0 x 1 B 0 6	An unexpected error is preventing execution of the BizTalk Server WMI provider query "%1": %2.
MSG_WMI_GET OBJ_FAILED	0 x 1 B 0 7	The BizTalk Server WMI provider instance of "%1" cannot be retrieved because of an unexpected error: %2.
MSG_WMI_PUT PROP_FAILED	0 x 1 B 0 8	The property value of "%1" cannot be changed because of an unexpected error: %2.
MSG_WMI_PUT INST_FAILED	0 x 1 B 0 9	The property values of the BizTalk Server WMI provider instance "%1" cannot be updated because of an unexpected error: %2.
MSG_WMI_DELI NST_FAILED	0 x 1 B 0 A	The BizTalk Server WMI provider instance "%1" cannot be deleted because of an unexpected error: %2.
MSG_WMI_CRE ATEINST_FAILED	0 x 1 B 0 B	A new instance of the WMI class "%1" cannot be created in the BizTalk Server WMI provider: %2.

MSG_WMI_CREATEGETOBJ_FAILED	0 x 1 B 0 C	A new instance of the BizTalk Server WMI provider class "%1" cannot be created because of an unexpected error: %2.
MSG_WMI_EXECUTE_METHOD_GETOBJ_FAILED	0 x 1 B 0 D	The method "%1" of the BizTalk Server WMI provider class "%2" cannot be executed because of a failure to retrieve the class: %3.
MSG_WMI_EXECUTE_METHOD_CLASSES_FAILED	0 x 1 B 0 E	The method "%1" of the BizTalk Server WMI provider class "%2" cannot be executed because of a failure to retrieve the method information: %3.
MSG_WMI_EXECUTE_METHOD_SPACE_FAILED	0 x 1 B 0 F	The method "%1" of the BizTalk Server WMI provider class "%2" cannot be executed because of an unexpected error: %3.
MSG_WMI_EXECUTE_METHOD_PARAMETER_FAILED	0 x 1 B 1 0	The method "%1" of the BizTalk Server WMI provider class "%2" cannot be executed because of a failure to set the parameter value: %3.
MSG_WMI_EXECUTE_METHOD_FAILED	0 x 1 B 1 1	The method "%1" of the WMI class "%2" cannot be executed by the BizTalk Server WMI provider: %3.
MSG_GET_HOSTNAME_FAILED	0 x 1 B 1 2	The local computer name cannot be obtained because of an unexpected error: %1.
MSG_OUT_OF_MEMORY	0 x 1 B 1 4	Insufficient memory.
MSG_FAIL_LOAD_BITMAP	0 x 1 B 1 7	At least one of the bitmaps cannot be loaded in the BizTalk Server Administration console: %1.
MSG_FAIL_SET_BITMAPSTRIP	0 x 1 B 1 8	At least one pair of bitmaps cannot be added to the image list of the BizTalk Server Administration console: %1.

MSG_ERROR_WMI_PATH_EMPTY	0 x 1 B 1 9	The requested operation cannot be completed because of a previous WMI failure. The WMI object path is empty in this case.
MSG_ERROR_BTM_GRP_ENUM_FAIL	0 x 1 B 2 0	Unknown problems are preventing the WMI provider from enumerating a list of server groups from the BizTalk Messaging Management database: %1.
MSG_ERROR_GRP_DTA_DB_FAIL	0 x 1 B 2 1	Unknown problems are preventing the WMI provider from accessing the Tracking database for the "%1" group.
MSG_ERROR_GRP_SQ_DB_FAIL	0 x 1 B 2 2	Unknown problems are preventing the WMI provider from accessing the Shared Queue database the "%1" group.
MSG_ERROR_GRP_BOTH_DB_FAIL	0 x 1 B 2 3	Unknown problems are preventing the WMI provider from accessing the Tracking and Shared Queue databases for the "%1" group.
MSG_ERROR_DECRYPT_FAIL	0 x 1 B 2 4	Password decryption failed: %1.
MSG_WARN_ENUM4ROOTUPD_FAILED	0 x 1 B 2 7	Unknown problems are preventing the WMI provider from retrieving following list of servers and their states to prepare for BizTalk Messaging Management database update: %1
MSG_ERROR_CHANGE_ROOTDB	0 x 1 B 2 8	The server "%1" cannot be updated with the new BizTalk Messaging Management database information: %2.
MSG_ERROR_CHANGE_ROOTDB_CONNECT	0 x 1 B 2 9	We cannot connect to the WMI namespace "%1" to update server "%2" with the new BizTalk Messaging Management database information: %3
MSG_CHANGE_ROOTDB_SUMMARY	0 x 1 B 3 0	The BizTalk Messaging Management database change request has been completed. %1%2 %3%4

MSG_CHANGE_ROOTDB_ON_LOCAL	0 x 1 B 3 A	Because the server and server group information cannot be retrieved from the original BizTalk Messaging Management database, the BizTalk Messaging Management database information will be updated only on the local computer "%1". The update has been successful.
MSG_ERROR_UNEXPECTED_ENDOFLIST	0 x 1 B 3 C	An unexpected end of list (EOL) for the "%1" class enumeration has been reached.
MSG_ERROR_ORG_QUALIFIERS_FROM_DB_FAILED	0 x 1 B 3 D	The organization qualifiers cannot be retrieved from the BizTalk Messaging Management database because of an unexpected error. "%1".
MSG_ERROR_ORG_VALUES_FROM_DB_FAILED	0 x 1 B 3 E	The organization values cannot be retrieved from the BizTalk Messaging Management database because of an unexpected error. "%1".
MSG_WARNING_NOT_RESUBMITTABLE	0 x 1 B 3 F	In the selected group of multiple items, at least one item cannot be submitted again.
MSG_WARNING_PROPERTY_VALUES_CHANGED	0 x 1 B 4 0	%1 "%2" specified for receive function "%3" has been removed from the BizTalk Messaging Management database.
MSG_WARNING_QUALIFIER_CHANGED	0 x 1 B 4 1	The qualifier and identifier pair "%1" and "%2" specified for receive function "%3" is not valid in the BizTalk Messaging Management database.
MSG_WARNING_ORGANIZATION_CHANGED	0 x 1 B 4 2	Organization "%1" specified for receive function "%2" is not valid in the BizTalk Messaging Management database.
MSG_TIMEBOMB_DAYS_LEFT	0 x 1 B 4 3	Thank you for evaluating Microsoft BizTalk Server 2000. The period for this evaluation version has %1 days left. Please contact Microsoft or your software reseller to obtain a licensed version of Microsoft BizTalk Server 2000.
INTERCHANGE_EVENT	0 x 3 0 0 5	BizTalk Server: %1

 **Note**

- When an error occurs, the %n variables are replaced with relevant information, such as an object name.

# Submitting Documents

This section provides information about how to submit documents to Microsoft BizTalk Server 2000. For additional information, see the following sections:

- For help with specific tasks, see [How To](#).
- For general background information, see [Concepts](#).
- For information about COM interfaces and enumerations, see the [Submitting Documents Reference](#).
- For examples of code, see [BizTalk Messaging Services Code Samples](#).

# How To...

This section provides task-specific information about how to submit documents to Microsoft BizTalk Server 2000. It is highly recommended that you review the [Concepts](#) as well. The following topics are covered:

- [Read the Tracking Database](#)
- [Submit a Document from a Remote Client](#)

# Read the Tracking Database

The purpose of the tracking interface, **IBizTalkTrackData**, is to facilitate programmatic access to the tracking information of Microsoft BizTalk Server 2000. This complements the **IInterchange** interface so that returns from **IInterchange** calls can be fed to these **IBizTalkTrackData** methods to access data about the activity of documents submitted to BizTalk Server 2000.

There can be a one-to-one or a one-to-many relationship between input and output documents. In a normal document flow, one document is submitted to the server, is tracked and possibly transformed, and one document results as output from the server. However, the [messaging port](#) can be configured so that one document submitted can result in many documents as output to several destinations:

1. Get the *SubmissionHandle* return from the **Submit** method of the **IInterchange** interface.
2. Call the **GetInterchanges** method, using the *SubmissionHandle* return as the input. This method returns a list of [interchanges](#) contained in that submission, including all the data from the Tracking database. Because transport-specific information (delivery times, receipt flags, and so on) appears in the interchange data, you can look here to confirm or check status on delivery, for example.
3. Call the **GetInDocDetails** method, using the *SubmissionHandle* return as the input. This method returns a list of the documents that were included in that submission. You can look here to find information about an input document (for example, was a specific document valid, how many bytes was it, and so on).
4. Call the **GetOutDocDetails** method, using the *SubmissionHandle* return as the input. This method returns a list of the documents that were generated as a result of the submission. You can look here to find information about an output document (for example, looking for PO #123456 out of a submission made earlier today).

## Related Topic

[Submitting Documents Reference](#)

# Submit a Document from a Remote Client

A document can be submitted to Microsoft BizTalk Server 2000 from a remote client running an application that uses the **Interchange** interface. To accomplish this, follow these steps:

1. Using a computer that has Microsoft BizTalk Server 2000 installed, go to the **Start** menu, point to **Programs**, point to **Administrative Tools**, and then click **Component Services**.
2. In the Tree pane, click **Component Services**, expand **Computers**, expand **My Computer**, expand **COM+ Applications**, and then click **BizTalk Server Interchange Application**.
3. On the **Action** menu, click **Export**.
4. On the **Welcome to the COM Application Export Wizard** dialog box, enter the name of an export installation package to be created.
5. In the **Export as** area, click the **Application proxy** option and click **Next** to finish the wizard.

The COM Application Export Wizard creates a Windows Installer Package file with an .msi extension and its associated Cabinet file with a .cab extension. Copy these files to the remote client and run the Windows Installer Package file. Now the remote client can run applications that use the **Interchange** interface.

## Notes

- The remote client must be running Microsoft Windows 2000.
- The computer used to create the installation package acts as an "interchange server" for the remote client that is submitting documents. Therefore, all documents submitted on the remote client are routed through that server.
- You can also create a remote client during the BizTalk Server 2000 installation.

# Submitting Documents Reference

This section provides reference information about components and interfaces used to submit documents to Microsoft BizTalk Server 2000 for both Microsoft Visual C++ and Visual Basic programming. Reference information is provided for all interfaces, objects, and [enumerations](#) exposed for submitting documents to BizTalk Server 2000.

The following COM interfaces and enumerations are documented in this reference:

- [IBizTalkTrackData](#)
- [IBTSCustomProcess](#)
- [IBTSCustomProcessContext](#)
- [IInterchange](#)
- [Interchange Enumerations](#)

# IBizTalkTrackData Interface

## IBizTalkTrackData Interface [C++]

## BTSDocTracking Object [Visual Basic]

Use this object to facilitate programmatic access to the tracking information of Microsoft BizTalk Server 2000. This object complements the **Interchange** object so that returns from **Interchange** methods can be passed to these methods for reading tracking data about the documents submitted to BizTalk Server 2000.

In C++, use the **IBizTalkTrackData** interface to access the methods of the **BizTalkTrackData** object.

The methods of the **BizTalkTrackData** object are shown in the following table.

Method	Description
<a href="#">GetInDocDetails</a>	Returns an ADO recordset that contains a list of the documents that were included in the <i>SubmissionHandle</i> return from the <b>Submit</b> method of the <b>Interchange</b> interface. This method returns specific information for an input document.
<a href="#">GetInterchanges</a>	Returns an ADO recordset that contains a list of interchanges contained in the <i>SubmissionHandle</i> return from the <b>Submit</b> method of the <b>Interchange</b> interface, including all the data from the Tracking database. Transport-specific information, such as delivery times and receipt flags, appears in the Tracking database; you can check there to confirm or check status on delivery, for example.
<a href="#">GetOutDocDetails</a>	Returns an ADO recordset that contains a list of the documents that were generated when the <b>Submit</b> method of the <b>Interchange</b> interface was called. This method returns specific information for an output document, for example, PO #123456 from a <b>Submit</b> call made earlier today.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BTSDocTracking.h

**Library:** Use Microsoft BizTalk Server Doc Tracking 1.0 Type Library (CISDTA.dll)

### Related Topics

[Understanding the Tracking Database Schema](#)

[Document Definitions](#)

[Read the Tracking Database](#)

[Document Tracking](#)

# IBizTalkTrackData::GetInDocDetails Method

## IBizTalkTrackData::GetInDocDetails Method [C++]

## BTSDocTracking.GetInDocDetails Method [Visual Basic]

The **GetInDocDetails** method returns an ADO recordset that contains a list of the documents that were included in the *SubmissionHandle* return from the **Submit** method of the **IInterchange** interface. This method returns specific information for an input document.

### Syntax

[C++]

```
HRESULT GetInDocDetails(  
    BSTR bstrSubmissionID,  
    IDispatch** ppdispResult  
);
```

[Visual Basic]

```
object.GetInDocDetails( _  
    bstrSubmissionID As String _  
)
```

### Parameters

[C++]

*bstrSubmissionID*

[in] **BSTR** that contains the *SubmissionHandle* string returned by **Submit** for this document instance.

*ppdispResult*

[out, retval] Address of a pointer to an **IDispatch** interface that contains a list of the documents that were included in the submission.

[Visual Basic]

*bstrSubmissionID*

**String** that contains the *SubmissionHandle* string returned by **Submit** for this document instance.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This method returns an **Object** that contains a list of the documents that were included in the submission.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BTSDocTracking.h

**Library:** Use Microsoft BizTalk Server Doc Tracking 1.0 Type Library (CISDTA.dll)

### Related Topic



# IBizTalkTrackData::GetInterchanges Method

## IBizTalkTrackData::GetInterchanges Method [C++]

## BTSDocTracking.GetInterchanges Method [Visual Basic]

The **GetInterchanges** method returns an ADO recordset that contains a list of interchanges contained in the *SubmissionHandle* return from the **Submit** method of the **IInterchange** interface, including all the data from the Tracking database. Because transport-specific information, such as delivery times and receipt flags, appears in the Tracking database, you can check there to confirm or check status on delivery, for example.

### Syntax

[C++]

```
HRESULT GetInterchanges (
    BSTR bstrSubmissionID,
    IDispatch** ppdispResult
);
```

[Visual Basic]

```
object.GetInterchanges ( _
    bstrSubmissionID As String, _
)
```

### Parameters

[C++]

*bstrSubmissionID*

[in] **BSTR** that contains the *SubmissionHandle* string returned by **Submit** for this document instance.

*ppdispResult*

[out, retval] Address of a pointer to an **IDispatch** interface that contains a list of interchanges contained in this submission, including all the data from the Tracking database.

[Visual Basic]

*bstrSubmissionID*

**String** that contains the *SubmissionHandle* string returned by **Submit** for this document instance.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This method optionally returns an **Object** that contains a list of interchanges contained in this submission, including all the data from the Tracking database.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BTSDocTracking.h

**Library:** Use Microsoft BizTalk Server Doc Tracking 1.0 Type Library (CISDTA.dll)

## Related Topic

[Understanding the Tracking Database Schema](#)

# IBizTalkTrackData::GetOutDocDetails Method

## IBizTalkTrackData::GetOutDocDetails Method [C++]

## BTSDocTracking.GetOutDocDetails Method [Visual Basic]

The **GetOutDocDetails** method returns an ADO recordset that contains a list of the documents that were generated as a result of the **Submit** method of the **IInterchange** interface. This method returns specific information for an output document, for example, PO #123456 from a **Submit** call made earlier today.

### Syntax

[C++]

```
HRESULT GetOutDocDetails(  
    BSTR bstrSubmissionID,  
    IDispatch** ppdispResult  
);
```

[Visual Basic]

```
object.GetOutDocDetails( _  
    bstrSubmissionID As String _  
)
```

### Parameters

[C++]

*bstrSubmissionID*

[in] **BSTR** that contains the *SubmissionHandle* string returned by **Submit** for this document instance.

*ppdispResult*

[out, retval] Address of a pointer to an **IDispatch** interface that contains a list of the documents that were generated as a result of the submission.

[Visual Basic]

*bstrSubmissionID*

**String** that contains the *SubmissionHandle* string returned by **Submit** for this document instance.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This method returns an **Object** that contains a list of the documents that were generated as a result of the submission.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BTSDocTracking.h

**Library:** Use Microsoft BizTalk Server Doc Tracking 1.0 Type Library (CISDTA.dll)

### Related Topic



# IBTSCustomProcess Interface

## IBTSCustomProcess Interface [C++]

## IBTSCustomProcess Object [Visual Basic]

Implement **IBTSCustomProcess** to create a custom preprocessor for BizTalk Server [receive functions](#).

The methods of **IBTSCustomProcess** are shown in the following table.

Method	Description
<a href="#">Execute</a>	Performs the custom processing of the data prior to sending the data to BizTalk Server for processing.
<a href="#">SetContext</a>	Retrieves context information associated with the data being processed.

### Remarks

For information about custom preprocessors, see [Preprocessing Documents in a Receive Function](#).

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include btsaic.h

**Library:** Use Microsoft BizTalk Server Application Interface Components 1.0 Type Library (btscomplib.tlb)

# IBTSCustomProcess::Execute Method

## IBTSCustomProcess::Execute Method [C++]

## IBTSCustomProcess.Execute Method [Visual Basic]

The **Execute** method performs the custom processing on data obtained from a receive function.

### Syntax

[C++]

```
HRESULT Execute(  
    VARIANT vDataIn,  
    long nCodePageIn,  
    VARIANT_BOOL bIsFilePath,  
    VARIANT* nCodePageOut,  
    VARIANT* vDataOut  
);
```

[Visual Basic]

```
object.Execute( _  
    vDataIn As Variant, _  
    nCodePageIn As Long, _  
    bIsFilePath As Boolean, _  
    nCodePageOut As Variant, _  
    vDataOut As Variant _  
)
```

### Parameters

[C++]

*vDataIn*

[in] **VARIANT** that contains the input data read by the receive function. For data read from a message queue, the data can be either an array or a **BSTR**. If the data is read from a file receive function, this parameter contains the file path. For file receive functions, the *bIsFilePath* parameter is set to **VARIANT\_TRUE**.

*nCodePageIn*

[in] **Long** that contains the code page of the input data. The code page indicates the character set and keyboard layout used on a computer.

*bIsFilePath*

[in] **VARIANT\_BOOL** flag that indicates the type of input data. A value of **VARIANT\_TRUE** indicates that the *vDataIn* parameter contains a file path. A value of **VARIANT\_FALSE** indicates that the *vDataIn* parameter contains data from a message queue.

*nCodePageOut*

[out] Pointer to a **VARIANT** that contains the code page of the output data. The code page indicates the character set and keyboard layout used on a computer.

*vDataOut*

[out] Pointer to a **VARIANT** that contains the output data. For file receive functions, this will be a **BSTR**. The data in this parameter is sent to BizTalk Server for processing.

[Visual Basic]

*vDataIn*

**VARIANT** that contains the input data read by the receive function. If the data is read from a file receive function, this parameter contains the file path. For file receive functions, the *bIsFilePath* parameter must be set to **True**.

*nCodePageIn*

**Long** that contains the code page of the input data. The code page indicates the character set and keyboard layout used on a

computer.

*bIsFilePath*

**VARIANT\_BOOL** flag that indicates the type of input data. A value of **True** indicates that the *vDataIn* parameter contains a file path. A value of **False** indicates that the *vDataIn* parameter contains data from a message queue.

*nCodePageOut*

**VARIANT** that contains the code page of the output data. The code page indicates the character set and keyboard layout used on a computer.

*vDataOut*

**VARIANT** that contains the output data. The data in this parameter is sent to BizTalk Server for processing.

## Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None

## Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

## Remarks

If BizTalk Server fails to create the custom preprocessor component, or if the **Execute** method returns an error or invalid data, the document being processed is placed in the Suspended queue.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include `btsaic.h`

**Library:** Use Microsoft BizTalk Server Application Interface Components 1.0 Type Library (`btscomplib.tlb`)

# IBTSCustomProcess::SetContext Method

## IBTSCustomProcess::SetContext Method [C++]

## IBTSCustomProcess.SetContext Method [Visual Basic]

The **SetContext** method retrieves information associated with a document submitted to BizTalk Server.

### Syntax

[C++]

```
HRESULT SetContext(  
    IBTSCustomProcessContext* pCtx  
);
```

[Visual Basic]

```
object.SetContext ( _  
    pCtx As IBTSCustomProcessContext _  
)
```

### Parameters

[C++]

*pCtx*

[in] **IBTSCustomProcessContext** that contains information associated with the document being processed by BizTalk Server.

[Visual Basic]

*pCtx*

**IBTSCustomProcessContext** that contains information associated with the document being processed by BizTalk Server.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

For additional information about the custom process context object, see [IBTSCustomProcessContext](#).

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include btsaic.h

**Library:** Use Microsoft BizTalk Server Application Interface Components 1.0 Type Library (btscomplib.tlb)

# IBTSCustomProcessContext Interface

## IBTSCustomProcessContext Interface [C++]

## IBTSCustomProcessContext Object [Visual Basic]

Use this object to retrieve information associated with data being processed by using a custom preprocessor component.

In C++, use the **IBTSCustomProcessContext** interface to access the methods of the **BTSCustomProcessContext** object.

The properties of the **BTSCustomProcessContext** object are shown in the following table.

Property	Type	Description
<a href="#">ChannelName</a>	BSTR	Name of the <a href="#">channel</a> .
<a href="#">DestID</a>	BSTR	Value of the destination <a href="#">organization</a> qualifier.
<a href="#">DestQualifier</a>	BSTR	Qualifier type of the destination organization.
<a href="#">DocName</a>	BSTR	Name of the document.
<a href="#">EnvelopeName</a>	BSTR	Name of the <a href="#">envelope</a> used with the document.
<a href="#">Openness</a>	long	Value that indicates if the <a href="#">messaging port</a> is open.
<a href="#">PassThrough</a>	long	Value that indicates whether <a href="#">pass-through submission</a> mode is being used.
<a href="#">SourceID</a>	BSTR	Value of the source organization qualifier.
<a href="#">SourceQualifier</a>	BSTR	Qualifier type of the source organization.

### Remarks

This object can be obtained by calling the [SetContext](#) method on the [IBTSCustomProcess](#) object. For information about custom preprocessors, see [Preprocessing Documents in a Receive Function](#).

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include btsaic.h

**Library:** Use Microsoft BizTalk Server Application Interface Components 1.0 Type Library (btscomplib.tlb)

# IBTSCustomProcessContext::ChannelName Property

## IBTSCustomProcessContext::ChannelName Property [C++]

## IBTSCustomProcessContext.ChannelName Property [Visual Basic]

The **ChannelName** property returns the name of the channel used for processing the current document.

### Syntax

[C++]

Get method:

```
HRESULT get_ChannelName (  
    BSTR* bstrPipelineName  
);
```

[Visual Basic]

```
object.ChannelName ()
```

### Parameters

[C++]

*bstrPipelineName*

[out, retval] Pointer to a **BSTR** that contains the name of the channel used for processing the current document.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the channel name.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include bsaic.h

**Library:** Use Microsoft BizTalk Server Application Interface Components 1.0 Type Library (btscomplib.tlb)

# IBTSCustomProcessContext::DestID Property

## IBTSCustomProcessContext::DestID Property [C++]

## IBTSCustomProcessContext.DestID Property [Visual Basic]

The **DestID** property returns the value of the destination organization qualifier.

### Syntax

[C++]

Get method:

```
HRESULT get_DestID(  
    BSTR* bstrDestID  
);
```

[Visual Basic]

```
object.DestID()
```

### Parameters

[C++]

*bstrDestID*

[out, retval] Pointer to a **BSTR** that contains the value of the destination organization qualifier.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the value of the destination organization qualifier.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include btsaic.h

**Library:** Use Microsoft BizTalk Server Application Interface Components 1.0 Type Library (btscomplib.tlb)

# IBTSCustomProcessContext::DestQualifier Property

IBTSCustomProcessContext::DestQualifier Property [C++]

IBTSCustomProcessContext DestQualifier Property [Visual Basic]

The **DestQualifier** property returns the destination organization qualifier type.

## Syntax

[C++]

Get method:

```
HRESULT get_DestQualifier(  
    BSTR* bstrDestQualifier  
);
```

[Visual Basic]

```
object.DestQualifier()
```

## Parameters

[C++]

*bstrDestQualifier*

[out, retval] Pointer to a **BSTR** that contains the destination organization qualifier type.

[Visual Basic]

None

## Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

## Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

[Visual Basic]

This property returns a **String** that contains the destination organization qualifier type.

## Remarks

This is a read-only property.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include bsaic.h

**Library:** Use Microsoft BizTalk Server Application Interface Components 1.0 Type Library (btscomplib.tlb)

# IBTSCustomProcessContext::DocName Property

## IBTSCustomProcessContext::DocName Property [C++]

## IBTSCustomProcessContext.DocName Property [Visual Basic]

The **DocName** property returns the name of the document definition used by the current document.

### Syntax

[C++]

Get method:

```
HRESULT get_DocName (  
    BSTR* bstrDocName  
);
```

[Visual Basic]

```
object.DocName ()
```

### Parameters

[C++]

*bstrDocName*

[out, retval] Pointer to a **BSTR** that contains the document definition name.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the document definition name.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include btsaic.h

**Library:** Use Microsoft BizTalk Server Application Interface Components 1.0 Type Library (btscomplib.tlb)

# IBTSCustomProcessContext::EnvelopeName Property

## IBTSCustomProcessContext::EnvelopeName Property [C++]

## IBTSCustomProcessContext.EnvelopeName Property [Visual Basic]

The **EnvelopeName** property returns the name of the envelope used with the current document.

### Syntax

[C++]

Get method:

```
HRESULT get_EnvelopeName(  
    BSTR* bstrEnvelopeName  
);
```

[Visual Basic]

```
object.EnvelopeName()
```

### Parameters

[C++]

*bstrEnvelopeName*

[out, retval] Pointer to a **BSTR** that contains the envelope name.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the envelope with the current document.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include bsaic.h

**Library:** Use Microsoft BizTalk Server Application Interface Components 1.0 Type Library (btscomplib.tlb)

# IBTSCustomProcessContext::Openness Property

## IBTSCustomProcessContext::Openness Property [C++]

## IBTSCustomProcessContext.Openness Property [Visual Basic]

The **Openness** property returns the openness associated with the messaging port.

### Syntax

[C++]

Get method:

```
HRESULT get_Openness (  
    long* lOpenness  
);
```

[Visual Basic]

```
object.Openness ()
```

### Parameters

[C++]

*lOpenness*

[out, retval] Pointer to a **long** that indicates openness on the messaging port. The **long** returned in this parameter represents a value in the [BIZTALK\\_OPENNESS\\_TYPE](#) enumeration.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Long** that indicates openness on the messaging port. The **Long** returned in this property represents a value in the [BIZTALK\\_OPENNESS\\_TYPE](#) enumeration.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include btsaic.h

**Library:** Use Microsoft BizTalk Server Application Interface Components 1.0 Type Library (btscomplib.tlb)

# IBTSCustomProcessContext::PassThrough Property

## IBTSCustomProcessContext::PassThrough Property [C++]

## IBTSCustomProcessContext.PassThrough Property [Visual Basic]

The **PassThrough** property indicates whether the document uses pass-through submission mode.

### Syntax

[C++]

Get method:

```
HRESULT get_PassThrough(  
    long* fPassThrough  
);
```

[Visual Basic]

```
object.PassThrough()
```

### Parameters

[C++]

*fPassThrough*

[out, retval] Pointer to a **long** that indicates whether the document uses pass-through submission mode. A value of 0 indicates that pass-through submission mode is not used. A non-zero value indicates that pass-through submission mode is used with the current document.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Long** that indicates whether the document uses pass-through submission mode. A value of 0 indicates that pass-through submission mode is not used. A non-zero value indicates that pass-through submission mode is used with the current document.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include btsaic.h

**Library:** Use Microsoft BizTalk Server Application Interface Components 1.0 Type Library (btscomplib.tlb)

# IBTSCustomProcessContext::SourceID Property

## IBTSCustomProcessContext::SourceID Property [C++]

## IBTSCustomProcessContext.SourceID Property [Visual Basic]

The **SourceID** property returns the value of the source organization qualifier.

### Syntax

[C++]

Get method:

```
HRESULT get_SourceID(  
    BSTR* bstrSourceID  
);
```

[Visual Basic]

```
object.SourceID()
```

### Parameters

[C++]

*bstrSourceID*

[out, retval] Pointer to a **BSTR** that contains the value of the source organization qualifier.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the value of the source organization qualifier.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include btsaic.h

**Library:** Use Microsoft BizTalk Server Application Interface Components 1.0 Type Library (btscomplib.tlb)

# IBTSCustomProcessContext::SourceQualifier Property

## IBTSCustomProcessContext::SourceQualifier Property [C++]

## IBTSCustomProcessContext.SourceQualifier Property [Visual Basic]

The **SourceQualifier** property returns the source organization qualifier type.

### Syntax

[C++]

Get method:

```
HRESULT get_SourceQualifier(  
    BSTR* bstrSourceQualifier  
);
```

[Visual Basic]

```
object.SourceQualifier()
```

### Parameters

[C++]

*bstrSourceQualifier*

[out, retval] Pointer to a **BSTR** that contains the source organization qualifier type.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains the source organization qualifier type.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include btsaic.h

**Library:** Use Microsoft BizTalk Server Application Interface Components 1.0 Type Library (btscomplib.tlb)

# Interchange Interface

## Interchange Interface [C++]

## Interchange Object [Visual Basic]

Use this object to exchange documents between applications and BizTalk Server 2000 directly or through a receive function

In C++, use the **Interchange** interface to access the methods of the **Interchange** object.

The methods of the **Interchange** object are shown in the following table.

Method	Description
<a href="#">CheckSuspendedQueue</a>	Checks the Suspended queue and returns a list of handles to documents or <a href="#">interchanges</a> in the queue that match the request criteria.
<a href="#">DeleteFromSuspendedQueue</a>	Deletes all specified documents from the Suspended queue.
<a href="#">GetSuspendedQueueItemDetails</a>	Returns details of a document in the Suspended queue.
<a href="#">Submit</a>	Submits an interchange to BizTalk Server 2000 for asynchronous processing. This method accepts only a string variable as the document or interchange. This means that applications cannot submit other objects, such as DOM objects, <b>CDictionary</b> objects, ADO objects, or any other data type or object type.
<a href="#">SubmitSync</a>	Submits an interchange to BizTalk Server 2000 for synchronous transmission. This method returns a response if one is provided. This method accepts only a string variable for the document or interchange. This means that applications cannot submit other objects, such as DOM objects, <b>CDictionary</b> objects, ADO objects, or any other data type or object type.

### Remarks

Using parameters with **Submit** and **SubmitSync** overrides certain fields in the header of a self-routing document.

For information about submitting documents from a remote client, see [How To](#).

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include cisapi.h

**Library:** (cisapi.tlb)

### Related Topics

[Submitting](#)

[Routing](#)

[Steps for Submitting a Document by Using COM Interfaces](#)

# Interchange::CheckSuspendedQueue Method

## Interchange::CheckSuspendedQueue Method [C++]

## Interchange.CheckSuspendedQueue Method [Visual Basic]

The **CheckSuspendedQueue** method checks the Suspended queue and returns a list of documents that match the request criteria.

### Syntax

[C++]

```
HRESULT CheckSuspendedQueue (
    BSTR DocName,
    BSTR SourceName,
    BSTR DestName,
    VARIANT* DocumentHandleList
);
```

[Visual Basic]

```
object.CheckSuspendedQueue ( _
    DocName As String, _
    SourceName As String, _
    DestName As String _
)
```

### Parameters

[C++]

*DocName*

[in] **BSTR** that contains the name of the **BizTalkDocument** object. This parameter narrows the search for items in the Suspended queue. If this parameter is omitted, this method matches all **BizTalkDocument** objects. This is an optional parameter.

*SourceName*

[in] **BSTR** that contains the name of the source **BizTalkOrganization** object. This parameter narrows the search criteria for items in the Suspended queue. If this parameter is omitted, this method matches all **BizTalkOrganization** objects. This is an optional parameter.

*DestName*

[in] **BSTR** that contains the name of the destination **BizTalkOrganization** object. This parameter narrows the search criteria for items in the Suspended queue. If this parameter is omitted, this method matches all **BizTalkOrganization** objects. This is an optional parameter.

*DocumentHandleList*

[out] Pointer to a **VARIANT** that contains a list of handles to all documents in the Suspended queue.

[Visual Basic]

*DocName*

**String** that contains the name of the **BizTalkDocument** object. This parameter narrows the search for items in the Suspended queue. If this parameter is omitted, this method matches all **BizTalkDocument** objects. This is an optional parameter.

*SourceName*

**String** that contains the name of the source **BizTalkOrganization** object. This parameter narrows the search criteria for items in the Suspended queue. If this parameter is omitted, this method matches all **BizTalkOrganization** objects. This is an optional parameter.

*DestName*

**String** that contains the name of the destination **BizTalkOrganization** object. This parameter narrows the search criteria for

items in the Suspended queue. If this parameter is omitted, this method matches all **BizTalkOrganization** objects. This is an optional parameter.

## Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This method returns a **VARIANT** that contains a list of handles to all documents in the Suspended queue.

## Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

## Remarks

The returned items are not deleted from the queue. To delete items from the Suspended queue, use the [DeleteFromSuspendedQueue](#) method.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include cisapi.h

**Library:** (cisapi.tlb)

## Related Topics

[Submitting](#)

[Steps for Submitting a Document by Using COM Interfaces](#)

# Interchange::DeleteFromSuspendedQueue Method

## Interchange::DeleteFromSuspendedQueue Method [C++]

## Interchange.DeleteFromSuspendedQueue Method [Visual Basic]

The **DeleteFromSuspendedQueue** method deletes all specified documents from the Suspended queue.

### Syntax

[C++]

```
HRESULT DeleteFromSuspendedQueue (  
    VARIANT* DocumentHandleList  
);
```

[Visual Basic]

```
object.DeleteFromSuspendedQueue ( _  
    DocumentHandleList As Variant _  
)
```

### Parameters

[C++]

*DocumentHandleList*

[in] Pointer to a **VARIANT** that contains a full list of handles or a subset for documents to be deleted from the Suspended queue.

[Visual Basic]

*DocumentHandleList*

**VARIANT** that contains a full list of handles or a subset for documents to be deleted from the Suspended queue.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include cisapi.h

**Library:** (cisapi.tlb)

### Related Topics

[Submitting](#)

[Steps for Submitting a Document by Using COM Interfaces](#)

# Interchange::GetSuspendedQueueItemDetails Method

## Interchange::GetSuspendedQueueItemDetails Method [C++]

## Interchange.GetSuspendedQueueItemDetails Method [Visual Basic]

The **GetSuspendedQueueItemDetails** method uses the list of handles returned by the [CheckSuspendedQueue](#) method to get information about a single entry in the Suspended queue.

### Syntax

[C++]

```
HRESULT GetSuspendedQueueItemDetails(  
    BSTR ItemHandle,  
    VARIANT* SourceName,  
    VARIANT* DestName,  
    VARIANT* DocName,  
    VARIANT* ReasonCode,  
    VARIANT* ItemData  
);
```

[Visual Basic]

```
object.GetSuspendedQueueItemDetails( _  
    ItemHandle As String, _  
    SourceName As Variant, _  
    DestName As Variant, _  
    DocName As Variant, _  
    ReasonCode As Variant, _  
    ItemData As Variant _  
)
```

### Parameters

[C++]

*ItemHandle*

[in] **BSTR** that contains the handle to an item in the Suspended queue.

*SourceName*

[out] Pointer to the **VARIANT** that contains the name of the source [BizTalkOrganization](#) object.

*DestName*

[out] Pointer to the **VARIANT** that contains the name of the destination [BizTalkOrganization](#) object.

*DocName*

[out] Pointer to the **VARIANT** that contains the name of the [BizTalkDocument](#) object.

*ReasonCode*

[out] Pointer to the **VARIANT** that contains the reason a document or interchange has been placed in the Suspended queue. For more information about this value, see the [CISReasonToQueue](#) enumeration.

*ItemData*

[out] Pointer to the **VARIANT** that contains the document instance or interchange.

[Visual Basic]

*ItemHandle*

**String** that contains the handle to an item in the Suspended queue.

*SourceName*

**Variants** that contains the name of the source **BizTalkOrganization** object. The value of this output parameter is set by calling this method.

*DestName*

**Variants** that contains the name of the destination **BizTalkOrganization** object. The value of this output parameter is set by calling this method.

*DocName*

**Variants** that contains the name of the associated **BizTalkDocument** object. The value of this output parameter is set by calling this method.

*ReasonCode*

**Variants** that contains the reason a document or interchange has been placed in the Suspended queue. For more information about this value, see the **CISReasonToQueue** enumeration. The value of this output parameter is set by calling this method.

*ItemData*

**Variants** that contains the document instance or interchange. The value of this output parameter is set by calling this method.

## Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None.

## Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include cisapi.h

**Library:** (cisapi.tlb)

## Related Topics

[Submitting](#)

[Steps for Submitting a Document by Using COM Interfaces](#)

# Interchange::Submit Method

## Interchange::Submit Method [C++]

## Interchange.Submit Method [Visual Basic]

The **Submit** method sends a document to BizTalk Server 2000 for asynchronous processing. BizTalk Server 2000 places the document in a queue until the next available server can process it.

### Syntax

[C++]

```
HRESULT Submit(  
    BIZTALK_OPENNESS_TYPE lOpenness,  
    BSTR Document,  
    BSTR DocName,  
    BSTR SourceQualifier,  
    BSTR SourceID,  
    BSTR DestQualifier,  
    BSTR DestID,  
    BSTR ChannelName,  
    BSTR FilePath,  
    BSTR EnvelopeName,  
    long PassThrough,  
    BSTR* SubmissionHandle  
);
```

[Visual Basic]

```
object.Submit( _  
    lOpenness As BIZTALK_OPENNESS_TYPE, _  
    Document As String, _  
    DocName As String, _  
    SourceQualifier As String, _  
    SourceID As String, _  
    DestQualifier As String, _  
    DestID As String, _  
    ChannelName As String, _  
    FilePath As String, _  
    EnvelopeName As String, _  
    PassThrough As Long _  
)
```

### Parameters

[C++]

*lOpenness*

[in] Enumeration value that indicates whether associated **BizTalkPort** objects can be open. Valid values are from the **BIZTALK\_OPENNESS\_TYPE** enumeration.

*Document*

[in] **BSTR** that contains the document instance submitted. This parameter accepts only a string buffer as the document or interchange. This means that applications cannot submit other objects, such as DOM objects, **CDictionary** objects, ADO objects, or any other data type or object type. Either the *Document* parameter or the *FilePath* parameter must be specified. Do not specify both. This is an optional parameter.

*DocName*

[in] **BSTR** that contains the name of the **BizTalkDocument** object associated with the instance of the document being submitted. If the *lOpenness* parameter is set to **BIZTALK\_OPENNESS\_TYPE\_SOURCE**, you can select an input **BizTalkDocument** object that has an X12 or EDIFACT specification. If you do, however, the output **BizTalkDocument** must not have an X12 or EDIFACT specification. If *lOpenness* is set to **BIZTALK\_OPENNESS\_TYPE\_DESTINATION**, the **BizTalkDocument** object must not have an X12 or EDIFACT specification. The *DocName* parameter cannot be used if the *PassThrough* parameter is set to TRUE. This is an optional parameter.

### *SourceQualifier*

[in] **BSTR** that contains the qualifier of the source organization. This indicates how the *SourceID* parameter is to be interpreted. Valid values come from the organization identifier qualifiers that are created when the user creates an alias for an organization. Common qualifiers include the DUNS number, telephone number, and BizTalk. You must specify a *SourceID*. The default qualifier for all new organizations is *Organization Name* and refers to the name of the organization in the database. If a BizTalk Framework 2.0–compliant document is submitted and a qualifier is not found during parsing, the qualifier defaults to *BizTalk*. The *SourceQualifier* parameter cannot be used if the *PassThrough* parameter is set to TRUE. This is an optional parameter.

### *SourceID*

[in] **BSTR** that contains the value of the qualifier of the source organization. For example, if the *SourceQualifier* parameter is Telephone, this value is the telephone number. If the *Openness* flag is set to *OpenSrc*, *SourceID* is interpreted as the source organization name. The *SourceID* parameter cannot be used if the *PassThrough* parameter is set to TRUE. This is an optional parameter.

### *DestQualifier*

[in] **BSTR** that contains the qualifier of the destination organization. This indicates how the *DestID* parameter is to be interpreted. Valid values come from the organization identifier qualifiers that are created when the user creates an alias for an organization. Common qualifiers include the DUNS number, telephone number, and BizTalk. You must specify a *DestID*. The default qualifier for all new organizations is *OrganizationName* and refers to the name of the organization in the database. If a BizTalk Framework 2.0–compliant document is submitted and a qualifier is not found during parsing, the qualifier defaults to *BizTalk*. The *DestQualifier* parameter cannot be used if the *PassThrough* parameter is set to TRUE. This is an optional parameter.

### *DestID*

[in] **BSTR** that contains the value of the qualifier of the destination organization. For example, if the *DestQualifier* parameter is Telephone, this value is the telephone number. If the *Openness* flag is set to *OpenDest*, *DestID* is used as the destination address. Note that the *queue://* prefix must be used with an open messaging port when a Message Queue is specified as the destination address. The *DestID* parameter cannot be used if the *PassThrough* parameter is set to TRUE. This is an optional parameter.

### *ChannelName*

[in] **BSTR** that contains the name of the **BizTalkChannel** object that is executed for this document. This bypasses the normal processing in which the parser tries to determine which messaging port/channel pair to execute, based on routing information in the parameters or in the document. This is an optional parameter unless the *PassThrough* parameter is set to TRUE.

### *FilePath*

[in] **BSTR** that specifies a fully qualified path that contains the document to be submitted, rather than submitting the document directly as a string. BizTalk Server 2000 supports URL, UNC, and drive: format only. If the document is submitted as a file that is pointed to by the *FilePath* parameter, the call returns successfully after BizTalk Server 2000 has successfully copied the file to the Work queue. It is safe to delete the file from the specified path as soon as this method returns successfully. When a document is submitted to the server, using *FilePath* to specify the data, **Submit** can take 30 seconds or longer if the location of the file resides on a remote server that is unavailable, if the UNC path is invalid, or if the SQL server is down. Either the *Document* parameter or the *FilePath* parameter must be specified. Do not specify both. The *FilePath* parameter cannot be used if the *PassThrough* parameter is set to TRUE and a map is specified. This is an optional parameter.

### *EnvelopeName*

[in] **BSTR** that contains the name of the envelope specification to use to break the interchange into documents. When an envelope name is provided in this parameter, the envelope must have a valid interchange specification. This requirement is enforced for envelopes created for Custom XML format also. When submitting a flat file to BizTalk Server 2000, you must create an envelope for this flat file and specify the name of the envelope in *EnvelopeName*. This is an optional parameter.

### *PassThrough*

[in] **Long** that indicates how the server processes the document. When this parameter is set to TRUE, no decryption, decoding, or signature verification is performed on the document. When set to FALSE, the document is decrypted and decoded, and the signature is verified. When using pass-through submission mode (TRUE), the **BIZTALK\_OPENNESS\_TYPE** value must be set to **BIZTALK\_OPENNESS\_TYPE\_NOTOPEN** and the *ChannelName* parameter must be specified. In addition, the *DocName*, *SourceQualifier*, *SourceID*, *DestQualifier*, and *DestID* parameters cannot be specified with pass-through submission mode. Pass-through submission mode should be used to prevent data corruption when exchanging binary files, or when only the server transport and global tracking features are being used.

### *SubmissionHandle*

[out, retval] Pointer to a **BSTR** that contains a unique identifier for the submitted document or interchange. This handle can be

used to query the Tracking database for the status of the interchange or document submitted. If more than one document is submitted (an interchange), a single handle is returned, yet the Tracking database enables the user to get the status of all child documents related to this interchange identifier.

[Visual Basic]

*Openness*

Enumeration value that indicates whether associated **BizTalkPort** objects can be open. Valid values are from the **BIZTALK\_OPENNESS\_TYPE** enumeration.

*Document*

**String** that contains the document instance submitted. This parameter accepts only a string buffer as the document or interchange. This means that applications cannot submit other objects, such as DOM objects, **CDictionary** objects, ADO objects, or any other data type or object type. Either the *Document* parameter or the *FilePath* parameter must be specified. Do not specify both. This is an optional parameter.

*DocName*

**String** that contains the name of the **BizTalkDocument** object associated with the instance of the document being submitted. If the *Openness* parameter is set to **BIZTALK\_OPENNESS\_TYPE\_SOURCE**, you can select an input **BizTalkDocument** object that has an X12 or EDIFACT specification. If you do, however, the output **BizTalkDocument** must not have an X12 or EDIFACT specification. If *Openness* is set to **BIZTALK\_OPENNESS\_TYPE\_DESTINATION**, the **BizTalkDocument** object must not have an X12 or EDIFACT specification. The *DocName* parameter cannot be used if the *PassThrough* parameter is set to **True**. This is an optional parameter.

*SourceQualifier*

**String** that contains the qualifier of the source organization. This indicates how the *SourceID* parameter is to be interpreted. Valid values come from the organization identifier qualifiers that are created when the user creates an alias for an organization. Common qualifiers include the DUNS number, telephone number, and BizTalk. You must specify a *SourceID*. The default qualifier for all new organizations is *Organization Name* and refers to the name of the organization in the database. If a BizTalk Framework 2.0–compliant document is submitted and a qualifier is not found during parsing, the qualifier defaults to *BizTalk*. The *SourceQualifier* parameter cannot be used if the *PassThrough* parameter is set to **True**. This is an optional parameter.

*SourceID*

**String** that contains the value of the qualifier of the source organization. For example, if the *SourceQualifier* parameter is Telephone, this value is the telephone number. If the *Openness* flag is set to *OpenSrc*, *SourceID* is interpreted as the source organization name. The *SourceID* parameter cannot be used if the *PassThrough* parameter is set to **True**. This is an optional parameter.

*DestQualifier*

**String** that contains the qualifier of the destination organization. This indicates how the *DestID* parameter is to be interpreted. Valid values come from the organization identifier qualifiers that are created when the user creates an alias for an organization. Common qualifiers include the DUNS number, telephone number, and BizTalk. You must specify a *DestID*. The default qualifier for all new organizations is *OrganizationName* and refers to the name of the organization in the database. If a BizTalk Framework 2.0–compliant document is submitted and a qualifier is not found during parsing, the qualifier defaults to *BizTalk*. The *DestQualifier* parameter cannot be used if the *PassThrough* parameter is set to **True**. This is an optional parameter.

*DestID*

**String** that contains the value of the qualifier of the destination organization. For example, if the *DestQualifier* parameter is Telephone, this value is the telephone number. If the *Openness* flag is set to *OpenDest*, *DestID* is used as the destination address. Note that the *queue://* prefix must be used with an open messaging port when a Message Queue is specified as the destination address. The *DestID* parameter cannot be used if the *PassThrough* parameter is set to **True**. This is an optional parameter.

*ChannelName*

**String** that contains the name of the **BizTalkChannel** object that is executed for this document. This bypasses the normal processing in which the parser tries to determine which messaging port/channel pair to execute, based on routing information in the parameters or in the document. This is an optional parameter unless the *PassThrough* parameter is set to **True**.

*FilePath*

**String** that specifies a fully qualified path that contains the document to be submitted, rather than submitting the document directly as a string. BizTalk Server 2000 supports URL, UNC, and drive: format only. If the document is submitted as a file that is pointed to by the *FilePath* parameter, the call returns successfully after BizTalk Server 2000 has successfully copied the file to the

Work queue. It is safe to delete the file from the specified path as soon as this method returns successfully. When a document is submitted to the server, using *FilePath* to specify the data, **Submit** can take 30 seconds or longer if the location of the file resides on a remote server that is unavailable, if the UNC path is invalid, or if the SQL server is down. Either the *Document* parameter or the *FilePath* parameter must be specified. Do not specify both. The *FilePath* parameter cannot be used if the *PassThrough* parameter is set to **True** and a map is specified. This is an optional parameter.

*EnvelopeName*

**String** that contains the name of the envelope specification to use to break the interchange into documents. When an envelope name is provided as an argument, the envelope must have a valid interchange specification. This requirement is enforced for envelopes created for Custom XML format also. When submitting a flat file to BizTalk Server 2000, you must create an envelope for this flat file and specify the name of the envelope in *EnvelopeName*. This is an optional parameter.

*PassThrough*

**Long** that indicates how the server processes the document. When this parameter is **True**, no decryption, decoding, or signature verification is performed on the document. When set to **False**, the document is decrypted and decoded, and the signature is verified. When using pass-through submission mode (**True**), the **BIZTALK\_OPENNESS\_TYPE** value must be set to **BIZTALK\_OPENNESS\_TYPE\_NOTOPEN** and the *ChannelName* parameter must be specified. In addition, the *DocName*, *SourceQualifier*, *SourceID*, *DestQualifier*, and *DestID* parameters cannot be specified with pass-through submission mode. Pass-through submission mode should be used to prevent data corruption when exchanging binary files, or when only the server transport and global tracking features are being used.

## Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This method returns a **String** that contains a unique identifier for the submitted document or interchange. This handle can be used to query the Tracking database for the status of the interchange or document submitted. If more than one document is submitted (an interchange), a single handle is returned; yet the Tracking database can access the status of all child documents related to this interchange identifier.

## Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include cisapi.h

**Library:** (cisapi.tlb)

## Related Topics

[Openness](#)

[Routing](#)

[Submitting](#)

[Steps for Submitting a Document by Using COM Interfaces](#)

# Interchange::SubmitSync Method

## Interchange::SubmitSync Method [C++]

## Interchange.SubmitSync Method [Visual Basic]

The **SubmitSync** method sends an interchange or document to BizTalk Server 2000 for synchronous processing. An optional response document is returned to the caller.

### Syntax

[C++]

```
HRESULT SubmitSync(  
    BIZTALK_OPENNESS_TYPE lOpenness,  
    BSTR Document,  
    BSTR DocName,  
    BSTR SourceQualifier,  
    BSTR SourceID,  
    BSTR DestQualifier,  
    BSTR DestID,  
    BSTR ChannelName,  
    BSTR FilePath,  
    BSTR EnvelopeName,  
    long PassThrough,  
    VARIANT* SubmissionHandle,  
    VARIANT* ResponseDocument  
);
```

[Visual Basic]

```
object.SubmitSync( _  
    lOpenness As BIZTALK_OPENNESS_TYPE, _  
    Document As String, _  
    DocName As String, _  
    SourceQualifier As String, _  
    SourceID As String, _  
    DestQualifier As String, _  
    DestID As String, _  
    ChannelName As String, _  
    FilePath As String, _  
    EnvelopeName As String, _  
    PassThrough As Long, _  
    SubmissionHandle As Variant, _  
    ResponseDocument As Variant _  
)
```

### Parameters

[C++]

*lOpenness*

[in] Enumeration value that indicates whether associated **BizTalkPort** objects can be open. Valid values are from the **BIZTALK\_OPENNESS\_TYPE** enumeration.

*Document*

[in] **BSTR** that contains the document instance submitted. This parameter accepts only a string buffer as the document or interchange. This means that applications cannot submit other objects, such as DOM objects, **CDictionary** objects, ADO objects, or any other data type or object type. Either the *Document* parameter or the *FilePath* parameter must be specified. Do not specify both. This is an optional parameter.

*DocName*

[in] **BSTR** that contains the name of the **BizTalkDocument** object associated with the instance of the document submitted. If the *lOpenness* parameter is set to **BIZTALK\_OPENNESS\_TYPE\_SOURCE**, you can select an input **BizTalkDocument** object that has an X12 or EDIFACT specification. If you do, however, the output **BizTalkDocument** must not have an X12 or EDIFACT specification. If *lOpenness* is set to **BIZTALK\_OPENNESS\_TYPE\_DESTINATION**, the **BizTalkDocument** object must not have an

X12 or EDIFACT specification. The *DocName* parameter cannot be used if the *PassThrough* parameter is set to TRUE. This is an optional parameter.

#### *SourceQualifier*

[in] **BSTR** that contains the qualifier of the source organization. This indicates how the *SourceID* parameter is to be interpreted. Valid values come from the organization identifier qualifiers that are created when the user creates an alias for an organization. Common qualifiers include the DUNS number, telephone number, and BizTalk. You must specify a *SourceID*. The default qualifier for all new organizations is *Organization Name* and refers to the name of the organization in the database. If a BizTalk Framework 2.0–compliant document is submitted and a qualifier is not found during parsing, the qualifier defaults to *BizTalk*. The *SourceQualifier* parameter cannot be used if the *PassThrough* parameter is set to TRUE. This is an optional parameter.

#### *SourceID*

[in] **BSTR** that contains the value of the qualifier of the source organization. For example, if the *SourceQualifier* parameter is Telephone, this value is the telephone number. If the *Openness* flag is set to *OpenSrc*, *SourceID* is interpreted as the source organization name. The *SourceID* parameter cannot be used if the *PassThrough* parameter is set to TRUE. This is an optional parameter.

#### *DestQualifier*

[in] **BSTR** that contains the qualifier of the destination organization. This indicates how the *DestID* parameter is to be interpreted. Valid values come from the organization identifier qualifiers that are created when the user creates an alias for an organization. Common qualifiers include the DUNS number, telephone number, and BizTalk. You must specify a *DestID* parameter. The default qualifier for all new organizations is *Organization Name* and refers to the name of the organization in the database. If a BizTalk Framework 2.0–compliant document is submitted and a qualifier is not found during parsing, the qualifier defaults to *BizTalk*. The *DestQualifier* parameter cannot be used if the *PassThrough* parameter is set to TRUE. This is an optional parameter.

#### *DestID*

[in] **BSTR** that contains the value of the qualifier of the destination organization. For example, if the *DestQualifier* parameter is Telephone, this value is the telephone number. If the *Openness* flag is set to *OpenDest*, *DestID* is used as the destination address. Note that the *queue://* prefix must be used with an open messaging port when a Message Queue is specified as the destination address. The *DestID* parameter cannot be used if the *PassThrough* parameter is set to TRUE. This is an optional parameter.

#### *ChannelName*

[in] **BSTR** that contains the name of the **BizTalkChannel** object that is executed for this document. This bypasses the normal processing in which the parser tries to determine which messaging port/channel pair to execute, based on routing information in the parameters or in the document. This is an optional parameter unless the *PassThrough* parameter is set to TRUE.

#### *FilePath*

[in] **BSTR** that specifies a fully qualified path that contains the document to be submitted, rather than submitting the document directly as a string. BizTalk Server 2000 supports URL, UNC, and drive: format only. Either the *Document* parameter or the *FilePath* parameter must be specified. Do not specify both. The *FilePath* parameter cannot be used if the *PassThrough* parameter is set to TRUE and a map is specified. This is an optional parameter.

#### *EnvelopeName*

[in] **BSTR** that contains the name of the envelope specification to use to break the interchange into documents. When an envelope name is provided in this parameter, the envelope must have a valid interchange specification. This requirement is enforced for envelopes created for Custom XML format also. This is an optional parameter.

#### *PassThrough*

[in] **Long** that indicates how the server processes the document. When this parameter is set to TRUE, no decryption, decoding, or signature verification is performed on the document. When set to FALSE, the document is decrypted and decoded, and the signature is verified. When using pass-through submission mode (TRUE), the **BIZTALK\_OPENNESS\_TYPE** value must be set to **BIZTALK\_OPENNESS\_TYPE\_NOTOPEN** and the *ChannelName* parameter must be specified. In addition, the *DocName*, *SourceQualifier*, *SourceID*, *DestQualifier*, and *DestID* parameters cannot be specified with pass-through submission mode. Pass-through submission mode should be used to prevent data corruption when exchanging binary files, or when only the server transport and global tracking features are being used.

#### *SubmissionHandle*

[out] Pointer to a **BSTR** that contains a unique identifier for the submitted document or interchange. This handle can be used to query the Tracking database for the status of the interchange or document submitted. If more than one document is submitted (an interchange), a single handle is returned; yet the Tracking database can access the status of all child documents related to this interchange identifier.

## *ResponseDocument*

[out] Pointer to the **VARIANT** that contains the optional response document.

[Visual Basic]

## *Openness*

Enumeration value that indicates whether associated **BizTalkPort** objects can be open. Valid values are from the **BIZTALK\_OPENNESS\_TYPE** enumeration.

## *Document*

**String** that contains the document instance submitted. This parameter accepts only a string buffer as the document or interchange. This means that applications cannot submit other objects, such as DOM objects, **CDictionary** objects, ADO objects, or any other data type or object type. Either the *Document* parameter or the *FilePath* parameter must be specified. Do not specify both. This is an optional parameter.

## *DocName*

**String** that contains the name of the **BizTalkDocument** object associated with the instance of the document submitted. If the *Openness* parameter is set to **BIZTALK\_OPENNESS\_TYPE\_SOURCE**, you can select an input **BizTalkDocument** object that has an X12 or EDIFACT specification. If you do, however, the output **BizTalkDocument** must not have an X12 or EDIFACT specification. If *Openness* is set to **BIZTALK\_OPENNESS\_TYPE\_DESTINATION**, the **BizTalkDocument** object must not have an X12 or EDIFACT specification. The *DocName* parameter cannot be used if the *PassThrough* parameter is set to **True**. This is an optional parameter.

## *SourceQualifier*

**String** that contains the qualifier of the source organization. This indicates how the *SourceID* parameter is to be interpreted. Valid values come from the organization identifier qualifiers that are created when the user creates an alias for an organization. Common qualifiers include the DUNS number, telephone number, and BizTalk. You must specify a *SourceID*. The default qualifier for all new organizations is *Organization Name* and refers to the name of the organization in the database. If a BizTalk Framework 2.0–compliant document is submitted and a qualifier is not found during parsing, the qualifier defaults to *BizTalk*. The *SourceQualifier* parameter cannot be used if the *PassThrough* parameter is set to **True**. This is an optional parameter.

## *SourceID*

**String** that contains the value of the qualifier of the source organization. For example, if the *SourceQualifier* parameter is Telephone, this value is the telephone number. If the *Openness* flag is set to OpenSrc, *SourceID* is interpreted as the source organization name. The *SourceID* parameter cannot be used if the *PassThrough* parameter is set to **True**. This is an optional parameter.

## *DestQualifier*

**String** that contains the qualifier of the destination organization. This indicates how the *DestID* parameter is to be interpreted. Valid values come from the organization identifier qualifiers that are created when the user creates an alias for an organization. Common qualifiers include the DUNS number, telephone number, and BizTalk. You must specify a *DestID*. The default qualifier for all new organizations is *Organization Name* and refers to the name of the organization in the database. If a BizTalk Framework 2.0–compliant document is submitted and a qualifier is not found during parsing, the qualifier defaults to *BizTalk*. The *DestQualifier* parameter cannot be used if the *PassThrough* parameter is set to **True**. This is an optional parameter.

## *DestID*

**String** that contains the value of the qualifier of the destination organization. For example, if the *DestQualifier* parameter is Telephone, this value is the telephone number. If the *Openness* flag is set to OpenDest, *DestID* is used as the destination address. Note that the queue:// prefix must be used with an open messaging port when a Message Queue is specified as the destination address. The *DestID* parameter cannot be used if the *PassThrough* parameter is set to **True**. This is an optional parameter.

## *ChannelName*

**String** that contains the name of the **BizTalkChannel** object that is executed for this document. This bypasses the normal processing in which the parser tries to determine which messaging port/channel pair to execute, based on routing information in the parameters or in the document. This is an optional parameter unless the *PassThrough* parameter is set to **True**.

## *FilePath*

**String** that specifies a fully qualified path that contains the document to be submitted, rather than submitting the document directly as a string. BizTalk Server 2000 supports URL, UNC, and drive: format only. Either the *Document* parameter or the *FilePath* parameter must be specified. Do not specify both. The *FilePath* parameter cannot be used if the *PassThrough* parameter

is set to **True** and a map is specified. This is an optional parameter.

#### *EnvelopeName*

**String** that contains the name of the envelope specification to use to break the interchange into documents. When an envelope name is provided in this parameter, the envelope must have a valid interchange specification. This requirement is enforced for envelopes created for Custom XML format also. This is an optional parameter.

#### *PassThrough*

**Long** that indicates how the server processes the document. When this parameter is **True**, no decryption, decoding, or signature verification is performed on the document. When set to **False**, the document is decrypted and decoded, and the signature is verified. When using pass-through submission mode (**True**), the **BIZTALK\_OPENNESS\_TYPE** value must be set to **BIZTALK\_OPENNESS\_TYPE\_NOTOPEN** and the *ChannelName* parameter must be specified. In addition, the *DocName*, *SourceQualifier*, *SourceID*, *DestQualifier*, and *DestID* parameters cannot be specified with pass-through submission mode. Pass-through submission mode should be used to prevent data corruption when exchanging binary files, or when only the server transport and global tracking features are being used.

#### *SubmissionHandle*

**VARIANT** that contains a unique identifier for the submitted document or interchange. This handle can be used to query the Tracking database for the status of the interchange or document submitted. If more than one document is submitted (an interchange), a single handle is returned; yet the Tracking database can access the status of all child documents related to this interchange identifier.

#### *ResponseDocument*

**VARIANT** that contains the optional response document.

## Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None.

## Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

## Remarks

**SubmitSync** returns an optional response document when provided. If no response is returned, the call returns successfully, but with no response and with an HRESULT value of S\_FALSE. If the destination is another BizTalk Server, an ASP page must be used to return a response.

A synchronous interchange bypasses all queues and executes all the components required by the messaging port on the calling thread. For synchronous protocols (HTTP and AIC), an optional response document is returned to the user, if available. This method is valid only for a single channel match. If the parameters set cause multiple channels to match, synchronous submission returns an error indicating that multiple channel matches are not allowed for synchronous submission. This method can be used only for single document interchanges. If the submission contains multiple documents, synchronous submission returns an error indicating that multiple document submissions are not allowed. This method does not support port groups.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include cisapi.h

**Library:** (cisapi.tlb)

## Related Topics

[Openness](#)

[Routing](#)

Submitting

Steps for Submitting a Document by Using COM Interfaces

# Interchange Enumerations

The following enumeration lists the possible values of properties and parameters:

- [CISReasonToQueue](#)

# CISReasonToQueue

The **CISReasonToQueue** enumerations are defined in the `cisapi.h` header file, located on the BizTalk Server installation drive in the Program Files\Microsoft BizTalk Server\SDK\Include folder.

The **CISReasonToQueue** enumeration has one of the following values:

Name	Value	Description
<b>noReason</b>	0	Not supported for this release.
<b>rtdlqParserFailure</b>	1	Specifies that the instance of the document was placed in the queue because of failure of the parser.
<b>rtdlqParserDocFailure</b>	2	Specifies that the instance of the document was placed in the queue because the business document was invalid.
<b>rtdlqDocValidation</b>	3	Specifies that the document was placed in the queue because document validation failed.
<b>rtdlqChannelSelectFailure</b>	4	Specifies that the instance of the document was placed in the queue because of failure in selecting the correct <b>BizTalkChannel</b> object.
<b>rtdlqInvalidMap</b>	5	Specifies that the instance of the document was placed in the queue because the map referred to by the <b>BizTalkChannel</b> object was formatted incorrectly.
<b>rtdlqFieldTrackingFailure</b>	6	Specifies that the instance of the document was placed in the queue because the server was unable to track the requested fields within the document.
<b>rtdlqMappingFailure</b>	7	Specifies that the instance of the document was placed in the queue because of failure of transformation.
<b>rtdlqSerializerFailure</b>	8	Specifies that the instance of the document was placed in the queue because the server could not convert this document to its native format.
<b>rtdlqEncodingFailure</b>	9	Specifies that the instance of the document was placed in the queue because the server was unable to encode this interchange.
<b>rtdlqSigningFailure</b>	10	Specifies that the instance of the document was placed in the queue because the server was unable to sign this interchange.
<b>rtdlqEncryptionFailure</b>	11	Specifies that the instance of the document was placed in the queue because the server was unable to encrypt this interchange.
<b>rtdlqTransmissionFailure</b>	12	Specifies that the instance of the document was placed in the queue because the server was unable to deliver this document.
<b>rtdlqUserMove</b>	13	Specifies that the administrator moved this instance of the document to the queue.
<b>rtdlqTimeout</b>	14	Specifies that the instance of the document was placed in the queue because a time-out occurred.
<b>rtdlqCustomComponentFailure</b>	15	Specifies that the instance of the document was placed in the queue because of failure of a custom component.
<b>unkReason</b>	16	Specifies that this item was marked as "In process" by an inactive server. On restart of this server, this item was automatically moved to the Suspended queue. There was probably a catastrophic failure on the original server. Contact the system administrator for more information.
<b>rtdlqNoChannel</b>	17	Specifies that the instance of the document was placed in the queue because the <b>BizTalkChannel</b> object was deleted.
<b>rtdlqMissingChannel</b>	18	Specifies that the instance of the document was placed in the queue because the <b>BizTalkChannel</b> object specified by the <b>Submit</b> method of the <b>IInterchange</b> interface was not found.

<b>rtdlqInvalidChannel</b>	19	Specifies that the instance of the document was placed in the queue because the <b>BizTalkChannel</b> object specified by the <b>Submit</b> method of the <b>Interchange</b> interface specifies an open <b>BizTalkPort</b> object. This is not permitted.
<b>rtdlqOutOfMemory</b>	20	Specifies that your computer has run out of memory. Rebooting is recommended.
<b>rtdlqBTFRecReqExpired</b>	21	Specifies that the document was placed in the queue because the BTF timestamp <b>receiptRequiredBy</b> expired.
<b>rtdlqBTExpiresAtExpired</b>	22	Specifies that the document was placed in the queue because the BTF timestamp <b>expiresAt</b> expired.
<b>rtdlqCorrelationFailure</b>	23	Specifies that the document receipt failed.

# Concepts

This section provides detailed conceptual information that is important to understand how to submit documents to Microsoft BizTalk Server 2000. The following topics are covered:

- [Submitting](#)
- [Accessing the Suspended queue](#)
- [Routing](#)
- [Preprocessing Documents in a Receive Function](#)
- [Steps for Submitting a Document by Using COM Interfaces](#)

# Submitting

All documents must be sent to Microsoft BizTalk Server 2000 by using the **Submit** or **SubmitSync** method of the **IInterchange** interface in order to be processed. If an application is Microsoft Windows–based and is capable of invoking methods on COM objects, it can submit a document directly. The business application calls the **Submit** or **SubmitSync** method of the **IInterchange** interface, passing in the document or the file path of the document as a string supplied as a parameter. This is the simplest approach because no additional configuration is necessary. However, this method requires that the business application be designed to support direct calls to BizTalk Server 2000.

If the application is not capable of invoking methods on COM objects, [receive functions](#) can be used to submit documents to BizTalk Server. Receive functions enable applications to post [documents](#) or [interchanges](#) to specific locations that BizTalk Server 2000 is monitoring. These locations are defined according to the specific receive function. Each receive function uses event-based monitoring to recognize the presence of a document or interchange. Once the data is received by the function, it submits the data to BizTalk Server 2000. For example, a file receive function can be configured to submit a document to BizTalk Server 2000 when the business application can save a document as a file but cannot submit it directly. For more information about adding and configuring receive functions, see [Manage Receive Functions for a Server Group](#).

The receive functions are configured to continuously monitor a specific directory or queue for a file to appear and then be submitted to BizTalk Server 2000. HTTP and SMTP protocols are configured outside BizTalk Server 2000. You must create script pages for these transport services.

## Notes

- There is a size limit for interchanges and documents that use logging, which, if exceeded, greatly affects the performance of BizTalk Server. For more information about the size limit, see [Interchange and document size limit](#).
- A script or application that uses the **IInterchange** interface to submit documents to BizTalk Server can be run in any user account.
- When processing envelopes that are compliant with BizTalk Framework 2.0, BizTalk Server 2000 should be considered the endpoint with regard to the expiration time. When BizTalk Framework 2.0-compliant documents are submitted to BizTalk Server 2000, either from an application or a trading partner, the following fields are overwritten if present, or created if absent:

- In the properties subsection:

<prop:identity>

<prop:sentAt>

<expiresAt>

- In the receipt information subsection:

<sendTo>

<address>

<sendReceiptBy>

For examples of code, see [BizTalk Messaging Services Code Samples](#).

## Sending documents to BizTalk Server 2000 asynchronously

Applications that submit documents asynchronously to BizTalk Server 2000 call **Submit**. Receive functions also call **Submit**. **Submit** returns after sending the document. No response document is returned, since the protocol does not support it.

**Submit** accepts only a string buffer or a file path as the document or interchange. BizTalk Server 2000 supports UNC and local file path formats.

## Sending documents to BizTalk Server 2000 synchronously

Applications that submit documents synchronously to BizTalk Server 2000 call **SubmitSync**.

A synchronous interchange bypasses all queues and executes all the components required by the messaging port on the calling thread. For synchronous protocols, an optional response document is returned to the user, if available. This method is valid only for a single [channel](#) match. If the parameters set cause multiple channels to match, synchronous submission returns an error

indicating that multiple channel matches are not allowed for synchronous submission. This method can be used only for single document interchanges. If the submission contains multiple documents, synchronous submission returns an error indicating that multiple document submissions are not allowed. This method does not support [port groups](#).

**SubmitSync** accepts only a string buffer or a file path as the document or interchange. BizTalk Server 2000 supports UNC and local file path formats.

### **Error handling with the Submit and SubmitSync methods**

When an error occurs when submitting interchanges or documents to BizTalk Server 2000, an event log entry is created and/or an error is returned to the caller, depending on which method is called and the nature of the failure. Documents submitted can end up in the [Suspended queue](#) due to a number of possible conditions. The following table describes what happens when one or more of the documents or interchanges submitted are placed in the Suspended queue due to an error during submission.

<b>Method called</b>	<b>Error returned to caller</b>	<b>Event log entry</b>
<a href="#">Submit</a>	Document failure error	For every document that fails in processing
<a href="#">SubmitSync</a>	Document failure error	None

### **Related Topics**

[Routing](#)

[Steps for Submitting a Document by Using COM Interfaces](#)

[Submitting Documents Reference](#)

# Accessing the Suspended queue

The [Suspended queue](#) contains work items that have failed processing for a variety of reasons, including parsing errors, serialization errors, failed transmissions, or the inability to find a [channel](#) configuration. You can retrieve or delete items from the queue using the interfaces provided.

## Note

- When accessing or deleting items in the Suspended queue, the script or application must be run in the context of a user account in the BizTalk Server Administrators group. The BizTalk Server Administrators group is created when BizTalk Server 2000 is installed. Additional users can be added to this group as necessary.

## Retrieving items from the Suspended queue

To retrieve items from the Suspended queue, applications call the [CheckSuspendedQueue](#) method of the **IInterchange** interface.

**CheckSuspendedQueue** retrieves a list of items in the Suspended queue that meets the search criteria specified by the parameters of the method. This returns a list of handles that can subsequently be used to call the [DeleteFromSuspendedQueue](#) or the [GetSuspendedQueueItemDetails](#) method of the **IInterchange** interface.

## Getting item details from the Suspended queue

**CheckSuspendedQueue** returns a list of handles to items in the Suspended queue. To process these items, you must get the item details associated with each item in the Suspended queue by using **GetSuspendedQueueItemDetails**.

**GetSuspendedQueueItemDetails** retrieves the details about an item in the Suspended queue. If this method does not return individual details about this item (because the item has been removed between the time **CheckSuspendedQueue** was called and the call to this method, for example), each parameter that cannot be determined is returned.

## Removing items from the Suspended queue

To remove items from the Suspended queue, applications call **DeleteFromSuspendedQueue**.

**DeleteFromSuspendedQueue** removes a list of items from the Suspended queue that meets the search criteria specified by the parameters of the method.

# Routing

To process a document, Microsoft BizTalk Server 2000 must load the rules that govern how the incoming [document instance](#) is to be processed. These rules are known as the [channel](#). A specific [BizTalkChannel](#) object is associated with a [BizTalkPort](#) object and connects two [organizations](#).

To find the channel to process the received document, the server must have the [source organization](#), the [destination organization](#), and the [document definition](#). The server can obtain this information by one of the following methods:

- This information can be found in the content of the document itself from the data contained in the routing fields (self-routing documents).
- This information can be explicitly declared in the parameter list of the [Submit](#) method of the [IInterchange](#) interface (call-based routing).
- This information can be explicitly declared in the properties of a custom [receive function](#). For more information about receive functions, see [Understanding Receive Functions and Document Routing](#).
- You can choose to specify the channel to use when calling [Submit](#). This causes the server to bypass the channel selection process.

Once the server has this information, it searches for the [messaging port/channel](#) pair that matches these routing criteria. If more than one channel matches, each of the channels is processed, possibly resulting in multiple output documents.

## Call-based routing

In call-based routing, the source [organization identifier](#) (*SourceID*), the destination organization identifier (*DestID*), and the name of the document definition (*DocName*) are specified as parameters of [Submit](#). If *SourceQualifier* and *DestQualifier* are not specified, they default to *OrganizationName* and refer to the name of the organization in the database. If a [BizTalk Framework 2.0](#)-compliant document is submitted and a qualifier is not found during parsing, the qualifier defaults to *BizTalk*. If the *Openness* flag is set to *OpenDest*, the *DestID* is used as the destination address. If *SourceID*, *DestID*, or *DocName* is left blank, the missing information must be provided by the routing information contained within the document. If one of these parameters/fields is not in [Submit](#) or in the document, the document goes to the [Suspended queue](#).

### Note

- Note that the `queue://` prefix must be used with an [open messaging port](#) when a Message Queue is specified as the destination address.

## Self-routing documents

Self-routing documents have the source organization identifier (*SourceID* field), the destination organization identifier (*DestID* field), and the name of the document definition (*DocName* field) defined in the routing tags defined by the document [specification](#), which are contained within the `<SelectionFields>` tag. If *SourceQualifier* and *DestQualifier* are not specified, they default to *OrganizationName* and refer to the name of the organization in the database. If a BizTalk Framework 2.0-compliant document is submitted and a qualifier is not found during parsing, the qualifier defaults to *BizTalk*. The BizTalk Framework specification also defines the routing tags for BizTalk Framework-compliant messages. These tags are defined as the `<to>` and `<from>` tags under the `<route>` tag, which is contained in the `<header>` tag under the root `<biztalk>` tag. The first tag under the `<body>` tag determines the document type. For more information, see the *BizTalk Framework 2.0 Independent Document Messaging Specification*. For [X12](#) or [EDIFACT](#) routing, the locations of the routing fields are hard-coded and are not specified in a document specification.

# Preprocessing Documents in a Receive Function

Documents can be submitted to BizTalk Server 2000 for processing by using a [receive function](#). Using this mechanism, other applications can send their output files to a specified directory or message queue. BizTalk Server continually monitors the specified location at regular intervals and processes the files or messages placed in that location. BizTalk Server provides interfaces that allow you to create custom preprocessing components. These components process the file or message picked up by the receive function prior to submitting the data to BizTalk Server for processing.

A custom preprocessor component is required to implement the category identifier (CATID) CATID\_BIZTALK\_CUSTOM\_PROCESS in the registry. This allows the [BizTalk Server Administration](#) user interface, or administration console, to recognize the custom preprocessor and display it in the **Preprocessor** list, where it can be selected.

For additional information, see [IBTSCustomProcess](#) and [IBTSCustomProcessContext](#).

## Related Topics

[BizTalk Server Administration User Interface](#)

[Receive Functions](#)

# Steps for Submitting a Document by Using COM Interfaces

Use the following steps as a guideline when submitting documents to BizTalk Server with the **Interchange** interface,

1. Determine whether the [source organization](#), [destination organization](#), and [document definition](#) name are in the parameters of the **Submit** or the **SubmitSync** method of the **Interchange** interface or are included in the document; it might be a combination of the two.
  - This information can be explicitly declared in the parameter list of **Submit** or **SubmitSync** (call-based routing).  
One or more of these parameters can be left blank and the missing information can be provided by the routing information contained within the document.
  - This information can be found in the content of the document itself from the data in the routing fields (self-routing documents).
  - The user can choose to explicitly call out the specific [channel](#) to use when calling **Submit**. This causes the server to bypass channel selection.
  - This information can be explicitly declared in the properties of a custom [receive function](#).
2. Decide whether to submit asynchronously or synchronously.
  - Call **Submit**, passing in the document or the file path of the document as a string supplied as a parameter. BizTalk Server 2000 supports URL, UNC, and drive: format for the file path.  
**Submit** accepts only a string variable as the document or [interchange](#).
  - Call **SubmitSync**, passing in the document or the file path of the document as a string supplied as a parameter.
    - A response document is returned to the user, if available.
    - This method is valid only for a single channel match.
    - This method can be used only for single-document interchanges.
3. Decide whether to call some of the [Suspended queue](#) methods. (This is optional and can be implemented in the same application or a different application.)
  - Call the **CheckSuspendedQueue** method of the **Interchange** interface.
    - Retrieve items from the Suspended queue.
    - This returns a list of handles that can subsequently be used to call the **DeleteFromSuspendedQueue** or the **GetSuspendedQueueItemDetails** method of the **Interchange** interface.
  - Call **GetSuspendedQueueItemDetails**.  
Retrieve the details about a particular item in the Suspended queue.
  - Call **DeleteFromSuspendedQueue**.  
Remove items from the Suspended queue.

# Creating Custom Components

This section provides information about how to create custom components and extend Microsoft BizTalk Server 2000 to integrate [line-of-business applications](#) and add features such as encryption and decryption or digital signature. With this information, you can do the following:

- Create application integration components (AICs) that enable your applications to receive business documents, using BizTalk Server 2000.
- Extend the functionality of BizTalk Server 2000 by developing custom components to perform digital signature, encryption and decryption, parsing, serializing, and transport of documents.

For additional information, see the following sections:

- For help with specific tasks, see [How To](#).
- For general background information, see [Concepts](#).
- For information about COM interfaces, see [Creating Custom Components Reference](#).
- For examples of code, see [BizTalk Messaging Services Code Samples](#).

# How To...

This section provides task-specific information about how to create server components. It is highly recommended that you review the [Concepts](#) in "Creating Custom Components" as well. The following topics are covered:

- [Creating Pipeline Components](#)
- [Use the SAP R/3 AIC](#)

# Creating Pipeline Components

Use the following steps to create a pipeline component:

1. Create an Active Template Library wizard-generated Inproc server project.
2. Add a simple COM object.
3. Go to the Projectname.idl file and remove the dual or custom interface generated by the wizard in step 2.
4. Verify that the resulting IDL file looks like the code examples that follow. You might choose to implement your own set of interfaces from the ones defined in Pipecomp.idl.

```
// SimplePipeComponent.idl : IDL source for SimplePipeComponent.dll
//
import "oaidl.idl";
import "ocidl.idl";
import "pipecomp.idl";

[
    uuid(D26A52F6-63A0-42B1-8C88-3C71C66BB189),
    version(1.0),
    helpstring("SimplePipeComponent 1.0 Type Library")
]
library SIMPLEPIPECOMPONENTLib
{
    importlib("stdole32.tlb");
    importlib("stdole2.tlb");
    [
        uuid(E66CAF06-18D8-4C70-9D39-5ED9756C21AD),
        helpstring("MySimplePipelineComponent Class")
    ]
    coclass MySimplePipelineComponent
    {
        [default] interface IPipelineComponentAdmin;
        interface IPipelineComponent;
        interface IPipelineComponentDescription;
    };
};
```

5. One of the implementations of MySimplePipelineComponent [coclass] is defined in the header file as follows:

```
// MySimplePipelineComponent.h : Declaration of the
// CMySimplePipelineComponent

#ifndef __MYSIMPLEPIPELINECOMPONENT_H_
#define __MYSIMPLEPIPELINECOMPONENT_H_

#include "resource.h" // main symbols

////////////////////////////////////
// CMySimplePipelineComponent
class ATL_NO_VTABLE CMySimplePipelineComponent :
    public CComObjectRootEx<CComSingleThreadModel>,
    public CComCoClass<CMySimplePipelineComponent, &CLSID_MySimplePipelineComponent>,
    public ISupportErrorInfo,
    public IDispatchImpl<IPipelineComponentAdmin, &IID_IPipelineComponentAdmin, &LIBID_SIMPLEPIPECOMPONENTLib>,
    public IDispatchImpl<IPipelineComponent, &IID_IPipelineComponent, &LIBID_SIMPLEPIPECOMPONENTLib>,
```

```

    public IDispatchImpl<IPipelineComponentDescription, &IID_IPipelineComponentDescription, &LIBID_SIMPLEPI
PECOMPONENTLib>
{
public:
    CMySimplePipelineComponent()
    {
    }

DECLARE_REGISTRY_RESOURCEID(IDR_MYSIMPLEPIPELINECOMPONENT)

DECLARE_PROTECT_FINAL_CONSTRUCT()

BEGIN_COM_MAP(CMySimplePipelineComponent)
    COM_INTERFACE_ENTRY2(IDispatch, IPipelineComponentAdmin)
    COM_INTERFACE_ENTRY(IPipelineComponentAdmin)
    COM_INTERFACE_ENTRY(IPipelineComponent)
    COM_INTERFACE_ENTRY(IPipelineComponentDescription)
    COM_INTERFACE_ENTRY(ISupportErrorInfo)
END_COM_MAP()

// ISupportsErrorInfo
    STDMETHOD(InterfaceSupportsErrorInfo)(REFIID riid);

public://IPipelineComponentAdmin
    STDMETHODIMP GetConfigData(IDispatch** ppDict );
    STDMETHODIMP SetConfigData(IDispatch* pDict );

public://IPipelineComponent
    STDMETHODIMP Execute(IDispatch* pdispObject, IDispatch* pdispContext, LONG lFlags, LONG* pLErrorLevel);
    STDMETHODIMP EnableDesign(BOOL fEnable);
public: //IPipelineComponentDescription
    STDMETHODIMP ValuesRead(VARIANT* pvar);
    STDMETHODIMP ValuesWritten(VARIANT* pvar);
    STDMETHODIMP ContextValuesRead(VARIANT* pvar);

};

#endif //__MYSIMPLEPIPELINECOMPONENT_H_

```

## Related Topics

[Creating Application Integration Components](#)

[IPipelineComponent](#)

[IPipelineComponentAdmin](#)

# Use the SAP R/3 AIC

To use the Systems, Applications, and Products in Data Processing (SAP) AIC, do the following:

## Install the DCOM connector

1. Download the SAP Remote Function Call SDK ([www.sap.com/bapi](http://www.sap.com/bapi)).
  - Go to the COM section and click the DCOM Component Connector.
  - Follow the instructions from the File Download wizard.
2. Run the image, and unzip it to add the Rfcsdk subdirectories to the client computer.
3. Install the DCOM connector.
4. Follow the installation instructions from the \Rfcsdk\Ccwww subdirectory Install page.
5. Once the connector is installed, create a destination, entering information for the following:
  - Destination name
  - Application server
  - Server number
  - Client
  - Language
  - User
  - Password

## Enter the destination name in BizTalk Messaging Manager

This is the destination name chosen during SAP DCOM connector configuration. For more information, see [Select a destination organization](#).

## Create a COM+ server package

1. Create a COM+ server package.
2. Mark it as Transactions Not Supported.
3. Add AICOMP.dll to this package.

# Creating Custom Components Reference

This section provides reference information about components and interfaces used by Microsoft BizTalk Server 2000 for both C++ and Visual Basic programming. Reference information is provided for all interfaces exposed for extending BizTalk Server 2000.

The following COM interfaces are documented in this reference for C++ developers:

- [IBizTalkParserComponent](#)
- [IBizTalkSerializerComponent](#)

The following COM interfaces and enumerations are documented in this reference for C++ and Visual Basic developers:

- [IBizTalkAcknowledge](#)
- [IBizTalkCorrelation](#)
- [IBTSAppIntegration](#)
- [IFunctoid](#)
- [IPipelineComponent](#)
- [IPipelineComponentAdmin](#)
- [ISchemaImporter](#)
- [ISchemaImporterError](#)
- [ISchemaImporterErrorProvider](#)
- [Receipt Enumerations](#)
- [Functoid Enumerations](#)

# IBizTalkAcknowledge Interface

## IBizTalkAcknowledge Interface [C++]

## IBizTalkAcknowledge Object [Visual Basic]

Use this object to process receipts sent to the server.

In C++, use the **IBizTalkAcknowledge** interface to access the methods of the **BizTalkAcknowledge** object.

The methods of the **BizTalkAcknowledge** object are shown in the following table.

Method	Description
<a href="#">AckDocument</a>	Processes receipts received for documents.
<a href="#">AckGroup</a>	Processes receipts received for document groups.
<a href="#">AckInterchange</a>	Processes receipts received for document interchanges.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BTSDocTracking.h

**Library:** Use Microsoft BizTalk Server Doc Tracking 1.0 Type Library (CISDTA.dll)

### Related Topics

[Creating Receipt Correlator Components](#)

[How Receipts Are Logged](#)

[Understanding Receipts](#)

# IBizTalkAcknowledge::AckDocument Method

## IBizTalkAcknowledge::AckDocument Method [C++]

## IBizTalkAcknowledge.AckDocument Method [Visual Basic]

The **AckDocument** method processes receipts for documents.

### Syntax

[C++]

```
HRESULT AckDocument(  
    BSTR bstrSyntax,  
    BSTR bstrTrackingId,  
    DTA_ACK_STATUS enumAckStatus  
);
```

[Visual Basic]

```
object.AckDocument( _  
    bstrSyntax As String, _  
    bstrTrackingId As String, _  
    enumAckStatus As DTA_ACK_STATUS _  
)
```

### Parameters

[C++]

*bstrSyntax*

[in] **BSTR** that contains the syntax of the outbound document to be acknowledged, for example, X12 or EDIFACT.

*bstrTrackingId*

[in] **BSTR** that contains the unique tracking identifier of the document. This value is a globally unique identifier (GUID). This value can be obtained from the Tracking\_ID field in the dta\_outdoc\_details table. For more information, see [Supporting the Tracking Database with Parser and Serializer Components](#).

*enumAckStatus*

[in] Enumeration value that indicates the receipt status. Valid values are from the **DTA\_ACK\_STATUS** enumeration.

[Visual Basic]

*bstrSyntax*

**String** that contains the syntax of the outbound document to be acknowledged, for example, X12 or EDIFACT.

*bstrTrackingId*

**String** that contains the unique tracking identifier of the document. This value is a globally unique identifier (GUID). This value can be obtained from the Tracking\_ID field in the dta\_outdoc\_details table. For more information, see [Supporting the Tracking Database with Parser and Serializer Components](#).

*enumAckStatus*

Enumeration value that indicates the receipt status. Valid values are from the **DTA\_ACK\_STATUS** enumeration.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None

## Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This method is called only for receipts on individual documents. If the receipt needs to be mapped, a document definition that points to CanonicalReceipt.xml shipped in WebDAV must be created for the receipt.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BTSDocTracking.h

**Library:** Use Microsoft BizTalk Server Doc Tracking 1.0 Type Library (CISDTA.dll)

# IBizTalkAcknowledge::AckGroup Method

## IBizTalkAcknowledge::AckGroup Method [C++]

## IBizTalkAcknowledge.AckGroup Method [Visual Basic]

The **AckGroup** method processes receipts for document groups.

### Syntax

[C++]

```
HRESULT AckGroup (  
    BSTR bstrSyntax,  
    BSTR bstrVersion,  
    BSTR bstrRelease,  
    BSTR bstrFunctionalGroupId,  
    BSTR bstrControlId,  
    BSTR bstrSrcAppName,  
    BSTR bstrDestAppName,  
    DTA_ACK_STATUS enumAckStatus  
);
```

[Visual Basic]

```
object.AckGroup( _  
    bstrSyntax As String, _  
    bstrVersion As String, _  
    bstrRelease As String, _  
    bstrFunctionalGroupId As String, _  
    bstrControlId As String, _  
    bstrSrcAppName As String, _  
    bstrDestAppName As String, _  
    enumAckStatus As DTA_ACK_STATUS _  
)
```

### Parameters

[C++]

*bstrSyntax*

[in] **BSTR** that contains the syntax of the outbound document to be acknowledged, for example, X12 or EDIFACT. You must use the exact strings for the following syntax types:

- X12
- EDIFACT
- Custom XML

*bstrVersion*

[in] **BSTR** that contains the version of the syntax, used primarily for EDI.

*bstrRelease*

[in] **BSTR** that contains the release of the version of the syntax, used primarily for EDI.

*bstrFunctionalGroupId*

[in] **BSTR** that contains the code for the type of documents in a group, used primarily for EDI.

*bstrControlId*

[in] **BSTR** that contains the unique identifier for the control number, used primarily for EDI.

*bstrSrcAppName*

[in] **BSTR** that contains the name of the source application.

*bstrDestAppName*

[in] **BSTR** that contains the name of the destination application.

*enumAckStatus*

[in] Enumeration value that indicates the receipt status. Valid values are from the [DTA\\_ACK\\_STATUS](#) enumeration.

[Visual Basic]

*bstrSyntax*

**String** that contains the syntax of the outbound document to be acknowledged, for example, X12 or EDIFACT. You must use the exact strings for the following syntax types:

- X12
- EDIFACT
- Custom XML

*bstrVersion*

**String** that contains the version of the syntax, used primarily for EDI.

*bstrRelease*

**String** that contains the release of the version of the syntax, used primarily for EDI.

*bstrFunctionalGroupId*

**String** that contains the code for the type of documents in a group, used primarily for EDI.

*bstrControllId*

**String** that contains the unique identifier for the control number, used primarily for EDI.

*bstrSrcAppName*

**String** that contains the name of the source application.

*bstrDestAppName*

**String** that contains the name of the destination application.

*enumAckStatus*

Enumeration value that indicates the receipt status. Valid values are from the [DTA\\_ACK\\_STATUS](#) enumeration.

## Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None

## Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

## Remarks

This method is called only for receipts on document groups.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BTSDocTracking.h

**Library:** Use Microsoft BizTalk Server Doc Tracking 1.0 Type Library (CISDTA.dll)

# IBizTalkAcknowledge::AckInterchange Method

## IBizTalkAcknowledge::AckInterchange Method [C++]

## IBizTalkAcknowledge.AckInterchange Method [Visual Basic]

The **AckInterchange** method processes receipts for document interchanges.

### Syntax

[C++]

```
HRESULT AckInterchange(  
    BSTR bstrSyntax,  
    BSTR bstrInterchangeId,  
    BSTR bstrVersion,  
    BSTR bstrControlId,  
    BSTR bstrSrcAliasQualifier,  
    BSTR bstrSrcAliasId,  
    BSTR bstrSrcAppName,  
    BSTR bstrDestAliasQualifier,  
    BSTR bstrDestAliasId,  
    BSTR bstrDestAppName,  
    DTA_ACK_STATUS enumAckStatus  
);
```

[Visual Basic]

```
object.AckInterchange( _  
    bstrSyntax As String, _  
    bstrInterchangeId As String, _  
    bstrVersion As String, _  
    bstrControlId As String, _  
    bstrSrcAliasQualifier As String, _  
    bstrSrcAliasId As String, _  
    bstrSrcAppName As String, _  
    bstrDestAliasQualifier As String, _  
    bstrDestAliasId As String, _  
    bstrDestAppName As String, _  
    enumAckStatus As DTA_ACK_STATUS _  
)
```

### Parameters

[C++]

*bstrSyntax*

[in] **BSTR** that contains the syntax of the outbound document to be acknowledged, for example, X12 or EDIFACT. You must use the exact strings for the following syntax types:

- X12
- EDIFACT
- Custom XML

*bstrInterchangeId*

[in] **BSTR** that contains the unique tracking identifier of the interchange. This value is a globally unique identifier (GUID).

*bstrVersion*

[in] **BSTR** that contains the version of the syntax, used primarily for EDI.

*bstrControlId*

[in] **BSTR** that contains the unique identifier for the control number, used primarily for EDI.

### *bstrSrcAliasQualifier*

[in] **BSTR** that contains the qualifier of the source organization. This indicates how the *bstrSrcAliasID* parameter is to be interpreted. Valid values come from the organization identifier qualifiers that are created when the user creates an alias for an organization. Common qualifiers include the DUNS number, telephone number, and BizTalk. The default qualifier for all new organizations is *Organization Name* and refers to the name of the organization in the database. If a BizTalk Framework 2.0–compliant document is submitted and a qualifier is not found during parsing, the qualifier defaults to *BizTalk*.

### *bstrSrcAliasId*

[in] **BSTR** that contains the value of the qualifier of the source organization. For example, if the *bstrSrcAliasQualifier* parameter is Telephone, this value is the telephone number.

### *bstrSrcAppName*

[in] **BSTR** that contains the name of the source application.

### *bstrDestAliasQualifier*

[in] **BSTR** that contains the qualifier of the source organization. This indicates how the *bstrDestAliasID* parameter is to be interpreted. Valid values come from the organization identifier qualifiers that are created when the user creates an alias for an organization. Common qualifiers include the DUNS number, telephone number, and BizTalk. The default qualifier for all new organizations is *Organization Name* and refers to the name of the organization in the database. If a BizTalk Framework 2.0–compliant document is submitted and a qualifier is not found during parsing, the qualifier defaults to *BizTalk*.

### *bstrDestAliasId*

[in] **BSTR** that contains the value of the qualifier of the source organization. For example, if the *bstrDestAliasQualifier* parameter is Telephone, this value is the telephone number.

### *bstrDestAppName*

[in] **BSTR** that contains the name of the destination application.

### *enumAckStatus*

[in] Enumeration value that indicates the receipt status. Valid values are from the [DTA\\_ACK\\_STATUS](#) enumeration.

[Visual Basic]

### *bstrSyntax*

**String** that contains the syntax of the outbound document to be acknowledged, for example, X12 or EDIFACT. You must use the exact strings for the following syntax types:

- X12
- EDIFACT
- Custom XML

### *bstrInterchangeld*

**String** that contains the unique tracking identifier of the interchange. This value is a globally unique identifier (GUID).

### *bstrVersion*

**String** that contains the version of the syntax, used primarily for EDI.

### *bstrControlld*

**String** that contains the unique identifier for the control number, used primarily for EDI.

### *bstrSrcAliasQualifier*

**String** that contains the qualifier of the source organization. This indicates how the *bstrSrcAliasID* parameter is to be interpreted. Valid values come from the organization identifier qualifiers that are created when the user creates an alias for an organization. Common qualifiers include the DUNS number, telephone number, and BizTalk. The default qualifier for all new organizations is *Organization Name* and refers to the name of the organization in the database. If a BizTalk Framework 2.0–compliant document is submitted and a qualifier is not found during parsing, the qualifier defaults to *BizTalk*.

### *bstrSrcAliasId*

**String** that contains the value of the qualifier of the source organization. For example, if the *bstrSrcAliasQualifier* parameter is Telephone, this value is the telephone number.

*bstrSrcAppName*

**String** that contains the name of the source application.

*bstrDestAliasQualifier*

**String** that contains the qualifier of the source organization. This indicates how the *bstrDestAliasID* parameter is to be interpreted. Valid values come from the organization identifier qualifiers that are created when the user creates an alias for an organization. Common qualifiers include the DUNS number, telephone number, and BizTalk. The default qualifier for all new organizations is *Organization Name* and refers to the name of the organization in the database. If a BizTalk Framework 2.0–compliant document is submitted and a qualifier is not found during parsing, the qualifier defaults to *BizTalk*.

*bstrDestAliasId*

**String** that contains the value of the qualifier of the source organization. For example, if the *bstrDestAliasQualifier* parameter is Telephone, this value is the telephone number.

*bstrDestAppName*

**String** that contains the name of the destination application.

*enumAckStatus*

Enumeration value that indicates the receipt status. Valid values are from the [DTA\\_ACK\\_STATUS](#) enumeration.

## Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None

## Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

## Remarks

This method is called only for receipts on document interchanges.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BTSDocTracking.h

**Library:** Use Microsoft BizTalk Server Doc Tracking 1.0 Type Library (CISDTA.dll)

# IBizTalkCorrelation Interface

Implement **IBizTalkCorrelation** to create receipt correlator components.

The method of the **BizTalkCorrelation** object is shown in the following table.

Method	Description
<a href="#">Correlate</a>	Extracts all relevant information from the document, document group, or interchange.

## Note

- This interface is not available in Microsoft Visual Basic.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BTSParserComps.h

## Related Topic

[Creating Receipt Correlator Components](#)

# IBizTalkCorrelation::Correlate Method

The **Correlate** method extracts all relevant information from the document, document group, or interchange.

## Syntax

[C++]

```
HRESULT Correlate(  
    IUnknown* Acknowledge,  
    IDictionary* Dict  
);
```

[Visual Basic]

This method is not available in Microsoft Visual Basic.

## Parameters

[C++]

*Acknowledge*

[in] Pointer to the [IBizTalkAcknowledge](#) interface to invoke and set the receipt flag.

*Dict*

[in] Pointer to an [IDictionary](#) interface of an object that contains the receipt information.

[Visual Basic]

Not applicable

## Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

Not applicable

## Requirements

[C++]

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BTSParserComps.h

[Visual Basic]

Not applicable

# IFunctoid Interface

## IFunctoid Interface [C++]

## CannedFunctoid Object [Visual Basic]

In C++, implement **IFunctoid** to create custom mapping functions. **IFunctoid** defines the generic protocol for calling custom functions used by the mapping tool.

In Microsoft Visual Basic, implement **CannedFunctoid** to create custom mapping functions. **CannedFunctoid** defines the generic protocol for calling custom functions used by the mapping tool.

This object must register its class identifier (CLSID) under a well-known category identifier (CATID) of the function objects enumerated by the mapping tool. The CATID is {2560F3BF-DB47-11D2-B3AE-00C04F72D6C1}. Each custom object can support multiple functions and can contain icons and names for each supported function.

Function identifiers from 0 to 1000 are reserved for built-in functions in the BizTalk Mapper. User-defined functions (custom functions) should use function identifiers 1001 and above.

The properties of the **CannedFunctoid** object are shown in the following table.

Property	Description
<b>FunctionsCount</b>	Returns the number of functions implemented by the functoid.
<b>Version</b>	Returns the version of the functoid.

The methods of the **CannedFunctoid** object are shown in the following table.

Method	Description
<b>GetFunctionParameter</b>	Retrieves the connection-type bit flags for the specified parameter.
<b>GetFunctionDescriptor</b>	Retrieves information about a specific functoid.
<b>GetScriptBuffer</b>	Retrieves the script code used to implement the functoid.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include CannedFunctoid.h

**Library:** Use Microsoft BizTalk Server Canned Functoids 1.0 Type Library (CannedFunctoid.dll)

# IFunctoid::FunctionsCount Property

## IFunctoid::FunctionsCount Property [C++]

## CannedFunctoid.FunctionsCount Property [Visual Basic]

The **FunctionsCount** property returns the number of functions implemented by the functoid.

### Syntax

[C++]

```
HRESULT get_FunctionsCount(  
    long* pICount  
);
```

[Visual Basic]

```
object.FunctionsCount
```

### Parameters

[C++]

*pICount*

[out, retval] Pointer to a **long** that contains the number of functions implemented by the functoid.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Long** that contains the number of functions implemented by the functoid.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include CannedFunctoid.h

**Library:** Use Microsoft BizTalk Server Canned Functoids 1.0 Type Library (CannedFunctoid.dll)

# IFunctoid::GetFunctionDescriptor Method

## IFunctoid::GetFunctionDescriptor Method [C++]

## CannedFunctoid.GetFunctionDescriptor Method [Visual Basic]

The **GetFunctionDescriptor** method retrieves information about a specific functoid.

### Syntax

[C++]

```
HRESULT GetFunctionDescriptor(  
    long lIndex,  
    FUNC_CATEGORY* pFuncCategory,  
    SCRIPT_CATEGORY* pScriptCategory,  
    FUNC_TYPE* pFuncType,  
    BSTR* pbstrName,  
    BSTR* pbstrToolTip,  
    long* plBitmapID,  
    long* plParmCount,  
    FUNCID* pFuncId  
);
```

[Visual Basic]

```
object.GetFunctionDescriptor( _  
    lIndex As Long, _  
    pFuncCategory As FUNC_CATEGORY, _  
    pScriptCategory As SCRIPT_CATEGORY, _  
    pFuncType As FUNC_TYPE, _  
    pbstrName As String, _  
    pbstrToolTip As String, _  
    plBitmapID As Long, _  
    plParmCount As Long _  
)
```

### Parameters

[C++]

*lIndex*

[in] **Long** that specifies the index number of the function.

*pFuncCategory*

[in, out] Pointer to a value that contains the **FUNC\_CATEGORY** bit flags for this function.

*pScriptCategory*

[in, out] Pointer to a value that contains the **SCRIPT\_CATEGORY** bit flags for this function. This value must be set to **SCRIPT\_CATEGORY\_VBSCRIPT** for this release.

*pFuncType*

[in, out] Pointer to a value that contains the **FUNC\_TYPE** bit flags for this function.

*pbstrName*

[in, out] Pointer to a **BSTR** that contains the function name.

*pbstrToolTip*

[in, out] Pointer to a **BSTR** that contains the ToolTip that appears when the mouse pointer is paused over the custom functoid icon in the mapping tool.

*plBitmapID*

[in, out] Pointer to the **long** bitmap identifier of the bitmap used for the custom functoid icon displayed in the mapping tool.

*plParmCount*

[in, out] Pointer to a **long** that contains the number of parameters implemented by the function.

*pFuncId*

[out, retval] Pointer to a **long** that contains the function identifier.

[Visual Basic]

*lIndex*

**Long** that specifies the index number of the function.

*pFuncCategory*

Value that contains the [FUNC\\_CATEGORY](#) bit flags for this function.

*pScriptCategory*

Value that contains the [SCRIPT\\_CATEGORY](#) bit flags for this function. This value must be set to **SCRIPT\_CATEGORY\_VBSCRIPT** for this release.

*pFuncType*

Value that contains the [FUNC\\_TYPE](#) bit flags for this function.

*pbstrName*

**String** that contains the function name.

*pbstrToolTip*

**String** that contains the ToolTip that appears when the mouse pointer is paused over the custom functoid icon in the mapping tool.

*plBitmapID*

**Long** that contains the bitmap identifier of the bitmap used for the custom functoid icon displayed in the mapping tool.

*plParmCount*

**Long** that contains the number of parameters implemented by the function.

## Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This method returns a **Long** that contains the function identifier.

## Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include CannedFunctoid.h

**Library:** Use Microsoft BizTalk Server Canned Functoids 1.0 Type Library (CannedFunctoid.dll)

# IFunctoid::GetFunctionParameter Method

## IFunctoid::GetFunctionParameter Method [C++]

## CannedFunctoid.GetFunctionParameter Method [Visual Basic]

The **GetFunctionParameter** method retrieves the connection-type bit flags for the specified parameter.

### Syntax

[C++]

```
HRESULT GetFunctionParameter(  
    FUNCID funcId,  
    long lParameter,  
    long* plConnectionType  
);
```

[Visual Basic]

```
object.GetFunctionParameter( _  
    funcId As FUNCID, _  
    lParameter As Long _  
)
```

### Parameters

[C++]

*funcId*

[in] **Long** that contains the function identifier.

*lParameter*

[in] **Long** that contains the function parameter number. For output parameters, a value of -1 is used.

*plConnectionType*

[out, retval] Pointer to a **long** that contains the [CONNECTION\\_TYPE](#) bit flags for the specified parameter.

[Visual Basic]

*funcId*

**Long** that contains the function identifier.

*lParameter*

**Long** that contains the function parameter number. For output parameters, a value of -1 is used.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This method returns a **Long** that contains the [CONNECTION\\_TYPE](#) bit flags for the specified parameter.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include CannedFunctoid.h

**Library:** Use Microsoft BizTalk Server Canned Functoids 1.0 Type Library (CannedFunctoid.dll)

# IFunctoid::GetScriptBuffer Method

## IFunctoid::GetScriptBuffer Method [C++]

## CannedFunctoid.GetScriptBuffer Method [Visual Basic]

The **GetScriptBuffer** method retrieves the script code used to implement the functoid.

### Syntax

[C++]

Get method:

```
HRESULT GetScriptBuffer(  
    FUNCID cFuncId,  
    long lInputParameters,  
    BSTR* pbstrScriptBuffer  
);
```

[Visual Basic]

```
object.GetScriptBuffer( _  
    cFuncId As FUNCID, _  
    lInputParameters As Long _  
)
```

### Parameters

[C++]

*cFuncId*

[in] **Long** that contains the function identifier.

*lInputParameters*

[in] **Long** that indicates the number of connected input parameters for the specified function.

*pbstrScriptBuffer*

[out, retval] Pointer to a **BSTR** that contains the script code used to implement the function.

[Visual Basic]

*cFuncId*

**Long** that contains the function identifier.

*lInputParameters*

**Long** that indicates the number of connected input parameters for the specified function.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This method returns a **String** that contains the script code used to implement the function.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

## **Requirements**

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include CannedFuncoid.h

**Library:** Use Microsoft BizTalk Server Canned Functoids 1.0 Type Library (CannedFuncoid.dll)

# IFunctoid::Version Property

## IFunctoid::Version Property [C++]

## CannedFunctoid.Version Property [Visual Basic]

The **Version** property returns the version of the functoid.

### Syntax

[C++]

```
HRESULT get_Version(  
    long* pVersion  
);
```

[Visual Basic]

*object*.**Version**

### Parameters

[C++]

*pVersion*

[out, retval] Pointer to a **long** that contains the custom functoid version.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Long** that contains the custom functoid version.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

If the custom functoid is modified in any way, the author should update the version number.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include CannedFunctoid.h

**Library:** Use Microsoft BizTalk Server Canned Functoids 1.0 Type Library (CannedFunctoid.dll)

# IBizTalkParserComponent Interface

Use this object to convert a document to XML for later processing and to identify the **BizTalkChannel** objects necessary to process the documents.

In C++, use the **IBizTalkParserComponent** interface to access the methods of the **BizTalkParserComponent** object.

The methods of the **BizTalkParserComponent** object are shown in the following table.

Method	Description
<a href="#">GetGroupDetails</a>	Gets details of the group for the Tracking database. This method is called only if there are groups in the interchange.
<a href="#">GetGroupSize</a>	Gets the size of the group after all documents in the group are parsed. This method is called only if there are groups in the interchange.
<a href="#">GetInterchangeDetails</a>	Gets information about the organization identifiers of the source and destination <a href="#">BizTalkOrganization</a> objects.
<a href="#">GetNativeDocumentOffsets</a>	Identifies offsets from the beginning of the stream for final details about the group in the Tracking database for final logging.
<a href="#">GetNextDocument</a>	Examines the data in a document and determines when to get the next document if this is not the last document.
<a href="#">GroupsExist</a>	Determines if the interchange contains groups.
<a href="#">ProbeInterchangeFormat</a>	Identifies the format of the interchange.

## Remarks

Application integration components must be properly registered so that BizTalk Server 2000 can recognize that they belong to BizTalk Server 2000. Application integration components register themselves with the category ID **CATID\_BIZTALK\_AIC**. The CATIDs are defined in the `bts_sdk_guids.h` file. For more information, see [Registering Application Integration Components](#).

### Note

- This interface is not available in Microsoft Visual Basic.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include `BTSParserComps.h`

## Related Topics

[Identification](#)

[Sequence for Calling Methods of the IBizTalkParserComponent Interface](#)

[Using the IBizTalkParserComponent Interface](#)

# IBizTalkParserComponent::GetGroupDetails Method

[C++]

The **GetGroupDetails** method gets details of the group for the Tracking database.

[Visual Basic]

This method is not available in Microsoft Visual Basic.

## Syntax

[C++]

```
HRESULT GetGroupDetails(  
    IDictionary* Dict  
);
```

[Visual Basic]

Not applicable

## Parameters

[C++]

*Dict*

[in] Pointer to an **IDictionary** interface of an object that contains details about the group. All information is returned as string types, no matter how it appears in the data.

[Visual Basic]

Not applicable

## Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

Not applicable

## Remarks

[C++]

This method is called only if groups are detected in the interchange.

[Visual Basic]

Not applicable

## Requirements

[C++]

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BTSParserComps.h

[Visual Basic]

Not applicable

## Related Topics

[Sequence for Calling Methods of the IBizTalkParserComponent Interface](#)

[Using the IBizTalkParserComponent Interface](#)

# IBizTalkParserComponent::GetGroupSize Method

[C++]

The **GetGroupSize** method gets the size of the group after all documents in the group are parsed.

[Visual Basic]

This method is not available in Microsoft Visual Basic.

## Syntax

[C++]

```
HRESULT GetGroupSize (  
    long* GroupSize,  
    BOOL* LastGroup  
);
```

[Visual Basic]

Not applicable

## Parameters

[C++]

*GroupSize*

[out] Pointer to a **long** that contains the size of the interchange.

*LastGroup*

[out] Pointer to a Boolean value that indicates whether the group is the last group in the interchange. If this parameter is set to TRUE, the next method called is **GetGroupDetails** for the next group in the data. If it is set to FALSE, the component is finished. When it is released, it leaves the **IStream** interface after the last byte it has read.

[Visual Basic]

Not applicable

## Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

Not applicable

## Remarks

[C++]

After all documents in the group are called, the final details about the group are required. Both output parameters are added to the Tracking database for final logging.

This method is called only if there are groups in the interchange.

[Visual Basic]

Not applicable

## Requirements

[C++]

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BTSParserComps.h

[Visual Basic]

Not applicable

## **Related Topics**

[Sequence for Calling Methods of the IBizTalkParserComponent Interface](#)

[Using the IBizTalkParserComponent Interface](#)

# IBizTalkParserComponent::GetInterchangeDetails Method

[C++]

The **GetInterchangeDetails** method gets information about the organization identifiers of the source and destination **BizTalkOrganization** objects.

[Visual Basic]

This method is not available in Microsoft Visual Basic.

## Syntax

[C++]

```
HRESULT GetInterchangeDetails(  
    IDictionary* Dict  
);
```

[Visual Basic]

Not applicable

## Parameters

[C++]

*Dict*

[in] Pointer to an **IDictionary** interface of an object that contains information about the organization identifiers of the source and destination **BizTalkOrganization** objects.

[Visual Basic]

Not applicable

## Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

Not applicable

## Remarks

[C++]

The minimum sets of fields are:

Field	Description
src_id_type	Source qualifier
src_id_value	Source ID
dest_id_type	Destination qualifier
dest_id_value	Destination ID

The parameters of the **Submit** method of the **IInterchange** interface override any fields set here.

[Visual Basic]

Not applicable

## Requirements

[C++]

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BTSParserComps.h

[Visual Basic]

Not applicable

## **Related Topics**

[Sequence for Calling Methods of the IBizTalkParserComponent Interface](#)

[Using the IBizTalkParserComponent Interface](#)

# IBizTalkParserComponent::GetNativeDocumentOffsets Method

[C++]

The **GetNativeDocumentOffsets** method identifies offsets from the beginning of the stream for final details about the group in the Tracking database for final logging.

[Visual Basic]

This method is not available in Microsoft Visual Basic.

## Syntax

[C++]

```
HRESULT GetNativeDocumentOffsets (  
    BOOL SizeFromXMLDoc,  
    LARGE_INTEGER* StartOffset,  
    long* DocLength  
);
```

[Visual Basic]

Not applicable

## Parameters

[C++]

*SizeFromXMLDoc*

[out] Boolean value that indicates the XML document passed in from the **GetNextDocument** method was used to determine the size. If this parameter is TRUE, the server fills in the *StartOffset* and *DocLength* values for the document just parsed. If this parameter is FALSE, the server ignores the values in *StartOffset* and *DocLength*.

*StartOffset*

[out] Pointer to a **LARGE\_INTEGER** that contains the location of the beginning of the document. This parameter is returned if the *SizeFromXMLDoc* parameter is set to TRUE.

*DocLength*

[out] Pointer to a **long** that contains the length of the document. This parameter is returned if the *SizeFromXMLDoc* parameter is set to TRUE.

[Visual Basic]

Not applicable

## Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

Not applicable

## Remarks

[C++]

This method is called immediately after **GetNextDocument** whether or not the document is valid (as long as the parser does not return an error value). These are offsets into the **IStream** object relative to the beginning of the stream, not the beginning of the interchange.

[Visual Basic]

Not applicable

## Requirements

[C++]

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BTSParserComps.h

[Visual Basic]

Not applicable

## **Related Topics**

[Sequence for Calling Methods of the IBizTalkParserComponent Interface](#)

[Using the IBizTalkParserComponent Interface](#)

# IBizTalkParserComponent::GetNextDocument Method

[C++]

The **GetNextDocument** method examines the data in a document and determines when to get the next document, if this is not the last document.

[Visual Basic]

This method is not available in Microsoft Visual Basic.

## Syntax

[C++]

```
HRESULT GetNextDocument (  
    IDictionary* Dict,  
    BSTR DocSpecName,  
    BOOL* DocIsValid,  
    BOOL* LastDocument,  
    GeneratedReceiptLevel ReceiptGenerated,  
    BOOL* DocIsReceipt,  
    BSTR* CorrelationCompProgID  
);
```

[Visual Basic]

Not applicable

## Parameters

[C++]

*Dict*

[in] Pointer to an **IDictionary** interface of an object into which to set the XML instance created on parsing the current document. The parsed XML document is placed into the `working_data` field of the dictionary.

*DocSpecName*

[in] **BSTR** that contains the name of the BizTalk document specification used to generate the XML from the document's native format.

*DocsValid*

[out] Pointer to a Boolean value that indicates whether the document instance is valid. If it is invalid but the parser can recover from it, set this parameter to FALSE. This parameter and the *LastDocument* parameter are independent. Therefore, if there are no more documents and the last one is invalid, both flags are set. If the document is invalid and the parser cannot continue, it might return an error value. The server then stops at the current position of the **IStream** pointer. The component places the invalid data (if the parser can recover) in the `working_data` field for inspection by the system administrator if the document is invalid.

*LastDocument*

[out] Pointer to a Boolean value that indicates whether this is the last document instance in the group or interchange. When the last document is found, the *LastDocument* flag is set to TRUE. If there are groups, this flag signals the last document in the group, and the **GetGroupSize** method is called. If there are no groups, this is the last call to get document data from the parser, and the **IStream** pointer is set appropriately.

*ReceiptGenerated*

Enumeration value. Valid values are from the **GeneratedReceiptLevel** enumeration.

*DocIsReceipt*

[out] Pointer to Boolean value that identifies whether or not this document is a receipt.

*CorrelationCompProgID*

[out] Pointer to a **BSTR** that contains the program ID for the correlation of documents.

[Visual Basic]

Not applicable

## Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

Not applicable

## Requirements

[C++]

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BTSParserComps.h

[Visual Basic]

Not applicable

## Related Topics

[Sequence for Calling Methods of the IBizTalkParserComponent Interface](#)

[Using the IBizTalkParserComponent Interface](#)

# IBizTalkParserComponent::GroupsExist Method

[C++]

The **GroupsExist** method determines whether the interchange contains groups.

[Visual Basic]

This method is not available in Microsoft Visual Basic.

## Syntax

[C++]

```
HRESULT GroupsExist(  
    BOOL* GrpsExist  
);
```

[Visual Basic]

Not applicable

## Parameters

[C++]

*GrpsExist*

[out, retval] Pointer to a Boolean value that indicates whether the data format contains groups. If this parameter is set to FALSE, the [GetGroupDetails](#) and [GetGroupSize](#) methods are never called.

[Visual Basic]

Not applicable

## Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

Not applicable

## Requirements

[C++]

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BTSParserComps.h

[Visual Basic]

Not applicable

## Related Topics

[Sequence for Calling Methods of the IBizTalkParserComponent Interface](#)

[Using the IBizTalkParserComponent Interface](#)

# IBizTalkParserComponent::ProbeInterchangeFormat Method

[C++]

The **ProbeInterchangeFormat** method identifies the format of the interchange.

[Visual Basic]

This method is not available in Microsoft Visual Basic.

## Syntax

[C++]

```
HRESULT ProbeInterchangeFormat (  
    IStream* pData,  
    BOOL FromFile,  
    BSTR EnvName,  
    IStream* pReceiptData,  
    BSTR* Format  
);
```

[Visual Basic]

Not applicable

## Parameters

[C++]

*pData*

[in] Pointer to the **IStream** object that contains the data for the document interchange. Additional information about the **IStream** object is available on the Microsoft Developer Network at [msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp).

*FromFile*

[in] Boolean value. TRUE indicates that the data came from the file referred to by the *FilePath* parameter of the **Submit** or the **SubmitSync** method of the **IInterchange** interface. FALSE indicates that the data came from the *Document* parameter of **Submit** or **SubmitSync** as a string. If the data is from a file, no conversion is made. If the data is a string, you can use UNICODE/MBCS techniques to understand it.

*EnvName*

[in] **BSTR** that contains the name of the envelope.

*pReceiptData*

[in] Pointer to the **IStream** object that contains the receipt document.

*Format*

[out] Pointer to a **BSTR** that contains the format. If the server recognizes the format, it must fill in this parameter with a nonempty string and hold on to (add a reference count to) the **IStream** interface because it is not given back to the component. This **IStream** object is read-only; it supports only the **Read**, **Stat**, and **Seek** methods. All other methods return E\_NOTIMPL. This method should not return a failure if it does not recognize the format. It returns S\_FALSE or an empty or NULL *Format* string. If you do not recognize the format, you do not need to move the **IStream** pointer back to its original position; the server resets the **IStream** pointer. Unless your format requires it, do not assume that the pointer is at the beginning. The pointer can be somewhere in the middle during the probing stage.

[Visual Basic]

Not applicable

## Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

Not applicable

## Remarks

[C++]

This is the first method that is called by the server. If **ProbeInterchangeFormat** returns an error in the middle of the document list, it blocks the server from detecting more document types, even if they could be handled by a custom parser that follows the failed parser, if there are two or more custom parsers on a server. If the first custom parser fails, any document that follows is not parsed, even if the other custom parser could handle it, because the server ends the entire parsing operation at the time of the failure.

[Visual Basic]

Not applicable

## Requirements

[C++]

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BTSParserComps.h

[Visual Basic]

Not applicable

## Related Topics

[Sequence for Calling Methods of the IBizTalkParserComponent Interface](#)

[Using the IBizTalkParserComponent Interface](#)

# IBizTalkSerializerComponent Interface

Use this object to convert a document from XML to the document's original native format.

In C++, use the **IBizTalkSerializerComponent** interface to access the methods of the **BizTalkSerializerComponent** object.

The methods of the **BizTalkSerializerComponent** object are shown in the following table.

Method	Description
<a href="#">AddDocument</a>	Adds an XML document for storage by the serializer component.
<a href="#">GetDocInfo</a>	Gets details of the document.
<a href="#">GetGroupInfo</a>	Gets details of the group, such as size and offset, for the Tracking database.
<a href="#">GetInterchangeInfo</a>	Gets information about the interchange created.
<a href="#">Init</a>	Outputs the document instance to the serializer component and indicates where it should be sent.

## Remarks

Application integration components must be properly registered so that Microsoft BizTalk Server 2000 can recognize that they belong to BizTalk Server 2000. Application integration components register themselves with the category ID

**CATID\_BIZTALK\_AIC**. The CATIDs are defined in the `bts_sdk_guids.h` file. For more information, see [Registering Application Integration Components](#).

### Note

- This interface is not available in Microsoft Visual Basic.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include `BTSSerializerComps.h`

## Related Topics

[Sequence for Calling Methods of the IBizTalkSerializerComponent Interface](#)

[Using the IBizTalkSerializerComponent Interface](#)

# IBizTalkSerializerComponent::AddDocument Method

[C++]

The **AddDocument** method adds an XML document for storage by the serializer component.

[Visual Basic]

This method is not available in Microsoft Visual Basic.

## Syntax

[C++]

```
HRESULT AddDocument(  
    long DocHandle,  
    IDictionary* Transport,  
    BSTR TrackID,  
    long ChannelID  
);
```

[Visual Basic]

Not applicable

## Parameters

[C++]

*DocHandle*

[in] **Long** that contains the handle to the document that is stored by the component and later retrieved when calling the **GetDocInfo** method. This parameter supports out-of-order recreation of the interchange in case the documents need to be reordered (such as in X12).

*Transport*

[in] Pointer to an **IDictionary** interface of an object that contains the XML document to be stored. It is on the *working\_data* field. This parameter cannot be set by the component. This is an optional parameter.

*TrackID*

[in] **BSTR** that contains the document tracking ID used by the server.

*ChannelID*

[in] **Long** that contains the **BizTalkChannel** object associated with the current document.

[Visual Basic]

Not applicable

## Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

Not applicable

## Remarks

[C++]

This method is called only once per interchange.

[Visual Basic]

Not applicable

## Requirements

[C++]

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BTSSerializerComps.h

[Visual Basic]

Not applicable

## **Related Topics**

[Sequence for Calling Methods of the IBizTalkSerializerComponent Interface](#)

[Using the IBizTalkSerializerComponent Interface](#)

# IBizTalkSerializerComponent::GetDocInfo Method

[C++]

The **GetDocInfo** method gets details of the document.

[Visual Basic]

This method is not available in Microsoft Visual Basic.

## Syntax

[C++]

```
HRESULT GetDocInfo (  
    long* DocHandle,  
    BOOL* SizeFromXMLDoc,  
    LARGE_INTEGER* DocStartOffset,  
    long* DocLen  
);
```

[Visual Basic]

Not applicable

## Parameters

[C++]

*DocHandle*

[out] Pointer to a **long** that contains the document handle. For each ID that is passed back, this address is assigned to the group record that was created when the **GetGroupInfo** method was called. This parameter also returns properties of the document, for example, size and length, unless the *SizeFromXMLDoc* parameter is set to TRUE, in which case the other parameters are ignored.

*SizeFromXMLDoc*

[out] Pointer to a Boolean value that indicates that the document offset and length values are retrieved from the XML document. If this parameter is TRUE, the server fills in the *DocStartOffset* and *DocLen* values for the document. If this parameter is FALSE, the server ignores the values in *DocStartOffset* and *DocLen*.

*DocStartOffset*

[out] Pointer to a **LARGE\_INTEGER** that contains the offset to the beginning of the document. This parameter is returned if *SizeFromXMLDoc* is set to TRUE.

*DocLen*

[out] Pointer to a **long** that contains the length of the document. This parameter is returned if *SizeFromXMLDoc* is set to TRUE.

[Visual Basic]

Not applicable

## Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

Not applicable

## Remarks

[C++]

This method is called once for every document in a group (or interchange, if there are no groups).

[Visual Basic]

Not applicable

## Requirements

[C++]

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BTSSerializerComps.h

[Visual Basic]

Not applicable

## Related Topics

[Sequence for Calling Methods of the IBizTalkSerializerComponent Interface](#)

[Using the IBizTalkSerializerComponent Interface](#)

# IBizTalkSerializerComponent::GetGroupInfo Method

[C++]

The **GetGroupInfo** method gets details of the group, such as size and offset, for the Tracking database.

[Visual Basic]

This method is not available in Microsoft Visual Basic.

## Syntax

[C++]

```
HRESULT GetGroupInfo (  
    long* NumDocs,  
    LARGE_INTEGER* GrpStartOffset,  
    long* GrpLen  
);
```

[Visual Basic]

Not applicable

## Parameters

[C++]

*NumDocs*

[out] Pointer to a **long** that contains the number of documents in the group.

*GrpStartOffset*

[out] Pointer to a **LARGE\_INTEGER** that contains the offset to the start of the group in the **IStream** interface.

*GrpLen*

[out] Pointer to a **long** that contains the length of the group.

[Visual Basic]

Not applicable

## Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

Not applicable

## Remarks

[C++]

This method is called the number of times returned by the **GetInterchangeInfo** method. Call the **GetDocInfo** method for each document in the group.

[Visual Basic]

Not applicable

## Requirements

[C++]

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BTSSerializerComps.h

[Visual Basic]

Not applicable

## **Related Topics**

[Sequence for Calling Methods of the IBizTalkSerializerComponent Interface](#)

[Using the IBizTalkSerializerComponent Interface](#)

# IBizTalkSerializerComponent::GetInterchangeInfo Method

[C++]

The **GetInterchangeInfo** method gets information about the interchange created.

[Visual Basic]

This method is not available in Microsoft Visual Basic.

## Syntax

[C++]

```
HRESULT GetInterchangeInfo(  
    BSTR* InterchangeID,  
    long* lNumGroups  
);
```

[Visual Basic]

Not applicable

## Parameters

[C++]

*InterchangeID*

[out] Pointer to a **BSTR** that contains the interchange ID, which is placed in the Tracking database.

*lNumGroups*

[out] Pointer to a **long** that contains the number of groups generated in the interchange. This can be either 0 or 1. A document can exist in only one group.

[Visual Basic]

Not applicable

## Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

Not applicable

## Remarks

[C++]

This method is called after all the documents are passed in.

[Visual Basic]

Not applicable

## Requirements

[C++]

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BTSSerializerComps.h

[Visual Basic]

Not applicable

## Related Topics

Sequence for Calling Methods of the IBizTalkSerializerComponent Interface

Using the IBizTalkSerializerComponent Interface

# IBizTalkSerializerComponent::Init Method

[C++]

The **Init** method outputs the document instance to the serializer component and indicates its destination.

[Visual Basic]

This method is not available in Microsoft Visual Basic.

## Syntax

[C++]

```
HRESULT Init(  
    BSTR srcQual,  
    BSTR srcID,  
    BSTR destQual,  
    BSTR destID,  
    long EnvID,  
    IDictionary* pDelimiters,  
    IStream* OutputStream,  
    long NumDocs  
);
```

[Visual Basic]

Not applicable

## Parameters

[C++]

*srcQual*

[in] **BSTR** that contains the source-organization identifier qualifier.

*srcID*

[in] **BSTR** that contains the source-organization identifier value.

*destQual*

[in] **BSTR** that contains the destination-organization identifier qualifier.

*destID*

[in] **BSTR** that contains the destination-organization identifier value.

*EnvID*

[in] **Long** that contains the envelope identifier value.

*pDelimiters*

[in] Pointer to an **IDictionary** interface of an object that contains the delimiters used in the document.

*OutputStream*

[in] Pointer to an **IStream** interface that contains the data of this document. This **IStream** pointer is write-only. The only methods that are supported are **Write** and **Stat**; all other methods return E\_NOTIMPL. Additional information about the **IStream** object is available on the Microsoft Developer Network at [msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp).

*NumDocs*

[in] **Long** that contains the number of documents sent as part of this interchange. For this release, this parameter is set to 1.

[Visual Basic]

Not applicable

## Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

Not applicable

## Requirements

[C++]

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include BTSSerializerComps.h

[Visual Basic]

Not applicable

## Related Topics

[Sequence for Calling Methods of the IBizTalkSerializerComponent Interface](#)

[Using the IBizTalkSerializerComponent Interface](#)

# IBTSAppIntegration Interface

## IBTSAppIntegration Interface [C++]

## IBTSAppIntegration Object [Visual Basic]

Use this object to create an entry point for receiving a document.

In C++, use the **IBTSAppIntegration** interface to access the methods of the **BTSAppIntegration** object.

The method of the **BTSAppIntegration** object is shown in the following table.

Method	Description
<a href="#">ProcessMessage</a>	Processes the document.

### Remarks

Application integration components must be properly registered so that Microsoft BizTalk Server 2000 can recognize that they belong to BizTalk Server 2000. Application integration components register themselves with the category ID **CATID\_BIZTALK\_AIC**. The CATIDs are defined in the `bts_sdk_guids.h` file. For more information, see [Registering Application Integration Components](#).

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include `btsaic.h`

**Library:** Use Microsoft BizTalk Server Application Interface Components 1.0 Type Library (`btscomplib.tlb`)

### Related Topic

[Using the IBTSAppIntegration Interface](#)

# IBTSAppIntegration::ProcessMessage Method

## IBTSAppIntegration::ProcessMessage Method [C++]

## IBTSAppIntegration.ProcessMessage Method [Visual Basic]

The **ProcessMessage** method processes a document and returns a response document, if available. This method is called at run time when the server is sending a document to the component.

### Syntax

[C++]

```
HRESULT ProcessMessage (  
    BSTR bstrDocument,  
    BSTR* pbstrResponseDocument  
);
```

[Visual Basic]

```
object.ProcessMessage ( _  
    bstrDocument As String _  
)
```

### Parameters

[C++]

*bstrDocument*

[in] **BSTR** that contains the document.

*pbstrResponseDocument*

[retval, out] Pointer to a **BSTR** that contains the response document.

[Visual Basic]

*bstrDocument*

**String** that contains the document.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

**String** that contains the response document.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

Components can return a response string to pass back a text-based response to an application, using the **SubmitSync** method of the **IInterchange** interface to send documents.

Components must raise an error if a problem with processing occurs so that the document can be retransmitted or sent to the Suspended queue. If no error is returned, the server assumes that the component successfully processed the data.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include btsaic.h

**Library:** Use Microsoft BizTalk Server Application Interface Components 1.0 Type Library (btscomplib.tlb)

# IPipelineComponent Interface

## IPipelineComponent Interface [C++]

## IPipelineComponent Object [Visual Basic]

Use this object to create custom pipeline components that can execute in Microsoft BizTalk Server 2000 to extend its functionality.

In C++, use the **IPipelineComponent** interface to access the methods of the **PipelineComponent** object.

The methods of the **PipelineComponent** object are shown in the following table.

Method	Description
<a href="#">EnableDesign</a>	Configures the component for execution in one of two modes: design mode or execution mode.
<a href="#">Execute</a>	Executes the operation expected of the component, given the transport <a href="#">Dictionary</a> object and other configuration settings.

### Remarks

Application integration components must be properly registered so that BizTalk Server 2000 can recognize that they belong to BizTalk Server 2000. Application integration components register themselves with the category ID **CATID\_BIZTALK\_AIC**. The CATIDs are defined in the `bts_sdk_guids.h` file. For more information, see [Registering Application Integration Components](#).

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include `pipecomp.h`

**Library:** Use Microsoft Commerce 2000 Default Pipeline Components Type Library (`pipecomplib.tlb`)

### Related Topic

[Creating Application Integration Components](#)

# IPipelineComponent::EnableDesign Method

## IPipelineComponent::EnableDesign Method [C++]

## IPipelineComponent.EnableDesign Method [Visual Basic]

The **EnableDesign** method configures the component for execution in one of two modes: design mode or execution mode.

### Syntax

[C++]

```
HRESULT EnableDesign(  
    BOOL fEnable  
);
```

[Visual Basic]

```
object.EnableDesign( _  
    fEnable As Boolean _  
)
```

### Parameters

[C++]

*fEnable*

Boolean value that indicates the mode of the component. A value of TRUE specifies that the component runs in design mode. A value of FALSE (default) specifies execution mode.

[Visual Basic]

*fEnable*

**Boolean** that indicates the mode of the component. A value of True specifies that the component runs in design mode. A value of False (default) specifies execution mode.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

The pipeline component runs in execution mode by default.

This method is called when the **Override messaging port defaults** page is opened in the Channel Wizard's **Advanced Configuration** page. It is also called when the property page is closed and the *fEnable* parameter is set to true. Design mode is not enabled unless this method has been called with the *fEnable* parameter set to True.

Design-only fields are returned only when the *fEnable* parameter is set to true. Otherwise, the **Dictionary** object passed to the server contains unnecessary information.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include pipecomp.h

**Library:** Use Microsoft Commerce 2000 Default Pipeline Components Type Library (pipecomplib.tlb)

# IPipelineComponent::Execute Method

## IPipelineComponent::Execute Method [C++]

## IPipelineComponent.Execute Method [Visual Basic]

The **Execute** method executes the operation expected of the component, given the transport **Dictionary** object and other configuration settings. Microsoft BizTalk Server 2000 calls this method, passing in the transport **Dictionary** object. The component can read these **Dictionary** object values, perform the necessary functions, and optionally write new values back to the transport **Dictionary** object for further processing.

### Syntax

[C++]

```
HRESULT Execute(  
    IDispatch* pDispOrder,  
    IDispatch* pDispContext,  
    long lFlags,  
    long* plErrorLevel  
);
```

[Visual Basic]

```
object.Execute( _  
    pDispOrder As Object, _  
    pDispContext As Object, _  
    lFlags As Long _  
)
```

### Parameters

[C++]

*pDispOrder*

[in] Pointer to the transport **Dictionary** object.

*pDispContext*

[in] Not supported for this release.

*lFlags*

[in] Reserved.

*plErrorLevel*

[out, retval] Reserved.

[Visual Basic]

*pDispOrder*

**Object** that contains the transport **CDictionary** object.

*pDispContext*

Not supported for this release.

*lFlags*

Reserved.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This method returns a **Long** that contains the error level.

## Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

## Remarks

For a component designed to run in BizTalk Server 2000, the first parameter is a **Transport Dictionary** object. The **Transport Dictionary** values can be read by the component for processing. The string values supplied by the server for all application integration components (AICs) are as follows:

- **Src\_ID\_Type**: The type of identifier used for the source organization.
- **Src\_ID\_Value**: The value of the source organization identifier.
- **Dest\_ID\_Type**: The type of identifier used for the destination organization.
- **Dest\_ID\_Value**: The value of the destination organization identifier.
- **Document\_Name**: The name of the input document definition.
- **Tracking\_ID**: A key value that is based on the globally unique identifier (GUID) and used for tracking.

For a component that runs in a Commerce Server order-processing pipeline, the first parameter contains the **OrderForm** object.

This method is called at run time when the server is sending a document to the component. This method is called immediately after the **SetConfigData** method of the **IPipelineComponentAdmin** interface. The document is passed in the first parameter as a dictionary within the **working\_data** field of the **Dictionary** object. Components can add the *ResponseField* key to the **Dictionary** object to pass back a text-based response to an application, using the **SubmitSync** method of the **IInterchange** interface.

The component must raise an error if a problem with processing occurs so that the server can retry transmission later and, after all retries, send the document to the Suspended queue. If no error is returned, the server assumes that the component successfully processed the data.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include pipecomp.h

**Library:** Use Microsoft Commerce 2000 Default Pipeline Components Type Library (pipecomplib.tlb)

# IPipelineComponentAdmin Interface

## IPipelineComponentAdmin Interface [C++]

## IPipelineComponentAdmin Object [Visual Basic]

Use this object between the component and the component user interface.

In C++, use the **IPipelineComponentAdmin** interface to access the methods of the **PipelineComponentAdmin** object.

The methods of the **PipelineComponentAdmin** object are shown in the following table.

Method	Description
<a href="#">GetConfigData</a>	Returns a <b>Dictionary</b> object that contains the configuration data for the component for the user interface to display these values.
<a href="#">SetConfigData</a>	Sets the configuration settings for a component, using the contents of a <b>Dictionary</b> object.

### Remarks

Application integration components must be properly registered so that BizTalk Server 2000 can recognize that they belong to BizTalk Server 2000. Application integration components register themselves with the category ID **CATID\_BIZTALK\_AIC**. The CATIDs are defined in the `bts_sdk_guids.h` file. For more information, see [Registering Application Integration Components](#).

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include `pipecomp.h`

**Library:** Use Microsoft Commerce 2000 Default Pipeline Components Type Library (`pipecomplib.tlb`)

### Related Topic

[Creating Application Integration Components](#)

# IPipelineComponentAdmin::GetConfigData Method

## IPipelineComponentAdmin::GetConfigData Method [C++]

## IPipelineComponentAdmin.GetConfigData Method [Visual Basic]

The **GetConfigData** method returns a **Dictionary** object that contains the configuration data for the component to be used to display these values. **GetConfigData** enables the user interface component to read the current value from the component and display it on the property page initially.

### Syntax

[C++]

```
HRESULT GetConfigData (  
    IDispatch** ppConfigDictionary  
);
```

[Visual Basic]

```
object.GetConfigData ()
```

### Parameters

[C++]

*ppConfigDictionary*

[out, retval] Address of a pointer to a **Dictionary** object from which the user interface can read the configuration data.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This method optionally returns a **CDictionary** object from which the user interface can read the configuration data.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

When a **BizTalkPort** object is first saved, this method is called to get the defaults for use in autoconfiguring the application integration component (AIC) from the **Dictionary** object provided. Components must provide defaults for all mandatory properties, whenever possible.

This method is called when the user selects the property page. It is used to supply property page defaults. It is called again when the property page is closed. The contents of this returned **Dictionary** object are not used.

Components must always return a valid dictionary pointer from **GetConfigData**.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include pipecomp.h

**Library:** Use Microsoft Commerce 2000 Default Pipeline Components Type Library (pipecomplib.tlb)

# IPipelineComponentAdmin::SetConfigData Method

## IPipelineComponentAdmin::SetConfigData Method [C++]

## IPipelineComponentAdmin.SetConfigData Method [Visual Basic]

The **SetConfigData** method sets the configuration for a component, using the contents of a **Dictionary** object. With this method, the user interface can set or change these values. **SetConfigData** enables the user interface to write the updated value from the property page to the component.

### Syntax

[C++]

```
HRESULT SetConfigData (  
    IDispatch* pConfigDictionary  
);
```

[Visual Basic]

```
object.SetConfigData ( _  
    pConfigDictionary As Object _  
)
```

### Parameters

[C++]

*pConfigDictionary*

[in] Pointer to a **Dictionary** object that contains the configuration information.

[Visual Basic]

*pConfigDictionary*

**CDictionary** object that contains the configuration information.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

None.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

The server calls **SetConfigData** when the property page is saved. It is used to verify the values entered by the user on the property page. The contents of this provided **Dictionary** object are also stored in the database.

This method is called immediately before the **Execute** method of the **IPipelineComponent** interface at run time, when the server is ready to send a document to the component. Data stored during design time from autoconfiguration or from property-page updates is passed to the component to allow for property setup prior to calling **Execute**.

Components validate the properties provided in **SetConfigData** and raise an error if any of the properties are invalid or missing.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include pipecomp.h

**Library:** Use Microsoft Commerce 2000 Default Pipeline Components Type Library (pipecomplib.tlb)

# ISchemaImporter Interface

## ISchemaImporter Interface [C++]

## SchemaImporter Object [Visual Basic]

Use this object to handle the importing of DTDs, XDRs, and well-formed XML documents.

In C++, use the **ISchemaImporter** interface to access the properties and methods of the **SchemaImporter** object.

The properties of the **SchemaImporter** object are shown in the following table.

Property	Description
<a href="#">ImportFormatDescription</a>	Returns descriptive text about a supported import format.
<a href="#">ImportFormatIcon</a>	Returns an icon for a supported import format.
<a href="#">NumberOfSupportedImportFormats</a>	Returns the number of supported data formats from which a schema can be extracted.

The method of the **SchemaImporter** object is shown in the following table.

Method	Description
<a href="#">ExtractXMLSchema</a>	Extracts a schema from a document.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SchemaImporter.h

**Library:** Use Microsoft BizTalk Server Import Extension Module 1.0 Type Library (ExtensionMod.dll)

# ISchemaImporter::ExtractXMLSchema Method

## ISchemaImporter::ExtractXMLSchema Method [C++]

## SchemaImporter.ExtractXMLSchema Method [Visual Basic]

The **ExtractXMLSchema** method extracts a schema from a document.

### Syntax

[C++]

```
HRESULT ExtractXMLSchema (  
    long lFormatIndex,  
    BSTR strDocumentPath,  
    IDispatch** ppSchemaDOM  
);
```

[Visual Basic]

```
object.ExtractXMLSchema ( _  
    lFormatIndex As Long, _  
    bstrDocumentPath As String _  
)
```

### Parameters

[C++]

*lFormatIndex*

[in] Index value that specifies the type of document from which to import the schema. Pass in 0 to import well-formed XML, 1 to import a document type definition (DTD), or 2 to import an XDR schema.

*strDocumentPath*

[in] Path to the document from which to import the schema.

*ppSchemaDOM*

[out, retval] Address of a pointer to an **IDispatch** interface that contains the extracted XML schema.

[Visual Basic]

*lFormatIndex*

Index value that specifies the type of document from which to import the schema. Pass in 0 to import well-formed XML, 1 to import a document type definition (DTD), or 2 to import an XDR schema.

*bstrDocumentPath*

Path to the document from which to import the schema.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This method returns an **Object** that contains information about the extracted XML schema.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SchemalImporter.h

**Library:** Use Microsoft BizTalk Server Import Extension Module 1.0 Type Library (ExtensionMod.dll)

# ISchemaImporter::ImportFormatDescription Property

## ISchemaImporter::ImportFormatDescription Property [C++]

## SchemaImporter.ImportFormatDescription Property [Visual Basic]

The **ImportFormatDescription** property returns descriptive text about a supported import format.

### Syntax

[C++]

```
HRESULT get_ImportFormatDescription(  
    long lFormatIndex,  
    BSTR* ppbstrDescription  
);
```

[Visual Basic]

```
object.ImportFormatDescription( _  
    lFormatIndex As Long _  
)
```

### Parameters

[C++]

*lFormatIndex*

[in] Index value that specifies the type of document from which to import the schema. Pass in 0 to import well-formed XML, 1 to import a document type definition (DTD), or 2 to import an XDR schema.

*ppbstrDescription*

[out, retval] Pointer to a **BSTR** that contains a textual description of the input document format.

[Visual Basic]

*lFormatIndex*

Index value that specifies the type of document from which to import the schema. Pass in 0 to import well-formed XML, 1 to import a document type definition (DTD), or 2 to import an XDR schema.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that contains a textual description of the input document format.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SchemalImporter.h

**Library:** Use Microsoft BizTalk Server Import Extension Module 1.0 Type Library (ExtensionMod.dll)

# ISchemaImporter::ImportFormatIcon Property

## ISchemaImporter::ImportFormatIcon Property [C++]

## ISchemaImporter.ImportFormatIcon Property [Visual Basic]

The **ImportFormatIcon** property returns an icon for a supported import format.

### Syntax

[C++]

```
HRESULT get_ImportFormatIcon(  
    long lFormatIndex,  
    long* pIconID  
);
```

[Visual Basic]

```
object.ImportFormatIcon( _  
    lFormatIndex As Long _  
)
```

### Parameters

[C++]

*lFormatIndex*

[in] Index value that specifies the type of document from which to import the schema. Pass in 0 to import well-formed XML, 1 to import a document type definition (DTD), or 2 to import an XDR schema.

*pIconID*

[out, retval] Pointer to a **long** that contains the icon identifier for the input format.

[Visual Basic]

*lFormatIndex*

Index value that specifies the type of document from which to import the schema. Pass in 0 to import well-formed XML, 1 to import a document type definition (DTD), or 2 to import an XDR schema.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Long** that is the icon identifier for the input format.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read only-property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SchemaImporter.h

**Library:** Use Microsoft BizTalk Server Import Extension Module 1.0 Type Library (ExtensionMod.dll)



# ISchemaImporter::NumberOfSupportedImportFormats Property

## ISchemaImporter::NumberOfSupportedImportFormats Property [C++]

## SchemaImporter.NumberOfSupportedImportFormats Property [Visual Basic]

The **NumberOfSupportedImportFormats** property returns the number of supported data formats from which a schema can be extracted.

### Syntax

[C++]

```
HRESULT get_NumberOfSupportedImportFormats (  
    long* pINumber  
);
```

[Visual Basic]

```
object.NumberOfSupportedImportFormats
```

### Parameters

[C++]

*pINumber*

[out, retval] Pointer to a **long** that indicates the number of supported import formats.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Long** that contains the number of supported import formats.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SchemaImporter.h

**Library:** Use Microsoft BizTalk Server Import Extension Module 1.0 Type Library (ExtensionMod.dll)

# ISchemaImporterError Interface

## ISchemaImporterError Interface [C++]

## SchemaImporterError Object [Visual Basic]

Use this object to identify and decipher errors or warnings.

In C++, use the **ISchemaImporterError** interface to access the properties of the **SchemaImporterError** object.

The properties of the **SchemaImporterError** object are shown in the following table.

Property	Description
<b>IsWarning</b>	Returns a value that identifies the object as an error or a warning.
<b>NodePath</b>	Returns the path to the node that generated the error or warning.
<b>Text</b>	Returns the error or warning message.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SchemaImporter.h

**Library:** Use Microsoft BizTalk Server Import Extension Module 1.0 Type Library (ExtensionMod.dll)

# ISchemaImporterError::IsWarning Property

## ISchemaImporterError::IsWarning Property [C++]

## SchemaImporterError.IsWarning Property [Visual Basic]

The **IsWarning** property returns a value that identifies the object as an error or a warning.

### Syntax

[C++]

```
HRESULT get_IsWarning(  
    VARIANT_BOOL* pIsWarning  
);
```

[Visual Basic]

*object*.**IsWarning**

### Parameters

[C++]

*pIsWarning*

[out, retval] Set to **VARIANT\_TRUE** if the object is a warning; otherwise, set to **VARIANT\_FALSE** to indicate that the object is an error.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Boolean** value. Set to **True** if the object is a warning; otherwise, set to **False** to indicate that the object is an error.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SchemaImporter.h

**Library:** Use Microsoft BizTalk Server Import Extension Module 1.0 Type Library (ExtensionMod.dll)

# ISchemaImporterError::NodePath Property

## ISchemaImporterError::NodePath Property [C++]

## SchemaImporterError.NodePath Property [Visual Basic]

The **NodePath** property returns the path to the node that generated the error or warning.

### Syntax

[C++]

```
HRESULT get_NodePath(  
    BSTR* pBstrNodePath  
);
```

[Visual Basic]

*object*.NodePath

### Parameters

[C++]

*pBstrNodePath*

[out, retval] Pointer to a **BSTR** that contains the fully qualified name of the node that generated the error or warning.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that is the fully qualified name of the node that generated the error or warning.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SchemaImporter.h

**Library:** Use Microsoft BizTalk Server Import Extension Module 1.0 Type Library (ExtensionMod.dll)

# ISchemaImporterError::Text Property

## ISchemaImporterError::Text Property [C++]

## SchemaImporterError.Text Property [Visual Basic]

The **Text** property returns the error or warning message.

### Syntax

[C++]

```
HRESULT get_Text(  
    BSTR* pBstrText  
);
```

[Visual Basic]

*object*.**Text**

### Parameters

[C++]

*pBstrText*

[out, retval] Pointer to a **BSTR** that contains the text associated with the error or warning.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **String** that is the text associated with the error or warning.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SchemaImporter.h

**Library:** Use Microsoft BizTalk Server Import Extension Module 1.0 Type Library (ExtensionMod.dll)

# ISchemaImporterErrorProvider Interface

## ISchemaImporterErrorProvider Interface [C++]

## SchemaImporterErrorProvider Object [Visual Basic]

Use this object to return errors or warnings.

In C++, use the **ISchemaImporterErrorProvider** interface to access the properties of the **SchemaImporterErrorProvider** object.

The properties of the **SchemaImporterErrorProvider** object are shown in the following table.

Property	Description
<a href="#">Error</a>	Returns the error or warning.
<a href="#">NumberOfErrors</a>	Returns the number of errors or warnings.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SchemaImporter.h

**Library:** Use Microsoft BizTalk Server Import Extension Module 1.0 Type Library (ExtensionMod.dll)

# ISchemaImporterErrorProvider::Error Property

## ISchemaImporterErrorProvider::Error Property [C++]

## SchemaImporterErrorProvider.Error Property [Visual Basic]

The **Error** property returns the error or warning.

### Syntax

[C++]

```
HRESULT get_Error(  
    long lIndex,  
    ISchemaImporterError** pdswError  
);
```

[Visual Basic]

```
object.Error(  
    lIndex As Long _  
)
```

### Parameters

[C++]

*lIndex*

[in] Index of the required error or warning.

*pdswError*

[out, retval] Address of a pointer to an [ISchemaImporterError](#) interface that contains the error or warning.

[Visual Basic]

*lIndex*

Index of the required error or warning.

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a [SchemaImporterError](#) object that contains the error or warning.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SchemaImporter.h

**Library:** Use Microsoft BizTalk Server Import Extension Module 1.0 Type Library (ExtensionMod.dll)

# ISchemaImporterErrorProvider::NumberOfErrors Property

## ISchemaImporterErrorProvider::NumberOfErrors Property [C++]

## SchemaImporterErrorProvider.NumberOfErrors Property [Visual Basic]

The **NumberOfErrors** property returns the number of errors or warnings.

### Syntax

[C++]

```
HRESULT get_NumberOfErrors(  
    long* pNumberOfErrors  
);
```

[Visual Basic]

```
object.NumberOfErrors
```

### Parameters

[C++]

*pNumberOfErrors*

[out, retval] Pointer to a **long** that indicates the number of errors.

[Visual Basic]

None

### Return Values

[C++]

For a list of all error messages returned by BizTalk Server, see [Error Messages](#).

[Visual Basic]

This property returns a **Long** that indicates the number of errors.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [Error Messages](#) page.

### Remarks

This is a read-only property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SchemaImporter.h

**Library:** Use Microsoft BizTalk Server Import Extension Module 1.0 Type Library (ExtensionMod.dll)

# Receipt Enumerations

The following receipt enumeration provides possible values of properties and parameters for the **IBizTalkAcknowledge** interface:

- [DTA\\_ACK\\_STATUS](#)
- [GeneratedReceiptLevel](#)

# DTA\_ACK\_STATUS

The **DTA\_ACK\_STATUS** enumeration has one of the following values:

<b>Name</b>	<b>Value</b>	<b>Description</b>
<b>DTA_ACK_NONE</b>	0	No receipt is expected.
<b>DTA_ACK_PENDING</b>	1	The receipt is expected but has not yet arrived.
<b>DTA_ACK_OVERDUE</b>	2	The receipt has timed out.
<b>DTA_ACK_ACCEPTED</b>	3	The receipt has arrived with a status of accepted.
<b>DTA_ACK_PARTIALLY_ACCEPTED</b>	4	The receipt has arrived with a status of accepted with errors.
<b>DTA_ACK_REJECTED</b>	5	The receipt has arrived with a status of rejected.

# GeneratedReceiptLevel

The GeneratedReceiptLevel enumeration has one of the following values:

<b>Name</b>	<b>Value</b>	<b>Description</b>
NoReceiptGenerated	0	No receipt is created.
DocReceiptGenerated	1	A receipt is generated for each document.
GroupReceiptGenerated	2	A receipt is generated for each group.
InterchangeReceiptGenerated	3	A receipt is generated for each interchange.

# Funcoid Enumerations

The following funcoid enumerations provide possible values of properties and parameters:

- [CONNECTION\\_TYPE](#)
- [FUNC\\_CATEGORY](#)
- [FUNC\\_TYPE](#)
- [SCRIPT\\_CATEGORY](#)

# CONNECTION\_TYPE

The **CONNECTION\_TYPE** enumeration defines the following values:

Name	Value	Description
<b>CONNECT_TYPE_NONE</b>	0	The connection type is none.
<b>CONNECT_TYPE_FIELD</b>	1	The connection type is field.
<b>CONNECT_TYPE_RECORD</b>	2	The connection type is record.
<b>CONNECT_TYPE_RECORD_CONTENT</b>	4	The connection type is record content.
<b>CONNECT_TYPE_FUNC_STRING</b>	8	The connection type function is string.
<b>CONNECT_TYPE_FUNC_MATH</b>	16	The connection type function is mathematical.
<b>CONNECT_TYPE_FUNC_DATACONV</b>	32	The connection type function is data conversion.
<b>CONNECT_TYPE_FUNC_DATETIME_FMT</b>	64	The connection type function is date/time format.
<b>CONNECT_TYPE_FUNC_SCIENTIFIC</b>	128	The connection type function is scientific.
<b>CONNECT_TYPE_FUNC_BOOLEAN</b>	256	The connection type function is Boolean.
<b>CONNECT_TYPE_FUNC_SCRIPTER</b>	512	The connection type function is script.
<b>CONNECT_TYPE_FUNC_COUNT</b>	1024	The connection type function is count.
<b>CONNECT_TYPE_FUNC_INDEX</b>	2048	The connection type function is index.
<b>CONNECT_TYPE_FUNC_CUMULATIVE</b>	4096	The connection type function is cumulative.
<b>CONNECT_TYPE_FUNC_VALUE_MAPPING</b>	8192	The connection type function is value mapping.
<b>CONNECT_TYPE_FUNC_LOOPING</b>	16384	The connection type function is looping.
<b>CONNECT_TYPE_FUNC_ITERATION</b>	32768	The connection type function is iteration.
<b>CONNECT_TYPE_FUNC_DBLOOKUP</b>	65536	The connection type function is database lookup.
<b>CONNECT_TYPE_FUNC_DBEXTRACT</b>	131072	The connection type function is database extraction.
<b>CONNECT_TYPE_ALL</b>	-1	The connection type includes all connection types.
<b>CONNECT_TYPE_ALL_EXCEPT_RECORD</b>	-3	The connection type includes all connection types except records.

# FUNC\_CATEGORY

The **FUNC\_CATEGORY** enumeration defines the following values:

Name	Value	Description
<b>FUNC_CATEGORY_STRING</b>	3	The function category is string.
<b>FUNC_CATEGORY_MATH</b>	4	The function category is mathematical.
<b>FUNC_CATEGORY_DATACONV</b>	5	The function category is data conversion.
<b>FUNC_CATEGORY_DATETIME_FMT</b>	6	The function category is date/time format.
<b>FUNC_CATEGORY_SCIENTIFIC</b>	7	The function category is scientific.
<b>FUNC_CATEGORY_BOOLEAN</b>	8	The function category is Boolean.
<b>FUNC_CATEGORY_SCRIPTER</b>	9	The function category is script.
<b>FUNC_CATEGORY_COUNT</b>	10	The function category is count. This value is not supported for this release.
<b>FUNC_CATEGORY_INDEX</b>	11	The function category is index.
<b>FUNC_CATEGORY_CUMULATIVE</b>	12	The function category is cumulative.
<b>FUNC_CATEGORY_VALUE_MAPPING</b>	13	The function category is value mapping. This value is not supported for this release.
<b>FUNC_CATEGORY_LOOPING</b>	14	The function category is looping. This value is not supported for this release.
<b>FUNC_CATEGORY_ITERATION</b>	15	The function category is iteration. This value is not supported for this release.
<b>FUNC_CATEGORY_DBLOOKUP</b>	16	The function category is database lookup.
<b>FUNC_CATEGORY_DBEXTRACT</b>	17	The function category is database extraction.
<b>FUNC_CATEGORY_UNKNOWN</b>	31	The function category is unknown.

# FUNC\_TYPE

The **FUNC\_TYPE** enumeration defines the following values:

<b>Name</b>	<b>Value</b>	<b>Description</b>
<b>FUNC_TYPE_STD</b>	1	The function type is standard.
<b>FUNC_TYPE_VARIABLEINPUT</b>	2	The function type is variable input.
<b>FUNC_TYPE_SCRIPTOR</b>	3	The function type is script.

# SCRIPT\_CATEGORY

The **SCRIPT\_CATEGORY** enumeration defines the following values:

<b>Name</b>	<b>Value</b>	<b>Description</b>
<b>SCRIPT_CATEGORY_VBSCRIPT</b>	0	The custom functoid function is written in the Microsoft Visual Basic Scripting Edition (VBScript) language.
<b>SCRIPT_CATEGORY_JSCRIPT</b>	1	The custom functoid function is written in the Microsoft JScript language. This value is not supported for this release.
<b>SCRIPT_CATEGORY_XSLSCRIPT</b>	2	The custom functoid function is written in the Extensible Stylesheet Language (XSL). This value is not supported for this release.

# Concepts

This section provides detailed conceptual information that is important to understanding how to extend Microsoft BizTalk Server 2000. BizTalk Server 2000 can perform data transformation, digital signature, encryption and decryption, parsing, serializing, and transport of documents. In addition, you can create your own application integration components (AICs) to extend the capabilities of BizTalk Server 2000.

The following topics are covered:

- [Creating Application Integration Components](#)
- [Using the IBizTalkParserComponent Interface](#)
- [Using the IBizTalkSerializerComponent Interface](#)
- [Supporting the Tracking Database with Parser and Serializer Components](#)
- [Creating Receipt Correlator Components](#)

For samples of code, see [BizTalk Messaging Services Code Samples](#).

# Creating Application Integration Components

When creating an application integration component (AIC), you can implement either the pipeline model using the [IPipelineComponent](#) interface or the lightweight model using the [IBTSAppIntegration](#) interface.

Application integration components are COM objects that the BizTalk Server state engine calls to deliver data to an application. If a [messaging port](#) is configured in BizTalk Server 2000 to include the use of an AIC for application integration, this component is automatically instantiated and passed the requisite data. The component then determines how to handle communicating this data back to the application. This can be done using private API calls, invoking other COM objects, using database writes, and so on.

By default, AICs run in the LocalSystem account. If another security context is required, set it as part of the implementation of the AIC. However, if an AIC is installed as a COM+ application, an administrator can configure security of the AIC by using the Component Services console.

## Related Topics

[Lightweight Application Integration Components](#)

[Pipeline Application Integration Components](#)

[Registering Application Integration Components](#)

# Pipeline Application Integration Components

One approach for application integration with BizTalk Server 2000 is the creation of a pipeline component. This is the same model used in Microsoft Site Server Commerce Edition 3.0 for application integration with the Commerce Interchange pipeline (CIP) and the Order Processing pipeline (OPP). BizTalk Server 2000 supports this method so that pipeline components written for application integration for CIP and OPP are compatible. This is also a useful technique when the component requires configuration properties.

The primary entry point for a pipeline component is the **Execute** method of the **IPipelineComponent** interface. This is the method that BizTalk Server 2000 calls to transfer control and to pass the data to the component. It is in the implementation of this method that the component does its work.

## Related Topics

[IPipelineComponent](#)

[IPipelineComponentAdmin](#)

# Lightweight Application Integration Components

BizTalk Server 2000 supports an additional model for application developers who want a lighter-weight model for application integration, one that does not support a design-time user interface or configuration properties. This model requires a single interface that contains a single method as an entry point. The component is implemented, and the document is passed to it through the **ProcessMessage** method of the **IBTSAppIntegration** interface.

**IBTSAppIntegration** is for applications that do not need properties for their component and need only an entry point for receiving a document. This is a simpler approach to application integration than pipeline components. BizTalk Server 2000 queries for this interface first. If it does not find this interface implemented, it queries for the pipeline component interfaces.

# Registering Application Integration Components

To use an application integration component (AIC) in BizTalk Server 2000, the component must be registered with the category IDs for all pipeline components and for the specific type of pipeline component, in this case application integration.

Register the AIC as an out-of-process component to provide better isolation. An AIC can be registered as an in process (inproc) component to increase its performance. However, an inproc component that fails to respond during an error condition might cause BizTalk Server to fail. Therefore, an AIC should be thoroughly tested before registering it as an inproc component.

## Notes

- An out-of-process component registered as a COM+ application must be configured to run in an identity other than the interactive user.
- The application integration component must be registered by a user in the BizTalk Server Administrators group. The BizTalk Server Administrators group is created when BizTalk Server 2000 is installed. Additional users can be added to this group as necessary.

For more information about Component Services and COM+, go to the MSDN Online Library Web site ([msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp)) and browse to Component Services in the Platform SDK.

## Assigning affinity

Each application integration component (AIC) must be associated with two category IDs. One category ID marks the component as a BizTalk Server component. A component so marked appears in a list of components in the BizTalk Server administration console. The second category ID indicates the type or purpose of the component. This second association is called affinity. Only those components whose affinity is registered as application integration components appear in lists of such components.

To register affinity for an AIC created with Microsoft Visual C++ using ATL, include the following code in your header file:

```
#include "bts_sdk_guids.h"
// Implement the Component and AIC Category IDs (CATID)
BEGIN_CATEGORY_MAP(AIC_ClassName)
    IMPLEMENTED_CATEGORY(CATID_BIZTALK_COMPONENT)
    IMPLEMENTED_CATEGORY(CATID_BIZTALK_AIC)
END_CATEGORY_MAP()
```

To register affinity for an AIC created with Microsoft Visual Basic:

1. After registering your component using Regsvr32.exe, search the registry for the CLSID of your AIC under the following key:

HKEY\_CLASSES\_ROOT\CLSID

2. Expand the Implemented Categories key of your AIC.

3. Add two new keys with the following names:

HKEY\_CLASSES\_ROOT\CLSID\AIC\_CLSID\Implemented Categories\{5C6C30E7-C66D-40e3-889D-08C5C3099E52}

HKEY\_CLASSES\_ROOT\CLSID\AIC\_CLSID\Implemented Categories\{BD193E1D-D7DC-4b7c-B9D2-92AE0344C836}

These GUIDs can be found in `bts_sdk_guids.h` in the Program Files\Microsoft BizTalk Server\SDK\Include folder. The first key shown in step 3 above identifies the AIC as a BizTalk Server component (CATID\_BIZTALK\_COMPONENT). The second key shown in step 3 above identifies the component as an AIC (CATID\_BIZTALK\_AIC).

## Testing affinity

To test affinity, use [BizTalk Messaging Manager](#) to create a port that uses the AIC. For more information, see [Select an application integration component](#).

# Using the IBizTalkParserComponent Interface

The [parser](#) has two responsibilities:

- Convert the documents to XML for later processing.
- Get the parameters necessary to select the channel (these are the source qualifier, source identifier, destination qualifier, destination identifier, and [document definition](#) name). These returned fields are combined with the parameters of the [Submit](#) method of the [IInterchange](#) interface to select the [channels](#) necessary to process the documents.

This interface gets information from the component for one [interchange](#). If the incoming data stream represents multiple interchanges, the server selects the component at every interchange boundary. This simplifies construction of a component because it deals with only one interchange at a time. There is one component instance per thread. No single object needs to be safe for multiple threads. This interface is supported only in C++.

If the [ProbeInterchangeFormat](#) method of the [IBizTalkParserComponent](#) interface returns an error in the middle of the document list, it blocks the server from detecting more document types, even if they could be handled by a custom parser that follows the failed parser, if there are two or more custom parsers on a server. If the first custom parser fails, any document that follows is not parsed, even if the other custom parser could handle it, because the server ends the entire parsing operation at the time of the failure.

For additional information, see [Sequence for Calling Methods of the IBizTalkParserComponent Interface](#).

## Related Topic

[Registering Application Integration Components](#)

# Sequence for Calling Methods of the IBizTalkParserComponent Interface

The following tables show a possible sequence for calling the methods, based on the sample [interchange](#).

If you have an interchange with two groups, with two documents in the first group and one in the second, the methods are called in the following sequence:

Method	Return
<a href="#">ProbeInterchangeFormat</a>	Non-empty format string
<a href="#">GetInterchangeDetails</a>	N/A
<a href="#">GroupsExist</a>	True
<a href="#">GetGroupDetails</a>	N/A
<a href="#">GetNextDocument</a>	The <i>LastDoc</i> parameter is set to False.
<a href="#">GetNativeDocumentOffsets</a>	N/A
<a href="#">GetNextDocument</a>	The <i>LastDoc</i> parameter is set to True.
<a href="#">GetNativeDocumentOffsets</a>	N/A
<a href="#">GetGroupSize</a>	The <i>LastGroup</i> parameter is set to False.
<a href="#">GetGroupDetails</a>	N/A
<a href="#">GetNextDocument</a>	The <i>LastDoc</i> parameter is set to True.
<a href="#">GetNativeDocumentOffsets</a>	N/A
<a href="#">GetGroupSize</a>	The <i>LastGroup</i> parameter is set to True.

If you have an interchange with two documents, the methods are called in the following sequence:

Method	Return
<a href="#">ProbeInterchangeFormat</a>	Non-empty format string
<a href="#">GetInterchangeDetails</a>	N/A
<a href="#">GroupsExist</a>	False
<a href="#">GetNextDocument</a>	The <i>LastDoc</i> parameter is set to False.
<a href="#">GetNativeDocumentOffsets</a>	N/A
<a href="#">GetNextDocument</a>	The <i>LastDoc</i> parameter is set to True.
<a href="#">GetNativeDocumentOffsets</a>	N/A

# Using the IBizTalkSerializerComponent Interface

The [serializer](#) converts the document from XML back to its native format. This interface is intended to work on a single [interchange](#) and is designed to get information from the component for one interchange. This simplifies the construction of this component because it has to deal with only one interchange at a time. There is only one instance per thread. No single object needs to be safe for multiple threads. This interface is supported only in C++.

## Related Topic

[Registering Application Integration Components](#)

# Sequence for Calling Methods of the IBizTalkSerializerComponent Interface

The following tables show the possible sequence of calling the methods of the **IBizTalkSerializerComponent** interface, based on the following sample interchanges.

If you have an interchange with one document, the methods are called in the following sequence:

Method	Return
<a href="#">Init</a>	The <i>numdocs</i> parameter is set to 1.
<a href="#">AddDocument</a>	The <i>docHandle</i> parameter is set to 0.
<a href="#">GetInterchangeInfo</a>	The <i>numGroups</i> parameter is set to 0.
<a href="#">GetDocInfo</a>	The <i>docHandle</i> parameter is set to 0.

If you have an interchange with one group, with one document in the group, the methods are called in the following sequence:

Method	Return
<a href="#">Init</a>	The <i>numdocs</i> parameter is set to 1.
<a href="#">AddDocument</a>	The <i>docHandle</i> parameter is set to 0.
<a href="#">GetInterchangeInfo</a>	The <i>numGroups</i> parameter is set to 1.
<a href="#">GetGroupInfo</a>	The <i>numdocs</i> parameter is set to 1.
<a href="#">GetDocInfo</a>	The <i>docHandle</i> parameter is set to 0.

If you have an interchange with two groups, with two documents in the first group and one in the second, the methods are called in the following sequence (this assumes support of batching):

Method	Return
<a href="#">Init</a>	The <i>numdocs</i> parameter is set to 3.
<a href="#">AddDocument</a>	The <i>handle</i> parameter is set to 0.
<a href="#">AddDocument</a>	The <i>handle</i> parameter is set to 1.
<a href="#">AddDocument</a>	The <i>handle</i> parameter is set to 2.
<a href="#">GetInterchangeInfo</a>	The <i>numGroups</i> parameter is set to 2.
<a href="#">GetGroupInfo</a>	The <i>numdocs</i> parameter is set to 2.
<a href="#">GetDocInfo</a>	The <i>handle</i> parameter is set to 1.
<a href="#">GetDocInfo</a>	The <i>handle</i> parameter is set to 0.
<a href="#">GetGroupInfo</a>	The <i>numdocs</i> parameter is set to 1.
<a href="#">GetDocInfo</a>	The <i>handle</i> parameter is set to 2.

## Related Topic

[IBizTalkSerializerComponent](#)

# Supporting the Tracking Database with Parser and Serializer Components

When creating a custom [parser](#) or [serializer](#), you might want your component to support the BizTalk Server [Tracking database](#). To accomplish this, the component must use the [IDictionary](#) interface to add key/value pairs into the database.

## Interchange table

The following table contains the list of keys that can be used to support the Tracking database from the interchange level with a custom component. The table used in the database is dta\_interchange\_details.

Dictionary key	Inbound or Outbound	Column logged in Tracking database	Description
Src_ID_Type	Both	*nvcSrcAliasQualifier	This is the qualifier for the source organization. This value can come from a parameter supplied in a <a href="#">Submit</a> call or from a receive function in the <a href="#">BizTalk Server Administration</a> user interface. A parser can overwrite this value to manipulate the routing information used for <a href="#">channel</a> selection.
Src_ID_Value	Both	*nvcSrcAliasId	This contains the value of the qualifier of the source organization. This value can come from a parameter supplied in a <a href="#">Submit</a> call or from a receive function in the BizTalk Server Administration user interface. A parser can overwrite this value to manipulate the routing information used for channel selection.
In_Src_ID_App	Inbound	nvcSrcAppName	This is the interchange level identifier for the source application of an <a href="#">EDI</a> interchange. When the parser sets the value with this dictionary key, the value is logged on the inbound interchange in the Tracking database.
Dest_ID_Type	Both	*nvcDestAliasQualifier	This is the qualifier for the destination organization. This value can come from a parameter supplied in a <a href="#">Submit</a> call or from a receive function in the BizTalk Server Administration user interface. A parser can overwrite this value to manipulate the routing information used for channel selection.
Dest_ID_Value	Both	*nvcDestAliasId	This contains the value of the qualifier of the destination organization. This value can come from a parameter supplied in a <a href="#">Submit</a> call or from a receive function in the BizTalk Server Administration user interface. A parser can overwrite this value to manipulate the routing information used for channel selection.
In_Dest_ID_App	Inbound	nvcDestAppName	This is the interchange level identifier for the destination application of an <a href="#">EDI</a> interchange. When the parser sets the value with this dictionary key, the value is logged on the inbound interchange in the Tracking database.
interchange_id	Inbound	nvcControlID	This is the unique control number used to identify an <a href="#">EDI</a> interchange instance between trading partners. When the parser sets the value with this dictionary key, the value is logged on the inbound interchange in the Tracking database.
interchange_version	Inbound	nvcVersion	This is the version of an <a href="#">EDI</a> interchange. When the parser sets the value with this dictionary key, the value is logged on the inbound interchange in the Tracking database.
Out_Src_ID_App	Outbound	*nvcSrcAppName	This is the interchange level identifier for the source application of an <a href="#">EDI</a> interchange. When the serializer sets the value with this dictionary key, the value is logged on the outbound interchange in the Tracking database.
Out_Dest_ID_App	Outbound	*nvcDestAppName	This is the interchange level identifier for the destination application of an <a href="#">EDI</a> interchange. When the serializer sets the value with this dictionary key, the value is logged on the outbound interchange in the Tracking database.
out_interchange_id	Outbound	*nvcControlID	This is the unique control number used to identify an <a href="#">EDI</a> interchange instance between trading partners. The serializer usually generates this unique value. When the serializer sets the value with this dictionary key, the value is logged on the outbound interchange in the Tracking database.
out_interchange_version	Outbound	*nvcVersion	This is the version of the <a href="#">EDI</a> standard. When the serializer sets the value with this dictionary key, the value is logged on the outbound interchange in the Tracking database.

- The columns of the dta\_interchange\_details table marked with an asterisk (\*) are used for receipt correlation.

## Group table

The following table contains the list of keys that can be used to support the Tracking database from the group level with a custom component. The table used in the database is dta\_group\_details. This table applies to both inbound and outbound documents.

Dictionary key	Column logged in Tracking database	Description
group_id	*nvcControlID	This is the unique control number of a group instance within an EDI interchange. Both the parser and the serializer can set the value with this key. The value is logged on the inbound and the outbound group, respectively, in the Tracking database. For outbound document processing, the serializer usually generates this value.
functional_identifier	*nvcFunctionCode	This is the code for the type of documents in an EDI group. Both the parser and the serializer can set the value with this key. The value is logged on the inbound and the outbound group, respectively, in the Tracking database. In the serializer, this value can be read from the document's <b>PropertySet</b> .
application_sender_code	*nvcSrcAppName	This is the group level identifier for the source application in an EDI group. Both the parser and the serializer can set the value with this key. The value is logged on the inbound and the outbound group, respectively, in the Tracking database. In the serializer, this value can be read from the document's <b>PropertySet</b> .
application_receiver_code	*nvcDestAppName	This is the group level identifier for the destination application in an EDI group. Both the parser and the serializer can set the value with this key. The value is logged on the inbound and the outbound group, respectively, in the Tracking database. In the serializer, this value can be read from the document's <b>PropertySet</b> .
standard_version	*nvcVersion	This is the version of the EDI standard. Both the parser and the serializer can set the value with this key. The value is logged on the inbound and the outbound group, respectively, in the Tracking database.
standard_release	*nvcRelease	This is the release of the version of the EDI standard. Both the parser and the serializer can set the value with this key. The value is logged on the inbound and the outbound group, respectively, in the Tracking database.

### Note

The columns of the dta\_group\_details table marked with an asterisk (\*) are used for receipt correlation.

## Inbound document table

The following table contains the list of keys that can be used to support the Tracking database from the document level with a custom component. The table used in the database is dta\_indoc\_details. This table applies to inbound documents only.

Dictionary key	Column logged in Tracking database	Description
doc_id	nvcControlID	This is the unique control number of an EDI document instance. When the parser sets the value with this dictionary key, the value is logged on the inbound document in the Tracking database.
standards_version	nvcVersion	This is the version of the EDI standard. When the parser sets the value with this dictionary key, the value is logged on the inbound document in the Tracking database.
standards_release	nvcRelease	This is the release of the version of the EDI standard. When the parser sets the value with this dictionary key, the value is logged on the inbound document in the Tracking database.
doc_type	nvcDocType	This is the document type or transaction set identifier. When the parser sets the value with this dictionary key, the value is logged on the inbound document in the Tracking database.

## Outbound document table

The following table contains the list of keys that can be used to support the Tracking database from the document level with a custom component. The table used in the database is dta\_outdoc\_details. This table applies to outbound documents only.

Dictionary key	Column logged in Tracking database	Description
out_doc_id	nvcControlID	This is the unique control number of an EDI document instance. When the serializer sets the value with this dictionary key, the value is logged on the outbound document in the Tracking database.
out_doc_syntax	nvcSyntax	This is the code for document syntax, such as XML, X12, EDIFACT, H7, and so on. When the serializer sets the value with this dictionary key, the value is logged on the outbound document in the Tracking database.
out_doc_standards_version	nvcVersion	This is the version of the EDI standard. When the serializer sets the value with this dictionary key, the value is logged on the outbound document in the Tracking database. In the serializer, this value can be read from the document's <b>PropertySet</b> .
out_doc_standards_release	nvcRelease	This is the release of the version of the EDI standard. When the serializer sets the value with this dictionary key, the value is logged on the outbound document in the Tracking database. In the serializer, this value can be read from the document's <b>PropertySet</b> .
out_doc_type	nvcDocType	This is the document type or transaction set identifier. When the serializer sets the value with this dictionary key, the value is logged on the outbound document in the Tracking database.
Tracking_ID	uidTrackingGUID	This is the tracking identifier of the document for which a receipt is generated.

#### Note

- The Tracking\_ID key is used when calling the **AckDocument** method.

## Interchange and document tables

The following table contains the list of keys that can be used to support the Tracking database from the interchange and document level with a custom component. The table used in the database for interchange data is `dta_interchange_data`. The table used in the database for document data is `dta_document_data`.

Dictionary key	Inbound or Outbound	Column logged in Tracking database	Description
in_codepage	Inbound	nCodePage	This is the system code page value with which interchange/document data is encoded. When the parser sets the value with this dictionary key, the value is logged in the data record related to the inbound interchange/document in the Tracking database.
out_codepage	Outbound	nCodePage	This is the system code page value with which interchange/document data is encoded. When the serializer sets the value with this dictionary key, the value is logged in the data record related to the outbound interchange/document in the Tracking database.

## Related Topic

[Understanding the Tracking Database Schema](#)

# Creating Receipt Correlator Components

Receipt correlator components can be implemented to correlate documents, groups of documents, and interchanges with their receipts. To use a receipt correlator, you must implement a custom parser using the **IBizTalkParserComponent** interface. This is required because the server can obtain only the **progID** of the receipt correlator to be used by calling the **GetNextDocument** method on the **IBizTalkParserComponent** interface.

In addition, with BizTalk Server on the receiver side where the receipt is being generated, the parser component is responsible for putting the acknowledgment status, as well as sufficient information, on the receipt (a Canonical Receipt to begin with, but it can be mapped into other receipt document schemas, such as AK997 in [EDI](#)) to allow the correlator component on the sender side to uniquely identify the original outbound interchange, group, or document record. For an XML document, using the GUID is usually sufficient. But for EDI interchanges, since GUID cannot be used (there is no placeholder for any GUID in an EDI interchange), a combination of EDI-specific fields is needed for this unique identifier. For instance, the default **X12** correlator component uses a combination of the following fields for this purpose: version, release, functional group ID, control ID, source application name, and destination application name.

Whenever the server receives a receipt as an inbound document, the parser component's responsibility is to detect the inbound document as being a receipt, to extract all relevant information needed for correlation, and to place the receipt onto the transport dictionary. Upon returning from the **GetNextDocument** method call, the parser should set the *DocsReceipt* parameter to TRUE and the *CorrelationCompProgID* parameter to the **progID** of the corresponding correlator component.

The server calls the **Correlate** method on the **IBizTalkCorrelation** interface, and passes in a pointer to the **IBizTalkAcknowledge** object and the transport dictionary containing the receipt as the working data. Then the receipt correlator's implementation of the **Correlate** method extracts all relevant information about the document, document group, or interchange that should have been set by the parser component from the transport dictionary. Using this information, the **Correlate** method then calls **AckDocument**, **AckGroup**, or **AckInterchange** on the **IBizTalkAcknowledge** interface and sets the **DTA\_ACK\_STATUS** value for that document, group, or interchange.

Note that the server does not immediately call **IBizTalkCorrelation**. The receipt document and the correlation **progID** are stored to the database for later correlation. When the document is picked up for processing, the correlation component is created and invoked with the transport dictionary that was given by the parser component and a pointer to **IBizTalkAcknowledge**.

## Related Topic

[Understanding Receipts](#)

# Administering XLANG Schedules

To administer XLANG schedules, use the following interfaces:

- [IWFSystemAdmin](#)
- [IWFGroupAdmin](#)

To access a running instance of a specific XLANG schedule, use the following interfaces:

- [IWFWorkflowInstance](#)
- [IWFPProxy](#)

For more information, see [Programmatic Administration](#).

# Administering XLANG Schedules

To administer XLANG schedules, use the following interfaces:

- [IWFSystemAdmin](#)
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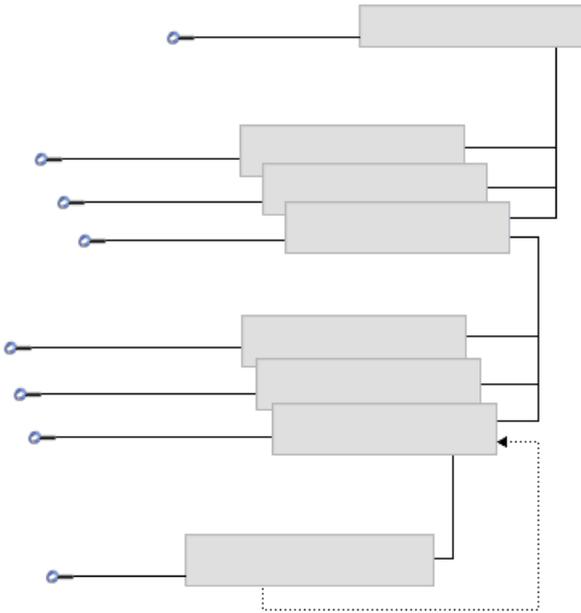
To access a running instance of a specific XLANG schedule, use the following interfaces:

- [IWFWorkflowInstance](#)
- [IWFPProxy](#)

For more information, see [Programmatic Administration](#).

# XLANG Schedule Reference

The following illustration shows the relationship between the XLANG interfaces covered in this section, and the corresponding [monikers](#).



sked://[host]

## System manager

IWFSystemAdmin

sked://[host][!group]

## XLANG schedule instance

XLANG schedule instance

XLANG schedule instance

## Group manager

Group manager

Group manager

WorkflowInstance

IWFProxy

IWFWorkflowInstance

IWFWorkflowInstance

IWFWorkflowInstance

IWFGroupAdmin

IWFGroupAdmin

IWFGroupAdmin

sked://[host][!group]/file.skx

sked://[host][!group]/file.skx/port

Proxy to COM-bound XLANG port

The following XLANG schedule interfaces are available:

## Administrator Interfaces:

- [IWFGGroupAdmin](#)
- [IWFSSystemAdmin](#)

## Schedule Instance Interfaces:

- [IWFProxy](#)
- [IWFWorkflowInstance](#)

## Related Topics

[Programmatic Administration](#)

# IWFGroupAdmin Interface

## IWFGroupAdmin Interface [C++]

## IWFGroupAdmin Object [Visual Basic]

The **IWFGroupAdmin** interface allows a client application to control running instances of an XLANG schedule. Use this interface to stop, suspend, resume, and retrieve information about all the schedule instances associated with a group manager.

The **IWFGroupAdmin** interface defines the following properties:

Property	Type	Description
<b>Count</b>	<b>long</b>	The number of running schedule instances associated with this group manager.
<b>FullyQualifiedName</b>	<b>BSTR</b>	The moniker of this group manager.
<b>InstancesResident</b>	<b>VARIANT_BOOL</b>	A value that indicates whether the specified schedule instance is currently resident in memory.
<b>InstancesSuspended</b>	<b>VARIANT_BOOL</b>	A value that indicates whether the specified schedule instance is currently in a suspended state.
<b>Name</b>	<b>BSTR</b>	The name of this group manager.
<b>UseFileDSN</b>	<b>VARIANT_BOOL</b>	A value that indicates whether a file Data Source Name (DSN) is used for dehydrating the schedule instances.

The **IWFGroupAdmin** interface defines the following methods:

Method	Description
<b>ResumeInstance</b>	Resumes the execution of a schedule in a suspended state.
<b>Shutdown</b>	Dehydrates all running schedule instances, and stops the group manager.
<b>Startup</b>	Starts all the dehydrated schedule instances for the current group manager.
<b>SuspendInstance</b>	Pauses execution of the schedule instance.
<b>TerminateInstance</b>	Stops execution of the schedule instance.

### Remarks

To obtain a reference to an **IWFGroupAdmin** object, you can invoke the COM **GetObject** function using a moniker. The following Microsoft Visual Basic code sample shows how to obtain a reference to the default XLANG Scheduler Group Manager on the local computer.

```
Dim oGM As IWFGroupAdmin
Set oGM = GetObject("sked://!XLANG Scheduler")
```

To obtain a reference to other group managers, replace "XLANG Scheduler" with the name of the COM+ application that has been designated as an XLANG Scheduler Engine host or group manager. You can determine whether a COM+ application is a group manager by using the **IsWorkflowHost** method on the **IWFSystemAdmin** interface.

You can also obtain a reference to all group managers associated with the XLANG Scheduler System Manager through the collection of **IWFGroupAdmin** objects contained by the **SysMgr** object. The following Microsoft Visual Basic code displays the fully qualified name of each group manager.

```
Dim oSM As SysMgr
Dim oGM As IWFGroupAdmin
Set oSM = GetObject("sked://")
For Each oGM In oSM
    MsgBox ("Group Manager: " + oGM.FullyQualifiedName)
Next
```

The **IWFGroupAdmin** object also enumerates a collection of the **IWFWorkflowInstance** objects that represent currently running schedule instances for this group manager.

You can determine the XLANG Scheduler System Manager associated with any group manager by following these steps:

1. Retrieve the **FullyQualifiedName** property of the **IWFGroupAdmin** object.

2. Parse the XLANG Scheduler System Manager name out of the moniker string returned.

This is the portion between the sked:// prefix and the exclamation point (!).

3. Obtain a reference to the **SysMgr** object using a moniker created with the XLANG Scheduler System Manager name from step 2.

For additional information about monikers, see [Moniker Syntax](#).

#### **Note**

- When using C++, the COM **CoGetObject** function is used in place of **GetObject**.

## **Requirements**

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SkedCore.h

**Library:** Use XLANG Scheduler Runtime Type Library (SkedCore.dll)

# IWFGroupAdmin::Count Property

## IWFGroupAdmin::Count Property [C++]

## IWFGroupAdmin.Count Property [Visual Basic]

The **Count** property contains the number of running XLANG schedule instances associated with this group manager.

### Syntax

[C++]

Get method:

```
HRESULT get_Count(  
    long* lCount  
);
```

[Visual Basic]

*object*.**Count**

### Parameters

[C++]

Get method:

*lCount*

[out, retval] Pointer to a **long** that contains the number of running schedule instances associated with this group manager.

[Visual Basic]

None

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

This property returns a **Long** that contains the number of running schedule instances associated with this group manager.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

This is a read-only property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SkedCore.h

**Library:** Use XLANG Scheduler Runtime Type Library (SkedCore.dll)

# IWFGroupAdmin::FullyQualifiedName Property

## IWFGroupAdmin::FullyQualifiedName Property [C++]

## IWFGroupAdmin.FullyQualifiedName Property [Visual Basic]

The **FullyQualifiedName** property contains the moniker of this group manager.

### Syntax

[C++]

Get method:

```
HRESULT get_FullyQualifiedName (  
    BSTR* varFullyQualifiedName  
);
```

[Visual Basic]

*object*.FullyQualifiedName

### Parameters

[C++]

Get method:

*varFullyQualifiedName*

[out, retval] Pointer to a **BSTR** that contains the moniker of this group manager.

[Visual Basic]

None

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

This property returns a **String** that contains the moniker of this group manager.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

This is a read-only property.

Although a group manager can be instantiated through a local moniker, this property always includes the full Domain Name Services (DNS) style system name. For example, suppose the default XLANG Scheduler Group Manager, named *XLANG Scheduler*, is running on a computer named *MyMachine* in the domain *vigorair-18.com*. The **FullyQualifiedName** property would contain a value of *sked://MyMachine.vigorair-18.com!XLANG Scheduler*.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SkedCore.h

**Library:** Use XLANG Scheduler Runtime Type Library (SkedCore.dll)

## **Related Topic**

[Moniker Syntax](#)

# IWFGroupAdmin::InstancelIsResident Property

## IWFGroupAdmin::InstancelIsResident Property [C++]

## IWFGroupAdmin.InstancelIsResident Property [Visual Basic]

The **InstancelIsResident** property contains a value that indicates whether the specified XLANG schedule instance is currently resident in memory.

### Syntax

[C++]

Get method:

```
HRESULT get_InstanceIsResident(  
    BSTR varInstanceId,  
    VARIANT_BOOL* pvarIsResident  
);
```

[Visual Basic]

```
object.InstanceIsResident( _  
    varInstanceId As String _  
)
```

### Parameters

[C++]

Get method:

*varInstanceld*

[in] **BSTR** that contains the globally unique identifier (GUID) assigned to the schedule instance.

*pvarIsResident*

[out, retval] Pointer to a **VARIANT\_BOOL** set to VARIANT\_TRUE if the specified schedule instance is currently resident in memory. If the specified schedule instance is currently dehydrated, this parameter is set to VARIANT\_FALSE.

[Visual Basic]

*varInstanceld*

**String** that contains the globally unique identifier (GUID) assigned to the schedule instance.

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

This property returns a **Boolean** set to **True** if the specified schedule instance is currently resident in memory. If the specified schedule is currently dehydrated, this property is set to **False**.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

This is a read-only property.

## **Requirements**

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SkedCore.h

**Library:** Use XLANG Scheduler Runtime Type Library (SkedCore.dll)

# IWFGroupAdmin::InstancelSuspended Property

## IWFGroupAdmin::InstancelSuspended Property [C++]

## IWFGroupAdmin.InstancelSuspended Property [Visual Basic]

The **InstancelSuspended** property contains a value that indicates whether the specified XLANG schedule instance is currently in a suspended state.

### Syntax

[C++]

Get method:

```
HRESULT get_InstanceIsSuspended(  
    BSTR varInstanceId,  
    VARIANT_BOOL* pvarIsSuspended  
);
```

[Visual Basic]

```
object.InstanceIsSuspended( _  
    varInstanceId As String _  
)
```

### Parameters

[C++]

Get method:

*varInstanceld*

[in] **BSTR** that contains the globally unique identifier (GUID) assigned to the schedule instance.

*pvarIsSuspended*

[out, retval] Pointer to a **VARIANT\_BOOL** set to VARIANT\_TRUE if the specified schedule instance is currently in a suspended state. If the specified schedule instance is not suspended, this parameter is set to VARIANT\_FALSE.

[Visual Basic]

*varInstanceld*

**String** that contains the globally unique identifier (GUID) assigned to the schedule instance.

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

This property returns a **Boolean** set to **True** if the specified schedule instance is currently in a suspended state. If the specified schedule is not suspended, this property is set to **False**.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

This is a read-only property.

This property should be checked prior to calling the [ResumeInstance](#) method.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SkedCore.h

**Library:** Use XLANG Scheduler Runtime Type Library (SkedCore.dll)

# IWFGroupAdmin::Name Property

## IWFGroupAdmin::Name Property [C++]

## IWFGroupAdmin.Name Property [Visual Basic]

The **Name** property contains the name of this group manager.

### Syntax

[C++]

Get method:

```
HRESULT get_Name (  
    BSTR* varName  
);
```

[Visual Basic]

*object*.Name

### Parameters

[C++]

Get method:

*varName*

[out, retval] Pointer to a **BSTR** that contains the name of this group manager.

[Visual Basic]

None

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

This property returns a **String** that contains the name of this group manager.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

This is a read-only property.

This property is the same as the name of the hosting COM+ application.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SkedCore.h

**Library:** Use XLANG Scheduler Runtime Type Library (SkedCore.dll)

# IWFGGroupAdmin::ResumeInstance Method

## IWFGGroupAdmin::ResumeInstance Method [C++]

## IWFGGroupAdmin.ResumeInstance Method [Visual Basic]

The **ResumeInstance** method starts the XLANG schedule instance executing from a suspended state.

### Syntax

[C++]

```
HRESULT ResumeInstance(  
    BSTR bInstanceId  
);
```

[Visual Basic]

```
object.ResumeInstance( _  
    bInstanceId As String _  
)
```

### Parameters

[C++]

*bInstanceId*

[in] **BSTR** that contains the globally unique identifier (GUID) assigned to the schedule instance to be resumed.

[Visual Basic]

*bInstanceId*

**String** that contains the globally unique identifier (GUID) assigned to the schedule instance to be resumed.

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

The schedule instance can be paused with the [SuspendInstance](#) method. Prior to calling the **ResumeInstance** method, the [InstancelsSuspended](#) property should be checked.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SkedCore.h

**Library:** Use XLANG Scheduler Runtime Type Library (SkedCore.dll)

# IWFGroupAdmin::Shutdown Method

## IWFGroupAdmin::Shutdown Method [C++]

## IWFGroupAdmin.Shutdown Method [Visual Basic]

The **Shutdown** method stops the group manager and dehydrates all running XLANG schedule instances.

### Syntax

[C++]

```
HRESULT Shutdown ();
```

[Visual Basic]

```
object.Shutdown ()
```

### Parameters

[C++]

None

[Visual Basic]

None

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

Prior to stopping the group manager, all running schedule instances associated with this group manager are dehydrated to the database specified in the Data Source Name (DSN) file, and requests for activation of any new schedule instances are refused until shutdown is completed.

Any component that is bound in an XLANG schedule should not invoke this method to stop the group manager, as this can produce unexpected results.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SkedCore.h

**Library:** Use XLANG Scheduler Runtime Type Library (SkedCore.dll)

# IWFGroupAdmin::Startup Method

## IWFGroupAdmin::Startup Method [C++]

## IWFGroupAdmin.Startup Method [Visual Basic]

The **Startup** method starts all the previously running dehydrated XLANG schedule instances associated with this group manager.

### Syntax

[C++]

```
HRESULT Startup();
```

[Visual Basic]

```
object.Startup()
```

### Parameters

[C++]

None

[Visual Basic]

None

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

The XLANG Scheduler System Manager normally calls this method. Users should not call this method directly.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SkedCore.h

**Library:** Use XLANG Scheduler Runtime Type Library (SkedCore.dll)

# IWFGroupAdmin::SuspendInstance Method

## IWFGroupAdmin::SuspendInstance Method [C++]

## IWFGroupAdmin.SuspendInstance Method [Visual Basic]

The **SuspendInstance** method pauses the running XLANG schedule instance in its current state.

### Syntax

[C++]

```
HRESULT SuspendInstance(  
    BSTR bInstanceId  
);
```

[Visual Basic]

```
object.SuspendInstance( _  
    bInstanceId As String _  
)
```

### Parameters

[C++]

*bInstanceId*

[in] **BSTR** that contains the globally unique identifier (GUID) assigned to the schedule instance to be suspended.

[Visual Basic]

*bInstanceId*

**String** that contains the globally unique identifier (GUID) assigned to the schedule instance to be suspended.

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

The schedule instance can be restarted with the [ResumeInstance](#) method.

This method might block if actions with COM-bound ports are waiting for a method to complete, or if a short-lived transaction is currently in progress.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SkedCore.h

**Library:** Use XLANG Scheduler Runtime Type Library (SkedCore.dll)

# IWFGroupAdmin::TerminateInstance Method

## IWFGroupAdmin::TerminateInstance Method [C++]

## IWFGroupAdmin.TerminateInstance Method [Visual Basic]

The **TerminateInstance** method stops a running XLANG schedule instance.

### Syntax

[C++]

```
HRESULT TerminateInstance(  
    BSTR bInstanceId  
);
```

[Visual Basic]

```
object.TerminateInstance( _  
    bInstanceId As String _  
)
```

### Parameters

[C++]

*bInstanceId*

[in] **BSTR** that contains the globally unique identifier (GUID) assigned to the schedule instance to be stopped.

[Visual Basic]

*bInstanceId*

**String** that contains the globally unique identifier (GUID) assigned to the schedule instance to be stopped.

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

A terminated schedule instance can never be restarted or resumed.

This method might block if actions with COM-bound ports are waiting for a method to complete, or if a short-lived transaction is currently in progress.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SkedCore.h

**Library:** Use XLANG Scheduler Runtime Type Library (SkedCore.dll)

# IWFGGroupAdmin::UseFileDSN Property

## IWFGGroupAdmin::UseFileDSN Property [C++]

## IWFGGroupAdmin.UseFileDSN Property [Visual Basic]

The **UseFileDSN** property contains a value that indicates whether a Data Source Name (DSN) file is used for dehydrating the XLANG schedule instances.

### Syntax

[C++]

Get method:

```
HRESULT get_UseFileDSN(  
    VARIANT_BOOL* pfUseFileDSN  
);
```

[Visual Basic]

*object*.UseFileDSN

### Parameters

[C++]

Get method:

*pfUseFileDSN*

[out, retval] Pointer to a **VARIANT\_BOOL** set to VARIANT\_TRUE if the group manager uses a DSN file for dehydrating schedule instances. If a DSN file is not used, this parameter is set to VARIANT\_FALSE.

[Visual Basic]

None

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

This property returns a **Boolean** set to **True** if the group manager uses a DSN file for dehydrating schedule instances. If a DSN file is not used, **False** is returned.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

This is a read-only property.

The value of this property is set when the group manager process is launched. The DSN setting in the COM+ catalog is changed either on the **XLANG** tab of the **XLANG Scheduler Properties** dialog box or by setting the **UseFileDSN** property on the **IWFSystemAdmin** interface. If the DSN value is changed while the group manager is running, the value of this property is not dynamically updated. The new value is not reflected until the next time the group manager is launched. Updates to this property require the caller to be in the XLANG Administrator role and are not normally performed by user code.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SkedCore.h

**Library:** Use XLANG Scheduler Runtime Type Library (SkedCore.dll)

# IWFProxy Interface

## IWFProxy Interface [C++]

## IWFProxy Object [Visual Basic]

The **IWFProxy** interface contains information about ports in an XLANG schedule instance that are bound to a COM component. Use this interface to obtain a schedule instance. If this interface is used on a non-COM port binding, an error is returned.

The **IWFProxy** interface defines the following properties:

Property	Type	Description
<a href="#">FullyQualifiedName</a>	BSTR	The fully qualified name of a COM-bound port.
<a href="#">WorkflowInstance</a>	IWFWorkflowInstance	The current schedule instance.

### Remarks

A reference to this interface can be obtained from:

- The [Port](#) property available on the [IWFWorkflowInstance](#) interface.
- An XLANG schedule moniker that specifies the port name.

The following Microsoft Visual Basic code sample shows how to activate an XLANG schedule on the local computer by using a moniker, and obtain a reference to the named port on that XLANG schedule instance.

```
Dim oPort As Object
Set oPort = GetObject("sked:///C:\schedules\test.skx/PortA")
```

At this point, the *oPort* variable contains a reference to the COM object bound in *PortA* of the schedule instance.

For additional information about monikers, see [Moniker Syntax](#).

### Note

When using C++, the COM **CoGetObject** function is used in place of **GetObject**.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SkedCore.h

**Library:** Use XLANG Scheduler Runtime Type Library (SkedCore.dll)

# IWFProxy::FullyQualifiedName Property

## IWFProxy::FullyQualifiedName Property [C++]

## IWFProxy.FullyQualifiedName Property [Visual Basic]

The **FullyQualifiedName** property contains the moniker of the port instance to which this proxy is bound.

### Syntax

[C++]

Get method:

```
HRESULT get_FullyQualifiedName (  
    BSTR* varFullyQualifiedName  
);
```

[Visual Basic]

*object*.FullyQualifiedName

### Parameters

[C++]

Get method:

*varFullyQualifiedName*

[out, retval] Pointer to a **BSTR** that contains the moniker of the port.

[Visual Basic]

None

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

This property returns a **String** that contains the moniker of the port.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

This is a read-only property.

The moniker retrieved with this property can be used with the COM **GetObject** function to obtain a reference to the XLANG schedule instance. This moniker is valid as long as the schedule instance is running. If the schedule instance is [dehydrated](#) and [rehydrated](#) for any reason, such as rebooting the system, the moniker remains valid. Once the schedule instance completes, or ends by using the [TerminateInstance](#) method, the moniker can no longer be used.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SkedCore.h

**Library:** Use XLANG Scheduler Runtime Type Library (SkedCore.dll)

# IWFProxy::WorkflowInstance Property

## IWFProxy::WorkflowInstance Property [C++]

## IWFProxy.WorkflowInstance Property [Visual Basic]

The **WorkflowInstance** property contains a reference to the current XLANG schedule instance.

### Syntax

[C++]

Get method:

```
HRESULT get_WorkflowInstance(  
    IWFWorkflowInstance** varScheduleInst  
);
```

[Visual Basic]

*object*.WorkflowInstance

### Parameters

[C++]

Get method:

*varScheduleInst*

[out, retval] Address of a pointer to an [IWFWorkflowInstance](#) interface that contains the current schedule instance.

[Visual Basic]

None

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

This property returns an **Object** that contains the current schedule instance.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

This is a read-only property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SkedCore.h

**Library:** Use XLANG Scheduler Runtime Type Library (SkedCore.dll)

# IWFSystemAdmin Interface

## IWFSystemAdmin Interface [C++]

### SysMgr Object [Visual Basic]

The **IWFSystemAdmin** interface provides a client application with system-wide administrative control over the XLANG Scheduler Engine. Use this interface to start, stop, and retrieve information about the group managers.

The **IWFSystemAdmin** interface defines the following properties:

Property	Type	Description
<a href="#">Count</a>	<b>long</b>	Contains the number of group managers associated with this XLANG Scheduler System Manager.
<a href="#">FullyQualifiedName</a>	<b>BSTR</b>	Contains the fully qualified DNS-style name of the XLANG Scheduler System Manager.
<a href="#">IsWorkflowHost</a>	<b>VARIANT_BOOL</b>	Checks whether the COM+ server application is an XLANG Scheduler Engine host.
<a href="#">Item</a>	<b>BSTR</b>	Returns a reference to the named schedule group.
<a href="#">UseFileDSN</a>	<b>VARIANT_BOOL</b>	Indicates whether a file Data Source Name (DSN) is used for dehydrating the XLANG schedule instances.

The **IWFSystemAdmin** interface defines the following methods:

Method	Description
<a href="#">ShutdownAll</a>	Shuts down all group managers.
<a href="#">ShutdownApp</a>	Shuts down a specific group manager.
<a href="#">Startup</a>	Starts all group managers.
<a href="#">TestAdminStatus</a>	Checks a caller for XLANG Scheduler Engine administrator access.

### Remarks

To obtain a reference to this object, you can invoke the COM **GetObject** function using a moniker. The following Microsoft Visual Basic code sample shows how to obtain a reference to the XLANG Scheduler System Manager on the local computer.

```
Dim oSM As SysMgr
Set oSM = GetObject("sked://")
```

This object also enumerates a collection of the **IWFGroupAdmin** objects that represent the group managers associated with this XLANG Scheduler System Manager.

For additional information about monikers, see [Moniker Syntax](#).

### Note

- When using C++, the COM **CoGetObject** function is used in place of **GetObject**.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SysMgr.h

**Library:** Use XLANG Scheduler - System Manager (SKEDSMGR.dll)

# IWFSystemAdmin::Count Property

## IWFSystemAdmin::Count Property [C++]

## SysMgr.Count Property [Visual Basic]

The **Count** property contains the number of running group managers.

### Syntax

[C++]

Get method:

```
HRESULT get_Count (  
    long* lCount  
);
```

[Visual Basic]

*object*.**Count**

### Parameters

[C++]

Get method:

*lCount*

[out, retval] Pointer to a **long** that contains the number of running group managers.

[Visual Basic]

None

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

This property returns a **Long** that contains the number of running group managers.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

This is a read-only property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SysMgr.h

**Library:** Use XLANG Scheduler - System Manager (SKEDSMGR.dll)

# IWFSystemAdmin::FullyQualifiedName Property

## IWFSystemAdmin::FullyQualifiedName Property [C++]

## SysMgr.FullyQualifiedName Property [Visual Basic]

The **FullyQualifiedName** property contains the moniker of this XLANG Scheduler System Manager.

### Syntax

[C++]

Get method:

```
HRESULT get_FullyQualifiedName (  
    BSTR* varFullyQualifiedName  
);
```

[Visual Basic]

*object*.FullyQualifiedName

### Parameters

[C++]

Get method:

*varFullyQualifiedName*

[out, retval] Pointer to a **BSTR** that contains the moniker of this XLANG Scheduler System Manager.

[Visual Basic]

None

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

This property returns a **String** that contains the moniker of this group manager.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

This is a read-only property.

Although an XLANG Scheduler System Manager can be instantiated through a local moniker, this property always includes the full Domain Name Services (DNS) style system name. For example, suppose the XLANG Scheduler System Manager is running on a computer named *MyMachine* in the domain *vigorair-18.com*. The **FullyQualifiedName** property would contain a value of *sked://MyMachine.vigorair-18.com*.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SysMgr.h

**Library:** Use XLANG Scheduler - System Manager (SKEDSMGR.dll)

## **Related Topic**

[Moniker Syntax](#)

# IWFSystemAdmin::IsWorkflowHost Property

## IWFSystemAdmin::IsWorkflowHost Property [C++]

## SysMgr.IsWorkflowHost Property [Visual Basic]

The **IsWorkflowHost** property controls whether the named COM+ server application is an XLANG Scheduler Engine host.

### Syntax

[C++]

Get method:

```
HRESULT get_IsWorkflowHost(  
    BSTR varAppName,  
    VARIANT_BOOL* pIsWorkflowHost  
);
```

Put method:

```
HRESULT put_IsWorkflowHost(  
    BSTR varAppName,  
    VARIANT_BOOL varIsWorkflowHost  
);
```

[Visual Basic]

```
object.IsWorkflowHost( _  
    varAppName As String _  
)
```

### Parameters

[C++]

Get method:

*varAppName*

[in] **BSTR** that contains the COM+ server application name.

*pIsWorkflowHost*

[out, retval] Pointer to a **VARIANT\_BOOL** that indicates whether the COM+ server application is hosting the XLANG Scheduler Engine.

Put method:

*varAppName*

[in] **BSTR** that contains the COM+ server application name.

*varIsWorkflowHost*

[out, retval] **VARIANT\_BOOL** that indicates whether the COM+ server application is hosting the XLANG Scheduler Engine.

[Visual Basic]

*varAppName*

**String** that contains the COM+ server application name.

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

This property returns a **Boolean** that indicates whether the COM+ server application is hosting the XLANG Scheduler Engine.

## **Error Value [Visual Basic]**

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

## **Remarks**

This property cannot be set on the XLANG Scheduler Engine application, or on any COM+ application marked as read-only.

## **Requirements**

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SysMgr.h

**Library:** Use XLANG Scheduler - System Manager (SKEDSMGR.dll)

# IWFSystemAdmin::Item Property

## IWFSystemAdmin::Item Property [C++]

## SysMgr.Item Property [Visual Basic]

The **Item** property returns a reference to one of the running group managers.

### Syntax

[C++]

Get method:

```
HRESULT get_Item(  
    BSTR strGrpMgrName,  
    IUnknown** ppItem  
);
```

[Visual Basic]

```
object.Item( _  
    strGrpMgrName As String _  
)
```

### Parameters

[C++]

Get method:

*strGrpMgrName*

[in] **BSTR** that contains the group name corresponding to the hosting COM+ server application name. Group names are case sensitive and can contain spaces.

*ppItem*

[out, retval] Address of a pointer to an **IUnknown** interface that refers to a group manager.

[Visual Basic]

*strGrpMgrName*

[in] **String** that contains the group name corresponding to the hosting COM+ server application name. Group names are case sensitive and can contain spaces.

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

This property returns a group manager **Object**.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

This is a read-only property.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SysMgr.h

**Library:** Use XLANG Scheduler - System Manager (SKEDSMGR.dll)

# IWFSysAdmin::ShutdownAll Method

## IWFSysAdmin::ShutdownAll Method [C++]

## SysMgr.ShutdownAll Method [Visual Basic]

The **ShutdownAll** method stops the group managers and terminates their associated COM+ applications.

### Syntax

[C++]

```
HRESULT ShutdownAll ();
```

[Visual Basic]

```
object.ShutdownAll ()
```

### Parameters

[C++]

None

[Visual Basic]

None

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

When the **ShutdownAll** method is called, new schedule activations are disabled and the shutdown notice is propagated to all running group managers. Once this method has completed, all group managers are stopped and the system can be safely rebooted.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SysMgr.h

**Library:** Use XLANG Scheduler - System Manager (SKEDSMGR.dll)

# IWFSystemAdmin::ShutdownApp Method

## IWFSystemAdmin::ShutdownApp Method [C++]

## SysMgr.ShutdownApp Method [Visual Basic]

The **ShutdownApp** method stops a specific group manager application and terminates the associated COM+ application.

### Syntax

[C++]

```
HRESULT ShutdownApp(  
    BSTR varAppName  
);
```

[Visual Basic]

```
object.ShutdownApp( _  
    varAppName As String _  
)
```

### Parameters

[C++]

*varAppName*

[in] **BSTR** that contains the COM+ server application name to be stopped.

[Visual Basic]

*varAppName*

**String** that contains the COM+ server application name to be stopped.

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

When the **ShutdownApp** method is called, new schedule activations on the named application are disabled and all running XLANG schedule instances associated with that application are stopped. If this method is called on the default XLANG Scheduler Group Manager, all group managers are shut down. Calling this method on the default XLANG Scheduler Group Manager is equivalent to calling the **ShutdownAll** method.

### Note

- The COM+ application name of the default XLANG Scheduler Group Manager is XLANG Scheduler.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SysMgr.h

**Library:** Use XLANG Scheduler - System Manager (SKEDSMGR.dll)

# IWFSystemAdmin::StartUp Method

## IWFSystemAdmin::StartUp Method [C++]

## SysMgr.StartUp Method [Visual Basic]

The **StartUp** method starts the group managers.

### Syntax

[C++]

```
HRESULT StartUp();
```

[Visual Basic]

```
object.StartUp()
```

### Parameters

[C++]

None

[Visual Basic]

None

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

When this method is invoked, rehydration is initiated for all group managers and, subsequently, all XLANG schedules. This method is asynchronous, and it can complete before all group managers and schedules are running.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SysMgr.h

**Library:** Use XLANG Scheduler - System Manager (SKEDSMGR.dll)

# IWFSysAdmin::TestAdminStatus Method

## IWFSysAdmin::TestAdminStatus Method [C++]

## SysMgr.TestAdminStatus Method [Visual Basic]

The **TestAdminStatus** method determines whether a caller on the [IWFGGroupAdmin](#) interface is an XLANG Scheduler Engine administrator.

### Syntax

[C++]

```
HRESULT TestAdminStatus ();
```

[Visual Basic]

```
object.TestAdminStatus ()
```

### Parameters

[C++]

None

[Visual Basic]

None

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

This method is intended for internal use by the group managers.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SysMgr.h

**Library:** Use XLANG Scheduler - System Manager (SKEDSMGR.dll)

# IWFSystemAdmin::UseFileDSN Property

## IWFSystemAdmin::UseFileDSN Property [C++]

## SysMgr.UseFileDSN Property [Visual Basic]

The **UseFileDSN** property contains a value that indicates whether a COM+ server application uses a Data Source Name (DSN) file for dehydrating the XLANG schedule instances.

### Syntax

[C++]

Get method:

```
HRESULT get_UseFileDSN(  
    BSTR varAppName,  
    VARIANT_BOOL* pfUseFileDSN  
);
```

Put method:

```
HRESULT put_UseFileDSN(  
    BSTR varAppName,  
    VARIANT_BOOL* varUseFileDSN  
);
```

[Visual Basic]

```
object.UseFileDSN( _  
    varAppName As String _  
)
```

### Parameters

[C++]

Get method:

*varAppName*

[in] **BSTR** that contains the COM+ server application name.

*pfUseFileDSN*

[out, retval] Pointer to a **VARIANT\_BOOL** set to VARIANT\_TRUE if the COM+ server application uses a DSN file for dehydrating schedule instances. If a DSN file is not used, this parameter is set to VARIANT\_FALSE.

Put method:

*varAppName*

[in] **BSTR** that contains the COM+ server application name.

*varUseFileDSN*

[out, retval] **VARIANT\_BOOL** that indicates whether the COM+ server application uses a DSN file for dehydrating schedule instances. If a DSN file is not used, this parameter is set to VARIANT\_FALSE.

[Visual Basic]

*varUseFileDSN*

**Boolean** that indicates whether the COM+ server application uses a DSN file for dehydrating schedule instances. If a DSN file is not used, this parameter is set to **False**.

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#)

or [Standard COM Errors](#).

[Visual Basic]

This property returns a **Boolean** set to **True** if the COM+ server application uses a DSN file for dehydrating schedule instances. If a DSN file is not used, **False** is returned.

### **Error Value [Visual Basic]**

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### **Remarks**

If this property is changed while any group manager is running, the value of this property is not dynamically updated in the group managers. Therefore, the **UseFileDSN** property value exposed by the **IWFGroupAdmin** interface contains an incorrect value. The updated value is not reflected until the next time the group manager is launched.

### **Requirements**

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SysMgr.h

**Library:** Use XLANG Scheduler - System Manager (SKEDSMGR.dll)

# IWFWorkflowInstance Interface

## IWFWorkflowInstance Interface [C++]

## IWFWorkflowInstance Object [Visual Basic]

The **IWFWorkflowInstance** interface allows a client application to navigate the ports of an XLANG schedule instance, check the completion status, and determine whether the schedule instance completed successfully. Use this interface to gather information about a specific, running schedule instance.

The **IWFWorkflowInstance** interface defines the following properties:

Property	Type	Description
<a href="#">CompletionStatus</a>	<b>long</b>	A value that indicates the success or failure of the schedule instance.
<a href="#">FullPortName</a>	<b>BSTR</b>	The full name of a port in a form usable by the associated technology.
<a href="#">FullyQualifiedName</a>	<b>BSTR</b>	The fully qualified name of this schedule instance.
<a href="#">InstanceID</a>	<b>BSTR</b>	The unique identifier associated with this schedule instance.
<a href="#">IsCompleted</a>	<b>VARIANT_BOOL</b>	A value that indicates whether the schedule instance completed.
<a href="#">ModuleID</a>	<b>BSTR</b>	The unique identifier of the XML module that contains the schedule and binding information.
<a href="#">ModuleName</a>	<b>BSTR</b>	The name of the XML module that contains the schedule and binding information.
<a href="#">ParentInstanceID</a>	<b>BSTR</b>	The unique identifier of the parent schedule instance.
<a href="#">Port</a>	<b>IUnknown</b>	A reference to the named port. This is applicable only to COM-based port bindings.

The **IWFWorkflowInstance** interface defines the following method:

Method	Description
<a href="#">WaitForCompletion</a>	Blocks until the schedule instance completes.

### Remarks

A reference to this interface can be obtained from:

- The [WorkflowInstance](#) property available on the [IWFPProxy](#) interface.
- The collection of **IWFWorkflowInstance** objects returned by the [IWFGGroupAdmin](#) object.
- An XLANG schedule moniker.

The following Microsoft Visual Basic code sample shows how to instantiate an XLANG schedule on the local computer and obtain a reference to that schedule instance.

```
Dim oWFI As IWFWorkflowInstance
Set oWFI = GetObject("sked:///C:\schedules\test.skx")
```

To obtain a reference to all currently running schedule instances in a group manager, you can access the collection of **IWFWorkflowInstance** objects contained by the [IWFGGroupAdmin](#) object. The following Microsoft Visual Basic code displays the fully qualified name of each schedule instance running in the default XLANG Scheduler Group Manager.

```
Dim oGM As IWFGGroupAdmin
Dim oWFI As IWFWorkflowInstance
Set oGM = GetObject("sked://!XLANG Scheduler")
For Each oWFI In oGM
    MsgBox ("XLANG Schedule: " + oWFI.FullyQualifiedName)
Next
```

When using multiple group managers, you can determine the group manager associated with any schedule instance by following these steps:

1. Retrieve the **FullyQualifiedName** property of the **IWFWorkflowInstance** object.
2. Parse the group manager name out of the moniker string returned.  
This is the portion that begins with an exclamation point (!) and ends with a slash (/).
3. Obtain a reference to the **IWFGroupAdmin** object using a moniker created with the group manager name from step 2.

For additional information about monikers, see [Moniker Syntax](#).

#### **Note**

- When using C++, the COM **CoGetObject** function is used in place of **GetObject**.
- When accessing this object in Microsoft Visual Basic, you must declare your object variable with the appropriate type information rather than using the **Object** type. For example:

```
Dim myInstance As IWFWorkflowInstance
```

## **Requirements**

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SkedCore.h

**Library:** Use XLANG Scheduler Runtime Type Library (SkedCore.dll)

# IWFWorkflowInstance::CompletionStatus Property

## IWFWorkflowInstance::CompletionStatus Property [C++]

## IWFWorkflowInstance.CompletionStatus Property [Visual Basic]

The **CompletionStatus** property indicates the final completion status of the XLANG schedule instance.

### Syntax

[C++]

Get method:

```
HRESULT get_CompletionStatus(  
    long* varCompletionStatus  
);
```

[Visual Basic]

*object*.CompletionStatus

### Parameters

[C++]

Get method:

*varCompletionStatus*

[out, retval] Pointer to a **long** that contains the completion status of the schedule instance. A value of 0 indicates success.

[Visual Basic]

None

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

### Note

- A return value of S\_OK does not indicate that the processes or applications associated with the schedule instance completed successfully. It indicates only that the schedule instance was completely processed by the XLANG Scheduler Engine, without errors.

[Visual Basic]

This property returns a **Long** that contains the completion status.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

This is a read-only property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SkedCore.h

**Library:** Use XLANG Scheduler Runtime Type Library (SkedCore.dll)

# IWFWorkflowInstance::FullPortName Property

## IWFWorkflowInstance::FullPortName Property [C++]

## IWFWorkflowInstance.FullPortName Property [Visual Basic]

The **FullPortName** property contains the full name of the specified port.

### Syntax

[C++]

Get method:

```
HRESULT get_FullPortName(  
    BSTR varParam,  
  
    BSTR* varFullPortName  
);
```

[Visual Basic]

```
object.FullPortName( _  
    varParam As String _  
)
```

### Parameters

[C++]

Get method:

*varParam*

[in] **BSTR** that contains the name of the port to be retrieved.

*varFullPortName*

[out, retval] Pointer to a **BSTR** that contains the full port name.

[Visual Basic]

*varParam*

**String** that contains the name of the port to be retrieved.

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

This property returns a **String** that contains the full port name.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

This is a read-only property.

The full port name is returned in a form that is usable by the associated binding technology. For example, a port that is bound to a COM component returns a fully qualified moniker as the name of the port. For a port that is bound to Microsoft Message

Queuing, this method returns the full path of the queue.

## **Requirements**

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SkedCore.h

**Library:** Use XLANG Scheduler Runtime Type Library (SkedCore.dll)

# IWFWorkflowInstance::FullyQualifiedName Property

## IWFWorkflowInstance::FullyQualifiedName Property [C++]

## IWFWorkflowInstance.FullyQualifiedName Property [Visual Basic]

The **FullyQualifiedName** property contains the moniker of the XLANG schedule instance.

### Syntax

[C++]

Get method:

```
HRESULT get_FullyQualifiedName (  
    BSTR* varFullyQualifiedName  
);
```

[Visual Basic]

```
object.FullyQualifiedName
```

### Parameters

[C++]

Get method:

```
varFullyQualifiedName
```

[out, retval] Pointer to a **BSTR** that contains the moniker of the schedule instance.

[Visual Basic]

None

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

This property returns a **String** that contains the moniker of the schedule instance.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

This is a read-only property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SkedCore.h

**Library:** Use XLANG Scheduler Runtime Type Library (SkedCore.dll)

# IWFWorkflowInstance::InstanceId Property

## IWFWorkflowInstance::InstanceId Property [C++]

## IWFWorkflowInstance.InstanceId Property [Visual Basic]

The **InstanceId** property contains the globally unique identifier (GUID) assigned to the current XLANG schedule instance.

### Syntax

[C++]

Get method:

```
HRESULT get_InstanceId(  
    BSTR* varInstanceId  
);
```

[Visual Basic]

*object*.InstanceId

### Parameters

[C++]

Get method:

*varInstanceId*

[out, retval] Pointer to a **BSTR** that contains the GUID of the schedule instance.

[Visual Basic]

None

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

This property returns a **String** that contains the GUID of the schedule instance.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

This is a read-only property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SkedCore.h

**Library:** Use XLANG Scheduler Runtime Type Library (SkedCore.dll)

# IWFWorkflowInstance::IsCompleted Property

## IWFWorkflowInstance::IsCompleted Property [C++]

## IWFWorkflowInstance.IsCompleted Property [Visual Basic]

The **IsCompleted** property indicates whether the XLANG schedule instance has finished executing.

### Syntax

[C++]

Get method:

```
HRESULT get_IsCompleted(  
    VARIANT_BOOL* varIsCompleted  
);
```

[Visual Basic]

*object*.IsCompleted

### Parameters

[C++]

Get method:

*varIsCompleted*

[out, retval] Pointer to a **VARIANT\_BOOL** that, if VARIANT\_TRUE, indicates the schedule instance has finished executing. If VARIANT\_FALSE, the schedule instance is still executing.

[Visual Basic]

None

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

This property returns a **Boolean** that, if **True**, indicates the schedule instance has finished executing. If **False**, the schedule instance is still executing.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

This is a read-only property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SkedCore.h

**Library:** Use XLANG Scheduler Runtime Type Library (SkedCore.dll)

# IWFWorkflowInstance::ModuleId Property

## IWFWorkflowInstance::ModuleId Property [C++]

## IWFWorkflowInstance.ModuleId Property [Visual Basic]

The **ModuleId** property contains the globally unique identifier (GUID) of the XLANG module associated with the current XLANG schedule instance.

### Syntax

[C++]

Get method:

```
HRESULT get_ModuleId(  
    BSTR* varModuleId  
);
```

[Visual Basic]

*object*.ModuleId

### Parameters

[C++]

Get method:

*varModuleId*

[out, retval] Pointer to a **BSTR** that contains the GUID of the XLANG module associated with the current schedule instance.

[Visual Basic]

None

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

This property returns a **String** that contains the GUID of the XLANG module associated with the current schedule instance.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

This is a read-only property.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SkedCore.h

**Library:** Use XLANG Scheduler Runtime Type Library (SkedCore.dll)

# IWFWorkflowInstance::ModuleName Property

## IWFWorkflowInstance::ModuleName Property [C++]

## IWFWorkflowInstance.ModuleName Property [Visual Basic]

The **ModuleName** property contains the name of the XLANG module associated with the current XLANG schedule instance.

### Syntax

[C++]

Get method:

```
HRESULT get_ModuleName (  
    BSTR* varModuleName  
);
```

[Visual Basic]

*object*.**ModuleName**

### Parameters

[C++]

Get method:

*varModuleName*

[out, retval] Pointer to a **BSTR** that contains the name of the XLANG module associated with the current schedule instance.

[Visual Basic]

None

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

This property returns a **String** that contains the name of the XLANG module associated with the current schedule instance.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

This is a read-only property.

The module name is defined in the XLANG schedule (.skx) file.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SkedCore.h

**Library:** Use XLANG Scheduler Runtime Type Library (SkedCore.dll)

# IWFWorkflowInstance::ParentInstanceID Property

## IWFWorkflowInstance::ParentInstanceID Property [C++]

## IWFWorkflowInstance.ParentInstanceID Property [Visual Basic]

The **ParentInstanceID** property contains the globally unique identifier (GUID) assigned to the parent XLANG schedule instance of the current schedule instance.

### Syntax

[C++]

Get method:

```
HRESULT get_ParentInstanceID(  
    BSTR* varParentInstanceID  
);
```

[Visual Basic]

```
object.ParentInstanceID
```

### Parameters

[C++]

Get method:

```
varParentInstanceID
```

[out, retval] Pointer to a **BSTR** that contains the GUID of the parent schedule instance of the current schedule instance.

[Visual Basic]

None

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

This property returns a **String** that contains the GUID of the parent schedule instance of the current schedule instance.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

This is a read-only property.

The property returns a NULL value if no parent schedule instance exists.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SkedCore.h

**Library:** Use XLANG Scheduler Runtime Type Library (SkedCore.dll)

# IWFWorkflowInstance::Port Property

## IWFWorkflowInstance::Port Property [C++]

## IWFWorkflowInstance.Port Property [Visual Basic]

The **Port** property contains a reference to a COM-bound port.

### Syntax

[C++]

Get method:

```
HRESULT get_Port(  
    BSTR varParam,  
    IUnknown** varPort  
);
```

[Visual Basic]

*object*.Port

### Parameters

[C++]

Get method:

*varParam*

[in] **BSTR** that contains the name of the port to which to obtain a reference.

*varPort*

[out, retval] Address of a pointer to an **IUnknown** interface that contains a reference to a port in the current XLANG schedule instance.

[Visual Basic]

*varParam*

**String** that contains the name of the port to which to obtain a reference.

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

This property returns an **Object** that contains the specified port.

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Remarks

This is a read-only property.

The MK\_E\_NOOBJECT error code is returned if the moniker or port name passed in the *varParam* parameter is incorrect.

When using Microsoft Visual Basic, the variable used for the port reference returned by using this property should be declared as

a specific class or as a **Variant**. You can't obtain the port reference if you declare the variable as an **Object** since the port actually returns an **IUnknown** reference.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SkedCore.h

**Library:** Use XLANG Scheduler Runtime Type Library (SkedCore.dll)

# IWFWorkflowInstance::WaitForCompletion Method

## IWFWorkflowInstance::WaitForCompletion Method [C++]

## IWFWorkflowInstance.WaitForCompletion Method [Visual Basic]

The **WaitForCompletion** method waits until the current XLANG schedule instance completes executing.

### Syntax

[C++]

```
HRESULT WaitForCompletion();
```

[Visual Basic]

```
object.WaitForCompletion()
```

### Parameters

[C++]

None

[Visual Basic]

None

### Return Values

[C++]

For a list of error messages returned by the XLANG Scheduler Engine, see [XLANG Schedule Error Messages](#) or [Standard COM Errors](#).

[Visual Basic]

None

### Error Value [Visual Basic]

[Visual Basic]

If an error is raised, **Err.Number** is set to one of the values documented on the [XLANG Schedule Error Messages](#) or [Standard COM Errors](#) page.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header:** Include SkedCore.h

**Library:** Use XLANG Scheduler Runtime Type Library (SkedCore.dll)

# BizTalk Messaging Services Code Samples

Sample files are located in the Messaging Samples folder in the Microsoft BizTalk Server installation drive. Browse to \Program Files\Microsoft BizTalk Server\SDK\Messaging Samples on the installation drive to find the sample files. This is only a relative path. Depending on your installation of BizTalk Server 2000, you might have to modify this path.

The following samples are available in the BizTalk Server 2000 SDK:

Sample folder name	Readme file	Description
BTConfigAssistant	Readme.doc	This tool enables the user to see all details of a configuration. It also provides a mechanism to easily import and export configurations.
BTFDevToolkit	ReadMe.txt	This folder contains the BizTalk Framework Developers' Toolkit and XML Components.
BTSApplication\VB (Visual Basic)	Readme.txt	This sample demonstrates an application integration component (AIC) that implements the <b>IBTSApplicationIntegration</b> interface.
BTSApplication\VC (C++)	Readme.txt	This sample demonstrates an AIC that implements the <b>IBTSApplicationIntegration</b> interface using ATL.
CustomPreProcessor	Readme.txt	This sample demonstrates a simple implementation of a custom preprocessor to be used with either File or Message Queuing receive functions.
DirectIntegration	Readme.doc	This tool helps users submit documents to BizTalk Messaging Services and check the results of the submission. Tracking and Suspended Queue information is used to determine the results.
DistributionList	DistributionListReadme.txt	This sample configures a BizTalk distribution list (port group) and submits a document to it.
MapTest	Readme.txt	This tool allows users to create a document using an XML document instance, a compiled BizTalk Server map, and an optional schema.
Miscellaneous	No readme files are included with these samples.	Several Microsoft Visual Basic Scripting Edition (VBScript) files are included in this folder that perform various tasks. Descriptions are available in comment blocks at the beginning of these files. To view them, open the .vbs file in an editor.
PipelineComponent\VB (Visual Basic)	Readme.txt	This sample demonstrates an AIC that implements the <b>IPipelineComponent</b> and <b>IPipelineComponentAdmin</b> interfaces in Visual Basic.
PipelineComponent\VC (C++)	Readme.txt	This sample demonstrates an AIC that implements the <b>IPipelineComponent</b> and <b>IPipelineComponentAdmin</b> interfaces, using ATL.
ReceiveScripts	ReceiveReadme.txt	This folder contains example files for receiving data into BizTalk Messaging Services.
Sample1	Sample1Readme.txt	This sample demonstrates how to configure BizTalk Messaging Services and submit a document to BizTalk Server 2000. Also included in the sample are the creation and use of open destination messaging ports, organization aliases, and custom envelopes.
Sample2	Sample2Readme.txt	This sample demonstrates how to configure BizTalk Messaging Services to generate "receipts" when sending documents.
Sample3	Sample3Readme.txt	This sample demonstrates how to configure a distribution list (port group) and send a document to it.
SampleFunctionoid	Readme.txt	This sample demonstrates a custom functoid that performs date format conversion.
SampleImporter	Readme.txt	This sample demonstrates a custom import module, which imports a delimited flat file and displays it in BizTalk Editor.

SOC	Readme.txt	This sample demonstrates a synchronous interaction with the XLANG Scheduler Engine.
SQLServerAgentJobs	Readme.txt	This sample demonstrates SQL scripts for monitoring receipts and purging the tracking information.
VBCustomPreProcessor	Readme.txt	This sample demonstrates a simple implementation of a custom preprocessor to be used with a File receive function.
XSDConverter	Readme.txt	This sample converts an XDR schema to an XSD schema.

#### Notes

- When using C++, you need to add Program Files\Microsoft BizTalk Server\SDK\Include to the include directory list.
- Some of the samples have a dependency on the Pipecomplib.tlb file. For these samples, you need to add \Program Files\Common Files\Microsoft Shared\Enterprise Servers\Commerce to the include directory list.

# BizTalk: Implement Design Patterns for Business Rules with Orchestration Designer

Christian Thilmany and Todd McKinney

This article assumes you're familiar with COM+, MSMQ, and Visual Basic

Level of Difficulty 1 2 3

Browse the code for this article at **Code Center**: [BizTalk Patterns](#)

**SUMMARY** Because the value of good software planning and design should never be underestimated, it can be beneficial to use one of the many existing design patterns as a foundation for solving some of your toughest architecture problems. This article describes several traditional design patterns including the Observer pattern and the Dispatcher pattern, elaborates on their structures, what they're used for, and how they can help you build a BizTalk-based solution. Following this is a discussion on using the BizTalk Orchestration Designer to build designs and integrate existing business processes.

**W**hen it comes to software design, a good design is a good solution regardless of the technology. And no matter how good the

technology may be, it is only as good as its design, and specifically the implementation of that design. In fact, a great design with older technology may still be good, but a bad design with new technology is usually just bad. Most great designs aren't developed on the first attempt; they must go through stages of change before they can be considered valuable. How do you learn to approach existing designs in a new way? And once you have a good design, how do you make it reusable? An even better question is how do you reuse what others have struggled to perfect?

If you are thinking about Unified Modeling Language (UML), you are close, but not quite there. UML helps, but it really only contains the hieroglyphics (or language) you may need to convey your design. It is the standardized and fossilized assemblage of those UML symbols we need, and all of the historical toil that has gone along with those assemblies. Enter design patterns.

In this article, we will explain and implement the Observer and Chain of Responsibility patterns adapted from the book *Design Patterns: Elements of Reusable Object-Oriented Software* (Addison-Wesley, 1995). We'll do the same with one of our own patterns, called the Dispatcher. We'll show you how to use these patterns in such a way that they can be applied to a loosely coupled architecture as one implemented with BizTalk. This is not to say that these patterns only apply to BizTalk or any particular implementation. In fact, design patterns have traditionally been associated with purely object-oriented languages. In this article we will take some of the more traditional object-oriented design patterns, such as the Observer pattern, and use them in slightly different ways, while still keeping their behavioral benefits intact.

We hope to show how traditional design patterns can be seen and utilized in any design, or in any technology. Recognizing them not only helps improve your own custom design, but it also helps explain an existing implementation, whether this implementation is custom code you must now support or a commercial application such as BizTalk. We will also refer to other related patterns such as Interface, Factory Method, and Delegation. Finally, we will implement each pattern in the context of the BizTalk Orchestration Designer and put the patterns to work in a custom way. In addition, we'll even point out a few patterns that BizTalk itself uses.

Our sample implementation, available for download from the link at the top of this article, focuses on a product support department. (No, it is not another purchase order or reservations code sample!) The sample application will show how applying patterns to BizTalk can significantly ease the development and design for each subdepartment. It will provide the ability to answer and route online product support questions effectively and efficiently. But first we must explain the patterns themselves.

## Learning about Design Patterns

One of the better places to start learning about patterns is with the "Gang of Four" Erich Gamma, Richard Helm, Ralph Johnson, and John Vlissides, authors of *Design Patterns*. Like the "three amigos" of UML (Grady Booch, James Rumbaugh, and Ivar Jacobson), these four began the work of forming what is now thought of as the standard patterns. Besides Christopher Alexander, who first spoke of design patterns when referring to the actual architecture of buildings, the Gang of Four's work represents some of the original thoughts on object-oriented design patterns. In their book, they use C++ and Smalltalk; however, the book is geared to the patterns themselves, and not the language used to implement them. This general applicability to all languages is what makes patterns so powerful.

If you're looking for a true introduction to the world of object-oriented design, and to some of the more fundamental patterns, read Craig Larman's *Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and the Unified Process* (Prentice Hall, 2001). His General Responsibility Assignment Software Patterns (GRASP) provide some of the more basic object-oriented principles as applied to design patterns such as Low Coupling, High Cohesion, Expert, and so on. Traditionally, howev

er, design patterns are geared to object-oriented languages.

For the developer using Visual Basic® 6.0 or earlier, this presents somewhat of a challenge. Using patterns with these versions of Visual Basic (which only support interface inheritance and don't support implementation inheritance) limits developers from using those patterns that do not make heavy use of implementation inheritance. Those patterns, such as the ones from the Gang of Four that use moderate levels of implementation inheritance, can be used with interface inheritance instead. This can still be done without damaging the intent of the pattern. This is exactly what we will demonstrate when we apply the Observer and Chain of Responsibility patterns later in our code. This does not apply to architectural patterns or to known design patterns that originally (or only) intended to use interface inheritance.

## Design Patterns versus Architectural Patterns

Besides being an outstanding communications tool, design patterns help make the design process faster. This allows solution providers to take the time to concentrate on the business implementation. More importantly, patterns help formalize the design to make it reusable. Reusability not only applies to the components themselves, but also to the stages the design must go through to morph itself into your final solution. The ability to apply a patterned repeatable solution is worth the little time spent learning formal patterns, or to even formalize your own.

When referring to design patterns in this article you will note that we usually leave out the word "design" since we are not only covering design patterns, but also what some refer to as architectural patterns. Most pattern books typically cover design patterns since more of the well-known patterns are at the design level. Rarely do they encroach upon the architectural level.

What is the difference? Some of this is subjective, but design patterns tend to be applied at lower levels of detail than architectural patterns. This means looking at how design applies to the structure of code within an architecture and the structure of the application as well.

In contrast, architectural patterns are usually focused on the reexecutable binary pieces of the system and not as much on the design within the system. Existing material covering architectural patterns is currently rather limited, but will hopefully become commonplace as time progresses. What we will be discussing in this article is a mixture of the two: combining known design patterns with a more architectural solution.

## Pattern Descriptions

To help explain what patterns are, the Gang of Four breaks a pattern's description into sections, which helps not only explain the pattern in detail, but also shows its context and its relationship with other design principles. These sections include: intent, motivation, applicability, structure (for example, UML notation), and consequences. In addition, areas such as the pattern's participants, its collaborations with other elements, and its implementation help provide elemental detail so that the pattern can be specifically applied to a design. A little sample code helps as well.

Some patterns can be self-explanatory. Others, however, are not. Some patterns may even overlap in meaning, thus it is recommended that all patterns follow certain classifications based on principles such as the pattern's purpose and scope. *Design Patterns* breaks this down into creational, structural, and behavioral categories. The point of all this sometimes convoluted classification is to give the pattern its context. Otherwise it is sometimes difficult to know when, or even how, to apply it.

Unlike the Gang of Four, we limit our pattern descriptions to a few consolidated descriptives. Hopefully this will give enough information about each pattern and how it can be implemented.

## The Chain of Responsibility Pattern

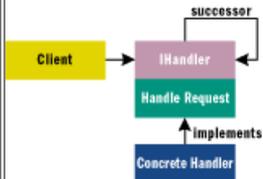
The intent of the Chain of Responsibility pattern is to provide a loosely coupled sender/receiver relationship by providing more than one component an opportunity to handle a request. This chains all receiving components and passes the request along the chain until the request is handled.

**Motivation** In an environment where business rules may be implemented in different components, or even in different applications, request senders should only have to maintain simple relationships. The sender or requester may only have enough information to send requests to one party. Also, to avoid unnecessary coupling of business logic among all requesters, only one receiver need be contacted in order to initiate a request. In cases where business rules may be distributed among separated applications or environments, it is prudent to hold requesters to a single relationship to avoid unnecessary coupling.

**Context** When a request is made that may require complex resolution, you might have to distribute the business rules used to fulfill that request. This may be due to system complexity, application architecture, or the request may be general enough to warrant a form routing to adequately respond with a reasonable answer.

As is the case for our product support sample, the request may not be fulfilled at one application site due to the distribution of the knowledge bases used to answer a request. The request must be routed until it can be handled. This also provides the benefit of not requiring the sender to have intimate knowledge of the appropriate receiver upon which to make the request. Finally, as in our sample, it provides enough flexibility to allow the routing order to change or even provide additional receivers in the system without the sender ever knowing.

**Solution and Structure** Here's where this pattern gets interesting. Traditionally when dealing with only object implementations of a class structure (for example, a system of just Visual Basic-based components and no BizTalk), the structure would look exactly like the Chain of Responsibility class model (see **Figure 1**).



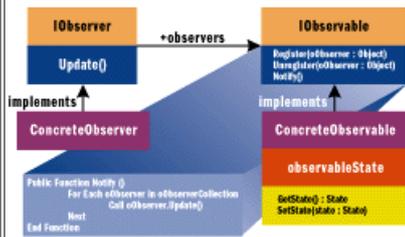
**Figure 1 Pattern Class Model**

Any client could make a request to a member of the chain via a single interface, IHandler. Notice that this is where our UML model differs slightly from the original UML model from the Gang of Four: we substitute the base class for an interface so that this can be implemented using Visual Basic 6.0. When calling HandleRequest, the implementor of IHandler would then either handle the request or forward it on to the next member of the chain. Each handler, via the ConcreteHandler implementation, would have the ability to decide how to handle the request. The client doesn't know or care who handles it, as long as it is handled somewhere. In a loosely coupled system such as BizTalk, the choice for applying this pattern opens up several additional implementation possibilities, as we'll soon show later in this article.

**Implementation** In our example, the product support concrete handler can be a direct recipient of a method call, as we just described. However, with BizTalk you can now loosely couple the links between each concrete handler by using message queuing. This not only allows each concrete handler a loosely coupled way of receiving a request in a BizTalk-friendly manner, but it also provides a guaranteed form of delivering a request. This implementation can even be further expanded to span organizations by means of the BizTalk Messaging Manager. (Unfortunately, we don't have the space to cover this part of BizTalk here.) In our product support example we use Microsoft® Message Queuing (MSMQ) to do just that (see [Figure 2](#)).

**The Observer Pattern**

The intent of the Observer pattern (see **Figure 3**) is to provide a mechanism to allow objects to subscribe dynamically to state change notifications from another object.



**Figure 3 Observer Pattern Class Model**

**Motivation** When client objects communicate with a server object of some kind, it's beneficial for those client objects to be made aware of server-side state changes in that object. This allows subscriber clients the opportunity to react to those state changes in a more dynamic fashion, thus adding robustness to the application.

**Context** Suppose a client communicates on a regular basis with a server object, but that communication is time-critical. As in the case with our observable component in the product support sample, each initial registration with the observable causes the publisher of information (Observable) to retain a copy of that reference for later notification. The server, or observable object in this case, just notifies all observers of the state change, not caring which objects (or schedules in our case) are actually observing it. Take heed, however. If there are hundreds of schedules all needing to be notified, this could be a significant performance hit. In this case, the notification mechanism would be better served running from a separate multicasting thread.

**Solution and Structure** As with the Chain of Responsibility pattern, this is where this pattern becomes interesting in the context of BizTalk. Traditionally, the Observer pattern is made up of an observer class which implements an interface containing a method that the Observable will call during notification. Notice that, like the Chain of Responsibility, our pattern model differs from the Gang of Four's by our use of interfaces. On the other side, the Observable class implements an interface that the observer calls in order to register with it. The observer calls Register whenever that client wants to begin receiving notifications. The Observable class then keeps a list of observers and, during state changes, calls the notification method on the interface passed to it by the observer during registration.

You may already be familiar with this publisher/subscriber-type relationship. If an observer wants to stop receiving notification, then that observer simply unregisters with the Observable object in similar fashion, or during notification unregistration may be automatic and immediate; this is a design decision. With BizTalk, the Observer and Observable boundaries usually will begin and end with exit and entry points of a compiled schedule, as you'll soon see.

**Implementation** In our example, we use the Observer pattern to receive notification of changes to the knowledge base. This notification takes the form of application-to-application communication. A component that wants to receive notification passes in a reference to itself, which is instantiated and called when the status change occurs. Note that this implementation also takes a loosely coupled, stateless form. We do not pass a live object reference, as with a callback, but rather a BizTalk-based schedule path that is composed as a moniker and used to instantiate the observer on notification.

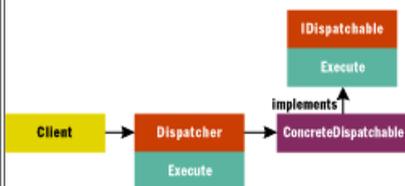
## The Dispatcher Pattern

The intent of the Dispatcher pattern is to provide a single point of contact, or brokered handler, to all external requesters. In addition, it also provides a simple mechanism or entry/exit point into an existing system to decouple external systems from requesting internal components.

**Motivation** When trying to decouple synchronous or even asynchronous component-to-component communications, this pattern helps provide a single point upon which to communicate. This also isolates internally running components from having knowledge of which protocols will be used to communicate with external systems. This is especially important where existing orchestrations in BizTalk have already been implemented, thus preventing multiple changes from being made within the BizTalk-based schedule.

**Context** In our product support example, BizTalk will be used to orchestrate support question responses and route those questions/responses appropriately. The dispatcher will be used to forward those questions not handled by anyone in the product support channel that we have set up. This external communication could be with external trading partners or within the organization. By providing a loosely coupled single point of communication to external resources from within each BizTalk-based schedule, we provide a proxy upon which to implement any change in that communication path. Changes could include protocol, message type, or process flow change as handled by other BizTalk-based schedules or directly with the external partner.

**Solution and Structure** The Dispatcher pattern (see **Figure 4**) is made up of a main broker-like Dispatcher component which is called by any client (an existing path within a BizTalk-based schedule in our case). The Dispatcher component then forwards that request in a uniform fashion to the external resource which can be identified by the message itself (an XML message in our case). Identifying the external component to call by message is only one option. The contract between the Dispatcher and the external resource, in this case a ConcreteDispatchable, must be established.



**Figure 4 Dispatcher Pattern Class Model**

For example, if direct component communication through COM is determined as the means of communication from the Dispatcher to the Dispatchable, then through the message that is passed to the Dispatcher, the Dispatcher may be able to instantiate the external components, and through its established contract call a predetermined interface on that method (IDispatchable). This is only one example of the many implementation forms of this pattern.

**Implementation** In our example, the Dispatcher pattern is used to provide a flexible integration point with external systems. This particular implementation uses a factory-method style of object creation based on the topic. Another viable option would be to pass the progid of the ConcreteDispatchable object in the XML message itself, or even use the BizTalk "openness" features to dynamically instantiate the appropriate external component (see the BizTalk documentation for details). The choice is yours but the same principles apply. The following code illustrates the creation of specific implementation component instances based on the topic found in the XML document.

```
sTopic = oDOM.selectSingleNode("./topic").Text
If sTopic <> "" Then
    'Dispatcher ACTS as a factory method pattern as well
    If sTopic = "BizTalk" Then
        Set oDispatchable =
        CreateObject("BizTalkPatterns.ConcreteDispatchable")
        Call oDispatchable.Execute(sXML)
    ElseIf sTopic = "MSMQ" Then
        'and so on...
        'Set oDispatchable = CreateObject("...")
```

## Other BizTalk-friendly Patterns

Two other database-friendly patterns worth mentioning are the Interface pattern and the Factory Method pattern. Although the Interface pattern is a simple design pattern, using interfaces in an environment such as BizTalk is extremely useful. In keeping with using patterns that exhibit loosely coupled aspects, using an interface to all components abstracts the caller from changes to the implementation of the component implementing the interface. This increases the robustness of the architecture and may eliminate unnecessary recompilations in Visual Basic as well as provide a contract upon which to build further implementations using that same interface.

The Dispatcher pattern in our example demonstrated another well-known design pattern that uses a single method as the factory or creator of other objects. This Factory Method pattern isolates the caller from knowing the complexities of instantiating and initializing other worker components in the system. This comes in handy when dealing with external systems where coupling external components in each BizTalk Orchestration would violate its loosely coupled design.

But what does all this have to do with BizTalk? Well, let's see.

## BizTalk and the Orchestration Designer

BizTalk is made up of many elements, including the Orchestration Designer which we used to orchestrate the components in our sample. The Orchestration Designer is one of the most powerful and flexible features of BizTalk. Misusing it is also one of the easiest ways to turn a bad design into a bad solution.

Communicating to a BizTalk server implementation simply means using XML as the message format. As you may already know, BizTalk is completely structured around XML and uses a SOAP 1.1 XML message format. The BizTalk-friendly XML message is nothing more than a SOAP 1.1 XML message with additional biztags to comply with the BizTalk Framework specification.

BizTalk Server 2000 is the Microsoft implementation of the BizTalk framework specification. While BizTalk Server happens to run on a Windows® 2000 platform, the framework specification is implementation-agnostic. Any language could be used to implement a BizTalk server as long as it complies with the framework. This provides one of the most powerful features of BizTalk. A message could be sent to a BizTalk server (known as reliable messaging in BizTalk Server 2000) from anywhere as long as it's a well-formed and valid BizTalk message (see the BizTalk Framework 1.0 for details at <http://www.biztalk.org>). A BizTalk message can be received by an Active Server Page or message queue and forwarded to a running BizTalk server via BizTalk Messaging Manager. A message may even be sent directly to a compiled BizTalk Orchestration schedule. But where do you implement complex logic after a BizTalk server gets its hands on the message? This is where the Orchestration Designer comes in.

The BizTalk Orchestration Designer is a Microsoft Visio® 2000-based design tool that, when compiled, can run as an XLANG schedule. XLANG itself is described through XML (view a compiled schedule in Notepad and see for yourself). The designer provides a high-level means of orchestrating a middleware system's moving parts. Those moving parts can take the form of a message queue, COM component, BizTalk Channel, file, e-mail message, or HTTP-based service. Orchestration Designer provides a way to create loosely coupled business processes that may optionally be long-running in nature. With the Orchestration Designer, analysts not privy to the implementation complexities of COM or Web development can participate in the development of business rules by using the designer in Visio to lay out the business flow. The developer can then implement the moving parts that these designers orchestrate.

But what is the best way to implement BizTalk-friendly moving parts? This is where design patterns come in.

## Using the BizTalk Orchestration Designer

There are three key object categories in the business process page of the Orchestration Designer: flowchart shapes, ports, and implementation shapes. Conceptually, the way this works is that you, or your friendly neighborhood business analyst, use the flowchart shapes to create the process flow. The flowchart shapes support basic constructs such as if-then-else decisions, looping while a condition is true, branching execution, rejoining the branches together, and defining transactional boundaries. These relatively simple constructs can be used to create infinitely complex process logic. Implementation shapes come in a few varieties, most of which will be familiar to readers who have used MSMQ and COM+. You can implement application functionality in four basic ways: COM+ components, script components, MSMQ, or BizTalk Messaging. The glue that binds the business process to the implementation code is the third major object category in BizTalk process design: the port.

Ports are named locations where messages are sent and received. Ports can be defined initially as unbound or bound. To create an unbound port, on a design page in the BizTalk Orchestration Designer, right-click on the separator bar and select Add New Port from the popup menu. One primary use of the unbound port is to import an XML document and define the fields that will comprise the message to be passed. Note that unbound ports are less useful than bound ports for defining message flows, especially those that are bidirectional.

To create a bound port, drag an implementation shape onto the right side of the Orchestration Designer page and follow the wizard steps for that implementation. Binding a port provides the ability to define precisely what will travel through the port in each direction, since the target implementation is known when the binding is created. These steps are explained in greater detail in the BizTalk Server 2000 help file. The difference between these two means of port creation is illustrated in [Figure 5](#). Ports are located on the separator bar, with the business process depicted to the left of the bar and the implementation displayed to the right.

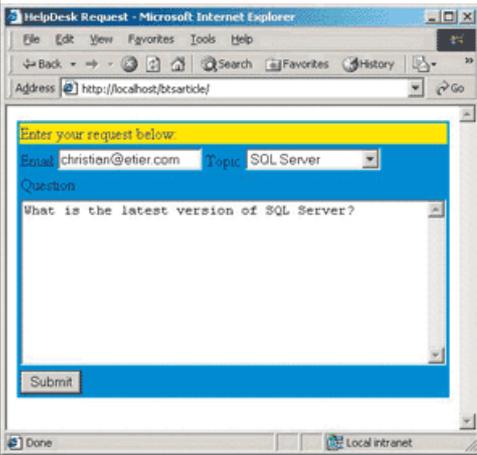
BizTalk Orchestration shouldn't be used to design processes at too granular a level (see the Orchestration whitepapers at <http://www.microsoft.com/biztalk>). Its primary value is integration of existing business processes. To illustrate this idea, consider a traditional business application that uses COM+ components to control the process, and additional COM+ components to perform the work. System designers should strive to replace the controller functionality of such an application with BizTalk, and make use of the existing COM+ work components. As an analogy, you should do your choreography with BizTalk, and do the dancing with COM+, MSMQ, script components, and the BizTalk message tools.

Enough of the tool itself, how do we implement our patterns?

## Implementing the Patterns

To provide some context to the scenario that we are tackling, consider the following situation. A hypothetical software company that is small but growing fast has engaged us to consult on their internal systems. The problem is that their existing product support process is taking too much manpower to staff, and the company is having a difficult time gathering quality metrics on this function. The existing system is implemented in Microsoft Exchange, and uses the workflow capabilities of that product to route issues among support personnel.

What is needed is a comprehensive self-service solution to augment the existing application, and to answer questions without direct product support involvement. It would be a simple matter to expose the existing internal knowledge database to the Web as a solution to the problem (see **Figure 6**), but we want to illustrate that there are benefits to using BizTalk Server to accomplish this integration of existing and new functionality.



**Figure 6 Default.asp Query Submission Form**

One of our goals in creating the samples was to demonstrate the flexibility of using BizTalk Server Orchestration as the core application engine. Multiple integration points are possible using this architecture. Consider our first entry point into the system: an ASP page creates a COM+ component, then calls a method on that component that places the request message into an MSMQ queue. An XLANG schedule, which already has an instance running, picks up the request from the queue, launches a new schedule instance to monitor the queue, and proceeds to service the request by calling other COM+ components. Entry point number two illustrates a completely different scenario for achieving similar functionality. Here we take a request message from the browser and post it directly into the XLANG schedule from the ASP page.

The pattern implementations we have chosen also achieve a high degree of flexibility and extensibility. The Chain of Responsibility pattern is inherently flexible, functioning similarly to a linked list. The only knowledge required of a participant in the chain is where to forward the request if it can't be resolved. This is made even more flexible in our BizTalk implementation by allowing the component to directly forward the message via a call to Client.Execute. Client.Execute simply acts as a wrapper around the MSMQ APIs such that a message can be sent to a specified queue. The ConcreteHandler tells Client.Execute which queue to send to, which also happens to be the next queue in the chain. If, however, the component developer does not want to mess with the MSMQ APIs, the queue name can also be returned back to a running schedule where BizTalk is used to dynamically send the message to the appropriate queue in the chain. This is one of the niceties of BizTalk. The designer can now benefit by diverging from the traditional pattern implementation by doing it the "BizTalk way."

The code in [Figure 7](#) shows the logic for arbitrarily passing a message to the next component using each of the methods just described. If the Boolean variable bSendDirect is true, the component is instantiated and called. If bSendDirect is false, the value is returned to the schedule and the orchestration invokes the component via MSMQ.

BizTalk Server also greatly simplifies the implementation of the Dispatcher pattern in our samples. We simply branch execution of unhandled requests to the Dispatcher implementation from within our orchestration schedule. By doing this, we have created a well-defined integration point with external systems that has built-in flexibility and extensibility to guard against major code rewrites when the operating environment changes.

Finally, the Observer pattern's functionality provides a simple and powerful mechanism for dynamically modifying system functionality, and responding to events that the application developer deems to be interesting. With a minimum of additional effort, we could use BizTalk Server's persistence mechanisms to create Observer/Observable relationships (or publish/subscribe if you prefer) that live beyond catastrophic events like system failures. In the following code, we illustrate the Observable object as it provides notification to all registered observers through XLANG. The XLANG scheduler allows us to access the schedule as an object.

```

From IObservable_Notify:
    While (nCount < m_iObserverCount)
        sSchedule = m_saObservers(nCount)

        strURL = "sked:/// " & sSchedule
        ' This enables the XLANG Scheduler Engine to execute the XLANG
        ' schedule.
        Set objExecute = GetObject(strURL)
        Set oObserver = objExecute.Port("Observer")
    
```

**For related articles see:**

House of COM

["Make Your Legacy Apps Work on the Internet"](#)

**For background information see:**

<http://www.microsoft.com/biztalk>

*Design Patterns: Elements of Reusable Object-Oriented Software* by Gamma, Helm, Johnson, and Vlissides (Addison-Wesley, 1995)

**Christian Thilmany** is President of the eTier Group Inc. a consulting firm in Houston, TX. He specializes in distributed application architectures for Internet, Intranet, and client/server development. He can be reached at [christian@etier.com](mailto:christian@etier.com).

**Todd McKinney** is a Senior Consultant for Microsoft Services, specializing in middleware, enterprise development technologies, and system design. He can be reached at [toddmck@microsoft.com](mailto:toddmck@microsoft.com).

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# BizTalk Messaging: Building BizTalk Server Custom Parsers and Serializers

Joseph Fultz  
Microsoft Corporation

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**Summary:** BizTalk Server 2000 includes interfaces that allow developers to add proprietary parsers and serializers for specialize incoming and outgoing file formats. This article discusses and defines custom BizTalk Server 2000 parsers and serializers, the purposes they serve, and the interfaces required to implement them. It also walks you through a simple parser and serializer pair implementation. (50 printed pages)

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## Introduction

Microsoft® BizTalk™ Server 2000 is one of Microsoft's .NET Servers. It is a powerful tool for handling the trading of documents between companies, organizations, and applications. It has state-of-the-art features for handling transactions, workflow, document transformation, and delivery—all of which are based on industry standards such as HTTP, HTTPS, XML, and XSL.

While the out-of-the-box features and tools of BizTalk Server will meet the needs of most users, there will be times when custom work is needed to handle specialized incoming and outgoing file formats. For this reason, BizTalk Server 2000 has been created with interfaces to allow developers to add their own proprietary parsers and serializers. This document explores and describes what custom BizTalk Server 2000 parsers and serializers are, what purposes they serve, the interfaces required to implement them, and walks through an implementation of a simple parser and serializer pair.

This white paper is targeted at those who have at least a working familiarity with BizTalk Server 2000, COM, and Microsoft Visual C++®. Throughout the paper, terminology associated with BizTalk Server 2000—channels, ports, receipts, interchanges, and so on—will be used freely. If you need clarification on any of the topics covered, there are articles online at <http://www.microsoft.com/biztalk>, or you can review the BizTalk Server documentation.

BizTalk Server 2000 includes parsers for flat file formats, XML, and EDI that when combined with document specifications defined within BizTalk Editor are very powerful and flexible and will usually meet your needs. However, there are various reasons that implementing a custom parser and serializer pair might be important. Some examples of this would be receiving and parsing a document that contains binary data that must be submitted to BizTalk Server 2000, the desire to have custom receipt correlation, accepting interchanges (files) that contain multiple documents, or simply to handle custom document types that do not lend themselves to XML-Data Reduced (XDR) representations, for example, RosettaNet objects (<http://www.rosettanet.org>). The case of the interchange with multiple documents is a very tangible example. Imagine that you want to enable partners to submit to you a document that represents a batch of documents. This is a very common practice in the health care industry for processing billing. So, each of the documents in a single file can be a valid XML instance of the document, but the included XML parser will not be able to parse it because the document as a whole has multiple root nodes and is not a valid instance of the document, nor is it a valid XML instance at all. For example, a valid instance might have the following format:

```
<docroot>
<header>
<field1/>
<field2/>
</header>
<body>
<field3/>
<field4/>
</body>
```

```
</docroot>
```

However, the partners from whom you receive interchanges that represent a batch would send a file containing:

```
<docroot>
<header>
<field1/>
<field2/>
</header>
<body>
<field3/>
<field4/>
</body>
</docroot>

<docroot>
<header>
<field1/>
<field2/>
</header>
<body>
<field3/>
<field4/>
</body>
</docroot>

...n
```

While you could simply implement a custom BizTalk Server preprocessor, the most you could do with the preprocessor is wrap the documents in a parent XML structure or reorder the file completely. However, doing either one of these will break the concept of groups and multiple documents per group by making the input interchange appear to be one document. Thus, you want to implement a custom parser to handle the parsing of this document. In this case, it would be as simple as breaking up the stream into its separate documents and passing on the data. The parsers that ship with BizTalk Server recognize groups and multiple documents per group.

This document will review interface and method implementations as they relate to BizTalk Server parsers and serializers. While addressing these topics, this document will explore other BizTalk Server 2000 topics, as they are relevant to the sections on the component and interface implementations. The sample implementation will be based upon passing a simple equation into BizTalk Server 2000, parsing that equation, solving the equation, and serializing the response in a format similar to the incoming document. The example that we are using was chosen because it enables you to easily review and compare the inbound interchange contents pre- and post-parser and serializer execution. A simple data example is chosen, because complex XML and file structures are not the focus of this document.

The inbound and outbound documents will be persisted commerce dictionaries. Commerce dictionaries are objects originally introduced into the platform within Microsoft Site Server and are very similar to the dictionary objects provided by the scripting library (Scripting.Dictionary). The dictionary objects that we will be using are for storing in memory name and value pairs as defined by the user (developer). Commerce dictionaries differ from their scripting library counterparts in several ways, one of which is that commerce dictionaries are free threaded. Additionally, commerce dictionaries support persistence of the entire dictionary object into XML through the **IPersistXML** interface. It is this interface that we will use to create the object (dictionary) representation of our incoming dictionary-persisted XML and to persist the resulting data dictionary into an XML format.

For the sample implementation, the flow of the document will be as follows:

1. Receive XML persisted dictionary.
2. BizTalk Server passes data to custom parser.
3. Parser recreates dictionary object.
4. Parser creates XML instance from dictionary.
5. Equation solved in the channel by a BizTalk Server map.
6. Serializer creates a dictionary object from the outbound XML.
7. Serializer creates outbound XML by calling the dictionary's IPersistXML interface.
8. BizTalk Server saves final instance of outbound document.

**Note** The code samples used do not have exception handling, are not optimized, and are not factored. Thus, they are not intended for production systems.

## Prerequisites

To implement the examples set forth in this document, you need to have BizTalk Server 2000 and all of its prerequisites installed. Additionally, you must have Microsoft Visual Studio® 6 (SP4) installed.

Some files that are needed specifically for BizTalk Server 2000 development are as follows:

- **bts\_sdk\_guids.h**
- **btsparsercomps.h**
- **btsserializercomps.h**
- **commerce.h**

All of these files can be found in the /SDK/Include folder where BizTalk Server 2000 is installed. For example, on my computer the path is C:\Program Files\Microsoft BizTalk Server\SDK\Include\.

Additionally, I made use of a couple of files, computil.h and computil.cpp, from Microsoft Commerce Server 2000 (they were formerly shipped with Site Server 3.0 Commerce Edition). While it is not necessary to use these files, they contain some functions for setting and retrieving dictionary elements that you would probably write yourself to minimize having to repeat the same few lines of code every time that you want to set or retrieve values from the dictionary object with which you are working.

For the purpose of this example, I have also created a couple of functions for use in the sample code and placed them into misc.h and misc.cpp files. You can find those functions in the appendix. Now that the prerequisites are out of the way, we can set up the test harness, which will help us to validate that everything is working as it should before we introduce custom code.

## Setting Up the Test Harness

At this point I am sure that you are ready to create the custom parser and serializer, but first we need to put in place the BizTalk Server artifacts that are needed to test our example parser and serializer. To test this, we need to set up some type of harness for the application. This will include a channel, a receive function, a port, a document definition, and a map.

Once BizTalk Server has been set up with our test harness, we will validate the harness by passing in a compliant XML equation document, solve it through the map inside the channel, and write the outbound document. Having validated that BizTalk Messaging is set up appropriately to handle the equation XML instance, we can move forward to implementing the parser.

So, before we even begin with the code, let us set up BizTalk Messaging Services so that we can test our parser and serializer. Of the items that we need to set up, the first thing is to decide on and define the document that we will be using in our sample.

## Creating the Document Specification

I am using a standard equation document that I use variances of in testing various XML-based application prototypes. The following schema defines the document that we are going to use:

```
<?xml version="1.0"?>
<!-- Generated by using BizTalk Editor on Tue, Dec 05 2000 01:32:56 PM -->
<!-- Microsoft Corporation (c) 2000 (http://www.microsoft.com) -->
<Schema name="Equation" b: BizTalkServerEditorTool_Version="1.0" b:root_
reference="Equation" b:standard="XML" xmlns="urn:schemas-microsoft-
com:xml-data" xmlns:b="urn:schemas-microsoft-com: BizTalkServer"
xmlns:d="urn:schemas-microsoft-com:datatypes">
<b: SelectionFields/>

<ElementType name="Result" content="textOnly" model="closed">
<b: RecordInfo/>
</ElementType><ElementType name="Operator" content="textOnly" model="closed">
<b: RecordInfo/>
</ElementType><ElementType name="Operand2" content="textOnly" model="closed">
<b: RecordInfo/>
</ElementType><ElementType name="Operand1" content="textOnly" model="closed">
<b: RecordInfo/>
</ElementType><ElementType name="Equation" content="eltOnly" model="closed">
<b: RecordInfo/>
<element type="Operand1" maxOccurs="1" minOccurs="0"/>
<element type="Operand2" maxOccurs="1" minOccurs="0"/>
```

```
<element type="Operator" maxOccurs="1" minOccurs="0"/>
<element type="Result" maxOccurs="1" minOccurs="0"/>
</ElementType></Schema>
```

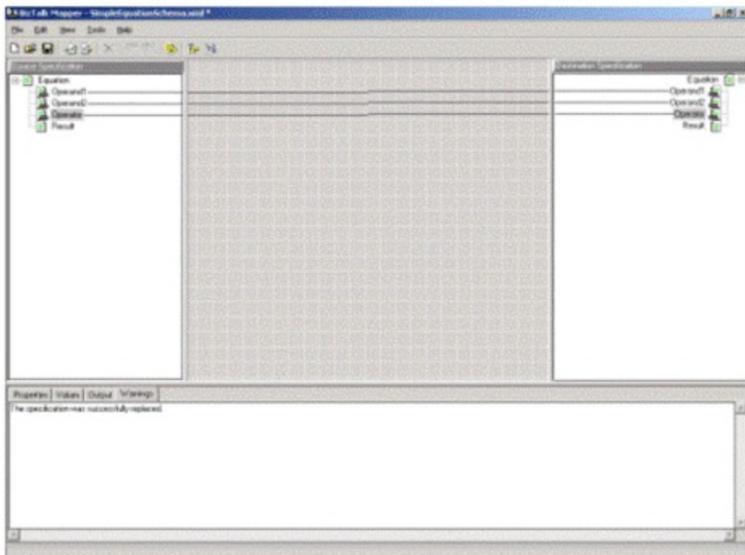
An instance of the above schema would look like this:

```
<Equation>
  <Operand1>43</Operand1>
  <Operand2>26</Operand2>
  <Operator>*</Operator>
  <Result></Result>
</Equation>
```

There is purposefully nothing complex about this data or its representation so that we can focus on the details of implementing parsers and serializers. Once you have created the specification as a file, save it to your repository and create a document definition using BizTalk Messaging Manager. Name the definition SimpleEquationXML. We will need to map the inbound equation to an outbound equation and, through the map, solve the equation.

### Creating the Map

Open BizTalk Editor and use SimpleEquationXML as both your source and destination document. Map Operand1, Operand2, and Operator one-to-one.



**Figure 1. BizTalk Mapper**

Next you will need to use the **Scripting** functoid to generate the result. Place the **Scripting** functoid onto the mapping surface and connect Operand1, Operand2, and Operator into it in the given order. Open the **Scripting** functoid and ensure that the parameters are in the correct order. Click the **Script** tab and place the following script in it:

```
Function SolveEquation(oper1, oper2, operator)
  Dim result

  oper1 = cdbl(oper1)
  oper2 = cdbl(oper2)

  Select Case cstr(operator)
    Case "*"
      result = oper1 * oper2
    Case "+"
      result = oper1 + oper2
    Case "-"
      result = oper1 - oper2
    Case "/"
      if oper2 = 0 then
        result = 0
      else
```

```

        result = oper1/oper2
    end if
end select

SolveEquation = result
End Function

```

Save and test your map. Save the map as map\_SolveSimpleEquation. Be sure to put it into the repository. Now that the document and the map are defined, BizTalk Messaging must be configured to receive and process the instances of the document.

### Setting Up for Document Processing

You need to create a place for incoming and outgoing documents. I used C:\input and C:\output on my computer. Now let's set up the port. Open BizTalk Messaging Manager and create a new port to an organization. I called mine port\_TestParser. For this test I used a couple of organizations that I have defined for testing on my computer. Define the primary transport of File with a location of C:\output\solved\_%tracking\_id%.xml. Accept the defaults for everything else.

When prompted, create a new channel named cha\_TestParser, set the source organization to open, use our previously defined document definition (SimpleEquationXML) as both the incoming and outgoing document, use the previously defined map as the document map, and take the defaults for everything else.

Lastly, set up a receive function in the BizTalk Server Administration snap-in. Create a new File receive function named recv\_SimpleEquation and point it to your receive location for types of \*.xml. On the advanced settings, set the channel to cha\_TestParser.

At this point you should be able to create a sample XML instance from the editor. Modify it and run the document through the channel by using the File receive function. You can use this instance of the document if you want:

```

<Equation>
  <Operand1>43</Operand1>
  <Operand2>26</Operand2>
  <Operator>*</Operator>
  <Result></Result>
</Equation>

```

The output file should look like this:

```

<Equation>
  <Operand1>43</Operand1>
  <Operand2>26</Operand2>
  <Operator>*</Operator>
  <Result>118</Result>
</Equation>

```

At this point we have not done anything with the custom parser and serializer. Instead, we have set up and validated our test harness, thus ensuring that our configuration will produce expected results before we introduce the parser and serializer into the environment. It is a good practice when working with BizTalk Server to ensure that you can successfully pass through the channel first. Subsequently, it is good to ensure that you have channel pass-through and appropriate mapping of the document types—which is what we just accomplished through our test. Make sure that you are able to generate this type of output through your BizTalk Server configuration before you continue.

Now that the pieces of BizTalk Messaging are set up, we will move to implementing the parser and serializer pair to work with XML generated from persisting a dictionary object. The following XML is an instance of that dictionary XML. You will want to create an XML file with it on your system for your use.

```

<DICTIONARY xmlns:dt="uuid:304FB305-29A4-11d3-B0D4-00C04F8ED7A2" version="1.0">
  <DICTIONARY key="Operation"><VALUE dt:dt="string" xml-space="preserve">*</VALUE></DICTIONARY>
  <DICTIONARY key="Operand1"><VALUE dt:dt="string" xml-space="preserve">1</VALUE></DICTIONARY>
  <DICTIONARY key="Operand2"><VALUE dt:dt="string" xml-space="preserve">4</VALUE></DICTIONARY>
</DICTIONARY>

```

Save the file for later. Once the code for the parser is implemented and the parser is ready to run within BizTalk Server, we will need this file to test the parser.

## Implementing a BizTalk Custom Parser

We will implement a parser that expects a dictionary object persisted to XML. The parser will create a dictionary object from the XML, pull out the expected name-value pairs, build the expected SimpleEquationXML document, and place it into the transport dictionary for BizTalk Server to pass on to subsequent parsers and then into the channel. This will allow BizTalk Messaging to produce the equation XML with a mapped result at the other end of the channel.

Within a channel, BizTalk Messaging can be configured to track inbound and outbound documents in both native and XML format. These tracked documents can then be viewed through the BizTalk Document Tracking tool. The native format is the original document format, whereas the XML format represents the format that BizTalk Server places the document into internally. The XML format will match the document specification used, whereas the native format will not necessarily be the same. Thus in our example, the native format will be the document as it exists on disk and before our parser does anything with it. The XML format will be the output from our parser. We very well could have used a binary object BLOB of some type, but using the XML persisted dictionary will give us a very visible example. This will enable us to visibly inspect the native and XML representations within BizTalk Document Tracking and be able to easily read and compare the pre- and post-parser documents. Next let us take a look at what the parser interface looks like and how it works.

### The Parser Interface

A custom parser in BizTalk Server is a COM component that implements the **IBizTalkParserComponent** interface. A custom parser is responsible for transforming data from an incoming document into a representation that is used and expected within BizTalk Server. In our example, the parser will be responsible for transforming a commerce dictionary object persisted to XML into the SimpleEquationXML document that BizTalk Messaging is expecting. The **IBizTalkParserComponent** interface is comprised of seven methods. The following table shows the method names and describes their function.

Method	Description
<b>GetGroupDetails</b>	Gets details of the group for the Document Tracking database. This method is called only if there are groups in the interchange.
<b>GetGroupSize</b>	Gets the size of the group after all documents in the group are parsed. This method is called only if there are groups in the interchange.
<b>GetInterchangeDetails</b>	Gets information about the organization identifiers of the source and destination <b>BizTalkOrganization</b> objects.  This function also performs a sleuth of other tasks, such as finding dynamic delimiters and codepages. It also fills the selection fields.
<b>GetNativeDocumentOffsets</b>	Identifies offsets from the beginning of the stream for final details about the group in the Document Tracking database for final logging.
<b>GetNextDocument</b>	Examines the data in a document and determines when to get the next document if this is not the last document.
<b>GroupsExist</b>	Determines if the interchange contains groups.
<b>ProbeInterchangeFormat</b>	Identifies the format of the interchange.

For a simple interchange that contains a single document, the calling order for the methods is:

1. **ProbeInterchangeFormat**
2. **GetInterchangeDetails**
3. **GroupsExist**
4. **GetNextDocument**
5. **GetNativeDocumentOffsets**

The number of times the methods for handling document groups and retrieving the next document information are called is dependent on the number of groups and number of documents that exist in a given interchange. The parser method calls have been designed to facilitate handling multiple documents and multiple groups of documents in any given interchange. The parser is responsible for informing BizTalk Server as to the existence of groups. If groups exist and are expected in an interchange, the parser must be able to handle them.

A more complex interchange might contain groups and multiple documents per group. BizTalk Server handles the interchange by

calling the parser interfaces in the following manner:

BizTalk Server calls **ProbeInterchangeFormat**, in which the parser gathers information about the interchange, checks the document to determine if it will handle it, potentially grabs a pointer to the data in the interchange, and informs BizTalk Server of the document format if it recognizes it.

**GetInterchangeDetails** is called and the parser grabs any needed information from the dictionary passed to the call.

**GroupsExists** is next in the call order, and the parser checks for the existence of multiple groups and subsequently informs BizTalk Server that this interchange has groups, thus causing BizTalk Server to call some additional methods.

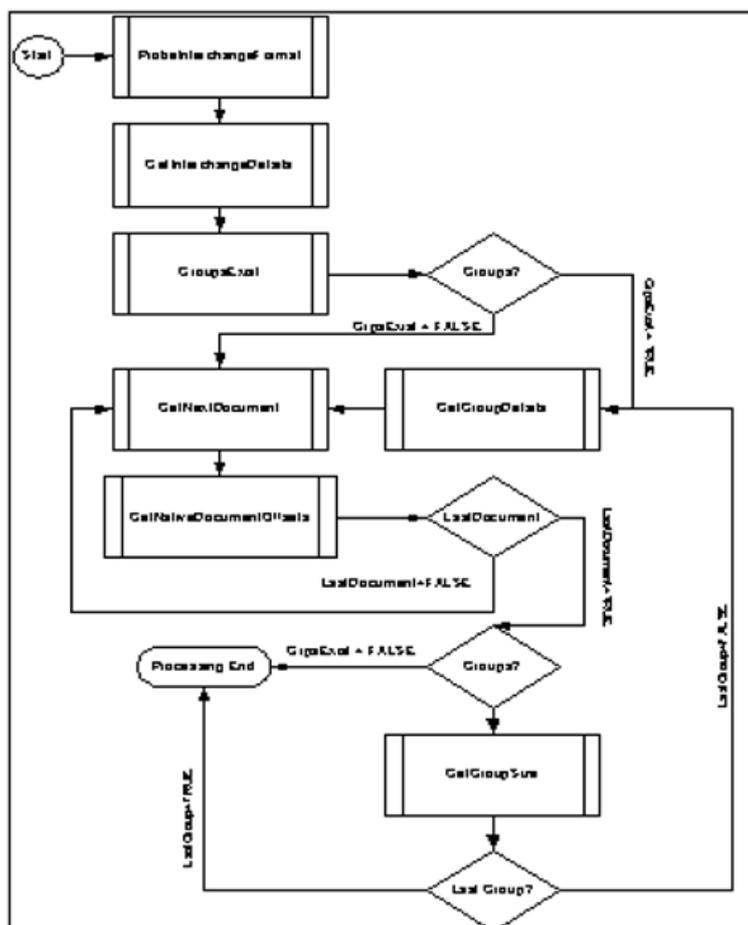
**GetGroupDetails** is the next method called and is where the call pattern diverges from the simple example. Within this call the parser returns information to BizTalk Server with regard to the group identity of the document or documents that the parser is about to process.

**GetNextDocument** is called until the parser reaches the last document in the group. Then the parser indicates that this is the last document as it normally would, but because the parser already determined that the group exists, this indication is of the last document in the group, but not necessarily in the interchange.

**GetNativeDocumentOffsets** operates as it usually would by indicating to BizTalk Server from where in the stream to grab the original data for this document.

**GetGroupSize** is called and the parser informs BizTalk Server of the number of documents in the group and whether this is the last group. If this is not the last group, BizTalk Server subsequently calls **GetGroupDetails**, thus starting another round of document parsing.

Figure 2 shows the flow and decision tree for parser method calls described here.



**Figure 2. Logical flow of parser method calls**

Between the text and the diagram you should have a pretty clear picture of how the methods are called from BizTalk Server. Since we have now covered what the methods are, described briefly their function, and reviewed the call order, let's review the code implemented in the sample.

### Base Code

In creating our example components, we will keep it as simple as possible to focus on the purpose of learning how and why to implement the interface methods. Hence, there will not be any complex error handling or reporting and the code will not be

optimized and factored. Follow these steps to create the skeleton code:

1. Create a new project through the ATL COM App Wizard named FirstParser.
2. Inside FirstParser, create a new ATL Simple Object named Parser1. This is the component in which we will implement the **IBizTalkParserComponent** interface.
3. Include the following files inside Parser1.h:
  - a. bts\_sdk\_guids.h
  - b. BTSParserComps.h. This file contains the definition for our interface, **IBizTalkParserComponent**.
  - c. Computil.h. This file contains the method **PutDictValue**, which we will use to add data to dictionary objects. While this is not necessary, it relieves you from writing similar code to accomplish the same task.
4. Include the functions from the appendix. I created separate files, but you can add the functions to the project however you see fit. These functions are not necessary for BizTalk Server development, but rather were developed specifically for this example.
5. Compile the project to make sure that everything is sitting in place.
6. Add the interface and method for **IBizTalkParserComponent**.
7. Inside Parser1.h, add "public IBizTalkParserComponent" to the class inheritance list.
8. Add the following method prototypes to the class declaration:

```
//Methods for IBizTalkParserComponent
HRESULT STDMETHODCALLTYPE ProbeInterchangeFormat(IStream
    __RPC_FAR *pData, BOOL FromFile,
    BSTR EnvName, IStream __RPC_FAR *pReceiptData, BSTR __RPC_
    FAR *Format);

HRESULT STDMETHODCALLTYPE GetInterchangeDetails(IDictionary __RPC
    _FAR *Dict);

HRESULT STDMETHODCALLTYPE GroupsExist(BOOL __RPC_FAR *GrpsExist);

HRESULT STDMETHODCALLTYPE GetGroupDetails(IDictionary __RPC_FAR *Dict);

HRESULT STDMETHODCALLTYPE GetGroupSize(long __RPC_
    FAR *GroupSize,
    BOOL __RPC_FAR *LastGroup);

HRESULT STDMETHODCALLTYPE GetNextDocument(IDictionary __RPC_FAR *Dict,
    BSTR DocName, BOOL __RPC_FAR *DocIsValid, BOOL __RPC_
    FAR *LastDocument,
    enum GeneratedReceiptLevel __RPC_FAR *ReceiptGenerated, BOOL __RPC
    _FAR *DocIsReceipt,
    BSTR __RPC_FAR *CorrelationCompProgID);

HRESULT STDMETHODCALLTYPE GetNativeDocumentOffsets(BOOL __RPC_FAR *SizeFromXMLDoc,
    LARGE_INTEGER __RPC_FAR *StartOffset, long __RPC_
    FAR *DocLength);
```

9. Add COM\_INTERFACE\_ENTRY(IBizTalkParserComponent) to COM\_MAP so that it will be returned from a **QueryInterface** request.
10. Add IMPLEMENTED\_CATEGORY(CATID\_BIZTALK\_PARSER) to the CATEGORY\_MAP. This is what will identify your component as a parser to BizTalk server. So don't forget it.
11. While you are in this file, go ahead and add the following private members to the class; we will use them later:

```
IStream*    m_pData;
char*       m_pCharData;
BOOL        m_FromFile;
long        m_TotalNumDocs;
long        m_LastDocEndIndex;
```

```

long        m_LastDocLength;
long        m_CurrentDocument;
long        m_LastPositionInString;

BOOL        IsValidDocType(IStream* pStream);
BOOL        CreateXMLFromDictionary(IDictionary* pDataDict, BSTR* OutputXML);
BOOL        CheckStreamForMultipleDocs();

```

12. In the class constructor we will initialize all the member variables:

```

CParser1()
{
    m_TotalNumDocs= 0;
    m_LastDocEndIndex= 0;
    m_LastDocLength= 0;
    m_CurrentDocument= 0;
    m_LastPositionInString = 0;
    m_FromFile= 0;
    m_pData= 0;
}

```

13. Add an override for the **FinalRelease** method so that we can let go of our **IStream** interface:

```

void FinalRelease()
{
    if(m_pData != NULL){m_pData->Release();}
}

```

14. At this point you should have the class declaration complete. Now open the CPP file and add empty method implementations for each of the methods defined by **IBizTalkParserComponent**.

15. Compile. At this point you should have an empty implementation of a BizTalk Server parser.

Just for your own edification during a debug session, in each of the parser method calls add a line similar to this:

```
ATLTRACE("In CParser1::[method name]\n");
```

Additionally, you might want to add "hr = TraceDictionaryValues(Dict);" to the **GetInterchangeDetails**, **GetNextDocument**, and **GetGroupDetails** methods just to give you a look at what is in the dictionary as it is passed in to the method.

If you are re-implementing this sample code, I would suggest that you use the example code for implementing the functions through the copy-paste coding style. I will refer to implementing code snippets within the document, but to get the entire code base you will need to refer to the sample source because this document serves to explain the interfaces, not to deliver the code.

With the base code and base understanding in place, the following sections will go through each method on the parser interface in detail. The methods will be covered in the order of expected execution.

### Implementing the parser interfaces

In implementing the parser, we will focus on implementing the parser to handle a single instance or multiple instances of the document inside the interchange and to assume static routing. In a more complex scenario there could exist dynamically routed and self-routed documents. For the sake of clarity, we are keeping the example complex enough to be relevant, but simple enough to be easily understood. During the coverage of the interface methods, this document will briefly review the items that would be used and how they would be used to address tracking, dynamic routing, and groups inside the interchange. Refer to the parser implementation in the sample code as you work your way through this implementation. While parts of it will be in this document, it will be clearer if you relate the contents of this document to the sample source code.

## ProbeInterchangeFormat

This method is the first method called by the BizTalk Server parser engine. In this method we gather several pieces of information and inform BizTalk Server of whether this is a format that is recognized by our parser.

First the parser must extract enough information from the stream pointer to ascertain whether it has a document with which it can work. This can be as complex or as simple as you need it to be. In other words, if a document coming in has a special encryption algorithm, if it needs to have checksums verified on it that are related only to pieces of the interchange, or if it needs anything else special and specific to determine whether this is an interchange for your parser, you would implement it here. It could be checking for a version number, validating some checksum, or checking a digital signature in the document. In other words, it is up to you, or the semantics of the document exchange agreement, to define the mechanism by which you verify that this is a document that the parser should operate on. In our case, we will simply check for the GUID of the Commerce.Dictionary object to exist within the first 64 bytes of the stream. To do this, the sample code implements a function, **IsValidDocType**:

```
BOOL CParser1::IsValidDocType(IStream* pStream)
{
    HRESULT      hr;
    ULONG        bytesread;
    BOOL         retval = FALSE;

    BYTE*        pbData = new BYTE[TEST_DOC_NUM_BYTES + 1];
```

We read the first 64 bytes from the stream to check for the GUID:

```
hr = pStream->Read ((void*)pbData, TEST_DOC_NUM_BYTES, &bytesread);
```

If indeed we read 64 bytes, let's check it for our GUID:

```
//test for guid
if (SUCCEEDED(hr))
{
    //set the null
    BYTE* pFinalChar = pbData + bytesread;
    *pFinalChar = 0;

    //do the test
    char* lpszTestReturn = NULL;

    lpszTestReturn = strstr((char*)pbData, "uuid:304FB305-29A4-11d3-B0D4-00C04F8ED7A2");
```

Based on the return from the string compare, we return a TRUE or FALSE to indicate whether this appears to be an interchange that we want:

```
        retval = ( *lpszTestReturn == NULL) ? (FALSE) : (TRUE);
    }

    delete pbData;
    return retval;
}
```

Within the parser we implement some code to check the document to see if it is the type that the parser can handle. If it is not, we must return a value to BizTalk Server telling it that we didn't fail, but we don't want this data. The code looks something like this:

```
if(!IsValidDocType(pData))
{
    hr = pData->Seek (dLibMove, STREAM_SEEK_SET, NULL);
    return S_FALSE;
}
```

The return code `S_FALSE` lets BizTalk Server know that we didn't do anything with this interchange. For a complete list of possible BizTalk Server return codes, look in the BizTalk Server online documentation under the topic BizTalk Server 2000 Error Messages.

Note that we only validated that the interchange appears to have something in it that we handle. We could investigate the stream a little more to also determine if it appears to be the type of dictionary we want, that is, a dictionary representing a simple equation. If we did so, it would be to determine whether we think that the stream contains the type of dictionary, but not actually validate any documents. The **GetNextDocument** method allows the parser to inform BizTalk Server as to the validity of a given document, thus document validation is done there.

Once the parser has verified that this is an interchange it wants, it needs to save a reference to the **IStream\*** that is passed into the method. Within this method call is the only place where BizTalk Server will pass the parser a pointer to the data stream. If the parser doesn't get a reference to it now, there will not be another chance. Add a member variable to the class for this, that is, `IStream* m_pData`. Now you need to save the reference:

```
m_pData = pData;
pData->AddRef ();
```

Determine the number of documents within the interchange by counting the number of end tags in the interchange:

```
//get the number of documents in this interchange
CheckStreamForMultipleDocs();
```

Set the document format variable. BizTalk Server will pass this information on to subsequent parsers.

```
bstrFormat = *Format;
bstrFormat = "Custom XML";
*Format = bstrFormat.Detach ();
```

Don't forget to include **AddRef** or you will potentially find yourself with a NULL or invalid **IStream** pointer when the subsequent calls to your parser are made. In the sample code, I have added a couple of other pieces of code for tracing some information to the output window, but you only need to check the message type, save a reference to the stream, and set the message format.

Additionally, in this method we retrieve all the data from the stream and place it in a member variable of the parser class. This simplifies the parsing, as the code will only deal with the character pointer.

Near the top of the function, before we actually checked the interchange, we ensured the stream pointer was at the beginning and retrieved some information on the stream with the following code:

```
//check the data in the stream to see if it is what we want
STATSTG          stats;
LARGE_INTEGER    dLibMove;
CComBSTR         BSTRData;
ULONG            bytesread;
BYTE*            pbData;

hr = pData->Stat (&stats, 0);
m_FromFile = FromFile;
//make sure that the stream is at the beginning.
    It should be, but being defensive isn't all //bad.
if (SUCCEEDED(hr))
{
    dLibMove.QuadPart = 0;
    hr = pData->Seek (dLibMove, STREAM_SEEK_SET, NULL);
}
}
```

We allocate memory for a `BYTE` pointer by using the `cbsize` member of the `stats` (type `STATSTG`) variable, which contains the size in bytes of the stream. We add one byte for a null terminator so that we can treat this as a null-terminated string.

```
//get all of the data out of the stream
pbData = new BYTE[stats.cbSize.LowPart + 1];
```

Now we read all the data and then set the last byte of the BYTE pointer to NULL.

```
hr = pData->Read ((void*)pbData, stats.cbSize.LowPart , &bytesread);

//add null terminator

BYTE* pFinalChar = pbData + bytesread;
*pFinalChar = 0;
```

Also, notice that I have written code to determine if the stream was originally from a file. If it is from a file, it is likely single-byte characters. If it is not, it is likely a BSTR.

```
//save off the data to a member variable for use later
if(m_FromFile)
{
    m_pCharData = (char*)pbData;
}
else
{
    USES_CONVERSION;
    m_pCharData = W2A((LPWSTR)pbData);
};
```

Since I am saving off the data for this example, I am converting to a char\* before saving it. Later on when we look at **GetNextDocument** we will discuss this further. However, for now leave the stream pointer at its end location as we move on to covering **GetInterchangeDetails**.

### GetInterchangeDetails

In this method call the parser will retrieve information with regard to source and destination organization identifiers. Additionally, if an envelope were being used, that information would be available to the parser through this method call. In the sample code, you will see that there is only a method call to write the dictionary name-value pairs out to the debug window.

```
HRESULT STDMETHODCALLTYPE CParser1::GetInterchangeDetails(
    IDictionary __RPC_FAR *Dict)
{
    ATLTRACE("In CParser1::GetInterchangeDetails\n");
    //write the minimal fields from the dictionary to the output device
    //I am using some helper functions borrowed from a commerce server.
    HRESULT hr;

    hr = TraceDictionaryValues(Dict);
    return hr;
}
```

For most XML implementations you will likely not do anything within this function. The dictionary will probably contain the following fields, which can be viewed in the debug window from the **TraceDictionaryValues** call.

Name	Description
Tracking_ID	GUID (string) for tracking purposes
Document_Name	String name of document type
submission_id	GUID (string) to uniquely identify submission
s_Interchange_Spec	String for identifying interchange specification (envelope)

Additionally, if you were working with an EDI type you would possibly have these name-value pairs in the dictionary.

Type	Value Name	Description
EDIFACT		
	interchange_release	Message type release number
	interchange_id	Interchange control reference
	Dest_ID_Value	Recipient identification
	Dest_ID_Type	Identification qualifier
	Out_Dest_ID_App	Identification application
	Src_ID_Value	Sender identification
	Src_ID_Type	Identification qualifier
	In_Src_ID_App	Identification application
X12		
	interchange_id	Interchange control reference
	Dest_ID_Value	Recipient identification
	Dest_ID_Type	Identification qualifier
	Src_ID_Value	Sender identification
	Src_ID_Type	Identification qualifier

Several of the values presented in these tables are used for self-routing documents, for example, the Dest\_ID\_ and Src\_ID\_ prefixed value names. In the sample code we did not do anything with envelopes or the source and destination identifiers. Thus, this method has no effect on our sample implementation. The only thing that we do in the sample implementation is display any values within the incoming dictionary in the debug window.

Now that the parser has retrieved information with regard to the interchange and has grabbed a pointer to the data stream, BizTalk Server is interested in knowing whether the interchange contains groups.

### GroupsExist

In any given interchange, you might have multiple documents that are batched for processing. For example, you might have a document specification that represents a remittance. However, that remittance might not contain the concept of a batch within its specification. Additionally, not only might more than one document exist, but more than one group of documents might exist. Hence, you might have data within a single file that is logically similar to the following:

```

<interchange header> [header info] </interchange header>
<groupheader> [lots of group information] </groupheader>
<document> [very valuable doc info ] </document>
<document> [very valuable doc info ] </document>
<document> [very valuable doc info ] </document>
    <grouptrailer> [group trailer info ] </grouptrailer>
<groupheader> [lots of group information] </groupheader>
<document> [very valuable doc info ] </document>
<document> [very valuable doc info ] </document>
<document> [very valuable doc info ] </document>
    <grouptrailer> [trailer info ] </grouptrailer>
<interchange trailers>[interchange trailer info]<interchange trailer>

```

Notice that since there are multiple root nodes, it would be impossible to represent this as XML without wrapping the entire thing within a root node. This is because the XML specification dictates that an XML document must contain one and only one root node. However, this is the manner in which many batched EDI transactions are communicated. BizTalk Server ships EDI parsers and serializers that handle these types of complex interchanges automatically.

The **GroupsExist** method is where you tell the BizTalk Server parsing engine whether the interchange that you are dealing with has multiple groups within your document. This function is targeted at EDI type transactions where not only might you have multiple documents within the interchange, but additionally you might have multiple groups. This is because historically EDI is handled by batching all transactions and sending them at set intervals of time. An example could be that a reseller might batch all purchase orders (POs) from multiple distributors into a single interchange and send that to the vendor, in which case the vendor will potentially have multiple POs from multiple distributors. Whereas you were starting from scratch and creating an XML-based PO for this purpose, you might take this into consideration and create a group PO superstructure, thus facilitating the existence of multiple POs from multiple organizations and removing the complexity of a multidocument interchange.

If you tell BizTalk Server that you have multiple groups within an interchange, BizTalk Server will subsequently make a call into your component to **GetGroupDetails**. Furthermore, within **GetNextDocument** if the parser informs BizTalk Server that it has



Within the **GetNextDocument** method is where the majority of a parser's work exists. It is within this method that your parser will transform the input document into the XML format that is expected by the channel. It is also within this method that you would discover the route of a self-routing document. Examining the elements specified in the document specification as routing tags would do this. Hence, you would create the XML instance, discover the source and destination values contained within the self-routing document, and set the SrcQual, SrcID, DestQual, and DestID name-value pairs of the transport dictionary within the method call. Our sample implementation is not using a self-routing document and therefore does not set those fields.

However, we do parse the document, create the expected XML document, and set the WORKING\_DATA field of the transport dictionary to our resulting XML. Furthermore, if within the interchange more than one document exists, the call to this method would return **LastDocument** as false and parse the subsequent documents, repeating the same steps until there are no more documents to process within the interchange.

In the **ProbelInterchangeFormat** method call, the sample code stores a char\* within the class that contains the data of the stream. I will work with it to parse through the interchange and determine document offsets. Keep in mind that this sample code is using single-byte character strings. In the following code, we will also see that there are member variables of the class being set to track the end position of the current document and the length of the current document. In the **GetNativeDocumentOffsets** call that is made subsequent to this call, the parser engine will be looking for the offset from the beginning of the stream and the document length in order to track the inbound document.

```
//parse out the document
long CurrentDocLength;
char* pUnprocessedSubString;
char* pEndTag;
char* pCurrentDocument;
//get a pointer to the character after the end tag
```

Get a pointer to the part of the character pointer that we haven't processed. We do this by tracking our offset in bytes during processing and adding the number of bytes to the pointer variable that contains our data.

```
pUnprocessedSubString = m_pCharData + m_LastDocEndIndex;
pEndTag = strstr(pUnprocessedSubString, END_DOC_IDENTIFIER);
```

Get a character pointer to the character after the last character of the end tag of a single instance of the dictionary document.

```
pEndTag += strlen(END_DOC_IDENTIFIER);
```

Determine the current document's length by subtracting the address of the first character of the unprocessed string from the address of the end character.

```
//determine the length of the document
CurrentDocLength = pEndTag - pUnprocessedSubString + 1;
```

Next we allocate and initialize memory for our document bytes based on the length that we just determined.

```
//copy document from string
pCurrentDocument = new char[CurrentDocLength+1];
memset((void*)pCurrentDocument, 0, CurrentDocLength + 1);
```

We will now need to copy the string of the dictionary XML into a variable so that we can pass it to the **RehydrateDictionary** call and get back our source dictionary.

```
strncpy(pCurrentDocument, pUnprocessedSubString, CurrentDocLength);
```

As we parse the data, we want to keep track of where we are in the data stream so that we can inform BizTalk Server where to find the native document in the **IStream\*** and so that we can know from where to continue parsing in subsequent calls to

## GetNextDocument.

```
//set the position place holders
//these are noted with Last, but represent current doc in this fn call
//they represent the last doc processed in the GetNativeDocOffsets call
m_LastDocLength = CurrentDocLength;
m_LastDocEndIndex= m_LastDocEndIndex + m_LastDocLength;
```

Now that we have the Commerce.Dictionary XML from the stream, we will reconstruct the dictionary object through its **LoadXML** method. The **IPersistXML::LoadXML** method accepts XML previously created by the **IPersistXML::SaveXML** method. The dictionary object implements the **IPersistXML** interface. The **LoadXML** method is called within the **RehydrateDictionary** function in order to turn the source XML into a Commerce.Dictionary object.

```
if (SUCCEEDED(hr))
{
    hr = pDataDict.CoCreateInstance (L"Commerce.Dictionary");
    if(SUCCEEDED(hr))
    {
        BYTE* pFinalChar = pbData + bytesread;
        *pFinalChar = 0;
        BSTRData = (char*)pbData;
        hr = RehydrateDictionary (BSTRData, pDataDict);
    }
}
```

At this point we have parsed a single document from our input stream (interchange) and we have converted to a Commerce.Dictionary object. The next step is to create, from the data in the dictionary, an instance of an XML document, the SimpleEquationXML document in our case, that BizTalk Messaging is expecting in the channel. We should have a dictionary object from which we can extract expected name-value pairs and create the XML instance. Once we have created the proper XML document, we have to set the WORKING\_DATA field of the dictionary passed to the method call. Parsed data is passed back to BizTalk Server from the parser through the WORKING\_DATA field of the working dictionary passed to the **GetNextDocument** method.

```
if (SUCCEEDED(hr))
{
    //create the output xml instance
    *DocIsValid = CreateXMLFromDictionary (pDataDict, &bstrData);
    //Attempting to set the WORKING_DATA field of the transport dictionary
    hr = PutDictValue(Dict, L"WORKING_DATA", bstrData);
}
```

Note that in the code block the *DocIsValid* flag is set based on whether we could successfully create the expected XML document. If you attempted to parse the document and create the XML representation that is expected in the channel, but were unable to do so because the native document does not contain the correct data or correct fields, you would set this variable to FALSE. Be sure to set **LastDocument** to TRUE or you might end up sending BizTalk Server spiraling into an infinite loop of calling **GetNextDocument**.

```
*LastDocument = (m_CurrentDocument == m_TotalNumDocs) ? (TRUE):(FALSE);
```

The following table can be used as a truth table as to what the implications are with regard to the various output combinations for the function's HRESULT and the *DocIsValid* flag.

HRESULT	DocIsValid	Meaning
S_OK	T	Document accepted, continue with next document
S_OK	F	Document rejected, continue with next document
S_FALSE	T	Errors occurred, accept document and continue
S_FALSE	F	Errors occurred, reject document and continue

E_FAILED	Any	Catastrophic failure, dump data and terminate
----------	-----	---

With regard to the copy of the data to a `char*` in the **ProbeInterchangeFormat** method, normally you would move through the stream as you parse. However, in the sample code all the data is saved to a `char*` and all the parsing takes place against the `char*`. However, notice that the **IStream\*** was left at its end position in **ProbeInterchangeFormat**. There are some things to note that are of significant consequence:

If you do not move the **IStream\*** from the beginning byte, BizTalk Server will fail the parsing. For example, if I read all the data into a `char*` and then reset the **IStream\*** to the beginning, even though I might parse and return a valid document from the `char*`, BizTalk Server will recognize that the **IStream\*** is at the beginning and fail the parsing session, reporting an error that nothing was read from the stream.

If the **IStream\*** is not at the end and you set **LastDocument** to TRUE, BizTalk Server will disregard the **LastDocument** flag and call **GetNextDocument** again.

Once the last document has been processed for the interchange, or for a particular group in the interchange, BizTalk Server calls the **GetNativeDocumentOffsets** method call of the parser. It is within this call that the parser provides BizTalk Server with the information needed to facilitate document tracking.

### GetNativeDocumentOffsets

In this method, the parser informs BizTalk Server about how to extract the information related to the last parsed document from the stream. Let's say that for the purposes of auditing we want to ensure that we log all incoming files and store them in their inbound format. To do this, BizTalk Server will call this function. Inside this function you must set the *SizeFromXMLDoc* parameter to FALSE. If we set this to TRUE, BizTalk Server will try to ascertain from what point and how far from that point to read from the stream to log the native data by sizing the outbound XML instance that your parser creates. Since our incoming format does not directly match the size of the resulting XML instance, we must set this to FALSE and also manually set the *StartOffset* and *DocLength* parameters within the code.

The *StartOffset* parameter is the variable that BizTalk Server uses to determine from where in the stream to start reading to get the native document. The *DocLength* variable is how far BizTalk Server should read from the *StartOffset* parameter. BizTalk Server will use this information to read from the stream and log the document in the BizTalk Server tracking repository.

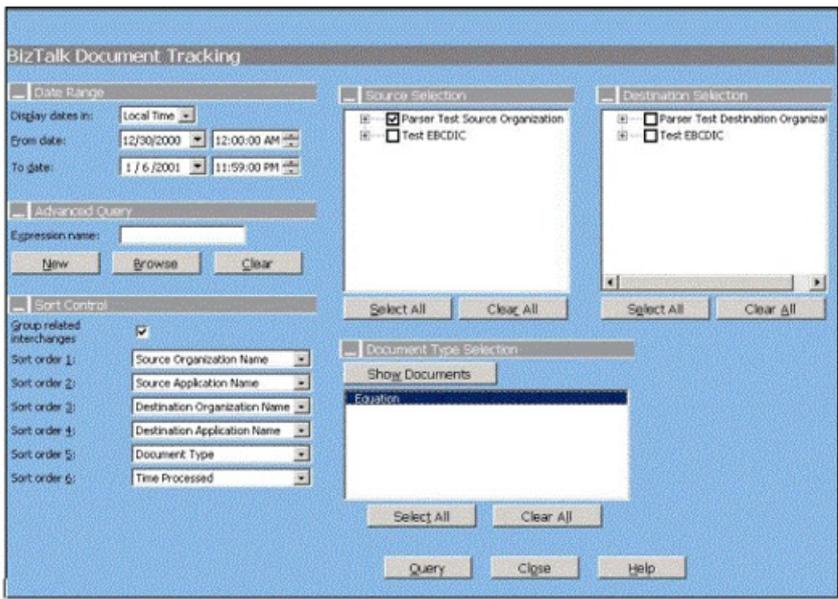
To accomplish this, we can track our processing by adding member variables to our class:

```
Long    m_LastDocEndIndex;
Long    m_LastDocLength;
```

During the **GetNextDocument** call, we will set these. Thus, the code for this implementation of **GetNativeDocumentOffsets** looks like this:

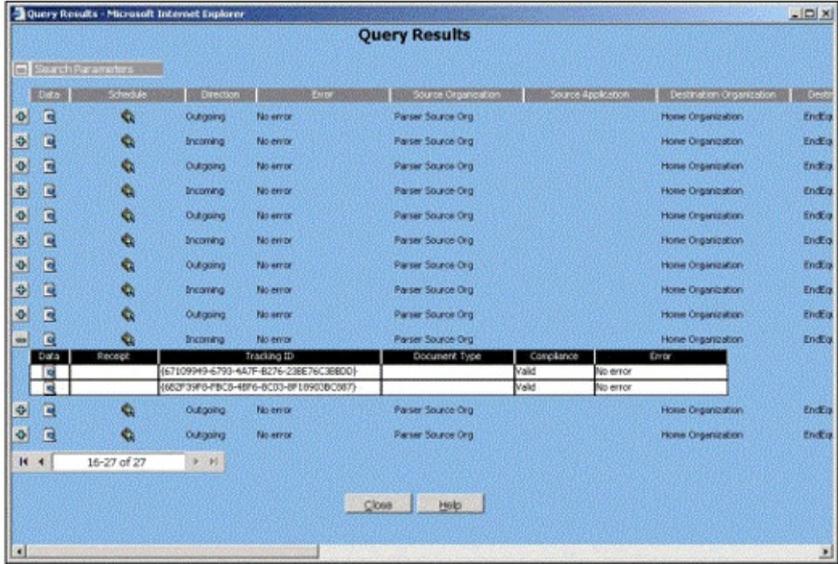
```
HRESULT STDMETHODCALLTYPE CParser1::GetNativeDocumentOffsets(BOOL __RPC_
    FAR *SizeFromXMLDoc, LARGE_INTEGER __RPC_
    FAR *StartOffset, long __RPC_FAR *DocLength)
{
    ATLTRACE("In CParser1::GetNativeDocumentOffsets\n");
    //Tell BizTalk Server that we will give it the doc offset and length
    *SizeFromXMLDoc = FALSE;
    StartOffset->QuadPart = m_LastDocEndIndex - m_LastDocLength;
    *DocLength = m_LastDocLength;
    return S_OK;
}
```

Using the sample dictionary XML from earlier in this document, I copied it and created a file that contained two instances of that XML. Thus we have one file that contains two XML documents. I ran through this sample parser, and the single document became two output documents. Of interest, and to the point of this paragraph, is the document tracking. Because of the code that was implemented in this method and the fact that in the channel setup I selected to track the inbound document in both native format and XML format, I was able to view the data pre-Parser1 and post-Parser1. By running BizTalk Document Tracking from my **Start** menu and querying for the documents as related to the document type and organization, I can view the documents in the interchange.



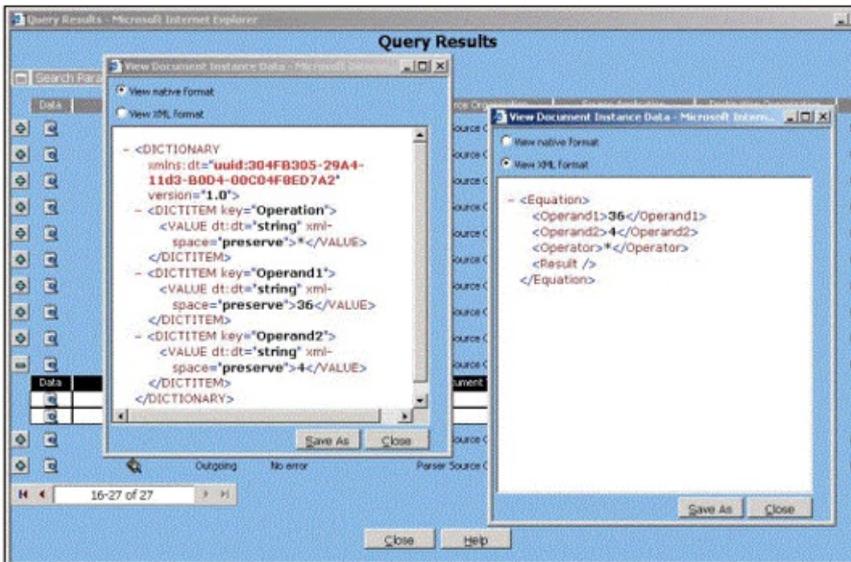
**Figure 3. BizTalk Document Tracking main page**

By running a query for the test source organization and the document definition that was used (in this case the definition is Equation, with a logical name associated with the document specification SimpleEquation), BizTalk Document Tracking produces a screen with results as shown in the following illustration.



**Figure 4. Document Tracking Query Results page**

You can clearly see the two documents as the two line items with GUIDs in figure 4. These are the two documents that the parser produced as part of the two-document interchange; if either of the documents is selected, BizTalk Document Tracking will display both the native input data and the resulting XML from the Parser1 implementation. Be sure to note that this is data from before the document passes through the channel. You can see what they look like in the following illustration.



**Figure 5. Document data views**

By tracking both documents, you can ensure that you will pass audit. Furthermore, if indeed there ever were a problem, a comparison could be made between the incoming document and the post-parser document.

Something to consider is document tracking with regard to binary document submission, that is, a Microsoft Excel document. BizTalk Server cannot effectively track the document, since the document cannot be broken apart. This means for tracking purposes the parser would either respond to BizTalk Server in such a way as to not track binary objects or documentsBLOBs within BizTalk Document Tracking, or the parser would indicate to BizTalk Server to track the entire binary stream for each parsed out document. Once again, a Microsoft Excel spreadsheet might have several sheets, each of which is a distinct document. For the purposes of tracking, it might be better in practice to store binary documents in place of your own design and keep a set of data to relate the document to the Tracking\_ID and submission\_id that you get through the parser interfaces.

### GetGroupSize

Take solace in knowing that this is the last interface that we must address with regard to parsers. This method is required when processing interchanges that include groups. Though we did not implement a group processing parser in the sample, had we done so, you would need to fully implement this method. If you refer to figure 2, you can clearly see that **GetGroupSize** is called directly after the call to **GetNativeDocumentOffsets**. However, it is only called if the parser indicated that the interchange it is parsing contains groups. For our example we set it to return E\_UNEXPECTED. For our sample this method should never be called; if it is called, the call is indeed unexpected.

```

HRESULT STDMETHODCALLTYPE CParser1::GetGroupSize(long __RPC_
    FAR *GroupSize,
    BOOL __RPC_FAR *LastGroup)
{
    ATLTRACE("In CParser1::GetGroupSize\n");
    return E_UNEXPECTED;
}

```

Fortunately, even if we had implemented groups within our parser, there is not much happening in this function call. If the parser had indicated that groups exist, this call would be made after the parser returned a TRUE for the *LastDocument* flag of **GetNextDocument**. At that point, our custom parser would return the size of the group in the *GroupSize* parameter and indicate whether it had just finished processing the last group in the *LastGroup* parameter. If the last group is processed, the parser will exit. If not, **GetGroupDetails** will be called subsequent to this method.

At this point all the methods on the parser interface have been covered, so you should be able to run the example parser with this information and be able to clearly ascertain how the parser works.

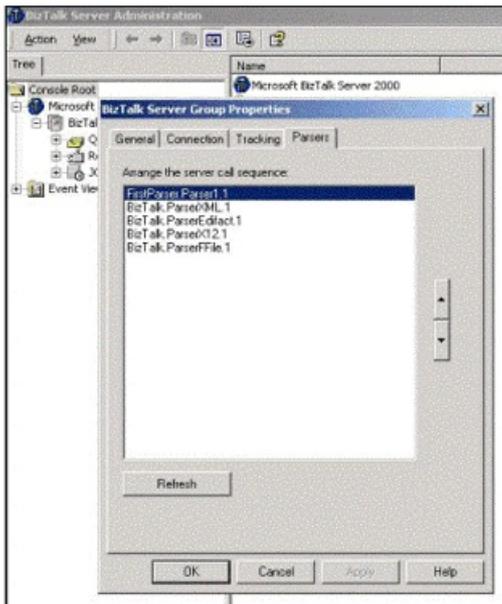
### Running the Parser

Now that all the interfaces are complete, you can build and register the parser. Once the parser is successfully registered, run BizTalk Server Administration and choose the properties for the BizTalk Server root node.



**Figure 6. BizTalk Server Administration main page**

Once the **Properties** dialog box appears, click the **Parsers** tab and click **Refresh**. Parser1 should show up in the list.



**Figure 7. BizTalk Server Group Properties dialog box**

Use the arrows on the right side of the dialog box to move Parser1 to the top of the list so that it will be called first. Click **OK**. The parser is ready to be used by BizTalk Server.

You should be able to run through the test harness we initially set up by dropping an instance of the dictionary XML into the File receive function. If you were to drop a SimpleEquationXML instance and a dictionary XML instance into the receive function, providing that the same values are used in both documents, they should both produce the same results from passing through the channel. This is because the parser converts the dictionary XML into the SimpleEquationXML document type before passing it to BizTalk Server.

One more thing to note on running the parser: If you wanted to debug your parser as BizTalk Server called the methods, you would simply need to attach to the MSCIS.EXE process. I find that the easiest way to work when debugging is to stop the BizTalk Server service and set up the debugger to use MSCIS.EXE as its debugging process. Thus, the BizTalk Server service will start running when you start debugging and stop when you are finished.

### Implementing the Parser Summary

At this point the FirstParser component has an interface name Parser1. This object is able to receive Commerce.Dictionary objects that contain certain fields and that have been persisted to XML through their **IPersistXML** interface. Moreover, the document should run through a channel and, on the other end, BizTalk Server should produce XML that represents the equation XML that we set up internally and that contains the result of the equation inside the XML. Furthermore, the parser can handle multiple instances of the dictionary equation XML within a single interchange. While this is a fairly simple example, we have explored how to build a BizTalk Server parser component. That is, we parsed the incoming data stream into a format that BizTalk Server is expecting within the channel. We also looked at how we tell BizTalk Server where the native document sits within the input stream so that it can save a copy of the data to the Tracking database. Although there is no code for it in the example, we also outlined what the parser would need to do if the document was self-routing and what it means for an interchange to contain groups.

That parser represents only half of the equation. Most likely if there is a very specialized format coming in, there will be a requirement for the same format coming out. It is on the outbound side that the custom serializer does its work.

## Implementing a BizTalk Server Serializer

Congratulations! If you are going through this document top-down and reviewing the code, you are halfway done, and the example serializer is simpler to implement than the example parser. While the job of the custom parser is to parse the incoming data and convert it into a format that is understood by BizTalk Server, the job of the serializer is to take an outgoing document and write it to a particular format from the internal XML representation. Examples of this might be persisting outgoing documents to Microsoft Word, Microsoft Excel, EBCDIC, and Packed Decimal, or anything else that you can imagine. For the example code, the serializer takes the outgoing XML document, pulls out the data from the fields, places the data as name-value pairs into a dictionary, retrieves the XML representation of that dictionary object through the **IPersistXML** interface, and finally places the data to be stored into the outgoing stream. Let's take a look at what the serializer interface methods are and how they work.

### Serializer Interfaces

To implement a custom BizTalk Server serializer, we must implement a single interface consisting of five methods.

Method	Description
<b>AddDocument</b>	Adds an XML document for storage by the serializer component.
<b>GetDocInfo</b>	Gets details of the document.
<b>GetGroupInfo</b>	Gets details of the group, such as size and offset, for the Document Tracking database.
<b>GetInterchangeInfo</b>	Gets information about the interchange created.
<b>Init</b>	Outputs the document instance to the serializer component and indicates where it should be sent.

For a simple interchange that contains a single document, the calling order for the methods will be:

1. **Init**
2. **AddDocument**
3. **GetInterchangeInfo**
4. **GetDocInfo**

**GetGroupInfo** will be called only if a group exists in the document. In the example implementation we will not be dealing with groups, so **GetGroupInfo** will not be called. The number of times the methods for handling document groups and adding documents are called is dependent on the number of groups and number of documents that exist in a given interchange. For further information on the call order of the methods for the serializer, see the BizTalk Server 2000 documentation and look for the topic "Sequence for Calling Methods of the IBizTalkParserComponent Interface."

The calls to the serializer currently seem to pass only one document at a time, so we will not have to parse the data before preparing it for serialization. If we were to implement a more complex interchange containing groups, the serializer execution would take the following steps:

**Init** is called so that the serializer can retrieve some information and get a pointer to the output data stream.

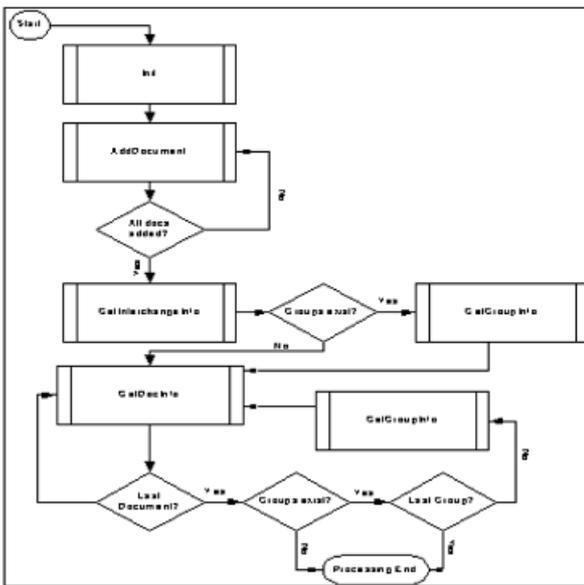
Next **AddDocument** is called to allow the serializer to parse, translate, and transform the outbound data into the format that it wants and add it to the outbound stream.

**AddDocument** is called repeatedly until the last document has been processed. At that point, **GetInterchangeInfo** is called and the serializer returns an interchange identifier and the number of groups that exist.

If groups exist in the outbound interchange, the next call is to **GetGroupInfo**. In **GetGroupInfo** the serializer will tell BizTalk Server how many documents are in the group, the offset into the stream to find the group, and the length, in bytes, of all documents in the group.

**GetDocInfo** is then called for each document in each group and has similar responsibility as the parser method of **GetNativeDocumentOffsets**. Once this method has been called for each document in a group, **GetGroupInfo** is called and then **GetDocInfo** is called again.

The following diagram represents the call path for the serializer functions as described above.



**Figure 8. Logical flow of serializer method calls**

For this release of BizTalk Server, the number of documents passed to the serializer at a time seems to always be one. This is not all bad because it simplifies the work that we have to do. Note that the execution path has the serializer processing all documents and placing them into the outgoing stream before BizTalk Server starts requesting information on the groups and documents in the interchange. Having reviewed the execution flow, let's take look at the code.

### Base Code

In FirstParser, create a new ATL simple object named Serializer1. This will give us two objects within this library: FirstParser.Parser1 and FirstParser.Serializer1.

Include the following files in Serializer1.h:

- **bts\_sdk\_guids.h**
- **BTSSerializerComps.h**. This file contains the definition for the **IBizTalkSerializer** interface.
- **Computil.h**. This file contains the **GetDictValue** method, which we will use to add data to dictionary objects. While this is not necessary, it relieves you from writing similar code to accomplish the same task.
- Include the functions from the appendix. I included the misc.h and misc.cpp files from the parser implementation.

Compile the project to make sure that everything compiles. If it compiles, it must work.

Add the interface and method for the IBizTalkSerializerComponent interface.

In Serializer1.h, add "public IBizTalkSerializerComponent" to the class inheritance list. This enables us to implement the methods for the parser on our component and, once finished with a few following details, be able to return an IBizTalkSerializerComponent pointer from our component when requested by QueryInterface.

Add the following method prototypes to the class declaration:

```

//Serializer method prototypes
HRESULT STDMETHODCALLTYPE CSerializer1::Init(BSTR srcQual, BSTR srcID, BSTR destQual,
    BSTR destID, long EnvID, IDictionary __RPC_FAR *pDelimiters,
    IStream __RPC_FAR *OutputStream, long NumDocs, long PortID);

HRESULT STDMETHODCALLTYPE CSerializer1::AddDocument(long DocHandle,
    IDictionary __RPC_FAR *Transport, BSTR TrackID, long ChannelID);

HRESULT STDMETHODCALLTYPE CSerializer1::GetInterchangeInfo(BSTR __RPC_
    FAR *InterchangeID, long __RPC_FAR *lNumGroups);

HRESULT STDMETHODCALLTYPE CSerializer1::GetGroupInfo(long __RPC_FAR *NumDocs,
    LARGE_INTEGER __RPC_FAR *GrpStartOffset, long __RPC_FAR *GrpLen);

HRESULT STDMETHODCALLTYPE CSerializer1::GetDocInfo(long __RPC_FAR *DocHandle,
    BOOL __RPC_FAR *SizeFromXMLDoc, LARGE_INTEGER __RPC_FAR *DocStartOffset,
    long __RPC_FAR *DocLen);
  
```

Add COM\_INTERFACE\_ENTRY(IBizTalkSerializerComponent) to COM\_MAP so that it will be returned if requested through QueryInterface.

Add IMPLEMENTED\_CATEGORY(CATID\_BIZTALK\_SERIALIZER) to CATEGORY\_MAP. This is what will identify your component as a serializer to BizTalk Server. So don't forget it.

While you are in this file, go ahead and add the following private members to the class; we will use them later.

```
IStream*    m_DataStream;
long        m_CurrentStreamPos;
long        m_LastDocLength;
long        m_LastDocHandle;

HRESULT CreateDictionaryFromEquationXML(IDictionary* OutputDict, BSTR DictXML);
```

In the constructor, initialize the member variables:

```
CSerializer1()
{
    m_CurrentStreamPos = 0;
    m_LastDocLength = 0;
    m_LastDocHandle = 0;
    m_DataStream = 0;
}
```

Add an override for the FinalRelease method so that we can release our IStream interface:

```
void FinalRelease()
{
    if(m_DataStream != NULL){m_DataStream->Release();}
}
```

At this point you should have the class declaration complete. Now open the CPP file and add empty method implementations for each of the methods defined by IBizTalkSerializerComponent.

Compile. At this point you should have an empty implementation of a BizTalk Server serializer.

Just for your own edification during a debug session, in each of the parser method calls add a line similar to this:

```
ATLTRACE("In CSerializer1::[method name]\n");
```

Additionally, you might want to add "hr = TraceDictionaryValues(Dict);" to the methods that receive from or write to a dictionary.

You will want to reference the MSXML libraries. You could do this by including the proper header files in your project. In the sample, we used the #import directive to import msxml3.dll:

```
#import "msxml3.dll" named_guids raw_interfaces_only
```

If you are reimplementing this sample code, I would suggest that you use the example code for implementing the functions through the copy-paste coding style. I will refer to implementing code snippets within the document, but to get the entire code base you will need to refer to the sample source because this document serves to explain the interfaces, not to deliver the code.

## Implementing the Serializer Interfaces

You should now have a complete parser and a skeleton serializer. In the serializer we will focus on where to get the document and what to do with it by reviewing the serializer sample method implementations.

## Init

This method is the first method called on the serializer component, and it is where we grab some information that we need and a pointer to our outgoing data stream. The example code does not do a lot of work here. The source and destination information is passed into this method for use. The number of documents is passed in and currently will always be 1. However, just in case something changes, we will add code to ensure that the number of documents is indeed 1. We will also ensure that the stream pointer is not null.

```
if ( !OutputStream || NumDocs != 1) {return E_INVALIDARG;}
```

We will need to save a reference to the stream that gets passed into the method.

```
//grab the stream pointer, you won't get another chance  
hr = OutputStream->AddRef ();  
m_DataStream = OutputStream;
```

Additionally, as a proactive measure, we will make sure that the stream is at the beginning.

```
//make sure the stream is at the beginning. It should be, but this can't hurt  
Move.QuadPart = 0;  
hr = m_DataStream->Seek (Move, STREAM_SEEK_SET, NULL);
```

If we were expecting to get passed delimiters into the serializer, they would be found within the dictionary passed into this method. Once the call to **Init** is completed, the BizTalk Server parsing engine will continue by calling **AddDocument**.

## AddDocument

**AddDocument** is the primary place in the serializer where work is performed. This is where you will implement all the code within the serializer to move the data from the format within the stream to the expected output format.

As a parameter to this method, we receive a pointer to a Commerce.Dictionary object, which contains the document that we have to convert to the output format. For our example this is an elementary process. First, we grab the data from the dictionary object.

```
hr = EquationDict.CoCreateInstance (L"Commerce.Dictionary");  
if(SUCCEEDED(hr)){hr = GetDictValue(Transport, L"working_data", &IncomingXML);}  
//just ensuring proper type  
if(SUCCEEDED(hr)){hr = IncomingXML.ChangeType (VT_BSTR);}
```

The next step is to convert the XML into a dictionary instance so that we can generate the dictionary XML. The following method call is responsible for doing this.

```
if(SUCCEEDED(hr)){hr = CreateDictionaryFromEquationXML(EquationDict, IncomingXML.bstrVal);}
```

The code implemented within **CreateDictionaryFromEquationXML** is implemented as:

```
HRESULT CSerializer1::CreateDictionaryFromEquationXML(IDictionary* OutputDict, BSTR DictXML)  
{  
    HRESULT hr;  
    VARIANT_BOOL IsLoaded;  
    CComBSTR NodeValue;  
    CComPtr<MSXML2::IXMLDOMDocument2> pXMLDoc;  
    CComPtr<MSXML2::IXMLDOMNodeList> pXMLNodeList;  
    CComPtr<MSXML2::IXMLDOMNode> pXMLNode;
```

Create an XMLDom instance and load it with the SimpleEquation XML passed into the **AddDocument** method.

```
hr = pXMLDoc.CoCreateInstance (MSXML2::CLSID_DOMDocument30);
hr = pXMLDoc->loadXML(DictXML, &IsLoaded);
```

The next several sections of code retrieve the specific values from the XML document that the serializer needs to create the outgoing dictionary object.

```
NodeValue="";
hr = pXMLDoc->getElementsByTagName(L"Operand1", &pXMLNodeList);
if(SUCCEEDED(hr)){hr = pXMLNodeList->get_item(0, &pXMLNode);}
if(SUCCEEDED(hr)){hr = pXMLNode->get_text(&NodeValue);}
hr = PutDictValue(OutputDict, L"Operand1", NodeValue);
pXMLNodeList.Release();
pXMLNode.Release();

NodeValue="";
hr = pXMLDoc->getElementsByTagName(L"Operand2", &pXMLNodeList);
if(SUCCEEDED(hr)){hr = pXMLNodeList->get_item(0, &pXMLNode);}
if(SUCCEEDED(hr)){hr = pXMLNode->get_text(&NodeValue);}
hr = PutDictValue(OutputDict, L"Operand2", NodeValue);
pXMLNodeList.Release();
pXMLNode.Release();

NodeValue="";
hr = pXMLDoc->getElementsByTagName(L"Operator", &pXMLNodeList);
if(SUCCEEDED(hr)){hr = pXMLNodeList->get_item(0, &pXMLNode);}
if(SUCCEEDED(hr)){hr = pXMLNode->get_text(&NodeValue);}
hr = PutDictValue(OutputDict, L"Operation", NodeValue);
pXMLNodeList.Release();
pXMLNode.Release();

NodeValue="";
hr = pXMLDoc->getElementsByTagName(L"Result", &pXMLNodeList);
if(SUCCEEDED(hr)){hr = pXMLNodeList->get_item(0, &pXMLNode);}
if(SUCCEEDED(hr)){hr = pXMLNode->get_text(&NodeValue);}
hr = PutDictValue(OutputDict, L"result", NodeValue);

return hr;
}
```

This code is pretty simple. You could explore different mechanisms (for example, XPath) to accomplish the same task that was accomplished using *getElementsByTagName*, *get\_item*, and *get\_text*. At the end of this method call we return *OutputDict* with all the expected name-value pairs.

Once we have the dictionary, we use the **IPersistXML** interface of the dictionary to generate the outgoing XML. This done within the call to **DehydrateDictionary**.

```
if(SUCCEEDED(hr)){hr = DehydrateDictionary(&OutgoingXML, EquationDict);}
```

The code for **DehydrateDictionary** can be found in the appendix of this document.

Once we have the XML in a BSTR, we need to place it into the stream. The stream expects double-byte characters. If you place ANSI characters into the stream, you will find that the persisted document will come out as garbage. Additionally, we will have to tell BizTalk Server how large this document is inside the stream. We will take the easy way out by multiplying the string length by two. In a real implementation you would want to convert the BSTR to a byte pointer and set the size from that. However, for our example, this will be sufficient.

```
m_LastDocLength = OutgoingXML.Length () * 2;
hr = m_DataStream->Write((void*)OutgoingXML.m_str , m_
    LastDocLength, &byteswritten);
m_CurrentStreamPos +=byteswritten;
```

Note that the length is assigned to a member variable because it will be needed again later in the **GetDocInfo** call. We took the easy road here, because we know two things:

- BizTalk Server currently is only passing one document at a time.
- In our **Init** implementation we checked to make sure that it had only one document coming into the serializer.

We also have to save the *DocHandle* to a member variable, because BizTalk Server will also be expecting it in the **GetDocInfo** call. This would be a little more complex if we were expecting multiple documents, because we would need to save off the document handle for each document and track each document's offset inside the stream.

### GetInterchangeInfo

In **GetInterchangeInfo** we will tell BizTalk Server the number of groups and return an *InterchangeID*. For our sample implementation we will set the number of groups to 0 and return a GUID for the *InterchangeID*.

```
HRESULT    hr;
*lNumGroups = 0;
// Use a GUID tracking ID
UUID       tracking_id;
CComBSTR   StringUUID;
WCHAR*     pwszUUID;
```

Next we will create a GUID for the *InterchangeID*.

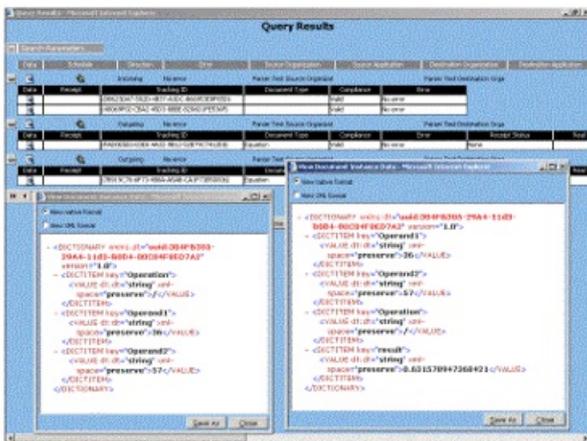
```
hr=HRESULT_FROM_WIN32(UuidCreate(&tracking_id));
hr=HRESULT_FROM_WIN32(UuidToStringW(&tracking_id, &pwszUUID));
StringUUID = pwszUUID;
*InterchangeID = StringUUID.Detach ();
hr = HRESULT_FROM_WIN32(RpcStringFreeW(&pwszUUID));
```

### GetDocInfo

Similar to the parser method **GetNativeDocumentOffsets**, in this method we will tell BizTalk Server the handle to the document that it gave to us in **AddDocument** and the size and location of the document inside the stream.

```
*DocHandle = m_LastDocHandle;
*SizeFromXMLDoc = FALSE;
DocStartOffset->QuadPart = m_CurrentStreamPos - m_LastDocLength;
*DocLen = m_LastDocLength;
```

This information will be used by BizTalk Document Tracking to track the document as it is being serialized. If we were to take a look at document tracking, we should be able to see the native and the XML formats of the documents. Running a two-document interchange through the serializer and parser pair resulted in BizTalk Document Tracking having an incoming interchange with two documents and two separate outgoing interchanges. The following illustration shows the native and XML format windows for one of the documents.



**Figure 9. BizTalk Document Tracking showing documents for the parser and serializer**

The window on the left shows the document as it was submitted to BizTalk Server. The window on the right shows the document after it passed through the parser, the mapping in the channel, and finally through the serializer back to the dictionary XML format. If we were to click the **View XML format** option, we would be shown the equation XML that BizTalk Server was using internally.

### GetGroupInfo

Once again, we are not doing anything with groups in this sample. We simply return E\_NOTIMPL.

```
HRESULT hr;
hr = E_NOTIMPL;
return hr;
```

However, were this method to be implemented, it would return to BizTalk Server the number of documents in the group, the offset into the stream for the start of the group, and the number of bytes (length) of the group.

### Modifying the Initial Test Harness for the Serializer

Once you have all the needed code in the serializer, or even if you want to do it with just the stub code, compile the parser and then register it. This will allow us to set up the test scenario.

Setting up the test for the serializer is exactly the same as the parser test harness setup except for a couple of minor changes. You could follow those directions augmented by the following or modify the existing ports and channels that were used for the parser test. Furthermore, you could simply use the parser test harness and make a few minor changes.

You will need to create a document definition for the dictionary XML. I called mine DictionaryXMLSchema and the Schema. Up until now we have been using the dictionary XML without a schema. However, for our serializer we need an envelope that represents the document's persisted form. That schema looks like this:

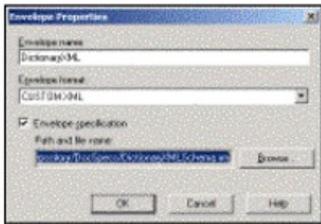
```
<?xml version="1.0" ?>
<!-- Generated by using BizTalk Editor on Wed, Dec 20 2000 10:59:42 AM -->
<!-- Microsoft Corporation (c) 2000 (http://www.microsoft.com) -->
<Schema name="DICTIONARY" b: BizTalkServerEditorTool_
Version="1.0" b:root_
reference="DICTIONARY" b:standard="XML" xmlns="urn:schemas-microsoft-
com:xml-data" xmlns:b="urn:schemas-microsoft-
com: BizTalkServer" xmlns:d="urn:schemas-microsoft-
com:datatypes">
  <b: SelectionFields />
  <ElementType name="VALUE" content="textOnly" model="open">
  <b: RecordInfo />
  <AttributeType name="xml-space">
    <b: FieldInfo />
  </AttributeType>
  <AttributeType name="dt_dt">
    <b: FieldInfo />
  </AttributeType>
```

```

<attribute type="dt_dt" />
<attribute type="xml-space" />
</ElementType>
<ElementType name="DICTITEM" content="eltOnly" model="open">
<b:RecordInfo />
<AttributeType name="key">
  <b:FieldInfo />
</AttributeType>
<attribute type="key" />
  <element type="VALUE" maxOccurs="*" minOccurs="0" />
</ElementType>
<ElementType name="DICTIONARY" content="eltOnly" model="open">
<b:RecordInfo />
<AttributeType name="version">
<b:FieldInfo />
  </AttributeType>
  <attribute type="version" />
  <element type="DICTITEM" maxOccurs="*" minOccurs="0" />
</ElementType>
</Schema>

```

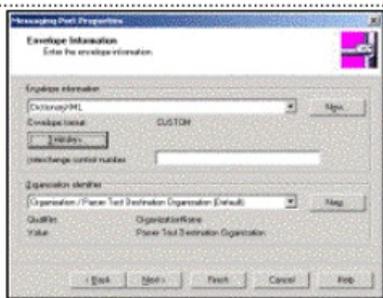
Once you have created the document definition, the next step is to create an envelope of CUSTOM type that uses this document definition. I called mine DictionaryXML.



**Figure 10. Creating an envelope**

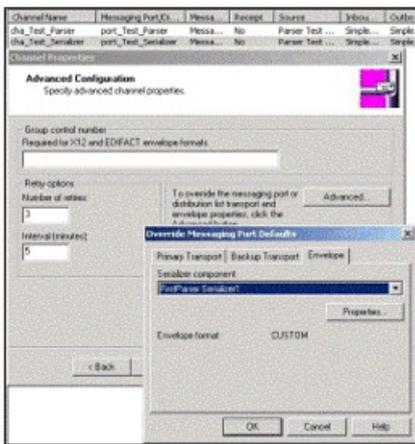
Once the envelope is created, you create your associated port and channel. I created a separate port and channel for clarity, but you could reuse the ones from the parser test and modify the envelope being used.

In the envelope page we must specify the envelope that we just created. Notice the **Delimiters** button. If you put delimiters in here, they will show up in the dictionary passed into the serializer's **Init** method.



**Figure 11. Setting the port properties to include the envelope**

The next change is creating the channel. At the end of the channel setup, in the **Advanced Configuration** dialog box, you will need to click the **Advanced** button so that we can point to our serializer. Once you have clicked it and receive the tabbed dialog box, click the **Envelope** tab. From the drop-down list, select the serializer.



**Figure 12. Setting the channel properties to use the custom serializer**

Once that is selected, you should be able to modify the receive function from earlier to point to the new channel that is set up with the serializer, run a document through the parser and serializer, and test to see if it produces the correct output. Of course, I would suggest running debug first to step through the code.

### Running the Serializer

Once messaging has been configured or reconfigured, to use the custom serializer (and envelope), you can run the same example files that were used for the parser. If you set up a separate set of messaging artifacts for testing the serializer, you will need to either create a new File receive function or change the existing one to use the new channel.

Execution and debugging should work the same as before. The major difference is that now once the document has passed through the channel, the end result should be a dictionary XML document and not an equation XML document.

### Implementing the Serializer Summary

After implementing the parser, the serializer should have seemed simple. This is due to the fact that we were dealing with a single document at a time, whereas in the parser we had multiple documents in the interchange and a little more complication. We looked at how to retrieve the data and format it for sending it back into the stream. We also looked at how to tell BizTalk Server to track our outgoing document so that we could use BizTalk Document Tracking not only to look at our inbound documents in native and XML formats, but also to look at our outbound documents. Finally, we looked at how to set up BizTalk Server to use the serializer that we implemented.

### Overall Summary

While the BizTalk Server interfaces for integrating your own form of parsing and serializing at first seem daunting, the challenge is knowing what BizTalk Server is expecting in the method calls and that, in fact, it boils down to parsing a character string.

While not covered in this document in detail, we briefly touched on what one would have to change to implement the handling of groups within a single interchange. Additionally, we referred to the fact that if we want to implement our own custom correlation, we would implement the parser to expect receipts. Once the parser found that the incoming document was indeed a receipt, the parser would parse the receipt and pass back to BizTalk Server a ProgID for a custom correlator to handle processing the receipt.

In reality, this example was not complex, but I hope that it served its purpose of delineating the information and facilitating the review of the documents so that you could see the incoming and outgoing documents in a way as to help make everything lucid. Included with the source download that accompanies this document will be the BizTalk Server 2000 exports for the channels, ports, envelopes, and document definitions used in this example.

### Appendix: Code Snippets

The following two miscellaneous functions handle calls to the **IPersistXML** interface of a Commerce.Dictionary object.

```

HRESULT STDMETHODCALLTYPE RehydrateDictionary(BSTR DictXML, CComPtr<IDictionary> pDict)
{
    HRESULT hr;
    CComPtr<IPersistXML> pPersistXML;
    hr = pDict.QueryInterface(&pPersistXML);
    if(SUCCEEDED(hr)){ hr = pPersistXML->LoadXML( NULL, DictXML);}

    return hr;
}

```

```

}

HRESULT DehydrateDictionary (BSTR* outXML, CComPtr<IDictionary> pDict)
{
    HRESULT hr;
    CComPtr<IPersistXML>    pPersistXML;

    hr = pDict.QueryInterface(&pPersistXML);
    hr = pPersistXML->SaveXML(NULL, outXML);
    return hr;
}

```

This method serves a heuristic purpose in facilitating inspection of the contents of Commerce.Dictionary objects.

```

HRESULT STDMETHODCALLTYPE TraceDictionaryValues(IDictionary *pDict)
{
    HRESULT
    CComPtr<IEnumVARIANT>    pEnumVar;
    CComPtr<IUnknown>        pEnum;
    CComVariant              *ItemsInDict;
    CComVariant              ValuesInDict;
    CComBSTR                 TraceMSG;
    ULONG                    NumFetched;
    long                     ElemsInDict;
    long                     idxElem;

    TraceMSG = "\n";
    hr = pDict->get__NewEnum (&pEnum);
    if(SUCCEEDED(hr)){hr = pDict->get_Count(&ElemsInDict);}
    ItemsInDict = new CComVariant[ElemsInDict];
    if(SUCCEEDED(hr)){hr = pEnum.QueryInterface (&pEnumVar);}

    hr = pEnumVar->Next(ElemsInDict, ItemsInDict, &NumFetched);
    if(SUCCEEDED(hr))
    {
        for (idxElem=0;idxElem<ElemsInDict;idxElem++)
        {
            if (ItemsInDict[idxElem].vt == VT_BSTR)
            {
                hr = GetDictValue(pDict, ItemsInDict[idxElem].bstrVal , &ValuesInDict);
                if(SUCCEEDED(hr))
                {
                    TraceMSG += ItemsInDict[idxElem].bstrVal;
                    TraceMSG += " = ";
                    TraceMSG += ValuesInDict.bstrVal;
                    TraceMSG += "\n";
                }
            }
        }
        //end for loop
    }
    if(SUCCEEDED(hr)){ATLTRACE(TraceMSG);}
    return hr;
}

```

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# BizTalk Orchestration Example: Automating the Procurement Process

Brian Loesgen  
Stellcom, Inc.

July 2001

Download [Biztalkrfqsample.exe](#).

**Summary:** This white paper will show an example of how to use BizTalk Orchestration and COM+ to solve a common real-world business requirement. (13 printed pages)

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## Overview

The purpose of this white paper is to illustrate usage of various elements of Microsoft® BizTalk™ Server 2000. It highlights the following key technologies:

- Automatic schedule instantiation
- Importing flat files
- BizTalk Orchestration timed transactions
- Schedule correlation with a non-instantiating COM component
- BizTalk Orchestration while loops
- Dynamic document routing

This white paper is based on a procurement process business scenario. Requests for quotation (RFQs) for a particular commodity item are sent out to three suppliers. The suppliers send back their quotes and users issue an order to the lowest bidder.

The procurement process is divided into two logical business processes:

- **The RFQ process** of requesting, receiving, and processing quotations (an XLANG schedule sends out the requests for quotation and selects a winning bidder).
- **The purchase process** of actually placing orders (an XLANG schedule sends out an order using the BizTalk Server self-routing document capability).

## Data Flow

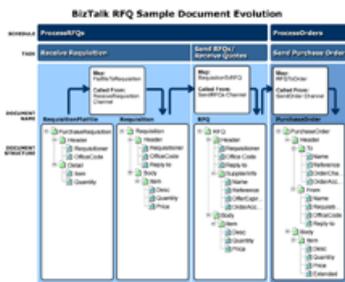
The following illustration shows the entire procurement cycle, which consists of two XLANG schedules. The illustration shows the tasks that the schedules contain and the evolution of the data as it moves through those tasks.

The top band shows the two BizTalk Orchestration XLANG schedules. These are stand-alone schedules that are loosely coupled through Message Queuing (also known as MSMQ).

The second band shows the high-level tasks that occur in the XLANG schedules.

The third band shows the names of the documents as identified using BizTalk Messaging Manager.

The fourth band shows the structure of the documents at the various stages in their life cycle, and shows where in the process flow the documents evolve from one type of document to another.



**Figure 1. BizTalk RFQ Sample Document Evolution (Click to enlarge)**

## The RFQ Process

The RFQ process sends out requests for quotation to three suppliers, waits for a predetermined period of time, and selects the lowest bidder as the winner. At a high level, we will follow these steps:

- Convert a flat file requisition to an XML message
- Instantiate the schedule
- Send the RFQ to three suppliers
- Wait for either three responses or a time-out, whichever occurs first
- Place the winning bid on a Message Queuing queue

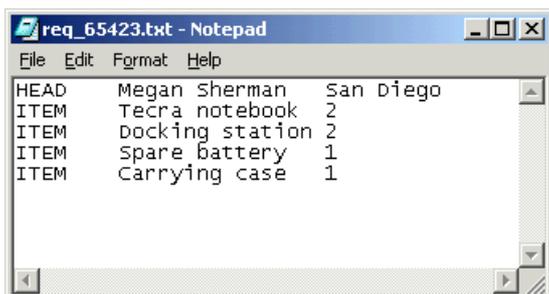
## BizTalk Messaging Entities

The entities we will need in BizTalk Messaging to support our ProcessRFQs XLANG schedule are as follows:

Name	Type	Use
ReceiveRequisition	Messaging port	Activation port to our ProcessRFQs XLANG schedule
RFQ_Supplier_1 RFQ_Supplier_2 RFQ_Supplier_3	Messaging ports	Ports to the three suppliers used in this scenario
ReceiveResponse	Messaging port	Non-instantiating COM port used to receive quotation responses from the suppliers
SendRFQs	Distribution list	Distribution list that points at the three supplier ports
ReceiveRequisition	Channel	Channel called by the receive function as part of schedule instantiation
SendRFQs	Channel	Channel to the distribution list of bidders
Supplier_1 Supplier_2 Supplier_3	Organizations	Supplier organizations
RequisitionFlatfile Requisition RFQ	Document definitions	Documents that we will flow through the business process
FlatfileToRequisition RequisitionToRFQ	Maps	Maps that are used to convert between document types

## Schedule Instantiation

The entire procurement process is triggered by a tab-delimited flat file appearing in a folder that is being polled by a BizTalk Server receive function. The file is deposited into the folder by an external process, perhaps an export operation from another application, an FTP transfer, creation from an ASP page, or even a file copy operation. The following is a sample file:



**Figure 2. Sample file**

BizTalk Server needs to know the structure of a flat file in order to parse it properly. This is achieved by using an envelope, which

sets out the structure of the ASCII file and serves as a wrapper for the document as it moves through BizTalk Server. Delimiters for the flat file are specified in BizTalk Editor on the Parse tab.

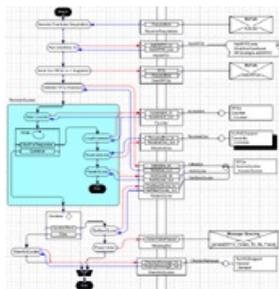
The Advanced tab of the file receive function allows you to specify which envelope should be used (if any), as well as a channel. In our case, we have an envelope called *Requisition* and a channel called *ReceiveRequisition*.

The final step in importing the document is to let BizTalk Server know how to convert the ASCII file to the document definition set forth by the envelope, which is done by the FlatfileToRequisition map.

At this point, BizTalk Messaging Services now has enough information to be able to pick up the flat file and send it to the channel. The map is applied as the message flows through the channel. The document that emerges is an XML document, a *Requisition*.

## Into the Schedule

After the requisition has been passed on by the receive function, the remainder of our business process is managed by BizTalk Orchestration. The following is the XLANG schedule for this process, as seen from BizTalk Orchestration Designer:



**Figure 3. XLANG schedule (Click to enlarge)**

At a high level, the following steps occur in the schedule:

- Receive a requisition.
- Add a reference to this instance of the schedule.
- Send the RFQ out to three suppliers.
- Enter a timed transaction and wait for three responses or a time-out (whichever occurs first).
- Determine the lowest bidder.
- Place the RFQ returned from the lowest bidder on a Message Queuing queue.

We will now look at each of these steps in detail.

### Receiving a requisition

We have seen that a receive function polls a folder for a flat file and pushes it through a channel that maps it to a *Requisition XML* document.

The *ReceiveRequisition* channel called by the receive function is connected to a *ReceiveRequisition* messaging port that has a new XLANG schedule specified as a destination with a port name of *ReceiveRequisition*. When the channel is invoked, a new instance of the schedule will be created and the received document will be passed into it at the *ReceiveRequisition* port.

### Adding an instance reference

As the business process runs and we send out RFQs, we will in all likelihood have multiple instances of this schedule in progress at various stages of their life cycle and at any given time. We need a mechanism that will allow us to correlate each response that we receive back to the schedule instance that originated the corresponding RFQ.

Each instance of an XLANG schedule has a unique identifier associated with it (a GUID). This GUID can be derived from a port reference.

In this example, we pass our RFQ document to a Windows® Script Component that builds a URL to an Active Server Pages (ASP) page that will act as the response recipient. The URL consists of two distinct parts: the ASP page that will receive the response, and a parameter, *wfid*, which specifies the GUID of the schedule instance. We build this *Reply-to* URL dynamically in the script component and it will look something like this:

```
http://localhost/rfq_sample/receiveQuote.asp?wfid=sked://b1-notebook!XLANG  
Scheduler/{6CF959C3-7374-414E-8B03-EA8D0B1A1FE9}
```

---

With the moniker value assigned to *wfid*, we will have everything we need to make the correlation between the originating requests and the responses we receive from our suppliers.

## **Sending out RFQs**

For the sake of this sample, we have set up three fictitious suppliers, each of which has a BizTalk Server messaging port set up to receive the RFQs. The ports point at *RFQ.asp* on localhost. The sole purpose of *RFQ.asp* is to receive an RFQ document, populate the price with a random value, and then post the document to the location specified in the *Reply-to* element.

We could have sent out the RFQs individually to each supplier, but for the sake of convenience, we have set up in BizTalk Messaging Manager a BizTalk Server distribution list that includes each of these three messaging ports. This allows us to send out all three RFQs at one time.

## **Receiving responses—the RFQs component**

The RFQs COM component contains two classes:

- A loop iteration counter
- An RFQ assessor

The loop iteration counter is used to count the number of passes through the message receiving loop, and the RFQ assessor captures the returned quotations and exposes a method to determine the lowest bidder.

There may be many concurrent instances of this schedule in progress at any point in time. This leaves us with a dilemma. We need to maintain state information (the iteration count through the loop and any messages received as part of the loop), yet doing so would require the server to keep the stateful resources alive as it waits for responses. This is not a viable solution because it would not scale.

The solution is to let BizTalk Server dehydration persist the stateful components.

For the XLANG Scheduler Engine to be able to persist a COM component, it must support the *IPersist* interface. To do this with a Microsoft Visual Basic® component such as the RFQs component, select "Persistable" in the properties of the class in the Visual Basic IDE.

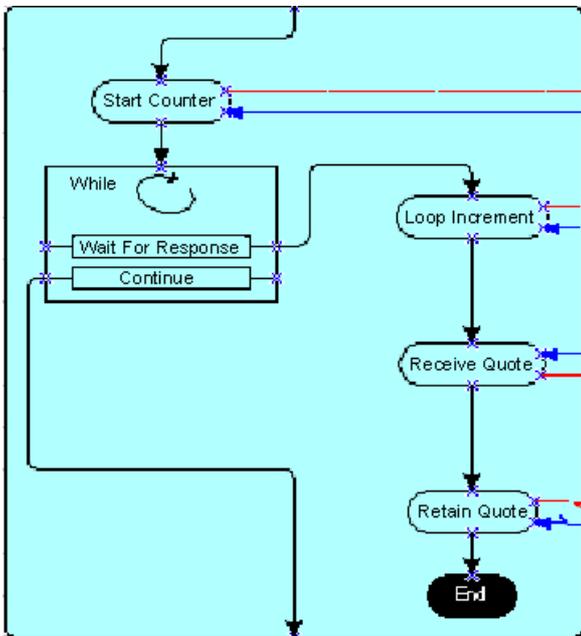
The XLANG Scheduler will not be able to dehydrate schedules that host stateful components that do not support *IPersist*, so this situation should be avoided if there are considerations around scalability or server resources.

## **Receiving responses—the timed transaction**

From a business perspective, there is a special consideration in our scenario that must be taken into account: although we sent out three requests for quotation, we don't know how many responses we will receive. We can request a receipt for the message and use a receipt channel to confirm that the message was received, however that only tells us that the RFQ was received and does not necessarily mean that the supplier will be sending a reply.

The solution to the non-responding bidder issue is to use a timed transaction, and set the transaction time-out to be the time to wait before moving on.

BizTalk Orchestration Designer uses colored regions to indicate transaction boundaries. These regions are color-coded according to transaction type, and in the case of a timed transaction are blue as shown. Note that in the schedule we refer to our COM component both before and after the transaction. We need to select the winning bidder after the transaction has completed or aborted, because we have two potential exit conditions: receiving all the responses or a transaction time-out. If we create the RFQ assessor inside the transaction, it will not be available to us if the transaction fails. For this reason, we have an *Initialize* stub method that is called to force the XLANG Scheduler to create the component before entering the transaction.



**Figure 4. Receiving quotes**

### Receiving responses—the while loop

Responses are received inside of a while loop in the schedule.

As you would expect, BizTalk Server while loops continue processing a specified set of tasks while a specified condition is true. A while shape has two exit branches: the "Continue" branch that is followed when the loop check condition is not true, and the loop branch that leads to the tasks that make up the loop itself. This loop branch is terminated with an End shape—which when executed indicates the end of the branch, not the end of schedule execution—and control returns to the loop check condition.

In our case, the check condition is the counter in the RFQs component. However, we have a sequencing issue to resolve: the loop continuation condition (a Boolean value) needs to be initialized before we test it, or it will be null as far as the XLANG Scheduler is concerned and we will never enter the while loop. This is the reason for making sure the *Start Counter* task immediately precedes the while loop.

After we enter into our loop, we increment the iteration counter and then wait for a response to be received. If three responses have been received prior to the time-out, the loop condition is no longer true and we exit the loop.

### Receiving responses—the non-instantiating COM object

XLANG schedules can contain a special kind of COM component, a non-instantiated COM component that serves as a point you can refer to from outside the schedule. The *wfid* parameter we added to our *Reply-to* URL is actually a moniker, and by appending the name of the non-instantiating COM component port, we will be able to get a reference into the schedule. Conceptually, this is a one-way path from an outside application into a running XLANG schedule instance, and this is how we will ultimately be able to correlate a response with the schedule instance that originated it.

In the sample application, we use an ASP page, *ReceiveQuote.asp*, to receive the incoming quotations. To clarify this topic further, relevant code from the page is shown below:

```

'// Read the workflow ID parameter. Must do this before doing the binary read.
strWorkflowID = Request("wfid")
'// Create a moniker using the workflow instance ID and the port reference
strMoniker = strWorkflowID & "/ReceiveDoc"
'// Create an instance of the XMLDOM to hold the incoming response
Set xmlDoc = Server.CreateObject("MSXML2.DOMDocument")
xmlDoc.async=false
'// Do a binary read of the XML that was POSTed to us
xmlDoc.load(Request)
'// Create an instance of the support object
Set objPort = Server.CreateObject("XLANGSupport.Correlate")
'// Submit the document we received
Call objPort.SubmitToPort(strMoniker, xmlDoc.xml)
  
```

ReceiveQuote.asp receives the response that was posted by HTTP from one of our bidders, loads it into an instance of the XMLDOM and instantiates an XLANGSupport.Correlate component that is used as part of the correlation process (included with the source code for this white paper). We then call the submitToPort method of the XLANGSupport.Correlate component, passing through the moniker and received document, as shown below:

```
Public Function submitToPort(strMoniker, strDoc)
    Dim objPort
    Set objPort = GetObject(strMoniker)
    objPort.ReceiveDoc (strDoc)
    Set objPort = Nothing
End Function
Public Function ReceiveDoc(strDoc As String)
'// shell required by BTS port binding wizard. Do not remove...
End Function
```

There are three ways to use the GetObject function to work with schedules:

1. When you issue a GetObject call passing through a moniker that includes the name of a schedule, a new instance is created and a reference to it is returned.
2. When you issue a GetObject call passing through a moniker that includes an instance GUID for a schedule, a reference to that running schedule instance is returned.
3. When you issue a GetObject call passing through a moniker that includes an instance GUID for a schedule, and also a port name, a reference to that port in that running schedule instance is returned.

The port name refers to a non-instantiating COM object in the schedule. We are effectively calling a method that only accepts a single parameter, which is a message being injected into a running schedule instance. A stub method must exist in a COM component in order for the COM Component Binding Wizard in BizTalk Orchestration to identify the port, although no code will be executed. The port is just an entry point to our schedule.

In this case, the *GetObject(strMoniker)* call will get us a reference to the *ReceiveDoc* port of the running instance of the schedule identified by the GUID in the moniker. We then call the *ReceiveDoc* stub function on the port to pass in the received document.

So, to recap the route back into the workflow from our bidder:

- Message is received by ReceiveQuote.asp.
- ReceiveQuote.asp instantiates XLANGSupport.Correlate.
- ReceiveQuote.asp calls the SubmitToPort method of XLANGSupport.Correlate, passing through a moniker containing instance and port information, as well as the document being submitted.
- SubmitToPort gets a reference to the specified workflow instance.
- SubmitToPort calls the "ReceiveDoc" method of the port.

The XLANG Scheduler resumes execution of the workflow at the ReceiveQuote port. The only input value is the document that was received.

The last step in our quotation receive process is to save a copy of the document in our COM component, which is the RetainQuote task that passes the document it just received to the AddQuote method of the RFQs component.

## Determining the lowest bidder

As we iterated through the while loop that received quotations from our suppliers, we were collecting those quotations inside a stateful COM component.

It is very important for performance reasons to specify the statefulness of components in the Orchestration COM Component Binding Wizard. This is where you are telling the XLANG Scheduler whether your component maintains state information and if so, whether it can be persisted.

The *GetBestQuote* task calls the *GetBestQuote* method of the RFQs component, which will return the lowest priced quotation.

## Placing the winning bid on a Message Queuing queue

The ProcessRFQ schedule communicates with the ProcessOrder schedule through a message queue. The end result of our Request for Quotation business process, the winning bid, gets placed on an MSMQ message queue.

This loosely coupled message-based architecture affords us the most scalability and flexibility.

## Connecting Up the Data Flow

The following diagram shows the message flow through the schedule.

Item 1 shows the call to the Windows Script Component. Note the Port Reference to AddWFID. It is from this value that we are able to extract the instance GUID that we use for correlation. The output of the AddWFID script is the RFQ message, Item 2.

Item 3 shows the quotation we received being passed through to the AddQuote method call. Item 4 shows the result of the GetBestQuote flowing to the OrderToBePlaced message that we will put on the message queue.

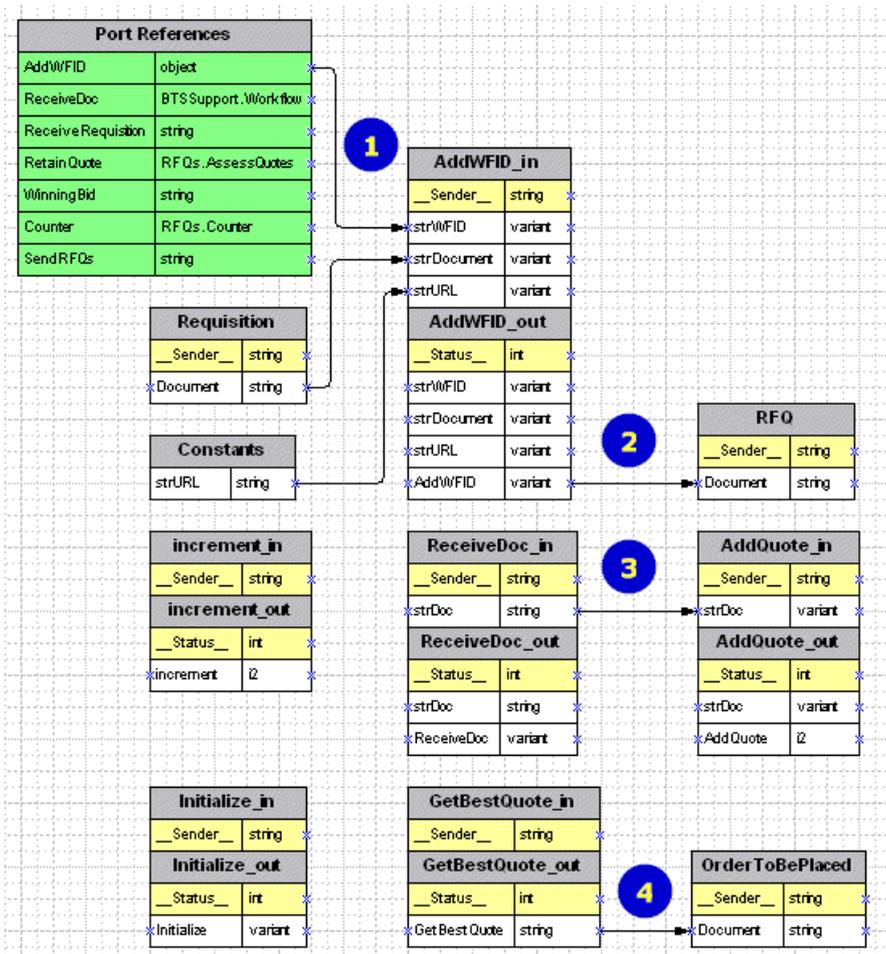


Figure 5. Quotation in the AddQuote method call

## The Purchase Process

The second workflow involved in this example is far simpler than the first, because the business process itself is far simpler. All we do here is pick up a winning bid from a known queue location, convert it to a purchase order, and send it out to a vendor.

This schedule features an important capability of BizTalk Messaging: dynamic routing. The endpoint to which we send the purchase order is specified in the document itself.

## BizTalk Messaging Entities

The entities we will need in BizTalk Messaging Services to support our PlaceOrder XLANG schedule are as follows:

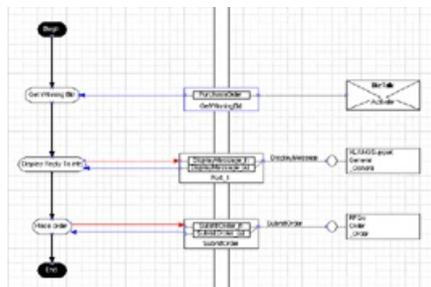
Name	Type	Use
WinningBid	Messaging port	Activation port to the PlaceOrder XLANG schedule
Order	Messaging port	Open destination messaging port used to send orders
WinningBid	Channel	Channel called by the receive function as part of schedule instantiation
Order	Channel	Channel used to send outbound order
Purchase Order	Document definition	Purchase order sent to a supplier
RFQtoPurchaseOrder	Map	Converts an RFQ to a purchase order

## Schedule Instantiation

The purchase order issuing process is triggered when an RFQ appears in a Message Queuing queue that is being polled by a BizTalk Server receive function. In our case the message is being deposited by the ProcessRFQs XLANG schedule that we just discussed, but other processes or applications could also be depositing messages there.

## Into the Schedule

After the RFQ has been passed on by the receive function, the remainder of the business process is managed by BizTalk Orchestration. The following is the XLANG schedule for this process, as seen from the BizTalk Orchestration Designer:



**Figure 6. The remainder of the business process (Click to enlarge)**

You can see that this schedule is far simpler than the first one. These are the steps that occur in the schedule:

- Receive RFQ
- Display a message
- Send an order

We will now look at each of these steps in detail.

### Receiving an RFQ

In the prior example, we saw that a receive function can poll a file folder. In this case we're polling a Message Queuing queue instead.

When an RFQ appears in this predefined queue, the receive function pushes it through the *WinningBid* channel. As it flows through the channel, the *RFQToPurchaseOrder* map is applied and the RFQ document is converted into a *PurchaseOrder* document.

The *WinningBid* channel called by the receive function is connected to a *WinningBid* messaging port that has a XLANG schedule instantiation specified as a destination, with a port name of *GetWinningBid*. This means that when the channel is invoked, a new instance of the *PlaceOrder* schedule will be created and the received document will be passed into it at the *GetWinningBid* port.

### Display a message

Obviously we would not have this situation in the real world. This task simply provides feedback as the sample runs because this is the only feedback mechanism in either of the schedules in this white paper. It displays the endpoint of the winning bidder.

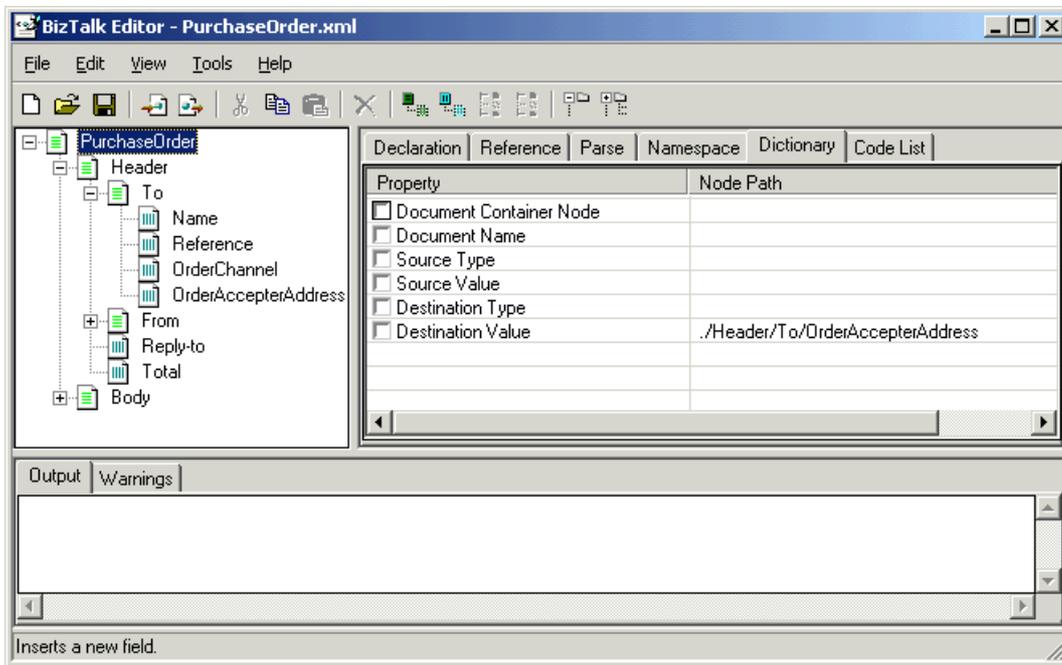
### Send an order

We have now reached the end of this business process that began with a simple flat file. This is also where we see the dynamic routing at work.

When we reach this task we call the *submitOrder* method of our RFQs component, passing the document into it.

The *submitOrder* method will take that document and submit it to BizTalk Messaging, which in turn will send it to the proper destination. The destination endpoint is included in the RFQ document with which we started this business process—in the *OrderAcceptorAddress* element. But how does BizTalk Server know which element to use?

The answer is that we have told it where to look, by using BizTalk Editor to specify in the document definition that the *OrderAcceptorAddress* element is the "Destination Value." This identification is done on the Dictionary tab, as shown below:



**Figure 7. Identifying the destination value**

## Conclusion

This white paper has shown an example of using BizTalk Orchestration and COM+ to solve a common real-world business requirement.

From a business standpoint, we have created a process whereby a flat file enters one end of a business process, it gets sent to multiple suppliers as a request for quotation, and the successful bidder receives an order. The entire process is highly automated and runs with no human intervention whatsoever.

From a technical standpoint, we have exercised many capabilities of BizTalk Server. We have seen:

- How to use while loops and timed transactions in BizTalk Orchestration.
- How to use a non-instantiating COM component to correlate a response with a running schedule instance.
- How separate business processes can be loosely coupled together using Message Queuing.
- How the dynamic self-routing document capabilities of BizTalk Server can be used to route a document to a destination specified inside the document itself.

This white paper has exercised some of the more advanced capabilities of BizTalk Messaging and BizTalk Orchestration, and has shown how they can be assembled to provide advanced business process automation solutions.

*Brian Loesgen is a Principal Software Engineer at Stellcom Inc., a leader in providing wireless-based engineering solutions for the mobile economy. Brian utilizes his XML expertise to translate new, leading-edge technology into real-world value. He is a co-author of the "Professional XML," "Professional ASP/XML," and "Professional Windows DNA" books from Wrox, as well as having written technical white papers for Intel, Microsoft and others. Brian has spoken at XML One, XML Devcon Conferences, the Wrox Developer Conferences, and numerous other major technical conferences worldwide.*

# BizTalk Orchestration: Transactions, Exceptions, and Debugging

Ulrich Roxburgh  
Microsoft Corporation

February 2001

**Summary:** This article examines the transactional support available in Microsoft BizTalk Orchestration Services and looks at how to use the transactions and exception-handling support to handle errors that might occur in schedules. In addition, it looks at how to debug schedules and components in schedules. This article is targeted at designers and developers implementing long-running business processes using BizTalk Orchestration Services. (22 printed pages)

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## Introduction

With Microsoft® BizTalk™ Orchestration Designer, users can design long-running business processes, specify an implementation for the individual actions that make up those processes, and compile this information into an executable XML representation, known as an XLANG schedule. The schedules created are distributed across time, organizations, and applications, in a loosely coupled and scalable manner. However, because of the highly distributed nature of these processes, the likelihood of errors and exceptions occurring during execution of schedules is even greater than for traditional short-lived business processes.

Orchestration Designer presents a visual design and development environment that separates the business process being developed from the implementation of that process. Using this tool, developers can specify an implementation for each of the individual actions that make up those processes and can compile this information into an executable XML representation. BizTalk Orchestration Designer provides a rich set of programming constructs, including transactions and exception processing semantics.

Transactions are provided to group collections of actions into a single logical unit of work, to ensure that all the work done by the actions within the group is committed, or that all the work is undone. This grouping of actions provides the highest level of structure and reliability. There is support not only for short-lived transactions, but also for transactions spanning long-running business processes, and timed transactions

Exception processing provides additional logic to undo the results of transactions or to provide an alternate series of actions to take in the event of a processing error. This exception processing includes On Failure and Compensation processing to support error handling for long-running business processes.

Finally this article discusses methodologies to debug and troubleshoot BizTalk Server Orchestration Services and BizTalk Messaging Services.

## Orchestration and Transactions: The Long and the Short of It!

### What Is a Transaction?

Mankind has engaged in transactions since the earliest times. In a typical scenario, a buyer and a seller negotiate a suitable price for some goods. Assuming an agreement is struck, the buyer hands over the money in exchange for the goods. The important point here is that either the whole transaction proceeds or none of the transaction proceeds. If the buyer gets the money and the seller gets the goods, everyone is happy. If the seller doesn't get the money, he doesn't give the goods to the buyer, which is still an acceptable outcome. However, if the buyer hands over the money and doesn't get the goods, the buyer is unhappy. Similarly, if the seller hands over the goods but doesn't get the money, the seller is unhappy.

If the buyer and the seller don't trust each other to uphold their end of the bargain, they might call on the services of a trusted intermediary. To carry out the transaction, the buyer hands the money to the intermediary, and the seller hands the goods to the intermediary. The intermediary then ensures that the seller receives the money and the buyer receives the goods.

What does all this have to do with transactions on computers? Consider a process to transfer money in a banking application: money is taken from one account (a value is decremented in a record in one database) and put into another account (a value is incremented by the same amount in a record in another database). This series of operations must act like a single atomic

operation (that is, perform as a single indivisible operation). This is termed a transaction (the term is derived from the phrase "transformation action"). A transaction is an action or series of actions that transform a system from one consistent state to another.

Transactions adhere to a set of properties known as ACID properties:

- **Atomicity.** A transaction represents an atomic unit of work. Either all modifications within a transaction are performed or none of the modifications are performed.
- **Consistency.** When committed, a transaction must preserve the integrity of the data within the system. If a transaction performs a data modification on a database that was internally consistent before the transaction started, the database must still be internally consistent when the transaction is committed. Ensuring this property is largely the responsibility of the application developer.
- **Isolation.** Modifications made by concurrent transactions must be isolated from the modifications made by other concurrent transactions. Isolated transactions that run concurrently will perform modifications that preserve internal database consistency exactly as they would if the transactions were run serially.
- **Durability.** After a transaction has committed, all modifications are permanently in place in the system. The modifications persist even if a system failure occurs.

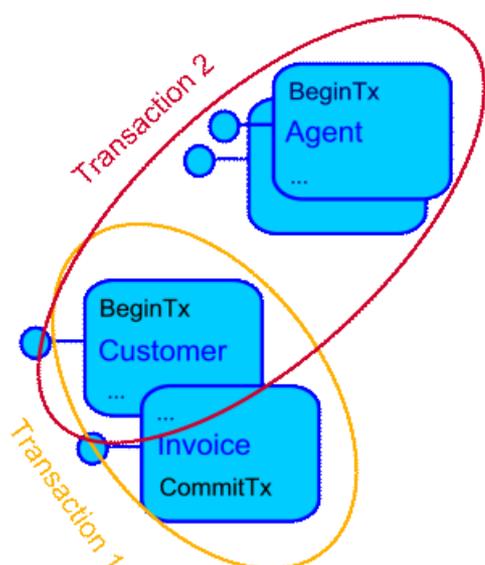
Just like the analogy about transactions in a marketplace, often neither party involved in a transaction has control over the other one (for example, in a transaction involving updates in two separate databases), so neither party is able to guarantee the atomicity of the process. And just like in the marketplace analogy, the solution to this problem is to introduce a third party or intermediary to ensure that either both actions occur or neither action occurs.

On Microsoft® Windows NT® 4 and Microsoft Windows® 2000, this intermediary is known as the Microsoft Distributed Transaction Coordinator (MSDTC). MSDTC was first released together with Microsoft SQL Server™ 6 and provides an object-based programming model for creating, destroying, managing, and monitoring transactions. MSDTC works in conjunction with some helper services (known as resource managers) to ensure that the ACID properties for a transaction are maintained.

Resource managers own the objects affected by the transactions and are responsible for the persistent storage of the resource objects. A resource must have a resource manager to take part in a transaction with the Distributed Transaction Coordinator. Note also that the Distributed Transaction Coordinator and the resource managers can be distributed across multiple nodes on a network.

To coordinate the actions in a transaction, and to maintain the ACID properties, the Distributed Transaction Coordinator and the resource managers use a protocol known as the two-phase commit protocol. The algorithm for the two-phase commit protocol is a complex sequence of operations, which increases in complexity as the number of resources (and therefore resource managers) increases. The most significant feature of the protocol is that the records that will be updated must be locked during the two-phase commit. This lock on the database records remains until the transaction is either aborted or committed. This factor has an important bearing on transactions in long-running business processes.

Despite the fact that the Distributed Transaction Coordinator greatly improves the ease with which programmers utilize transactions in their applications, this model still suffers from one big weakness. Transactions are typically implemented within components (initiated, and committed or aborted). When the actions that make up a complete transaction are spread across multiple components (that is, initiated in one component and either committed or aborted in another), it is difficult to reuse those components to implement new transactions composed of a different combination of components.



In the diagram, **Transaction 1** is initiated inside the Customer component and committed in the Invoice component. There is also an Agent component, which initiates a second transaction. Now if for some business process another transaction (**Transaction 2**) is created that consists of the Customer and Agent components, the transaction can't be easily composed, because both components initiate a transaction but neither component completes the transactions (commits or aborts the transaction).

In 1997, Microsoft released the Microsoft Transaction Server (and also released a new version of the MSDTC). This product was revolutionary in providing a declarative model for transaction programming. Now, instead of programming the transaction semantics within a component (and thus essentially hard-coding the composition of the transaction), the programmer declares transaction properties for a component as a whole, and implements entire transactions by composing the transaction from individual COM components.

This new model allowed programmers to compose their transactions in a much simpler manner, greatly increasing reuse of transactional components. COM components became the building blocks for business transactions. All of the services provided by Microsoft Transaction Server have now migrated to Windows 2000 and have been significantly enhanced as COM+ services under Windows 2000.

COM+ provides five levels of transactional support:

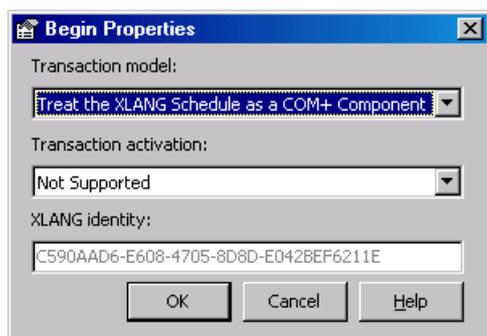
- **Disabled.** This selection specifies that the component will ignore COM transaction management.
- **Not Supported.** This selection specifies that the component will not participate in a transaction, or propagate the transactions of other components.
- **Supported.** This selection specifies that if a transaction is currently running, the component will be included in the transaction. However, the component will not initiate a transaction.
- **Required.** This selection specifies that if a transaction is currently running, the component will be included in the transaction. If there is no transaction running, a new transaction will be created for the component.
- **Requires new.** This selection specifies that a new transaction will always be created for the component.

BizTalk Orchestration leverages off the existing COM+ services, providing a sophisticated graphical programming paradigm for developing complex business processes, complete with transaction programming and exception handling semantics, that provide the same kind of revolutionary transaction programming semantics as COM+ services.

There are multiple levels of transactional support within BizTalk Orchestration. The first level of that support comes from treating an entire schedule as a COM+ transactional component. Next, it is possible to specify transactional semantics for a collection of actions within that schedule by enclosing those actions within a transaction shape. This allows schedules to support short-lived DTC style transactions (transactions managed by the Distributed Transaction Coordinator and utilizing the underlying COM+ services), and to additionally support long-running transactions (which represent business processes that run over an extended time period) and timed transactions (which represent actions that might time out after an extended period). Schedules also support transaction compensation and exception processing semantics.

## Business Process Diagrams as a Transaction Participant

The first level of transaction support provided by BizTalk Orchestration Services allows an entire schedule to be treated as a transactional component. The transactional support of the schedule is set declaratively in a manner similar to the way transactional support is declared for a COM+ component. The schedule is then initiated by a COM+ component, which might or might not already be running within a transactional context. In essence, the schedule provides the implementation of that transactional COM+ component.



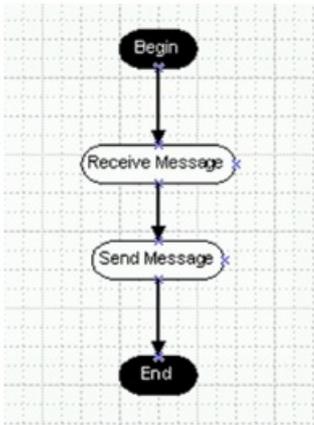
The transaction model for a schedule can be set by opening the **Properties** dialog box for the **Begin** shape at the start of the schedule. By default this is set to **Include transactions within the schedule**. To treat the whole schedule as a transactional component, select **Treat the XLANG Schedule as a COM+ Component**. The level of transactional activation for the schedule can also be set:

- Select **Not Supported** if the XLANG schedule does not support transactions.

- Select **Supports** if the XLANG schedule participates in a COM+ transaction.
- Select **Requires** if the XLANG Scheduler Engine works with COM+ to ensure that all the COM components that are created by the schedule are transactional.
- Select **Requires New** if the XLANG schedule must participate in a new transaction. If this setting is enabled, COM+ services automatically initiate a new transaction that is distinct from the caller's transaction.

Using this mechanism, the orchestration engine effectively provides business process automation implemented within a single COM+ component. That is, the whole schedule functions as a single COM+ component, and that COM+ component can support transactions as described above. Note that when using an entire schedule as a component, that schedule cannot contain any transaction shapes itself (transaction shapes can be included in the schedule, but the schedule won't compile), and there are limitations on the use of concurrent streams of execution within the schedule—when using the **Fork** shape in the schedule, all transactional actions must occur in one stream of execution.

Note that the mechanism of using the schedule as a self-contained transactional component relies on the underlying COM+ services to manage transactions. If a transaction is aborted, only the actions implemented in terms of transactional components will be rolled back. Transactional components can be COM+ components, Script Components, or transactional Microsoft Message Queues.



In this example, the schedule has been configured as **Treat the XLANG Schedule as a COM+ Component** (in the **Properties** dialog box of the **Begin** shape). It has also been configured to require a transaction. The implementation of the schedule (not shown) reads a message from a transactional message queue (receive queue) and writes the message to another transactional message queue (send queue).

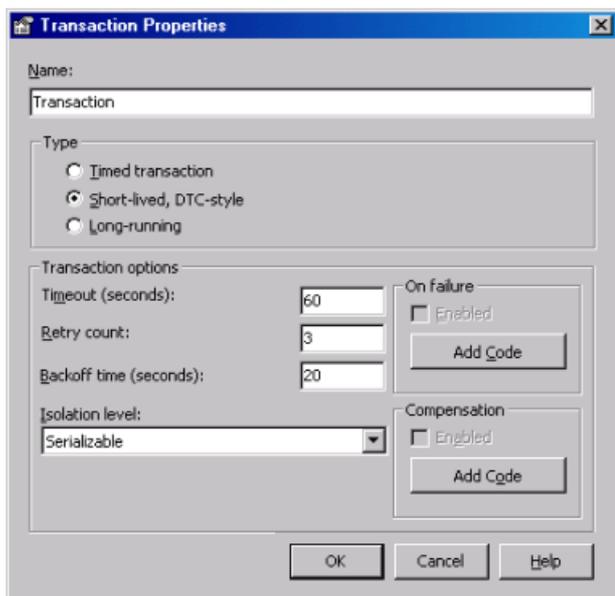
If this schedule is executed by instantiating it from a COM+ component, which is also configured to require a transaction, and that transaction is committed (the component calls **SetCommit**), a message will be read from the receive queue and written to the send queue. If, however, the COM+ component for some reason aborts the transaction (calls **SetAbort**), the message that was read from the receive queue will be replaced in the queue, and no message will be written to the send queue.

## Types of Transactions within Schedules

If the transaction model for a schedule is set to **Include Transactions within the XLANG Schedule** (the default setting), the schedule can contain transaction shapes. To add transactions to a schedule, drag the **Transaction** shape from the flowchart palette and position it to enclose all the actions that will take part in the transaction.

It is also possible to nest one or more transaction shapes within an outer transaction shape. A short-lived transaction groups a series of actions within its boundaries, but it cannot nest another transaction. Long-running transactions and timed transactions, however, can be used to group any combination of actions—short-lived transactions, long-running transactions, or timed transactions. Note, however, that transactions cannot be nested deeper than two levels.

Properties for the transaction can be set by clicking **Properties** for the transaction shape, which displays the **Transaction Properties** dialog box. This allows the transaction to be named and the transaction type (timed, short-lived, or long-running) and other transaction properties to be set.



Additionally, On Failure code or Compensation code can be added to the schedule if appropriate. On Failure code creates a new page on the schedule (**On Failure of Transaction** page), which is used to design an alternate business process to handle the failure of the selected transaction. This option is available for all transactions (see "Transaction On Failure Processing" later in this article). Compensation code also creates a new page in the schedule (**Compensation for Transaction** page), which is used to design an alternate business process to undo the logical unit of work that was performed in a nested transaction that has already committed. This option is available only for nested transactions (see "Transaction Compensation Processing" later in this article).

The other transaction properties that can be set are:

- **Timeout.** This property sets the time a transaction is allowed to run before it will be automatically aborted or retried. This property cannot be set for long-running transactions.
- **Retry count.** This property determines the number of times a process within a short-lived transaction will be run if the process within the transaction does not complete. For each retry, the state of the application is reset to the starting point of the process within the transaction. This option is available only for short-lived transactions.
- **Backoff time.** This property determines the interval between each attempt to retry the transaction. The backoff time is used with the retry count value to determine how long to wait before the next transaction retry. The backoff value is exponential. A backoff value of 2 seconds results in intervals of 2, 4, 8, 16 seconds, and so on between each retry. The formula is **B\*\*R (B** raised to the power of **R)**, where **B**=backoff time and **R**=current retry count. If the backoff time of a specific transaction retry attempt is greater than 180 seconds, the XLANG schedule instance will be dehydrated to the persistence database immediately. This option is available only for short-lived transactions.
- **Isolation level.** The isolation level determines the degree to which data within concurrent transactions is accessible to each other. This option is available only for short-lived transactions. The choices are:
  - **Serializable** to prevent concurrent transactions from making data modifications until the selected transaction is complete. This is the most restrictive of the four isolation levels.
  - **Read Uncommitted** to allow concurrent transactions to make data modifications before the selected transaction is complete. This is the least restrictive of the four isolation levels.
  - **Read Committed** to prevent the selected transaction from accessing data modifications in concurrent transactions until they are committed. This option is the Microsoft SQL Server default setting.
  - **Repeatable Read** to require read locks until the selected transaction is complete.

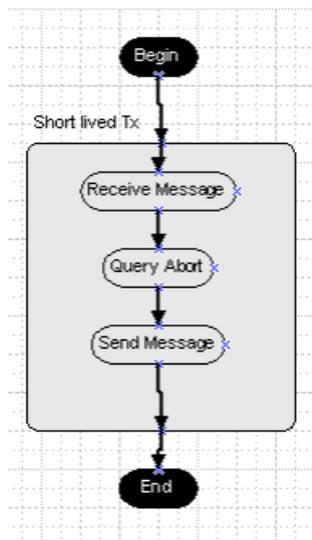
## Short-lived (DTC Style) Transactions

When a transaction shape is set up on a schedule, it defaults to being a short-lived transaction (transaction box is filled in gray). This transaction type is dependent on the underlying transaction support from COM+ and MSDTC. Short-lived transactions allow atomic (single, indivisible) units of work to be created from a number of discrete and independent units.

Although the properties for the transaction can be set in the **Properties** dialog box, and the boundaries of the transaction defined by the actions that are grouped within the transaction shape, short-lived transactions depend on the transaction properties set for the implementation port connected to that action, and the transaction properties of the components, message queues, or scripts referenced by that implementation port.

Specifically, this means that the implementation for the actions enclosed by a transaction shape should be COM+ components that support transactions, scripts that are marked as transactional, or reads and writes to transactional message queues if those

actions are to be successfully aborted. If a transaction shape encloses an action connected to an implementation port that does not support transactions, the work done by that COM+ component, script, or queue will not be rolled back if the transaction is aborted. Taking this into account, nontransactional components can still be used to implement actions that are part of a transaction.



The schedule shows three actions that are enclosed in a short-lived transaction. In the implementation of this schedule (not shown), the first action is a message arriving in a transactional message queue (receive queue). A COM+ component is then instantiated, and a method is called on the component. The method displays a dialog box, which lets the user select either to commit or to abort the transaction (call **SetCommit** or **SetAbort** within the method on the COM+ component). The last action takes the original message and writes it to another transactional message queue (send queue). When this schedule is executed, if the user elects to call **SetCommit**, the message will be read from the receive queue and placed in the send queue. However, if the user elects to call **SetAbort**, the message will remain in the receive queue.

The last thing to note is that for every instance of this schedule, a new instance of the **Query Abort** component will be instantiated as the short-lived transaction starts, and that instance will be destroyed when the transaction terminates (either aborts or commits). This is the same just-in-time activation model first delivered with Microsoft Transaction Server. Any state held by the component will be lost.

## Long-running Transactions

When looking at a business process that might execute over an indefinite time period, traditional short-lived transactions can't be used. This is because each short-lived transaction holds database locks and resources. Given that there can be thousands of business processes running on a computer at any particular time, the number of these resources held would be impractical. Instead, the transaction type is set to be long-running. A long-running transaction has all the ACID properties described previously except one, Isolation.

Isolation means that nothing outside a transaction can even see (let alone update) any of the data that is being used within a transaction. The reason for isolation is that the result of the transaction is unknown until it either commits or aborts, so the current data value might be valid or invalid. Since the data might be invalid, nothing else can be allowed to access the data, in case it is misused. Isolation is a property of short-lived transactions (one of the ACID properties) and is implemented by locking records in the database.

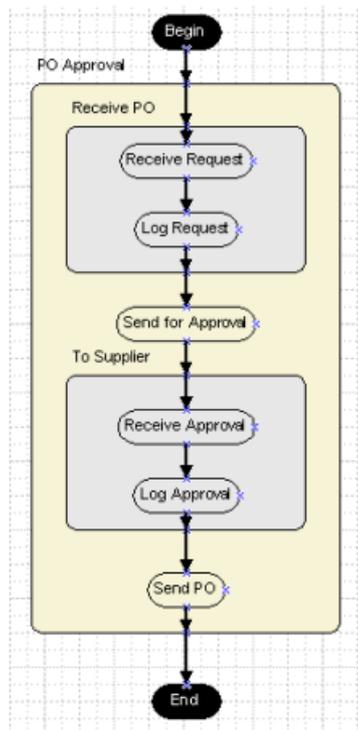
In a long-running distributed business process, records in a database can't be locked for extended periods of time, nor can records be locked in databases distributed across organizations (imagine trying to convince the database administrator of another organization to let you lock records in his database!). Long-running transactions are specifically designed to group collections of actions into more granular atomic units of work that can exist across time, organizations, and applications. In a long-running transaction, other transactions can see the data being used by the transaction. Of course long-running transactions can also be composed of actions that are themselves short-lived transactions (short-lived transactions can be nested within long-running transactions).

For example, imagine a business process that is initiated when a purchase order request is received. The request is logged to a database and then sent to the request approver. It might take some time (weeks!) for the approval response to be received, at which point the response is also logged to a database and the purchase order is sent to the supplier. Receiving the initial request (and logging it) and receiving the response (and logging it) are themselves each composed of multiple actions (receiving and logging).

In this scenario, short-lived transactions are used to group related actions into a single atomic transaction (receiving a message

and logging it to the database). However, the receipt of the purchase request message and the receipt of the approval message can't be grouped within a single short-lived transaction, because that would lock rows in the database for indefinite periods. Imagine if 5000 users all did that at the same time! Instead, a long-running transaction is used to group the two short-lived transactions, which might be separated by a significant time period.

Now imagine what happens when this business process is executed. First, the purchase request is received and the database is updated in a short-lived transaction. If anything goes wrong, the transaction will be aborted and all changes will be undone; otherwise, the transaction commits. Then the schedule waits for the arrival of the approval message. When the message arrives, the database is again updated transactionally.



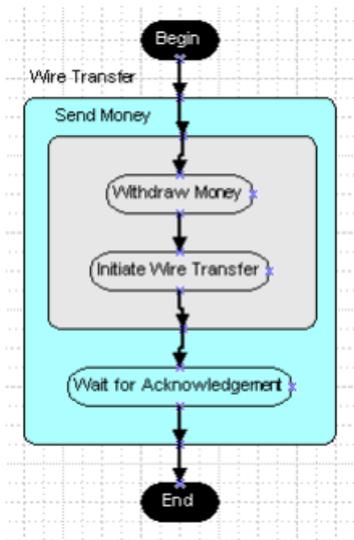
If anything goes wrong, the **To Supplier** transaction will abort automatically. However, the **Receive PO** transaction can't be aborted, because it has already been committed. In this event, the first transaction needs to supply some code that can undo the actions it has performed, in the event of a transaction abort after the transaction has already committed. This is known as a compensating transaction (see "Transaction Compensation Processing" later in this article). In this scenario, if something causes the **To Supplier** transaction to abort, the resource managers and MSDTC will take care of undoing all work done by the **To Supplier** transaction. The Compensation code supplied by the **Receive PO** transaction will undo the already committed changes made by that transaction.

The overall grouping (composition) of short-lived transactions into a long-lived transaction is controlled by the long-lived transaction. Typically, a long-running transaction will contain several nested short-lived transactions. Depending on the requirements of the business process described by the XLANG schedule drawing, an entire business process (with the exception of the **Begin** shape and an **End** shape) can be enclosed within a long-running transaction as shown here.

## Timed Transactions

Timed transactions are used to trigger an abort of a long-running transaction if it has not completed in a specified amount of time. Long-running transactions do not utilize the time-out property on the property page. It is typically very difficult to decide in advance how long a business process should take. However, it is possible to make a reasonable estimate of how long a specific action within a business process should take, for example, the arrival of a message.

Thus, a timed transaction can be used to group short-lived transactions and to wait for the arrival of a message within a specified time period. If the message arrives in time, the timed transaction commits; otherwise, the timed transaction aborts and causes the short-lived transactions to execute their Compensation code.



In the example, a short-lived transaction is used to **Send Money**. This transaction groups the **Withdraw Money** and **Initiate Wire Transfer** actions. When the **Initiate Wire Transfer** action has completed, the business process sequence flows out of the nested transaction. When this happens, the nested transaction is committed: the money is withdrawn from a bank account and sent to a destination. At this point, the business process sequence flows to the **Wait for Acknowledgement** action in the outer transaction.

In this scenario, the **Wire Transfer** transaction has been configured as a timed transaction. If the sender has not received an acknowledgement of receipt of the money within the specified amount of time, the outer transaction will abort. When this happens, the business process sequence flows to the **Compensation for Send Money** page for the nested transaction and to the **On Failure of Wire Transfer** page for the outer transaction (see "Transaction Compensation Processing" later in this article).

Timed transactions can also be modeled by having two flows of execution within a schedule, one of which waits for the arrival of the message, while the other has a timer that will time out within the specified period. Whichever event occurs first (arrival of the message or time-out of the timer) completes the transaction (causing a commit or abort, respectively). However, modeling a timed business process in this way would impose restrictions on the ability of the schedule to dehydrate itself, and, in any event, timed transactions are much more convenient.

## Transaction Properties of Implementation Ports

As noted previously, there is a distinction between the action shapes used in a schedule and the implementation of those shapes in the implementation port. The transaction properties of the actions are dependent on the transactional properties of the underlying implementation. This means that only actions that are implemented using transactional components will actually take part in a transaction.

Specifically, this means that the implementation of the actions enclosed by a transaction shape must be COM+ components that support transactions, scripts that are marked as transactional, or reads and writes to transactional Message Queues if those actions are to be successfully aborted. When linking the binding of COM+ or script components to the port implementation, the transaction support of that implementation port can be set in the same way as transaction support for a COM+ application is set (disabled, not supported, supported, required, requires new).

It is perfectly acceptable to implement actions inside a transaction with nontransactional implementation ports, but any changes made by those implementations won't be rolled back in the event of a transaction abort. In any case, transactions won't be supported in implementation ports unless they deal with resources that are managed by resource managers that can work with the Distributed Transaction Coordinator, which in practice means most common databases, and Microsoft Message Queuing. Nontransactional cases are handled using On Failure processing (see "Transaction On Failure Processing" later in this article).

The last transaction property that can be set in the port implementation is the ability to abort a transaction if an error occurs during the processing of that component or script. Using this mechanism, the current transaction can be aborted by returning a COM+ error from a COM+ object or script.

## What Causes Transactions to Abort?

How is a transaction potentially aborted? Transactions execute normally until either the process flows outside the transaction boundaries (the transaction commits and completes) or an abort occurs. An abort can occur for a number of reasons:

- Encountering the **Abort** shape within the process flow.
- A failure return code from a COM+ component (HRESULT) that is specified to cause an abort in a port binding.
- Any binding technology can, at a system level, introduce a failure event that aborts the transaction. For example, Message

Queuing might fail to put a message on a queue.

- The XLANG Scheduler Engine (the COM+ application that executes instances of schedules) might encounter an error that causes it to abort a transaction within a given instance. For example, there might be a DTC error.
- Pausing a schedule might require all transactions within that schedule to abort.
- A transaction time-out within the transaction properties.

When an abort occurs, a transaction might retry from the beginning, depending on the value set in the **Retry count** property of the transaction group. If, after a transaction has retried the specified number of times, it continues to fail, the On Failure business process will be called. This On Failure code provides a structured place to handle the failure of a transaction.

## Error Handling in Schedules

As the previous section shows, short-lived transactions can be used to provide automatic rollback and recovery for some of the actions in schedules. However, many of the actions can't be implemented in a transactional manner, so to handle error conditions, other forms of error handling, such as exception processing, and compensating transactions must be used. This section focuses on how to build error handling into schedules.

## Causes of Errors

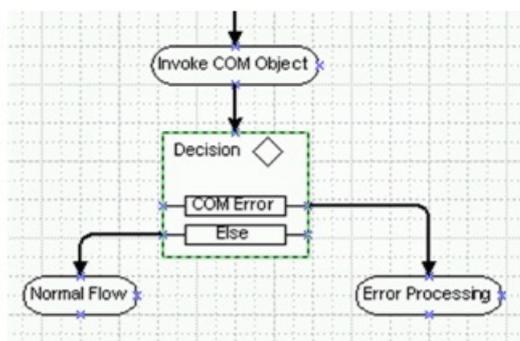
Looking first at the possible cause of errors in a schedule, there are three levels of errors that can occur while the XLANG Scheduler Engine is running. In decreasing order of severity, these are:

- Errors that cause a failure. System errors that cannot be trapped by the XLANG Scheduler Engine can cause the engine to fail along with all schedule instances that are running in the same COM+ application. The most likely cause of such a failure is an in-process, badly written COM+ component. Such components should be well tested out-of-process and then placed in process.
- Errors that cause an abnormal termination, including an out-of-sync COM+ component, a message queue that does not exist, or a messaging channel that does not exist.
- Errors that can be trapped.

Naturally, during the processing of the schedule, errors need to be detected and handled appropriately. Errors that can be trapped within an XLANG schedule include COM components that return failure HRESULTs (this applies to COM+ components or scripts) and transaction aborts caused by enlisted services (such as if the connection to a database was lost).

## Handling Errors

As indicated in the previous section, the XLANG Scheduler Engine can trap application and system errors. XLANG schedules can be designed to react to errors at run time, either by testing explicitly for an error result using a decision rule or by using transaction failure processing.



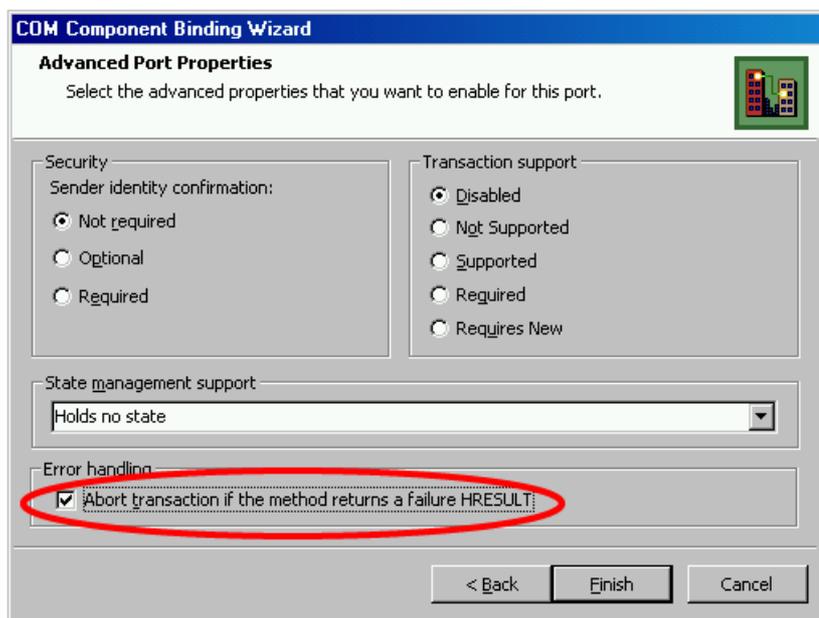
To use logical branching to explicitly test for an error result, the value returned after calling a method on a COM+ component or script is tested. This value is stored within the `__Status__` field of the `_out` message from the COM component (all actions in a schedule are implemented in terms of messages; in the case of COM+ components this means a message is sent in to the component and another message is sent out from the component).

To implement this, a **Decision** shape is added immediately after the action whose result needs to be tested, and a rule is added to test the output of the COM component (`_out.__Status__ >= 0`, where a negative HRESULT indicates failure and a positive HRESULT indicates success). Specific failure codes can also be tested for, if this is appropriate. These codes are defined in the header file `Winerror.h`.

Errors can also be handled using transaction failure processing. If an action is enclosed within a transaction shape and the action is implemented as a COM+ component or script, and that component or script aborts the transaction, the work done by all

components taking part in the transaction will be undone. If the component that triggers the abort is not transactional, the transaction abort needs to be triggered in some other way. Setting the error handling within the COM Component Binding Wizard to abort the transaction if the method returns a failure HRESULT does this.

This option will have an effect only if the communication action that uses this port is within the process flow of a transaction. When this is set for a COM+ component or script, and a bad HRESULT is returned, any transaction currently running will be aborted. The same functionality can be achieved in a schedule by testing for the bad HRESULT using a **Decision** shape, and then executing an **Abort** shape if a bad HRESULT is returned (but the error handling in the COM Component Binding Wizard is much more convenient).



Handling a failure in the Message Queuing or BizTalk Messaging implementation technologies can only be performed with transaction failure processes. Transactional support is specified in the Message Queuing Binding Wizard by indicating that transactions are required with this queue (this is done automatically for BizTalk Messaging). Note that a Message Queuing send action that returns successfully indicates that the message has been successfully placed onto the queue, but it does not indicate that the message has been delivered.

## Transaction On Failure Processing

Grouping individual actions that use short-lived transactions into more granular business processes is obviously one very effective mechanism for safeguarding schedules against errors. However, with long-running business processes, a number of other mechanisms must be used to develop schedules that can handle errors appropriately.

With short-lived transactions, the boundaries of transactions are set declaratively using the **Transaction** shape, and then those transactions are aborted either by calling **SetAbort** within a transactional component or by having a component return a bad HRESULT, which can be trapped. If the actions within the transaction are bound to transactional resources, the Distributed Transaction Coordinator will handle the rollback of all the enlisted actions within the transaction. Any work done will then be completely undone.

However, there are many circumstances where traditional short-lived transactions are either inadequate or unable to perform as required. In these cases, On Failure processing can be used to add additional error handling semantics to schedules. On Failure processing is implemented as unique, separate flows within schedules, implemented on separate processing pages in BizTalk Orchestration Designer. When setting the properties for a **Transaction** shape, the business process designer can choose to add code for On Failure processing. This results in an additional page, **On Failure of Transaction**, being added to the schedule. The business process designer can add additional logic here to handle the failure of the transaction. This code will be invoked if the transaction aborts (after the transaction has aborted, and all the transactional components have undone their work).



Now, when a short-lived transaction aborts, any actions bound to nontransactional resources (for example, sending e-mail) will not be rolled back. Additional actions can be added to the **On Failure of Transaction** processing page to undo these nontransactional actions (for example, sending another e-mail that states that the first e-mail should be ignored).

Of course On Failure code can do literally anything, and it does not have to confine itself to undoing actions grouped within the

transaction. As well as undoing nontransactional actions, other work might need to be done when a transaction aborts. In a typical business process, aborting a transaction and cleaning up the work done is seldom sufficient. At the very least, the transaction failure might need to be logged, but more typically it will also need to perform other actions, such as letting the user know the result of the transaction. Once again, On Failure processing can be used to implement these actions in the event of a transaction failure.

On Failure processing can also be applied to long-running transactions and timed transactions. For example, if a timed transaction is set up to await the receipt of a message, the On Failure processing can be used to alert the appropriate user when the message fails to arrive.

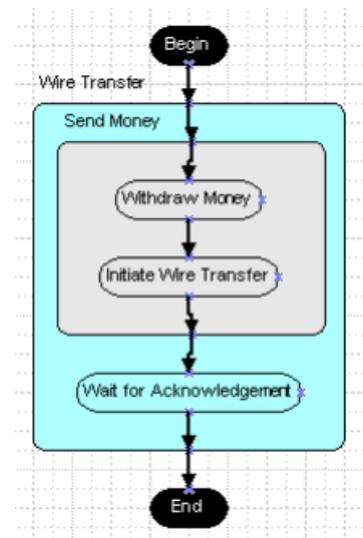
There is one further subtlety associated with On Failure processing, namely that any actions that occur after a transaction have no way to determine if that transaction committed or aborted, unless this information is passed to those actions in a message. For example, consider a schedule with a number of actions, some of which are grouped into a transaction. A message (an XML document perhaps) passes through the schedule from start to finish.

If the transaction commits, everything will operate correctly, and the message will be updated by the actions (the work done by the actions will be committed). However, imagine if one of the actions aborts the transaction. In this case, all the changes to the message will be undone. An action after the transaction will not be able to tell if the transaction has committed or aborted (that information is not passed on), and it won't have any idea which actions successfully processed the data and which action failed, since all changes to the message will be rolled back.

The **On Failure of Transaction** page again is the best way to implement this scenario. The On Failure code will be executed after the transaction aborts and, significantly, all changes made to messages will be available to the On Failure code. Additionally, the On Failure code can set fields in the message that indicate that a transaction abort has occurred, so that successive actions can take appropriate action.

## Transaction Compensation Processing

On Failure processing works in terms of a single transaction. Transaction abort processing becomes even more complex with long-running business processes and nested transactions (as discussed previously, transactions can be nested within long-running or timed transactions).



The example shows the timed transaction **Wire Transfer**, which groups the short-lived transaction **Send Money**. If this schedule is run, the **Send Money** transaction will execute (and presumably commit). The schedule will then wait for an acknowledgement to indicate that the wire transfer has occurred correctly.

If the acknowledgement does not arrive within the specified time period (whatever time-out was set for the timed transaction), the timed transaction (**Wire Transfer**) will abort. However, the inner transaction (**Send Money**) cannot be aborted, since it has already committed. Even if On Failure code were supplied for this transaction, it would not be called, because this inner transaction has not failed.

This scenario is handled by providing Compensation processing for the inner transaction. In the **Transaction Properties** dialog box for a nested transaction, Compensation processing code can be added, which (like On Failure processing) results in an additional page, **Compensation for Transaction**, being added to the schedule. Code can be added to this page to compensate for the (already committed) inner transaction.

With nested transactions, it is entirely feasible that multiple **Compensation for Transaction** and **On Failure of Transaction** processing pages will exist within the schedule, and that more than one of these will be executed to perform the error handling required. In the previous example, assume that the transaction **Send Money** has both an **On Failure of Transaction** page and a

**Compensation for Transaction** page, and that the timed transaction **Wire Transfer** has an **On Failure of Transaction** page.

There are two likely scenarios for failure in this schedule. The first is that the **Send Money** transaction aborts, in which case the On Failure processing for the **Send Money** transaction will be executed. Normally, the On Failure processing for the **Wire Transfer** transaction would not execute, since the outcome of the inner transaction does not affect the outcome of the outer transaction. In this case, since no acknowledgement will be sent, the outer timed transaction will also eventually fail, and the On Failure code for the **Wire Transfer** will be called. The second scenario is that **Send Money** will commit, but the acknowledgement message will not be received within the time-out period, causing the timed transaction to abort. In this case the Compensation processing for **Send Money** will execute first, followed by the On Failure processing for **Wire Transfer**.

## Debugging Schedules

With traditional development systems, it is now commonplace to provide visual debugging facilities, such as those found in Microsoft Visual Basic® and Microsoft Visual C++®. Microsoft BizTalk™ Server does not provide a graphical debugging facility for orchestration schedules. However, remember that orchestration schedules represent a different kind of executable process from traditional short-lived synchronous processes, so the traditional debugging model alone is not effective.

When an orchestration schedule is designed using BizTalk Orchestration Designer, the schedule drawing is in effect a painting of a business process. To represent a process, three artifices are used:

- An Action, which is always either send or receive a message.
- A Message, which is data that is sent or received.
- A Port, where messages are sent to or received from.

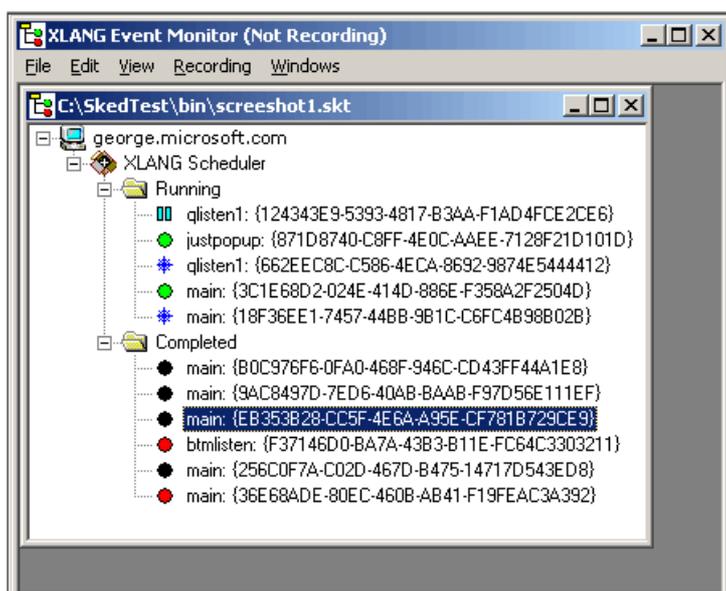
In addition, because the schedule represents a process, there is the concept of sequencing from one action to another. When the orchestration schedule is compiled and then executed, typically multiple instances of the schedule will be initiated as individual (long-running) executable processes.

To debug these executables, a combination of tracing and conventional debugging proves most effective. To debug the sequencing of a schedule (the flow from one action to another), tracing is useful. To debug the implementation of an individual action, traditional debugging mechanisms can be employed. By combining the two techniques, schedules can be debugged most effectively.

## Tracing Schedules

When running a schedule, the schedule is executed under the control of the XLANG Scheduler Engine, which is a COM+ application. When BizTalk Server is installed, a single instance of the scheduler engine is created, named XLANG Scheduler (the default). It is also possible to create custom COM+ applications that host XLANG schedules.

When these COM+ applications (default or custom) execute a schedule, they generate various events that can be trapped and displayed. BizTalk Server provides a tool, called the XLANG Event Monitor, to trap and display these events. The XLANG Event Monitor can subscribe to events published by host applications on any number of distributed computers, and can store these events for later analysis.

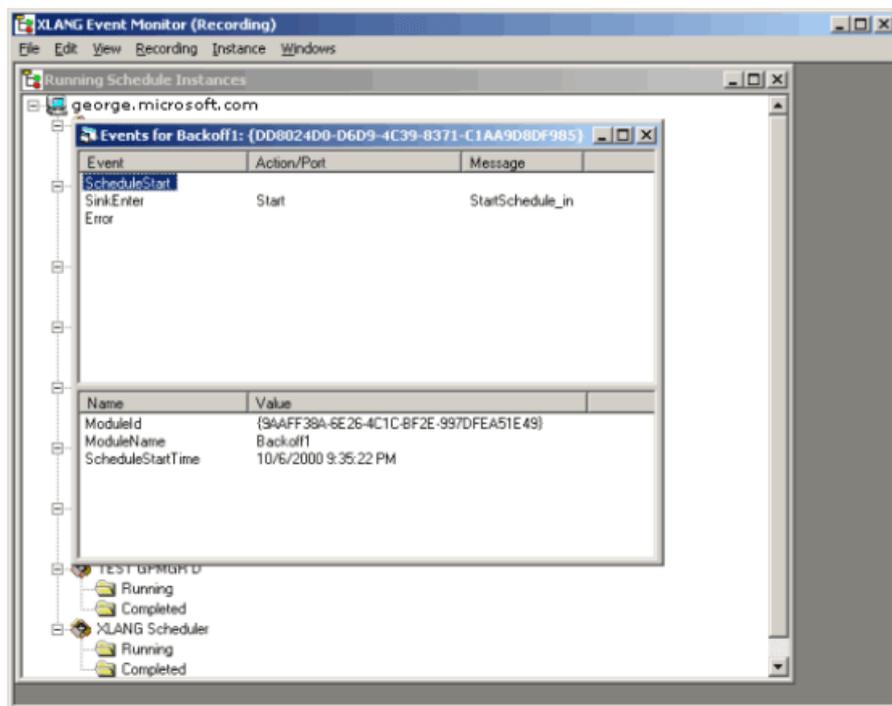


When the XLANG Event Monitor starts, it subscribes to receive events from all XLANG schedule host applications on the local computer. The main window shows all the COM+ applications that host XLANG schedules and, for each host COM+ application,

shows all schedule instances that are currently running or completed, coded according to the following scheme:

- **Green dot.** Represents a running XLANG schedule.
- **Black dot.** Represents a successfully completed XLANG schedule.
- **Red dot.** Represents an XLANG schedule that completed with an error.
- **Blue snowflake.** Represents a dehydrated XLANG schedule.
- **Blue lines.** Represents a suspended (or paused) XLANG schedule. The schedule stays in this state until it is resumed or terminated.

Each instance in addition has the unique identifier for the instance listed (the instance GUID). Any of the listed running schedule instances can be suspended or terminated from the XLANG Event Monitor.



The XLANG Event Monitor can also be used to start a new instance of a schedule by selecting the COM+ application that is to host the schedule instance and selecting the appropriate schedule file (.skx file).

All the events of a specific schedule instance can be viewed by double-clicking a schedule instance within the XLANG Event Monitor. The events shown can also be filtered to show only certain classes of events, such as transactions, or errors; once events have been captured, they can be saved to disk and later reloaded for display.

## Debugging Components in Schedules

While schedules themselves can't be loaded into a visual environment and debugged, COM+ components in those schedules can be debugged. This is done in exactly the same way as debugging a standard COM+ component that is being called from a client application (because in fact the schedule is implemented as a COM+ application, which instantiates and calls these custom COM+ objects).

To debug a Visual Basic component, the project is loaded into Visual Basic and built as usual. Note that the component must be compiled to **Compile to Native Code** and **Create Symbolic Debug Information**. The **No Optimization** check box should also be selected while debugging. Breakpoints can then be set, and the component run from the Visual Basic Integrated Development Environment. When the schedule is executed, it runs normally until it tries to instantiate the component and execute a method on that component. At this point, execution will stop at the breakpoint that was set. The component can be debugged as normal at this point.

**Note** If the XLANG Scheduler Engine has already loaded the DLL, it will not be possible to compile the component. If this occurs, the XLANG Scheduler Engine must be shut down, using the Component Services application. To do this, start the Component Services application, find the XLANG Scheduler Engine COM+ application, and click **Shut Down** on the context menu (right mouse button). The component should then compile. Alternatively, if BizTalk Orchestration Designer is running, it has a menu option to **Shut Down All Running XLANG Schedule Instances**, which can be used instead. After selecting this, all XLANG schedules will be shut down, releasing the lock on the DLL so it can be compiled.

## Other Debugging Tips

In addition to tracing the progress of a schedule using the XLANG Event Monitor, other system monitors can be used to detect errors in running schedules and to track execution of a schedule. Errors raised by the XLANG Scheduler Engine will appear on the **Application** tab of the Event Viewer. These events are labeled as XLANG Scheduler errors within the Event Viewer. If necessary, the events presented in the Event Viewer can also be filtered to show only this event type.

The WFBinding group of errors in the Event Viewer means that a problem has occurred in the per-instance message queue interface between BizTalk Messaging Services and BizTalk Orchestration Services. The Orchestration port setting in BizTalk Messaging Services Messaging Port wizard requires you to enter manually the Orchestration port name and should you spell incorrectly the Orchestration port name then a WFBinding error will occur.

Another common error is a parsing validation error. These errors are most often caused when the instance document does not conform to the document specification created in the BizTalk Editor. In this case the document is delivered to the Suspended Queue and the error is logged in the Event Viewer. If you right-click on the item in the Suspended Queue you can examine, and copy, the document contents to the clipboard. It is often easiest to solve these problems by pasting the clipboard contents into a text editor such as Notepad and saving the file. Now that you have a document instance on the file system open the document specification in the BizTalk Editor and use the Tools-Validate Instance menu item to validate against your existing document instance. Note that even though the dialog box defaults to \*.xml you can validate other file types, such as \*.csv if you have a flat-file schema. Once you have successfully validated the document then save it to WebDAV.

For performance reasons Microsoft BizTalk Server 2000 does not read document definitions or maps from WebDAV at runtime. While this significantly increases performance, it also results in more work for the developer that can cause versioning issues. In particular BizTalk Messaging Services do not refresh contents of any files saved in WebDAV into the runtime engine. When you change a document specification and save it to WebDAV you must also open up the Messaging Manager, open up the appropriate document definition and then press the Apply button. This will cause the Messaging Manager to refresh its copy of the data from WebDAV. Similarly you need to refresh envelopes and channels manually when the document specification for envelopes, or the maps used in the channels are changed.

Other commonly observed issues include:

*Symptom:* A File is dropped in a directory but the Receive function associated with it does not pick it up.

Possible causes of this are:

- The File has a read-only attribute. In this case there will be an event in Event Log saying that the Receive Function could not pickup a file with a certain name because it was read-only.
- The File name does not match the mask specified in Receive function configuration, in this case fix the configuration.
- An Incorrect directory specified in Receive function configuration. If the directory exists, there will be no symptoms of something being wrong. If the directory does not exist, the Receive function will get disabled and an event will get logged. Fix the error and re-enable the receive function in the properties page.
- BizTalk server is stopped. Each receive function is configured to run on a certain BizTalk server, and this server must be running.  
SQL server is stopped. If receive function cannot put the document on the Work queue it will not remove it from the directory

*Symptom:* A File is removed from the pickup directory but the subsequent processing does not happen.

Possible causes:

- Document could not be parsed or the Messaging Manager has not been refreshed from WebDAV.
- No channel matched the set of Source Org, Destination Org and Doc Def that was specified in receive function properties. Verify these properties to ensure a channel matches.

*Symptom:* The same schedule appears to be started multiple times after a single document submission.

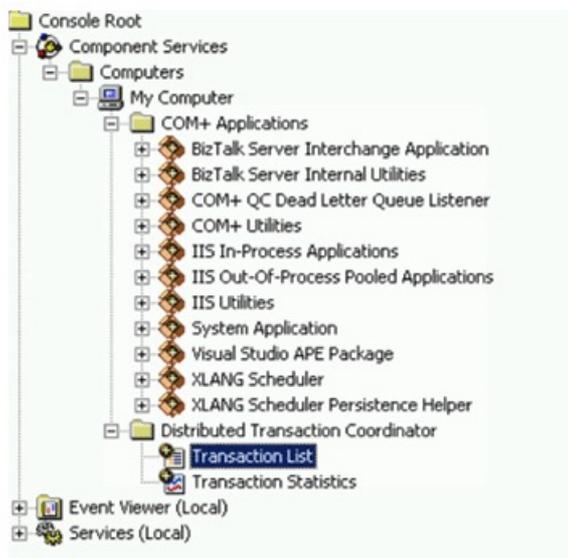
Possible causes:

- A channel can connect to one or more messaging ports. In this case multiple channels connect to a messaging port that instantiates an orchestration instance.

In a similar manner that you break down the complexity of a programming problem in Visual Basic into smaller more manageable parts, when you use BizTalk Server you should isolate which part of the infrastructure contains the issue you wish to resolve. For example, if you are uncertain that the document being delivered from BizTalk Messaging Services to BizTalk Orchestration Services contains the correct instance data then change the messaging port to output to a file instead and examine the contents of the document.

To track execution of running schedules, the Performance Monitor can be used to display the effects of the implementation components of the schedule. These effects include, but aren't limited to:

- Monitoring messages in specific message queues (from the Microsoft Message Queuing Queue object).
- Microsoft Message Queuing incoming and outgoing messages (from the Microsoft Message Queuing Service object).
- BizTalk Messaging document and interchanges processed (from the BizTalk Server object).
- Items in the BizTalk Messaging Suspended queue (from the BizTalk Server object).
- Active, aborted, and committed transactions (from the Distributed Transaction Coordinator object).



As well as the Performance Monitor, the Component Services MMC (Microsoft Management Console) can be used to monitor the transactions initiated and committed or aborted (this can also be done using the SQL Profiler application). The Component Services application can also be used to monitor the instantiation of any of the COM+ components that are installed as COM+ applications.

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## BizTalk Server 2000: Architecture and Tools for Trading Partner Integration

Aaron Skonnard and Bob Laskey

This article assumes you're familiar with Visual Basic and XML

Level of Difficulty 1 2 3

**Bob Laskey is a Senior Consultant in the Microsoft eBusiness Solutions Group in Austin, TX. Bob's current focus is helping dot-coms deploy Microsoft e-commerce technology using Windows 2000 and BizTalk Server 2000. You can reach him at [rlaskey@microsoft.com](mailto:rlaskey@microsoft.com).**

**Aaron Skonnard is an instructor and researcher at DevelopMentor where he co-manages the XML curriculum. Aaron wrote *Essential WinInet* (Addison-Wesley Longman, 1998) and co-authored *Essential XML* (Addison-Wesley Longman) to be released June 2000. Reach Aaron at <http://www.skonnard.com>.**

This article provides an overview of the concepts involved with implementing a trading partner integration system on BizTalk Server 2000 and details the document interchange server architecture and toolset. Additionally, an early look was taken at some business process integration features planned for the production release of the product that allow easy design, execution and sharing of new business processes with trading partners. The concepts and architecture presented allow companies to prepare internal line-of-business applications and trading partners for systems that improve customer service and reduce operating costs.

**B**uilding business-to-business (B2B) e-commerce systems presents many challenges to the system architect. Often, each company involved stores their data and documents in formats that are different from the formats used by the other participating companies. These companies need a way to integrate what tend to be vastly different systems.

Microsoft® BizTalk® Server 2000 can help organizations quickly establish and manage Internet relationships with other organizations. It makes it possible for them to automate document interchange with any other partner organization, regardless of the conversion requirements and data formats used. This provides a cost-effective approach for integrating business processes across enterprises. [Figure 1](#) describes some of the scenarios in which BizTalk Server 2000 can be used effectively. In this article we'll describe the important architectural concepts and features of BizTalk Server 2000 that you'll need to be familiar with before you can implement your own BizTalk Server 2000-based solution.

BizTalk Server 2000 is a data and business process integration server designed to facilitate collaborative e-commerce business processes. The server is built on industry-standard XML technology. It includes a document interchange engine, a business process execution engine, and a set of business document and server management tools. A business document editor and mapper are provided, in addition to useful tools for managing trading partner relationships, administering server clusters, and tracking transactions.

At runtime, BizTalk Server 2000 is a scalable engine for validating business documents, translating data formats, transforming schema, transporting documents, and tracking transactions. Supported data formats include UN/EDIFACT and X12 Electronic Data Interchange (EDI), text delimited, positionally delimited flat files, and XML. Transport protocols supported include HTTP, Secure Sockets Layer (SSL), Microsoft Message Queue (MSMQ), FTP, DCOM, and SMTP.

During the design and development stage, BizTalk Server 2000 provides an enterprise application integration framework for integrating third-party and custom applications. This is achieved by defining COM interfaces for application integration components and by providing out-of-the-box COM components for transport and security services.

The ultimate goal of BizTalk Server 2000 is to integrate trading partners as part of collaborative business processes. Here, an organization represents an endpoint in a document exchange. An organization can have properties associated with it including names and unique corporate identifiers, such as a corporation's Dun & Bradstreet number. Distribution lists allow the same do

document to be routed to multiple organizations as part of a single agreement. An agreement is a set of rules that will govern that distribution. Organization profiles may also be exported to facilitate the exchange of trading partner information.

## BizTalk Server Basics

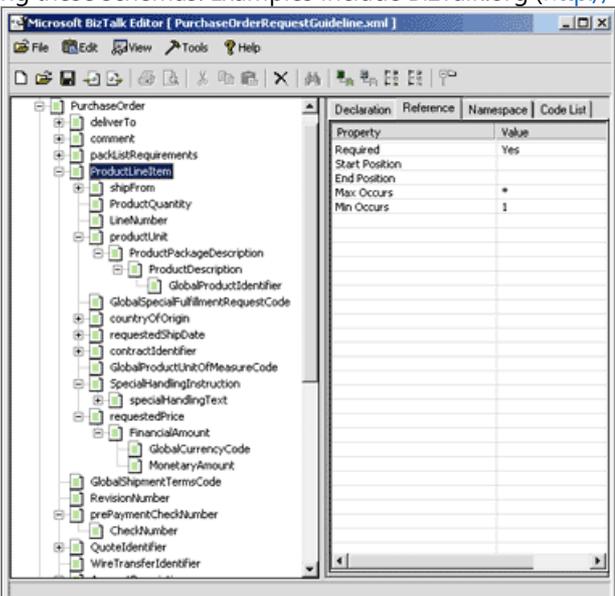
An agreement defines the rules for exchanging data between two or more organizations. They define the source and destination organizations, at least one document specification, document envelopes, security settings, and transport settings. Basically, the flow of data into and out of BizTalk Server 2000 must be governed by an agreement. [Figure 2](#) shows a typical agreement for a purchase order.

For example, say ESitesRUs, a fictitious online retailer, accepts orders from Web customers and sends purchase orders to Worldwide Importers Inc. for processing. Upon receiving the PO and fulfilling the order, Worldwide Importers Inc. sends ESitesRUs a shipment notification. ESitesRUs integrates the shipment status information into their online customer service site. To configure this traditional fulfillment transaction on BizTalk Server 2000, you create two agreements: an outbound agreement, which defines the rules for sending purchase orders, and an inbound agreement, which defines the rules for accepting shipment notifications.

An outbound agreement defines ESitesRUs as the source organization and Worldwide Importers as the destination organization. This agreement also includes the documentation specifications for the purchase order as well as security and transport settings for the data exchange. The inbound agreement defines Worldwide Importers Inc. as the source organization and ESitesRUs as the destination organization. The shipment notification document specification and security and transport settings are also defined in this agreement.

A third type of agreement—"an open agreement"—is a special type that defines a single organization. The missing trading partner information is provided when the document is submitted to BizTalk Server 2000.

Business documents are the fundamental unit of data exchange between trading partners in a BizTalk Server 2000-based solution. A business document's physical format may be XML, EDI, or comma-separated values, among others. Logically, they are simply collections of records and fields. Business analysts must review schema initiatives in their industries, perform gap analysis between published specifications and internal business requirements, and negotiate details with trading partners. Industry efforts are underway to ease this process by publishing schema libraries and providing tools for collaboratively defining and refining these schemas. Examples include BizTalk.org (<http://www.biztalk.org>), OASIS, and RosettaNet.



**Figure 3 Document Specification in BizTalk Editor**

BizTalk Server 2000 treats all document types as XML regardless of the original format. Document specifications are required to define the translation from the original document format to the BizTalk Server 2000 intermediate XML format. **Figure 3** shows an example of a document specification in the BizTalk Editor. **Figure 4** shows the XML source code for the document specification as generated by the editor. After the document exists in the internal XML format, it will have to be transformed. To perform schema transformations, the XML transformations can be defined through document maps.

```

File Edit View Favorites Tools Help
+ <:ElementType name="QuoteIdentifier">
- <:ElementType name="PurchaseOrder">
  <b:RecordInfo xmlns:b="urn:schemas-microsoft-com: BizTalkServer" />
  <:element type="deliverTo" maxOccurs="1" minOccurs="0" />
  <:element type="comment" maxOccurs="1" minOccurs="0" />
  <:element type="packListRequirements" maxOccurs="1" minOccurs="0" />
  <:element type="ProductLineItem" maxOccurs="*" minOccurs="1" />
  <:element type="GlobalShipmentTermsCode" maxOccurs="1" minOccurs="0" />
  <:element type="RevisionNumber" maxOccurs="1" minOccurs="0" />
  <:element type="prePaymentCheckNumber" maxOccurs="1" minOccurs="0" />
  <:element type="QuoteIdentifier" maxOccurs="1" minOccurs="0" />
  <:element type="WireTransferIdentifier" maxOccurs="1" minOccurs="0" />
  <:element type="AccountDescription" maxOccurs="1" minOccurs="0" />
  <:element type="generalServicesAdministrationNumber" maxOccurs="1" minOccurs="0" />
  <:element type="secondaryBuyerPurchaseOrderIdentifier" maxOccurs="1" minOccurs="0" />
  <:element type="GlobalFinanceTermsCode" maxOccurs="1" minOccurs="0" />
  <:element type="PartnerDescription" maxOccurs="1" minOccurs="0" />
  <:element type="secondaryBuyer" maxOccurs="1" minOccurs="0" />
  <:element type="GlobalPurchaseOrderTypeCode" maxOccurs="1" minOccurs="0" />
</:ElementType>

```

**Figure 4 Document Specification Source XDR**

Envelopes are EDI, text, or XML data structures that provide a way to add header information, such as addressing and document identifiers, to business documents. The server also uses envelopes to support processing of inbound and outbound EDI interchanges. Incidentally, the server supports batch processing of inbound EDI, but handles outbound EDI one transaction at a time.

Document maps are typically used to alter the schema or data format of a business document from a source organization's native representation to a representation requested by a destination organization. For example, a company's business application may be able to produce XML documents, but their trading partner's application may require a SAP IDOC or an EDI document. Or perhaps each partner has simply used different XML document structures to define a purchase order.

Pipelines tie together the built-in or custom processing steps during a data interchange. They allow a developer to customize many aspects of an agreement. Pipelines are used to link the document definitions for an outbound agreement or distribution list to a document definition of an inbound agreement. Agreements help the server identify the appropriate pipeline to run, and then provide important document processing rules to the pipeline.

A concept known as pipeline filtering is configured within BizTalk Server 2000 pipelines. This feature allows documents to be processed based on values in user-specified fields of a document. Tracking or storing subsets of documents or entire source or destination documents is also a feature supported within pipelines. Alternatively, document tracking settings may be specified in the document specification (as we'll discuss later). Specifying these settings in the document specification instead of in a pipeline allows the same settings to be used in multiple pipelines.

Digital certificate identification and processing rules are also defined within a pipeline. Finally, pipelines allow the analyst to select the map for creating a destination document from the source document submitted to BizTalk Server 2000.

Custom components called application integration components (AIC), or simply pipeline components, may also be inserted into a pipeline. AICs allow the line-of-business application developer to easily integrate existing third-party or custom applications with BizTalk Server 2000-brokered transactions by developing pipeline components that implement a set of COM interfaces. BizTalk Server 2000 invokes methods on the IPipelineComponent and related interfaces to access extended functionality during the execution of interchange agreements. Pipeline components frequently implement custom transport services.

There are numerous ways to exchange data between servers on the Internet, and BizTalk Server 2000 supports many standard protocols by encapsulating HTTP, SMTP, MSMQ, FTP, file, and DCOM functionality provided by Windows® 2000. The server features that support these protocols are called Transport Services and Receive Functions. Transport Services are used for sending business data from BizTalk Server 2000, while Receive Functions allow applications to submit business documents to BizTalk Server 2000 without any programming.

BizTalk Server 2000 supports the following transport services: HTTP, HTTPS, SMTP, MSMQ, FTP, file, and fax. Additionally, documents may be sent programmatically from BizTalk Server 2000 with a custom COM AIC.

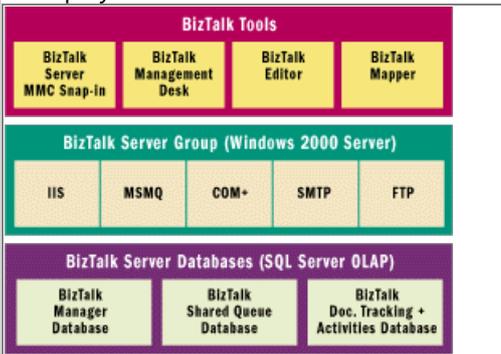
FTP, file, and message queuing are supported receive functions. The FTP receive function polls a given location and uses FTP to send files to BizTalk Server 2000. The file receive function is invoked by a file system event when activity occurs in the defined directory. The source file is copied and submitted to BizTalk Server 2000. The message queuing receive function provides event-based integration with MSMQ to read messages from a queue and submit the message body to BizTalk Server 2000. Documents may also be programmatically submitted, either synchronously or asynchronously, through COM interfaces. An ASP receive function may also be easily implemented by creating an ASP page to which partners will use HTTP to post business data. In the ASP, just submit the received HTML form data to BizTalk Server 2000 by calling the server's COM interface. That's all there is to it.

MIME is supported as a content encoding type, while S/MIME and PKCS are supported for data encryption and digital signatures. Custom encoding, security, and transport logic may also be plugged directly into BizTalk Server 2000. This encoding architecture conveniently allows data integration to be independent of the network protocol used to communicate with trading partners.

An interchange protocol is a set of rules each trading partner must adhere to in a business document exchange. This protocol may define characteristics such as acknowledgment requirements, retry and timeout thresholds, and performance requirements. Although BizTalk Server 2000 does not directly implement the concept of an interchange protocol, it is an important concept to negotiate among trading partners and to implement using the built-in components and extensibility model provided by the server.

## Architecture and Tools

The BizTalk Server 2000 architecture uses Windows 2000 Server and Microsoft SQL Server 2000 to implement a horizontally scalable, reliable, and extensible document interchange engine. **Figure 5** provides a system-level view of a BizTalk Server 2000 deployment.



**Figure 5 BizTalk Server 2000 Deployment**

A standard deployment may include one or more BizTalk Server 2000 servers configured as a group. Each server will process documents independently of the others to provide horizontal scaling and fault tolerance without a separate clustering solution. Server groups share document specifications and maps through the Windows 2000 Web Distributed Authoring and Versioning (WebDAV) service. They share working interchange data by accessing a set of shared SQL Server queues.

Four SQL Server queues are used during the processing of a document: scheduled queue, work queue, retry queue, and suspended queue. Documents are retrieved from the scheduled queue by the first available BizTalk server and placed on the work queue for processing. The scheduled queue ensures high server throughput by providing server resource management. If a necessary service is unavailable to process a document, the document will be placed onto the scheduled queue so the servers can proceed to another interchange. Documents that fail due to processing errors such as network or validation errors are placed on the suspended queue or retry queue for later attempts. Microsoft Cluster Server may be used in combination with SQL Server to provide scalable and fault-tolerant deployment for the BizTalk Server 2000 shared queues.

BizTalk Server 2000 relies on many Windows 2000 Server platform services. Internet Information Services (IIS) 5.0 and the Network Load Balancing Service provide the components necessary for scalable HTTP and ASP processing. Cluster Service provides a highly available deployment architecture to the shared SQL Server databases. COM+ component services and MSMQ provide DCOM-based integration and MSMQ receive functions and transports. The built-in WebDAV service provides distributed access to document schemas and maps.

BizTalk Server 2000 also uses the Microsoft XML toolset, which includes a validating XML parser that supports XML Data Reduced (XDR) Schemas and Document Type Definitions (DTD) as well as Extensible Stylesheet Language (XSL) and XSL Transformation Language (XSLT). Of course, the server also gains the increased scalability, reliability, and availability that is inherent in Windows 2000 Server.

## Document Processing

Submitting a business document to BizTalk Server 2000 triggers a series of logical processing steps by the interchange engine: agreement route, parse, validate, transform, serialize, and transport.

BizTalk Server 2000 receives business data from business applications in one of two ways. A document may be submitted directly by a COM-aware application through the Interchange interface, or indirectly by a file, FTP, MSMQ, or custom receive function. Here is an example of direct COM application submission:

```
strDocument = "<CommonPO/>"

Set objInterchange = _
    CreateObject("Interchange.Interchange")

objInterchange.Submit _
    MODELDB_OPENNESS_TYPE_NOTOPEN, _
    strDocument, "PurchaseOrder", _
    "Source Organization Name", _
    "SourceOrg", _
    "Destination Organization Name", _
    "DestOrg", [pipeline name], _
    [file path], [envelope name], _
    strSubmitHandle, _
    strResponseData
```

The Submit method takes arguments that describe the agreement, the document being submitted, source and destination organizations, custom pipelines, or enveloping information. It then returns a handle to the submitted document. This handle allows the developer to identify this document within queues or the document tracking and activity database.

Business data may be self-routing or the routing information may be placed explicitly in the COM method call. Routing information may also be described to the server in the configuration of a custom receive function. The server uses this routing information

mation to identify the correct interchange agreement used to process the document.

Business data is submitted to BizTalk Server 2000 as text. As described earlier, this text may be any file format as long as a BizTalk document specification can be created to describe its structure and format. The server ships with parsers for well-formed XML, UN/EDIFACT EDI, X12 EDI, text, or positionally delimited flat files. It also allows for third-party development of new parsers. The server selects the appropriate parser based on the envelope specified by the agreement.

Regardless of the original data format, the parser looks up the document specification defined in the agreement, loads it using the WebDAV protocol, and uses it to create intermediate XML representations of the submitted business data. The server performs internal document processing using this intermediate XML representation prior to serializing the data into the final destination document format. If the parsing step fails, the document will be placed in the server's suspended queue.

Once the server has created the XML representation of the business data, it will validate the structure and grammar of the document instance using rules provided by the document specification. Since all BizTalk Server 2000 agreements require document specifications, the validation will occur for both XML and non-XML business data. Invisible to the developer or analyst, the validation is implemented within BizTalk Server 2000 using standard XML technology. The intermediate XML representation of the business document created during the server's parsing step is simply an instance of the XDR document specification. This means that the server can use the validating Microsoft XML parser. In cases where XDR validation is not sufficient—such as with X12 and UN/EDIFACT documents—the server validation engine processes a set of extended attributes that correspond to special validation rules.

Validation errors cause the document to be flagged as invalid in the document tracking database and work queues. Since server queues are implemented in a SQL Server database, they can be processed by the developer through published object models or by direct access using Transact-SQL stored procedures.

Transformation is the process of executing the maps created with the BizTalk Mapper (see [Figure 6](#)). The server loads the map defined in the agreement's pipeline configuration and applies the transformation to the document. The maps move the data in the fields and records of a source document instance into the fields and records of a new destination document instance. The business data is in the server's private intermediate XML representation before and after this logical processing step.

The serialization process is the opposite of the parsing process. The internal XML representation of a document is serialized to the format defined by the document specification. This format may be well-formed XML, or it may be UN/EDIFACT EDI, X12 EDI, text, or positionally delimited flat files. This serialized format is the document routed to the destination organization specified by the agreement.

After the business data has been transformed into the appropriate format for the destination organization, the transport service defined by the agreement (HTTP, HTTP/S, SMTP, MSMQ, FTP, file, or fax) is selected and the data is sent to the destination location specified in the agreement. If the transport fails, the document will be placed in the retry queue if its count is nonzero; otherwise it will be placed in the suspended queue.

We've briefly mentioned the server's method of handling document-processing errors. Much of this is based on moving the erroneous document to the appropriate queue and on providing an object model (and T-SQL scripts) to query the SQL Server queues. In addition, the developer can make use of server-generated Windows Management Instrumentation (WMI) events to handle exception processing. Another technique is to employ stored procedures to analyze document queues.

Business-to-business e-commerce transactions must be secure whether the server is processing purchase transactions for a Fortune 500 enterprise or fulfilling orders for a startup internet company. BizTalk Server 2000 addresses the issue of security by giving the developer a number of out-of-the-box authentication and encryption components that take advantage of security services in Windows 2000. SSL support is provided through the built-in HTTPS transport service. This adds server-to-server authentication and transport layer encryption to the document interchange. Documents may also be encoded using built-in S/MIME encoding components, ensuring document integrity, authentication of the sending party, and payload encryption. The Public Key Cryptography System (PKCS) for encrypting and decrypting document payloads is also supported. Finally, digital signatures may be applied to outbound messages and verified on inbound messages using the BizTalk Server 2000 native support for digital signatures.

Most of these techniques require organizations to get X.509 digital certificates from a trusted certificate authority. If none of these techniques meets the demands of an enterprise's security policies, the server can be extended through custom security components that make use of the Microsoft Cryptography API as well as new security features in Windows 2000 such as support for smart cards and the Kerberos protocol.

## **BizTalk Document Editor and Mapper**

BizTalk Server 2000 represents business document schemas as document specifications. Document specifications define the structure of a business document in a way that is independent of the underlying data format (well-formed XML, UN/EDIFACT EDI, X12 EDI, text, or positionally delimited flat files) using a familiar metaphor based on records and fields. Document specifications define a way to translate between the document's original data format and the server's internal XML format.

The BizTalk Editor is a graphical tool that allows analysts and developers to create document specifications in a number of ways. A document specification can be created by manually defining records and fields in the editor tool. The server also provides ready-to-use specifications for many UN/EDIFACT and X12 EDI documents, SAP IDOCs, and sample XDR schemas. Finally, the editor provides instance import functionality that allows the user to import well-formed XML document instances, XML DTDs, and XDR schemas. It allows the user to edit and save the resulting BizTalk document specification.

Although it is transparent to the user, BizTalk Server 2000 represents document specifications internally with standard XDR s

chema technology plus extended attributes to enable server processing of the documents during an interchange. The document specification author can define attributes on data items such as minimum and maximum number of occurrences, whether it is optional, data types, fixed data values, enumerated lists, and more. BizTalk Server 2000 builds on standard XML to provide rich document specification capabilities.

As described earlier, **Figure 3** shows a purchase order document specification in the BizTalk Editor, and **Figure 4** is a partial listing of the XDR schema produced by the tool, illustrating the definition of the PurchaseOrder ElementType. Once it is finalized by the W3C, the standard XML Schema Definition Language (XSDL) will replace the current XDR syntax.

In addition to the tools provided for working with business document specifications, BizTalk Server 2000 includes the BizTalk Mapper for transforming a document from the internal XML representation of an inbound document to the internal XML representation of an outbound document. This mapping allows BizTalk Server 2000 to alter the schema (transformation) and data format (translation) of business documents. The final XML document is eventually serialized to the format defined by the outbound document specification, which may not always be XML.

BizTalk Mapper provides the design environment and BizTalk Server 2000 provides the runtime engine to create and execute document maps that translate data formats and transform data schemas. The BizTalk Mapper's use of standard XSLT technology to internally represent mapping rules is transparent to the analyst or developer. The Microsoft XSLT implementation provides COM and scripting language integration. BizTalk Mapper and BizTalk Server 2000 take advantage of this integration to provide built-in reusable components called functoids that may be inserted onto the BizTalk Mapper design surface and called at runtime.

Functoids that ship with BizTalk Server 2000 are grouped into seven categories: String, Mathematical, Logical, Date, Conversion, Scientific, and Advanced. Examples of common String functoids are Substring and upper or lower-case conversions. If a map needs to extract a manufacturer's part number from a vendor's 256-character catalog ID, these String functoids may be valuable. Obtaining a timestamp with the Current Date functoid also has clear value in business-to-business document processing. The Advanced functoids category includes the versatile Custom Visual Basic® Script functoid. As the name suggests, this allows the developer to define custom script logic that will be applied to source data values during the execution of a map.

```

<?xml version="1.0" ?>
<mapsource name="PurchaseOrderMap" version="1" xrange="100" yrange="420">
  + <srcree>
  + <sinktree>
  + <links>
  + <functions>
  - <CompiledXSL>
  + <xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
  xmlns:msxsl="urn:schemas-microsoft-com:xsrl" xmlns:var="urn:var" xmlns:user="urn:user"
  version="1.0">
  </CompiledXSL>
</mapsource>

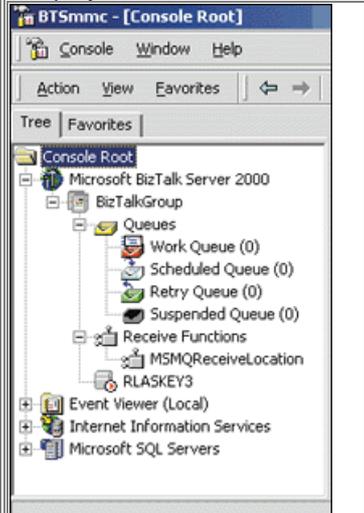
```

**Figure 7 BizTalk Mapper Compiled XSLT**

**Figure 6** shows a map between two different purchase order schemas in the BizTalk Mapper. **Figure 7** is a partial listing of the XML and XSLT produced by the tool. It illustrates the primary components of a BizTalk map. <srcree> and <sinktree> contain the document schema for the source and destination documents. <links> describes the graphical mapping. <functions> includes the functoids (or pre-built mapping components), and <CompiledXSL> contains the XSL transformation language required to execute the transformation at runtime.

### Management and Analysis Tools

There are two types of management tools included in BizTalk Server 2000. The first is the BizTalk Management Desk, which analysts and developers can use to define the important aspects of a trading partner relationship through a graphical console. The second, which system administrators use, is the Microsoft Management Console (MMC) snap-in environment used to configure deployment characteristics of server groups.



**Figure 9 BizTalk Server MMC Snap-in**

The BizTalk Management Desk allows the recreation and configuration of trading partner agreements and all associated properties (organizations, distribution lists, document specifications, envelopes, transport protocols, security settings, and pipelines). Document tracking and activity "the level of auditing the server groups will perform" is also configured from the Management Desk. **Figure 8** shows the Agreement Editor within the BizTalk Management Desk.

**Figure 9** shows the left-hand pane of the BizTalk Server 2000 MMC snap-in. Using this console, groups, queue activity, receive functions and individual servers may be managed remotely or locally. This includes adding or removing servers from groups, checking the status of documents on the shared queues, and creating new receive functions. It is often convenient to customize the MMC to include BizTalk Server 2000, IIS, SQL Server, Event Viewer, COM+ Component Services, and MSMQ management snap-ins so you can manage all of a solution's component s from a single console.

### Business Process Integration

Most of our discussion has centered on server capabilities to facilitate the exchange of business documents between trading partners. BizTalk Server 2000 will also provide tools and a runtime

me to facilitate the modeling, development, and execution of business processesâ"where data exchange is only one key aspect. COM+, of course, will provide the component architecture and services for business process implementation. Message sequencing, receipt correlation, content-based routing, and retry logic may easily be designed and implemented using the BizTalk Server 2000 core document interchange coupled with these advanced business process integration features.

**For related articles see:**

[MSDN Online XML Developer Center](#)

**Background information:**

[Microsoft BizTalk 2000](#)

[BizTalk.org Web site](#)

**Bob Laskey** is a Senior Consultant in the Microsoft eBusiness Solutions Group in Austin, TX. Bob's current focus is helping dot-coms deploy Microsoft e-commerce technology using Windows 2000 and BizTalk Server 2000. You can reach him at [rlaskey@microsoft.com](mailto:rlaskey@microsoft.com).

**Aaron Skonnard** is an instructor and researcher at DevelopMentor where he co-manages the XML curriculum. Aaron wrote *Essential WinInet* (Addison-Wesley Longman, 1998) and co-authored *Essential XML* (Addison-Wesley Longman) to be released June 2000. Reach Aaron at <http://www.skonnard.com>.

*From the May 2000 issue of MSDN Magazine.*

# High-Availability Solutions Using Microsoft Windows 2000 Cluster Service

Microsoft Corporation

Created: January 2002

Revised: March 2003

Applies to:

Microsoft® BizTalk™ Server 2000

Microsoft® Windows 2000 Advanced Server

Microsoft® Windows 2000 Datacenter Server

**Summary:** Learn how to plan, design, and deploy a highly available implementation of Microsoft BizTalk Server using the Cluster service component of Microsoft Windows 2000.

This article is intended for customers who have stringent requirements for system uptime and guaranteed data delivery.

- **Part 1** contains general information about the importance of clustering and the software, hardware, and cost considerations for its deployment.
- **Part 2** contains detailed steps for setting up the cluster.

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# Learning BizTalk Server 2000

Igor Leybovich and Scott Woodgate  
Microsoft Corporation

May 2001

Learning BizTalk is a set of lessons and code samples that are designed to get a new user up to speed with Microsoft® BizTalk™ Server 2000.

Unlike the BizTalk Tutorial that ships in the BizTalk Server 2000 box, these lessons follow the principle of learn by decomposition. Install the first lesson, understand the business problem and immediately run the entire scenario, which features two orchestration schedules and BizTalk Messaging services passing XML documents. Next, understand each element of the overall scenario by working through lessons that explain how to use the BizTalk Editor, Mapper, Messaging Manager, Administrator, and Orchestration Designer.

Download [LearnBizTalk.exe](#).

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# Learning BizTalk Server 2000: Lesson 1

Igor Leybovich and Scott Woodgate  
Microsoft Corporation

May 2001

**Summary:** The first in a series of 7 articles designed to show you how Microsoft BizTalk Server 2000 can help your business exchange a variety of documents with business partners, as well as integrate internal business processes and applications. In this lesson, you will learn the fundamental concepts surrounding BizTalk Server, and the tools and processes required to start building solutions with BizTalk Server. (8 printed pages)

Download [LearnBizTalk.exe](#).

## Note

You will need to install Microsoft® BizTalk Server™ 2000 in order to complete this lesson. Before you install Microsoft BizTalk Server, make sure you have read the Readme.htm and Installation Guide.htm documents, paying particular attention to the following important prerequisites:

- You must have a computer running Microsoft Windows® 2000 with Service Pack 1 or above (Professional or Server both work), including IIS and MSMQ services, and an account with administrative rights on that computer.
- You must have Microsoft SQL Server™ 7.0 with Service Pack 2 or above (you can install SQL Server Desktop Edition if you choose to run everything on a single workstation running Windows 2000 Professional) and password for the "sa" account. If you use SQL Server 2000, you must configure it for "mixed" security mode in the install wizards that is not the default.
- Microsoft Visio® 2000 SR1 Standard or above must be installed on the computer where you are installing BizTalk Server.
- In Internet Services Manager, turn off the **Enable authoring** option on the Server Extensions tab of the Default Web Site.

Also, in order to execute the scripts for these lessons, you need to install the MSMQ component of Windows 2000.

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## Introduction

Welcome to the "Learning Microsoft BizTalk Server" lesson series!

Over the course of the following lessons, you will learn how Microsoft BizTalk Server 2000 can help your business exchange a variety of documents with business partners, as well as integrate internal business processes and applications.

## What Is BizTalk Server?

Microsoft BizTalk Server 2000 provides a powerful development and execution environment that orchestrates business processes, both within and between businesses. BizTalk Server can handle business transactions that run as long as weeks or months.

BizTalk Server 2000 features include the ability to define business document specifications and how these documents have to be transformed when passed between applications, and the ability to monitor and log server activity.

The server provides a standard gateway for sending and receiving documents across the Internet, as well as providing a range of services that ensures data integrity, delivery, and security.

## Why Use BizTalk Server?

You might ask yourself: "Why should I use BizTalk Server over any other solution?" In today's world of fast-changing technologies and standards, it is imperative to ensure that a solution you build is based on commonly accepted protocols and document formats. It is also important to know that your solution will enable integration with the widest variety of business partners and

applications, will work securely over the Internet, and will scale as your business needs grow. As you will soon discover, BizTalk Server addresses these criteria very effectively.

The business environment in the 21<sup>st</sup> century is very different from what it used to be just a few years ago. Today's organizations embrace the global marketplace, and this dictates a need to be able to efficiently operate 24 hours a day, 7 days a week. The customers are now more sophisticated than ever, and they want to stay informed in real time, which translates into an accelerated pace of business and decision-making processes. Finally, business relationships have become highly dynamic, and new customers and partners expect businesses to adapt quickly.

The technical and operational challenges abound as well. There's a need to support multiple applications on a variety of platforms, and to integrate with business partners using the Internet, extranets, B2B exchanges, and other resources. At the same time, existing information technology investments need to be preserved and leveraged, which requires having an ability to support legacy systems and EDI (electronic data interchange) and X12 networks. And perhaps most importantly, to effectively compete in today's market, you need to be able to build new solutions on "Internet time," utilizing open Internet standards and technology to assure maximum interoperability.

Microsoft BizTalk Server uses XML internally to "describe" your business documents, and it uses such standard Internet protocols as HTTP and SMTP to deliver these documents to their destinations, thus allowing you to interoperate with various applications running in any environment as long as those applications support Internet standards. You can send documents to BizTalk Server as XML, EDI or as flat files.

So why is XML important, so important, in fact, that the BizTalk Server team chose this language to represent internal documents and processes?

## Do You Speak My Language?

To interchange documents in an environment where neither side wants to depend on the technology the other side is using, businesses need to choose a *lingua franca* in which to write these documents. This common language is exactly what XML has become lately.

XML, which stands for **eXtensible Markup Language**, is a flexible way to create common information formats and share both the format and the data on the Web. The document that is written in XML can be viewed and edited with any text editor, and it is usually pretty simple to understand. In the example below, a company called Northwind Traders is ordering two monitors from Contoso, Ltd. Take a look at Northwind's internal requisition request, which it represents in XML format.

```
<NorthwindReq>
<Header reqNumber="IL0829" reqStatus="New" dateCreated="2000-10-24" timeCreated="16:29:00" />
<Shipping name="Brian H. Valentine" addr1="1234 Main Street" city="Anytown" state="AB"
zip="12345" country="USA" phone="(800)555-0123" />
<Items count="2" totalPrice="790.00">
<Item partNo="270FS" description="27-inch flat screen monitor" qty="2" unitPrice="395.00" />
</Items>
</NorthwindReq>
```

Despite an abundance of angle brackets, equal signs, and quotation marks, this document is fairly easy to understand and to follow. Yet at the same time, this document follows a certain predefined format, called a *schema*. A schema is an XML document that describes the format of other XML documents. Unlike other XML documents, though, a schema does not contain any data, and it only defines rules of what might appear in an XML document based on this schema.

Both XML and XML schemas are currently undergoing a formal standardization process by the World Wide Web Consortium (W3C). XML has reached a level of "W3C Recommendation," the highest level that W3C assigns. This recommendation can be found at <http://www.w3.org/XML>. At the time of this writing, XML Schemas have not reached the status of Recommendation. Microsoft BizTalk Server 2000 defines documents using a format known as XML-Data Reduced, which is a functional subset of this specification and one of the precursors to the W3C XML Schema effort, which gives you many of the benefits of XML Schema today. You can get the latest information on XML Schema on the Web at <http://www.w3.org/XML/schema.html>.

## Document Exchange Concepts

Microsoft BizTalk Server addresses the two key aspects of any document exchange.

BizTalk Messaging Services provides the ability to send business documents in a secure and reliable manner. An example of such a document could be a purchase order sent to your supplier, or a request for a price quote on the same product sent to multiple suppliers in order to select the lowest bidder.

BizTalk Orchestration Services are all about defining business processes that were used to create the message and then implementing them using a highly integrated graphical environment. Processes defined using BizTalk Orchestration Services have the key characteristic that they are easily modifiable when the business changes, providing you with agility to respond to business changes.

Best of all, because most business processes involve sending and receiving documents and applying business rules to their processing, BizTalk Messaging Services and BizTalk Orchestration Services combine naturally, allowing you to create elegantly integrated solutions.

In this lesson, and in the lessons that follow, we will teach you about the fundamental concepts surrounding BizTalk Server, and also provide you with the skills to understand the tools and processes required to start building solutions with BizTalk Server.

## Install BizTalk Server

In the remaining lessons, we will work together through the sample scenario of Northwind Traders buying computer equipment from Contoso, Ltd. We will explain what happens at every step of that process, and we will show you how to define formats of business documents in XML using BizTalk Editor, how to describe internal business processes using BizTalk Orchestration Designer, and finally how to tie it all together without having to write any code! Well, okay—*some* code. While there is no coding specific to BizTalk Server integration, you still need to build your own business-specific rules; however, in these lessons we will keep this code to an absolute minimum.

All the examples in the lessons are designed in such a way that they can be installed and executed on a single computer; however, you can also configure two or more servers to closely match the distributed nature of your particular environment if you want to do so.

Before you install Microsoft BizTalk Server, make sure you have read the [Readme.htm](#) and [Installation Guide.htm](#) documents, paying particular attention to the following important prerequisites:

- You must have a computer running Microsoft Windows® 2000 with Service Pack 1 or above (Professional or Server both work), including IIS and MSMQ services, and an account with administrative rights on that computer.
- You must have Microsoft SQL Server™ 7.0 with Service Pack 2 or above (you can install SQL Server Desktop Edition if you choose to run everything on a single workstation running Windows 2000 Professional) and password for the "sa" account. If you use SQL Server 2000, you must configure it for "mixed" security mode in the install wizards that is not the default.
- Microsoft Visio® 2000 SR1 Standard or above must be installed on the computer where you are installing BizTalk Server.
- The **Enable authoring** option on the Server Extensions tab of the Default Web Site must be turned off in the Internet Services Manager.

Also, in order to execute the scripts for these lessons you need to install MSMQ component of Windows 2000.

## Let's Do Business

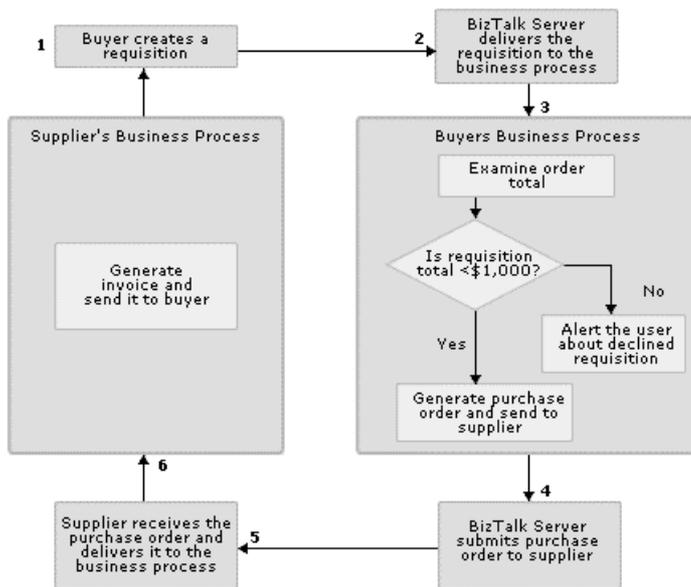
Now that you have successfully installed and configured BizTalk Server, let's talk about a business scenario we will use in our lessons.

A computer hardware retailer, Northwind Traders, is ordering computer parts from Contoso, Ltd. An internal procurement application at Northwind is creating a purchase requisition, just like the one we showed previously, and writes it as a file on a hard drive. This file is picked up by BizTalk Server and passed to Northwind's order approval process. If the requisition is declined, it is marked as such and written as a file on a hard drive. If it is approved, a purchase order is generated and sent to Contoso using HTTP protocol, just like in a real-world scenario. In our simplified example, a requisition is always approved if it does not exceed \$1,000, and is declined otherwise.

*In our example, both businesses are using Microsoft BizTalk Server 2000. While BizTalk Servers work well with each other, you can also use BizTalk Server to interact with businesses that are not using this technology.*

Once the BizTalk Server on the Contoso side receives the purchase order (in our scenario we will use the same instance of BizTalk Server to perform tasks for both sides), it passes the purchase order on to Contoso's business process, which generates an invoice to be delivered to Northwind, once again using HTTP protocol. Finally, BizTalk Server on Northwind's side receives the invoice and writes it as a file on a hard drive.

Figure 1 shows what this process looks like at a high level.



**Figure 1. Example of a business process that uses BizTalk Server and the HTTP protocol**

## Run the Scenario

To execute the scenario above, download and run the archive file LearnBizTalk.exe.

Be sure to choose C:\ as the default location where the files should be extracted. This creates a C:\LearnBizTalk directory containing all the files necessary for our lessons. After all the files have been extracted, run the script file Setup.vbs located in the C:\LearnBizTalk\Scripts directory. This script file configures BizTalk Server for use during these lessons. Depending on your server environment, the script might take a few minutes to complete, which will be indicated by a message box.

Once the script has completed, locate the files named ReqToApprove.xml and ReqToDecline.xml in the C:\LearnBizTalk\Documents directory. Examine each file by double-clicking it to open it in Microsoft Internet Explorer. Notice that the *reqStatus* field is set to New, and note the values of the *totalPrice* and *reqNumber* fields in each document.

You are now ready to see BizTalk Server in action. Copy the file named ReqToDecline.xml from the C:\LearnBizTalk\Documents directory and paste it into the C:\LearnBizTalk\Pickup directory. Make sure you are not moving the file but rather copying it because it will be processed by BizTalk Server and removed from the \Pickup directory. Since the order total in this requisition exceeds \$1,000, it gets declined and a message box is displayed informing you of this.

Copy the file named ReqToApprove.xml from the C:\LearnBizTalk\Documents directory and paste it into the C:\LearnBizTalk\Pickup directory. Now, instead of being declined, the requisition is approved, a purchase order is generated and sent to Contoso, the purchase order is processed, an invoice is created and sent back to Northwind, and finally an invoice is received at Northwind and written as a file to the C:\LearnBizTalk\Output directory. Go ahead and open ContosoInvoice.xml from the \Output directory in Internet Explorer by double-clicking it. Note the value of the *reference* field is now the same as the original *reqNumber* field.

That completes Lesson 1. Congratulations—you have successfully installed BizTalk Server and run your first scenario.

In [Lesson 2](#) and the lessons that follow, we will take a closer look at what happens at each step of this process, and how to configure BizTalk Server to perform all the necessary tasks.

# Learning BizTalk Server 2000: Lesson 2

Igor Leybovich and Scott Woodgate  
Microsoft Corporation

May 2001

**Summary:** The second in a series of 7 articles designed to show you how Microsoft BizTalk Server 2000 can help your business exchange a variety of documents with business partners, as well as integrate internal business processes and applications. In this lesson, we will configure BizTalk Server to perform all the necessary tasks in a sample business scenario, and discuss basic concepts and terminology. (9 printed pages)

## Note

You will need to install Microsoft® BizTalk™ Server 2000 in order to complete this lesson. Before you install Microsoft BizTalk Server, make sure you have read the Readme.htm and Installation Guide.htm documents, paying particular attention to the following important prerequisites:

- You must have a computer running Microsoft Windows® 2000 with Service Pack 1 or above (Professional or Server both work), including IIS and MSMQ services, and an account with administrative rights on that computer.
- You must have Microsoft SQL Server™ 7.0 with Service Pack 2 or above (you can install SQL Server Desktop Edition if you choose to run everything on a single workstation running Windows 2000 Professional) and password for the "sa" account. If you use SQL Server 2000, you must configure it for "mixed" security mode in the install wizards that is not the default.
- Microsoft Visio® 2000 SR1 Standard or above must be installed on the computer where you are installing BizTalk Server.
- In Internet Services Manager, turn off the **Enable authoring** option on the **Server Extensions** tab of the Default Web Site.

Also, in order to execute the scripts for these lessons, you need to install the MSMQ component of Windows 2000.

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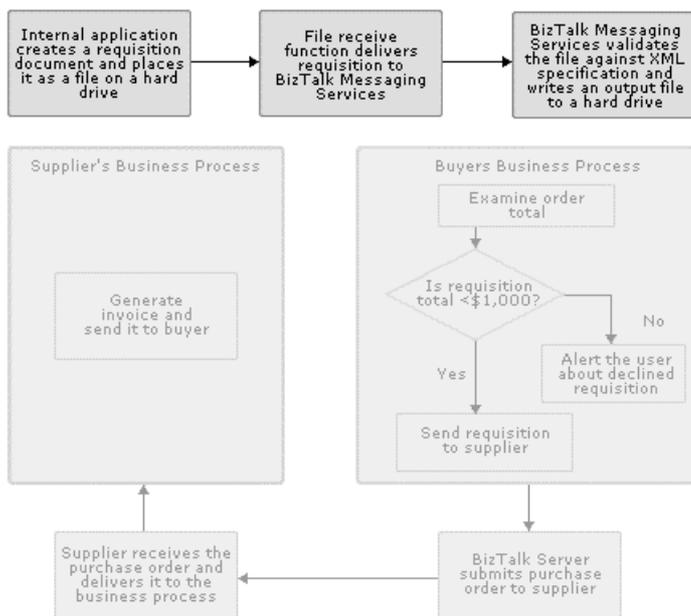
[Running It](#)

## Introduction

We will now review individual steps of the scenario that we set up in [Lesson 1](#). From time to time throughout the remaining lessons, we will ask you to execute additional script files. These files make adjustments to the BizTalk Server configuration that we originally created, so we can see the results of execution of individual steps rather than the complete process that we showed in Lesson 1.

To begin, run the script file L2Prep.vbs located in the C:\LearnBizTalk\Scripts directory. This alters the configuration of BizTalk Messaging Services, so instead of delivering the document to BizTalk Orchestration, it writes it as a file that we can examine.

Figure 1 provides you with a closer look at what happens during this phase.



**Figure 1. Supplier and buyer business processes**

## Why Use BizTalk Messaging Services?

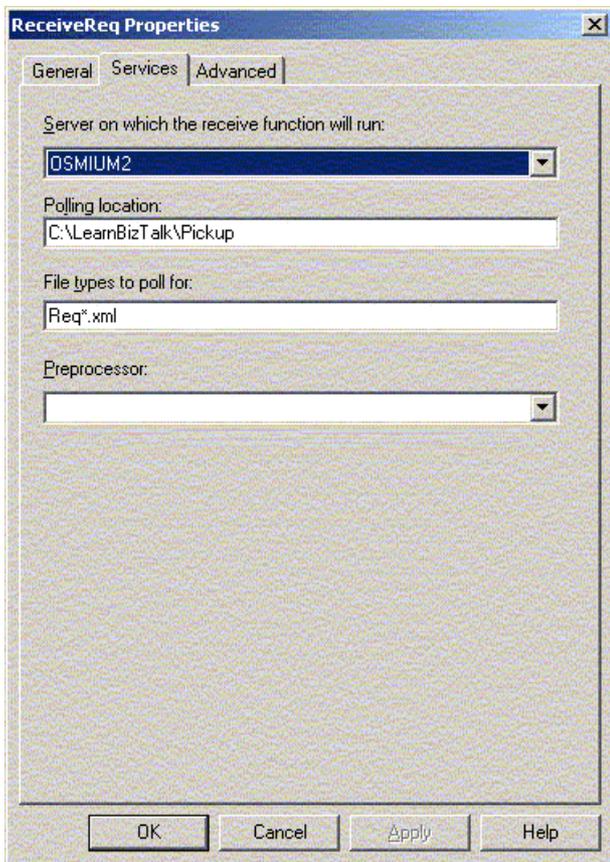
BizTalk Messaging Services provides a simple and efficient way to pass documents between internal applications, as well as between external business partners. BizTalk Messaging Services enable you define how your documents are received, processed, and delivered to their destinations, as well as providing such essential features as validating document structure, digital signatures, encryptions, and guaranteed delivery over unreliable transports.

## Configuring File Receive Functions

Suppose we need a means to take a file that was created by an internal application and get it into BizTalk Messaging Services. File Receive functions fulfill this role. One advantage of working with an output file is that an internal business application that creates this file does not need to know anything about BizTalk Server. It simply creates a file containing the document somewhere on a file system, and BizTalk Server instantly picks it up. Indeed, if you can create output files and receive input files into your existing applications, you probably will be able to use them with BizTalk Server without a single modification.

Another important aspect of using File Receive functions is that it introduces an element of asynchronous execution to your design. Asynchronous, from Greek meaning "not at the same time," pertains to processes that proceed independently of each other. Being asynchronous is very important in a distributed environment, because it allows each part in the solution to stand by itself and not be affected by the temporary unavailability of another part, whether due to failure or scheduled maintenance. For example, if you experience a brief network failure, the overall application is not affected since the documents produced by your internal business applications would simply accumulate on the hard drive. Once the network is available again, BizTalk Server picks up and processes all the files it finds in the designated directory. You could also easily add more BizTalk Servers and configure them to process documents from the same directory, should you generate more documents than could be processed by one server with an acceptable speed.

To look at how we configured the File Receive function, open the BizTalk Server Administration application, expand **BizTalk Server Group**, expand **Receive Functions**, right-click **ReceiveReq**, and then click **Properties**. You can see that this function was configured as a File Receive function, and on the **Services** tab you can see where we identified the directory to poll for files and the file types to pick up, as shown in Figure 2.



**Figure 2. A configured File Receive function**

On the **Advanced** tab, we instructed BizTalk Server where to deliver the files it finds. On that tab, we also identified a channel, called Channel To Approval, to which the receive function will pass the documents. Channels, as well as related messaging ports, are new concepts. We will discuss them next.

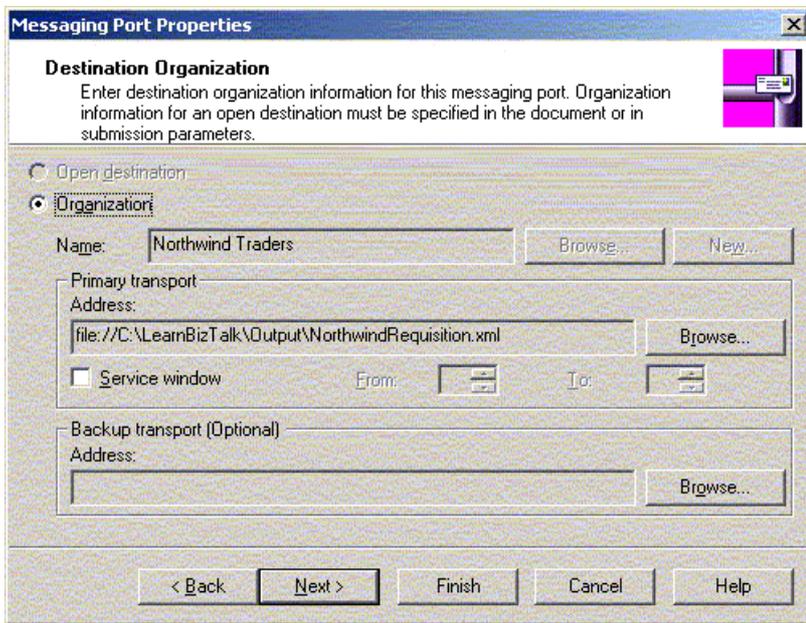
File Receive functions are not the only way to submit documents to BizTalk Server. You can also receive documents from Message Queuing, through e-mail (SMTP), and from Web pages (HTTP/HTTPS), as well as from COM from within your own applications.

## Configuring Messaging Ports and Channels

To deliver the document to a destination, you must define the destination in BizTalk Messaging Services. Destinations are known in BizTalk Messaging Services as messaging ports. A messaging port also contains a set of properties with which you can direct how documents are secured and transported to their destination, be it an internal application or an external business partner.

You can group messaging ports into distribution lists to send the same document to several different destinations, whether they are business partners or internal applications.

Let's take a look at the messaging port, which we called Req Approval Port, that we defined when you ran the setup script. This is a messaging port to an internal application that represents Northwind's business process for requisition approval. Open BizTalk Messaging Manager, click **Messaging ports**, and then click **Search Now**. In the right pane, double-click **Req Approval Port** to edit it. Click **Next**. The Destination Application dialog box shows that this document will be delivered to file, as shown in Figure 3.



**Figure 3. The Messaging Port Properties dialog box**

In [Lesson 1](#), this messaging port delivered the message to an XLANG schedule within BizTalk Orchestration Services, which implements the approval process. (We will discuss BizTalk Orchestration Services in more detail in the [next lesson](#).) We have deliberately changed this by running the script at the start of the lesson so you can see the output.

Instead of delivering a document to BizTalk Orchestration Services or a File, you can configure a messaging port to deliver documents using any of the supported protocols, which include HTTP(S), SMTP, Message Queuing, and custom application integration components (AICs).

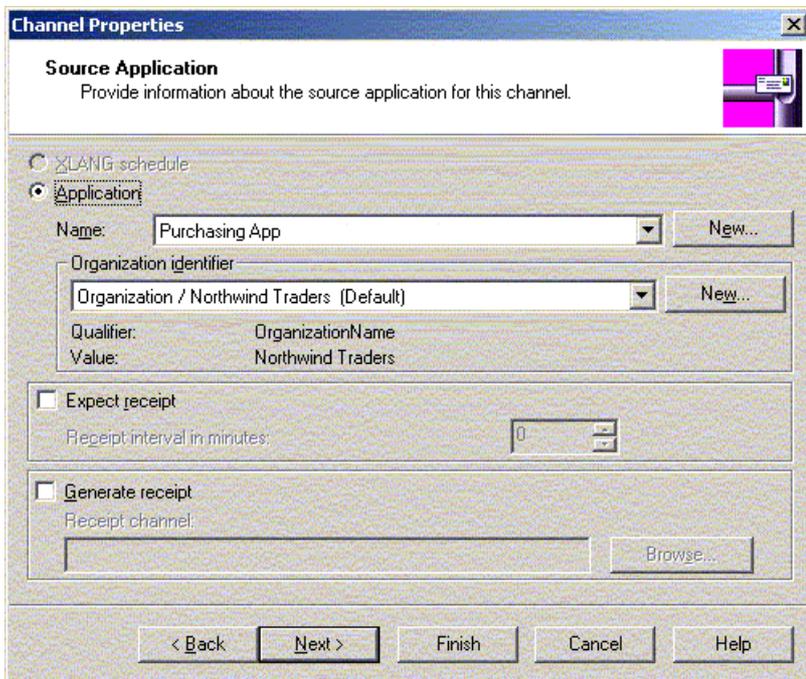
You can also configure a messaging port with extra security features by optionally encrypting your document and/or adding a digital signature to it.

Now let's define a channel through which this document is delivered. A channel contains a set of properties, which identifies the source organization or application that has sent out the document. The channel also defines the specific steps that are performed by BizTalk Server before the document is delivered to the associated messaging port. Take a look at the relationship between receive functions, channels, and messaging ports.



**Figure 4. Relationship between receive functions, channels, and messaging ports**

To see how we've set up the channel that delivers requisitions to Northwind's approval process, open BizTalk Messaging Manager, click **Channels**, and then click **Search Now**. In the right pane, double-click **Channel To Approval** to edit it. Click **Next**. Alternatively, you can right-click the messaging port **Req To Approval** and choose the menu option **Find Channels** to show you all the channels, or show only **Channel To Approval** connected to the **Req To Approval**. In the dialog boxes that follow, we have defined that the documents to be processed by this channel will originate from an internal purchasing application, and that these documents will be in a format described by a document definition named Northwind Req.



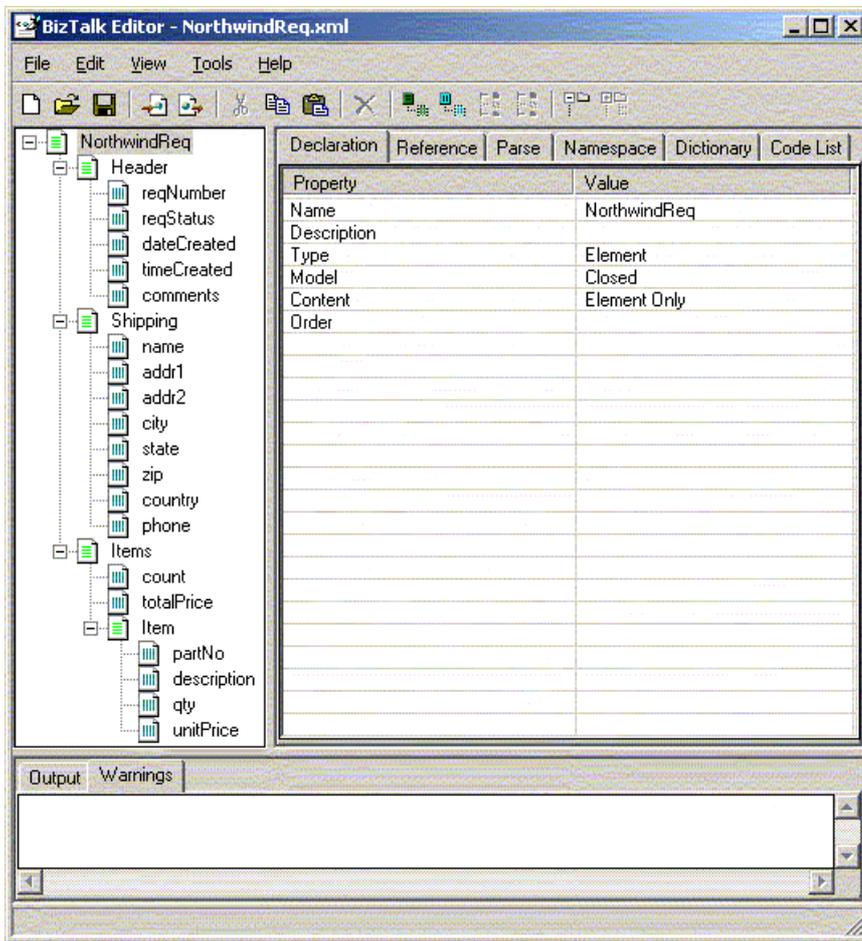
**Figure 5. The Channel Properties dialog box**

You can optionally instruct a channel to translate a document from one document definition into another, as well as specify which information must be logged for tracking purposes as the channel delivers documents. Lesson 5 contains more about document translation.

So what is this document definition, and how do we create one?

## Defining Document Specifications

In the [first lesson](#), we explained how important it is for businesses to use the same language for describing the documents that are passed between them. This common language is XML. Although XML documents are stored in a text format and can be opened with any text editor, creating or modifying them manually is a very tedious and error-prone process. Fortunately, BizTalk Server provides an excellent tool called BizTalk Editor that greatly simplifies this task. All of our XML specifications are stored in the C:\LearnBizTalk\Documents directory. Open the NorthwindReq.xml file located in this directory in BizTalk Editor and it will appear as shown here.



**Figure 6. The BizTalk Editor window**

BizTalk Editor provides an easy way to visualize a document's format, to define data types for individual elements and attributes, to define which data fields are required and which are optional, and much more. This particular document schema represents an XML document, but the Editor looks similar for EDI and Flat-file schemas.

Since you can work with the specification on any workstation where you have BizTalk Editor installed, after the specification has been created it also needs to be added to the BizTalk Server WebDAV repository so the BizTalk server can retrieve it.

WebDAV (World Wide Web Distributed Authoring and Versioning) is the Internet Engineering Task Force (IETF) standard for collaborative authoring on the Web. It facilitates collaborative editing and file management between users located remotely from each other on the Internet. You can find more information regarding WebDAV on the IETF Web site at <http://ietf.org/rfc/rfc2518.txt>.

Creating the document definition is now simply a matter of associating a specific XML specification created in the BizTalk Editor and stored in WebDAV with a name to be used by BizTalk Server. To test this feature, in BizTalk Messaging Manager, on the **File** menu, click **New**, and then click **Document Definition**. Type a name for the document definition, select the **Document specification** check box, and then click **Browse**. The dialog box that appears next lets you choose any schema stored in the BizTalk Server WebDAV repository. Click **OK** to save the new document definition.

You can create multiple document definitions that are based on the same schema document. You can optionally define global document tracking options for each document definition that you create.

## Running It

Now let's execute the part of the scenario we just reviewed. Copy the ReqToApprove.xml file from the C:\LearnBizTalk\Documents directory and paste it into the C:\LearnBizTalk\Pickup directory. The File Receive function ReceiveReq that we defined will pick up that file and deliver it to the Req Approval Port messaging port through the Channel To Approval channel. At the beginning of this lesson we ran a special script, which modified our channel and messaging port definitions. So instead of delivering the requisition document to BizTalk Orchestration Services, the messaging port simply wrote the document contents to a file called NorthwindRequisition.xml in the C:\LearnBizTalk\Output directory. Examine that file by double-clicking it to open it in Internet Explorer. You will see that it's exactly the same document which we placed in the \Pickup directory.

Perform these steps again, this time using the ReqToDecline.xml file. The file in the \Output directory will be overwritten with our newly submitted requisition.

It appears that you haven't achieved a lot with BizTalk Messaging in this lesson. We picked up a file from the file system in one directory and deposited it in another directory. Clearly there is a lot more that you can do with BizTalk Messaging Services, and now that you understand the basic concepts and terminology, we will show you some of these features.

In the [next lesson](#), we will take a look at how Northwind's requisition approval process is defined using BizTalk Orchestration Services.

# Learning BizTalk Server 2000: Lesson 3

Igor Leybovich and Scott Woodgate  
 Microsoft Corporation

May 2001

**Summary:** The third in a series of 7 articles designed to show you how Microsoft BizTalk Server 2000 can help your business exchange a variety of documents with business partners, as well as integrate internal business processes and applications. In this lesson, we will take a look at how a requisition approval process is defined using BizTalk Orchestration Services. (7 printed pages)

## Note

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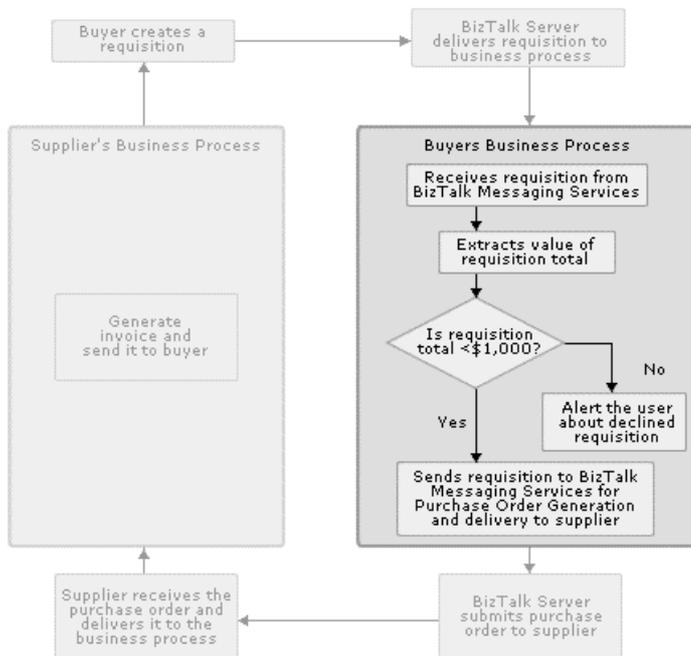
Also, in order to execute the scripts for these lessons, you need to install the MSMQ component of Windows 2000.

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## Introduction

Now let's discuss how Northwind Traders implemented its requisition approval process using BizTalk Orchestration Services. Figure 1 gives a more detailed view of what needs to be done.



**Figure 1. Requisition approval process for Northwind Traders**

## What Is Orchestration?

So now that you know how to submit your business documents to BizTalk Messaging Services from [Lesson 2](#), you might ask yourself: "How do I define what my business processes are, and how can BizTalk Server help me to apply these processes?" The answer to that question is BizTalk Orchestration Services. Microsoft BizTalk Server 2000 solves two problems: it provides you with BizTalk Messaging Services to send messages between business processes, and it provides you with BizTalk Orchestration Services to create your business processes.

BizTalk Orchestration Services enables you to create a detailed representation of your business process, and also to programmatically implement the business process within an integrated design environment based on Microsoft Visio 2000. Historically, the business-process design phase and the implementation phase were performed separately. One of the important features of BizTalk Orchestration Services is the integration of these previously distinct phases within a unified graphical design environment.

Because business processes are defined in a graphical environment, when these processes change at the business level this can be much more rapidly reflected at the implementation level.

In addition to integrating design and implementation, BizTalk Orchestration Services provides several other important features to solve tasks that are hard to achieve today: the ability to create processes containing concurrency, doing multiple tasks at the same time, and the ability to create robust, long-running business processes that span applications, platforms, and organizations. To achieve the second feature, create robust, long-running business processes, BizTalk Orchestration Services saves instances of long-running business processes and suspends them, which conserves computing resources and provides extra reliability. At a later point, the server restarts these processes from the exact point at which they were suspended while waiting for a long operation to finish. Even if the computer was turned off in the interim, the suspended processes restart when triggered. An example of such a long-running operation could be waiting for payment of an invoice, an operation that usually takes 20 to 30 days before completing. Go ahead and open the BizTalk Orchestration Designer and, from the **File** menu, open the file NorthWindApprovalL3.skv from c:\LearnBizTalk\Schedules.

## Analyst's Point of View

If you are one of the many business analysts who frequently draw diagrams using Microsoft Visio, you will feel right at home the moment you open BizTalk Orchestration Designer. Figure 2 shows Northwind's approval process drawing that was designed in BizTalk Orchestration Designer.

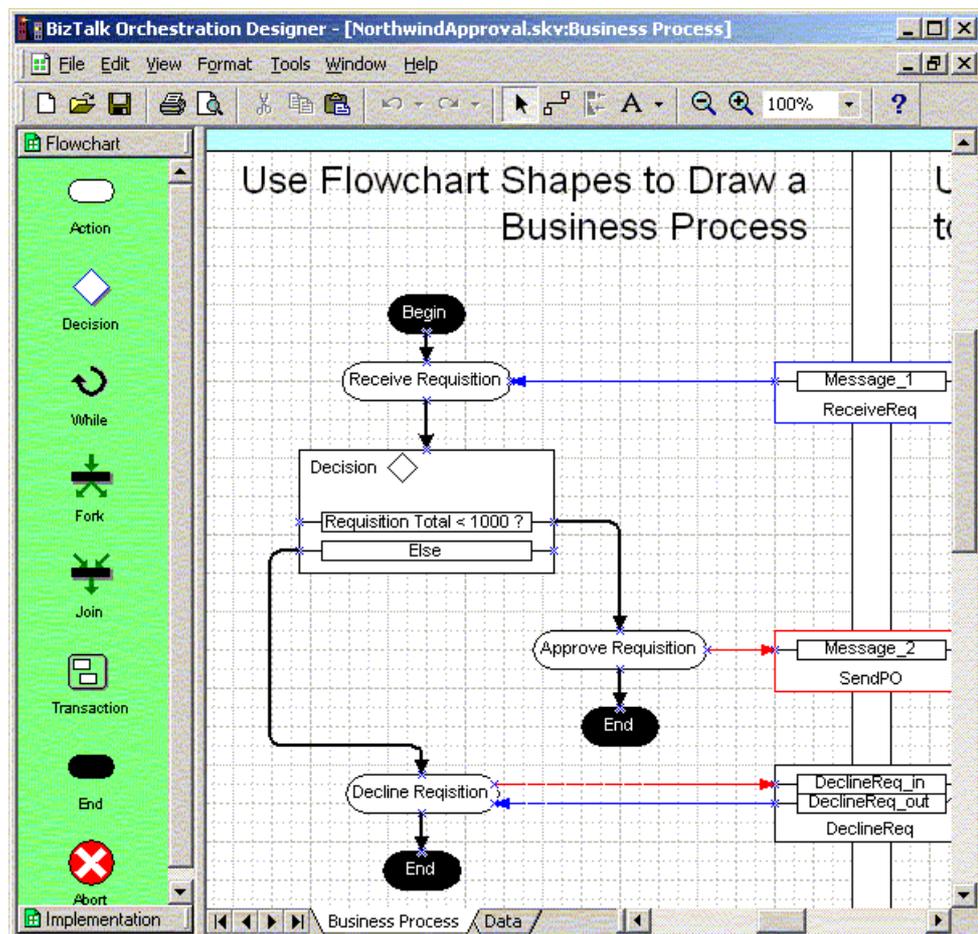


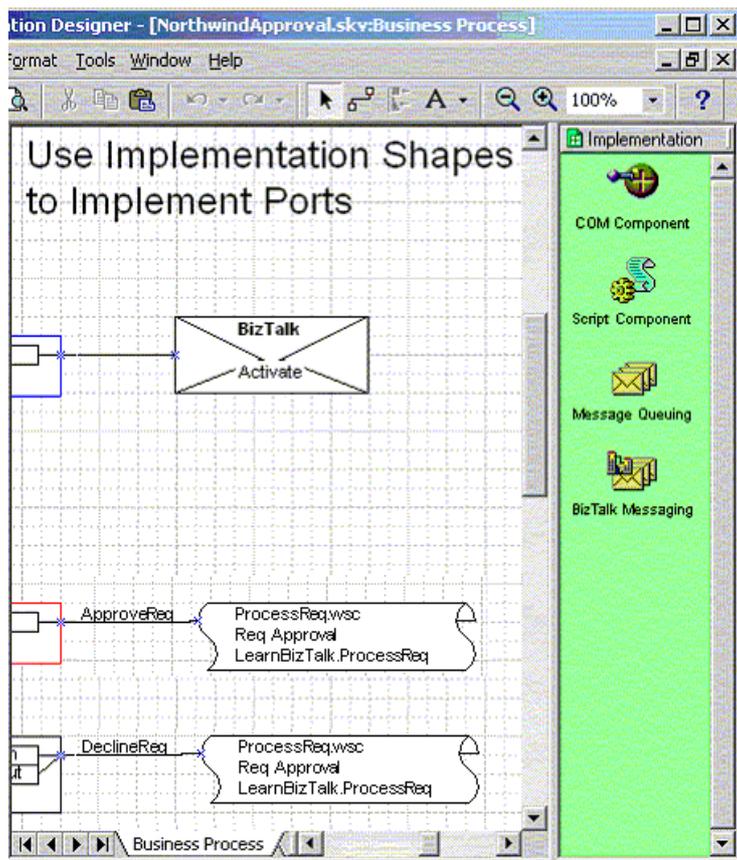
Figure 2. Approval process created in BizTalk Orchestration Designer

You are simply defining your business process using such basic shapes as **Action**, **Decision**, and **While** shapes. You are not required to think in terms of documents, specifications, components, and messages—leave this work to the developer. No limitations are imposed on the number or names of the steps in your process. In addition, you can use **Fork** shapes to split the process into multiple concurrent paths, such as requesting the same price quote from multiple suppliers, and later reunite these paths with a **Join** shape. Finally, you can use the **Transaction** shape to "wrap" several steps of the process into a unitary transaction if business requirements dictate this.

## Developers See It Differently

Once the business process has been defined, you can now implement it by instructing BizTalk Server as to what must be done to perform each of the tasks drawn by an analyst. If you are a software developer, this is probably the moment you've been waiting for, thinking that we would finally show some coding tasks. As much as we hate to disappoint you, we must say that BizTalk Orchestration Services does most of the work, so the amount of code that's left to be written is minimal, if any.

Figure 3 shows the developer's side of the diagram.



**Figure 3. Implementation process created in BizTalk Orchestration Designer**

As a developer you certainly need to understand how to use the **BizTalk Messaging** shape, the **COM Component** shape, and the **Message Queuing** shape. Note that you do not write any code to bind the business processes together; your coding is in the individual components of specialized business logic, rather than in the glue that holds them together.

For example, when you drag and drop the **BizTalk Messaging** shape onto the drawing, you open the BizTalk Messaging Binding Wizard, which walks you through a series of simple pages to define which messaging port is associated with a given implementation shape. As you may recall, a messaging port is simply a collection of properties associated with a certain document destination, and your business process can certainly be such a destination.

At the same time, for simpler tasks you can also create lightweight components in a scripting language of your choice, such as Microsoft Visual Basic® Scripting Edition (VBScript). We have used a component like this in this XLANG schedule drawing. Our script component exposes a method called **DeclineReq**, whose only job is to display a message box alerting the user that a requisition has been declined.

The NorthwindApprovalL3.skv XLANG schedule contains two script components and one BizTalk Messaging shape.

Of course, if a specific part of the business process requires you to perform specialized tasks, such as accessing internal databases or interfacing with a mainframe system, you would most likely implement them in a COM component and simply call its appropriate methods from BizTalk Orchestration Services.

In the next lesson, we will take a closer look at the process of creating a Script Component.

## Joining the Two Sides

Finally, we need to connect the business analyst's view with the implementation. Each flowchart shape used by an analyst, as well as each implementation shape used by a developer, has a "handle" on its side. Using familiar Visio techniques, you connect an action shape on the left with an implementation shape on the right by simply drawing a line between their handles. Once the shapes are connected, the XML Communication Wizard opens and you then answer a few questions to determine how the communication between the shapes occurs.

Now that all the action and implementation shapes have been connected, we are almost done. The last step, on the **Data** page, is to define how the actual business document will be passed from one action to the next. You can view the **Data** page by clicking the **Data** tab at the bottom of the drawing in BizTalk Orchestration Designer. The next lesson contains more details about that.

## Let's Run It

To test the parts of the scenario we have discussed up to this point, run the following script file: L3Post.vbs. This script temporarily alters our XLANG schedule drawing so the requisition does not get passed to Contoso just yet. Don't worry, we will return everything to its original configuration later, but now it is useful to make this change so that you can visualize this step of the process.

Copy the ReqToDecline.xml file from the C:\LearnBizTalk\Documents directory and paste it into the C:\LearnBizTalk\Pickup directory. The File Receive function picks up that file and delivers it to BizTalk Messaging Services. BizTalk Messaging Services in turn invokes the Northwind requisition approval process using BizTalk Orchestration Services, since we defined an XLANG schedule as the destination for the messaging port that was created for this business process. Finally, BizTalk Orchestration Services processes the requisition and displays a message box informing you that this particular requisition was declined. Go ahead and do it again, this time using the ReqToApprove.xml file. The message box informs you that the requisition has been approved.

In [Lesson 4](#), we will focus on configuring **Implementation** shapes in BizTalk Orchestration Designer, developing a Script Component, and determining what needs to be done on the **Data** page so that our document is properly passed from action to action.

# Learning BizTalk Server 2000: Lesson 4

Igor Leybovich and Scott Woodgate  
Microsoft Corporation

May 2001

**Summary:** The fourth in a series of 7 articles designed to show you how Microsoft BizTalk Server 2000 can help your business exchange a variety of documents with business partners, as well as integrate internal business processes and applications. In this lesson, we will examine the developer's implementation of a sample business requisition-approval process. (12 printed pages)

## Note

You will need to install Microsoft® BizTalk™ Server 2000 in order to complete this lesson. Before you install Microsoft BizTalk Server, make sure you have read the Readme.htm and Installation Guide.htm documents, paying particular attention to the following important prerequisites:

- You must have a computer running Microsoft Windows® 2000 with Service Pack 1 or above (Professional or Server both work), including IIS and MSMQ services, and an account with administrative rights on that computer.
- You must have Microsoft SQL Server™ 7.0 with Service Pack 2 or above (you can install SQL Server Desktop Edition if you choose to run everything on a single workstation running Windows 2000 Professional) and password for the "sa" account. If you use SQL Server 2000, you must configure it for "mixed" security mode in the install wizards that is not the default.
- Microsoft Visio® 2000 SR1 Standard or above must be installed on the computer where you are installing BizTalk Server.
- In Internet Services Manager, turn off the **Enable authoring** option on the **Server Extensions** tab of the Default Web Site.

Also, in order to execute the scripts for these lessons, you need to install the MSMQ component of Windows 2000.

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[Doing Something Useful](#)

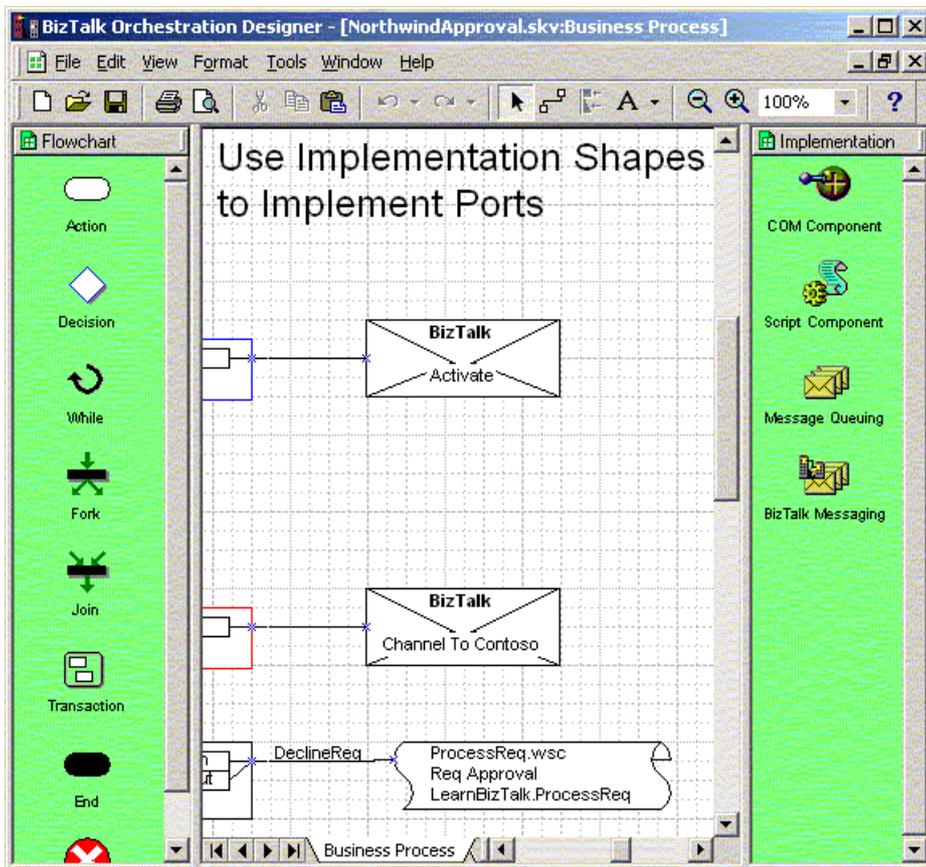
[Creating a Script Component](#)

[Sending the Document Out](#)

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## Introduction

In this lesson, we will slightly extend the [Lesson 3](#) XLANG schedule and examine the developer's implementation of the Northwind's requisition-approval process. First, open up the NorthwindApproval.skv file in BizTalk Orchestration Designer, as shown in Figure 1. This file is very similar to the NorthwindApprovalL3.skv that we used in Lesson 3, except one of the Windows Script Components has been replaced by a BizTalk Messaging shape with the words **Channel To Contoso** written on it.



**Figure 1. A requisition-approval process in BizTalk Orchestration Designer**

Using BizTalk Orchestration Services, the requisition-approval process is implemented in the form of an XLANG schedule. We will look at configuration parameters for various **Implementation** shapes, review the process involved in creating a Windows Script Component implementation, and explain what must be done on the **Data** page in BizTalk Orchestration Designer to assure the correct flow of information in and out of an XLANG schedule.

## Receiving Documents in BizTalk Orchestration Services

As we mentioned earlier, an XLANG schedule is the place where you implement your business process. In most cases, this process must examine various fields of an incoming document and make decisions or perform actions based on their values. In our example, we check the **Total** value of the Requisition document and approve the requisition only if its total is less than \$1,000.

Of course, the Requisition document must first be delivered to the approval process. By now you are probably wondering: "What *exactly* is this process, and where is it running?" We will answer this question in this lesson.

After a business analyst side of the XLANG schedule drawing has been completed, and a developer adds the implementations, the diagram is compiled into an XLANG schedule. The schedule is a file written in the XLANG language, which is a language that describes the logical sequencing of business processes, as well as the implementation of the business process by using various technologies. The XLANG language is expressed in XML. The XLANG schedule defines all the steps that must be performed, components that must be called, and data that must be passed in order to fulfill the defined process. Once both sides of the diagram are completed, you can compile the XLANG schedule drawing by clicking **Make XLANG filename.sxk** from the **File** menu in BizTalk Orchestration Designer.

In previous lessons you learned how to send a message containing a business document by using BizTalk Messaging Services. Now we need to combine the message and the business process.

In [Lesson 2](#), we defined a messaging port and configured it to deliver the Requisition document to an XLANG schedule. We specified the name of an XLANG schedule (the XLANG file) that should be started by BizTalk Messaging Services in order to process the requisition. We also specified the name of an *orchestration port* to receive the requisition within the schedule. This orchestration port must be configured inside BizTalk Orchestration Designer. Notice that the word port is used to refer to two different things, a messaging port defined in the BizTalk Messaging Manager and an orchestration port defined in the BizTalk Orchestration Designer are not the same thing—this is a little confusing, but once you understand the notion they are different, you will be fine. When you add a **BizTalk Messaging** shape to the right-hand side of the XLANG schedule drawing, the BizTalk Messaging Binding Wizard starts. Double-click the BizTalk Messaging shape with the Activation icon to follow through the wizard. In this wizard, you name the orchestration port (this name must match the one you specified in BizTalk Messaging Manager), and also indicate whether this port receives documents or sends them, and whether it is used to start a business process. That's it! Now you can pass documents from BizTalk Messaging Services to BizTalk Orchestration Services.

If you indicate that a port is used to send documents from the XLANG schedule to BizTalk Messaging Services (rather than receive them), the BizTalk Messaging Binding Wizard requires the name of a channel that will receive these documents. Note that this channel does not have to exist at the time you create your XLANG schedule drawing, but it must exist when the schedule is executed.

Another way to receive a document in an XLANG Schedule is to use the **Message Queuing** shape. When you add this shape to the drawing, the Message Queuing Binding Wizard starts and you are asked to specify the name of a private or public message queue that will be used to send or receive documents. However, if you choose to use Message Queuing to receive documents, the schedule does not start automatically, unlike when you receive documents from BizTalk Messaging Services. You must have another way to start the schedule after the document is posted on a queue.

After an orchestration port is configured, you need to associate it with an action defined by an analyst. Click on an **Action** shape on the left side of the drawing and connect the control handle on the right side to the orchestration port that you created. This will start the XML Communication Wizard, which once again reminds us that Microsoft® BizTalk™ Server 2000 handles all its internal data flow by using XML. You will be prompted to create a *message* that will be used to carry the document through the orchestration process represented by the XLANG schedule. If you are using the pre-built schedule, then double-click on the blue line that connects the Receive Requisition action with the ReceiveReq port to display the XML communication wizard. The wizard will also remind you to connect this message to other messages on the **Data** page. We will review the **Data** page at the end of this lesson.

Next, you need to specify whether the document is processed in XML format. If it isn't, the XLANG Scheduler Engine must "wrap" the document in the engine's standard XML wrapper.

After that, you will be asked to specify a message type. Use the same document definition you used to configure the messaging port that delivered this document to the XLANG schedule, or type in the name of the root element from your document schema here.

Finally, you can optionally specify the name and location of an XML file, which contains your document specification, and BizTalk Orchestration Services can validate each document against this specification prior to processing it.

Now that we know how to receive documents from BizTalk Messaging Services, let's look at what we can do with these documents within BizTalk Orchestration Services.

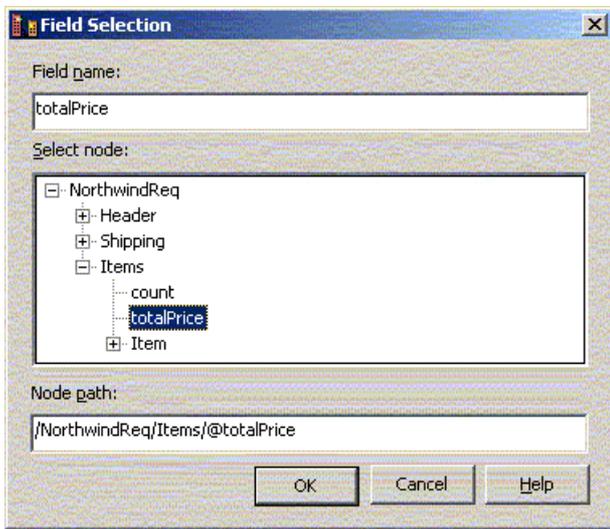
## Getting to the Data

Previously, you configured an XML communication for a message and indicated which XML specification represented the document being received. Now you can use BizTalk Orchestration Services to retrieve values of individual fields inside the document and transfer the information to COM components or other messages.

Open the XML communication wizard for the ReceiveReq port one more time and click **Next** four times to get to the **Message Specification Information** page of the wizard. In the **Message fields** area, you will notice several entries. One of them, named "*Document*", is the field that represents an entire document passed to the XLANG schedule. Click the **Add** button. Because we specified that the documents passed into the XLANG schedule would match a specific XML specification, namely the Northwind Requisition specification, you can now select individual fields from this document by using a standard XML query language called XPath.

XPath is a language for addressing parts of an XML document. XPath is a public standard maintained by the W3C. You can find more information about XPath at <http://www.w3.org/TR/xpath.html>.

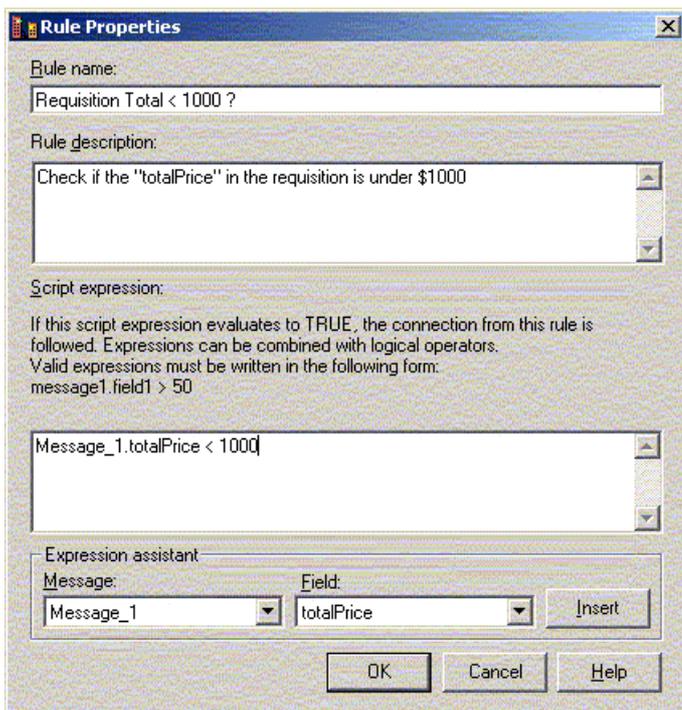
As you click on individual nodes of the XML specification, an XPath for the node appears in the **Node path** box. Figure 2 shows the **Field Selection** dialog box with the *totalPrice* field selected.



**Figure 2. Field Selection dialog box**

You can add other fields from the specification to your message in a similar way. All the fields added in this dialog box become available on the **Data** page in BizTalk Orchestration Designer, so they can now be used in expressions and passed as parameters to components. We will take a closer look at the **Data** page at the end of this lesson.

Now let's turn to the left side of the XLANG schedule drawing to see how we used this extracted field value, *totalPrice*, inside the **Decision** shape. In the **Decision** shape, right-click the **Requisition Total < 1000?** rule, and then click **Properties**. A dialog box similar to the one in Figure 3 appears.



**Figure 3. Rule Properties dialog box**

Look at the **Script expression** box—the value of the *totalPrice* field can be simply accessed by using the *MessageName.FieldName* notation. In our case, we used *Message\_1.totalPrice* to get the **Total Price** value of the Requisition document.

## Doing Something Useful

Now that we have the document inside the XLANG schedule, we can call various business components and simply pass our document as one of the parameters. These components can address a multitude of business rules, access corporate databases and legacy systems, send e-mail messages, and generally do anything you'd like them to do. The components could also modify the document itself if so required and return these changes back to the XLANG schedule to be passed on to the next action. All that's required of your developers is to implement the business logic as standard COM components, then add these components on the right side of the XLANG schedule drawing, choose which methods to call—and you are almost done!

Let's briefly review what we have achieved with BizTalk Server so far. We read the Requisition document from a file on the hard

drive and passed that file into BizTalk Messaging Services (using a File Receive function); then we validated this document against an XML specification (by using a channel) and passed it to BizTalk Orchestration Services; after that we received the document inside an XLANG schedule and retrieved values of specific fields (using XML Communication Wizard); and finally in a **Decision** shape, we used rule properties to evaluate values and build our business logic. Until now everything we did not require any programming on your part. At some point, however, you may need to write a business component to implement certain company-specific actions (such as looking up requisition-approval limits for certain members of your staff). This is the time to write a COM component.

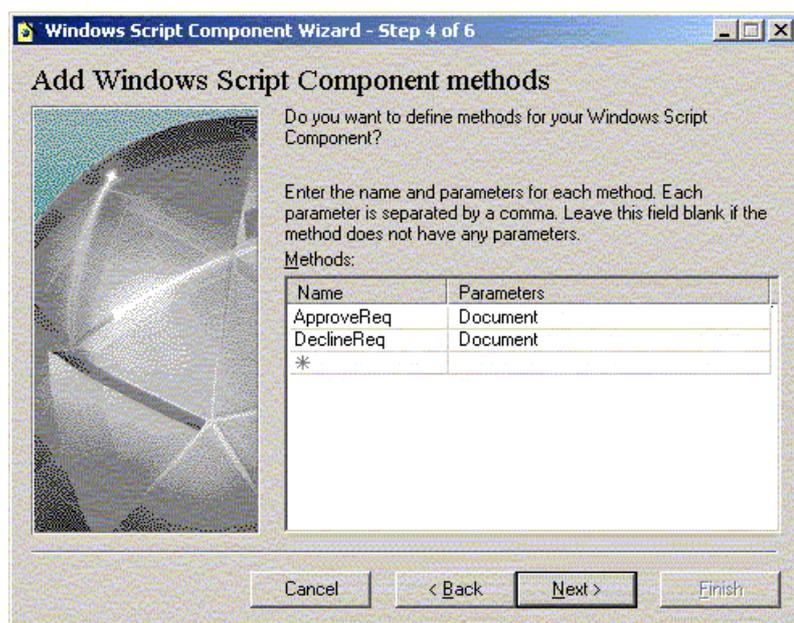
## Creating a Script Component

Did you know that you could create COM components by simply writing a script? The answer is to use Windows Script Components. Script Components provide you with an easy way to create COM components by using scripting languages such as Microsoft Visual Basic® Scripting Edition (VBScript) and Microsoft JScript®. You can use Script Components just like any other COM components in any application that supports COM.

Script Components are not as high performance as compiled components because they are interpreted at run time, but they are an excellent way to prototype an interface for a COM component that will be developed later.

To give you a head start on the creation of Script Components, Microsoft has released the Windows Scripting Component Wizard. Once you [download this wizard](#) and run it, creating the skeleton code for your component is quite easy: choose a name for the component, decide which scripting language you will use to implement it, specify which properties and methods your component will have, and click **Finish**. The wizard generates all the code necessary for your component and saves it in a file with a **.wsc** extension. All that's left for you to do is to open this file in the editor of your choice and to add the actual code behind your methods. It's that easy!

The component that we will use has two methods—**ApproveReq** and **DeclineReq** and each method has a single parameter: document. The step in the Windows Script Component Wizard where you add these methods to the script file is shown in Figure 4.



**Figure 4. Adding methods to the script file in Windows Script Component Wizard**

The following code is for the Requisition Approval component:

```
<?xml version="1.0"?>
<component>

<registration
  description="Req Approval"
  progid=" LearnBizTalk.ProcessReq"
  version="1.00"
  classid="{AD454A9F-58FE-4877-B7CD-F61BD45988F5}"
>
</registration>

<public>
  <method name="ApproveReq">
```

```

    <PARAMETER name="Document"/>
</method>
<method name="DeclineReq">
    <PARAMETER name="Document"/>
</method>
</public>

<script language="VBScript">
<![CDATA[

function ApproveReq(Document)
    MsgBox "Orchestration Engine Approved Requisition:" & vbCrLf & vbCrLf & Document, 64, "Req
uisition Approved"
end function

function DeclineReq(Document)
    MsgBox "Orchestration Engine Declined Requisition:" & vbCrLf & vbCrLf & Document, 16, "Req
uisition Declined"
end function

]]>
</script>

</component>

```

Everything in this file was generated by the wizard, except for the implementation code of the **ApproveReq** and **DeclineReq** methods that appear in boldface above.

In addition to being the easiest way to implement simple COM components, Script Components have another important use. Your business process flow might prove to be quite complex, with COM components to be created by your developers taking several weeks to write and test. This does not mean that you cannot design and test your XLANG schedule drawing before those components are finished. Simply use the Script Component Wizard to create mock-up versions of your complex COM components, complete with properties and methods they expose, and then use these script components in your XLANG schedule drawing in place of actual COM components that will be completed later. Not only can you now design your XLANG schedule drawing without having to wait for other developers to finish their coding, but you can also test BizTalk Messaging Services and BizTalk Orchestration Services integration with the confidence of knowing that your Script Components can be easily replaced with COM components developed in another language at any time in the future. When the time comes, simply add a **COM Component** shape to the drawing, answer a few questions in the COM Component Binding Wizard to create a new orchestration port, and then disconnect your existing **Action** shape that was previously attached to a Script Component port implementation and re-connect it to a new port. Recompile the schedule and you are done!

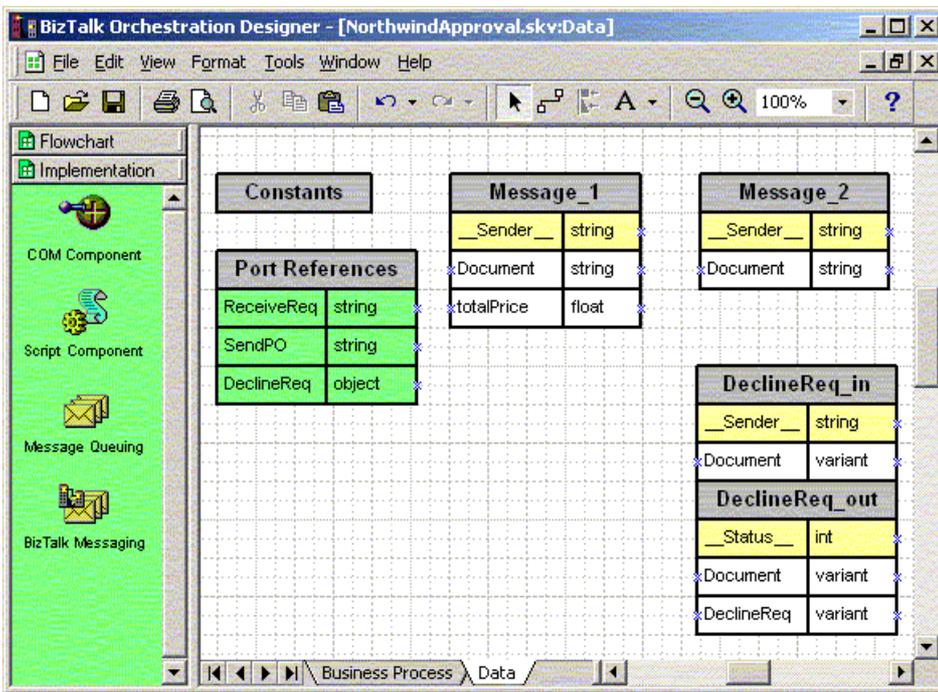
## Sending the Document Out

After you finished processing the document inside the XLANG schedule, sending it out is as easy as it was getting it in. If you want to send the document back to BizTalk Messaging, add a **BizTalk Messaging** shape to the right-hand side of the drawing and specify the name of the channel to which the document must be sent. After the orchestration port is created, connect an **Action** shape to this port and in the XML Communication Wizard specify whether the document is sent as XML or as a string, message type information, and an optional XML specification to validate the document, similar to what you did earlier when you configured BizTalk Orchestration Services to receive documents from BizTalk Messaging Services.

You can also send documents out of an XLANG schedule by using Message Queuing. In that case, instead of specifying the name of a channel, you will need to specify a name of a private or public queue to which the document will be posted.

## The Data Page

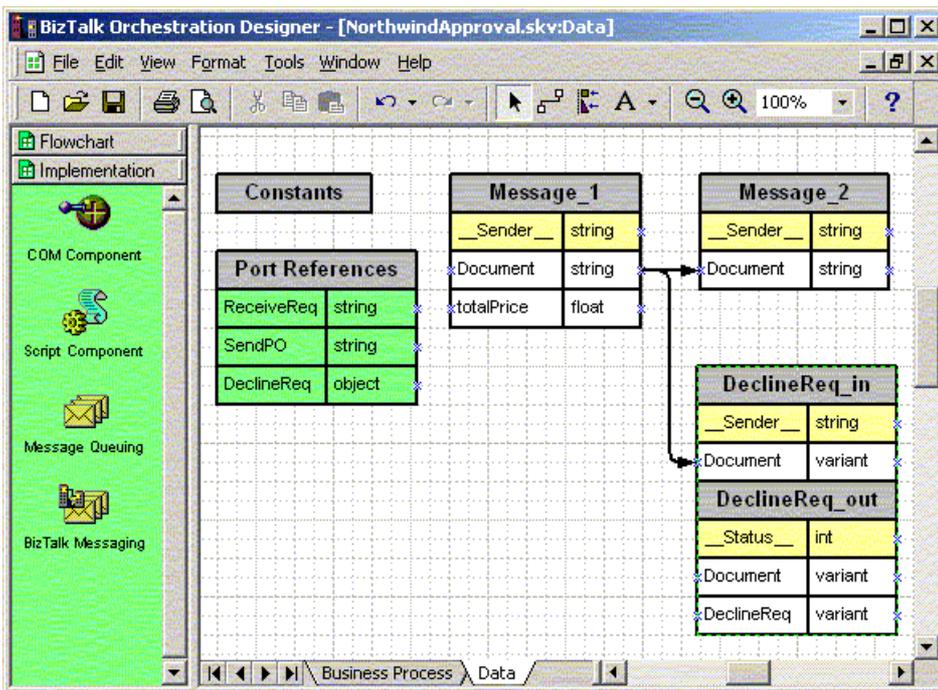
And now, the moment we have been putting off for a while. After an XLANG schedule drawing has been drawn, and all the **Implementation** shapes have been connected to their **Action** counterparts, all that's left to do is instruct BizTalk Orchestration Services how our document should "flow" from one step of the process to the next. Before you complete the **Data** page, it looks similar to Figure 5.



**Figure 5. An incomplete Data page in BizTalk Orchestration Designer**

Note that it shows several groups of fields, with each group named after the message that carries the document to or from an orchestration port.

We now need to indicate that the document received from BizTalk Messaging Services by **Message\_1** needs to be passed on to the **DeclineReq\_in** message, which is the message that will submit the document to the Script Component, as well as to **Message\_2**, which will send the same document back to BizTalk Messaging Services. You can rearrange the messages on this page to make the drawing look simpler to understand. The resulting page, which should look similar to the Data page in NorthwindApproval.skv, looks like Figure 6.



**Figure 6.**

After all the message fields have been connected, save the drawing and compile a schedule file using the **File** menu. You are done! Your XLANG schedule is now ready to be executed.

In the [next lesson](#), we will prepare the document for delivery to the trading partner by transforming it with maps, and explain how to use these maps with BizTalk Messaging Services.

# Learning BizTalk Server 2000: Lesson 5

Igor Leybovich and Scott Woodgate  
Microsoft Corporation

May 2001

**Summary:** The fifth in a series of 7 articles designed to show you how Microsoft BizTalk Server 2000 can help your business exchange a variety of documents with business partners, as well as integrate internal business processes and applications. In this lesson, we look at how the Requisition document is prepared for submission to a trading partner, and at the steps taken within BizTalk Messaging Services to accomplish this task. (6 printed pages)

## Note

You will need to install Microsoft® BizTalk™ Server 2000 in order to complete this lesson. Before you install Microsoft BizTalk Server, make sure you have read the Readme.htm and Installation Guide.htm documents, paying particular attention to the following important prerequisites:

- You must have a computer running Microsoft Windows® 2000 with Service Pack 1 or above (Professional or Server both work), including IIS and MSMQ services, and an account with administrative rights on that computer.
- You must have Microsoft SQL Server™ 7.0 with Service Pack 2 or above (you can install SQL Server Desktop Edition if you choose to run everything on a single workstation running Windows 2000 Professional) and password for the "sa" account. If you use SQL Server 2000, you must configure it for "mixed" security mode in the install wizards that is not the default.
- Microsoft Visio® 2000 SR1 Standard or above must be installed on the computer where you are installing BizTalk Server.
- In Internet Services Manager, turn off the **Enable authoring** option on the **Server Extensions** tab of the Default Web Site.

Also, in order to execute the scripts for these lessons, you need to install the MSMQ component of Windows 2000.

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[Putting it Together](#)

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## Introduction

In the [previous lessons](#), we learned how Microsoft BizTalk Server 2000 accepts documents from line-of-business applications, and how these documents are processed within BizTalk Orchestration Services.

Now let's look at how the Requisition document is prepared for submission to Contoso Ltd., and the steps taken within BizTalk Messaging Services to accomplish this task.

## The Map Holds the Answer

As you recall, the Requisition document we have been using so far represented an *internal purchase requisition* produced by an application at Northwind Traders. Once this requisition is approved by a business process (implemented in our scenario using BizTalk Orchestration Services), a *purchase order* must be sent to Contoso to actually buy the merchandise. Do you see what's missing here? We don't have a purchase order (PO) document yet; all we've got is a requisition! However, we do know the structure of Contoso PO, and we also know that most of the data required to create the PO document, such as list of items and a billing address, is actually contained within the requisition. Can BizTalk Server once again assist us in transforming one document into another without doing much coding? If you answered yes, you are right!

The tool that helps us do this job is BizTalk Mapper. BizTalk Mapper uses another Internet standard called XSL Transformations (XSLT), which is a language for transforming XML documents from one XML schema into another.

XSLT is a W3C recommendation and you can learn more about it by visiting W3C's Web site at <http://www.w3.org/TR/xslt.html>.

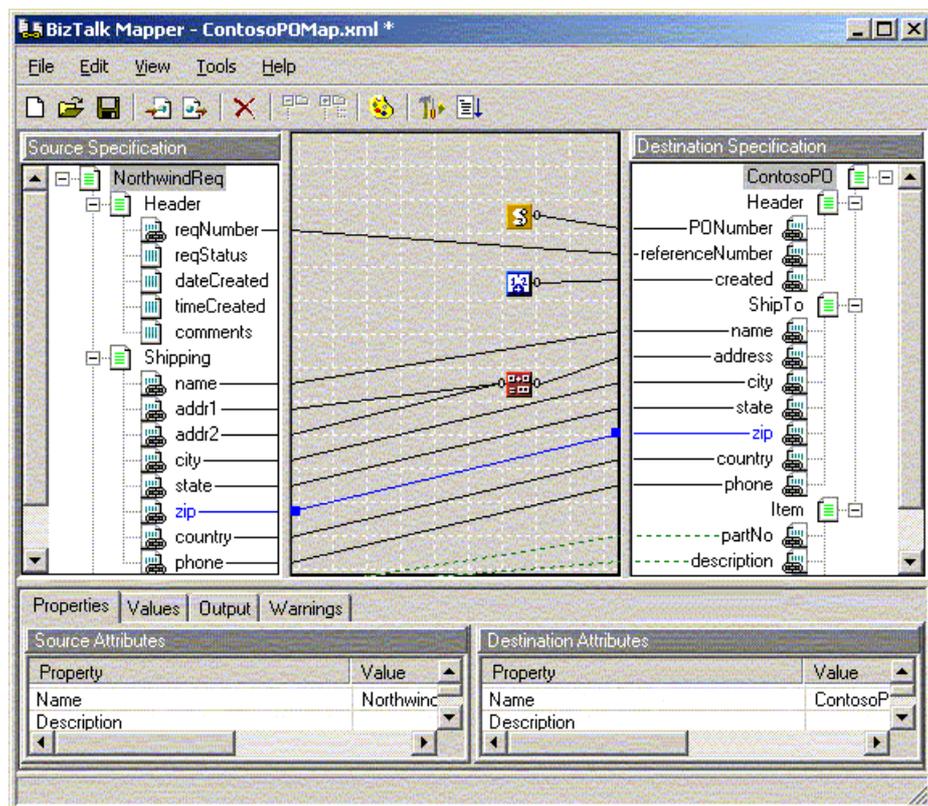
Luckily, you don't need to know anything about XSLT to use BizTalk Mapper. BizTalk Mapper is a highly graphical tool that presents you with both specifications side-by-side and lets you define transformations by simply drawing lines between the specification fields. For those cases when simple rules such as "Field A from Document 1 is mirrored into Field B in Document 2" are not enough, the Mapper offers a series of powerful transformation elements called *functoids*. There are over 60 functoids included with BizTalk Mapper, enabling you to perform mathematical, logical, string, date/time, scientific, database, and other

operations. There is also a script functoid that enables you to write your own subroutines in Microsoft Visual Basic® Scripting Edition (VBScript), in case none of the existing functoids are suited for the operation. The resulting VBScript code is embedded directly into the XSLT generated by BizTalk Mapper.

You can do even more powerful things using "cascading functoids," a method of passing results of one functoid execution as an input to the next functoid.

You can also create custom functoids in a language such as Visual Basic and add them to your functoid pallet for future use.

For our business scenario, we built a map that translates Northwind's requisition document into Contoso's purchase order. This map is stored in the file ContosoPOMap.xml located in the C:\LearnBizTalk\Documents\ directory. By opening this map in BizTalk Mapper, you will see the screen shown in Figure 1.

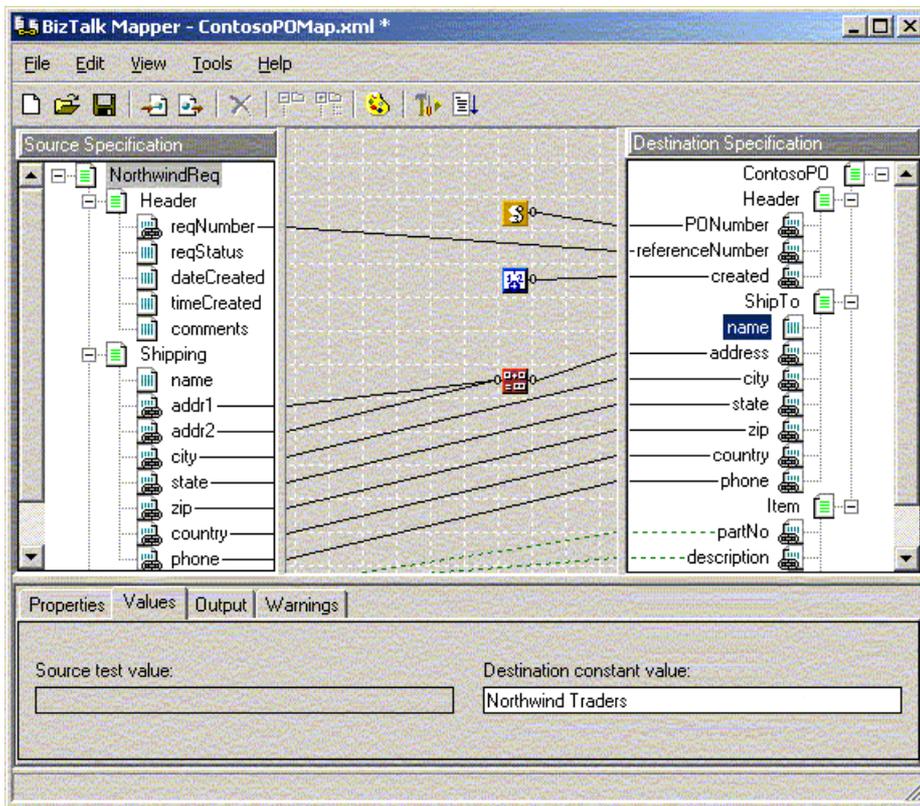


**Figure 1. A requisition mapped to a purchase order in BizTalk Mapper**

Most of the fields required to build the PO document for Contoso were already present in the Requisition document, perhaps under different names. Some of the fields, such as *PO Number*, are new, and therefore their values had to be generated.

You can see that we used three functoids in this map: a string concatenation functoid that combines two address fields in the requisition into one field in the PO, a date/time functoid that generates the current timestamp for the "created" field, and a script functoid that implements a specific business rule to generate a PO number (in our simplified world it simply picked a random number for the PO number).

If the values of some destination fields do not change over time (for example, your company's name and address), BizTalk Mapper enables you to specify constant values to be used. Simply highlight the field for which you need to provide a constant value, click the **Values** tab, and enter your value. Figure 2 shows the **Values** tab.



**Figure 2. Specifying constant values in BizTalk Mapper**

## Putting it Together

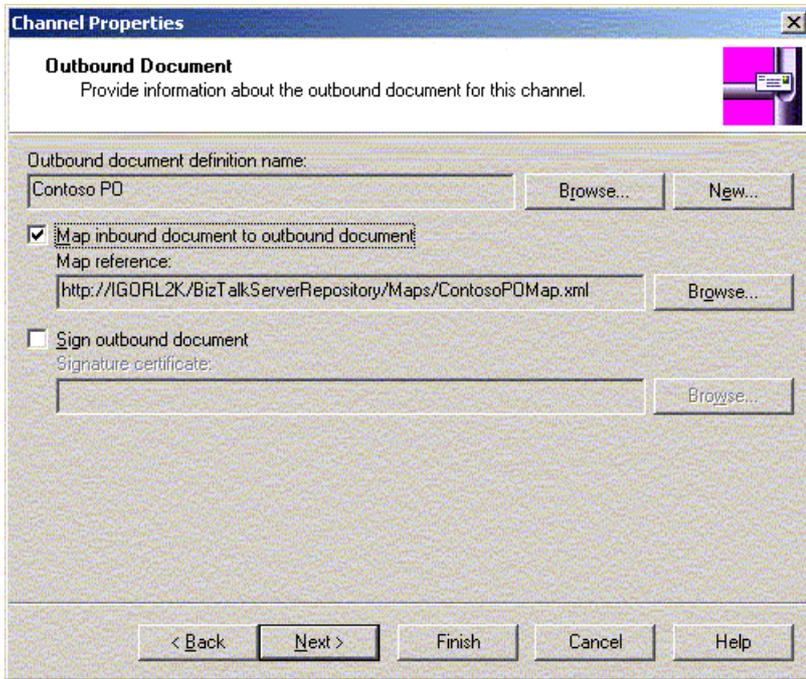
Now that we have created the map, let's go back to BizTalk Messaging Manager and configure the channel called "Channel To Contoso", which is used to deliver the PO to Contoso while using our map.

Remember, this is the same channel that we specified in XLANG schedule drawing described in [Lesson 3](#) when we configured an orchestration port "Send PO" that delivered the Requisition document to Contoso. Note that our XLANG schedule outputs the same Requisition document as it receives, and it is not aware of any potential transformations to this document (such as translation into a Purchase Order) that occur later inside the BizTalk Messaging Services. This separation between a business process used for the requisition approval and technical details behind managing document format and delivery mechanism is what makes the overall solution so flexible and easily adaptable.

The key point here is that BizTalk Orchestration Services is the technology for creating business processes, while BizTalk Messaging Services is the technology for reliably sending documents between business processes to integrate them.

In the future, if Contoso decides to change the format of its POs, you will only be required to update your specification for Contoso PO and update the map to reflect the new specification changes, rather than recreate the entire business process.

When you configure the channel in BizTalk Messaging Manager, if you specify an outbound document definition that is different from an inbound one, BizTalk Messaging Manager will automatically ask you to provide a map document to translate between these two document specifications. Figure 3 shows this process.



**Figure 3. Configuring a channel in the Channel Properties dialog box**

### Testing the Solution

Let's test the solution we have built so far. Before continuing, locate the L5Post.vbs script file in the C:\LearnBizTalk\Scripts\ directory and double-click to run it. This script will undo the temporary changes we made to our orchestration process at the end of Lesson 3 and will once again enable BizTalk Orchestration Services to output the document to BizTalk Messaging Services.

Now copy the ReqToDecline.xml file we used earlier and paste it into the C:\LearnBizTalk\Pickup\ directory. As before, this requisition gets declined and you receive the message box that informing you of this.

Copy and paste the ReqToApprove.xml file instead. This requisition will get approved and sent by BizTalk Orchestration Services to BizTalk Messaging Services. The channel receives the document, converts it into Contoso's PO by applying the map we specified, and for now BizTalk Messaging Services simply writes the resulting document under the name ContosoPO.xml to the C:\LearnBizTalk\Output\ directory.

Go ahead and double-click the output file to open it in Microsoft Internet Explorer. Look at the values of *PO Number* field that was randomly generated by the script functoid, the *Created* field that has the time when this file was generated, and the *Address* field that contains the values from both original *Addr1* and *Addr2* fields concatenated by the string functoid.

In the [next lesson](#), we will learn about some different ways to deliver documents to your business partners and how standard Internet protocols once again help to make this job easier.

# Learning BizTalk Server 2000: Lesson 6

Igor Leybovich and Scott Woodgate  
Microsoft Corporation

May 2001

**Summary:** The sixth in a series of 7 articles designed to show you how Microsoft BizTalk Server 2000 can help your business exchange a variety of documents with business partners, as well as integrate internal business processes and applications. In this lesson, you will learn about the business process used to send a purchase order to a trading partner, and how this order is received and stored by the partner. (6 printed pages)

## Note

You will need to install Microsoft® BizTalk™ Server 2000 in order to complete this lesson. Before you install Microsoft BizTalk Server, make sure you have read the Readme.htm and Installation Guide.htm documents, paying particular attention to the following important prerequisites:

- You must have a computer running Microsoft Windows® 2000 with Service Pack 1 or above (Professional or Server both work), including IIS and MSMQ services, and an account with administrative rights on that computer.
- You must have Microsoft SQL Server™ 7.0 with Service Pack 2 or above (you can install SQL Server Desktop Edition if you choose to run everything on a single workstation running Windows 2000 Professional) and password for the "sa" account. If you use SQL Server 2000, you must configure it for "mixed" security mode in the install wizards that is not the default.
- Microsoft Visio® 2000 SR1 Standard or above must be installed on the computer where you are installing BizTalk Server.
- In Internet Services Manager, turn off the **Enable authoring** option on the **Server Extensions** tab of the Default Web Site.

Also, in order to execute the scripts for these lessons, you need to install the MSMQ component of Windows 2000.

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## Introduction

In this lesson we will learn about the process Northwind uses to send the purchase order (PO) to Contoso, and how this order is received and stored by Contoso.

## Choosing a Protocol

After the PO document is generated, it needs to be submitted to Contoso for processing. When choosing a transport for this task, you must consider several important aspects:

1. The transport must use a standard protocol—you want to know that your trading partner can receive documents using a variety of software running on any platform.
2. The transport must be reliable—you want to be sure that the document was indeed received by the trading partner on the other side.
3. The transport must be secure—you want to know that you can encrypt the entire transmission process to protect sensitive data.

For our solution, we chose a transport that utilizes the HTTP protocol. HTTP is a standard protocol used by Internet browsers to retrieve information from Web servers. Most administrators of corporate firewalls feel comfortable with allowing transmissions based on HTTP to be sent outside the company. This is an important aspect of the process, and it involves choosing the right transport. Your Microsoft BizTalk Server needs to communicate with internal applications, databases, and legacy systems; therefore, it must be located within the firewall. At the same time, it may need to send and receive documents from an outside partner, preferably using a well-known protocol that can go through the firewall.

HTTP is reliable from a transport perspective because it defines a standard way for the receiving side to communicate the status of the transmission back to the sender. From a business process perspective, you want to be able to recover when temporary Internet glitches cause a transmission failure. BizTalk Server can monitor the transmission process, retry sending documents for a

pre-configured number of times, and alert an administrator if transmission was unsuccessful.

Finally, HTTP has a secure variation, HTTPS, which allows encryption of the entire transmission by using standard algorithms. HTTPS encrypts the entire communication stream with a trading partner, and it can be used in conjunction with encrypting and digitally signing the document to provide an extra level of security.

An alternative way of sending documents to business partners is to use the File transport to save a document into a file on a hard drive, and then use another process to pick up these files and deliver them to a partner with an EDI-VAN dialer or an FTP process.

## Receiving Documents over HTTP

Now let's look at what must be done on the receiving side in order to accept a document transmitted by BizTalk Server using HTTP and process it. For our scenario, we will assume that Contoso also uses BizTalk Server to receive POs and generate and send invoices.

Since BizTalk Server is running on Microsoft Windows 2000 Server, a platform that includes Internet Information Server (IIS) 5.0, Contoso can use a fairly simple Active Server Page (ASP) script to accept documents from Northwind's BizTalk Server and submit them for processing to BizTalk Server on Contoso's side.

Please note that in these lessons, we use a single instance of BizTalk Server to simulate processing on both Northwind and Contoso's sides. In the real world, these would be separate servers running at each respective company's sites.

After an ASP script receives the document, it must eventually send it back to BizTalk Server for further processing. While there are several options available to achieve this, we would like to emphasize the importance of designing a solution that can achieve this result in a fail-safe way. For example, if Contoso's servers are temporarily down for a scheduled maintenance or an upgrade, or if Contoso is experiencing an unusually high load on their servers, and the processing of POs cannot be done in real time, this should not affect Northwind's or any other trading partner's ability to submit PO documents. As a matter of fact, Northwind should be completely unaware of anything happening on Contoso's side and of technology being used, short of the fact that the PO can be transmitted successfully. Therefore, although BizTalk Server provides a standard way to accept documents using COM, it isn't the best approach in this particular example.

Let's look at a better way to architect this part of a solution. Once the ASP script receives the transmitted document, it should store it on some reliable medium, and then exit indicating that the document was successfully received. Meanwhile, BizTalk Server can retrieve the stored document and process it in a completely asynchronous manner. In [Lesson 2](#), we learned about File Receive functions in BizTalk Messaging Services and how to use them to monitor directories for files that have to be processed. So, in one possible scenario, our ASP script could simply store a document into a file to be picked up later by a File Receive function. Such architecture provides a lot of flexibility for us to decide when documents are to be processed by BizTalk Server, and to decide when to add more BizTalk Servers to process incoming documents, should business needs increase.

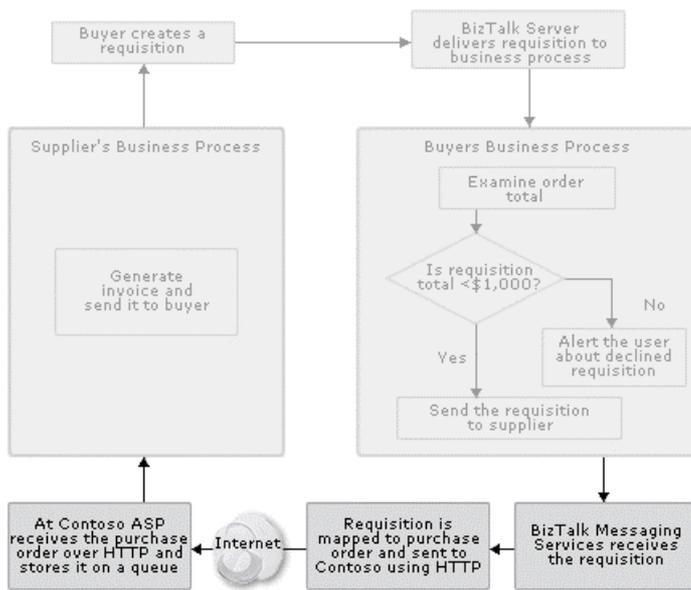
Now we would like to present an alternative way of achieving the same reliable results without storing documents in files and having the added benefit of being transactional.

## Using the Queue

Message Queuing (also known as MSMQ) is one of the standard components of Windows 2000 Server, and it provides a simple and reliable way to build an asynchronous solution just like the one we are designing.

After the document is received by an ASP script, instead of storing it into a file on a hard drive, we can post the document as a message on a message queue on the server, and then deliver it to BizTalk Messaging Services by using a Message Queuing Receive function, which works similarly to a File Receive function.

The overall process is presented in Figure 1.



**Figure 1. BizTalk Messaging Services transaction using ASP and MSMQ**

To create a new Message Queuing receive function, open BizTalk Server Administration, expand **BizTalk Server Group**, right-click **Receive Functions**, click **New**, and then click **Message Queuing Receive Function**. Provide a name for your function, then enter the queue name for the polling location, and click **Advanced** to enter a name of a channel that will process documents received by this function. You can look at the properties of the **ReceivePO** Message Queuing Receive function that was configured during setup. This receive function will process PO documents accepted by the ASP script discussed previously. This function has been temporarily suspended, so the documents will remain on the queue, which enables you to examine them. You can re-enable this function at the end of this lesson.

If you are using a private message queue to store documents, enter the queue name using the following format: `DIRECT=OS:\private$\<queue_name>`. If you are using a public queue, enter the queue name in the following format: `DIRECT=OS:<server_name>\<queue_name>`.

Now let's review the script inside the `ContosoReceive.asp` file to see the series of steps performed to accept the data transmitted by BizTalk Server, and to post it to a message queue. We begin by using a **BinaryRead** method of a **Request** object provided by ASP to read all of the transmitted data. Next, we utilize Microsoft Active Data Objects to transform the received data from binary format to text format. Finally, we use Message Queuing functions to create a new queue message and post it to a private queue that we chose.

You can see the entire source code inside the `ContosoReceive.asp` file located in `C:\LearnBizTalk\ASP\` directory.

## Testing the Scenario

Before testing our scenario, please locate the `L6Post.vbs` script file in the `C:\LearnBizTalk\Scripts\` directory and double-click to run it. This script will restore the configuration of the Port To Contoso messaging port that was modified earlier and instruct it to deliver documents to Contoso using HTTP transport, rather than writing it to a file as was done in [Lesson 5](#).

Now, copy the requisition file `ReqToApprove.xml` and paste it into a Pickup directory. The file will get processed by a File receive function, then passed from BizTalk Messaging Services to BizTalk Orchestration Services for approval, then delivered back to BizTalk Messaging Services, and finally transmitted to Contoso by using the HTTP protocol.

An ASP script simulating Contoso's side will read the transmitted data, convert it back into a document, and post the document to a local private queue.

Afterwards, a Message Queuing receive function should retrieve the document off the queue and submit it to BizTalk Messaging Services, however as you may recall we temporarily disabled this receive function so we can examine the document posted to the queue.

In order to see the messages on the queue, open the Administrative Tools application on your Windows 2000 computer and double-click the **Computer Management** icon. In **Computer Management**, expand **Services and Applications** and locate **Message Queuing**. Expand **Message Queuing**, expand **Private Queues**, and then expand **ContosoPOQueue**. When you click **Queue Messages** in the left pane, the right pane shows all the messages currently posted to the queue. You can right-click on the message in the right pane, click **Properties**, and then click the **Body** tab to see the beginning of the message body.

After you examine the message, delete it from the queue by right-clicking **Queue Messages** in the left pane, and then clicking **All Tasks** and **Purge**.

In the [next lesson](#), we will discuss the final steps of our scenario, such as processing the Purchase Order document by Contoso, generating the Invoice, and delivering it to Northwind.

# Learning BizTalk Server 2000: Lesson 7

Igor Leybovich and Scott Woodgate  
Microsoft Corporation

May 2001

**Summary:** The final installment in a series of 7 articles designed to show you how Microsoft BizTalk Server 2000 can help your business exchange a variety of documents with business partners, as well as integrate internal business processes and applications. In this lesson, you will learn how a supplier receives a PO sent by a buyer over the Internet, processes it using BizTalk Messaging Services and BizTalk Orchestration Services, generates the invoice, and sends it back. You will also see how the buyer receives the invoice and stores it, thus completing the buyer-supplier communications example. (7 printed pages)

## Note

You will need to install Microsoft® BizTalk™ Server 2000 in order to complete this lesson. Before you install Microsoft BizTalk Server, make sure you have read the Readme.htm and Installation Guide.htm documents, paying particular attention to the following important prerequisites:

- You must have a computer running Microsoft Windows® 2000 with Service Pack 1 or above (Professional or Server both work), including IIS and MSMQ services, and an account with administrative rights on that computer.
- You must have Microsoft SQL Server™ 7.0 with Service Pack 2 or above (you can install SQL Server Desktop Edition if you choose to run everything on a single workstation running Windows 2000 Professional) and password for the "sa" account. If you use SQL Server 2000, you must configure it for "mixed" security mode in the install wizards that is not the default.
- Microsoft Visio® 2000 SR1 Standard or above must be installed on the computer where you are installing BizTalk Server.
- In Internet Services Manager, turn off the **Enable authoring** option on the **Server Extensions** tab of the Default Web Site.

Also, in order to execute the scripts for these lessons, you need to install the MSMQ component of Windows 2000.

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[What's in the Queue](#)

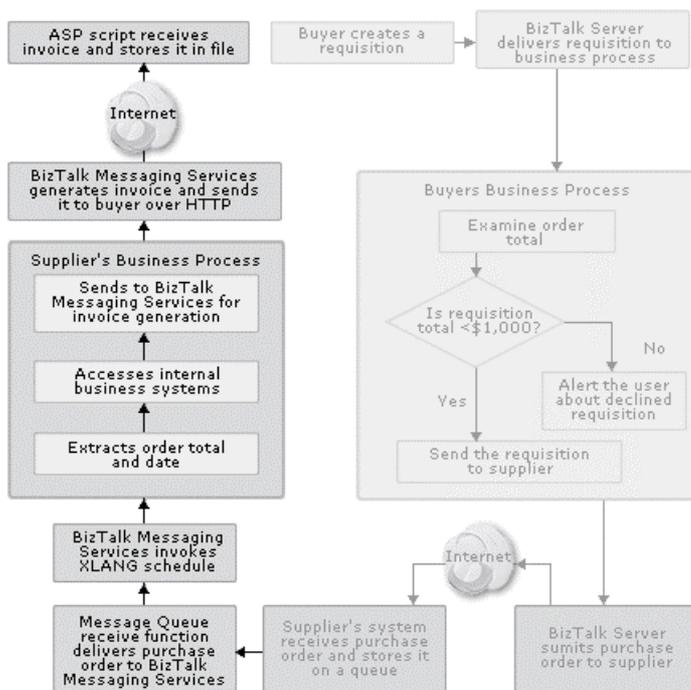
[Processing the Order](#)

[Closing the Loop](#)

## Introduction

In this lesson, we will learn how Contoso receives the PO sent by Northwind over the Internet, processes this order using BizTalk Messaging Services and BizTalk Orchestration Services, generates the invoice, and sends it back to Northwind. Finally, we will review how Northwind receives the invoice and stores it, thus completing our example of the buyer-supplier communications.

Figure 1 shows the remaining parts of the scenario.



**Figure 1. Buyer-supplier communications diagram**

Let's take a closer look at what happens in each individual step.

## What's in the Queue?

[Lesson 6](#) ended when a PO document received by an ASP script on Contoso's side was delivered to a message queue. We also learned about configuring a Message Queuing receive function, which monitors the message queue for any incoming messages and delivers them to BizTalk Orchestration Services. We chose to store incoming POs on a message queue, rather than storing them in files, because message queue offers an additional level of reliability by supporting transactions, a feature not found in a file system.

After the Message Queuing receive function takes the document off the queue, it submits the document to the channel, which in turn delivers it to the messaging port we created for Contoso's business process. This port is configured to transport the document to an XLANG schedule, indicating that it will start an XLANG schedule to run Contoso's business process in a manner similar to the Requisition document that was submitted to Northwind's XLANG schedule in [Lesson 4](#).

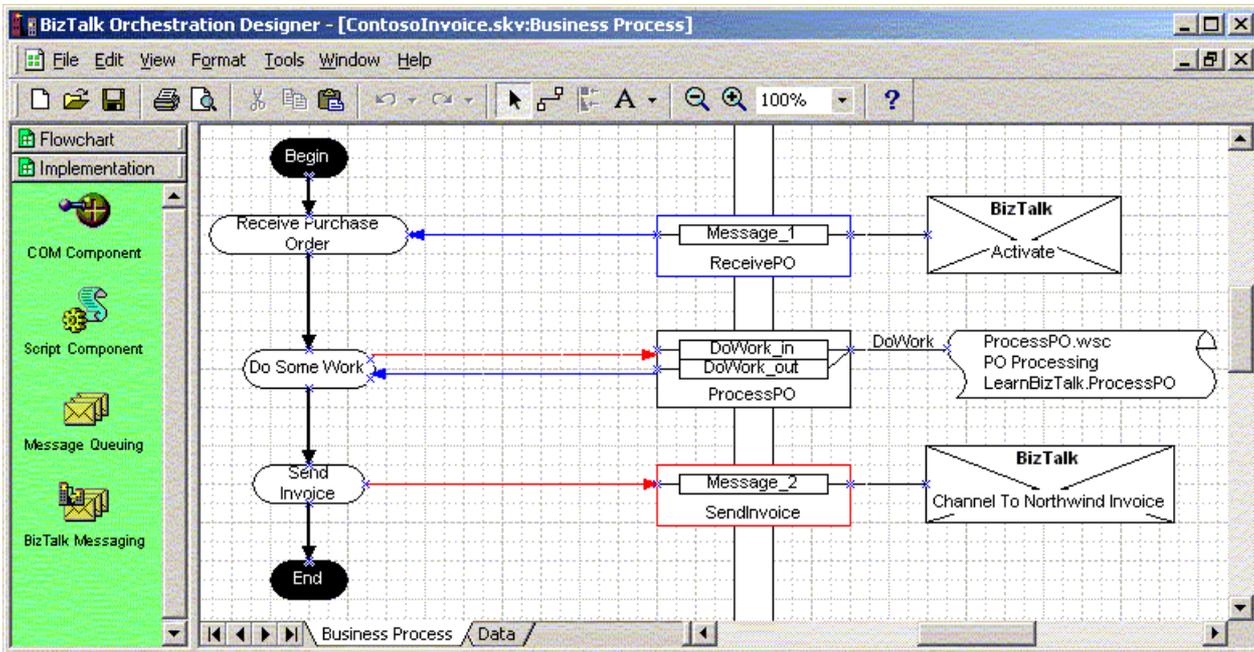
## Processing the Order

The actual work that has to be completed to process a real PO will of course vary from one company to the next. To simplify our scenario, we defined a single **Action** shape within Contoso's XLANG schedule drawing, which represented all of the actions that would be normally performed by a real-world supplier, such as checking inventory levels, communicating shipping instructions to the warehouse, and so on.

The implementation for the **Action** shape is a simple Script Component that displays a message box, which advises the user of a PO that is being processed. Here again, we used Script Component Wizard to assist us in the creation of this component.

Of course, in a production system, no message boxes should ever be displayed by any BizTalk Orchestration Services components, for the simple reason that there will not be a user currently logged on at the server to observe and acknowledge these messages. Until a user dismisses the message box, the schedule will not continue to run, potentially causing undesirable effects. A more appropriate means of communication is by sending e-mail messages, or by writing Windows Event Log entries that could in turn trigger other actions.

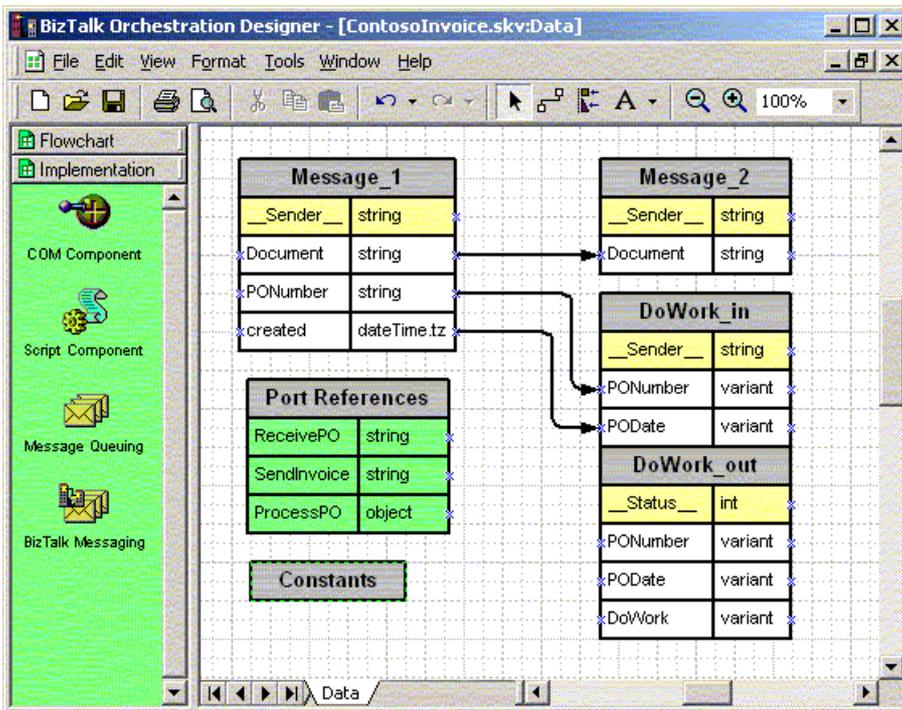
The BizTalk Orchestration process for Contoso is represented in Figure 2.



**Figure 2. Business process for Contoso in BizTalk Orchestration Designer**

Once again, in this XLANG schedule drawing, we utilized the XML Communication Wizard to extract individual values of fields, in this case *PONumber* and *Generated* fields, from the PO document and pass them to the Script Component as parameters without having to write any code. This is similar to the way we extracted the value of the *RequisitionTotal* field from the Requisition document in [Lesson 4](#).

On the **Data** page of the XLANG schedule drawing, we connected these fields to input parameters of the **DoWork** method of the Script component. As you can see in Figure 3, the entire PO is not passed to the component, just the two individual fields that we extracted.



**Figure 3. Fields from the PO document passed to Windows Script Component**

Finally, after the user clicks **OK** on the message box presented by the Script Component, the XLANG schedule sends the PO back to BizTalk Messaging Services, where it is transformed into an invoice by using another map, and then sent to Northwind by using the HTTP transport—the same transport Northwind used to send POs to Contoso.

Once an ASP script on Northwind's side receives the invoice document, it stores the invoice as a file for further processing. In a real-world scenario, such processing could include matching the invoice with the original requisition and PO, updating internal systems with invoice information, and so on.

## Closing the Loop

Congratulations! Over the course of these 7 lessons you have been involved in the creation of a fully functional, albeit simple, integration scenario between a buyer and a supplier. Let's test our final application.

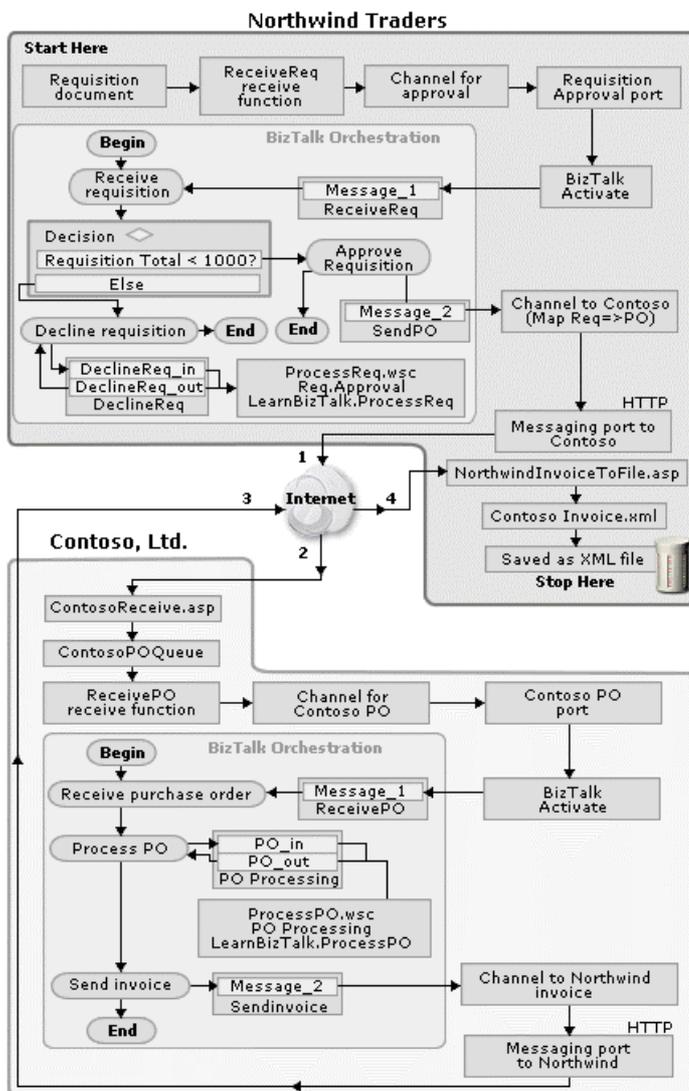
Before we begin, we must execute one last script, `L7Post.vbs`, located in `C:\LearnBizTalk\Scripts\` directory. This script will re-enable the Message Queuing receive function we temporarily suspended in [Lesson 6](#) so that we could see the messages posted to the queue.

Start by copying the requisition document, `ReqToApprove.xml`, from the `C:\LearnBizTalk\Documents` directory and, as we did earlier, pasting in into the `C:\LearnBizTalk\Pickup` directory.

Let's outline the complete flow for this scenario:

- The File Receive function at Northwind reads the file 'ReqToApprove.xml' that was placed in a Pickup directory and sends it to the Northwind's BizTalk Orchestration Services process by using BizTalk Messaging Services.
- The XLANG schedule extracts the value of the RequisitionTotal field, and because it is less than \$1,000, it approves the requisition by sending it back to BizTalk Messaging Services.
- BizTalk Messaging Services receives the requisition from BizTalk Orchestration Services and uses a map to create a PO document. This document is then transmitted to Contoso using the industry standard HTTP protocol.
- An ASP script on Contoso's side receives the transmission, extracts the document, and posts it as a message to a private message queue.
- A Message Queuing receive function finds a new document on the queue, retrieves it, and uses BizTalk Messaging Services to send it to BizTalk Orchestration Services for processing.
- The XLANG schedule extracts the values of *PONumber* and *Generated* fields and invokes a method on a Script Component, which simply alerts the user of the arrival of the PO by displaying a message box.
- The XLANG schedule sends the PO back to the BizTalk Messaging Services for invoice generation.
- BizTalk Messaging Services applies a map to turn the PO into an invoice and transmits it to Northwind by using the HTTP protocol.
- An ASP script at Northwind accepts the transmission, extracts the document and saves it as the file `C:\LearnBizTalk\Output\ContosoInvoice.xml`.
- This completes the process of integrating these two businesses.

Figure 4 represents the complete process by showing the two XLANG schedules, BizTalk Messaging Services, Receive Functions, ASP pages and queues and how they all interact:



**Figure 4. End-to-end buyer/supplier transaction process**

If you now open the C:\LearnBizTalk\Output directory, you will find a file named ContosoInvoice.xml containing the invoice that Northwind received from Contoso and stored in this file.

To undo the configuration changes made to your BizTalk Server installation by the scripts you ran during these lessons, execute Cleanup.vbs script located in C:\LearnBizTalk\Scripts\ directory. After the script completes, which will be indicated by a message box, you can safely remove the C:\LearnBizTalk directory and all the files it contains.

We hope these lessons have helped you better understand Microsoft BizTalk Server and shown you how BizTalk Server can significantly reduce the amount of work required to integrate businesses and business processes. You can learn more about the product on the Web at <http://www.microsoft.com/biztalk>, where you will find technical product information, white papers, training and events, and third-party offerings.

Also, use the BizTalk Server Tutorial found in the [BizTalk Server documentation](#). The tutorial works through a more complex scenario than the one we presented in these lessons, and is a useful next step.

# Legacy File Integration Using Microsoft BizTalk Server 2000

Microsoft Corporation

February 2001

**Summary:** This article discusses the integration of existing legacy systems using Microsoft BizTalk Server 2000. It is intended as an introduction to a range of concepts associated with BizTalk Server 2000 and is suitable for both technical and non-technical audiences who might be working with BizTalk Server for the first time.

Specifically, this paper provides an overview of the BizTalk Server tools that enable you to create the required components to interface to legacy systems. This includes a scenario with three phases that demonstrates integration by using industry-standard XML and EDI file formats as well as delimited and positional files. (28 printed pages)

Download [BTSLegacyFile.exe](#).

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## Introduction

A member of the Microsoft® .NET Enterprise Server family of products, Microsoft BizTalk™ Server 2000 unites, in a single product, enterprise application integration (EAI) and business-to-business integration. BizTalk Server 2000 enables developers, IT professionals, and business analysts to easily build dynamic business processes that span applications, platforms, and businesses over the Internet.

In addition to BizTalk Server 2000, Microsoft, with its industry partners, has led innovation on enabling technologies that are necessary for Internet-based business solutions, including BizTalk Framework 2.0, which is a platform-independent, Extensible Markup Language (XML) framework for application integration and electronic commerce. BizTalk Framework 2.0 provides the basis for interoperable reliable messaging for BizTalk Server 2000.

As well as these innovations, Microsoft recognizes there are many legacy systems in enterprises today that do not currently support XML. To provide a complete solution framework, BizTalk Server 2000 integrates with a wide range of file formats. This paper discusses the integration of existing legacy systems within EAI and business-to-business frameworks that use BizTalk Server 2000. It is intended as an introduction to a range of concepts associated with BizTalk Server 2000 and is useful to technical and non-technical audiences that might be working with BizTalk Server for the first time.

Specifically, this paper overviews the BizTalk Server concepts that provide you with the ability to create the required components to interface to legacy systems. This includes a scenario with three phases that demonstrates integration by using industry-standard XML and EDI file formats as well as delimited and positional files.

## Overview

It is generally acknowledged that organizations must embrace the global marketplace in order to expand the market for their goods and services. While embracing the global market expands the possible reach of an organization, it also introduces fundamentally new computing demands. It requires systems that run 24 hours a day, 365 days a year.

In addition to maintaining high availability, organizations need to reduce cycle times for every aspect of these systems. This enables them to reduce the time to market and achieve a higher level of service for both customers and partners.

In order for organizations to be able to act, react, and adapt at the speed that the modern economy requires, they need to be able to make decisions faster than they ever have before. They need to transform data into information and information into knowledge. They need to be able to share knowledge more effectively to assist in the identification of new business opportunities and to capitalize on opportunities when they are available.

Central to all of these changes is integration and interoperability between systems. The computing platform should enable you to use industry standards as well as organizational systems and skills to achieve the greatest gains both in time-to-market and efficiencies.

In order to minimize time-to-market, it is critical that organizations are able to use existing systems to reduce the time-to-market, regardless of the operating environment, programming model, or other constraints. In addition, to have a single, consistent infrastructure, the integration must enable organizations to integrate applications and processes internally as well as extend the integration to customers and business partners.

## Integrating Your Legacy System with the World

Most of the existing or legacy systems that are currently active in the corporate world are proprietary and utilize proprietary interfaces to expose themselves to the outside world. These take the form of either a document import facility or the exposure of an underlying data model through an application programming interface (API) or API equivalent. As a result, the integration of internal or external applications is an expensive exercise both in terms of initial development and ongoing maintenance.

Microsoft BizTalk Server provides the ability to expose these applications through an XML interface; therefore supporting both proprietary data formats as well as current and potentially future standards in XML.

Why is this important? BizTalk Server allows you to reuse existing files to take advantage of the investment you have made in current data formats that meet the specific needs of your business.

## BizTalk Editor: What Is It, How Does It Work, What Is the Purpose?

BizTalk Server defines the Extensible Markup Language (XML) representation of a document by using a graphical, simple-to-use tool. This tool, BizTalk Editor, enables you to create, edit, and manage specifications. A specification is a BizTalk Server-specific XML schema. It makes extensive use of XML, providing a common vocabulary to handle overlaps between syntactic, database, and conceptual data schemas.

Specifications represent the structured data as XML, regardless of the original format, and are a core component of integrating existing and legacy file formats into BizTalk Server.

Each specification describes the structure of the file, given a specific set of tags. BizTalk Editor also provides several templates that can be used as starting points for creating specifications for common documents, such as purchase orders, invoices, and advance shipping notices.

To assist in integrating formats, such as various flat files, BizTalk Editor enables the specification of the basic parsing rules for interpreting or producing file formats other than XML.

## How to Use Existing Data Sources

With the range of legacy systems currently available and the industry tendency to redefine terms on a regular basis, the following explains the basic terms and concepts used in the sample scenarios. Specifically, this section explains positional and delimited files, as well as the function of parsers, serializers, receive functions, and envelopes.

## What Are Positional and Delimited Files?

A delimited flat file contains one or more records separated by a record delimiter. A delimited record contains one or more fields separated by a common field delimiter. The following are examples of delimited files with delimited records.

### Example 1

```
DATE,PRODUCT,PRICE
DATE,PRODUCT,PRICE
```

### Example 2

```
DATE,PRODUCT,PRICE* DATE,PRODUCT,PRICE*
```

In Example 1, the delimiters are a comma (,) for separating the fields and a carriage return (<CR>) for distinguishing the end of records. In Example 2, the delimiters are a comma (,) for separating the fields and an asterisk (\*) for distinguishing the end of records.

When creating specifications within BizTalk Editor, remember that BizTalk Server does not read delimiters as part of the data when processing the files.

A delimited file can have positional records within it. A positional flat file consists of fields that are the same length and records that have a common end-of-record terminator.

The following is an example of a positional format:

The date field is fixed at a length of six characters, while the product code and price are fixed at a length of seven and six characters, respectively. In this example the end-of-record marker or delimiter is an asterisk (\*).

When using BizTalk Server, it is important to note that a positional record must always be a child of a delimited record. The delimiter character specified for the parent-delimited record must not appear in the data of the child positional record.

It is worth noting that files can consist of a combination of delimited and positional records.

## Envelopes

A BizTalk Server envelope consists of two key pieces of information:

- The type of envelope, which should match the envelope format for flat file, custom XML, X12, EDIFACT, or reliable document types.
- The optional envelope specification.

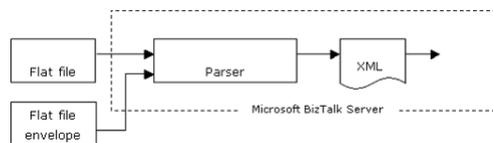
Envelopes fall into two main categories or types:

- Input document envelopes are required if the input document type is flat file because the envelope contains information about how to parse the document into XML and which parser should process the document. For additional information, see the previous section on flat files.
- Output document envelopes are used to wrap an output document that has been transformed into the native format. The envelope used with an output document is specified in the port configuration. An envelope is always required if the output document is in an X12 or EDIFACT format. For documents that are output in a custom XML format, the reference specification is used to assist with the serializing process.

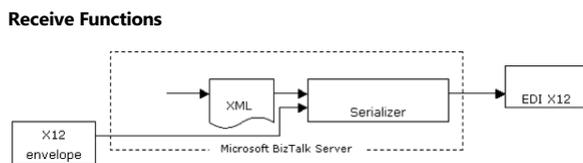
Envelopes are used in conjunction with parsers (input) to take input files into XML or serializers (output) to take XML intermediate files into the output format.

## Parsers and Serializers

Parsers and serializers are the key tools for facilitating integration into legacy file formats. Parsers are a component of BizTalk Server that processes files from a non-XML-based format such as X12, EDIFACT, or delimited flat file into a valid specification based on a set of predefined parameters. The following illustration shows a flat file being sent to BizTalk Server. The file is parsed into XML by the flat file parser with the help of the file envelope.



Serializers are a component of BizTalk Server that processes files from specifications or XML formats into non-XML-based file formats such as flat file, X12, and EDIFACT based on a set of rules or parameters. The following illustration shows BizTalk Server generating an X12 format file.



Receive functions are a component of BizTalk Server that enables any server to collect messages from external sources such as the file system or Microsoft Message Queuing. The File and Message Queuing receive functions use an event model rather than a polling model to collect messages.

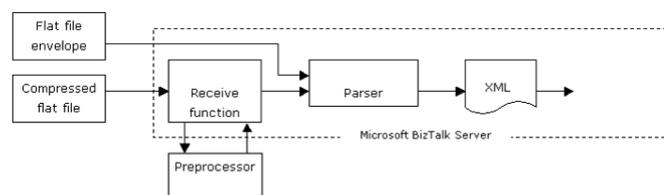
- A File receive function is activated when a file is created in a specified directory. If this file matches the required criteria, it is consumed by the receive function and submitted to BizTalk Server.
- A Message Queuing receive function is activated when a message arrives on the designated message queue. Like the File receive function, the message, if it matches the required criteria, is consumed by the receive function and submitted to BizTalk Server.

Receive functions provide an excellent, GUI based approach to integrate external systems, especially those from legacy systems, into BizTalk Server.

To extend the functionality of a receive function and to provide more flexibility when using legacy files, additional message processing can be conducted prior to the message being submitted to BizTalk Messaging. BizTalk Server provides interfaces that enable you to create custom preprocessing components.

A simple example of preprocessor use would be the conversion of a file that has been compressed for transmission from a proprietary format back into standard ASCII prior to submission to BizTalk Messaging.

## Application Integration Components



An application integration component (AIC) provides a method for creating a programmatic integration point to a legacy line-of-business application. The integration point is tightly coupled, meaning that the structure and logic of the integration component are often closely aligned with a particular application and application version.

Each AIC is a component (COM object) that BizTalk Server calls to deliver data to an application.

At a summary level, an AIC provides two different methods for achieving a tightly coupled integration into the designated line-of-business applications:

- The pipeline AIC. This will be familiar to any users of Microsoft Site Server Commerce Edition or Microsoft Commerce Server. It effectively allows the utilization of the Commerce Server pipeline components.
- The lightweight AIC. This is provided for developers who want a lightweight model for application integration. It does not support design-time user interface or configuration properties and requires a single interface that contains a single method as an entry point. The component is implemented, and the document is passed to it.

Note that if a messaging port is configured in BizTalk Server to include the use of an AIC, then the messaging port simply functions as a new transport protocol with the component being automatically instantiated and passed the requisite data.

## Scenario Overview

After extensive discussions, the Chief Technical Officer of Northwind Traders, Limited, has decided to introduce a message-based architecture enabling the company to decouple its applications and achieve a range of projected benefits, including loosely coupled integration with suppliers and partners.

Projected benefits from the new message-based environment include the ability to replace systems, or to adopt new best-of-breed solutions, with minimum impact on the existing installed technology. This change in architecture is expected to reduce ongoing system maintenance costs and total commitment to expenditure.

In addition, the specific financial benefits of the new direction will allow the company to take advantage of the investment it has made in current data formats that have been created to meet the specific needs of the business.

Northwind Traders currently has the following installed and operational line-of-business systems:

- Northwind Traders has maintained a mainframe-based manufacturing system that handles specific activities, including stock management, bill of materials, and just-in-time ordering activities. Although this system is being phased out and its functions replaced by the new Enterprise Resource Planning (ERP) system, it is expected to remain in place for the next two years.
- As part of the drive to reduce cost and introduce a range of enterprise-wide management efficiencies, the organization has commenced implementation of an ERP system that has already taken over key financial activities. Although the next, and future, versions will support many of the emerging XML-based industry standards, the current version has been on the market for two years and provides integration points through a proprietary flat-file format.
- In line with the improved management information, Northwind Traders recognizes its customers as its key asset and has recently implemented a Customer Relationship Management (CRM) system. This system, deployed on Microsoft SQL Server 2000, uses many of the new database features, allowing it to support XML natively even though it does not adopt a specific industry standard.

The project team determined that this was to be done in three phases:

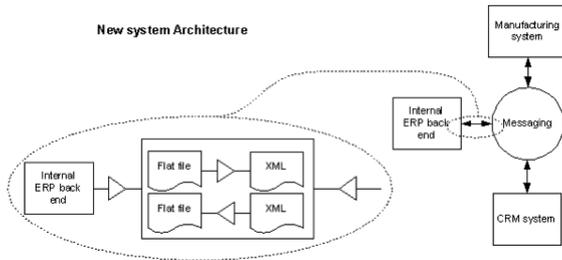
- Internal application integration
- Customer integration
- Supplier integration

The following sections detail the integration requirements to achieve these three phases and integrate various data and file formats into the legacy system.

### Internal Application Integration

As part of adopting the message-based architecture, the project team selected XML as the standard for integration of applications. Whenever possible, they adopted an industry-standard message format rather than creating their own. This enables the mapping of data between proprietary formats, including EDI, flat files, and custom XML, to a common XML format. The long-term goal is that as the available software matures and adopts emerging XML standards, Northwind Traders will be able to integrate new systems simply by passing them existing XML messages without the need for specialized integration efforts.

The following illustration is a high-level representation of the new system architecture for Northwind Traders.



### Application Integration Overview

Northwind Traders needed to create specifications for each of the data formats in the system. Initially both the ERP and the CRM system will integrate customer information and will produce a customer-details update message. Remembering that the selected architecture requires all messages to be translated into an industry-standard format, the following XML has been defined as the standard message type (*A2A\_CustomerUpdateMessage.xml*). This message is created through BizTalk Editor.

```
<CustomerUpdates>
  <CustomerUpdate @CustomerCode>
    <AddressDetails @Type @AddressLine1 @AddressLine2 @PostalCode @State @Country>
  </AddressDetails>
  <Contacts @FirstName @SecondName @Salutation @Email>
  </Contacts>
  <ArchiveDetails @UserID @Date @Time @Comment>
  </ArchiveDetails>
  </CustomerUpdate>
</CustomerUpdates>
```

This will require that both the ERP system and the CRM system have their messages translated into the standard format for distribution to the other systems. The following sample message (*CustomerUpdateTransaction.XML*) will be used in the system:

```
<CustomerUpdates>
  <CustomerUpdate CustomerCode="CC099">
    <AddressDetails Type="Delivery" AddressLine1="BizTalk Plaza"
AddressLine2="26 Building Terrace" PostalCode="10087" State="NS"
Country="United Land Colony">
  </AddressDetails>
    <Contacts FirstName="Mike" SecondName="Nash" Salutation="Capt"
E-mail="someone@microsoft.com">
  </Contacts>
    <ArchiveDetails UserID="GRAYT" Date="11/10/2001" Time="1:15AM"
Comment="Change of address">
  </ArchiveDetails>
  </CustomerUpdate>
</CustomerUpdates>
```

Now that a standard format for the customer update has been selected, the required specifications need to be built.

### ERP System Integration

First we will examine the document specifications and the envelopes for the ERP system.

#### Customer Update Specifications and Envelopes

The internal ERP system requires files in the following delimited flat-file format using record identifiers to differentiate the content:

```
1, CustomerCode,AddressType,Street,StreetAddress,DateUpdated,UpdatedBy
2, CustomerCode,FirstName,Surname,Phone,Email,DateUpdated,UpdatedBy
```

The ERP system is able to import this into a standard format for processing as a batch.

Information received in the standard message format is translated by the BizTalk Mapper tool. BizTalk Mapper requires two specifications to facilitate the translation of the data into the legacy format. The starting format is the standard XML message (*A2A\_CustomerUpdateMessage.xml*), while the legacy format is represented by the specification (*A2A\_ERPCustomerUpdateFile.XML*). The parsing information to allow BizTalk Messaging to both serialize the XML file into flat files and to parse flat files and create the matching XML document is in the specification, and the envelope type instructs BizTalk Server to serialize to a flat file specifically.

Once the specification has been created, the parsing information can be created to allow BizTalk Server to process the flat files into and out of the system. Important settings that are specified within BizTalk Editor are reviewed in the following tables.

Note that in some instances the default BizTalk Server setting has been selected specifically to highlight it. Most parameters within the specifications and envelopes have a default setting that is utilized when the user does not explicitly select an option. A comprehensive list of these can be found in the Microsoft BizTalk Server 2000 online Help.

Specification	Editor tab	Property	Comment
Root node	Reference	Standard	This is set to Custom.
		Default Record Delimiter	The default record delimiter is set to CR (carriage return) or (0xd) hex and is used on the <b>Parse</b> tab in the specification.
		Default Field Delimiter	The default field delimiter is set to a comma or (0x2c) hex and is used on the <b>Parse</b> tab in the specification.
		Envelope	This is set to YES to specify that the specification is an envelope.
	Parse	Structure	The structure for the file is delimited. This is how BizTalk Server is able to recognize or create the records within the file. This specifically describes the AddressDetails and Contacts record types.
		Field Order	The field order is PostFix, indicating that the record delimiters appear at the end of each record. N.B. PreFix, indicating that the record delimiters appear before the record is the default, so you often need to change this setting when you are working flat files (such as .CSV).
		Delimiter Type	The default record delimiter is selected because this has already been set. The CR (carriage return) delimiter allows BizTalk Server to determine at which point the record finishes and to validate that the data returned represents a valid record according to the specification.
		Append Newline	This value is set to Yes. The output file required a record delimiter similar to that of a text file. This delimiter is a CRLF (carriage return line feed). By selecting to append a new line, BizTalk Server automatically adds an LF (line feed) to the end of each record during serialization from the XML document to the flat file.
		Skip Carriage Return	This value is set to No. Because files sometimes have superfluous CR and LF characters to make the file readable, BizTalk Server enables you to automatically skip these when parsing the file. In this instance the default record delimiter is CR, which specifies to process this character.
		Skip Line Feed	This value is set to Yes. In this instance the default record delimiter is CR, and the additional LF during the parsing process can be skipped.
<b>AddressDetails</b>	<b>Reference</b>	<b>Maximum Occurrences</b>	<b>This value is set to * because this record type can appear multiple times.</b>
	Parse	Structure	The structure for the AddressDetails records will be Delimited.
		Source Tag Identifier	This value is set to 1. The record identifier for address details is the record type.
		Field Order	The field order is InFix, indicating that the field delimiters within this record are between the fields.
		Delimiter Type	The default field delimiter is selected because this has already been set to a comma. This enables BizTalk Server to determine where the data starts and ends and to validate that the data returned represents a valid record according to the specification.
AddressDetails/ StreetAddress1	Parse	Wrap Character	This value is set to quotation marks or (0x22) hex. This allows the field to be output and to include characters such as commas that have been specified as field delimiters.
AddressDetails/ StreetAddress2	Parse	Wrap Character	This value is set to quotation marks or (0x22) hex. This allows the field to be output and to include characters such as commas that have been specified as field delimiters.
<b>Contacts</b>	<b>Reference</b>	<b>Maximum Occurrences</b>	<b>This value is set to * because this record type can appear multiple times.</b>
	Parse	Structure	The structure for the Contacts records will be Delimited.
		Source Tag Identifier	This value is set to 2. The record identifier for address details is the record type.
		Field Order	The field order is InFix, indicating that the field delimiters within this record are between the fields.
		Delimiter Type	The default field delimiter is selected because this has already been set to a comma. This enables BizTalk Server to determine where the data starts and ends and to validate that the data returned represents a valid record according to the specification.

### Important Concepts

One of the important features provided by BizTalk Editor when processing and generating legacy files is the wrap character. The wrap character enables the author to enclose field data and is of specific relevance when dealing with delimited files. In some instances the data itself contains the delimiter character. For example, a street address might be represented as:

1st Floor, 25 Test Street., Manchester

In a comma-delimited file, this causes the single data field to be interpreted as two distinct fields. By utilizing the wrap character, a given data field can be isolated regardless of its content. Therefore, our previous example would become:

"1st Floor, 25 Test Street.",Manchester

The comma between the double quotation marks is interpreted by BizTalk Editor to be field data rather than a delimiter value.

### Testing Your Specification

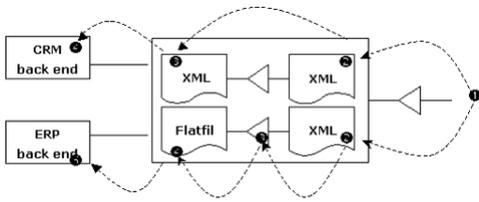
Once created, the specification can be validated against the sample file. This enables you to ensure that the specification can parse the data output from the ERP system and serialize data into a format for processing by the ERP system. The ERPCustomerUpdateBatch.dat file is a batch file from the ERP system. Use BizTalk Editor to load the new specification and use the **Validate Instance** option from the **Tools** menu to ensure that the parsing rules entered match the flat file. The sample file is found in the C:\Whitepaper samples\Sample Data directory.

### Updating BizTalk Server

Once the specifications and envelopes have been created, they must be registered within BizTalk Server, and the relevant ports, channels, and applications must be created. Note: If you have run the installation script then you have already completed this step. The definition of ports, channels, organizations, and applications is covered in detail in the Microsoft BizTalk Server 2000 online Help, and is dealt with specifically in the online tutorial.

Type	Format	Name	Comment
Envelope	FLATFILE	ERPCustomerUpdateEnvelope	The format tells BizTalk Server what parser to use when serializing or parsing the file.
Specification	-	ERP Customer Update File	This is the specification describing the XML incarnation of the final file format. It uses the document specification A2A_ERPCustomerUpdateFile.
Specification	-	Customer Update Message	This is the specification describing the XML file holding the updates to be processed.
Application	-	MessagingSystem	Because all messages are being handled by a central system, this has been entered into BizTalk Server as an application in its own right.
Port	-	Backoffice ERP System	This outputs a file for processing by the ERP system.
Channel	-	ERP Customer Update	This transforms the standard message to the XML representation of the data required by the ERP system and delivers it to the port.
Port	-	Backoffice CRM System	This outputs a file for processing by the CRM system.
Channel	-	CRM Customer Update	This transports the standard XML message to the port.

### System Processing Overview



1. The required message arrives from the messaging system, \Whitepaper Sample\A2A Processing\. Once collected by the receive function, CustomerUpdateProcessing, it is delivered into the channel. Because two channels are specified to receive this document format, BizTalk Server sends a copy to both channels, ERP Customer Update and CRM Customer Update.
2. Once in the channel, the document is matched and validated against the standard customer update specification.
3. ERP channel. A map transforms the standard format message into a format specifically for the ERP system before delivering it to the Port to Backoffice ERP System port. CRM channel. The XML file is validated against the output specification before being delivered to the Port to Backoffice CRM System port.
4. ERP channel. The designated envelope, ERPCustomerUpdateEnvelope, transforms the XML message into a flat file following all the rules and parameters contained in the envelope. CRM channel. The XML file is output directly to the file system.
5. Once complete, the file, now containing the new format, is delivered to the file system.

### Testing the Scenario

To test this scenario, install the article sample system using the instructions included in the appendix. Once set up, the process is activated by dropping a copy of CustomerUpdateMessage.xml from the \Whitepaper Sample\Sample Data\ directory into the \Whitepaper Sample\A2A Processing\ directory. Once the process completes, update the following directories as follows:

.\Whitepaper Sample\A2A Processing\	Should no longer have the sample file.
.\Whitepaper Sample\A2A Processing\CRM System\	Should now contain an additional .xml file.
.\Whitepaper Sample\A2A Processing\ERP System\	Should now contain an additional .dat file.

### Integrating Customers with EDI and Flat Files

After successfully completing the enterprise application integration, Northwind Traders proceeded to phase two, customer integration. Northwind Traders believed that two key business imperatives can be achieved by direct integration with its customers. These are:

- Maintaining its position as an organization that is responsive to customer requests.
- Reducing the cost per transaction, which is a key metric in the business-to-business environment, in order to gain additional competitive advantage.

After analysis of the key transactions processed, purchase orders were identified as a transaction that is processed in significant numbers with a considerable number of keying errors. By introducing purchase orders into the company as an STP (Straight Through Processing) transaction, they will be able to eliminate re-keying errors, increase the number of transactions processed, and improve the rate of responsiveness to customer queries. This required provision for the following scenarios:

- EDI support for purchase orders supplied in an X12 4010 850 format.
- Support for a delimited format.

While the ideal scenario is to utilize XML for the point-to-point integration with customers, the customers are heavily dependent on legacy technology, specifically electronic data interchange (EDI) and proprietary flat-file formats. By utilizing standard features in BizTalk Server, including support for EDI and XML, auditing, tracking, and encryption, Northwind Traders is able to implement its business-to-business integration in a timely manner.

### EDI Integration

The following section contains an overview of the key aspects of EDI only. EDI is the subject of another article and should be referred to for a more detailed review of the topic.

To enable the integration of EDI purchase orders, Northwind Traders utilized the standard specifications provided by BizTalk Server. This included the following specifications found in the templates directory of BizTalk Server:

- EDI - X12 4010 870 specification for purchasing
- EDI - X12 4010 997 specification for receipts
- XML - Common purchase order
- XML - Canonical receipt

When setting up EDI specifications, in this instance specifically X12, it is important to include the document selection criteria. Selection criteria are a unique set of name-value pairs that BizTalk Server uses when processing EDI documents. In the instance of X12 documents, the server uses selection criteria to uniquely identify and select a document definition because no document definition name is available within individual EDI documents.

The specification for the standard X12 4010 documents has not been included in this paper due to the document size; the specification is, however, available in the accompanying sample and in any default BizTalk Server installation.

When working with EDI X12 standards, make sure that you provide information that enables BizTalk Server to identify the documents correctly. In this instance the following settings are required to enable BizTalk Server to correctly select and process the X12 document. These settings represent the document's property set and are entered on the **Selection Criteria** tab during document creation within BizTalk Messaging. An example of the correct selection criteria can be found in the X12 specification, X12 850 Purchase Order, included in the samples.

- functional\_identifier* Equates to field GS01; should be a two-character field
- application\_receiver\_code* Equates to field GS03; should be a code 2 to 15 characters long
- application\_sender\_code* Equates to field GS02; should be a code 2 to 15 characters long
- standards version* Equates to field GS08; should be a number

### Updating BizTalk Server

The specifications and envelopes must be registered within BizTalk Server and the relevant ports, channels, and applications created. Note: If you have run the installation script then you have already completed this step.

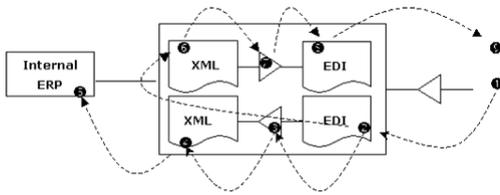
Type	Format	Name	Comment
Envelope	X12	X12	The format tells BizTalk Server what parser to use when parsing the file. No specification is required.
Specification	X12 4010	X12 850 Purchase Order	This is the specification describing the EDI format of the purchasing file.
Specification	X12 4010	X12 997 Acknowledgement/Receipt	This is the specification describing the EDI format of the receipt to be sent to the customer.
Specification	XML	Common Purchase Order	This is the specification describing the common purchase order and its associated XML structure.
Specification	XML	Receipt	This is the specification describing the canonical receipt and its associated XML structure.
Port	-	Incoming Purchase Orders	This outputs a file into the inbound directory for the company.
Channel	-	Incoming X12-850 Purchase Order	This transforms the EDI standard message to the XML representation of the data required by the system and delivers it to the port.

### Testing the Scenario

To test the process drop a copy of PurchaseOrder.edi from the \Whitepaper Sample\Customer A\Sample Data\ directory into the \Whitepaper Sample\Customer A\Documents Out\ directory. Once the process is completed, update the following directories as follows:

.\Whitepaper Sample\Customer A\Documents Out\	Should no longer have the sample file.
.\Whitepaper Sample\Customer A\Documents In\	Should now contain an additional .edi file.
.\Whitepaper Sample\Documents In\	Should now contain an additional .xml file.

### System Processing Overview



1. The required message arrives from the customer in an EDI format and is collected by the receive function, Receive Purchase Order.
2. BizTalk Server uses its EDI parser to process the document into XML and pass it into the channel, where it is validated against the required specification. In addition, it generates a receipt to acknowledge the successful arrival of the customer's purchase order. Receipt generation functionality is provided by BizTalk Server when dealing with EDI documents and is covered in more detail in the EDI article.
3. The map reformats the message from the EDI style to the common purchase order format.
4. The channel outputs the purchase order to the port.
5. The port delivers the message to the file system.
6. BizTalk Server delivers a canonical receipt to the designated receipt channel.
7. The receipt channel maps the canonical receipt to the required X12 4010 997 receipt format.
8. The receipt channel validates the message against the output specification and delivers the message to the port.
9. The X12 formatted receipt is delivered onto the file system.

## Flat File Integration

Some customers, using a popular industry-specific legacy system, deliver purchase order files in a positional format.

The parsing function translates the information received from the customer. The specification for the inbound message and therefore the parser is found in FixedLengthPurchaseOrder.xml.

Once the specification has been created, the parsing information can be created to allow BizTalk Server to process the flat files into and out of the system. Important settings that are specified within BizTalk Editor are shown in the following tables.

Specification	Editor tab	Property	Comment
Root Node	Reference	Standard	This is set to Custom.
		Default Record Delimiter	The default record delimiter is set to CR or (0xd) hex and is used on the <b>Parse</b> tab in the specification.
	Parse	Structure	The structure for the file will be both delimited and positional. This is the root node and describes the records within it. The records are positional, but each record is separated from the others by a CR (carriage return).
		Field Order	The field order is PostFix, indicating that the record delimiters will appear at the end of each record.
		Delimiter Type	The default record delimiter is selected since this has already been set. The CR (carriage return) delimiter allows BizTalk Server to determine at which point the record finishes and to validate that the data returned represents a valid record according to the specification.
		Skip Carriage Return	This value is set to No. Because files sometimes have superfluous CR and LF characters to make the file readable, BizTalk Server allows you to automatically skip these when parsing the file. In this instance the default record delimiter is CR and is specified to be processed.
		Skip Line Feed	This value is set to Yes. In this instance the default record delimiter is CR, and the additional LF can be skipped during the parsing process.

Header	Reference	Maximum Occurrences	This value is set to 1, indicating that only a single header line can appear.
	Parse	Structure	The structure for the header records will be Positional
		Source Tag Identifier	The value is H, indicating that the record is identified from all the others by the constant value H.
		Source Tag Position	This value is 1, indicating that the first position in the file is where the Source Tag Identifier will appear.
Header/OrderDate	Reference	Required	This value is set to Yes, indicating that the data field is required.
		Start Position	The value is 2, indicating that the field starts at position 2.
		End Position	The value is 20, indicating that the field ends at position 20.
Header/OrderNum	Reference	Required	This value is set to Yes, indicating that the data field is required.
		Start Position	The value is 10, indicating that the field starts at position 10.
		End Position	The value is 20, indicating that the field ends at position 20.

Detail	Reference	Maximum Occurrences	This value is set to *, indicating that any number of DETAIL lines can occur.
	Parse	Structure	The structure for the Detail records will be Positional.
		Source Tag Identifier	The value is D, indicating that the record is identified from all the others by the constant value D.
		Source Tag Position	The value is 1, indicating that the first position in the file is where the Source Tag Identifier will appear.
Detail/Product Code	Reference	Required	This value is set to Yes, indicating that the data field is required.
		Start Position	The value is 2, indicating that the field starts at position 2.
		End Position	The value is 11, indicating that the field ends at position 11.

Detail/Qty	Reference	Required	This value is set to Yes, indicating that the data field is required.
		Start Position	The value is 12, indicating that the field starts at position 12.
		End Position	The value is 16, indicating that the field ends at position 16.
Detail/Value	Reference	Required	This value is set to Yes, indicating that the data field is required.
		Start Position	The value is 17, indicating that the field starts at position 17.
		End Position	The value is 25, indicating that the field ends at position 25. By default the field is left-justified and padded with spaces so no additional information can be specified.

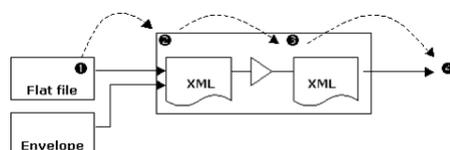
Once created, the specification can be validated against the sample file. This enables you to ensure that the specification can parse the data provided by the customer and convert it to XML that can be utilized by the messaging system that Northwind Traders is implementing. The FlatFilePurchaseOrder.dat file is a sample file from the customer and can be found in the C:\Whitepaper Samples\CustomerB\Sample Data\ directory. Use BizTalk Editor to load the new specification and use the **Validate Instance** option from the **Tools** menu to ensure that the parsing rules entered match the flat file.

## Updating BizTalk Server

Once the specifications and envelopes have been created, they must be registered within BizTalk Server and the relevant ports, channels, and applications created. Note: If you have run the installation script then you have already completed this step.

Type	Format	Name	Comment
Envelope	FLATFILE	CustomerTypeB	The format tells BizTalk Server what parser to use when serializing or parsing the file
Specification	XML	Fixed Length Purchase Order	This is the specification describing the XML incarnation of the file format. It uses the FixedLengthPurchaseOrder.xml specification.
Port	-	Incoming Purchase Orders	Outputs a file into the Documents In directory for processing.
Channel	-	Fixed Length Purchase Order	Transforms the standard message to the XML representation of the data required by the ERP system and delivers it to the port.

## System Processing Overview



1. The required message arrives from the customer site, \\Whitepaper Sample\Customer B\Documents Out\, and is delivered into the channel, Fixed Length Purchase Order, by the receive function, Receive Order From Customer B.

- Once in the channel, the document is parsed from its flat file format and converted to an XML format that matches the inbound specification. The parser uses the properties entered on the **Parse** tab within BizTalk Editor as the basic parsing parameters.
- The document is validated against the outbound XML specification and delivered to the port.
- Once complete, the file, now containing the new format, is delivered onto the file system.

### Testing the Scenario

To test this scenario drop a copy of FlatFilePurchaseOrder.dat from the .\Whitepaper Sample\Customer B\Sample Data\ directory into the .\Whitepaper Sample\Customer B\Documents Out\ directory. Once the process completes, update the following directories as follows.

.\Whitepaper Sample\Customer B\Documents Out\	Should no longer have the sample file.
.\Whitepaper Sample\Documents In\	Should now contain an additional .xml file.

### Integrating Suppliers with Flat Files

Northwind Traders deals with three main suppliers who use the same popular mainframe-based legacy system. For this reason, queries on stock availability are distributed into and out of the system in positional formats, similar to traditional COBOL copybooks.

The serializing function of BizTalk Server translates information into a format to be sent to the supplier. The specification for the outbound document and therefore the serializer is found in FixedLengthStockQuery.xml.

Once the specification has been created, the serializing information can be created to enable BizTalk Server to process the XML files into the required flat file format. Important settings that are specified within BizTalk Editor are shown in the following tables.

Specification	Editor Tab	Property	Comment
Root Node	Reference	Standard	This is set to Custom.
	Parse	Structure	The structure for the file is Positional.
Header	Reference	Minimum Occurrences	This value is set to 1, indicating that only a single header line can appear.
	Reference	Maximum Occurrences	This value is set to 1, indicating that only a single header line can appear.
	Parse	Structure	The structure for the header records will be Positional.

ProductCode	Reference	Required	This value is set to Yes, indicating that the data field is required.
		Start Position	The value is 1.
		End Position	The value is 11.
Qty	Reference	Required	This value is set to Yes, indicating that the data field is required.
		Start Position	The value is 12.
		End Position	The value is 16.
Package	Reference	Required	This value is set to Yes, indicating that the data field is required.
		Start Position	The value is 17.
		End Position	The value is 25.
		Declaration	Data Type Value

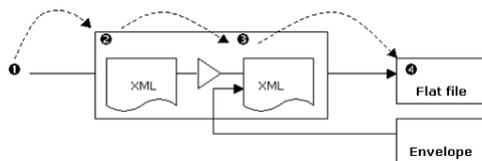
Once created, the specification can be validated against the sample file. This enables you to ensure that the specification can parse the data provided by the customer and convert it to XML that can be utilized by the messaging system that Northwind Traders is implementing. The FlatFileStockQuery.dat file is a sample file for the supplier. Use BizTalk Editor to load the new specification and use the **Validate Instance** option on the **Tools** menu to ensure that the parsing rules entered match the flat file.

### Updating BizTalk Server

Once the specifications and envelopes have been created, they must be registered within BizTalk Server and the relevant ports, channels, and applications created.

Type	Format	Name	Comment
Envelope	FLATFILE	FlatFileSupplier	The format tells BizTalk Server what serializer to use when serializing the file.
Specification	XML	Flat File Stock Query	This is the specification that describes the XML message and that also holds the rules for creating the flat file. It uses the specification FixedLengthStockQuery.xml.
Port	-	Outbound Stock Queries	This outputs a file into the Documents In directory for processing.
Channel	-	Stock Queries	This transfers the initial XML query to the port.

### System Processing Overview



- The required stock query message arrives from an internal application. This message comes from the customer site, .\Whitepaper Sample\ Documents Out\, and is delivered into the channel, Stock Queries, by the receive function, Request Stock Availability.
- Once in the channel, the document is validated against the inbound document specification.
- The document is validated against the outbound XML specification and delivered to the port.
- The outbound message is then processed by the serializer. Using the parameters entered on the **Parse** tab of BizTalk Editor and the envelope (FlatFileSupplier), the message is formatted as a flat file and delivered to the file system.

### Testing the Scenario

To test this scenario drop a copy of StockQuery.xml from the .\Whitepaper Sample\Sample Data\ directory into the .\Whitepaper Sample\ Documents Out\ directory. Once the process completes, update the directories as follows:

.\Whitepaper Sample\ Documents Out\	Should no longer have the sample file.
.\Whitepaper Sample\Supplier A\Documents In\	Should now contain an additional .dat file.

### Common Issues

The following are four of the more common questions about legacy files that do not have immediately obvious solutions. These are clearly documented in the online documentation and reproduced here for reference when working with the examples in this paper.

#### Flat file not completely parsed when submitted to BizTalk Server

A delimited flat file might have a parsing error when submitted to BizTalk Server if the file has the following characteristics:

- The **Field Order** property for the root node is set to Prefix or Postfix.
- The name of the root node is a substring of the name of another node in the file.

The solution to this is to rename the root node so that its name is not a substring of the name of any other node in the specification. Also, ensure that the document submitted matches the specification it is being validated against. You can do this by using the **Validate Instance** property on the **Tools** menu of the specification editor.

## White space not preserved in flat file submitted to BizTalk Server

When a flat file is submitted to BizTalk Server, white space in fields might be trimmed. This is because, by default, the underlying MSXML parser does not preserve white space in a field with its **Type** property (on the **Declaration** tab) set to Element.

If it is important to preserve white space in a field contained in a flat file, in BizTalk Editor be sure to set the **Type** property on the **Declaration** tab of the field in the source specification to Attribute.

## Server does not return all documents in a flat file interchange

This is usually caused because one of the documents in the interchange does not meet the document specification. For example, one of the documents is missing a required field.

The solution is to locate the document within the interchange that does not meet the specification, fix it, and resubmit the interchange. Although an error is returned for the specific document that does not meet the specification, BizTalk Server cannot process all the documents in the interchange. The flat file structure is an open format and is not designed to implement redundancy checking.

## The server returns the following error: "The X12 4010 855 document is missing the entire property set that is required for this serializer to run."

When working with EDI X12 standards, make sure that BizTalk Server has all the information required to identify the document. These criteria are represented in the document's property set and are entered on the **Selection Criteria** tab during document creation within BizTalk Messaging. An example of the correct selection criteria can be found in the X12 specification, X12 850 Purchase Order, included in the samples.

*functional\_identifier* Equates to field GS01; should be a two-character field  
*application\_receiver\_code* Equates to field GS03; should be a code 2 to 15 characters long  
*application\_sender\_code* Equates to field GS02; should be a code 2 to 15 characters long  
standards version Equates to field GS08; should be a number

## Appendix: Sample Installation

A range of specifications, sample scripts, ports, and channels is provided with this paper. To install the samples, perform the following steps:

Perform a clean installation of BizTalk Server, although this is not required if you have already defined conflicting names for document definitions, channels, ports, envelopes or organizations then the setup script will fail.

Unzip the attached WhitepaperSamples.zip file onto the C drive. This creates all the required directories that include sample data.

Edit the BuildWhitepaper2.vbs script and adjust the HOSTNAME variable to the name of your server.

```
' Change the HOSTNAME to your server before executing this script.  
Const HOSTNAME = "GRAYDEMO"
```

Copy the folder \Whitepaper Sample\Configuration\Maps\Whitepaper to the WebDAV repository which is located by default in \Program Files\Microsoft BizTalk Server\BizTalkServerRepository\Maps to create a \Program Files\Microsoft BizTalk Server\BizTalkServerRepository\Maps\Whitepaper folder

Copy the folder \Whitepaper Sample\Configuration\DocSpecs\Whitepaper to the WebDAV repository which is located by default in \Program Files\Microsoft BizTalk Server\BizTalkServerRepository\Maps to create a \Program Files\Microsoft BizTalk Server\BizTalkServerRepository\DocSpecs\Whitepaper folder

Execute the BuildWhitepaper2.vbs script. This builds all the dependencies and requirements for BizTalk Server.

Assuming an install on C drive, create the following four receive functions in the BizTalk Server Administrator:

Customer Update Processing (File)

Polling location: C:\Whitepaper Sample\A2A Processing\

File types to poll for: \*.XML

Envelope: <None>

Channel name: <None>

Source Selected:

Organization Name: OrganizationName

Organization identifier value: Home Organization

Destination Selected:

Organization Name: OrganizationName

Organization identifier value: Home Organization

Document definition name: Customer Update Message

Receive Order From Customer B (File)

Polling location: C:\Whitepaper Sample\Customer B\documents Out\

File types to poll for: \*.DAT

Envelope: Customer Type B

Channel name: Fixed Length Purchase Order

Document definition name: <None>

Receive Purchase Order (File)

Polling location: C:\Whitepaper Sample\Customer A\Documents Out\

File types to poll for: \*.EDI

Envelope: <None>

Channel name: Incoming X12-850 Purchase Order

Document definition name: <None>

Request Stock Availability (File)

Polling location: C:\Whitepaper Sample\Documents Out\

File types to poll for: \*.XML

Envelope: <None>

Channel name: Stock Queries

Document definition name: <None>

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# Microsoft BizTalk Server 2000: Building a Reverse Auction with BizTalk Orchestration

Bob Laskey  
James Parker  
Microsoft Corporation

July 2000

**Summary:** This article discusses the business process orchestration features of Microsoft BizTalk Server 2000. (16 printed pages)

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## Introduction

Building e-commerce applications requires the integration of data and business processes within and across organizations. The MSDN Magazine article, *BizTalk Server 2000: Architecture and Tools for Trading Partner Integration*, described a set of tools and services provided by Microsoft® BizTalk™ Server 2000. These tools and services add the following data messaging capabilities to the e-commerce architect's toolbox: document specification editor, document schema mapper, data format translation service, schema transformation service, document tracking database, and security and transport services. This set of XML-based messaging services is available for early prototyping today as a BizTalk Server 2000 Technology Preview Web release from Microsoft. In this article, we describe a second, just as important, set of tools and services provided by BizTalk Server 2000 that address business process orchestration. Business process orchestration includes the visual modeling, implementation and management of distributed business processes. BizTalk Server 2000 introduces BizTalk Orchestration (BTO), which adds business process orchestration capabilities to the e-commerce architect's toolbox. BTO is based on a new application of XML called XLANG, which is a language to define the semantics of business processes and for binding process activities to software implementations. Microsoft BizTalk Server 2000 is the integrated suite of messaging tools and services described in the MSDN Magazine article combined with the business process orchestration tools and services described in this article. BizTalk Server 2000 will be available from Microsoft to download in a Web beta release this summer.

In the remainder of this article, we provide an overview of BizTalk Orchestration and drill into an example solution. With the application developer in mind, we will show how to use BizTalk Server 2000 to model a simple *reverse auction*. Reverse auctions are a common dynamic pricing technique characterized by a single buyer issuing a request for quote (RFQ) and accepting bids from multiple sellers.

## Business Process Orchestration

Architectures that integrate applications and organizations must support a variety of data schemas, data formats, and application protocols. BizTalk Server 2000 messaging services provide an infrastructure to ease this burden. However, this only eases data integration challenges. Data must be integrated as part of an organization's or a value chain's e-business processes. BizTalk Orchestration (BTO) facilitates the visual modeling of processes by business analysts and the implementation of processes by developers. Additionally, a run-time engine executes the modeled business process. Finally, BTO includes tools to ease the management of processes and exceptions. All of these features leverage existing investments in Microsoft Windows® 2000, Microsoft Visual Studio®, and COM+.

## Visual Process Modeling for Analysts

BizTalk Server 2000 provides a graphical environment, the BTO visual designer, for business process modeling using the professional drawing capabilities of Microsoft Visio® 2000. The environment includes three views of a modeled process. A *Flowchart* view is provided for business analysts. The *Implementation* view and the *Data Flow* view, discussed below, are provided for developers. In the flowchart view, the analyst models business processes by defining a series of actions. An action is a step in a sequence of execution that sends or waits to receive data. The business analyst leverages a set of built-in Visio stencil shapes to model looping, parallel execution and branching or routing. The available flowchart shapes are listed in Table 1.

Flowchart shape	Purpose
e	

<b>Abort</b>	Triggers the rollback of a transaction, invoking a specified exception handling or compensation transaction schedule
<b>Action</b>	Specifies that a message is going to be sent or received through a specific implementation shape
<b>Begin</b>	Represents the start of a process
<b>Decision</b>	Branching construct to determine the next execution step based on user-defined or built-in rules
<b>End</b>	Represents the end of a branch of execution
<b>Join</b>	Joins two separate threads of execution
<b>Fork</b>	Splits a single thread of execution into two parallel threads
<b>While</b>	Looping construct to iterate through a group of actions
<b>Role</b>	Provides an abstraction to describe a set of shapes as a communicating entity that sends or receives messages
<b>Transaction</b>	Groups actions into a discrete unit of work that either completely succeeds or has no effect

Table 1. Available flowchart shapes and their purpose

Once the business process is defined and documented, the analyst's job is complete. Figure 1 is a screen-shot of the analyst's design canvas.

View Figure 1. Flowchart Design Canvas

## Implementation Binding for Developers

In addition to the flowchart view, the visual design environment provides an implementation view and a data flow view. Given the flowchart, a Windows 2000 developer or architect uses the implementation view to bind process activities to implementation shapes such as MSMQ queues, COM+ components, Windows Script Host scripts, and, of course, BizTalk Server 2000 messaging services. Finally, the developer uses the data flow view to flow data into and out of messages that are produced and consumed by the implementation artifacts. These implementation shapes may represent self-contained business components or they may be facades for legacy applications or distributed applications. For example, a COM+ component bound to a process action may invoke a SOAP RPC method call on a remote Web service or it may use COMTI to integrate with a legacy host application. Of course, a process action may bind to BizTalk Server messaging to produce X12 or UN/EDIFACT EDI messages or instances of specifications created with the BizTalk Editor and transformed with maps created with the BizTalk Mapper. Binding to BizTalk Server 2000 messaging services is discussed in more detail in the [Advanced BizTalk Orchestration Features](#) section of this article. The completed set of flowchart, implementation, and data flow views are referred to as a BizTalk application.

It is important to understand the concepts involved with binding an implementation to a process so let's spend some time discussing bindings, ports, messages, and data flows in more detail. Each action in a BizTalk application must be bound to, or associated with, an implementation. The BTO Engine is responsible for invoking the bound implementation at the time specified in the process model. Bindings are easy to create in the BTO visual designer by simply dragging an implementation shape onto the design canvas and connecting the dots. When an implementation shape appears on the design canvas, a port is automatically created and placed in between the action shape and the implementation shape. A port is an abstraction that BTO uses to associate messages with implementations and activities. Messages represent inputs and outputs flowing to and from implementations.

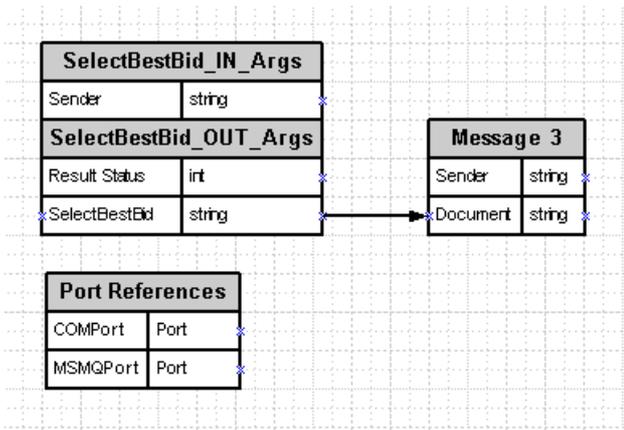
For example, consider an action called **CreateRFQ** that is bound to a **CRequestForQuote** Visual Basic component that exposes the following method:

```
Public Function CreateRFQ() As String
```

The visual design tool will create messages which correspond to the in and out arguments for the **CreateRFQ** method. In our reverse auction scenario described below, an RFQ is defined by a BizTalk Document Specification. Messages have a property, which can point to a BizTalk specification. A port will also be created that encapsulates the input and output messages and manages the flow of data into and out of the COM+ implementation.

Once the implementation has been selected and placed on the design canvas and connectors drawn between the process actions and the port, we must tell the BTO visual designer what data elements we are interested in flowing into and out of the port. To do this we navigate to the data flow view of our business process. In this view, we see shapes that represent each of the messages we have created in our implementation view. For example, we will see messages corresponding to the **CRequestForQuote** output arguments. We simply draw lines between data elements in messages—the run-time engine takes care of flowing the right data at the right time into and out of our implementations through Ports. Figures 2 and 3 are screen-shots of the developer's design canvases.

View Figure 2. Binding Design Canvas



**Figure 3. Data Flow Design Canvas**

COM+ components, MSMQ queues, WSH scripts and BizTalk messaging services are all supported in-the-box implementation bindings. Dragging each implementation onto the design canvas invokes a wizard specific to the implementation's properties. For example, a COM+ binding requires the developer to locate the registered component and select the interface and methods being bound to the port. The MSMQ binding requires the developer to specify a queue name. The BizTalk messaging services binding requires the developer to specify the BizTalk channel. Figure 4 is a screen-shot of the COM+ binding wizard. Properties on Ports, Messages, Actions and Implementations are, of course, also available outside of the wizard with a right-click of the mouse button. For extensibility, the binding architecture is open to third parties. Microsoft and other software vendors may add additional bindings such as relational databases, SOAP, or line-of-business application connectors. These third-party bindings may include implementation shapes, binding wizards, and off-the-shelf components for easy integration into modeled business processes.

View Figure 4. COM+ Binding Wizard

Once the visual business process model is completed, the Visio design environment may be used to validate and compile the model into its XML representation. The visual design file is saved with the .skv (schedule visual) extension and the compiled BizTalk application—the XLANG—is generated with an .skx (schedule XML) extension. The BTO Engine is capable of executing the process described by this generated BizTalk application. The Engine supports processes that include branching, sequencing, concurrency, and synchronization and long-running transactions.

It is important to highlight one of the basic premises of a BizTalk application: the separation of business process and implementation. A business process may be modeled and different software components and applications may be bound to the process either statically-at design time, or dynamically-at run time. This separation between process model and implementation goes deeper than the visual design environment. This separation is a core feature of BizTalk Orchestration and truly allows business analysts and developers to quickly adapt to meet new organizational and competitive requirements.

## Process Execution and Management

A BizTalk application defines a schedule for executing an implementation of a business process. The execution of the schedule is carried out by the BizTalk Orchestration Engine. The Engine is a COM+ application designed to manage a large number of concurrently executing, long-running business processes. The architecture manages long-running processes by persisting their state using Microsoft SQL Server™ 7.0 (and later versions) and COM+ components that support **IPersist** implementations. These persisted processes may then be re-hydrated at the appropriate time based on internal events, such as timers, or external events, such as message arrivals. Figure 5 illustrates the BTO Engine application in the Component Services MMC snap-in.

View Figure 5. Component Services MMC snap-In

Visual Basic programmers, or other COM+ developers working in languages such as Microsoft VBScript, Microsoft Jscript®, or Microsoft Visual C++®, can instantiate a BizTalk application by calling **GetObject** on a URL moniker string. The following is an example of a moniker.

```
sked://localhost/"c:\workflows\mywf.skx",name="main"
```

The moniker example above includes two parts. First, the name of the generated .skx file is provided. Second the name of the module that should be executed is given. The second part may be given by a workflow module name or by specifying an XPath query to the module's location in the .skx file. For example:

```
sked://localhost/"c:\workflows\mywf.skx",
  query="//module[@name='main']"
```

Both of these examples start the Engine and instruct it to begin executing the module named **main**. Note that this article is based on a pre-beta version of BizTalk Server 2000 so syntax is possible, and likely, to change by the time the beta becomes available.

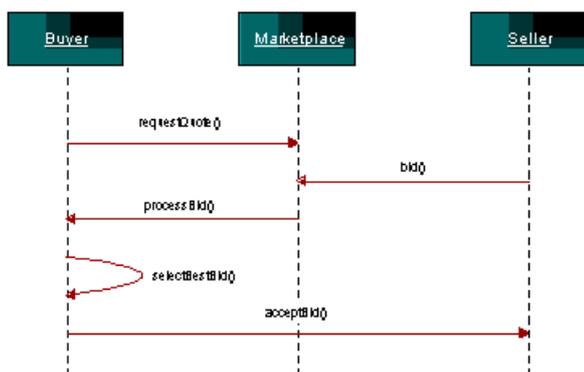
In addition to the URL moniker approach to executing BizTalk applications, the Engine exposes an object model for interacting with it and with individual application instances. Besides starting and stopping applications, this object model allows third parties to build sophisticated management tools for BizTalk Server 2000. The run-time engine persists running processes as XML and stores this state in a SQL Server database. This combination of XML and a relational database with built-in XML support provides a platform for querying and managing running processes. The BizTalk Server 2000 object model coupled with access to the state of running processes, Document Tracking and Activities (DTA) database, and Windows Management Interfaces (WMI) provides a large number of opportunities for managing business processes and for building third-party tools that make this job even easier.

Now we have enough of a background to allow us to move forward with using the tools and services to actually build an application with these BizTalk Server 2000 technologies.

## Implementing a Reverse Auction

A popular topic in business-to-business e-commerce is *dynamic pricing*. A common type of dynamic pricing is a *reverse auction*. In a reverse auction, a buyer issues a request for quote (RFQ) to a large number of sellers. The buyer then reviews multiple bids and accepts the optimal bid from the chosen supplier. The optimal bid is usually the bid with the lowest price. This contrasts with a typical *forward auction*. Forward auctions consist of a seller accepting buy bids from multiple buyers. The winning bid is usually the one with the highest price. Another popular topic is the digital marketplace for matching buyers and sellers of goods and services. The marketplace is often designed to be the broker between a buyer and seller in scenarios that involve dynamic pricing. For example, a buyer might submit an RFQ to a marketplace to which he belongs. Sellers who are also members of the marketplace have a right to bid on the RFQ. The marketplace provides a mass of buyers and sellers to create a more efficient business process as well as provides value-added services such as community services, localization, and trading partner authentication. The marketplace typically charges a subscription or transaction based fee.

We will not attempt to build an entire business-to-business marketplace that implements reverse auctions in this article. However, we will implement a simplified business process that addresses the RFQ/Bid business process between a single buyer and an online marketplace. A common way to represent interactions between components in an application or organizations in a business process is with Sequence, or Object Interaction, diagrams. These diagrams can easily communicate the delineation of responsibility between entities in an interaction and the ordering of these interactions for both technical and non-technical team members. Figure 6 is a sequence diagram that represents the buyer, marketplace, and seller in a simplified RFQ/Bid process. This diagram was simplified to ensure clarity of the process. Acknowledgement and receipt messages are excluded, exception and error processing is not shown, and interactions are limited to a single buyer and single seller. Our goal for the ensuing text is to implement the buyer-side of this RFQ/Bid interaction using BizTalk Server 2000 business process orchestration features.



**Figure 6. Reverse Auction Interaction Diagram**

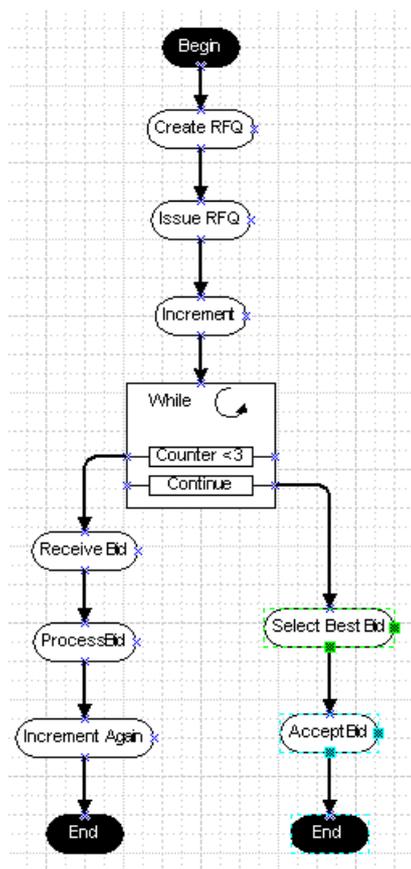
## The Reverse Auction Business Process

The starting point is to visually model the business process. The business analyst does this by creating a flowchart in the Visio 2000 BTO visual designer. The flowchart should represent the business process actions taken by the buyer's purchasing department or purchasing system. Initially the buyer decides to purchase 100 widgets. An RFQ is generated that represents the details of this order including items such as required delivery dates, approved vendors, and manufacturer warranties. The RFQ is sent to a digital marketplace where it will be processed according to marketplace rules and posted for appropriate vendors to review. Vendors may post bids in response to the RFQ that are forwarded to the buyer by the marketplace. Note that the marketplace provides the implementation of buyer and seller rules such as managing approved vendor lists, authenticating credentials, and verifying credit and inventory availability. The buyer processes each bid and selects the "best" bid based on

business criteria or bidding algorithms that help to ensure the best value. Once the best bid is selected, a bid acceptance is sent to the bidding vendor for transaction execution.

So let's model this business process using the BTO visual designer. We will use the term *action* to represent a step in the business process. The buyer requires two actions to make his buying requirements known to potential sellers: Create RFQ and Issue RFQ. Create RFQ generates an RFQ document. Issue RFQ sends the document to the marketplace. The buyer process now enters into a bid-processing loop. Each bid that is received triggers a Receive Bid action and a Process Bid action. Receive Bid consumes bids sent from the marketplace. Process Bid may be as simple as storing the bid-price, quantity, and ship date for example-in a purchasing database or it may include more complex business logic. The marketplace sends bids to the buyer until some loop exit criteria are met. These exit criteria may be something as simple as a count or a timer or a more complex business rule. For simplicity, our exit criteria will simply be the receipt of three bids. We will rely on the marketplace to ensure that each of our bids is from three separate sellers and that all sellers are buyer approved vendors. Once the loop exits, a set of business rules will be applied to select the optimal bid. Let's call this action Select Best Bid. Finally, the action Accept Bid will cause a Bid Acceptance document to be created and sent to the winning seller.

Figure 7 illustrates this business process in the BTO visual designer and includes each of the actions described above as well as a built-in While shape and canned COM+ Loop implementation to track the number of processed bids across this long running transaction. Note that a user-defined rule is provided to define the looping criteria—Counter < 3—and that a built-in continuation rule is provided by the While shape.



**Figure 7. Reverse Auction Flowchart**

This diagram is created in the same manner as any other Visio 2000 diagram. Create a new BizTalk application and drag shapes from the flowchart stencil onto the design canvas. Use the connector to connect actions and ensure to start and terminate the flowchart with Begin and End shapes. Once the diagram is complete, it must be saved to the file system. As noted earlier, these files have an .skv extension. We will validate and save the design after the implementation binding is complete.

## The Reverse Auction Implementation

Now that the business process is defined, the developer has an opportunity to provide an implementation. Our reverse auction will make use of XML, Visual Basic and MSMQ. A more complete implementation would involve other components, such as SQL Server and third-party purchasing applications. At a minimum however, we need to provide a custom implementation for Create RFQ, Process Bid, and Select Best Bid. Issue RFQ, Receive Bid, and Accept Bid also require implementation bindings but we will leverage the built-in support for MSMQ to limit the amount of custom development needed.

The following steps are required to implement the reverse auction: define XML specifications, implement and bind Visual Basic components, create and bind MSMQ queues, bind loop counter, configure data flows, and run the application. Let's walk through each of these steps in sequence.

## Define XML Specifications

First, we define the schema for the business documents we intend to exchange between buyer, seller, and marketplace. There are three such documents: Request for Quote, Bid, and Bid Acceptance. Using the BizTalk Editor, we have created specifications for each. Sample instances of each of these specifications are provided below. Recall from the MSDN Magazine article that these specifications are simply XML Data Reduced (XDR) schema with a bit of additional markup to assist the server with its translation, validation, and transformation services.

```
<RequestForQuote>
  <Product Quantity="150" Type="WidgetA">
    <Warranty TimePeriod="30"/>
  </Product>
  <Product Quantity="225" Type="WidgetB">
    <Warranty TimePeriod="120"/>
  </Product>
</RequestForQuote>

<Bid>
  <Product Quantity="150" Type="WidgetA" TotalCost="1345.65">
    <Availability PromiseDate="2000-09-09" PromiseQty="101"/>
  </Product>
  <Bidder BidderOrgID="TheBidder"/>
</Bid>

<BidAcceptance>
  <Product Quantity="150" Type="WidgetA" TotalCost="1345.65">
    <Availability PromiseDate="2000-09-09" PromiseQty="101"/>
  </Product>
  <Bidder BidderOrgID="TheBidder"/>
</BidAcceptance>
```

## Implement and Bind Visual Basic Components

Second, we identify and build components required to implement Create RFQ, Receive Bid and Accept Bid. We will define a class for RFQs called **CRequestForQuote** and a class for Bids called **CBid**. Although for production projects, it is a best practice to define interfaces prior to writing code, our sample application is simple enough that we will just use the default interface created by Visual Basic Public functions and subroutines. **CRequestForQuote** exposes the public method **CreateRFQ()**. **CreateRFQ()** takes no arguments and generates an instance of the **RequestForQuoteSpec**. **CBid** exposes the public methods **ProcessBid()** and **SelectBestBid()**. **ProcessBid()** accepts an instance of BidSpec.xml for application processing. **SelectBestBid()** takes no arguments and returns an instance of BidSpec.xml that represents the winning vendor bid. Stub implementations for each of these methods shown below.

After the Visual Basic components are registered, we can drag a COM+ implementation shape from the implementation stencil onto the design canvas. This initiates a Wizard for pointing the shape to the appropriate registered components and allows us to select which interfaces and methods we would like the BTO Engine to invoke. A port is created and messages are created for the input and output arguments derived from the input and output arguments of the COM+ component. We use the connector to associate the flowchart action with the port and to associate the port with the implementation shape. Figure 2, shown earlier, illustrates the COM+ implementation binding process. There is one implementation step remaining to complete our Visual Basic binding. The data flow into and out of the component must be configured. We will configure all data flows after we complete our implementation bindings, as shown below.

```
CRequestForQuote
-----

'CreateRFQ() interacts with a hypothetical line-of-business application
'to create an XML RFQ document instance. The RFQ is returned.
Public Function CreateRFQ() As String
  CreateRFQ = 'get the document
End Function

CBid
----
```

```

'ProcessBid() is given an instance of an XML Bid and submits it to an
'auction application for processing.
Public Sub ProcessBid(ByVal xmlstrBid As String)
    'send Bid to LOB
    Return
End Sub

'SelectBestBid() asks the auction system for the best bid and
'returns it as an XML document instance.
Public Function SelectBestBid() As String
    SelectBestBid = 'get the document
End Function

```

## Create and Bind MSMQ Queues

Third, we identify implementation required for the Issue RFQ, Receive Bid, and Accept Bid actions. For each of these, we will leverage the seamless support for MSMQ built into BizTalk Server 2000. Issue RFQ will be bound to a queue called **RFQOut**. Receive Bid will be bound to a queue called **BidIn**. Lastly, Accept Bid will be bound to a queue called **BidAcceptanceOut**. BizTalk Server 2000 will do all the work required to place messages on these queues and read messages off the queue. The BTO Engine will flow the specified messages into the queue and from the queue into the bound Visual Basic components. No coding required. For this sample application, we use private queues running on the local machine. This allows the sample to run on a single stand-alone Windows 2000 Advanced Server. The queues are named the following:

```

.\private$\BidIn
.\private$\RFQOut
.\private$\BidAcceptanceOut

```

It is important to specify each BTO queue to be transactional. For simplicity, this example binds directly to MSMQ queues. In a real scenario involving integration with an online exchange or trading partners, our binding is likely to require the data format translation and data schema transformation services of BizTalk messaging services. It may also make sense to leverage the secure transport features of BizTalk messaging. For example, business documents may be encrypted and digitally signed using S/MIME and then posted over a secure HTTPS channel. In this case, we would simply replace our MSMQ binding with a built-in BizTalk messaging services binding shape and configure the Channels and Ports in the BizTalk Management Desk. The BTO Engine application may be referenced directly from the Channel and Port Configuration Wizards. The integration is seamless. Nevertheless, for the sake of brevity and clarity we bind directly to MSMQ queues in this sample application.

After our queues are created, our binding process is very similar to what was required to bind the Visual Basic components. We simply drag a MSMQ implementation shape from the implementation stencil onto the design canvas. This initiates a wizard for pointing the shape to the appropriate queue. A port is created and a message is created for the data being placed on or read from the queue. We use the connector to associate the flowchart action with the port and to associate the port with the implementation shape. Figure 8 illustrates the completed MSMQ and COM+ implementation binding process.

View Figure 8. MSMQ and COM+ Binding for Reverse Auction

## Bind Loop Counter

Fourth, we must provide an implementation binding for the loop counter. For this, we use a canned, or in-the-box, **LoopControl** component that exposes **Initialize()** and **Increment()** methods. In the prerelease version tested for this article, the binding process was identical to the process used for the Visual Basic components. It is likely that this step will be simplified in the released version of BizTalk Server 2000. Certain activities such as looping, counters, and timers are commonplace in business processes and may be provided as out-of-the-box artifacts for inclusion in any design.

## Configure Data Flow

Once this binding is complete, there is one item left for the developer. Data flow must be configured on the data flow view, or in Visio parlance, the data flow sheet. The best way to describe the flow is with an illustration. Figure 9 is a screenshot of the completed data flow for the reverse auction sample application. There are six flow steps.

1. **CreateRFQ** generates a RFQ document instance that flows into the **RFQMessage**.
2. **RFQMessage** is placed on the outbound **RFQOut** queue.
3. Bids are received on the inbound **BidIn** queue and flow into the **BidMessage**.

4. The **BidMessage** flows into the **ProcessBid** input arguments.
5. **SelectBestBid** generates a Bid instance that flows into the **BidAcceptance** Message.
6. The **BidAcceptanceMessage** is placed on the outbound **BidAcceptanceOut** queue.

Note that we take a shortcut in this sample application. We magically turn the best Bid into a **BidAcceptance**. In a full implementation, we would use BizTalk messaging schema transformation services to perform this magic for us and insert the appropriate data fields from a Bid into the appropriate fields in a **BidAcceptance**. We may even leverage BizTalk Functoids to perform database looks up or other custom processing during the mapping process.

View Figure 9. Reverse Auction Data Flow

## Running the Reverse Auction

Now that the activity diagram, implementation binding, and data flows are complete, we use the **Validate** option of the BTO visual designer menu to validate the workflow and locate any errors. After all errors have been fixed, we can generate and save the application design file. The file, generated with an .skx extension (for schedule XML), is a well-formed XML document that describes the business process to the BTO Engine. Figure 10 is the completed BizTalk application.

View Figure 10. Reverse Auction BizTalk Server 2000 XLANG Schedule

A simple test harness was built using Windows Scripting Files (also known as Scriptlets). This HTML/JScript application simply creates and executes an instance of the reverse auction application and provides a button to place Bids on the inbound queue. Monitor the outbound **BidAcceptance** queue to determine when the Bid Acceptance is sent indicating completion. Simply run the application, send three bids and the BTO Engine does the rest. To gain a little more visibility into inner workings of the run time, open the MSMQ Explorer and monitor the arrival and departure of messages. Turn on queue journaling for more detail. Finally, COM+ Spy in the Platform SDK allows you to monitor, at the Action and Port level, precisely what the BTO Engine is doing by trapping BizTalk Events. Figure 11 is a screenshot of the test harness and Figure 12 shows the reverse auction queues in the MSMQ MMC snap-In.

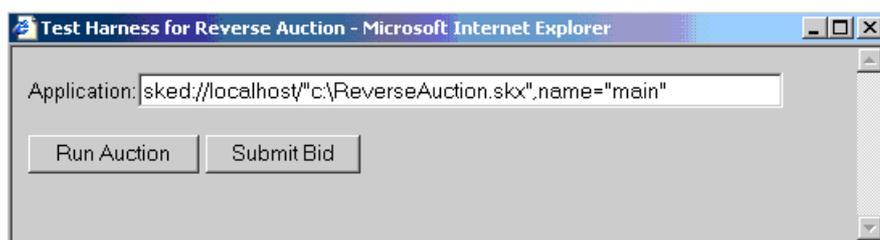


Figure 11. Reverse Auction Test Harness

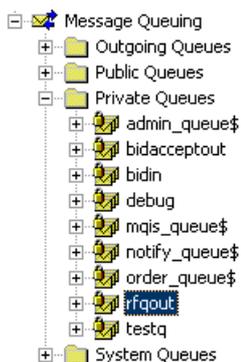


Figure 12. Reverse Auction Queues

The BizTalk specifications, sample instances, Visual Basic implementation stubs, BizTalk visual design (.skv), XML (.skx) files, and the wsf/htm test harness used in this article will be converted to work with the Web released beta BizTalk Server 2000 and made available for download from MSDN.

## Advanced BizTalk Orchestration Features

The reverse auction sample application described in this article only touches on the features provided by BizTalk Orchestration. The buyer's business process includes a single path of execution with a simple while-loop and a counter. A real business process is much more complicated. BizTalk Server 2000 provide features such as roles, dynamic ports, transactions, and BizTalk channel binding that allow these complex processes to be modeled and implemented using the tools and services employed in this article.

Most business processes involve multiple persons, computer systems, applications, or organizations interacting in complex ways. Roles are a BTO visual designer feature that is available to support this type of application. A role is an entity that sends or

receives messages and may be a collection of multiple roles. A business process can easily be broken into sub-processes and associated with a role. The roles can then communicate with each other to achieve the desired result. A simple example of this would be to extend our reverse auction sample application to include the seller business process in addition to the buyer process we have already modeled. We could then create a Buyer and a Seller role that communicate through a Marketplace role.

While roles help the modeler and developer modularize business process development, features such as sequential, concurrent, and conditional execution of actions allow the modeling of complex processes. The Fork and Join shapes provide a mechanism to model concurrency. The Decision and While shapes provide a mechanism to model conditional execution. Rules allow the business analyst or developer to query run-time information such as message values and to route the process' execution accordingly. Of course, each of these graphical shapes is translated into a description of the process and binding and the run-time engine manages the execution of these advanced process constructs.

Another characteristic of most business processes is their dynamic nature. The separation of process from implementation that BizTalk Server 2000 provides goes a long way towards supporting business processes that frequently change. However, what if the business process changes based on run-time characteristics? For example, our reverse auction buyer may wish to send an RFQ for direct goods directly to a small set of suppliers but send an RFQ for non-direct goods such as office supplies to a digital marketplace for ad hoc bidding. Dynamic ports are provided for this type of challenge. A process may be modeled that allows an implementation to be selected at run time. In our example, we might simply bind to a different queue based on the type of good being requested in the RFQ.

The Transaction flowchart shape was introduced earlier in the article. This shape is important because it represents an important BTO feature: support for both short-lived Microsoft Distributed Transaction Coordinator style transactions and long-running transactions. Long-running transactions are groups of short-lived transactions that must be treated together as discrete units of work. An important requirement of transaction design is the ability to rollback previously completed work when an error occurs. In a long-running transaction that is distributed across a wide-area network such as the Internet, a traditional two-phase commit transaction is undesirable but we would still like to commit and rollback the transaction as necessary. In these cases, the architect must provide the application infrastructure with details on how to undo work items in the case of failure. The BTO visual designer allows an architect to specify a *Catch* process or a *Compensating* process that will be invoked by the BTO Engine to catch error conditions or to provide a compensating transaction to undo work already completed.

The last and possibly most important feature of BizTalk Server 2000 is the seamless integration between the business process orchestration capabilities of BTO and the data processing capabilities of BizTalk messaging services. Note that some of the terminology between technology preview and beta has changed. Loosely speaking, *pipelines* are deprecated and *channels* and *ports* are introduced in the core-messaging engine. This allows trading partner agreements to be configured in the BizTalk Management Desk as channels and ports that can be bound directly to actions in a business process. Features such as SOAP Enveloping via the BizTalk Framework, Distribution Lists, Specifications, Maps, Transport, and Security Settings are all available directly from a business process. The Binding Wizard for BizTalk Messaging simply allows the developer to provide the name of a channel.

## Summary

In summary, this article discussed the business process orchestration features of BizTalk Server 2000. These features, called BizTalk Orchestration, coupled with the core BizTalk Server 2000 data messaging services discussed in the MSDN Magazine article comprise a sophisticated set of Windows 2000 XML based tools and services for integrating applications within and across businesses. Many of the data messaging features are available today for prototyping in the Technology Preview release, while the upcoming Web release of BizTalk Server 2000 Beta will provide an opportunity to begin piloting next generation e-commerce architectures. Visit the [BizTalk Server Web site](#) to keep up to date.

Bob Laskey is an e-commerce architect in Microsoft's dot-com consulting practice based in Austin, TX. He can be reached at [rlaskey@microsoft.com](mailto:rlaskey@microsoft.com).

James Parker is an e-commerce architect in Microsoft's Industry Solutions Group based in Austin, TX. He can be reached at [jampar@microsoft.com](mailto:jampar@microsoft.com).

# Microsoft BizTalk Server 2000 Deployment Considerations

Microsoft Corporation

February 2001

**Summary:** Microsoft BizTalk Server 2000 provides the infrastructure to enable solutions for business-to-business electronic commerce and enterprise application integration (EAI). This article describes deployment configurations, explains why you might decide to implement each configuration, and offers guidelines for building them. (31 printed pages)

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## Introduction

Microsoft® BizTalk™ Server 2000 provides an application infrastructure that enables businesses to implement remote data interchange with external partners. BizTalk Server 2000 also solves the problem of integrating dissimilar applications across

multiple remote and autonomous business units within a business domain. This article describes the deployment models and considerations for business-to-business electronic-commerce and enterprise application integration (EAI) implementations. For small businesses, deploying BizTalk Server can be straightforward and relatively trivial, but for large global businesses with a distributed application environment, much care and thought must be taken to design a deployment architecture that reduces the complexity of management while providing a robust and extensible application environment.

It is highly recommended that you have an understanding of the information contained in the BizTalk Server 2000 product documentation before you read this article.

This article outlines two basic deployment models and six types of deployment considerations:

- **Deployment models.** The deployment models are grouped into two general categories: application integration within a small- to medium-sized organization (SMORG), and application integration within a large organization (LORG). The information in this section will help you determine which deployment model is appropriate for your business environment.
- **Deployment considerations.** This section contains a variety of guidelines that describe the issues you need to consider when you deploy BizTalk Server 2000. The six most important deployment considerations are:
  1. **Firewall restrictions and considerations.** Many of the constraints that are placed on the implementation of business-to-business deployments are driven by the need for protection from external attacks. This section describes what you need to consider when you deploy BizTalk Server 2000 behind a firewall.
  2. **Load balancing considerations.** This section describes how to increase performance and optimize the use of processing power in a multiple-server deployment.
  3. **Building scalable and available Web applications.** This section compares the issues you need to consider when you build Web applications using either the synchronous model or the asynchronous model.
  4. **Designing BizTalk Server groups.** This section explains the key organizing principle in BizTalk Server Administration.
  5. **BizTalk Messaging Services.** This section describes some background information, information about best practices, and troubleshooting tips relating to BizTalk Messaging Services.
  6. **BizTalk Orchestration Services.** This section describes some of the design issues that are specific to BizTalk Orchestration Services that you need to consider for BizTalk Server deployment.

## Deployment Models

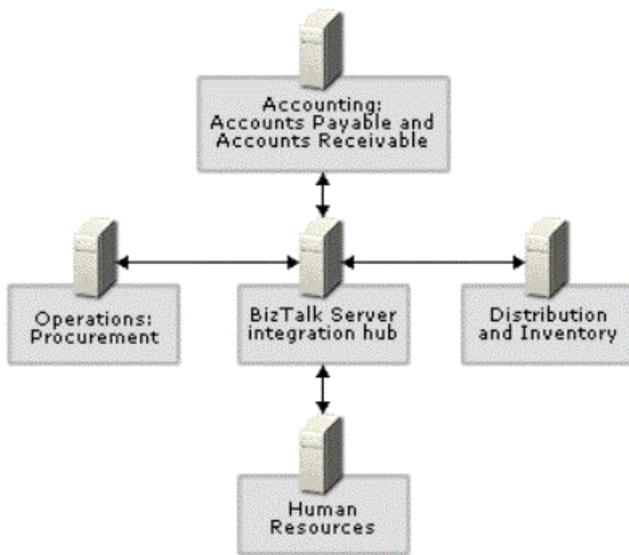
Unlike many competitive products that focus on either external or internal data interchange, BizTalk Server 2000 offers a platform and feature set that solves both the business-to-business and enterprise application integration (EAI) problem set. It can be as difficult to integrate custom-built applications with applications that are purchased as it is to integrate business processes between trading partners. The architecture for integrating applications within a business depends greatly on the size of the business, its structure, and the complexity of the business processes. The following sections focus on two deployment models. The first deployment model is for a simple small- to medium-sized business. The second model is for a more complex, large-scale business.

### Small- to Medium-sized Organization Application Integration

Typically, small- to medium-sized organizations (SMORGs) have a centralized Information Technology (IT) group that controls systems and applications. Often, a limited number of systems and applications within these businesses are core to business operations. Point-to-point application integration is a typical deployment architecture in this environment.

In a SMORG environment, you can deploy BizTalk Server as a routing and transformation hub that connects all applications with a single BizTalk Server group to facilitate application integration. Channels, ports, and XLANG schedules are created for the purpose of integrating specific applications. This model for a simple deployment of BizTalk Server is suitable for SMORGs. The same deployment in a LORG environment can quickly become inefficient and unmanageable. In point-to-point application integration, there is a one-to-one relationship between an application on one system and an application on another system. For example, a procurement application on one system might have a point-to-point application integration relationship with an inventory application on another system. Using BizTalk Server, management is centralized and each application is under the control of a single group.

The following illustration shows point-to-point application integration.



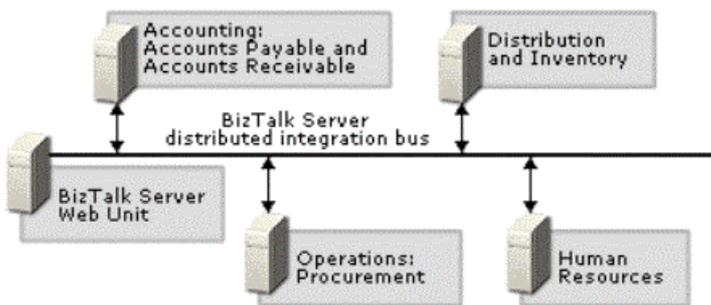
**Figure 1. Point-to-point application integration**

## Large Organization Application Integration

Many large businesses do not use a single centrally managed system. Large organizations (LORGs) are typically organized in autonomous, discrete business units that develop, maintain, support, and administer their own systems. There is a need for these business units to share data with applications that are controlled by other business units, as well as to communicate with external trading partners. Cross-business-unit integration is the combined burden of the central Information Technology (IT) group and the business unit development staff.

Many LORGs need a more distributed and manageable solution than the simple point-to-point application integration used by SMORGs. Competitive EAI technologies that specifically market to LORGs have adopted a new paradigm for integrating applications, known as Publish and Subscribe, or Pub-Sub. In Pub-Sub-based integration products, the publishers of, and subscribers to, the data is unaware of each other. Data is published by one application and subscribed to by other applications. This paradigm focuses on integrating applications with the data distribution infrastructure of the business domain, instead of integrating applications directly with each other. In this model, applications can be easily plugged into the business network data bus and the applications can participate in the business process flow without creating tightly coupled dependencies between systems. The BizTalk Server distributed integration bus can be deployed to provide Pub-Sub-based integration functionality. The BizTalk Server distributed integration bus is made up of distribution lists that enable a one-to-many data distribution model.

The following illustration shows one-to-many application integration using the BizTalk Server distributed integration bus.



**Figure 2. One-to-many application integration using the BizTalk Server distributed integration bus**

## XML format integration

Because applications are not bound by interfaces or common data stores, but by common or intermediary data formats, the applications can evolve their implementations without affecting the overall process flow of the business. BizTalk Server 2000 provides the basis for implementing content-based routing and an integration platform based on formats of document types, also known as specifications. BizTalk Server is document-type or specification-centric in nature. To achieve a greater level of business integration than most other products, BizTalk Server uses XML. When applications require specific non-XML formats, BizTalk Server provides transformation and serialization features that can deliver data in the native format of the target application or endpoint at the point of integration/transport. The ultimate goal is that the data flowing between applications is in an intermediary XML format and not in a format of any particular or specific application. This goal might not be realized initially and does not hamper the integration.

## BizTalk Server distribution lists

A key feature of BizTalk Server is the distribution list, which allows one-to-many distribution of data to applications and other BizTalk Server groups. Distribution lists are implemented in BizTalk Messaging Services by first creating a distribution list that contains a set of previously configured messaging ports. Channels for particular types of documents are then added to deliver documents to the distribution list that contains a collection of messaging ports that determines the delivery endpoints of the document. Each messaging port in the distribution list refers to another organization or application.

### **Loosely coupled integration using a data distribution bus**

BizTalk Server distribution lists facilitate the deployment of BizTalk Server-based enterprise application integration (EAI) middleware that interconnects applications and external counter-parties in a *loosely coupled* fashion. In this context, *loosely coupled* is defined as integrating endpoints by using a messaging infrastructure that does not require the sending and receiving endpoints to be preconfigured with specific knowledge of the counter endpoint's existence. Each BizTalk Server group can be configured as a part of a BizTalk Server data distribution bus so that each BizTalk Server group is aware of other BizTalk Server groups that have channels configured to receive and process a particular set of data. In this fashion, BizTalk Server groups can be linked for more efficient distribution of data by using distribution lists. Each BizTalk Server group can represent a subset of all endpoints, whether they are applications or trading partners. Effectively, each BizTalk Server group can serve to model the business unit and departmental system partitioning. For example, BizTalk Server groups used by the accounting department do not need to carry configuration data for subscribing members of other BizTalk Server groups that require copies of the same messages. BizTalk Server inter-group document delivery is a more efficient way to distribute data than using application-to-application integration.

### **Deployment Considerations**

The architecture for deploying EAI, using distributed and discrete application processing, is driven by the necessity to build business domains and boundaries. This section discusses and recommends solutions for these deployment problems. As deployments of BizTalk Server mature, new and updated XLANG schedules must be seamlessly integrated with tools that provide version control of server configurations. In high-performance environments, it is critical that BizTalk Server can be remotely monitored and proactively administered.

The BizTalk Server 2000 deployment areas for you to consider are:

- Firewall restrictions and considerations.
- Load balancing considerations.
- Building scalable and available Web applications.
- Designing BizTalk Server groups.
- BizTalk Messaging Services.
- BizTalk Orchestration Services.

### **Firewall Restrictions and Considerations**

Among the challenges that arise when businesses engage in business-to-business data interchange is the question of how companies can implement robust application solutions while maintaining a secure environment. Protecting systems and data is paramount to most businesses. Web-based application deployment must take into account the dangerous and volatile environment encountered on the Internet, where attacks are anticipated and occur frequently. To protect their domains, many businesses use firewalls that restrict network traffic to the HTTPS and FTP transport protocols. Additionally, firewalls open only a limited number of ports to the Internet (for example, port 80 for HTTP). Also, double firewalls are often used to isolate Web servers from an intranet or from local area networks (LANs). The space between these firewalls is referred to as the demilitarized zone (DMZ). In the past, network groups within businesses have stipulated that data cannot be persisted within the DMZ, and that all traffic from the DMZ to an intranet must be strictly monitored or filtered for textual data, using HTTP as the transport protocol. However, some of these restrictions have recently been relaxed as new business models require the implementation of Web-based applications running dynamic content. Previously, only static Web content crossed into the DMZ.

### **HTTP-only interactions**

Many Web-based applications require synchronous interactions between the client and the server. Although there are concerns about the scalability of this type of application architecture, it is still the predominant scenario that is deployed on the Internet at this time. Synchronous Web-based applications receive a request from a client and return a response to the client using the same request session. This is the model for HTTP Request and HTTP Response. Many clients expect HTTP Response to carry a business-level response to the request that they posted. The expectation is that the request waits for the response. The following scenario describes an architecture that complies with this synchronous requirement.

This scenario includes a data farm of Internet Information Services (IIS) servers. The data farm might also include Commerce

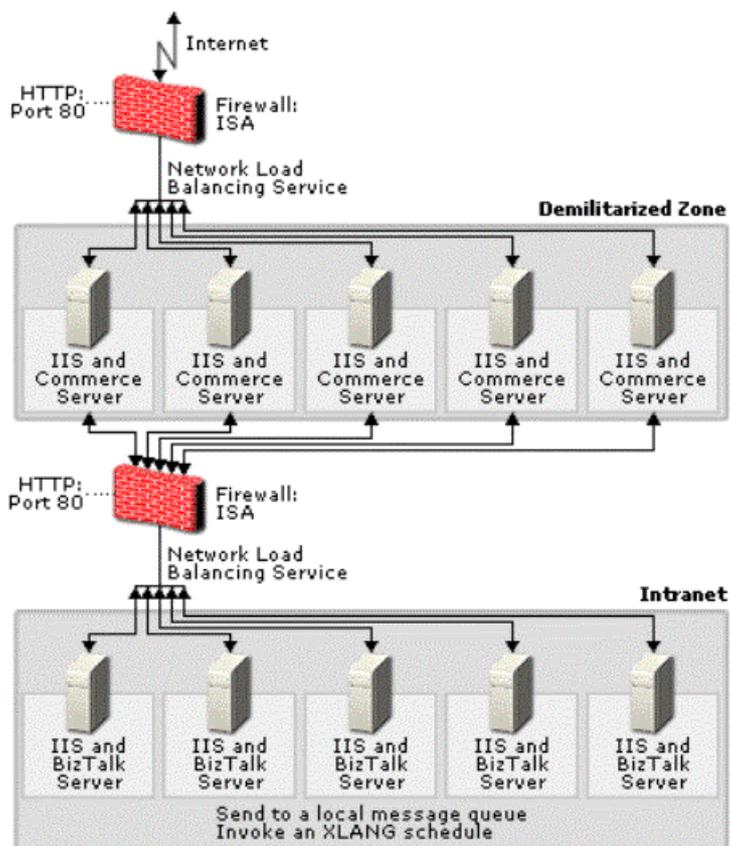
Servers. These servers receive documents over HTTPS and then submit the documents to a BizTalk Server group for processing. In this scenario, there might be a firewall that allows only HTTP traffic through port 80 between the IIS and Commerce Server data farm and the BizTalk Server group.

To build a configuration based on this scenario, you must adhere to the following requirements:

- The IIS and Commerce Server data farm and the BizTalk Server group must be scaled out independently.
- Communication between the two data farms must be restricted to port 80 and use HTTP exclusively.
- Load balance requests across servers in both data farms must be made independently.
- Optionally, you can design support for synchronous HTTP interactions between Web clients and BizTalk Servers.

To comply with these requirements, it is often not possible to use Distributed Component Object Model (DCOM) calls between the data farms. DCOM calls from the IIS and Commerce Servers in the DMZ to BizTalk Servers would require the opening of arbitrary ports. This is often unacceptable in a business environment.

The following illustration shows a configuration based on the scenario described in this section, using Microsoft Internet Security and Acceleration (ISA) Server as the firewall server.



**Figure 3. Configuration based on the scenario described in this section, using Microsoft Internet Security and Acceleration (ISA) Server as the firewall server**

This configuration provides a simple implementation model. The two data farms are loosely coupled and can scale out independently by using HTTP and the Network Load Balancing Service (NLBS) as intermediary load-balancing servers.

Active Server Pages (ASPs) on Commerce Server and IIS servers in the DMZ use the server-optimized MSXML 3.0 HTTP client to forward HTTP Requests with messages to the internal IIS and BizTalk Servers over HTTPS. The MSXML 3.0 HTTP client is multithreaded and reentrant. Optionally, a Microsoft Internet Security and Acceleration server can be used to implement a request-forwarding reverse proxy.

In the synchronous model, ASP pages on the IIS and BizTalk Servers within an intranet call directly into the local BizTalk Servers by using the **SubmitSync** method of the **IInterchange** interface. BizTalk Server returns a response. In the asynchronous model, the ASP page calls the **Submit** method or places the message onto a local message queue, or file share, that a Message Queuing receive function monitors. When asynchronous calls to the BizTalk Server are used, the following occurs:

- BizTalk Messaging Services are optimized to receive documents from a message queue by using a Message Queuing receive function. If the document size is greater than 4 megabytes (MB) in ASCII, or 2 MB in Unicode, the message queue size limit is exceeded. In this case, the document must be submitted to BizTalk Server using either the **IInterchange** interface (to support transactions), or by using a File receive function.

- ASP pages can quickly save messages in message queues without processing the messages. This reduces the page latency and releases HTTP connections in an expedient manner.
- ASP pages submit documents to BizTalk Server by using receive functions or the **Submit** method on the **IInterchange** interface.

When BizTalk Orchestration Services are used to implement business logic, the document that is passed to the **Submit** method or the **SubmitSync** method of the **IInterchange** interface is processed on the local server by an XLANG schedule instance. You can configure BizTalk Server to activate a new XLANG schedule instance to process the document, or the document can be processed by an activated XLANG schedule instance. For information about configuring BizTalk Orchestration Services, see "BizTalk Orchestration Services" later in this article. If new XLANG schedules are to be activated when a specified document type is received, and if there is a high volume of incoming documents of this type, the tightly coupled approach could overwhelm the servers on which XLANG schedules are activated. Newly activated XLANG schedules will compete for resources with the XLANG schedules that are already running. This might affect the throughput and the latency of the overall application. To avoid this problem use a loosely coupled approach.

### Responses and time-outs in long-running processes

In this scenario, the Web page is blocking the HTTP Request that is awaiting a response from the stateless component. The stateless component is polling a queue, awaiting a response message that is based on the globally unique identifier (GUID) of the request (also referred to as the message label). When processing on the back end is expeditious to the client, it appears to be synchronous. If there is heavy load, a time-out thread in the stateless object returns an out parameter to the Web page. This out parameter represents the following instruction:

- Processing incomplete, please check back later with the Message GUID to retrieve the response.

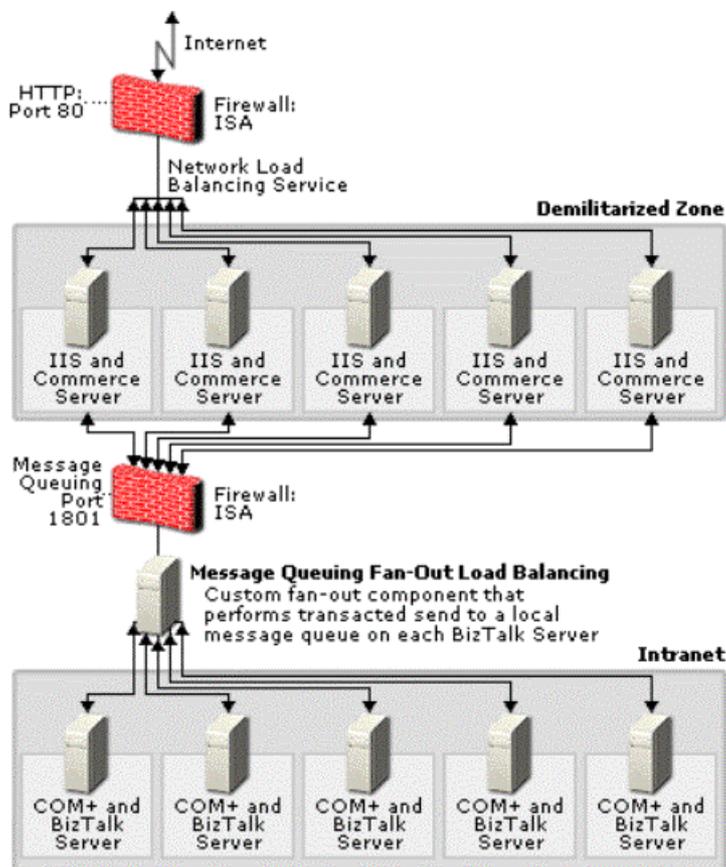
At that time, the Web page either redirects the client requests to a **CheckStatus/FetchResponse** page, which simply calls a component to poll the queue, or a script in the client browser handles the response polling. The GUID can be placed in the cookie and used to retrieve the response asynchronously.

Variations of this are possible; for example, using a SQL query to the **CheckStatus/FetchResponse** page from the Web page or component. This is not possible in businesses that require no direct back-end database interaction from Web servers in the firewall. In this situation, Message Queuing can be used for decoupling and throttling requests from responses.

### Message Queuing fan-out

To enable a firewall to allow Internet access to Message Queuing Services, Message Queuing traffic is delivered through port 1801, which is a reserved Transmission Control Protocol (TCP) port. If port 1801 is open for Message Queuing traffic and if asynchronous communication is used for the interaction between the Web client and the BizTalk Servers, it is recommended that you use Message Queuing to move messages out of the DMZ and into the business domain. Because Message Queuing 2.0 does not support remote transacted reads, a custom message queue fan-out component is required to move messages in a transacted fashion to local queues in the data farm. Assuming that messages have not been placed in the queue by an ASP page on the server running Message Queuing, this custom message queue fan-out component can be developed to pull messages off the queue and send them to local queues on the BizTalk Servers. Load balancing schemes can take advantage of Microsoft Windows® Management Instrumentation (WMI) reporting to determine the performance characteristics of each server before forwarding the message to the BizTalk Server with the smallest load.

The following illustration shows a configuration based on the scenario described in this section, using Microsoft Internet Security and Acceleration Server (ISA) as the firewall.



**Figure 4. Configuration based on the scenario described in this section, using Microsoft Internet Security and Acceleration Server (ISA) as the firewall**

## Load Balancing Considerations

To increase performance and optimize the use of processing power in a multiple-server deployment, it is necessary to ensure that new work is submitted to the server that is currently performing the least amount of processing. Load balancing is the process of determining the identity of the server that is currently performing the least amount of processing, and then directing new work to that server.

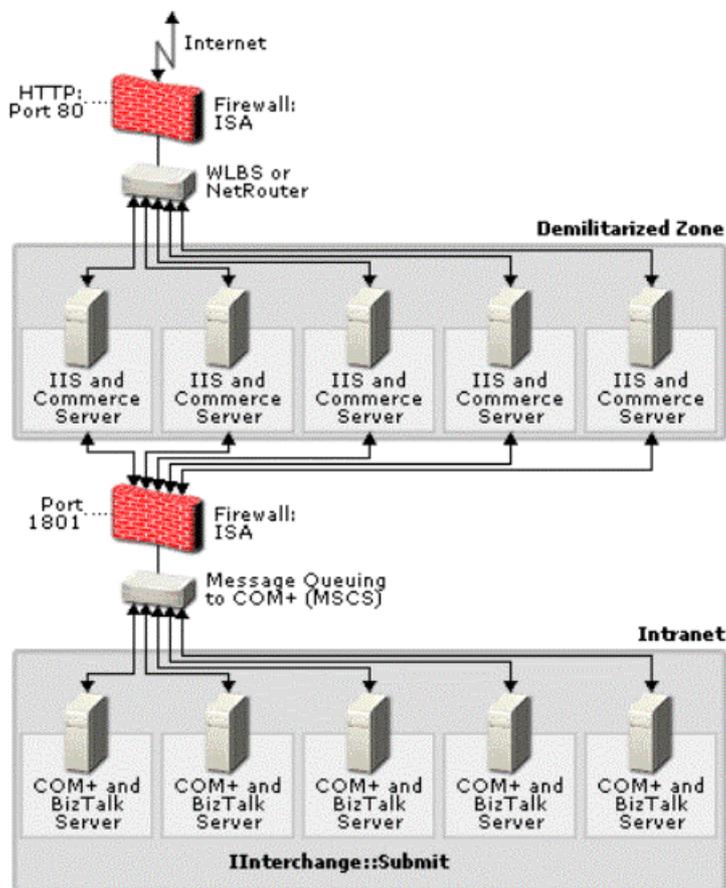
There are two load-balancing tools you can use in your BizTalk Server deployment:

- COM+ component load balancing
- Windows Network Load Balancing Service

### COM+ component load balancing

COM+ component load balancing implements load balancing on the middle tier of a three-tier deployment. In a three-tier deployment, the middle tier provides business services. The deployment model described in this section uses component load balancing to distribute the **Submit** method load across a BizTalk Server data farm where the messages are moved through the DMZ from IIS and Commerce Servers by using Message Queuing. Within a single transaction, a component reads messages from the clustered Message Queuing server, making a Distributed Component Object Model (DCOM) invocation to the **Submit** method on the **Interchange** interface. Although a synchronous implementation can be used, it is recommended that you use the asynchronous model for component load balancing because of the improvement in scalability that can be achieved with Message Queuing.

The following illustration shows a configuration based on the scenario described in this section, using Microsoft Internet Security and Acceleration (ISA) Server as the firewall server.



**Figure 5. Configuration based on the scenario described in this section, using Microsoft Internet Security and Acceleration (ISA) Server as the firewall server**

### Windows Network Load Balancing Service

Windows Network Load Balancing Service (NLBS), a component of Microsoft Windows 2000 Advanced Server and Windows 2000 Datacenter Server, distributes Internet Protocol (IP) requests across cluster members. NLBS is a software-based load balancer that resides on each cluster member. NLBS can be used to distribute HTTP calls across BizTalk Servers running within an IIS data farm. It is recommended that you separate NLBS traffic from BizTalk Server and Microsoft SQL Server™ processing traffic by using two network interface cards (NICs) in each NLBS server.

### Building Scalable and Available Web Applications

There are two core models you can use to build scalable and available Web applications. These models are:

- A synchronous Web-based model.
- A synchronous façade on an asynchronous back-end processing system.

#### Synchronous Web-based model

When using the Component Object Model (COM), the **SubmitSync** method on the **IInterchange** interface is used to make synchronous calls into BizTalk Server. In this way, a response document can be returned to the caller by using a back-end application integration component or by using an XLANG schedule. If the **SubmitSync** method is used, care must be taken to handle time-out and back-end application processing component failures. Using an asynchronous model is a more scalable approach to building application services, but it does not always correspond to many of the current synchronous Web application models. A request-response correlation architecture must be implemented to provide users and client applications with the synchronous façade that either provides an asynchronous **Submit** method invocation, or sends a response to a message queue.

Due to the nature of processing Web applications that require a synchronous HTTP interface, there are many scalability issues. Retaining open connections for long periods of time can make the application unavailable for new requests. The design goals for the processing of Web applications requiring a synchronous HTTP interface are:

- To receive and save the request, providing the caller with the acknowledgement and assurance that the request was received and understood.
- To process the request without impacting the ability to receive new requests.

- To return a response to the caller that is correlated to their request. When the scenario requires, return the response on the same HTTP connection stream of the original request.
- To support time-outs of the client requests by providing a subsequent mechanism that retrieves stored (queued) responses.

### **Synchronous façade on an asynchronous back-end processing system**

Many businesses want the Web-based user experience (or the programmatic experience) to be synchronous, if possible. However, understanding that there are scalability limitations when implementing a front-to-back synchronous solution, these businesses have chosen to place a synchronous façade on an asynchronous, back-end processing application architecture. In this way, these applications can continue to receive requests at high rates regardless of the back-end processing latencies. The back end can then be scaled out independently of the Web server layer.

The Web page that is accessed passes the message to a stateless component. This stateless component invokes a component (that might be pooled) to encapsulate Message Queuing and save the message to a queue. Either the Web page or the stateless component provides a globally unique identifier (GUID) to each request message. If the stateless component provides the GUID, the GUID is returned to the ASP page as an out parameter or placed into the IIS application or session object. In this way, messages can be safely moved from the DMZ through a single port in the last firewall into the business domain. These messages are then read within a Distributed Transaction Coordinator (DTC) transaction from the queue. This is known as a clustered resource. The messages are then sent in a load-balanced fashion to a data farm of processing servers using either COM+ Component Load Balancing or Message Queuing by a multithreaded component or service.

### **Designing BizTalk Server Groups**

A BizTalk Server group is the key organizing principle in BizTalk Server. BizTalk Server groups are collections of individual BizTalk Servers that are centrally managed, configured, and monitored. BizTalk Server uses the following queues to contain incoming and outgoing documents that are in various stages of routing and processing in BizTalk Server:

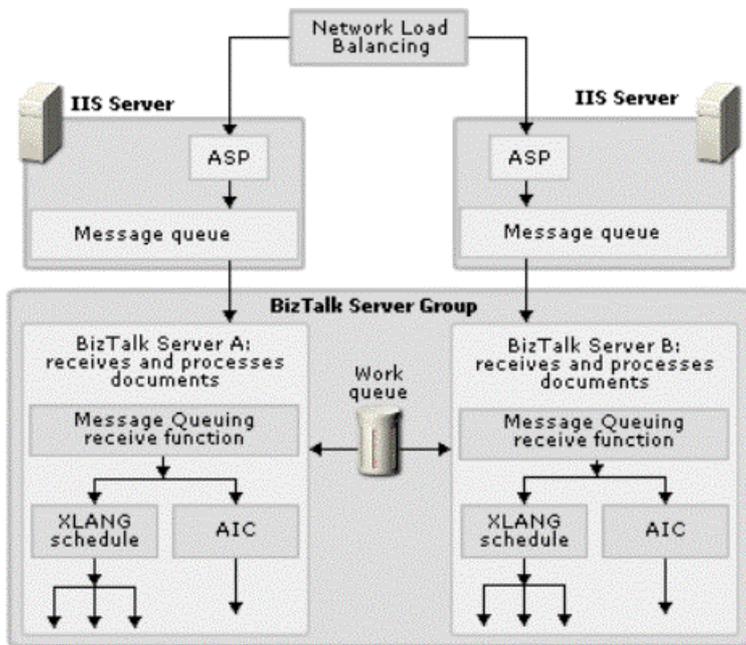
- Work queue
- Scheduled queue
- Retry queue
- Suspended queue

All servers in a group can be configured the same so they perform the same receiving and processing functions. Alternatively, servers can be configured to perform a specific function, such as receive only. The purpose of grouping is to provide redundancy and to increase performance and fault tolerance. This section provides recommendations for structuring a BizTalk Server group.

BizTalk Servers in a group host services that manage document interchange between endpoints and/or applications. These services include messaging components that are used to send and receive documents, and orchestration components that are used to implement business logic and manage state for long-running transactions.

### **Redundant server group configurations**

In a redundant server group configuration, all BizTalk Servers within a group are configured to share the same Shared Queue, Tracking, and BizTalk Messaging Management database. In this configuration, a document is posted to an ASP page. The ASP page is configured to place documents in a specific message queue that a Message Queuing receive function monitors. The Messaging Queuing receive function submits the document to BizTalk Server, where it is placed in the Work queue. The first available server picks up the document from the Work queue and completes processing. This solution enables any server in the group to process the document. The following illustration shows the structure of a group of servers.



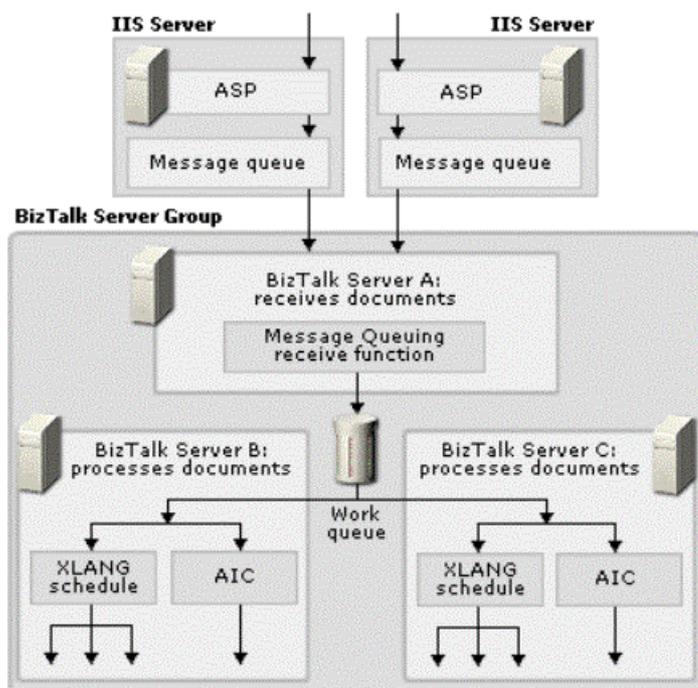
**Figure 6. Structure of a group of servers**

### Partitioned or specialized server group configurations

In this configuration, all servers in the group are configured to share the same Shared Queue, Tracking, and BizTalk Messaging Management databases. However, at least one BizTalk Server is specifically configured to receive documents, usually by using the HTTP transport service. A document arrives in a message queue and is picked up and submitted to BizTalk Server. The BizTalk Server that runs the Message Queuing receive function does not participate in document processing. This results in rapid document submission that helps prevent documents from accumulating in the message queue. BizTalk Servers configured only to receive documents provide the following functionality:

- Decryption, decoding, and digital signature verification.
- Parsing and document validation.
- Submitting the document to the Work queue for processing on successful submissions or into the Suspended queue for faulty submissions.

The other BizTalk Servers in the group are responsible for processing. In this partitioned configuration, the server used to receive documents must be part of a fail-over cluster to provide fault tolerance. This is because the receiving server is neither functionally replicated nor redundant. The following illustration shows the structure of a group of servers for partitioned processing.



**Figure 7. Structure of a group of servers for partitioned processing**

## To configure a BizTalk Server to receive documents

1. Open BizTalk Server Administration, expand Microsoft BizTalk Server 2000, and expand the server group for the server that you want to configure.
2. Right-click the server that you want to configure and click **Properties**.

The **Properties** dialog box appears.

3. Clear the **Participate in work-item processing** check box.

## To configure a BizTalk Server for document processing

1. Open BizTalk Server Administration, expand Microsoft BizTalk Server 2000, and expand the server group for the server that you want to configure.
2. Right-click the server that you want to configure, click **Properties**.

The **Properties** dialog box appears.

3. Select the **Participate in work-item processing** check box.
4. In the **Maximum number of receive function threads allowed** box, type a value greater than zero.
5. In the **Maximum number of worker threads per processor allowed** box, type the number of worker threads that you want to use.

**Note** The server will not participate in document processing if no receive functions are activated and no applications post documents to it by using the **Interchange** interface.

## BizTalk Servers running BizTalk Orchestration Services

BizTalk Orchestration Services can either run on the same server that runs BizTalk Messaging Services, or BizTalk Orchestration Services can be scaled out on individually dedicated BizTalk Servers. By scaling out BizTalk Orchestration Services on individually dedicated servers, BizTalk Messaging Services do not need to contend for CPU and file I/O resources with BizTalk Orchestration Services. XLANG schedule activation requires server affinity for rehydrated XLANG schedule instances; therefore, BizTalk Servers running BizTalk Orchestration Services must be clustered in an active-passive manner. Active servers and passive servers are part of a redundant configuration that provides a high level of availability. If the server that is performing the processing (the active server) fails, one or more of the passive servers will become active and perform the processing. In this configuration, if the active server fails, the passive server continues executing the XLANG schedule instances from the last known state.

## BizTalk Messaging Services

It is highly recommended that you review the information in the topic "BizTalk Services" in the BizTalk Server 2000 product documentation before you read this section. This section contains background information, information about best practices, and troubleshooting tips relating to BizTalk Messaging Services.

## BizTalk messaging objects

BizTalk Server uses the following objects to configure the necessary properties to process and transmit submitted work items:

- **Channels.** A set of properties that direct BizTalk Server through the appropriate steps to process documents. Channel properties include a source organization or application, a document definition, a map, and field and document tracking settings.
- **Messaging ports.** A set of properties that specify how an interchange or document is transported to a destination organization or application. Messaging port properties include transport services, destination organization or application, security settings, and envelope settings.
- **Distribution lists.** A group of messaging ports. Use a distribution list to send the same document to more than one trading partner organization or applications. In the BizTalk Messaging Configuration object model, a distribution list is called a port group.
- **Organizations.** The trading partners with which your business exchanges interchanges and documents. An organization can be internal, such as an application of another division of a company. Alternatively, an organization can be external, such as a different business.
- **Document definitions.** A set of properties that represents an inbound or outbound document and that might provide a pointer to a specification. A specification defines the document structure, document type, and version. However, a pointer from the document definition to a specification is not required.

- **Envelopes.** A set of properties that can represent the transport information for a document. An envelope associated with an inbound interchange or document provides BizTalk Server with the information that it needs to interpret the submitted document. For example, the envelope can contain a pointer to the document definition. An envelope associated with an outbound interchange or document gives BizTalk Server the information that it needs to create the document. Envelope properties are optional for most file formats.
- **BizTalk Configuration Assistant (BTConfigAssistant).** This tool enables you to view all of the details of a configuration. It also provides a mechanism for easily importing and exporting configurations, and deploying BizTalk Messaging Services to a new server. BTConfigAssistant is in the Messaging Samples folder in the Microsoft BizTalk Server installation drive. Browse to \Program Files\Microsoft BizTalk Server\SDK\Messaging Samples on the installation drive to find this tool. This is only a relative path. Depending on your installation of BizTalk Server 2000, you might have to modify this path.

### Custom BizTalk messaging components

There are several extensibility options for BizTalk Messaging Services. These include the ability to integrate custom components that implement one or more integration interfaces.

BizTalk Server 2000 Enterprise Edition supports product extensibility that enables more complex document processing. The extensions available in BizTalk Server Enterprise Edition are:

- **Custom parsers.** To enable parsing of formats that are not supported in the native parsers provided by BizTalk Server 2000, the enterprise edition enables you to create custom parser components that conform to a well-defined parser interface. You can configure these components in BizTalk Server to parse documents for the formats that they support.
- **Custom serializers.** To enable serializing of documents into proprietary or other formats that are not supported by the serializers that are provided with BizTalk Server 2000, the enterprise edition enables you to create custom serializer components that conform to a well-defined serializer interface. You can configure these components in BizTalk Server to serialize documents into the formats that they support.
- **Custom preprocessing components.** BizTalk Messaging Services support a preprocessing link to the Message Queuing and File receive functions that allows custom components implementing the **IPreProcess** interface to provide custom processing on the receiving of documents prior to submission to the server.

### Application integration components

Integrating with BizTalk Messaging Services using the Component Object Model (COM) at the transport layer is possible by implementing one of two sets of interfaces:

- **IPipelineComponent** and **IPipelineComponentAdmin**
- **IBTSAppIntegration**

Any object that implements the interface set (or the single interface) and selects the AIC messaging port transport type will be invoked by BizTalk Messaging Services when a document passes through the messaging port. Registering these AICs with an affinity GUID or within a COM+ application package enables them to appear in BizTalk Messaging Manager.

### ASP property pages

AICs that implement the **IPipelineComponent** set of interfaces can optionally receive additional configuration data at run time along with the delivery of messages on the **CDictionary** object. The additional run-time data is configured by placing ASP property pages in the directory designated for the property pages (for example, \Program Files\Microsoft BizTalk Server\MessagingManager\pipeline). To select and set the values of these property pages, open BizTalk Messaging Manager and edit the channel. The **Advanced** button in the last dialog box enables you to set the properties for the primary transport.

### Tracking database maintenance

When document tracking is used, the Tracking database will increase in size. It is necessary to implement SQL replication and purge procedures to move data from the Tracking database to a data warehouse. To maintain the Tracking database, you can use DTA\_SampleJobs.sql, a sample SQL Server script that is provided to remove records from the Tracking database. You can find this sample script in the \Program Files\Microsoft BizTalk Server\SDK\Messaging Samples\SQLServerAgentJobs folder. Review the readme included with this sample for more information about how to tailor the script to your specific BizTalk Server deployment.

**Note** If you are using SQL Server 7.0 with Service Pack (SP) 2, the tables that have image or text columns might not shrink in size, even if you delete rows from those tables in the Tracking database. SQL Server SP 3 helps to alleviate this issue. SP 3 is available at the Microsoft SQL Server Web site ([www.microsoft.com/sql/downloads/sp3.htm](http://www.microsoft.com/sql/downloads/sp3.htm)).

This issue does not occur in SQL Server 2000.

If you configure your BizTalk Server deployment to track documents, you might need to change the following SQL Server settings for the Tracking database:

- Auto shrink
- Truncate log on checkpoint
- Automatically grow file

The option, **Automatically grow file**, is the recommended configuration option for the Tracking database.

For more information about maintaining the Tracking database, see "Administering Databases" in the Microsoft BizTalk Server 2000 Operations article.

## BizTalk Orchestration Services

It is highly recommended that you review the information in the topics "BizTalk Services" and "Server Administration" in the BizTalk Server 2000 product documentation before you read this section. The Server Administration topics contain detailed information about the configuration of BizTalk Servers running BizTalk Orchestration Services. This section contains background information, information about best practices, and troubleshooting tips relating to BizTalk Orchestration Services.

### BizTalk Orchestration .skx and .skv files

In BizTalk Orchestration Designer, XLANG schedule drawings are saved with the .skv file extension. You can then compile the XLANG schedule drawing into an XLANG schedule, which is an XML-structured file with the .skx file extension. The XLANG Scheduler Engine can then process the .skx file. You will need to implement version control for both .skv files and .skx files using products such as Microsoft Visual SourceSafe®.

### Implementation technologies

BizTalk Orchestration Designer provides four **Implementation** shapes. These shapes are used to describe the implementation technologies that are used to implement a port in a business process. The implementation technologies are:

- **COM components.** This implementation technology enables you to use preexisting components or applications to perform actions within an XLANG schedule. The COM implementation technology is synchronous. There is always a bidirectional flow of messages when an action is performed.
- **Windows Script Components.** This implementation technology enables you to use preexisting components or applications to perform actions within an XLANG schedule, using a Windows Script Component (.wsc) file. The Windows Script Component implementation technology is synchronous. There is always a bidirectional flow of messages when an action is performed.
- **Message Queuing.** This implementation technology enables an XLANG schedule to communicate with another XLANG schedule (or with an application), in a loosely coupled manner by using a message queue.
- **BizTalk Messaging.** This implementation technology enables you to use BizTalk Messaging Services to exchange messages between BizTalk Orchestration Services and BizTalk Messaging Services.

By visually inspecting the \*.skv file, you can build an inventory of the required implementation technologies. It is also possible to create a list of specific binding objects programmatically by parsing the \*.skx files and extracting binding-specific elements.

The following code shows XLANG binding examples:

#### COM binding

```
<portBinding tag="0!57">
  <portRef location="LineItemUtil"/>
  <portTranslation>
    <com:interface tag="0!53" iid="55f3c4f3-fb27-4789-a5bd-263bbc4b672a"
      clsid="a8f6910c-bb6b-4edc-a93c-fa104066e858" holdstate="1" />
  </portTranslation>
</portBinding>
```

#### Message queue binding

---

```
<portTranslation>
  <msmq:queue tag="0!41"
queueName=".\\private$\Items_in"/>
</portTranslation>
```

## BizTalk Server run-time authentication and identity

When BizTalk Server is installed, a COM+ application named *XLANG Scheduler* is created on the system. This application can host or execute XLANG schedules. To simplify setup, especially for developers who initially install BizTalk Server, the COM+ application is configured to run as Interactive user. However, in the deployment scenario it is strongly recommended that you do not configure COM+ applications that host XLANG schedules to use the Interactive user account. Instead, configure COM+ applications that host XLANG schedules to run under a specific user account. This account should be distinct for each host, depending on the types of XLANG schedules that are being executed by the different hosts and depending on the security requirements. Configure access to the persistence database for this account, and configure access to any other required resources.

## Configuring BizTalk Orchestration Services

On a computer, multiple COM+ applications can be configured to host XLANG schedules. Hosting the BizTalk Orchestration Services run-time environment in different COM+ applications provides the following benefits:

- **Fault isolation.** An access violation in an in-process component used by an XLANG schedule can cause the BizTalk Scheduler Engine to fail. This is similar to a poorly written in-process Internet Server Application Programming Interface (ISAPI) dynamic-link library (DLL) causing Internet Information Server (IIS) to fail. If an access violation in an in-process component used by an XLANG schedule does cause the BizTalk Scheduler Engine to fail, it can affect all of the other hosted XLANG schedules. Therefore, it is recommended that you limit the use of in-process components used by XLANG schedules to those that have been thoroughly tested.
- **Flexible security.** Different COM+ applications can run using different security settings (such as COM+ roles).

To create a new COM+ application that can host the BizTalk Orchestration run-time environment:

- When creating the XLANG host, configure the application to run under a specific user identity (ID), do not use Interactive user. Otherwise, you will need to have the system logged in as this user permanently. This is not practical in a business deployment.
- Use unique accounts for each COM+ application, but group them together to simplify access control.
- It is recommended that you group all Access Control Lists (ACLs) in a single Windows 2000 group. This will enable you to use a unique identity for each server application and treat them the same with respect to ACLs on other system resources.
- Configure a Data Source Name (DSN) for the newly created XLANG host. As described in the "Persistence Database Configuration" section of this article, the DSN can point to a database that is shared by other XLANG hosts within the BizTalk Server group.

For more information, see "Create and Configure an XLANG Schedule Host Application" in the BizTalk Server 2000 product documentation.

**Note** For Component Services Administration Help, on the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Component Services**. Press **F1** or on the **Help** menu, click the **Help topics** item.

## Persistence database configuration and maintenance

BizTalk Orchestration Services use a Microsoft SQL Server database to manage the state of XLANG schedule instances. A Data Source Name (DSN) must be configured for every instance of an XLANG schedule to ensure that each XLANG schedule instance points to a Microsoft SQL Server database. As part of the setup process, the DSN is configured for the default XLANG Scheduler Engine. A DSN, pointing to a Microsoft SQL Server database, must be configured for additional COM+ applications that can host XLANG schedules. Each of the individual BizTalk Servers running BizTalk Orchestration Services can point to different databases, or share a common database. Using multiple Microsoft SQL Servers introduces additional complexity. It is recommended that you deploy a Microsoft SQL Server that is dedicated to providing state management for BizTalk Servers running BizTalk Orchestration Services.

For more information about how to configure a DSN for a persistence database, see "Manage XLANG Applications and Databases" in the BizTalk Server 2000 product documentation.

The persistence database size must be configured to grow as the XLANG Scheduler Engine persists data about activated XLANG schedule instances. BizTalk Orchestration Services will not remove the information about XLANG schedule instances from the persistence database. This is true even for XLANG schedule instances that have completed. Because the persistence database increases in size with use, it is necessary to implement SQL replication and purge procedures to move data from the persistence database to a data warehouse.

Scripts to purge completed XLANG schedule instances, along with other utilities to manage the persistence database are not included with BizTalk Server. For information about maintaining the persistence database, go to the Microsoft BizTalk Server Web site ([www.microsoft.com/biztalk/](http://www.microsoft.com/biztalk/)).

**Caution** Do not attempt to create your own tool(s) to maintain the persistence database. By creating and using your own tool(s) to maintain the persistence database, you risk deleting important production data or corrupting the persistence database.

## Security

XLANG Scheduler, the default COM+ application that is installed by BizTalk Server, defines the security roles that control which users can interact with XLANG hosts in different ways. These security roles apply to all XLANG hosts configured on a server. It is not possible to define unique sets of users for these roles on a per-XLANG host basis. For more information, see "Security for Applications That Host XLANG Schedule Instances" in the BizTalk Server 2000 product documentation.

### Security administration

Security data used to access resources such as message queues and file shares (for example, Domain\Account) must be implemented for the given deployment environment.

### Server affinity of XLANG schedules

Instances of an XLANG schedule have affinity to the COM+ XLANG application and the server on which they were activated. This implies that the XLANG schedule instances are not automatically rehydrated on a different server if the server on which the XLANG schedule instance has affinity fails. One way to address this issue is to set up servers running BizTalk Server in an active-passive type of fail-over cluster. In this configuration, if the active server fails, the passive server continues executing the XLANG schedule instances from the last known state.

### Message queue size limits

A message queue has a storage limit of 4 MB per-message that is stored in a message queue and a total limit of 2 gigabytes (GB) for all messages that can be stored in a message queue.

### Scalability issues

There are several reasons why the scalability of activated XLANG schedules might be affected by a particular deployment. The most common reasons are discussed here. Some of these are not related to the deployment architecture, but relate to the design and implementation of the XLANG schedules.

- If Microsoft Visual Basic® components are called in an XLANG schedule, a performance decrease is experienced when there is a large number of outstanding calls. The XLANG Scheduler Engine is configured to execute within a multithreaded apartment, and there is only a limited pool of threads that can be used by the XLANG Scheduler Engine to invoke components that need to execute in single threaded apartments. Because all Visual Basic components are single threaded apartments, calls to these components will block if there are many outstanding concurrent calls. To avoid this problem, use Microsoft Visual C++® to create multithreaded apartment components.
- Low throughput of XLANG schedule instances is often caused by bottlenecks in the database that is used to store the state of XLANG schedules. The problem is amplified when multiple BizTalk Servers are configured to use the same database. Throughput can be improved by configuring BizTalk Orchestration Services to use different databases. For further improvement, the databases can be configured to use different hard disks. Using different Microsoft SQL Servers for some or all of the Orchestration Services is likely to provide even better results.

Following are two additional methods you can use to reduce the use of the database by the XLANG Scheduler Engine:

- Review the design of XLANG schedule drawings to minimize the use of the **Transaction** shape.
- Review the design of XLANG schedule drawings to ensure that the latency on receive actions is set to a value that is less than three minutes. This prevents the dehydration of XLANG schedule instances that contain rapidly occurring receive actions.

- Private message queues are known to perform substantially better than public message queues because they do not require an Active Directory lookup. As described in "Persistence Database Configuration," the persistence database might become a bottleneck.
- Visual Basic components used from COM+ server applications could deadlock and cause XLANG schedule instances to stop responding. This is a known Visual Basic issue. The workaround is to ensure that the components are built with the **Retain in memory** option set (from project properties in the Visual Basic environment).
- Avoid making method calls to components that run for an extended period of time.
- The XLANG Scheduler Engine uses ActiveX® Data Objects (ADO) to save the state of XLANG schedules to the persistence database. By default, ADO installs itself as apartment threaded, which could cause a severe performance slowdown. You can run a batch file that ADO provides (\Program Files\Common Files\System\ado\makfre15.bat) that converts ADO to be "Both threaded."
- When XLANG schedules using transactions are executed under heavy stress (a large number of concurrent XLANG schedule instances), Distributed Transaction Coordinator (DTC) transactions might time out. This might occur because the XLANG Scheduler Engine enrolls in the application's DTC transaction to perform state management. XLANG schedule designers might not realize this and set the time-out to a value that might work well under low-stress situations but that can encounter problems at higher stress levels. Transaction time-out values of less than 60 seconds are not recommended.
- In addition to increasing the transaction time-out, the time-out values for ADO connection and commands might also need to be increased. Executing the following code in a .reg file adds the appropriate registry keys to the registry and also sets the time-out values to 300 seconds (the default is 60 seconds):

```
Windows Registry Editor Version 5.00

[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\BizTalk Server\1.0\XLANG Scheduler]
"ADOConnectionTimeout"=dword:0000012c
"ADOCommandTimeout"=dword:0000012c
```

Unfortunately, the error messages in the event log may not be very helpful when time-out problems occur. The following entries are typically seen in the event log:

```
event log:
Error1
The state of the XLANG schedule instance could not be saved to the database.
Detailed information is provided in the following message.
Module name: mymodule
Module ID: {EE8FB9FA-AB64-492A-A127-56A1EFDB2C50}
Instance ID: {6B48FF17-791B-474F-8EE2-AD35FF8E5A30}
Database error(s):
Error Code = 0x8004e007 : You made a method call on a COM+ component
that has a transaction that has already committed or aborted.
XLANG Scheduler Engine Internals Information:
File: d:\bts\private\sked\src\runtime\persistence\persist.cpp
Line: 261
Error 2:
An error was encountered while attempting to persist an XLANG schedule instance.
Detailed information is provided in the following message.
Error source: Field
name: __Correlation__
HRESULT: 0x80040e14
Module name: mymodule
Module ID: {EE8FB9FA-AB64-492A-A127-56A1EFDB2C65}
Instance ID: {6FE02E74-7FE2-401B-93F3-EC208636257B}
Error Code = 0x80040e14 :
```

## Shutting down applications that host XLANG schedules

If you need to bring a BizTalk Server that hosts BizTalk Orchestration Services offline, for example for maintenance purposes, you must perform a controlled shutdown of all XLANG applications to ensure that data associated with XLANG schedules is not lost. A controlled shutdown saves the state for running XLANG schedules to the appropriate persistence database. If you perform a controlled shutdown on the default XLANG Scheduler application, all XLANG schedules are gracefully shut down and preserved. If you perform a controlled shutdown on a COM+ application that you created after installation, only the XLANG schedules associated with that COM+ application are gracefully shut down and preserved. All other XLANG schedules will remain running until you shut down the COM+ application(s) with which they are associated.

To restart the XLANG schedules, you must restart all the schedules at the same time in the default XLANG Scheduler application. You cannot restart applications that are associated with a specific COM+ application.

## Message queuing dead letter queues

Each configured XLANG host creates a dead letter queue that is used to store documents that are rejected. The dead letter queue is a private message queue in the following format: <xleng hostname>.deadletter. All XML documents that either fail schema validation or are ill formed (and cannot, therefore, be parsed) are dropped into this queue. Data left in private queues that are created on a per-instance basis for the XLANG schedule is also moved to the dead letter queue before the queues are destroyed.

## XLANG schedule activation

The BizTalk Messaging implementation technology in BizTalk Orchestration Services uses a private message queue to pass data between BizTalk Orchestration Services and BizTalk Messaging Services. A private queue is created for each port that is bound to BizTalk Messaging Services when an XLANG schedule instance is activated. The private queue is destroyed when the XLANG schedule instance completes. Per-instance queues might become a management problem when there are hundreds of simultaneously active XLANG schedule instances.

To avoid the use of per-instance queues, use a Message Queuing port, instead of a BizTalk Messaging port, to activate an XLANG schedule. To implement this design, no changes are needed in the configuration of the messaging port in BizTalk Messaging Manager. However, if you require correlation to a running instance of an XLANG schedule, you must use per-instance queues.

## Updating XLANG schedules

As newer versions of BizTalk Server become available, you might need to update existing XLANG schedules to run on these newer versions. There are two ways to update an existing XLANG schedule. You can overwrite the original XLANG schedule, or you can add a new XLANG schedule that runs concurrently with the original XLANG schedule.

To overwrite the original XLANG schedule, use BizTalk Orchestration Designer to create a new XLANG schedule drawing and then compile the XLANG schedule drawing as an XLANG schedule that has the same name as the original XLANG schedule. The XLANG schedule drawing is saved as an .skv file. You can then compile the XLANG schedule drawing into an XLANG schedule, which is an XML-structured .skx text file. To update the original XLANG schedule, copy the new .skx file over the original .skx file.

To add a new XLANG schedule that runs concurrently with the original XLANG schedule, use BizTalk Orchestration Designer to create a new XLANG schedule drawing and compile the XLANG schedule drawing as an XLANG schedule with a new name. To ensure that the new XLANG schedule is correctly activated, you must change the XLANG schedule instance activation mechanism to point to the new .skx file instead of pointing to the old .skx file. When you have completed this process, new requests for XLANG schedules create instances of the new XLANG schedule.

Because all XLANG schedules and their components typically work on a per-instance basis, XLANG schedule instances that are in the process of executing the original XLANG schedule continue to run to completion. This includes XLANG schedule instances that have been dehydrated. In this scenario, the execution path continues to follow the original business process, and new requests for XLANG schedules create instances of the new XLANG schedule.

**Note** When an XLANG schedule uses an object with an interface that has changed, you must open the XLANG schedule drawing (the .skv file) in BizTalk Orchestration Designer and compile a new .skx file. This updates the binding information in the .skx file, enabling synchronization with the component's type library.

## Conclusion

BizTalk Server 2000 enables you to create solutions for enterprise application integration (EAI) and business-to-business integration with strategic trading partners. BizTalk Server 2000 enables Information Technology (IT) professionals and business analysts to build dynamic business processes that span applications, platforms, and businesses over the Internet. BizTalk Server 2000 also enables you to:

- Integrate dissimilar applications across multiple remote and autonomous business units within a business domain.
- Implement remote data interchange with external trading partners.

- Maintain security within your business, even as you use the Internet to expand your ability to implement data interchange with trading partners.
- Use existing XLANG schedules with future versions of BizTalk Server, as they become available.

## **For More Information**

"Microsoft BizTalk Server 2000 Operations." February 2001. 35 pp. Available on the [Microsoft BizTalk Server Web site](#).

"Orchestrating Business Processes with Microsoft BizTalk Server 2000." February 2001. 22 pp. Available on the [Microsoft BizTalk Server Web site](#).

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# Microsoft BizTalk Server 2000 Operations

Microsoft Corporation

February 2001

**Summary:** This article describes the concepts, tasks, and administrative issues a system administrator needs to know to operate and maintain a Microsoft BizTalk Server 2000 installation. An overview of the BizTalk Messaging Services and BizTalk Orchestration Services concepts relevant to administering BizTalk Server 2000 is provided. Additionally, this article outlines the administrative tasks and issues that system administrators might encounter. Anyone reading this article should also read the "Microsoft BizTalk Server 2000 Deployment Considerations" article, which contains important background information for this topic. (33 printed pages)

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## Introduction

Organizations that deploy a business-to-business e-commerce solution must keep the deployment functioning 24 hours a day, 7 days a week. Indeed it has become increasingly more common for enterprise application integration to have a similar up-time requirement. This article outlines the administrative tasks a system administrator must perform to keep an installation of Microsoft® BizTalk™ Server 2000 running on a continual basis. Also discussed are important concepts and common administrative issues about which system administrators must be aware.

The eight major areas of administration and management related to BizTalk Server 2000 are:

- **Server administration.** You can use BizTalk Server Administration to manage server groups and adjust server properties for maximum performance.
- **Database administration.** You can use scripts and tools to maintain the following four types of databases associated with BizTalk Server: BizTalk Messaging Management, Tracking, Shared Queue, and Orchestration Persistence.
- **Messaging objects administration.** You can use BizTalk Messaging Manager or the BizTalk Messaging Configuration object model to update messaging objects, such as channels and messaging ports. You can also use BizTalk Messaging Manager or the BizTalk Messaging Configuration object model to facilitate the processing and transmission of interchanges and documents.
- **Receive function and parser administration.** You can use BizTalk Server Administration to manage receive functions and parsers.
- **Application administration.** You can use Component Services to manage the default XLANG Scheduler application, or to add and configure additional COM+ applications that host XLANG schedules.
- **Tracking interchanges and documents.** You can use BizTalk Server Administration to change the tracking settings for a server group. Additional tracking settings can be set by using BizTalk Messaging Manager or the BizTalk Messaging Configuration object model. Tracking results can be viewed by using BizTalk Document Tracking.
- **Monitoring a BizTalk Server deployment.** You can use System Monitor, Microsoft® Windows® 2000 Event Viewer, and XLANG Event Monitor to monitor BizTalk Server.
- **Troubleshooting.** You can use BizTalk Server Administration to view the Suspended queue for processing and transmission errors. You can use Event Monitor to troubleshoot server errors, BizTalk Server application errors, XLANG Scheduler errors, and other COM+ application errors.

In addition to the administrative tasks associated with managing a BizTalk Server installation, all system administrators must be aware of the following concepts and administrative issues:

- **BizTalk Messaging Services.** How to submit interchanges and documents to BizTalk Server and how the appropriate properties must be configured to process and transmit submitted interchanges and documents.
- **BizTalk Orchestration Services.** The difference between XLANG schedule drawings and XLANG schedules and how XLANG schedules work.
- **Tracking overview.** How interchanges, documents, and action events related to messages processed by XLANG schedules are tracked in the Tracking database and viewed in BizTalk Document Tracking. After BizTalk Server is implemented, settings might need to be reconfigured to accommodate changes in business processes.
- **Transport services.** Common implementation and maintenance issues for a variety of transport services that should be considered when administering a BizTalk Server 2000 installation.
- **Security.** The security features that BizTalk Server uses and the configuration changes that might be necessary when managing a BizTalk Server 2000 installation.

## BizTalk Messaging Services Concepts

BizTalk Messaging Services are services included in Microsoft BizTalk Server 2000 that enable you to send, receive, parse, and track interchanges and documents from other organizations or applications. In addition, BizTalk Messaging Services include the ability to generate receipts for certain file formats, correlate and map data, verify the integrity of documents, and provide secure methods for exchanging documents with trading partners and applications.

To implement BizTalk Messaging Services, BizTalk Server uses messaging objects, receive functions, COM methods, parsers, and a Microsoft® SQL Server™ database (version 7.0 with SP2 or SQL Server 2000). Messaging objects, such as channels and messaging ports, are used to configure the necessary properties to process and transmit interchanges and documents submitted to BizTalk Server. Receive functions and in some cases the **Submit** and **SubmitSync** methods are used to submit incoming documents to BizTalk Server for processing. Once a document is submitted, the appropriate parser parses it and, if necessary, converts it to XML. Finally, the Tracking database stores interchange and document records for incoming and outgoing interchanges and documents that are processed by BizTalk Server.

## Messaging Objects

BizTalk Server uses the following messaging objects to configure the necessary properties to process and transmit submitted work items:

- **Channels.** A set of properties that directs BizTalk Server through the appropriate steps to process documents. Channel properties include a source organization or application, a document definition, a map, and field and document tracking settings.
- **Messaging ports.** A set of properties that specifies how an interchange or document is transported to a destination organization or application. Messaging port properties include transport services, destination organization or application, security settings, and envelope settings.
- **Distribution lists.** A group of messaging ports. Use a distribution list to send the same document to more than one trading partner organization or application. In the BizTalk Messaging Configuration object model, a distribution list is called a port group.
- **Organizations.** The trading partners with which your business exchanges interchanges and documents. An organization can be internal, such as an application in another division of your company. Or an organization can be external, such as a different business.
- **Document definitions.** A set of properties that represents an inbound or outbound document and that might provide a pointer to a specification. A specification defines the document structure, document type, and version. However, a pointer from the document definition to a specification is not required.
- **Envelopes.** A set of properties that can represent the transport information for a document. An envelope associated with an inbound interchange or document provides BizTalk Server with the information that it needs to interpret the submitted document. For example, the envelope can contain a pointer to the document definition. An envelope associated with an outbound interchange or document gives BizTalk Server the information that it needs to create the document. Envelope properties are optional for most file formats.

## Submitting Interchanges and Documents

Interchanges and documents must be submitted to BizTalk Server by using receive functions or the **Submit** or **SubmitSync** method of the **IInterchange** interface. Once an interchange or document is submitted, the appropriate parser in BizTalk Server parses it, unless the interchange or document is submitted with the pass-through flag enabled. BizTalk Server does not parse interchanges and documents submitted with the pass-through flag enabled.

## Using Receive Functions

It is recommended that you use receive functions to submit interchanges and documents to BizTalk Server. Receive functions can take advantage of caching, thus optimizing the performance of BizTalk Server. BizTalk Server supports two types of receive functions: File and Message Queuing.

Receive functions are event-based. This means that a receive function waits for an event in a specified folder or message queue. When an interchange or document is placed in the folder or message queue, the receive function immediately picks up the interchange or document and submits it to BizTalk Server for processing. If the interchange or document is large and it takes more than a few seconds to write the interchange or document to the folder or message queue, the receive function locks the file and goes into a polling mode until the interchange or document is completely copied to the receive location. Once the interchange or document is completely copied, the receive function submits it to BizTalk Server for processing and deletes the document from the message queue or the file system.

## Using the Submit and SubmitSync methods

You can use the **Submit** and **SubmitSync** methods if the application that submits interchanges and documents to BizTalk Server meets the following criteria:

- The application is a Microsoft Windows-based application.
- The application is capable of invoking methods on COM objects.
- The application can be designed to support direct calls to BizTalk Server 2000.

Again, it is recommended that you use receive functions to submit interchanges and documents to BizTalk Server. Use the **Submit** or **SubmitSync** method only if you cannot use a receive function.

## Parsers

Once an interchange or document is submitted to BizTalk Server, it is parsed. If the document is in a non-XML format, such as EDI or flat file, the parser converts the submitted interchange or document into an intermediary XML format for processing. Four specialty parsers are included with BizTalk Server to parse the following document type formats: XML, X12, EDIFACT, and flat file.

## Tracking Overview

Included in BizTalk Server 2000 is the capability to track:

- Metadata for interchanges, such as source and destination organization, time the interchange or document was processed, and so on.
- Whole copies of documents in their native or XML format.
- Specific fields.
- Custom fields.
- Action events related to messages processed by XLANG schedules.

For more information about tracking documents and interchanges, see "Tracking Interchanges and Documents" later in this paper.

## Security Overview

To facilitate the exchange of secure information between trading partners, BizTalk Server 2000 uses security features offered through Microsoft Windows 2000 and Microsoft SQL Server. Some of the security features used by BizTalk Server 2000 are included in the following list:

- **Authentication.** Authentication verifies the identity of a user who is logging on to a computer.
- **Public key infrastructure.** Public key infrastructure is a set of policies and procedures used to securely exchange information between trading partners. Elements of public key infrastructure include a public key, a private key, Certification Authorities, and digital signing.

For more information about planning your public key infrastructure by using Secure Sockets Layer (SSL) and Secure Multipurpose Internet Mail Extensions (S/MIME), go to the Microsoft TechNet Web site ([www.microsoft.com/TechNet/](http://www.microsoft.com/TechNet/)) and search for "Public Key Infrastructure."

- **Digital signatures.** Digital signatures are a guarantee that a document has not been altered after the digital signature was added. Digital certificates are used to ensure that the sender is not an impersonator.

- **Multipurpose Internet Mail Extensions (MIME).** MIME is a standard encoding method used to transmit data through Internet e-mail. When data is sent, it is encoded. When data is received, it is decoded. The file header includes the information that the recipient needs to decode the information.

For more information about MIME, go to the MSDN Online Library Web site ([msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp)) and search for "About Simple Internet (RFC 822) Messages."

- **Secure/Multipurpose Internet Mail Extensions (S/MIME).** S/MIME is the secure version of MIME. Before data is sent, it is encrypted to guarantee secure transmission.
- **Secure Sockets Layer (SSL).** Secure Sockets Layer uses a randomly generated private key that can be used only for that session. At the beginning of a session, the server sends the public key to the browser. The browser randomly generates a private key and sends it back to the server.

For more information about SSL, go to the MSDN Online Library Web site ([msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp)) and search for "Using Schannel CSPs."

In addition to the security features listed here, BizTalk Server 2000 uses logon properties, local policies, service accounts, control of a user's ability to send interchanges and documents to BizTalk Server 2000, and certificates to enhance security. These issues are described in "[Security Issues](#)," later in this article.

## BizTalk Server Orchestration Services Concepts

BizTalk Orchestration Services are composed of tools and services included in BizTalk Server that enable you to design, compile, and run XLANG schedules. Typically, a business analyst and a developer are involved in designing and compiling XLANG schedules. The system administrator manages the deployment and operation of XLANG schedules. Additionally, the system administrator might create custom COM+ applications to host XLANG schedules and create persistence databases to store dehydrated XLANG schedule states.

There are eight concepts related to understanding and running XLANG schedules. They are:

- **XLANG language.** An XML-based language that describes the logical sequencing of business processes. The XLANG language also describes the implementation of the business process by using various application services.
- **XLANG schedule drawing.** A representation of all the different steps in a business process. For example, if an employee requests a new computer, an XLANG schedule can be used to show the flow of information from the initial request from the employee, to the acceptance or denial of the request, to the purchase of the computer—if the request is accepted—to the generation of the invoice and the payment of the invoice. The XLANG schedule drawing includes the protocol that trading partners agree to use to exchange data and the flow of data between message fields. A completed drawing can be compiled and run as an XLANG schedule. An XLANG schedule drawing is saved with the file extension .skv.
- **XLANG schedule.** Specific business processes expressed in the XLANG language. An XLANG schedule is saved with the file extension .skx.
- **XLANG schedule instance.** A particular occurrence of an XLANG schedule. The XLANG Scheduler Engine can run a single instance, or multiple instances, of an XLANG schedule. Different instances of the same XLANG schedule contain different messages, but all instances follow the same business-process rules.
- **XLANG identity.** A globally unique identifier that is used to distinguish version instances of an XLANG schedule drawing. This property is read-only and cannot be changed by users. Each time an XLANG schedule drawing is updated, the identity is also updated. The XLANG identity can be used to correlate an XLANG schedule with the specific version of an XLANG schedule drawing from which the schedule was compiled.
- **XLANG schedule state.** The information contained in an XLANG schedule instance. This information includes:
  - Messages that have been sent or received by that instance.
  - Any COM objects used by that instance that contain state information and are able to preserve state information.
  - The progress of that instance toward the completion of the business process.
- **XLANG Scheduler.** The default COM+ application that is installed when you install BizTalk Server 2000. This application is used to host running instances of XLANG schedules.
- **XLANG Scheduler Engine.** A service that runs XLANG schedule instances and controls the activation, execution, dehydration, and rehydration of an XLANG schedule.

## Dehydration and Rehydration

When an instance of an XLANG schedule is running, it is processed in memory. Because XLANG schedules are designed to support long-running, loosely coupled, executable business processes, it can become impractical to have thousands of XLANG schedule instances continuously running over a long period of time because it would be a poor use of resources. In addition, if an

XLANG schedule runs only in memory, data is lost or possibly corrupted if the server on which the XLANG schedule is running fails. In these situations, the XLANG Scheduler Engine infrastructure dehydrates or rehydrates XLANG schedule instances.

An XLANG schedule is dehydrated when an XLANG schedule instance is waiting for a message and no other activity is occurring in the schedule instance. Dehydration means that the instance-specific state information is stored in the appropriate persistence database and the XLANG schedule no longer resides in memory.

An XLANG schedule is rehydrated when the message for which the XLANG schedule instance is waiting arrives. At this time the XLANG schedule instance is rehydrated, the instance-specific state information is removed from the persistence database, and the schedule instance resides in memory again.

An XLANG schedule instance remains dehydrated until it is either rehydrated or explicitly terminated by an administrator. This enables a business process to run reliably for an extended time period.

## Administering BizTalk Server

The following five areas of administration are related to maintaining BizTalk Server in a state of continuous operation:

- **Administering servers.** Administrative tasks include managing server groups and servers.
- **Administering databases.** Administrative tasks include maintaining the four types of databases associated with BizTalk Server.
- **Administering messaging objects.** Administrative tasks include managing messaging objects such as channels, messaging ports, and envelopes.
- **Administering receive functions and parsers.** Administrative tasks include managing receive functions and changing the parser order.
- **Administering applications.** Administrative tasks include managing the default XLANG Scheduler, creating and managing COM+ applications to host new XLANG schedules, and managing application identities.

## Administering Servers

Some of the most common tasks related to server administration include:

- Adding and managing server groups.
- Adding and managing servers installed with BizTalk Server 2000.
- Managing interchanges and documents in the Shared Queue database.

Use BizTalk Server Administration to perform these server administration tasks. Or perform many of these tasks programmatically by using the Windows Management Instrumentation (WMI) layer.

## Managing Server Groups

Server groups are the basic organizing principle for server administration in BizTalk Server 2000. Servers are organized into groups to increase performance and provide a level of redundancy and fault tolerance. Server groups have eight properties that can be configured to manage the servers within the group. There are many reasons why you might need to modify one or more of these properties after the initial deployment of BizTalk Server. For example, you might need to associate a server group with a new and/or replicated Tracking or Shared Queue database, or you might need to update the SMTP host that a server group uses.

Server group properties can be modified in BizTalk Server Administration in the **<Server Group Name> Properties** dialog box. The following table lists some of the common configuration updates and which property you must modify to implement the update.

If you need to do this	Modify this server group property	On this tab
Change the SMTP host that a server group uses.	<b>SMTP Host</b>	<b>General</b>
Change the URL the server group uses to receive reliable messaging receipts.	<b>Reliable messaging reply-to URL</b>	<b>General</b>
Modify how often the Messaging Management object cache is refreshed.	<b>Messaging Management object cache interval</b>	<b>General</b>
Add and/or change the proxy server that the server group uses.	<b>Proxy server</b>	<b>General</b>
Change the Tracking database that the server group uses.	<b>Tracking database</b>	<b>Connection</b>
Change the Shared Queue database that the server group uses.	<b>Shared Queue database</b>	<b>Connection</b>

Turn on or off tracking settings.	<b>Enable document tracking</b>	<b>Tracking</b>
Turn on or off the ability to log incoming interchanges.	<b>Log incoming interchange</b>	<b>Tracking</b>
Turn on or off the ability to log outgoing interchanges.	<b>Log outgoing interchange</b>	<b>Tracking</b>
Turn on or off the ability to log original MIME-encoded messages.	<b>Log the original MIME-encoded message</b>	<b>Tracking</b>
Change the parser order or refresh the parser list from the registry.	<b>Arrange the server call sequence</b>	<b>Parser</b>

## Managing Servers

There are two situations that require you to change server properties:

- Adding a server to a group
- Changing the balance between throughput and performance for one or more servers in one or more groups

Servers in a server group are configured to balance server performance and maximum throughput. If your business needs change, you might need to adjust the server settings that were configured when BizTalk Server was installed. For example, you might be required to process more documents more quickly. Or you might need to configure a server in a group to receive only interchanges and documents. When you adjust server properties, experiment with various combinations in a test environment before you change the server properties on your production BizTalk Servers.

You can change server properties in BizTalk Server Administration in the **<Server name> Properties** dialog box. The following list describes each of the server properties and the implications of changing the settings:

- **Maximum number of receive function threads allowed.** Specifies the maximum number of receive function threads on a per-processor basis. Increasing this number increases the throughput of the receive functions on the server. In general, if a BizTalk Server is receiving and processing documents or just processing documents, set this property to 1. However, if a BizTalk Server is configured to receive only, set this property to 4 to optimize throughput.
- **Participate in work-item processing.** Specifies whether the server is processing interchanges and documents. If the **Participate in work-item processing** check box is selected, the server processes interchanges and documents in the Work queue. If this check box is cleared, the server does not process any interchanges or documents in the Work queue.

If you need to configure a server so it receives only documents, clear the **Participate in work-item processing** check box. Or if you need to dedicate a server in one of the server groups to administration, clear the check box for this option on that server.

- **Maximum number of worker threads per processor allowed.** Specifies the maximum number of worker threads on a per-processor basis. A low setting might cause a bottleneck if your BizTalk Server installation processes a high volume of documents and interchanges. Increase the setting to relieve the bottleneck. However, if the setting is too high, performance degradation might occur. In general, setting this property to 14 or 16 provides the best throughput.
- **Time between BizTalk Server Scheduler calls.** Specifies the range for time between BizTalk Server Scheduler calls. A thread polls the Work queue for interchanges and documents that need to be processed. This option controls how often that thread polls the Work queue. If the amount of data that you receive increases, you might need to lower this number. If the amount of data that you receive decreases, you might need to increase this setting.

The **Maximum number of worker threads per processor allowed** and the **Time between BizTalk Server Scheduler calls** settings are two factors that influence how often BizTalk Server accesses the Shared Queue database. If the amount of data that you receive and process has changed since you installed BizTalk Server 2000, you might need to adjust these settings. For example, if you need to limit how often the Shared Queue database is accessed, set the number lower for **Maximum number of worker threads per processor allowed** and higher for **Time between BizTalk Server Scheduler calls**. Similarly, if you need to increase the volume to the databases, increase the number for the maximum number of worker threads and decrease the setting for the time between scheduler calls. Again, test the new configurations in a simulated environment before you implement the changes on your production BizTalk Servers.

## Managing Queues

When an interchange or document is submitted to BizTalk Server 2000, it is stored in the Shared Queue database until it is completely processed. The Shared Queue SQL Server database is graphically represented in BizTalk Server Administration as the **Queues** item in each server group. The **Queues** item, also called the Shared Queue, contains four subitems that represent the four queues of the Shared Queue. They are the Work, Scheduled, Retry, and Suspended queues. By accessing these queues, you can determine what stage of processing the interchange or document is in. For example, you can determine if a document has been processed and is waiting for transmission or if an interchange or document failed processing.

## Managing the Work queue

The Work queue contains interchanges and documents that are currently in process. Unless you are continually processing a large number of documents, this queue usually is empty. Interchanges and documents placed in this queue are processed upon arrival, and they are not in the queue for very long.

Any item in the Work queue can be moved to the Suspended queue. Move interchanges and documents to the Suspended queue only if you want to prevent them from being processed. Once an interchange or document is moved to the Suspended queue, it can be deleted, resubmitted, or retransmitted to the Work queue to complete processing.

## Managing the Scheduled queue

The Scheduled queue contains interchanges and documents that have been processed by BizTalk Server and are waiting for transmission based on the service window. Like the Work queue, any item in the Scheduled queue can be moved to the Suspended queue.

## Managing the Retry queue

The Retry queue contains interchanges and documents to be resubmitted for delivery and documents that are waiting for reliable messaging receipts. You cannot tell the difference between the two types of transmissions. By default, failed transmissions are retried every five minutes for a maximum of three tries before they are moved to the Suspended queue. If your business process requires that you change this default setting, you can change the number of retries available and the interval in the appropriate channel in BizTalk Messaging Manager. Or you can change the interval number of retries programmatically by using the **RetryCount** and **RetryInterval** properties of the BizTalk Messaging Configuration object model.

## Managing the Suspended queue

The Suspended queue stores and displays interchanges and documents that have failed processing for reasons such as parsing errors, serialization errors, missing channels, and so on. Most interchanges or documents in this queue can be deleted, resubmitted, or retransmitted to BizTalk Server for processing. Interchanges and documents that failed parsing cannot be resubmitted or retransmitted. You must delete these documents and submit them to BizTalk Server again from the original application or organization. In addition, the Suspended queue is a source of information to help you troubleshoot BizTalk Server errors and processing problems. For more information about troubleshooting, see "Troubleshooting BizTalk Server" later in this paper.

## Accessing and viewing the Shared Queue

You can access the Shared Queue by viewing the **Queues** item in each server group in BizTalk Server Administration. You can also access the Shared Queue by using the Windows Management Instrumentation (WMI) layer. Interchanges and documents appear in each of the queues in the order of "first in, first out." That is, the oldest items in the Work, Retry, Scheduled, or Suspended queue appear first and the newest items appear last. Additionally, up to 15,000 interchanges and/or documents appear in a queue at a time. In BizTalk Server Administration, the queue count in the console tree—the number in parentheses next to each queue—represents how many actual items are in that particular queue. If there are more than 15,000 actual items in a queue, remove or resubmit current items in the queue so that newer items can be displayed. For example, if there are 16,000 items in the Retry queue, you must move at least 1,000 items from the Retry queue to the Suspended queue to view the newest 1,000 items in the Retry queue. From the Suspended queue, you can resubmit or delete the interchanges or documents that were in the Retry queue.

## Refreshing BizTalk Server Administration

There is no automatic refresh cycle for BizTalk Server Administration. If you want to view the current status of server groups, servers, receive functions, the number of items in a queue, and so on, you must refresh BizTalk Server Administration. You can perform this procedure on any item in the console tree or on an individual item. For example, when you refresh the **Microsoft BizTalk Server Administration** item, all items in BizTalk Server Administration are refreshed. When you refresh a server group, only the items in that server group are refreshed.

## Administering Databases

The second aspect of administration that relates to BizTalk Server is database administration. The following four types of Microsoft SQL Server databases are associated with BizTalk Server 2000:

- **BizTalk Messaging Management database.** This database stores information for all server and messaging configuration. Server configuration information includes server group and server settings, and receive functions. Messaging configuration includes channels, messaging ports, document definitions, organizations, and so on.
- **Tracking database.** This database stores all interchanges, documents, and receipts that are processed by BizTalk Server if tracking settings for a server group, channel, and/or document definition are turned on.

- **Shared Queue database.** This database holds documents while they are being processed or waiting to be processed. Documents are removed from this database after they have been processed.
- **Orchestration Persistence database.** This database stores the XLANG schedule state when an XLANG schedule is dehydrated.

BizTalk Server 2000 stores the four types of databases it uses in SQL Server, so a majority of the administrative tasks associated with managing the databases are associated with managing SQL Server. Because there is a large amount of information published about SQL Server administration, this paper will not repeat that information with the exception of the following topics:

- Database replication
- SQL Server settings
- Database administration issues

For more information about administering SQL Server, see the Microsoft SQL Server Web site ([www.microsoft.com/sql](http://www.microsoft.com/sql)).

## Database Replication

A general administrative task that can be performed with databases is replication. It is recommended that you replicate and provide a backup facility for the four types of databases associated with BizTalk Server. You can make duplicate copies of your data, move those copies to different locations, and synchronize the data automatically. This ensures that all copies have the same data values. Replication can be implemented between databases on the same server, or on different servers that are connected by a local area network (LAN).

## SQL Server Settings

After you deploy BizTalk Server 2000, you might need to change the following settings associated with your SQL Server databases:

- **Auto shrink**
- **Truncate log on checkpoint**
- **Automatically grow file**

You can change the **Auto shrink** and **Truncate log on checkpoint** settings in SQL Server Enterprise Manager in the **<Database Name> Properties** dialog box on the **Options** tab. You can change the **Automatically grow file** setting in SQL Server Enterprise Manager in the **<Database Name> Properties** dialog box on the **Settings** tab.

The **Auto shrink** and **Truncate log on checkpoint** settings control disk space allocation. If you want to avoid unnecessary disk space allocation, enable the **Auto shrink** and **Truncate log on checkpoint** options in SQL Server. The **Truncate log** option is available only in SQL Server 7.0.

The **Automatically grow file** setting enables the four types of SQL Server databases associated with BizTalk Server to grow in size if necessary. When SQL Server is installed, the **Automatically grow file** setting is enabled by default. Keep this setting enabled under the following conditions:

- If you want SQL Server to handle low database space conditions automatically.
- If SQL Server is the only application using disk space and when ample disk space exists to grow databases.
- If you want to use disk Quota Alerts to alert you that a database is nearing its capacity limits. This enables you to prevent a BizTalk Server from failing because one of the databases it uses reaches capacity.

Although it is recommended that you leave the **Automatically grow file** setting enabled, you might need to turn this setting off in the following situations:

- If you must have control over how much space SQL Server uses.
- If SQL Server shares the same disk with other applications and those applications must have disk space available at all times.
- If you want BizTalk Server or other processes to stop when SQL Server is out of space. This allows clean-up processes to run, and BizTalk Server can be restarted when the clean-up process is complete.

## Database Administration Issues

Of the four types of databases associated with BizTalk Server, two require special maintenance attention: the Tracking and Orchestration Persistence databases. These two types of databases can grow in size quickly and require regular maintenance.

## Maintaining the Tracking database

If you configured all tracking options for a server group in BizTalk Server Administration and if you configured any channels or document definitions to track specific fields, your Tracking database will grow in size very quickly. To maintain the Tracking database, you can use DTA\_SampleJobs.sql, a sample SQL Server script that is provided to remove records from the Tracking database. This script removes copies of the intermediary XML records stored in the dta\_debug\_doc table if the number of records in the table is greater than 25,000. This script also monitors the dta\_outdoc\_details table for records that are expecting receipts, but the waiting period has elapsed. You can find this sample script in the \Program Files\Microsoft BizTalk Server\SDK\Messaging Samples\SQLServerAgentJobs folder. Review the readme included with this sample for more information about how to tailor the script to your specific BizTalk Server deployment.

**Note** If you are using SQL Server 7.0 with SP2, the tables that have image or text columns might not shrink in size, even if you delete rows from those tables in the Tracking database. SQL Server SP3 helps to alleviate this issue. SP3 is available at the Microsoft SQL Server Web site ([www.microsoft.com/sql/downloads/sp3.htm](http://www.microsoft.com/sql/downloads/sp3.htm)).

This issue does not occur in SQL Server 2000.

## Replicating the Tracking database

It is recommended that your database maintenance plan includes automatic replication of the Tracking database. If the Tracking database grows too large, BizTalk Server performance is greatly affected. You can use the SQL Server Enterprise Manager console to set up replication and to set up jobs to remove transactions from the database based on criteria that you specify.

**Caution** Do not change the code, such as stored procedures or triggers, in the Tracking database. Do not access the Tracking database directly. Do not directly call the stored procedures or add triggers. Making changes to the Tracking database in this way might cause BizTalk Server to function incorrectly, cause the loss of data, or corrupt the Tracking database.

## Maintaining the Orchestration Persistence database

Scripts to clean up old XLANG schedule instances along with other utilities to manage the persistence database used by BizTalk Orchestration Services are not included with BizTalk Server. However, this issue will be corrected in a future release. For information about maintaining the persistence database, articles, and the most recent updates on the availability of such scripts, go to the Microsoft BizTalk Server Web site ([www.microsoft.com/biztalk/](http://www.microsoft.com/biztalk/)).

**Caution** Do not attempt to create your own tool(s) to maintain the Orchestration Persistence database(s). If you access the Orchestration Persistence database in this way, you could delete important production data or corrupt the Orchestration Persistence database.

## Administering Messaging Objects

You can use BizTalk Messaging Manager or the BizTalk Messaging Configuration object model to configure additional messaging objects or to update and manage current messaging objects. For example, you might need to update the URL for the HTTP transport service in a messaging port. Or you might want to change the fields that you track in a channel or document definition.

The following table lists some of the messaging object properties that a system administrator might need to update or reconfigure.

If you need to do this	Configure this property	On this messaging object
Update or reconfigure a transport service.	<b>Primary transport, Backup transport</b>	Messaging ports or distribution lists (port groups)
Change where an interchange or document is sent.	<b>Open destination, Organization, New XLANG schedule, Running XLANG schedule, Application</b>	Messaging port or distribution list (port group)
Change the envelope for an interchange or document instance for a specific trading partner.	<b>Envelope information</b>	Messaging port or distribution list (port group)
Change or update an envelope format.	<b>Envelope format</b>	Envelope
Set the option so an interchange or document generates a receipt when it is received from a trading partner.	<b>Generate receipt</b>	Channel
Set the option for an interchange or document to expect a receipt when it is sent to a trading partner.	<b>Expect receipt</b>	Channel

Change from whom an interchange or document is expected.	<b>XLANG schedule, Application, Open source, Organization</b>	Channel
Change the name of an organization.	<b>Organization name</b>	Organization
Change fields that are tracked.	<b>Fields to track</b>	Channel or document definition
Change the name of a document definition.	<b>Document definition name</b>	Document definition

## Administering Receive Functions and Parsers

In addition to messaging objects, receive functions and parsers must also be managed in BizTalk Server 2000. You can use BizTalk Server Administration to manage receive functions and parsers.

### Receive Function Administration issues

For many different reasons, you might need to delete a server from a server group. For example, you might need to replace a server with a new one. Or you might need to move a server from one group to another to provide better load balancing in the new server group. If you plan to delete a server from a server group, you must first complete one of the following tasks:

- Reconfigure all receive functions that point to the server that you want to delete to point to a different server in the server group.
- Delete the receive functions that point to the server you want to delete if they can no longer be used.

You are prevented from deleting a server from a server group if one or more receive functions point to it.

### Parser administration issues

If you receive files in formats other than XML, X12, EDIFACT, or flat file, you must create your own parser and register it on the appropriate BizTalk Server. If you create a custom parser, it appears at the bottom of the parser list after the parser is registered and the list is refreshed. This list can only be refreshed locally. That is, if you registered the custom parser on BizTalk Server A, you must refresh the parser list on BizTalk Server A. You cannot refresh the parser list from a remote computer.

When BizTalk Server is installed, parsers appear in the parser list in the following order:

- BizTalk.ParserXML.1
- BizTalk.ParserEdifact.1
- BizTalk.ParserX12.1
- BizTalk.ParserFFile.1.

Again, if you add any custom parsers, they appear at the end of this list unless you change the parser order. To maximize BizTalk Server performance, for the document format that you receive most frequently, put the corresponding parser at the top of the list. For example, if you receive mostly flat files, change the parser order so that the flat-file parser is at the top of the list.

## Administering Applications

The focus of application administration is managing the COM+ applications that host XLANG schedules. When BizTalk Server is installed, two COM+ applications are installed that you must administer:

- **The default XLANG Scheduler application.** This application hosts the default instance of the XLANG Scheduler Engine.
- **The BizTalk Server Interchange Application.** This application hosts the roles that limit who can send interchanges and documents to BizTalk Server.

Tasks related to application administration include:

- Changing the configuration of the default XLANG Scheduler application.
- Adding new COM+ applications.
- Changing the application identity.
- Changing the default Orchestration Persistence database settings and configuring settings for new persistence databases.
- Adding new persistence databases.
- Changing data source name (DSN) settings.
- Performing a controlled shutdown of XLANG schedules.
- Restarting XLANG schedules.

## Managing XLANG Scheduler and Other COM+ Applications

The default XLANG Scheduler application and Orchestration Persistence database are created during the installation of BizTalk Server 2000. If all your security and application processes are exactly the same, the default XLANG Scheduler application could host all of your XLANG schedules. Since this business scenario is unlikely, you will probably need to create new COM+ applications to host XLANG schedules or you might need to modify the default XLANG Scheduler application. How and when you create new COM+ applications depends on security issues and application processes. For example, you might want to isolate applications that run specific schedule instances. To do this, you need to create a COM+ application for each application that you want to isolate. Or, if you have specific security requirements for some applications or XLANG schedules, you will need to create a COM+ application for those XLANG schedules.

Each new COM+ application that you create has an **XLANG** tab in the properties dialog box for that COM+ application. On the **XLANG** tab, you can enable the new COM+ application to host instances of the XLANG Scheduler Engine. The specific COM+ application in which a new XLANG schedule runs is determined by the moniker syntax used to activate an instance of an XLANG schedule.

### Changing the Application Identity

When you create a COM+ application, it is recommended that you change the application identity from an interactive user account to a service account. With an interactive user account, if a user is not logged on, the application will not run. However, if you change the interactive account to a service account, a specific user does not have to be logged on all the time, thus compromising security. A service account is an account with specific properties that allow the account to act as part of the operating system. Therefore, a specific user, or any user at all, does not have to be logged on for the application to process messages.

### Managing Orchestration Persistence Database Settings

You could use the default Orchestration Persistence database to store all dehydrated XLANG schedules. However, this configuration would cause the persistence database to grow in size quickly. It is recommended that you create new persistence databases as appropriate for your business needs and processes. If you have many XLANG schedules that dehydrate often, you will need more persistence databases than if you have a few XLANG schedules that dehydrate infrequently.

In addition, if you associate a COM+ application with a new or existing persistence database, you must change the data source name (DSN) for that COM+ application. The DSN connects the COM+ application to the correct persistence database. If you change the persistence database, you must change the DSN for the COM+ application.

### Shutting Down and Restarting XLANG Applications

If you need to bring a BizTalk Server that hosts BizTalk Orchestration Services offline, for example for maintenance purposes, you must perform a controlled shutdown of all XLANG applications so that data associated with XLANG schedules is not lost. A controlled shutdown saves the state for running XLANG schedules to the appropriate persistence database. If you perform a controlled shutdown on the default XLANG Scheduler application, all XLANG schedules are gracefully shut down and the XLANG schedule instance data is preserved. If you perform a controlled shutdown on a COM+ application that you created after installation, only the XLANG schedules associated with that COM+ application are gracefully shut down and preserved. All other XLANG schedules remain running until you shut down the COM+ application(s) with which they are associated.

To restart the XLANG schedules, you must restart all the schedules at the same time in the default XLANG Scheduler application. You cannot restart applications that are associated with a specific COM+ application.

**Caution** If you want to perform a controlled shutdown, do not right-click a COM+ application and choose **Shut down**. Additionally, do not use the **Shut down** item on the **Action** menu. These procedures perform an uncontrolled shutdown. If you perform an uncontrolled shutdown, one of the following might occur:

- If running XLANG schedules are fully transactional, executing transactions might abort.
- If running XLANG schedules are not fully transactional, data that is in process in the schedule is lost.
- If an XLANG schedule has not been persisted, there will be data loss and the XLANG schedule will not automatically restart.

Instead, go to BizTalk Server 2000 Help and follow the "Shut down all XLANG applications" procedure.

Do not shut down Windows without performing a controlled shutdown of all XLANG applications.

## Administering Transport Services

BizTalk Server 2000 supports the following transport services:

- HTTP
- HTTPS
- SMTP
- File
- Message Queuing
- Application integration components (AICs)
- Loopback

The type of transport that is used depends on the business process and the type of data that is exchanged. For example, the File transport service is often used with internal applications or with legacy systems. Message queuing is used to exchange messages and documents between BizTalk Orchestration Services and BizTalk Messaging Services. HTTP is often used to exchange documents with trading partners.

Each transport service requires special considerations to keep the system running smoothly. This topic discusses some of the issues you might encounter with some of the transport services.

When managing your BizTalk Server deployment, here are some things to keep in mind about some of the transport services.

## HTTP and HTTPS

- **Proxy servers and firewalls.** If you do not properly configure TCP ports or if you use nonstandard ports, BizTalk Server might have problems connecting to the HTTP server. In both cases, BizTalk Server will not specify that the improperly configured TCP ports or the nonstandard ports are the issue. However, an "unable to connect" error will appear in the Event Log.
- **User name and password changes.** HTTPS can be configured to require a user to log on. However, if the user name and password change, BizTalk Server might be unable to access the Active Server Pages (ASP). In this case, the failure shows up as a random HTTP error.

For more information about configuring user names and passwords with HTTPS, see "[Advanced Configuration of Channel Properties](#)" later in this paper.

- **Secure Sockets Layer port.** Determine if the server is using the standard Secure Sockets Layer (SSL) port. If you do not use the standard SSL port, port 443, you must know what port should be used and modify the HTTP URL accordingly.
- **Client certificates.** If you decide to implement client certificates, ensure that you determine if the issuer of the client certificate is a trusted Certificate Authority (CA). You might encounter situations where an HTTP client receives a certificate from a valid issuing Certificate Authority, but the HTTP server might not have knowledge of the Certificate Authority. In this situation, the HTTP server might not accept the client certificate when the client attempts a connection with the HTTP server. If you or your trading partners require client certificate authentication over HTTP, you must agree upon the Certificate Authority. For example, if you send a client certificate to a trading partner, you must also send them a link to where they can download the Certificate Authority's certificate.

Likewise, all your trading partners must inform you who their Certificate Authority is. Additionally, they must provide you with a link to their Certificate Authority's certificate.

## Message Queuing

Because transactional receives are limited to local computers and BizTalk Server does not forward messages, you can configure the Message Queuing server to forward messages. For more information about Message Queuing, go to the MSDN Online Library Web site ([msdn.microsoft.com/library/default.asp](http://msdn.microsoft.com/library/default.asp)) and search for "Message Queuing."

**Note** Transactional message queues are recommended, but not required. However, it is recommended that you use transactional message queues to ensure that no data is lost when documents are submitted from a message queue to BizTalk Server.

## SMTP

A common issue that you might encounter when using SMTP as a transport service is the recognition of the e-mail address to which the application is sending an interchange or document. For example, the SMTP address might not be known or the server that houses the address might not be known. In these situations, verify that the e-mail address is correct.

When BizTalk Server sends an interchange or document to a trading partner or internal application using SMTP as a transport service, it does not send the mail directly to the Internet or intranet. Instead, BizTalk Server uses an SMTP server to forward the mail message to its final destination. If the SMTP server is offline, the interchange or document will not be delivered.

Administrators must check the SMTP server to verify that it is running and routing e-mail correctly.

Some SMTP servers require a From address before they forward an e-mail message. In this situation, the messaging port must be configured with the correct return e-mail alias to accommodate the return SMTP address.

## Tracking Interchanges and Documents

When BizTalk Server is installed, the ability to track metadata for interchanges is automatically activated. However, the capability to store whole copies of documents or specific or custom fields, or to track action events related to messages processed by XLANG schedules, must be configured separately. This section provides an overview of the available tracking settings in BizTalk Server 2000 and when you might need to configure and/or adjust those settings.

### Tracking Settings for a Server Group

When BizTalk Server 2000 is installed, or when you add a new server group, the following tracking options for a server group are enabled by default:

- **Enable document tracking**
- **Log incoming interchange**
- **Log outgoing interchange**

These settings allow BizTalk Server to store the metadata for interchanges and documents to the Tracking database. The metadata for interchanges and documents includes source organization information, destination organization information, document type, date and time the interchange was processed by BizTalk Server, document count, error information, and control ID.

This tracking setting applies to a server group and is configured in BizTalk Server Administration.

### Tracking Settings in Channels and Document Definitions

The ability to store whole copies of documents or to store standard and/or custom fields is not automatically enabled. These options are configured in the appropriate channel or document definition. If channels and document definitions were not configured to track documents or standard and/or custom fields as part of the initial BizTalk Server deployment, be judicious about configuring these settings. Configure tracking settings in BizTalk Messaging Manager only if you need to:

- Store complete copies of incoming and outgoing document instances.
- Track specific fields.
- Track custom fields.

If you turn all the tracking settings on in a channel and/or document, you will store redundant data. This will cause the Tracking database to grow quickly in size. If the Tracking database gets too large and if you do not regularly maintain it, the performance of BizTalk Server 2000 will be negatively impacted.

### Tracking XLANG Schedule Action Events

Messages processed by an XLANG schedule can be exchanged between BizTalk Messaging Services and BizTalk Orchestration Services. The ability to track the action events related to these messages is not automatically enabled. If tracking XLANG schedule events was not configured as part of your BizTalk Server deployment, you can enable the sample application, `WorkFlowAuditClient.exe`, to track action events related to messages processed by XLANG schedules. You must complete the following three steps to enable this feature:

1. Register the sample dynamic-link library (DLL) file, `WorkFlowAudit.dll`.

You can find this sample file in the `\Program Files\Microsoft BizTalk Server\SDK\XLANG Samples\WorkFlowAudit\bin` folder.

2. Run the `WorkFlowAuditClient.exe` application to activate `WorkFlowAudit.dll`.

You can find this sample application in the `\Program Files\Microsoft BizTalk Server\SDK\XLANG Samples\WorkFlowAuditClient` folder.

For additional information, you can view the documentation (`Readme.txt`) found in the `\Program Files\Microsoft BizTalk Server\SDK\XLANG Samples\WorkFlowAudit\Docs` folder.

3. Click the **Start** button in the `WorkFlowAuditClient` application to initiate the logging of action events related to an XLANG schedule in the Tracking database.

## Tracking Issues

If you need to change the tracking settings configured with your deployment of BizTalk Server, this section discusses some of the implications involved:

- **Tracking settings.** Administrative issues include determining when you need to track metadata for interchanges and documents, whole copies of documents, specific fields, and custom fields.
- **Balancing tracking settings.** Administrative issues include adjusting the settings in BizTalk Server Administration, BizTalk Messaging Manager, or the BizTalk Messaging Configuration object model.
- **When to turn off tracking settings.** Administrative issues include determining if and when you need to turn off tracking settings.
- **Tracking action events related to messages processed by XLANG schedules.** Administrative issues include starting the application that enables the Tracking database to store action events related to messages processed by XLANG schedules.
- **Tracking database schema overview.** Administrative issues include accessing the Tracking database if you need to present data stored in the Tracking database in a different format—for example, when using a reporting tool such as Crystal Reports.

### Types of Tracking Settings

If your business needs require that you keep a copy of interchanges in their original format for nonrepudiation and commerce law concerns, make sure that the tracking settings for each server group are enabled. If you want to create an audit trail for internal purposes, or if you want easy access to data on a per-document basis, configure tracking settings in channels and/or document definitions using the BizTalk Messaging Configuration object model or BizTalk Messaging Manager.

**Note** If you use a preprocessor, be sure to provide a mechanism to preserve the interchange document before it is preprocessed. Interchanges and documents are not stored in the Tracking database until they are submitted to BizTalk Server for processing. Preprocessing occurs before an interchange or document is submitted to BizTalk Server. Therefore the interchange or document is not stored in the Tracking database before it is preprocessed.

### Balancing Tracking Settings

You can configure tracking settings for a server group and in channels and/or document definitions. However, enabling all these tracking settings will cause your Tracking database to grow quickly in size. In addition to affecting the performance of BizTalk Server, you will store redundant data.

### When to Turn Off Tracking Settings

There are two common situations in which you might need to turn off tracking settings for a server group and/or in a channel and/or document definition. They are:

- You plan to receive interchanges or documents that are larger than the equivalent of 20 MB of Unicode XML.
- You have absolutely no need to track interchanges and documents processed by BizTalk Server.

If you plan to receive interchanges or documents in XML Unicode format that are larger than 20 MB, it is advisable to turn off tracking settings for the server group that will receive the interchange. If you plan to receive ANSI flat-file interchanges that are larger than 7 to 10 MB in size, it is advisable to turn off tracking settings for the server group that will receive the interchange.

Similarly, if you plan to receive document instances in XML Unicode format that are greater than 20 MB, it is advisable to turn off document logging settings in BizTalk Messaging Manager. Or, if you plan to receive ANSI flat files that are larger than 7 to 10 MB, it is advisable to turn off document logging settings in BizTalk Messaging Manager.

If you have absolutely no need to track interchanges and documents that you send and receive, you can turn off all tracking settings. However, you must understand the implications of doing this. First, if tracking settings for a server group are disabled, tracking settings configured in channels and/or document definitions are also disabled. Second, no interchanges or documents are tracked in the Tracking database. This means that once a document leaves the Shared Queue, there is no way to trace it. If you need to trace an interchange or document for troubleshooting purposes, your task will be more difficult. Therefore, you must be very careful about disabling tracking settings for a server group(s).

### Tracking Action Events Related to Messages Processed by XLANG Schedules

If you completed the three steps necessary to track action events related to messages processed by XLANG schedules, but no

action events appear in the BizTalk Document Tracking user interface, the WorkFlowAuditClient application might have been stopped. Records are logged in the `dta_wf_EventData` and `dta_wf_WorkFlowEvent` tables only if the WorkFlowAuditClient application is started. To start the WorkFlowAuditClient application, you must complete the three steps listed in the topic "Tracking XLANG Schedule Action Events" earlier in this paper. If the WorkFlowAuditClient application is stopped, no records are logged in the `dta_wf_EventData` and `dta_wf_WorkFlowEvent` tables.

## Tracking Database Schema Overview

BizTalk Document Tracking is a stand-alone Web application included with BizTalk Server 2000 for the purpose of creating queries on the Tracking database to view interchange and document records. Most of the data that is stored in the Tracking database is available through BizTalk Document Tracking. However, it might be necessary for you to query the Tracking database directly. For example, you might want to create your own user interface or use Crystal Reports to create a custom report from the Tracking database.

In these situations, you will need to access the Tracking database tables directly. This section provides a general overview of the Tracking database schema. For more detailed information, in BizTalk Server 2000 Help, see "Understanding the Tracking Database Schema."

All servers in a server group share a single Tracking database. If tracking settings are enabled for the server group, the Tracking database stores metadata related to interchange and document activity in BizTalk Server. If tracking settings are enabled in a channel and/or document definition used by the server group, the Tracking database can also store:

- Whole copies of documents.
- Specific fields.
- Custom fields.

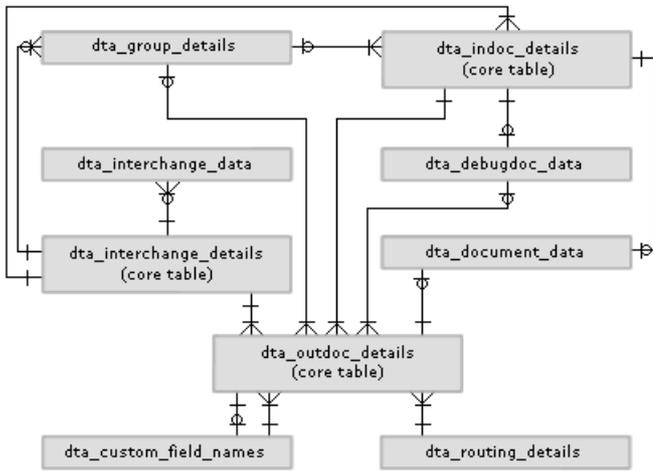
The Tracking database consists of three main tables and six secondary tables. The three main tables in the Tracking database are:

- **dta\_interchange\_details.** Contains one record for each document submitted to BizTalk Server.
- **dta\_outdoc\_details.** Contains one record for each document generated by BizTalk Server.
- **dta\_indoc\_details.** Contains one record for each interchange processed by BizTalk Server.

The secondary tables are:

- **dta\_group\_details.** Provides extensibility components (parser, serializer, and receipt correlator) for document formats that employ like-kind document groups (for example, X12 or EDIFACT) within an interchange.
- **dta\_interchange\_data.** Contains one row for every interchange submitted to or sent by BizTalk Server. This table also stores any response documents returned to the **Interchange::SubmitSync** method.
- **dta\_document\_data.** Contains one record for every document submitted to or sent by BizTalk Server.
- **dta\_debugdoc\_data.** Contains one row for every inDoc or outDoc item that is configured (on the messaging channel object) to record its interim XML format.
- **dta\_routing\_details.** Functions as a mirror of messaging ports for the purpose of eliminating a cross-database dependency on the BizTalk Messaging Management database.
- **dta\_custom\_field\_names.** Contains a row for each distinct capture-field node name and data type pair encountered by BizTalk Server.
- **dta\_MIME\_data.** Contains one row for every MIME-encoded interchange submitted to BizTalk Server.

The following illustration shows the overall database schema of the Tracking database. For clarity, only the table names are listed. The lines that connect the tables demonstrate how the tables are connected through foreign key fields and the relationship between the tables.



The following table explains what the different links between the tables represent.

This link	Represents this relationship
⌋	One-to-many relationship
⌋⊖	None or one-to-many relationship
⌋⊖⊖	One-to-none or one-to-many relationship
⌋⌋	One-to-one relationship
⌋⊖⌋	One-to-none or one-to-one relationship

**Caution** Do not change the code, such as stored procedures or triggers, in the Tracking database. Do not access the Tracking database directly. Do not directly call the stored procedures or add triggers. Making changes to the Tracking database in this way might cause BizTalk Server to function incorrectly, cause the loss of data, or corrupt the Tracking database.

**Note** If you need to access the Tracking database, for example to use a reporting tool such as Crystal Reports, access a replicated copy of the Tracking database.

### Related Tables

There are thirteen additional tables that are a part of the Tracking database. These tables are not included in the illustration because they support the secondary tables or store binary large object data. The related tables are:

- **dta\_ack\_status\_values.** Stores the receipt status values.
- **dta\_blobtype\_values.** Stores the binary large object types.
- **dta\_data\_level\_values.** Stores the data level values used in BizTalk Server.
- **dta\_direction\_values.** Stores the direction of the interchange.
- **dta\_error\_message.** Stores the error messages used in BizTalk Document Tracking.
- **dta\_group\_correlation\_keys.** Stores the group correlation keys.
- **dta\_interchange\_correlation\_keys.** Stores the interchange correlation keys.
- **dta\_transport\_type\_values.** Stores the transport type values.
- **dta\_ui\_codepage\_charset.** Stores the system code pages for character encoded data.
- **dta\_ui\_user\_queries.** Stores the advanced queries that individual users create and save.
- **dta\_validity\_values.** Stores the validity values.
- **dta\_wf\_EventData.** Contains one record for each property logged in relation to a monitored COM+ event fired by an XLANG schedule. Sets of multiple rows in this table share a common parent in the dta\_wf\_WorkFlowEvent table. Records are logged only if WorkflowAudit.dll is activated. For more information about activating WorkflowAudit.dll, see "Tracking XLANG Schedule Action Events" earlier in this paper.
- **dta\_wf\_WorkFlowEvent.** Contains one record for each monitored COM+ event fired by an XLANG schedule. Records are logged only if WorkflowAudit.dll is activated. For more information about activating WorkflowAudit.dll, see "Tracking XLANG Schedule Action Events" earlier in this paper.

### Security Issues

After the initial installation of BizTalk Server, you might need to change the following security settings:

- Logon properties and local policies
- Service accounts
- Roles in the BizTalk Server Interchange Application

## Logon Properties and Local Policies

Logon properties control a user's ability to access specific computers or data, such as a page on a Web site. If users provide the correct user name and password, they gain access to resources. If they do not provide the correct user name and password, they are denied access.

Local policies are based on the computer a user is logged on to and provide the second layer of security. The local policies on a computer control policies such as user rights assignment, audit policy, and passwords.

For more information about settings for logon properties and local policies, in BizTalk Server 2000 Help, see "BizTalk Server 2000 Setup and Configuration."

## Service Accounts

It is recommended that BizTalk Server 2000 be run under service accounts rather than interactive user accounts. With interactive user accounts, a user must be logged on for the application to run. For example, if BizTalk Server is set up to run under an interactive user account, and if that particular user is not logged on, BizTalk Server will not process any documents.

When BizTalk Server is installed, the account identity is automatically configured to run under a service account. However, the default XLANG Scheduler application, any new COM+ applications that you create, and the BizTalk Server Interchange Application default to an interactive user account. There are several potential problems with using an interactive user account. First, if the user logs off, the application stops running. Second, if a malicious hacker obtains the user's user name and password, the hacker could do a lot of damage. Third, if an application is running on a computer while an administrator is logged on, the application runs under the administrator's identity and could make calls on behalf of the client using the administrator's rights. To prevent this, it is recommended that you create a service account and use the service account to run BizTalk Server.

For more information about settings for service accounts, in BizTalk Server 2000 Help, see "Create a service account."

## Control of a User's Ability to Submit Documents

Controlling a user's ability to submit interchanges and documents to BizTalk Server provides yet another layer of security. The following properties for the BizTalk Server Interchange Application are configured to control who can send interchanges and documents:

- Authentication level
- Impersonation level
- Access permissions
- Launch permissions
- Configuration permissions

## Using Certificates

If your deployment of BizTalk Server includes using certificates, it is recommended that you associate all certificates with a computer instead of with a specific user. This means that when you issue a certificate, you must do one of the following:

- If you created a service account, log on using the service account you created.
- Specify that you want the certificate associated with the computer and not with a specific user when you issue the certificate.

If you associate a certificate with a specific user, BizTalk Server must be configured to run with the credentials of that specific user. Additionally, if you have certificates associated with multiple users, the administration tasks can increase significantly. However, if a certificate is associated with the computer, any valid user can be logged on and the validity of the certificate is not affected.

If your business process requires that you associate certificates with specific users, you must store the certificates in the **Certificates (Local Computer)** item in the Certificates snap-in. BizTalk Server does not check the user store for certificates. In addition, if a user's password changes and that user is associated with a certificate, you must update the following two applications:

- BizTalk Server Interchange Application

- BizTalk Messaging Service

For more information about certificates and BizTalk Server, in BizTalk Server 2000 Help, see "Certificates Overview." Or go to the MSDN Online Library Web site ([msdn.microsoft.com](http://msdn.microsoft.com)) and search for "Certificate services and components."

## Advanced Configuration of Channel Properties

When you create or edit a channel, you can configure the channel to override the messaging port properties, if necessary. This allows you to send interchanges and documents to password-protected folders, message queues, ASP pages, and so on. User names and passwords can be associated with a channel and messaging port combination for the following transport services:

- File
- HTTP and HTTPS
- SMTP
- Messaging Queuing

To associate a user name and password with a channel and messaging port combination, on the **Advanced Configuration** page of the Channel Wizard, click the **Advanced** button. Verify that the **Primary Transport** tab is selected and then click **Properties**. Type a valid user name and password. If necessary, you can change other relevant information such as the name of the message queue location or the From address if you are using SMTP.

## Monitor a BizTalk Server 2000 Deployment

Three tools are available to monitor and test the performance of BizTalk Messaging Services. They are:

- **System Monitor.** A part of the Performance tool provided with Microsoft Windows 2000. Use this tool to collect and review real-time data about memory, disk, processor, and so on.
- **Windows 2000 Event Viewer.** Included in BizTalk Server Administration. Use this tool to view BizTalk Server and XLANG Scheduler errors.
- **XLANG Event Monitor.** A tool provided with BizTalk Server 2000 that allows you to monitor XLANG schedule events and the progress of XLANG schedules.

This section describes each of these tools and provides an overview of how to use them to monitor your deployment of BizTalk Server 2000.

### System Monitor

You can use System Monitor, a part of the Performance tool included with Windows 2000, to graphically display counter readings that you specify as they change over time. To access System Monitor, perform the following step:

- On the **Start** menu, point to **Settings**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Performance**.

System Monitor is an item in the Performance tool console. What you monitor and how depends on your specific deployment of BizTalk Server 2000. However, you want to choose counters that monitor objects relevant to your installation and that indicate how well a specific component is working and/or is affected. For example, you might choose the Disk read/writes/sec counter to monitor the Physical Disk object. The information that you collect regarding the Disk read/writes/sec counter gives you insight about how SQL Server and the Message Queuing and File transport services are performing.

For more information about specific counters to use to monitor BizTalk Messaging Services, in BizTalk Server 2000 Help, see "Evaluating the Performance of a Configuration."

### Windows 2000 Event Viewer

Event Viewer is the second component of the monitoring plan. Use Event Viewer to assist you in troubleshooting server and document processing problems. You can find Event Viewer in BizTalk Server Administration.

You can configure Event Viewer to display all information about security, application, and system problems. Or you can configure Event Viewer to display only BizTalk Server application and XLANG Scheduler errors.

### XLANG Event Monitor

When the XLANG Scheduler Engine executes XLANG schedules, it generates many types of events, showing the progress of the schedule instances. BizTalk Server 2000 provides a tool that you can use to monitor XLANG schedule events and to see the

progress of the schedule instances. You can monitor the default XLANG Scheduler application, or you can monitor the custom COM+ applications that you create to host XLANG schedules. XLANG Event Monitor can subscribe to all events published by the host applications on local or remote computers. XLANG Event Monitor can also store these events to a file for future analysis.

XLANG Event Monitor has the capability to receive events from all XLANG schedule host applications on the local computer or from XLANG schedule host applications on one or more remote computers. When XLANG Event monitor is installed, the default behavior is to receive events from the XLANG schedule host applications on the local computer. If you want to include events from XLANG schedule hosts on remote computers, you must update the event sources by clicking the **EventSources** option on the **Recording** menu to include remote computers.

If you want to use XLANG Event Monitor, you must install it separately. You can find the XLANG Event Monitor application in the \Program Files\Microsoft BizTalk Server\SDK\XLANG Tools folder. Review the readme located in the same folder for more information about how to use XLANG Event Monitor.

## Troubleshooting BizTalk Server

Three major tools are available to aid you in troubleshooting BizTalk Server 2000: Event Viewer, the Suspended queue, and XLANG Event Monitor.

### Troubleshooting Using Windows 2000 Event Viewer

You can configure error handling in BizTalk Server 2000 at the server level through Event Viewer. Event Viewer creates a log that contains information about hardware, software, and system problems. From BizTalk Server Administration, you can customize the Event Viewer to show application and XLANG Scheduler errors that are specific to BizTalk Server 2000, which makes troubleshooting for BizTalk Server efficient.

### Troubleshooting Using the Suspended Queue

The following options are available from the Suspended queue to aid you in the troubleshooting process:

- **View Error Description.** Enables system administrators to view error descriptions that indicate why the document was sent to the Suspended queue.
- **View Interchange.** Enables system administrators to view the contents of an interchange that has failed processing for a variety of reasons, including parsing errors or failed transmissions.
- **View Document.** Enables system administrators to view the contents of a document that has failed processing for a variety of reasons, including serialization errors or the inability to find a channel.

Once you have determined the reason BizTalk Server could not process the interchange or document, the following options are available in the Suspended queue to help you resolve the situation:

- **Delete.** Enables system administrators to completely remove an entry from the Suspended queue. This action is not recoverable. After a document has been deleted from the Suspended queue, you cannot retrieve it.
- **Resubmit.** Enables system administrators to resubmit most interchanges and documents to BizTalk Server for processing. You cannot resubmit or retransmit interchanges or documents that failed parsing. You must delete those interchanges and documents and submit them to BizTalk Server again from the original organization or application. **Resubmit** can also be used to retransmit documents in the Suspended queue. When an interchange or document is resubmitted, it is processed from the point of failure. When a document is retransmitted, it is processed as though it was submitted to BizTalk Server for the first time.

### Troubleshooting Using XLANG Event Monitor

You can use XLANG Event Monitor to aid in troubleshooting BizTalk Server. XLANG Event Monitor can help you identify the following states of XLANG schedules:

- Running
- Successfully completed
- Completed with errors
- Dehydrated
- Suspended

You can also use XLANG Event Monitor to examine events that are published for an instance. Combine the event information with the XLANG schedule state information and the Event Viewer error messages to get a clearer picture of the issue you are troubleshooting.

## Conclusion

Understanding the eight major areas of administration related to BizTalk Server and understanding the concepts behind how BizTalk Messaging Services and BizTalk Orchestration Services work can help system administrators manage and configure BizTalk Server to boost performance for their particular installations. Understanding these concepts also helps the system administrator troubleshoot more effectively.

## For More Information

["Microsoft BizTalk Server 2000 Deployment Considerations."](#)

"Orchestrating Business Processes with Microsoft BizTalk Server 2000."

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# Using EDI with Microsoft BizTalk Server 2000

Microsoft Corporation

January 2001

**Summary:** This article shows how Microsoft BizTalk Server 2000 adds value to companies that use electronic data interchange (EDI). It also shows how BizTalk Server adds value to smaller companies that don't use EDI, but want to interoperate with companies that use EDI. The relative strengths and limitations of BizTalk Server and EDI are shown, and the article ends with a description of BizTalk Server limitations in its support of EDI in comparison with an EDI server. (14 printed pages)

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## Introduction

Many companies today use electronic data interchange (EDI) to exchange business documents. This article discusses how Microsoft® BizTalk™ Server 2000 can help both large businesses that are currently using EDI and smaller businesses that do not use EDI but that want to trade with these larger businesses.

BizTalk Server can help a company that uses EDI in the following ways:

- **Enabling enterprise application integration (EAI).** BizTalk Server automates the exchange of internal business data.
- **Creating new relationships with smaller trading partners.** BizTalk Server provides a cost-effective way to exchange electronic documents with companies that choose not to use EDI.
- **Facilitating future growth.** BizTalk Server provides a cost-effective way to handle the expansion of a company's messaging and document interchange requirements.

Smaller companies can benefit from BizTalk Server by using it to establish electronic document exchange relationships with larger companies that use both EDI and XML. A smaller company can also streamline its internal business processes by employing the EAI capabilities of BizTalk Server.

The ability of BizTalk Server to translate and transform documents is central to its EAI and document exchange capabilities. This article introduces BizTalk Editor and BizTalk Mapper, tools that help to direct the translation and transformation of EDI documents and other electronic documents. BizTalk Editor enables you to create and edit specifications (a BizTalk Server-specific schema). BizTalk Mapper uses specifications to map the structure of one document instance to the structure of another document instance.

This article also compares the relative strengths and weaknesses of BizTalk Server when compared with EDI technology.

## EDI Overview

Electronic data interchange (EDI) is a set of standards for controlling the exchange of business documents (such as purchase orders and invoices) between computers. Businesses can use EDI to ensure that the documents they exchange are interpreted correctly, regardless of the platforms or internal applications they use. Because EDI enables electronic documents to move from one computer to another without the need for human intervention, it is faster, cheaper, and more accurate than the exchange of paper documents.

Standardization efforts for EDI formats began in the 1960s, led by the transportation industry. The need for a uniform standard that encompassed all industries prompted the creation of the Accredited Standards Committee (ASC) X12, sanctioned by the American National Standards Institute (ANSI), in 1979. The Accredited Standards Committee X12 created the EDI standard commonly referred to as X12, which was used primarily for American domestic trade. Meanwhile, the European community developed its own EDI standard called Guidelines on Trade Data Interchange (GTDI). A new standard that borrowed from both X12 and GTDI, called Electronic Data Interchange for Administration, Commerce, and Transport (EDIFACT), was developed at the United Nations. The International Organization for Standardization (ISO) adopted EDIFACT in 1987. Although in 1992 ASC X12 members approved the adoption of EDIFACT as the universal EDI standard, X12 continues to be a widely used EDI standard in North America.

Although EDI has been around for nearly forty years, it has not triggered an explosion in business-to-business electronic commerce. In fact, the number of businesses trading electronically today compared to those using phone or fax is limited. The reasons for this are numerous and include the following:

- EDI server systems are typically expensive.
- The EDI document format is somewhat cryptic.
- EDI document transport was historically a value-added network (VAN) that incurred both an expensive setup fee and ongoing operational costs.

## Enhancing an EDI Environment by Using BizTalk Server

Although many companies have long-term strategies that involve replacing their legacy infrastructure, a company that is heavily invested in EDI might not want to immediately discard its investment and replace it entirely with an XML-based BizTalk Server system. However, BizTalk Server can add a great deal of value to a company that chooses to continue using EDI in the short term. Areas where BizTalk Server can enhance the operations of a company that uses EDI include:

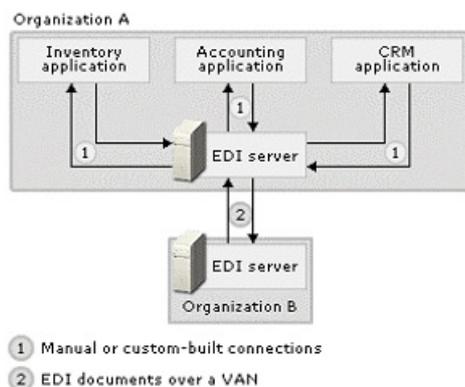
- Enabling enterprise application integration.
- Creating new relationships with smaller trading partners.
- Facilitating future growth.

## Enterprise Application Integration

Integrating with business partners is only one of the challenges that face businesses today. Equally important is the integration of internal business applications, such as accounting, inventory, and customer relationship management (CRM) systems.

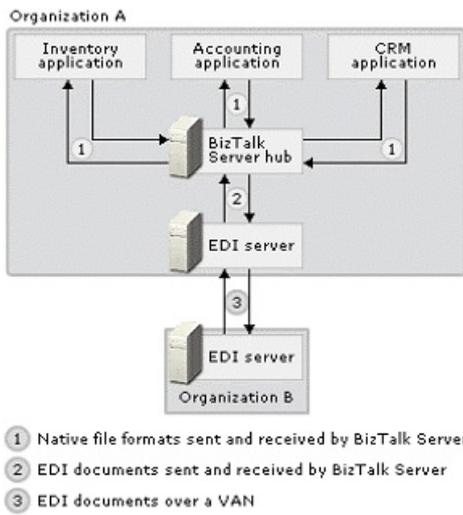
EDI systems do not typically offer EAI infrastructure, and they support only a limited subset of possible electronic document formats other than EDI. One of the strengths of BizTalk Server is its ability to automate and streamline the flow of a company's business data both internally and externally.

The following illustration shows a simplified representation of how a company that uses EDI might use its EDI server to exchange business documents.



Organization A's EDI server sends and receives standard EDI documents to and from Organization B over a VAN. Each transaction over the VAN incurs an expense for Organization A. Organization A's EDI server communicates with its accounting, inventory, and CRM applications either by manual data entry or by custom-built software.

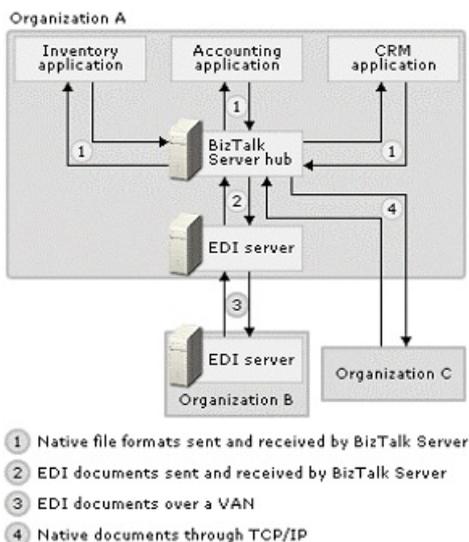
The following illustration shows how a BizTalk Server hub can be added to this system to facilitate the integration of Organization A's internal applications.



In this scenario, BizTalk Server becomes the hub of Organization A's internal data exchange. The BizTalk Server hub provides an accurate and cost-effective way to automatically update the organization's line-of-business applications when a transaction with Organization B occurs. The key to the success of this scenario is the ability of BizTalk Server to be the universal message gateway. BizTalk Server can automatically send data to Organization A's internal applications in XML or flat-file format, or even in custom formats with the introduction of custom parsers and serializers. BizTalk Server uses the TCP/IP communication layer built into Microsoft® Windows® 2000, which is commonly used for communication between applications in an organization. With BizTalk Server these EAI processes can be put in place at costs far lower than would be possible by paying developers to create custom communications applications. BizTalk Server enables internal data exchange that is far more accurate and efficient than can ever be achieved by manual processes.

## New Relationships with Smaller Trading Partners

BizTalk Server makes it easy for a company currently using EDI with trading partners to also exchange documents with smaller trading partners who cannot afford or do not want to use EDI. The following illustration shows how Organization A can add a new trading partner to its existing communications network.



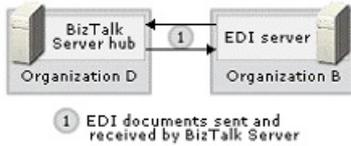
Organization A's BizTalk Server hub can electronically exchange business documents with Organization C using TCP/IP over the Internet. These documents can be delivered in a format that is easy for Organization C to use, such as XML. In this scenario both Organization A and Organization C enjoy the accuracy and efficiency of the automated exchange of electronic business documents. Neither company needs to incur the high costs of setting up a new EDI relationship or the ongoing expense of a VAN.

## Future Growth

Organization A might find that it needs to set up new automated messaging with Organization B beyond what it has implemented with its EDI server. Organization A will find that the least expensive and most direct solution is to use its BizTalk Server hub for exchanging these new messages. In this way it bypasses its EDI server altogether. In time, Organization A might need to make more significant changes in its data-exchange relationship with Organization B. This would be an ideal time for Organization A to forgo its EDI server entirely and replace it with the BizTalk Server hub.

## Using BizTalk Server in Smaller Companies

Many smaller companies could benefit from the exchange of electronic business documents with larger companies that use EDI, but they cannot justify the setup and operational costs associated with traditional EDI servers. BizTalk Server provides a cost-effective solution to this problem (and can also be leveraged with trading partners that use XML and other non-EDI formats). BizTalk Server enables a small company to automatically transform its business documents into an electronic format that an EDI server of a larger company can use. The following illustration shows such a relationship.

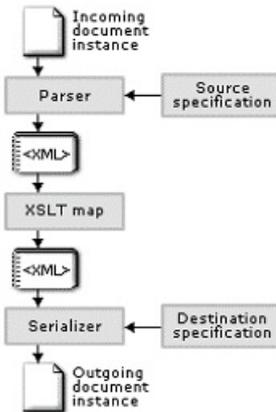


Organization D might be so small that it runs its entire business on Microsoft Office, or it might use another business tools suite that can read and write XML documents or provide adapters for BizTalk Server. BizTalk Server can process Organization D's documents and transport them to and from the EDI server of Organization B. Organization D might have BizTalk Server and other business applications installed on a single computer, or it might be a larger company with business applications distributed across several computers. In either case, Organization D's BizTalk Server hub can serve the dual purpose of exchanging EDI documents with Organization B and automatically integrating the flow of internal business data within the company.

## Translating and Transforming Documents

A key strength of BizTalk Server is its ability to accept input in a wide variety of document formats, map that input into almost any document structure, and then output the new document structure into a wide variety of document formats. XML is central to the translation and transformation capabilities of BizTalk Server, which is in large part what makes BizTalk Server such a powerful tool for enterprise application integration and business-to-business electronic commerce.

The following illustration and accompanying list show how BizTalk Server internally processes a document.

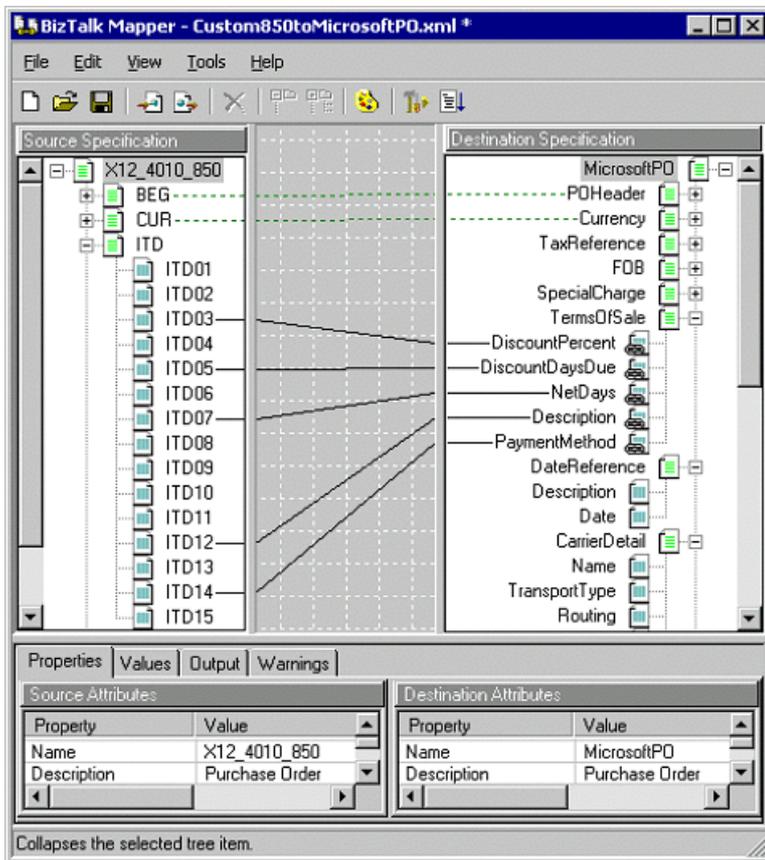


1. The incoming document instance is sent to BizTalk Server.
2. The parser uses the source specification associated with the incoming document instance to translate the incoming document instance to XML (if it is not already in this format). The source specification is created in BizTalk Editor.
3. The XML file is transformed by an XSLT map into another XML file of the desired structure (nodes in the incoming XML file are mapped to nodes in the outgoing XML file). The XSLT map is created in BizTalk Mapper.
4. The serializer uses the destination specification associated with the outgoing document instance to translate the outgoing XML file to the outgoing document instance (if it is not already in this format). The destination specification is created in BizTalk Editor.
5. BizTalk Server outputs the outgoing document instance and transports it to a destination.

The parsers and serializers included with BizTalk Server can translate XML, EDI (X12 and EDIFACT), and flat files (delimited and positional). Parsers and serializers for other formats might be available in the future. For more information, go to the Microsoft BizTalk Server 2000 Web site ([www.microsoft.com/biztalk](http://www.microsoft.com/biztalk)).

If you create your own parsers and serializers, BizTalk Server can translate files of any format. Regardless of the format of an incoming document instance, BizTalk Server translates it to an XML file so that the XSLT map can transform the incoming document structure into the structure necessary for the outgoing document. Even if a BizTalk Server hub inputs and outputs EDI documents, internally these documents are translated to XML. This enables BizTalk Server to take advantage of the power and flexibility of XML when transforming documents from one structure to another.





The illustration shows links from five nodes in the source specification to five corresponding nodes in the destination specification. If you viewed this map in BizTalk Mapper, you could see the remainder of the specifications by scrolling and by expanding nodes in the specifications. BizTalk Mapper uses built-in, reusable functions called functoids to enable more complex transformations than the simple links shown here.

BizTalk Mapper has a grid preview function that is useful for navigating to a particular subsection of a complex map, such as might be required when mapping EDI documents.

## Comparing BizTalk Server with EDI Technology

As explained earlier in this article, BizTalk Server offers functionality and advantages that EDI technology cannot provide. For anyone currently using EDI who is considering deploying BizTalk Server in their business, it is important to understand the strengths and limitations of both EDI and BizTalk Server.

### EDI Strengths

- **Currently deployed in many businesses.** EDI is a long-established standard, and many large businesses currently use it successfully.
- **Uses agreed-upon standards.** EDI standards are recognized by everyone who uses EDI.
- **Standards are fairly rigid.** Rigid standards require conformity.

### EDI Limitations

- **High cost.** EDI systems are costly to set up and maintain. Hiring and retaining EDI experts is expensive.
- **Value-added networks (VANs).** Many companies that use EDI use VANs to exchange documents. VANs are expensive to set up and incur costs each time they are used.
- **Document format is not easily human-readable.** It is difficult for a person to read an EDI document.
- **Not well suited for enterprise application integration (EAI).** An EDI server handles connections outside the business. BizTalk Server handles connections both outside the business and within the business.
- **Many industry-specific subvariations of standard documents.** In some industries, such as the automotive and aerospace industries, EDI document standards have been extended for industry-specific purposes. This can cause document translation difficulties between variants of standard EDI documents given the expectation for rigid standards interpretation.

### BizTalk Server Strengths

- **Uses XML as a foundation.** BizTalk Server uses XML to translate and transform documents regardless of the document

format required for input and output. This creates an extremely flexible environment for document exchange both now and in the future. XML as a document format has the following advantages:

- XML is self-describing and creates documents that are relatively easy for people to read. This makes it easier for a person unfamiliar with a particular BizTalk Server installation to become familiar with it.
- XML experts are plentiful, and they are less expensive than EDI experts.
- XML is very flexible and extensible.
- **Easy setup and maintenance.** BizTalk Server systems are easier to set up and maintain than EDI systems.
- **Many schemas available.** There is a large and growing library of schemas available to users of BizTalk Server. For more information about this schema library, go to the Microsoft BizTalk Server 2000 Web site ([www.microsoft.com/biztalk](http://www.microsoft.com/biztalk)).
- **Enterprise application integration.** BizTalk Server handles enterprise application integration, and does it very well. For more information about case studies on BizTalk Server for EAI, go to the Microsoft BizTalk Server 2000 Web site ([www.microsoft.com/biztalk](http://www.microsoft.com/biztalk)).
- **Orchestration capabilities.** In addition to the universal messaging capabilities described in this article, BizTalk Server has powerful orchestration capabilities. BizTalk Orchestration enables the user to design and execute long-running, loosely coupled business transactions.

## BizTalk Server Limitations in its Support of EDI

BizTalk Server supports EDI formats and receipting. While many customers have found that this is sufficient for interoperating with EDI-based systems, true EDI servers have functionality that is not available in BizTalk Server at the time of release. Following are limitations in BizTalk Server support of EDI. Included are approaches to using the BizTalk Server extensibility model and consulting to overcome many of these limitations. In a number of cases consultants have already implemented these features for customers, but currently there is no example code available to demonstrate these features. These solutions will add processing time to document throughput.

### Outbound Batching

- **Limitation.** Although BizTalk Server can process aggregate collections of EDI documents, it cannot produce them.
- **Solution.** Include a predelivery batching routine on the outbound side of BizTalk Server, and a debatching routine on the inbound side of BizTalk Server. This is to accommodate aggregate responses to transmittals batched outside BizTalk Server.
- **Effort Required.** A low to medium level of effort is required to implement a solution.

### Segment Compound "Tags"

- **Limitation.** Currently, the source tag identifier is the only mechanism in BizTalk Server by which instance data is matched to schema-defined structure. BizTalk Server cannot resolve parsing operations when the source tag identifier in the document instance, by itself, is not sufficient for determining a structure match in the schema. An example of this might occur with the HL segments in an X12 856 advanced ship notice, where field data other than the source tag identifier adds hierarchical context to the meaning of the record's tag ("HL" in this case).
- **Solution.** Create new EDI parsers that perform parsing look-ahead logic to consider not only the tag but also the content qualifiers of various EDI segments.
- **Effort Required.** A high level of effort is required to implement a solution.

### Envelope Creation

- **Limitation.** BizTalk Server cannot populate custom envelopes. Nor can BizTalk Server deviate from the EDI-based envelopes that it provides, in the case where it is necessary to use optional fields on the envelope.
- **Solution.** Develop a predelivery process to add content to envelopes. This might involve having BizTalk Server build an envelope, and then populating the envelope in the add-on process. Alternatively, the add-on process could create and populate the record. In either case, the data could be from the BizTalk Messaging Management database, a private add-on database, or both.
- **Effort Required.** A medium level of effort is required to implement a solution.

### Functional Acknowledgments

- **Limitation.** There are four limitations in this area:
  - BizTalk Server parsers cannot take advantage of the range of EDI batching or aggregation functionality that an EDI server can. For example, BizTalk Server is unable to reject an entire group based on individual document failure

within the group.

- Detail does not include the field level, so it is often impossible to know, for example, which field failed validation.
- The validation step stops at the first error.
- BizTalk Server provides no notification or other action when receipts become overdue.
- **Solution.** There are no solutions for the first three limitations. To solve the last limitation, you must set up stored procedures as Microsoft® SQL Server™ jobs. The purpose of this is to sweep the tracking database periodically to look for overdue receipts and to perform notification as needed.
- **Effort Required.** A low to medium level of effort is required to implement a solution.

## EDI Data Types

- **Limitation.** When creating a specification in BizTalk Editor, you cannot specify EDI data types for X12 document field contents. This limitation is most significant in custom data types that have to do with explicit or implied decimal placement and the number of digits before and after the decimal.
- **Solution.** There is no solution for this limitation within the context of BizTalk Server.

## Envelope Mapping

- **Limitation.** BizTalk Server cannot map data from envelopes.
- **Solution.** There is no solution for this limitation within the context of BizTalk Server.

## Binary Segment Content

- **Limitation.** BizTalk Server cannot specify a maximum size for a binary field if that maximum is in excess of 32-bit MAXINT.
- **Solution.** There is no solution for this limitation within the context of BizTalk Server.

## Control Number Enforcement

- **Limitation.** There is no way for BizTalk Server to know when duplicate items are submitted for processing except through the use of the BizTalk Framework.
- **Solution.** Develop a preprocess that scans all data in the tracking database (or in a replicated warehouse of all historic tracking data) to verify the uniqueness of received data prior to submitting it to BizTalk Messaging.
- **Effort Required.** A medium level of effort is required to implement a solution.

## Floating Segments

- **Limitation.** BizTalk Server does not support floating segments. Segments defined in schemas are fixed to specific locations in the data according to where the schema explicitly places them.
- **Solution.** There is no solution for this limitation within the context of BizTalk Server.

## VAN Integration

- **Limitation.** There are two limitations in this area:
  - BizTalk Server has no built-in VAN transport components for sending or receiving data.
  - BizTalk Server has no mechanism for entering VAN sender and receiver status reports into a tracking database.
- **Solution.** Develop application integration components (AICs) to serve as the transport mechanism to interact with a VAN. There might also be a need to create tables related to the tracking database that would hold VAN sender and receiver status reports. This is because there is also a foreign key relationship between the new tables and existing tracking tables.
- **Effort Required.** A medium to high level of effort is required to implement a solution.

## Envelope Data Viewing

- **Limitation.** It is not possible to see envelopes in BizTalk Document Tracking, other than by viewing the parent interchange for documents being searched.
- **Solution.** Modify the BizTalk Document Tracking user interface so that the envelopes are optionally displayed with the individual work items.
- **Effort Required.** A high level of effort is required to implement a solution.

## Conclusion

BizTalk Server can add value to any company that needs to automate its internal data flow or automate the exchange of business documents with other companies. This includes companies that use EDI as well as companies that don't use EDI but need to do so to build business relationships with EDI-based companies. Although BizTalk Server is not an EDI server, it enables you to use EDI and other formats for business-to-business integration as well as EAI. BizTalk Server provides a very powerful and flexible framework to move your enterprise forward.

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# WMI in Microsoft BizTalk Server 2000

Microsoft Corporation

March 2001

**Summary:** This white paper shows you how Microsoft BizTalk Server 2000 can be used with Windows Management Instrumentation (WMI) to manage Administration objects and consume events. BizTalk Server's implementation of WMI is discussed along with an example of a temporary event consumer. The schema classes are documented and the white paper ends with a library of code examples that provide solutions to common tasks encountered when using BizTalk Server with WMI. (94 printed pages)

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## Introduction

Windows® Management Instrumentation (WMI) is a data-management layer included in Microsoft® Windows® 2000. Microsoft BizTalk™ Server 2000 uses the WMI layer to encapsulate administrative functions that support the management of systems in an enterprise.

This white paper contains sample code in Microsoft Visual Basic®, and Visual Basic Script.

For background and overview information about WMI, see the article [Microsoft Windows Management Instrumentation: Background and Overview](#), at the MSDN Online Library Web site.

For information about how to use WMI to administer Windows and applications across your enterprise, see the article [Windows Management Instrumentation: Administering Windows and Applications across Your Enterprise](#), at the MSDN Online Library Web site.

The most recent version of the WMI SDK is available from the Microsoft Web site at <http://msdn.microsoft.com/Downloads/sdks/wmi/eula.asp>.

## Understanding WMI in BizTalk Server

When you use BizTalk Server Administration to change group, server, queue, and database management settings, the new values are stored in the BizTalk Messaging Management database through the BizTalk Server WMI provider. In BizTalk Server 2000, this WMI provider uses a Microsoft SQL Server™ database to store administrative objects. All timestamps are created by using the local time on the Microsoft SQL Server. However, the WMI provider refers to all timestamps in coordinated universal time (UTC). The administration console then converts the timestamps back to local time for display.

The WMI provider acts as an intermediary between WMI and BizTalk Administration objects. The WMI provider gathers information from a resource (managed object) and makes it available to management applications through the WMI API.

The BizTalk schema classes are registered and defined by using Managed Object Format (MOF), which is a compiled language based on the Interface Definition Language (IDL). You place this information in an .mof file that you submit to the MOF compiler, Mofcomp.exe.

The MOF code examples in the following sections are taken from the InterchangeProvSchema.mof file found in the \Program Files\Microsoft BizTalk Server\Setup folder. This file, along with SrvEvents.mof, contains the BizTalk Server namespace, provider, provider registration, and schema class definitions.

To access the WMI database layer programmatically, see [BizTalk Server WMI Reference](#), later in this white paper, which documents the BizTalk Server WMI schema classes that correspond to the administration objects.

## BizTalk Server Namespace

Every WMI namespace contains a set of system classes, including **\_\_NAMESPACE**. A namespace groups a collection of classes into logical units. Every computer has a defined namespace at the top of the hierarchy called the Root namespace. The location of a namespace is described by a path.

In the following MOF code, "MicrosoftBizTalkServer" is specified as the value for the **Name** property of the **\_\_NAMESPACE** system class for BizTalk Server:

```
#pragma namespace ("\\.\Root")
instance of __Namespace
{
    Name = "MicrosoftBizTalkServer";
}
```

BizTalk Server defines the "MicrosoftBizTalkServer" namespace as a sibling of the Root namespace, logically distinguishing the BizTalk Server-managed environment from other managed environments.

## BizTalk Server Provider and Registration

When WMI receives a request from a BizTalk Server management application, it forwards the request to the WMI provider, "InterchangeProv." The WMI provider retrieves, modifies, deletes, and/or enumerates instances of the BizTalk Server schema classes. In addition, "InterchangeProv" supplies dynamic instance information and generates event information.

In the following MOF code, "InterchangeProv" is specified as the value for the **Name** property of the of **\_\_Win32Provider** system class:

```
instance of __Win32Provider as $P
{
    Name = "InterchangeProv";
    CLSID = "{9ac8efd6-c454-11d2-92c7-00c04fa356e8}";
};
```

"InterchangeProv" is a custom provider designed to interact with the managed objects in the BizTalk Server environment. For a complete reference of these managed objects and their properties and methods, see [BizTalk Server WMI Reference](#), later in this white paper.

In the following MOF code, an instance of the **\_\_InstanceProviderRegistration** system class is used to register the instance provider with WMI:

```
instance of __InstanceProviderRegistration
{
    Provider = $P;
```

```
SupportsGet = TRUE;
SupportsPut = TRUE;
SupportsDelete = TRUE;
SupportsEnumeration = TRUE;
QuerySupportLevels = {"WQL:UnarySelect"};
};
```

The BizTalk Server instance provider supports data retrieval, data modification, data deletion, data enumeration, and query processing.

In the following MOF code, an instance of the **\_\_MethodProviderRegistration** system class is used to register the method provider with WMI:

```
instance of __MethodProviderRegistration
{
    Provider = $P;
};
```

## Using WMI in BizTalk Server

WMI provides a powerful event architecture that enables modifications in management information to be identified, aggregated, and associated with other management information, which can then be forwarded to local or remote management applications. Event handling and notification is a key benefit provided by WMI that provides a mechanism for identifying and dealing with hardware or software events and errors.

After an event occurs, a notification is delivered to one or more registered recipients, known as event consumers. Event consumers can register to receive certain types of notifications. Event consumers register to receive notifications without any knowledge of how events and notifications are provided. To register, event consumers specify a filter that is created by using the WMI Query Language (WQL). The query describes the conditions under which the consumer receives the event notification.

In addition to DCOM interfaces, WMI supports a uniform scripting application programming interface (API) that gives applications and scripts access to the WMI provider on either a local computer or a remote computer.

This section shows the basic steps necessary to write a temporary WMI event consumer with Microsoft Visual Basic script, although some of the associated DCOM interfaces are mentioned.

For code examples that show how to create and manipulate the BizTalk Administration objects by using WMI, see "Appendix: Solutions Library," later in this white paper.

**Note** If you have Health Monitor installed (either from Microsoft Application Center 2000 or Microsoft BackOffice®), you can configure Health Monitor through its Monitor Management Console (MMC) user interface (UI) (or its WMI class) to consume events.

For more information about publishing and consuming events, see the article Event Notification in the WMI SDK on the MSDN Online Library Web site.

For more information about WMI Application Programming, go to the [MSDN Online Library Web site](#) and search for WMI Application Programming.

## Declaring Variables

In order to write an event consumer using WMI, you will need to obtain a locator object, a services object, an event object, and an object to represent a WMI class instance.

First, declare the variables, as shown in the following code:

```
Dim wbemLocat
Dim wbemSrvcs
Dim wbemEvent
Dim wbemObject
```

The locator object variable, *wbemLocat*, of type **SwbemLocator** is used to connect to WMI. To connect to the "MicrosoftBizTalkServer" namespace under the Root namespace ("Root/MicrosoftBizTalkServer"), you set the services object

variable, *wbemSrvcs*, of type **SWbemServices**. The event object variable, *wbemEvent*, of type **SwbemEventSource** is needed to execute a query to receive events. To retrieve an event from the event query, you set the *wbemObject* variable of type **SwbemObject**.

## Connecting to the Microsoft\_BizTalk Server Namespace

After you declare the variables, you need to retrieve the locator object. If you are using the scripting API, create a **WbemScripting.SwbemLocator** object, as shown in the following code:

```
Set wbemLocat = CreateObject("WbemScripting.SwbemLocator")
```

Note that the first step for any application using WMI is to retrieve a locator object. If you are using the DCOM interfaces, you would retrieve an **IWBEMLocator** pointer by using the **CoCreateInstance** method with the **CLSID\_WbemLocator**, as shown in the following code:

```
IwbemLocator* piWMI = NULL;
HRESULT hr;

hr = CoCreateInstance(
    CLSID_WbemLocator,
    NULL,
    CLSCTX_INPROC_SERVER,
    IID_IwbemLocator,
    (LPVOID*) &piWMI
);
```

Using the locator object and the **ConnectServer** method, you can request a connection to the WMI service. The following code attempts to connect to WMI by specifying the Root namespace on the local computer. In the following code, substitute the string "*ComputerName*" with the name of the server that publishes the event:

```
Set wbemSrvcs = wbemLocat.ConnectServer("ComputerName", _
    "root\MicrosoftBizTalkServer")
```

If **Err.number** is equal to 0, then the connection to the WMI namespace is established. Specify both the computer name and the namespace; otherwise, if these fields are left blank, you will be connected to the default namespace on the local computer.

The returned **SWbemServices** object provides a communication path to the SQL Server database that is used to store administrative objects.

## Creating the Event Object

Now that you have connected to the "MicrosoftBizTalkServer" namespace, you need to create the event object. The following code generates an event object to receive event notifications:

```
Set wbemEvent = _
    wbemSrvcs.ExecNotificationQuery("Select * from DocSuspendedEvent")
```

The filter used in the **SWbemServices.ExecNotificationQuery** method call is "Select \* from DocSuspendedEvent", which is written using WQL. Like SQL queries, WQL queries can be refined to return a specific set of properties, or a subset of instances that satisfy some criteria.

When the consumer submits this query, it requests to be notified of all occurrences of the event represented by the **DocSuspendedEvent** class. This request includes a request for notification on all of the event's system and nonsystem properties. When the event provider submits the query, it registers support for generating notifications whenever an event represented by the **DocSuspendedEvent** class occurs.

## Monitoring Events

Now that you have created the event object for the **DocSuspendedEvent** class, you need to set up the mechanism to monitor

events represented by that class. First, set **wbemObject** of type **SWbemObject** to Empty, as shown in the following code:

```
wbemObject = Empty
```

Then, if an event is available, the **SWbemEventSource.NextEvent** method retrieves the event from an event query, as shown in the following code:

```
Set wbemObject = wbemEvent.NextEvent(Timeout)
```

The **SWbemObject** object supports generic properties and methods that apply to all WMI objects, as well as exposing the properties and methods of the object as dynamic automation properties and methods of this object.

Use the following code to retrieve the GUID for the item in the suspended queue event:

```
EventSuspendedQueueWaitForEvent = _  
    wbemObject.Properties_.Item("stringSuspendedGuid").Value
```

If the **wbemObject** is not set to Empty, then the GUID for the item in the Suspended queue event is retrieved; otherwise, a timeout error occurs while waiting for the Suspended queue event.

Note that **stringSuspendedGuid** is a property of the **DocSuspendedEvent** class. The **Properties\_** property returns an **SWbemPropertySet** object that is a collection of the properties for the current class or instance, in this case the **DocSuspendedEvent** class. The **Item** method then retrieves an **SWbemProperty** from the collection, in this case the **stringSuspendedGuid** property.

For more information about WMI Application Programming in BizTalk Server, see the next section, [Handling Errors](#), and [Appendix: Solutions Library](#), later in this white paper.

## Handling Errors

This section uses Microsoft Visual Basic code to illustrate how to determine whether a WMI method returns an error, and if so, how to decipher the meaning of the error.

First, you declare two variables: an **SwbemLastError** object to contain and manipulate error objects, and an array of **String** objects to contain the numerical value, parameter information, and text description of the error, as shown in the following code:

```
Dim objWMIError As SWbemLastError  
Dim strError(0 To 2) As String
```

To determine whether WMI raises an error, check the **Err** object. If the **Err** object is not equal to 0, then an error has been raised. Then, you can try to set the **SwbemLastError** object to a new instance.

Note that the **TypeName** function is used to return information about the *objWMIError* variable. If it is equal to Nothing, error information is not available, and the attempt to create the error object has failed.

If the call succeeds and an error object returns, the status of the object is reset and the members of the string array are set to meaningful values, as shown in the following code:

```
If Err <> 0 Then  
    strError(0) = Hex(Err.Number)  
    Set objWMIError = New SWbemLastError  
    If TypeName(objWMIError) <> "Nothing" Then  
        strError(1) = objWMIError.ParameterInfo  
        strError(2) = objWMIError.Description  
    Else  
        Err.Clear  
        strError(1) = ""  
        strError(2) = ""  
    End If  
Else
```

```
        strError(0) = 0
        strError(1) = ""
        strError(2) = ""
    End If
```

## BizTalk Server WMI Reference

The BizTalk Server WMI classes are defined in text files using the Managed Object Format (MOF). Note that each class has a key property qualifier. The key property qualifier tells you that any instance of that class (or any instance of a derived class) can be uniquely identified by the value of the key property qualifier. This is a concept borrowed from database technologies.

To access the functionality provided by WMI you implement a set of DCOM interfaces. These interfaces make it possible to write management applications that work with classes and instances managed by WMI. For more information about these interfaces, such as **IWbemClassObject** and **IWbemServices**, see the Platform SDK.

In addition, you can access WMI from environments that support Automation objects through scripting objects that wrap the DCOM interfaces. For example, the **SWbemObject** class wraps the **IWbemClassObject** interface, and **SWbemServices** wraps **IWbemServices**. When using WMI with the BizTalk Server schema classes, you can get complete access to WMI through Microsoft Visual Basic or Visual Basic Scripting Edition (VBScript). Visual Basic projects can access these objects by adding Microsoft WMI Scripting V1.1 Library in the Reference dialog box.

The COM API is available directly to C/C++ programmers. You can use the Scripting API to develop script and applications based on Microsoft Visual Basic that you can use to view or control managed objects.

For a complete description of the interfaces in the WMI COM API, see the article [COM API for WMI](#), in the WMI SDK on the MSDN Online Library Web site.

For a description of the interfaces in the Scripting API, see the article [Scripting API for WMI](#), in the WMI SDK on the MSDN Online Library Web site.

## DocSuspendedEvent

The **DocSuspendedEvent** class represents events raised by documents sent to the Suspended queue.

**DocSuspendedEvent** inherits from the **\_\_ExtrinsicEvent** system class, an abstract base class that serves as a superclass for all user-defined event types.

The **DocSuspendedEvent** class defines the following property:

Property	Description
<b>stringSuspendedGuid</b>	Contains the tracking key of the item in the Suspended queue event.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** SrvEvents.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## StringSuspendedGuid Property

Contains the tracking key of the item in the Suspended queue event.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string stringSuspendedGuid;
```

## Parameters

None

## Return values

A **string** data type.

## Remarks

This property is read-only.

The tracking key of the item in the Suspended queue event is based on a globally unique identifier (GUID).

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** SrvEvents.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## InterchangeProvError

The **InterchangeProvError** class represents error information returned by the interchange provider when creating class instances.

**InterchangeProvError** inherits from the **\_\_ExtendedStatus** system class, which is used to report detailed status and error information.

The **InterchangeProvError** class defines the following property:

Property	Description
<b>InterchangeProvName</b>	Contains the name of the interchange provider returning error information.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## InterchangeProvError Property

Contains the name of the interchange provider returning error information.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
String InterchangeProvName;
```

## Parameters

None

## Return values

**String** data type.

## Remarks

This property is read-only.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## MicrosoftBizTalkServer\_Group

The **MicrosoftBizTalkServer\_Group** class represents a logical grouping of a specific number of BizTalk Servers in an enterprise. It is the management abstraction for global BizTalk properties.

**MicrosoftBizTalkServer\_Group** is a dynamic class, supplied by the WMI provider "InterchangeProv" at run time, as needed.

The **MicrosoftBizTalkServer\_Group** class defines the following properties:

Property	Description
<b>ConfigurationCacheRefreshInterval</b>	Indicates how often the server refreshes the cache of the BizTalk Messaging Configuration objects, in seconds.
<b>ConnectToDbStatus</b>	Indicates the status of the connection to the Tracking and Shared Queue databases.
<b>DateModified</b>	Indicates the last modification date of the instance data.
<b>DocTrackDbLogon</b>	Contains the user ID component of the connect string for the Tracking database.
<b>DocTrackDbName</b>	Contains the database name component of the connect string for the Tracking database.
<b>DocTrackDbPassword</b>	Contains the password component of the connect string for the Tracking database.
<b>DocTrackDbServer</b>	Contains the server name component of the connect string for the Tracking database.
<b>EnableDocumentTracking</b>	Indicates whether document tracking is enabled or disabled.
<b>LoggingPointState</b>	Represents a collection of flags that indicate the events that cause a Tracking entry to be logged.
<b>Name</b>	Contains the name of the server.
<b>ParserOrder</b>	Contains the CLSIDs of the parser components registered in the Registry, sorted in parsing order.
<b>ProxyHost</b>	Contains the proxy host address.
<b>ProxyPort</b>	Indicates the proxy port number.
<b>QueueDbLogon</b>	Contains the user ID component of the connect string for the Shared Queue database.
<b>QueueDbName</b>	Contains the database name component of the connect string for the Shared Queue database.
<b>QueueDbPassword</b>	Contains the password component of the connect string for the Shared Queue database.
<b>QueueDbServer</b>	Contains the server name component of the connect string for the Shared Queue database.
<b>ReliableMessagingReplyToURL</b>	Contains the URL repository for reliable messaging.
<b>RetryQueueCount</b>	Indicates the number of documents in the Retry queue.
<b>ScheduledQueueCount</b>	Indicates the number of documents in the Scheduled queue.
<b>SMTPHost</b>	Contains the name of the SMTP host that is used for this group.
<b>SuspendedQueueCount</b>	Indicates the number of documents in the Suspended queue.
<b>UseProxyServer</b>	Indicates whether or not to use the proxy server.
<b>WorkQueueCount</b>	Indicates the number of documents in the Work queue.

The **MicrosoftBizTalkServer\_Group** class defines the following methods:

Method	Description
<b>PurgeSuspendedQueue</b>	Enables an administrator to remove all the documents in the Suspended queue.
<b>RefreshParserListFromRegistry</b>	Updates the list of parser components in the database, based on current components registered in the Registry.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## ConfigurationCacheRefreshInterval Property

Indicates how often the server refreshes the cache of the BizTalk Messaging Configuration objects, in seconds.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 ConfigurationCacheRefreshInterval = 50;
```

## Parameters

None

## Return values

Unsigned 32-bit unsigned integer that indicates how often the server refreshes the cache of the BizTalk Messaging Configuration objects, in seconds.

## Remarks

This property is read/write.

This property has a default value of 50.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## ConnectToDbStatus Property

Indicates the status of the connection to the Tracking and Shared Queue databases.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 ConnectToDbStatus;
```

## Parameters

None

## Return values

32-bit unsigned integer that indicates the status of the connection to the Tracking and Shared Queue databases.

## Remarks

This property is read-only.

Permissible values for this property are "BothDbConnectOK," "DTAConnectFail," "SQConnectFail," and "BothConnectFail," which map to the integers 0, 1, 2, and 3, respectively. Note that the integer values must be used in code and script.

The following code is taken from the MOF file (InterchangeProvSchema.mof), and shows the mapping:

```
Values {"BothDbConnectOK", "DTAConnectFail", "SQConnectFail",  
        "BothConnectFail"},  
ValueMap{"0", "1", "2", "3"}
```

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## DateModified Property

Indicates the last modification date of the instance data.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
datetime DateModified;
```

### Parameters

None

### Return values

A **datetime** data type that indicates the last modification date of the instance data.

### Remarks

This property is read-only.

The value of this property is in date and time format. For more information, see the Platform SDK.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## DocTrackDbLogon Property

Contains the user ID component of the connect string for the Tracking database.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string DocTrackDbLogon;
```

### Parameters

None

### Return values

A **string** data type that contains the user ID component of the connect string for the Tracking database.

### Remarks

This property is read/write.

The maximum value for the length of this property is 256 characters.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

### DocTrackDbName Property

Contains the database name component of the connect string for the Tracking database.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string DocTrackDbName;
```

### Parameters

None

### Return values

A **string** data type that contains the database name component of the connect string for the Tracking database.

### Remarks

This property is read/write.

The maximum value for the length of this property is 123 characters.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

### DocTrackDbPassword Property

Contains the password component of the connect string for the Tracking database.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string DocTrackDbPassword;
```

### Parameters

None

### Return values

A **string** data type that contains the password component of the connect string for the Tracking database.

### Remarks

This property is write-only.

The maximum value for the length of this property is 63 characters.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

### DocTrackDbServer Property

Contains the server name component of the connect string for the Tracking database.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string DocTrackDbServer;
```

### Parameters

None

### Return values

A **string** data type that contains the server name component of the connect string for the Tracking database.

### Remarks

This property is read/write

The maximum value for the length of this property is 60 characters.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

### EnableDocumentTracking Property

Indicates whether document tracking is enabled or disabled.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
boolean EnableDocumentTracking = 1;
```

### Parameters

None

### Return values

A **boolean** data type that indicates whether document tracking is enabled or disabled. If TRUE, document tracking is enabled;

otherwise, this value is FALSE and document tracking is disabled.

## Remarks

This property is read/write.

The default value for this property is TRUE.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## LoggingPointState Property

Represents a collection of flags that indicate the events that cause a Tracking entry to be logged.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 LoggingPointState;
```

## Parameters

None

## Return values

32-bit unsigned integer that represents a collection of flags which indicate the events that cause a Tracking entry to be logged.

## Remarks

This property is read/write.

Permissible values for this property are "LogIncomingInterchange," "LogMIMEBlob," and "LogOutgoingInterchange," which map to the integers 0, 1, and 2, respectively. Note that the integer values must be used in code and script.

The following code is taken from the MOF file (InterchangeProvSchema.mof), and shows the mapping:

```
Values{"LogIncomingInterchange", "LogMIMEBlob",  
      "LogOutgoingInterchange" },  
BitMap{"0", "1", "2"}
```

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## Name Property

Contains the name of the server.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

---

```
string Name;
```

#### Parameters

None

#### Return values

A **string** data type that contains the name of the server.

#### Remarks

This property is read/write.

The value of this property acts as the key for the class; its value uniquely identifies an instance of the class.

The maximum value for the length of this property is 256 characters.

#### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

#### ParserOrder Property

Contains the CLSIDs of the parser components registered in the Registry, sorted in parsing order.

#### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string ParserOrder[];
```

#### Parameters

None

#### Return values

A **string** data type that contains the CLSIDs of the parser components registered in the Registry, sorted in parsing order.

#### Remarks

This property is read/write.

#### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

#### ProxyHost Property

Contains the proxy host address.

#### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string ProxyHost;
```

#### Parameters

None

#### Return values

A **string** data type that contains the proxy host address.

#### Remarks

This property is read/write.

The maximum value for the length of this property is 256 characters.

#### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

#### ProxyPort Property

Indicates the proxy port number.

#### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 ProxyPort = 80;
```

#### Parameters

None

#### Return values

32-bit unsigned integer that indicates the proxy port number.

#### Remarks

This property is read/write.

The default value for this property is 80.

#### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

#### PurgeSuspendedQueue Method

Enables an administrator to remove all the documents in the Suspended queue.

## Syntax

The syntax shown is language neutral. This method is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 PurgeSuspendedQueue();
```

## Parameters

None

## Return values

32-bit unsigned integer, an HRESULT.

For more information, see [Handling Errors](#), earlier in this white paper.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## QueueDbLogon Property

Contains the user ID component of the connect string for the Shared Queue database.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string QueueDbLogon;
```

## Parameters

None

## Return values

A **string** data type that contains the user ID component of the connect string for the Shared Queue database.

## Remarks

This property is read/write.

The maximum value for the length of this property is 256 characters.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## QueueDbName Property

Contains the database name component of the connect string for the Shared Queue database.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string QueueDbName;
```

#### Parameters

None

#### Return values

A **string** data type that contains the database name component of the connect string for the Shared Queue database.

#### Remarks

This property is read/write.

The maximum value for the length of this property is 123 characters.

#### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

#### QueueDbPassword Property

Contains the password component of the connect string for the Shared Queue database.

#### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string QueueDbName;
```

#### Parameters

None

#### Return values

A **string** data type that contains the password component of the connect string for the Shared Queue database.

#### Remarks

This property is write-only.

The maximum value for the length of this property is 63 characters.

#### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

#### QueueDbServer Property

Contains the server name component of the connect string for the Shared Queue database.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string QueueDbServer;
```

## Parameters

None

## Return values

A **string** data type that contains the server name component of the connect string for the Shared Queue database.

## Remarks

This property is read/write.

The maximum value for the length of this property is 60 characters.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## ReliableMessagingReplyToURL Property

Contains the URL repository for reliable messaging.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string ReliableMessagingReplyToURL;
```

## Parameters

None

## Return values

A **string** data type that contains the URL repository for reliable messaging.

## Remarks

This property is read/write.

The maximum value for the length of this property is 512 characters.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## RefreshParserListFromRegistry Method

Updates the list of parser components in the database, based on current components registered in the Registry.

### Syntax

The syntax shown is language neutral. This method is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 RefreshParserListFromRegistry();
```

### Parameters

None.

### Return values

32-bit unsigned integer, an HRESULT.

For more information, see [Handling Errors](#), earlier in this white paper.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

### RetryQueueCount Property

Indicates the number of documents in the Retry queue.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 RetryQueueCount;
```

### Parameters

None

### Return values

32-bit unsigned integer that indicates the number of documents in the Retry queue.

### Remarks

This property is read-only.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

### ScheduledQueueCount Property

Indicates the number of documents in the Scheduled queue.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 ScheduledQueueCount;
```

#### Parameters

None

#### Return values

32-bit unsigned integer that indicates the number of documents in the Scheduled queue.

#### Remarks

This property is read-only.

#### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

#### SMTPHost Property

Contains the name of the SMTP host that is used for this group.

#### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string SMTPHost;
```

#### Parameters

None

#### Return values

A **string** data type that contains the name of the SMTP host that is used for this group.

#### Remarks

This property is read/write.

The maximum value for the length of this property is 256 characters.

#### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

#### SuspendedQueueCount Property

Indicates the number of documents in the Suspended queue.

#### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 SuspendedQueueCount;
```

#### Parameters

None

#### Return values

32-bit unsigned integer that indicates the number of documents in the Suspended queue.

#### Remarks

This property is read-only.

#### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

#### UseProxyServer Property

Indicates whether or not to use the proxy server.

#### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
boolean UseProxyServer = 0;
```

#### Parameters

None

#### Return values

A **boolean** data type that indicates whether or not to use the proxy server. If TRUE, a proxy server is used; otherwise, this value is FALSE and a proxy server is not used.

#### Remarks

This property is read/write.

The default value for this property is FALSE.

#### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

#### WorkQueueCount Property

Indicates the number of documents in the Work queue.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 WorkQueueCount;
```

## Parameters

None

## Return values

32-bit unsigned integer that indicates the number of documents in the Work queue.

## Remarks

This property is read-only.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## MicrosoftBizTalkServer\_GroupReceiveFunction

The **MicrosoftBizTalkServer\_GroupReceiveFunction** class is an association class that is provided as a convenience. Associations are instances of association classes and are used to represent relationships between other WMI objects.

**MicrosoftBizTalkServer\_GroupReceiveFunction** is a dynamic class, supplied by the WMI provider "InterchangeProv" at run time, as needed. This class allows you to retrieve all the receive functions in a group.

The **MicrosoftBizTalkServer\_GroupReceiveFunction** class defines the following properties:

Property	Description
<b>Antecedent</b>	References the properties of the BizTalk Server group.
<b>Dependent</b>	References the properties of the receive function that is associated with the BizTalk Server group.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## Antecedent Property

References the properties of the BizTalk Server group.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
MicrosoftBizTalkServer_Group ref Antecedent;
```

## Parameters

None

## Return values

A **ref** data type that references the properties of the BizTalk Server group. The returned reference is to an instance of a **MicrosoftBizTalkServer\_Group** object.

## Remarks

This property is read-only.

The value of this property acts as a key for the class; its value along with the value of **Dependent** uniquely identifies an instance of the class.

This property is the parent component of an aggregation association.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## Dependent Property

References the properties of the receive function that is associated with the BizTalk Server group.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
MicrosoftBizTalkServer_ReceiveFunction ref Dependent;
```

## Parameters

None

## Return values

A **ref** data type that references the properties of the receive function that is associated with the BizTalk Server group. The returned reference is to an instance of a **MicrosoftBizTalkServer\_ReceiveFunction** object.

## Remarks

This property is read-only.

The value of this property acts as a key for the class; its value along with the value of **Antecedent** uniquely identifies an instance of the class.

This property is the child component of an aggregation association.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## MicrosoftBizTalkServer\_GroupServer

The **MicrosoftBizTalkServer\_GroupServer** class is an association class that is provided as a convenience. Associations are instances of association classes and are used to represent relationships between other WMI objects.

**MicrosoftBizTalkServer\_GroupServer** is a dynamic class, supplied by the WMI provider "InterchangeProv" at run time, as needed. This class allows you to retrieve all the servers in a group.

The **MicrosoftBizTalkServer\_GroupServer** class defines the following properties:

Property	Description
<b>Antecedent</b>	References the properties of the BizTalk Server group.
<b>Dependent</b>	References the properties of the server that is associated with the BizTalk Server group.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## Antecedent Property

References the properties of the BizTalk Server group.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
MicrosoftBizTalkServer_Group ref Antecedent;
```

## Parameters

None

## Return values

A **ref** data type that references the properties of the BizTalk Server group. The returned reference is to an instance of a **MicrosoftBizTalkServer\_Group** object.

## Remarks

This property is read-only.

The value of this property acts as a key for the class; its value along with the value of **Dependent** uniquely identifies an instance of the class.

This property is the parent component of an aggregation association.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## Dependent Property

References the properties of the server that is associated with the BizTalk Server group.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
MicrosoftBizTalkServer_Server ref Dependent;
```

## Parameters

None

## Return values

A **ref** data type that references the properties of the server that is associated with the BizTalk Server group. The returned reference is to an instance of a **MicrosoftBizTalkServer\_Server** object.

## Remarks

This property is read-only.

The value of this property acts as a key for the class; its value along with the value of **Antecedent** uniquely identifies an instance of the class.

This property is the child component of an aggregation association.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## MicrosoftBizTalkServer\_MgmtDB

The **MicrosoftBizTalkServer\_MgmtDB** class represents the BizTalk Messaging Management database.

**MicrosoftBizTalkServer\_MgmtDB** is a dynamic class, supplied by the WMI provider "InterchangeProv" at run time, as needed.

The **MicrosoftBizTalkServer\_MgmtDB** class defines the following properties:

Property	Description
<b>LocalServer</b>	Contains the name of the class, identifying the instance of the class.
<b>MgmtDbLogo n</b>	Contains the user ID component of the BizTalk Messaging Management database connect string.
<b>MgmtDbNam e</b>	Contains the initial catalog component of the BizTalk Messaging Management database connect string and represents the database name.
<b>MgmtDbPass word</b>	Contains the password component of the BizTalk Messaging Management database connect string.
<b>MgmtDbServe r</b>	Contains the data source part of the BizTalk Messaging Management database connect string.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## LocalServer Property

Contains the name of the class, identifying the instance of the class.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string LocalServer;
```

## Parameters

None

## Return values

A **string** value that contains the name of the class, identifying the instance of the class.

## Remarks

This property is read-only.

The value of this property acts as the key for the class; its value uniquely identifies an instance of the class.

The maximum value for the length of this property is 63 characters.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## MgmtDbLogon Property

Contains the user ID component of the BizTalk Messaging Management database connect string.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string MgmtDbLogon;
```

## Parameters

None

## Return values

A **string** data type that Contains the user ID component of the BizTalk Messaging Management database connect string.

## Remarks

This property is read/write.

The maximum value for the length of this property is 256 characters.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## MgmtDbName Property

Contains the initial catalog component of the BizTalk Messaging Management database connect string and represents the database name.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string MgmtDbName;
```

## Parameters

None

## Return values

A **string** data type that contains the initial catalog component of the BizTalk Messaging Management database connect string and represents the database name.

## Remarks

This property is read/write.

The maximum value for the length of this property is 123 characters.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## MgmtDbPassword Property

Contains the password component of the BizTalk Messaging Management database connect string.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string MgmtDbPassword;
```

## Parameters

None

## Return values

A **string** data type that contains the password component of the BizTalk Messaging Management database connect string.

## Remarks

This property is write-only.

The maximum value for the length of this property is 63 characters.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## MgmtDbServer Property

Contains the data source part of the BizTalk Messaging Management database connect string.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string MgmtDbServer;
```

### Parameters

None

### Return values

A **string** data type that contains the data source part of the BizTalk Messaging Management database connect string.

### Remarks

This property is read/write.

The maximum value for the length of this property is 60 characters.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

### MicrosoftBizTalkServer\_Queue

The **MicrosoftBizTalkServer\_Queue** class is abstract and serves only as a base for new classes. This class should not be implemented.

The **MicrosoftBizTalkServer\_Queue** class defines the following properties:

Property	Description
<b>Destination</b>	Contains the name of the organization or application that receives the document.
<b>Group</b>	Contains the name of the group to which the queue belongs.
<b>QID</b>	Identifies an instance of the class.
<b>Source</b>	Contains the name of the organization or application that sends the document.
<b>Timestamp</b>	Indicates the last time the document was used, or when it entered the queue.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

### Destination Property

Contains the name of the organization or application that receives the document.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string Destination;
```

### Parameters

None

## Return values

A **string** data type that contains the name of the organization or application that receives the document.

## Remarks

This property is read-only.

The maximum value for the length of this property is 512 characters.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## Group Property

Contains the name of the group to which the queue belongs.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string Group;
```

## Parameters

None

## Return values

A **string** data type that contains the name of the group to which the queue belongs.

## Remarks

This property is read-only.

The value of this property acts as a key for the class; its value along with the value of **QID** uniquely identifies an instance of the class.

The maximum value for the length of this property is 256 characters.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## QID Property

Identifies an instance of the class.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 QID;
```

## Parameters

None

## Return values

32-bit unsigned integer that identifies an instance of the class.

## Remarks

This property is read-only.

The value of this property acts as a key for the class; its value along with the value of **Group** uniquely identifies an instance of the class.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## Source Property

Contains the name of the organization or application that sends the document.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string Source;
```

## Parameters

None

## Return values

A **string** data type that contains the name of the organization or application that sends the document.

## Remarks

This property is read-only.

The maximum value for the length of this property is 64 characters.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## Timestamp Property

Indicates the last time the document was used, or when it entered the queue.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
datetime Timestamp;
```

## Parameters

None

## Return values

Indicates the last time the document was used, or when it entered the queue.

## Remarks

This property is read-only.

The value of this property is in date and time format. For more information, see the Platform SDK.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## MicrosoftBizTalkServer\_ReceiveFunction

The **MicrosoftBizTalkServer\_ReceiveFunction** class represents a service that is set up on a BizTalk Server to handle incoming interchanges by using a specific protocol such as File, Message Queuing, or Script.

**MicrosoftBizTalkServer\_ReceiveFunction** is a dynamic class, supplied by the WMI provider "InterchangeProv" at run time, as needed.

The **MicrosoftBizTalkServer\_ReceiveFunction** class defines the following properties:

Property	Description
<b>ChannelName</b>	Contains the name of the channel that the receive function should pass to the <b>Submit</b> method call when the pass-through flag is enabled.
<b>Comment</b>	Contains user comments.
<b>DateModified</b>	Indicates the last modification date of the instance data.
<b>DestinationID</b>	Represents the ID of the organization or application that receives the document.
<b>DestinationQualifier</b>	Represents the ID type of the organization or application that receives the document.
<b>DisableReceiveFunction</b>	Indicates whether to enable or disable the receive function.
<b>DocumentName</b>	Contains the name of the document definition for the input document of a channel.
<b>EnvelopeName</b>	Contains the name of an envelope definition instance in the BizTalk Messaging Management database.
<b>FilenameMask</b>	Contains the file name mask to use for receive functions that pull files from the file system for input to BizTalk Server.
<b>GroupName</b>	Contains the name of the group to which the server belongs.
<b>IsPassThrough</b>	Indicates whether a <b>Submit</b> method call is made with the pass-through flag enabled or disabled.
<b>Name</b>	Contains the name of the component.
<b>OpennessFlag</b>	Indicates the value of the <i>lOpenness</i> parameter that the receive function passes to the <b>Submit</b> method.
<b>Password</b>	Contains the password to use for FTP or Message Queuing receive functions that require a user name and password.
<b>PollingLocation</b>	Contains the name of the directory to poll (directory, message queue, and so on) for receive functions that require polling.
<b>PreProcessor</b>	Indicates any pre-processing that must be done for received document.
<b>ProcessingServer</b>	Contains the name of the server that is currently processing the interchange.
<b>SourceID</b>	Contains the ID of the organization or application that sends the document.
<b>SourceQualifier</b>	Contains the ID type of the organization or application that sends the document.

<b>Username</b>	Contains the user name to use for FTP or Message Queuing receive functions.
-----------------	---

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## ChannelName Property

Contains the name of the channel that the receive function should pass to the **Submit** method call when the pass-through flag is enabled.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string ChannelName;
```

### Parameters

None

### Return values

A **string** data type that contains the name of the channel that the receive function should pass to the **Submit** method call when the pass-through flag is enabled.

### Remarks

This property is read/write.

The maximum value for the length of this property is 64 characters.

This property is required for custom receive functions.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## Comment Property

Contains user comments.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string Comment;
```

### Parameters

None

### Return values

A **string** data type that contains user comments.

### Remarks

This property is read/write.

The maximum value for this property is 256 characters.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

### DateModified Property

Indicates the last modification date of the instance data.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
datetime DateModified;
```

### Parameters

None

### Return values

A **datetime** data type that indicates the last modification date of the instance data.

### Remarks

This property is read-only.

The value of this property is in date and time format. For more information, see the Platform SDK.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

### DestinationID Property

Represents the ID of the organization or application that receives the document.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string DestinationID;
```

### Parameters

None

## Return values

A **string** data type that represents the ID of the organization or application that receives the document.

## Remarks

This property is read/write.

The maximum value for the length of this property is 256 characters.

This property is required for custom receive functions.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## DestinationQualifier Property

Represents the ID type of the organization or application that receives the document.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string DestinationQualifier;
```

## Parameters

None

## Return values

A **string** data type that represents the ID type of the organization or application that receives the document.

## Remarks

This property is read/write.

The maximum value for the length of this property is 64 characters.

This property is required for custom receive functions.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## DisableReceiveFunction Property

Indicates whether to enable or disable the receive function.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
boolean DisableReceiveFunction = 0;
```

## Parameters

None.

## Return values

A **boolean** data type that indicates whether to enable or disable the receive function. If TRUE, the receive function is disabled; otherwise, this value is FALSE and the receive function is enabled.

## Remarks

This property is read/write.

The default value for this property is FALSE.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## DocumentName Property

Contains the name of the document definition for the input document of a channel.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string DocumentName;
```

## Parameters

None

## Return values

A **string** data type that contains the name of the document definition for the input document of a channel.

## Remarks

This property is read/write.

The maximum value for the length of this property is 256 characters.

This property is required for custom receive functions.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## EnvelopeName Property

Contains the name of an envelope definition instance in the BizTalk Messaging Management database.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string EnvelopeName;
```

#### Parameters

None

#### Return values

A **string** data type that contains the name of an envelope definition instance in the BizTalk Messaging Management database.

#### Remarks

This property is read/write.

The maximum value for the length of this property is 256 characters.

This property is required for custom receive functions.

#### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

#### FilenameMask Property

Contains the file name mask to use for receive functions that pull files from the file system for input to BizTalk Server.

#### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string FilenameMask;
```

#### Parameters

None

#### Return values

A **string** data type that contains the file name mask to use for receive functions that pull files from the file system for input to BizTalk Server.

#### Remarks

This property is read/write.

The maximum value for the length of this property is 256 characters.

#### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## GroupName Property

Contains the name of the group to which the server belongs.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string GroupName;
```

### Parameters

None

### Return values

A **string** data type that contains the name of the group to which the server belongs.

### Remarks

This property is read-only.

The maximum value for the length of this property is 256 characters.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## IsPassThrough Property

Indicates whether a **Submit** method call is made with the pass-through flag enabled or disabled

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
boolean IsPassThrough = 0;
```

### Parameters

None

### Return values

A **boolean** data type that indicates whether a **Submit** method call is made with the pass-through flag enabled or disabled. If TRUE, the pass-through flag is enabled; otherwise, this value is FALSE and the pass-through flag is disabled.

### Remarks

This property is read/write.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## Name Property

Contains the name of the component.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string Name;
```

### Parameters

None

### Return values

A **string** data type that contains the name of the component.

### Remarks

This property is read/write.

The value of this property acts as the key for the class; its value uniquely identifies an instance of the class.

The maximum value for the length of this property is 256 characters.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## OpennessFlag Property

Indicates the value of the *lOpenness* parameter that the receive function passes to the **Submit** method.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 OpennessFlag;
```

### Parameters

None

### Return values

32-bit unsigned integer that indicates the value of the *lOpenness* parameter that the receive function passes to the **Submit** method.

### Remarks

This property is read/write.

Permissible values for this property are "NotOpen", "OpenSource", and "OpenDestination," which map to the integers 0, 1, and 2, respectively. Note that the integer values must be used in code and script.

The following code is taken from the MOF file (InterchangeProvSchema.mof), and shows the values:

```
Values {"NotOpen", "OpenSource", "OpenDestination"}
```

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## Password Property

Contains the password to use for FTP or Message Queuing receive functions that require a user name and password.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string Password;
```

## Parameters

None

## Return values

A **string** data type that contains the password to use for FTP or Message Queuing receive functions that require a user name and password.

## Remarks

The property is read/write.

The maximum value for the length of this property is 63 characters.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## PollingLocation Property

Contains the name of the directory to poll (directory, message queue, and so on) for receive functions that require polling.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string PollingLocation;
```

## Parameters

None

## Return values

A **string** data type that contains the name of the directory to poll (directory, message queue, and so on) for receive functions that require polling.

## Remarks

This property is read/write.

The maximum value for the length of this property is 260 characters.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## PreProcessor Property

Indicates any pre-processing that must be done for received document.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string PreProcessor;
```

## Parameters

None

## Return values

A **string** data type that indicates any pre-processing that must be done for received document.

## Remarks

This property is read/write.

The maximum value for the length of this property is 256 characters.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## ProcessingServer Property

Contains the name of the server that is currently processing the interchange.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string ProcessingServer;
```

## Parameters

None

## Return values

A **string** data type that contains the name of the server that is currently processing the interchange.

## Remarks

This property is read/write.

The maximum value for the length of this property is 63 characters.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## SourceID Property

Contains the ID of the organization or application that sends the document.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string SourceID;
```

## Parameters

None

## Return values

A **string** data type that contains the ID of the organization or application that sends the document.

## Remarks

This property is read/write.

The maximum value for the length of this property is 256 characters.

This property is required for custom receive functions.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## SourceQualifier Property

Contains the ID type of the organization or application that sends the document.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string SourceQualifier;
```

### Parameters

None

### Return values

A **string** data type that contains the ID type of the organization or application that sends the document.

### Remarks

This property is read/write.

The maximum value for the length of this property is 64 characters.

This property is required for custom receive functions. The value of this property can be a phone number, a Dunn & Bradstreet number, and so on.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

### Username Property

Contains the user name to use for FTP or Message Queuing receive functions.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string Username;
```

### Parameters

None

### Return values

A **string** data type that contains the user name to use for FTP or Message Queuing receive functions.

### Remarks

This property is read/write.

The maximum value for the length of this property is 256 characters.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

### MicrosoftBizTalkServer\_RetryQueue

The **MicrosoftBizTalkServer\_RetryQueue** class represents a logical grouping of interchanges in the Shared queue that are

awaiting receipt correlation, or interchanges that are due to be sent to multiple destinations.

**MicrosoftBizTalkServer\_RetryQueue** is a dynamic class, supplied by the WMI provider "InterchangeProv" at run time, as needed.

**MicrosoftBizTalkServer\_RetryQueue** inherits the following properties from the **MicrosoftBizTalkServer\_Queue** class.

Property	Description
<b>Destination</b>	Represents the organization or application that receives the document.
<b>Group</b>	Represents the name of the group to which the queue belongs.
<b>QID</b>	Identifies an instance of the class and is used as the key.
<b>Source</b>	Represents the organization or application that sends the document.
<b>Timestamp</b>	Represents the last time the document was used, or when it entered the queue.

The **MicrosoftBizTalkServer\_RetryQueue** class defines the following properties:

Property	Description
<b>LastRetryTime</b>	Indicates the last time the server attempted a transmission.
<b>ProcessingServer</b>	Contains the name of the server that last processed the document.
<b>RemainingRetryCount</b>	Indicates the number of outstanding retries remaining.
<b>RetryInterval</b>	Indicates the wait time between retry intervals.
<b>ServiceWindowFromTime</b>	Indicates the start time of the service window in which to send interchanges.
<b>ServiceWindowToTime</b>	Indicates the end time of the service window in which to send interchanges.

The **MicrosoftBizTalkServer\_RetryQueue** class defines the following method:

Method	Description
<b>MoveToSuspendedQueue</b>	Enables the administrator to move the selected document to the Suspended queue.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## LastRetryTime Property

Indicates the last time the server attempted a transmission.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
datetime LastRetryTime;
```

## Parameters

None

## Return values

A **datetime** data type that indicates the last time the server attempted a transmission.

## Remarks

This property is read-only.

The value of this property is in date and time format. For more information, see the Platform SDK.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## MoveToSuspendedQueue Method

Enables the administrator to move the selected document to the Suspended queue.

### Syntax

The syntax shown is language neutral. This method is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 MoveToSuspendedQueue();
```

### Parameters

None.

### Return values

32-bit unsigned integer, an HRESULT.

For more information, see [Handling Errors](#), earlier in this white paper.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## ProcessingServer Property

Contains the name of the server that last processed the document.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string ProcessingServer;
```

### Parameters

None

### Return values

A **string** data type that contains the name of the server that last processed the document.

### Remarks

This is a read-only property.

The maximum value for the length of this property is 63 characters.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## RemainingRetryCount Property

Indicates the number of outstanding retries remaining.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 RemainingRetryCount;
```

### Parameters

None

### Return values

32-bit unsigned integer that indicates the number of outstanding retries remaining.

### Remarks

This property is read-only.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## RetryInterval Property

Indicates the wait time between retry intervals, in minutes.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 RetryInterval;
```

### Parameters

None

### Return values

32-bit unsigned integer that indicates the wait time between retry intervals, in minutes.

### Remarks

This property is read-only.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## ServiceWindowFromTime Property

Indicates the start time of the service window in which to send interchanges.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
datetime ServiceWindowFromTime;
```

### Parameters

None

### Return values

A **datetime** data type that indicates the start time of the service window in which to send interchanges.

### Remarks

This property is read-only.

The value of this property is in date and time format. For more information, see the Platform SDK.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## ServiceWindowToTime Property

Indicates the end time of the service window in which to send interchanges.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
datetime ServiceWindowToTime;
```

### Parameters

None

### Return values

A **datetime** data type that indicates the end time of the service window in which to send interchanges.

### Remarks

This property is read-only.

The value of this property is in date and time format. For more information, see the Platform SDK.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## MicrosoftBizTalkServer\_ScheduledQueue

The **MicrosoftBizTalkServer\_ScheduledQueue** class represents a logical grouping of interchanges in the Shared queue that are scheduled for a later delivery time based on a service window.

**MicrosoftBizTalkServer\_ScheduledQueue** is a dynamic class, supplied by the WMI provider "InterchangeProv" at run time, as needed.

**MicrosoftBizTalkServer\_ScheduledQueue** inherits the following properties from the **MicrosoftBizTalkServer\_Queue** class.

Property	Description
<b>Destination</b>	Represents the organization or application that receives the document.
<b>Group</b>	Represents the name of the group to which the queue belongs.
<b>QID</b>	Identifies an instance of the class and is used as the key.
<b>Source</b>	Represents the organization or application that sends the document.
<b>Timestamp</b>	Represents the last time the document was used, or when it entered the queue.

The **MicrosoftBizTalkServer\_ScheduledQueue** class defines the following properties:

Property	Description
<b>ProcessingServer</b>	Contains the name of the server that last worked on the document.
<b>ServiceWindowFromTime</b>	Indicates the start time of the service window in which to send interchanges.
<b>ServiceWindowToTime</b>	Indicates the end time of the service window in which to send interchanges.

The **MicrosoftBizTalkServer\_ScheduledQueue** class defines the following method:

Method	Description
<b>MoveToSuspendedQueue</b>	Enables the administrator to move the selected document to the Suspended queue.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## MoveToSuspendedQueue Method

Enables the administrator to move the selected document to the Suspended queue.

### Syntax

The syntax shown is language neutral. This method is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 MoveToSuspendedQueue();
```

### Parameters

None

### Return values

32 bit unsigned integer.

For more information, see [Handling Errors](#), earlier in this white paper.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## ProcessingServer Property

Contains the name of the server that last worked on the document.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string ProcessingServer;
```

### Parameters

None

### Return values

A **string** data type that contains the name of the server that last worked on the document.

### Remarks

This property is read-only.

The maximum value for the length of this property is 63 characters.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## ServiceWindowFromTime Property

Indicates the start time of the service window in which to send interchanges.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
datetime ServiceWindowFromTime;
```

### Parameters

None

### Return values

A **datetime** data type that indicates the start time of the service window in which to send interchanges.

### Remarks

This property is read-only.

The value of this property is in interval format. For more information, see the Platform SDK.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## ServiceWindowToTime Property

Indicates the end time of the service window in which to send interchanges.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
datetime ServiceWindowToTime;
```

## Parameters

None

## Return values

A **datetime** data type that indicates the end time of the service window in which to send interchanges.

## Remarks

This property is read-only.

The value of this property is in interval format. For more information, see the Platform SDK.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## MicrosoftBizTalkServer\_Server

The **MicrosoftBizTalkServer\_Server** class represents specific Windows 2000 computers within a BizTalk Server group that are running BizTalk Messaging Services.

**MicrosoftBizTalkServer\_Server** is a dynamic class, supplied by the WMI provider "InterchangeProv" at run time, as needed.

The **MicrosoftBizTalkServer\_Server** class defines the following properties:

Property	Description
<b>DateModified</b>	Indicates the date of the last modification of the instance data.
<b>GroupName</b>	Contains the name of the group to which the server belongs.
<b>MaxRecvSvcThreadsPerProcessor</b>	Indicates the maximum number of receive function threads that BizTalk Server can use per process or for asynchronous calls.
<b>MaxWorkerThreadsPerProcessor</b>	Indicates the maximum number of worker threads that BizTalk Server can use per processor for asynchronous calls.
<b>Name</b>	Contains the name of the server.
<b>ParticipateInWorkItemProcessing</b>	Indicates whether or not the server participates in work-item processing.
<b>SchedulerWaitTime</b>	Indicates the time interval that BizTalk Server scheduler waits between tries.
<b>ServiceState</b>	Indicates the state of the BizTalk Server services on a particular server.

The **MicrosoftBizTalkServer\_Server** class defines the following methods:

Method	Description
<b>FreeInterchanges</b>	Frees interchanges that are currently assigned to a specific server if the server is stopped, removed, or in an error state, so that other servers can work on these interchanges.
<b>StartServer</b>	Starts BizTalk Server services on a specific server.
<b>StopServer</b>	Stops the BizTalk Server services on a specific server.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## DateModified Property

Indicates the date of the last modification of the instance data.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
datetime DateModified;
```

## Parameters

None

## Return values

A **datetime** data type that indicates the date of the last modification of the instance data.

## Remarks

This property is read-only.

The value of this property is in date and time format. For more information, see the Platform SDK.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## FreeInterchanges Property

Frees interchanges that are currently assigned to a specific server if the server is stopped, removed, or in an error state, so that other servers can work on these interchanges.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 FreeInterchanges();
```

## Parameters

None

### Return values

32-bit unsigned integer, an HRESULT.

For more information, see [Handling Errors](#), earlier in this white paper.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

### GroupName Property

Contains the name of the group to which the server belongs.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string GroupName;
```

### Parameters

None

### Return values

A **string** data type that contains the name of the group to which the server belongs.

### Remarks

This property is read-only.

The maximum value for the length of this property is 256 characters.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

### MaxRecvSvcThreadsPerProcessor Property

Indicates the maximum number of receive function threads that BizTalk Server can use per processor for asynchronous calls.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 MaxRecvSvcThreadsPerProcessor = 4;
```

### Parameters

None

## Return values

32-bit unsigned integer that indicates the maximum number of receive function threads that BizTalk Server can use per processor for asynchronous calls.

## Remarks

This property is read/write.

The default value for this property is 4.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## MaxWorkerThreadsPerProcessor Property

Indicates the maximum number of worker threads that BizTalk Server can use per processor for asynchronous calls.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 MaxWorkerThreadsPerProcessor = 4;
```

## Parameters

None

## Return values

32-bit unsigned integer that indicates the maximum number of worker threads that BizTalk Server can use per processor for asynchronous calls.

## Remarks

This property is read/write.

The default value for this property is 4.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## Name Property

Contains the name of the server.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string Name;
```

## Parameters

None

## Return values

A **string** data type that contains the name of the server.

## Remarks

This property is read/write.

The value of this property acts as the key for the class; its value uniquely identifies an instance of the class.

The maximum value for the length of this property is 63 characters.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## ParticipateInWorkItemProcessing Property

Indicates whether or not the server participates in work-item processing.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
boolean ParticipateInWorkItemProcessing = 1;
```

## Parameters

None

## Return values

A **boolean** data type that indicates whether or not the server participates in work-item processing. If TRUE, the server participates in work-item processing; otherwise, this value is FALSE and the server does not participate in work-item processing.

## Remarks

This property is read/write.

The default value for this parameter is TRUE.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## SchedulerWaitTime Property

Indicates the time interval that BizTalk Server scheduler waits between tries, in milliseconds.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

---

```
uint32 SchedulerWaitTime = 2000;
```

### Parameters

None

### Return values

32-bit unsigned integer that indicates the time interval that BizTalk Server scheduler waits between tries, in milliseconds.

### Remarks

This property is read/write.

The default value for this parameter is 2000 milliseconds.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

### ServiceState Property

Indicates the state of the BizTalk Server services on a particular server.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 ServiceState;
```

### Parameters

None

### Return values

32-bit integer that indicates the state of the BizTalk Server services on a particular server.

### Remarks

This property is read-only.

Permissible values for this parameter are

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

### StartServer Method

Starts BizTalk Server services on a specific server.

### Syntax

The syntax shown is language neutral. This method is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 StartServer();
```

#### Parameters

None

#### Return values

32-bit unsigned integer, an HRESULT.

For more information, see [Handling Errors](#), earlier in this white paper.

#### Remarks

The execution of this method is valid anytime the specific server is in a stopped state.

#### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

#### StopServer Method

Stops the BizTalk Server services on a specific server.

#### Syntax

The syntax shown is language neutral. This method is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 StopServer();
```

#### Parameters

None

#### Return values

32-bit unsigned integer, an HRESULT.

For more information, see [Handling Errors](#), earlier in this white paper.

#### Remarks

The execution of this method is valid anytime the specific server is in a running state.

#### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

#### MicrosoftBizTalkServer\_SuspendedQueue

The **MicrosoftBizTalkServer\_SuspendedQueue** class represents a logical grouping of interchanges in the Shared queue that

could not be successfully processed.

**MicrosoftBizTalkServer\_SuspendedQueue** is a dynamic class, supplied by the WMI provider "InterchangeProv" at run time, as needed.

**MicrosoftBizTalkServer\_SuspendedQueue** inherits the following properties from the **MicrosoftBizTalkServer\_Queue** class.

Property	Description
<b>Destination</b>	Represents the organization or application that receives the document.
<b>Group</b>	Represents the name of the group to which the queue belongs.
<b>QID</b>	Identifies an instance of the class and is used as the key.
<b>Source</b>	Represents the organization or application that sends the document.
<b>Timestamp</b>	Represents the last time the document was used, or when it entered the queue.

The **MicrosoftBizTalkServer\_SuspendedQueue** class defines the following properties:

Property	Description
<b>DocName</b>	Contains the name of the document definition related to the document in the queue.
<b>ErrorDescription</b>	Contains the first 64 characters of the error description.
<b>QGUID</b>	Contains the submission GUID of the Suspended queue work item.
<b>State</b>	Indicates the state of the document or interchange in the Suspended queue.

The **MicrosoftBizTalkServer\_SuspendedQueue** class defines the following methods:

Method	Description
<b>Resubmit</b>	Enables an administrator to resubmit the selected document to the server.
<b>ViewDocument</b>	Enables an administrator to view the contents of a selected document on the Suspended queue.
<b>ViewErrorDescription</b>	Enables the administrator to view a description of the error.
<b>ViewInterchange</b>	Enables the administrator to view the contents of a selected interchange on the Suspended queue.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## DocName Property

Contains the name of the document definition related to the document in the queue.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string DocName;
```

## Parameters

None

## Return values

A **string** data type that contains the name of the document definition related to the document in the queue.

## Remarks

This property is read only.

The maximum value for the length of this property is 256 characters.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## ErrorDescription Property

Contains the first 64 characters of the error description.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string ErrorDescription;
```

### Parameters

None

### Return values

A **string** data type that contains the first 64 characters of the error description.

### Remarks

This property is read only.

The maximum value for the length of this property is 64 characters.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## QGUID Property

Contains the submission GUID of the Suspended queue work item.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string QGUID;
```

### Parameters

None

### Return values

A string data type that contains the submission GUID of the Suspended queue work item.

### Remarks

This property is read only.

The maximum value for the length of this property is 256 characters.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## Resubmit Method

Enables an administrator to resubmit the selected document to the server.

## Syntax

The syntax shown is language neutral. This method is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 Resubmit();
```

## Parameters

None

## Return values

32-bit unsigned integer, an HRESULT.

For more information, see [Handling Errors](#), earlier in this white paper.

## Remarks

This method enables an administrator to resubmit interchanges after problems have been fixed.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## State Property

Indicates the state of the document or interchange in the Suspended queue.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 State;
```

## Parameters

None

## Return values

32-bit integer that indicates the state of the document or interchange in the Suspended queue. For more information, see Remarks.

## Remarks

This property is read-only.

The tables in this section show the possible processing states of a document or interchange in the Suspended queue.

Documents in the following states are at the interchange level, so you should use the **ViewInterchange** method to view the data. In addition, interchanges in these states cannot be resubmitted, so in this case you should not call **Resubmit**.

Value	Description
0	Initial
1	Custom component
2	Parsing

Documents in the following states are at the document level, so you should use the **ViewDocument** method to view the data. In addition, documents in the document validation state (3) cannot be resubmitted, so in this case you should not call **Resubmit**.

Value	Description
3	Document validation
4	Channel selection
5	Field tracking
6	Correlating
7	Mapping
8	Serializing

Documents in the following states are at the interchange level, so you should use the **ViewInterchange** method to view the data.

Value	Description
9	Encoding
10	Signing
11	Encrypting
12	Transmitting

Note that the **ViewErrorDescription** method can be used to retrieve error description information on failed documents and interchanges.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## ViewDocument Method

Enables an administrator to view the contents of a selected document on the Suspended queue.

## Syntax

The syntax shown is language neutral. This method is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 ViewDocument(  
    uint8 Document[],  
    uint32 CodePage  
);
```

## Parameters

*Document[]*

[out] An array of bytes, representing the information in the document. This data may need to be converted into a readable format. The maximum size for this parameter is 4 MB. If the data exceeds 4 MB, the data will be truncated. For more information

about this parameter, see Remarks.

#### *CodePage*

[out] The code page of the document. For more information about this parameter, see Remarks.

#### Return values

32-bit unsigned integer, an HRESULT.

For more information, see [Handling Errors](#), earlier in this white paper.

#### Remarks

The following table shows the possible values for the *CodePage* parameter and their meanings.

Value	Description
-1	No codepage available
0	Default system codepage
1200	Unicode codepage
1252	ASCII codepage

If the value returned in *CodePage* is 0 or 1200, the data is displayable and no conversion is needed. However, if the value is -1, you should try loading the data into MSXML.

If the value returned in *CodePage* is 1252, you should try loading the data into MSXML. If this fails, you can use the **MultiByteToWideChar** function, passing in *CodePage* as the codepage parameter to the Win32 API. For information on **MultiByteToWideChar**, see the Platform SDK.

For more information about displaying the contents of the document, see "Displaying the Contents of a Document or Interchange" in "Appendix: Solutions Library," later in this white paper.

If the data contained in *Document* is over 4 MB, C++ programmers can use the **Interchange::GetSuspendedQueueItemDetails** method to retrieve the document.

If the data contained in *Document* is over 4 MB, Microsoft Visual Basic programmers can use the **Interchange.GetSuspendedQueueItemDetails** method to retrieve the document.

#### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

#### ViewErrorDescription Method

Enables the administrator to view a description of the error.

#### Syntax

The syntax shown is language neutral. This method is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 ViewErrorDescription(  
    string CompleteErrorDescription  
);
```

#### Parameters

*CompleteErrorDescription*

[out] A string describing the error.

#### Return values

32-bit unsigned integer, an HRESULT.

For more information, see [Handling Errors](#), earlier in this white paper.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## ViewInterchange Method

Enables the administrator to view the contents of a selected interchange on the Suspended queue.

### Syntax

The syntax shown is language neutral. This method is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 ViewInterchange(  
    uint8 Interchange[],  
    uint32 CodePage  
);
```

### Parameters

#### *Interchange[]*

[out] An array of bytes, representing the information in the interchange. This data may need to be converted into a readable format. The maximum size for this parameter is 4 MB. If the data exceeds 4 MB, the data will be truncated. For more information, see Remarks.

#### *CodePage*

[out] The code page of the interchange. For more information, see Remarks.

### Return values

32-bit unsigned integer, an HRESULT.

For more information, see [Handling Errors](#), earlier in this white paper.

### Remarks

The following table shows the possible values for the *CodePage* parameter and their meanings.

Value	Description
-1	No codepage available
0	Default system codepage
1200	Unicode codepage
1252	ASCII codepage

If the value returned in *CodePage* is 0 or 1200, the data is displayable and no conversion is needed. However, if the value is -1, you should try loading the data into MSXML.

If the value returned in *CodePage* is 1252, you should try loading the data into MSXML. If this fails, you can use the **MultiByteToWideChar** function, passing in *CodePage* as the codepage parameter to the Win32 API. For information on **MultiByteToWideChar**, see the Platform SDK.

For more information about displaying the contents of the interchange, see "Displaying the Contents of a Document or Interchange" in the [Working with Documents](#) section of the [Appendix: Solutions Library](#).

If the data contained in *Interchange* is over 4 MB, C++ programmers can use the **Interchange::GetSuspendedQueueItemDetails** method to retrieve the interchange.

If the data contained in *Interchange* is over 4 MB, Microsoft Visual Basic programmers can use the **Interchange.GetSuspendedQueueItemDetails** method to retrieve the interchange.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## MicrosoftBizTalkServer\_WorkQueue

The **MicrosoftBizTalkServer\_WorkQueue** class represents a logical grouping of interchanges in the Shared queue that are currently in process.

**MicrosoftBizTalkServer\_WorkQueue** is a dynamic class, supplied by the WMI provider "InterchangeProv" at run time, as needed.

**MicrosoftBizTalkServer\_WorkQueue** inherits the following properties from the **MicrosoftBizTalkServer\_Queue** class.

Property	Description
<b>Destination</b>	Represents the organization or application that receives the document.
<b>Group</b>	Represents the name of the group to which the queue belongs.
<b>QID</b>	Identifies an instance of the class and is used as the key.
<b>Source</b>	Represents the organization or application that sends the document.
<b>Timestamp</b>	Represents the last time the document was used, or when it entered the queue.

The **MicrosoftBizTalkServer\_WorkQueue** class defines the following properties:

Property	Description
<b>DocName</b>	Contains the name of the document definition related to the document in the queue.
<b>EngineState</b>	Indicates whether the work item is waiting for receipt correlation or waiting for transmission.
<b>ProcessingServer</b>	Contains the name of the server that last processed the document.

The **MicrosoftBizTalkServer\_WorkQueue** class defines the following method:

Method	Description
<b>MoveToSuspendedQueue</b>	Enables the administrator to move the selected document to the Suspended queue.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## DocName Property

Contains the name of the document definition related to the document in the queue.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string DocName;
```

## Parameters

None

## Return values

A **string** data type that contains the name of the document definition related to the document in the queue.

## Remarks

This property is read-only.

The maximum value for the length of this property is 256 characters.

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## EngineState Property

Indicates whether the work item is waiting for receipt correlation or waiting for transmission.

## Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 EngineState;
```

## Parameters

None

## Return values

32-bit unsigned integer that indicates whether the work item is waiting for receipt correlation or waiting for transmission. For more information, see Remarks below.

## Remarks

This property is read-only.

The possible values for this property are defined by the **BTSCoreQueueStates** enumeration, as shown in the following code:

```
typedef enum {
    Processing = STATE_TRANSLATION,
    Correlation = STATE_RECEIPT_CORRELATION,
    TransmissionWServiceWindow = STATE_FIND_TRANSMISSION,
    Transmission = STATE_TRANSMISSION
} BTSCoreQueueStates;
```

The following table provides the numerical values of the constants defined in the **BTSCoreQueueStates** enumeration.

Value	Constant
29	<b>Processing</b>
30	<b>Correlation</b>
31	<b>TransmissionWServiceWindow</b>
33	<b>Transmission</b>

## Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

## MoveToSuspendedQueue Method

Enables the administrator to move the selected document to the Suspended queue.

### Syntax

The syntax shown is language neutral. This method is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
uint32 MoveToSuspendedQueue();
```

### Parameters

None

### Return values

32-bit unsigned integer, an HRESULT.

For more information, see [Handling Errors](#), earlier in this white paper.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

### ProcessingServer Property

Contains the name of the server that last processed the document.

### Syntax

The syntax shown is language neutral. This property is supported in C++, Microsoft Visual Basic, and Visual Basic Script.

```
string ProcessingServer;
```

### Parameters

None

### Return values

A **string** data type that contains the name of the server that last processed the document.

### Remarks

This property is read-only.

The maximum value for the length of this property is 63 characters.

### Requirements

**Windows NT/2000:** Requires Windows 2000 SP1 or later

**Header and Library:** Wbemidl.h, Wbemuuid.lib

**MOF File:** InterchangeProvSchema.mof

**Scripting Library:** Microsoft WMI Scripting V1.1 Library (wbemdisp.tlb)

### Appendix: Solutions Library

This section uses Microsoft Visual Basic examples to demonstrate code solutions to common tasks encountered when using

BizTalk Server with WMI.

To ensure that your Visual Basic projects can access the WMI objects used in the following code, you need to add the Microsoft WMI Scripting V1.1 Library in the Reference dialog.

Then, you can declare the WMI locator and services variables:

```
Public g_objLocator As SWbemLocator
Public g_objService As SWbemServices
```

In addition, the following constants should be defined:

```
Public Const GROUP_NAMESPACE = "MicrosoftBizTalkServer_Group"
Public Const MGMT_NAMESPACE = "MicrosoftBizTalkServer_MgmtDB"
Public Const SERVER_NAMESPACE = "MicrosoftBizTalkServer_SERVER"
Public Const RECVSVC_NAMESPACE = "MicrosoftBizTalkServer_ReceiveFunction"
Public Const QUEUE_NAMESPACE = "MicrosoftBizTalkServer_Queue"
Public Const WORKQ_NAMESPACE = "MicrosoftBizTalkServer_WorkQueue"
Public Const SCHEDULEDQ_NAMESPACE = _
    "MicrosoftBizTalkServer_ScheduledQueue"
Public Const RETRYQ_NAMESPACE = "MicrosoftBizTalkServer_RetryQueue"
Public Const SUSPENDEDQ_NAMESPACE = _
    "MicrosoftBizTalkServer_SuspendedQueue"
```

You should make the connection to WMI with the following code:

```
Set g_objLocator = New SWbemLocator
Set g_objService = g_objLocator.ConnectServer(, _
    "root/MicrosoftBizTalkServer")
```

## Working with Documents

The code examples in this section are useful when working with documents and interchanges. An interchange is a collection of one or more document instances that comprises a single transmission.

This section presents functions that work together to convert variant data from a document or interchange into a string.

### Displaying the Contents of a Document or Interchange

When using the **ViewDocument** or **ViewInterchange** methods of the **MicrosoftBizTalkServer\_SuspendedQueue** class, you may need to convert the returned byte array into a readable format.

The following function takes a codepage and variant data and returns a string:

```
Function ConvertViewDocument(ByVal varData As Variant, _
    ByVal codepage As Long) As String
    Dim varData2() As Byte
    Dim i As Long
    Dim strTemp As String
    Dim Dom As New DOMDocument

    On Error Resume Next
    ReDim varData2(UBound(varData))
    For i = LBound(varData) To UBound(varData)
        varData2(i) = varData(i)
    Next
    If codepage = -1 Then
        strTemp = CStr(varData2)
        Call Dom.loadXML(strTemp)
        If Err <> 0 Then
            ConvertViewDocument = ""
        ElseIf Dom.parseError.errorCode <> 0 Then
```



```

ByVal strDocTrackDbPassword As String, _
ByVal strDocTrackDbServer As String, _
ByVal strQueueDbLogon As String, _
ByVal strQueueDbName As String, _
ByVal strQueueDbPassword As String, _
ByVal strQueueDbServer As String, _
Optional ByVal lAdminCacheRefreshInterval As Long, _
Optional ByVal strSMTPHost As String, _
Optional ByVal strReliableMessagingReplyToURL As String, _
Optional UseProxyServer As Boolean, _
Optional strProxyName As String, _
Optional lProxyport As Long, _
Optional lLoggingPointState As Integer) _
    As Boolean

```

```

Dim objBTGroup As SwbemObject
Dim objBTGroupInstance As SwbemObject

```

```

On Error Resume Next
Set objBTGroup = g_objService.Get(GROUP_NAMESPACE)
Set objBTGroupInstance = objBTGroup.SpawnInstance_

```

```

CreateGroup = True
objBTGroupInstance.Name = strGroupName
objBTGroupInstance.DocTrackDbLogon = strDocTrackDbLogon
objBTGroupInstance.DocTrackDbName = strDocTrackDbName
objBTGroupInstance.DocTrackDbPassword = strDocTrackDbPassword
objBTGroupInstance.DocTrackDbServer = strDocTrackDbServer
objBTGroupInstance.QueueDbLogon = strQueueDbLogon
objBTGroupInstance.QueueDbName = strQueueDbName
objBTGroupInstance.QueueDbPassword = strQueueDbPassword
objBTGroupInstance.QueueDbServer = strQueueDbServer

```

```

If strReliableMessagingReplyToURL <> "" Then
    objBTGroupInstance.ReliableMessagingReplyToURL = _
        strReliableMessagingReplyToURL
End If
If lAdminCacheRefreshInterval <> 0 Then
    objBTGroupInstance.ConfigurationCacheRefreshInterval = _
        lAdminCacheRefreshInterval
End If
objBTGroupInstance.UseProxyServer = UseProxyServer
objBTGroupInstance.ProxyHost = strProxyName
If lProxyport = 0 Then
    objBTGroupInstance.ProxyPort = lProxyport
Else
    objBTGroupInstance.ProxyPort = lProxyport
End If
objBTGroupInstance.LoggingPointState = lLoggingPointState
objBTGroupInstance.SMTPHost = strSMTPHost
objBTGroupInstance.Put_ (wbemChangeFlagCreateOnly)
If Err <> 0 Then
    ' Handle the error.
    CreateGroup = False
End If
End Function

```

## Deleting a Group

The following function deletes a group:

```

Public Function DeleteGroup(ByVal strGroupName As String) As Boolean
    On Error Resume Next
    DeleteGroup = True
    Call g_objService.Delete(GROUP_NAMESPACE & ".NAME=\"" & _
        & strGroupName & "\"")

```

```

    If Err <> 0 Then
        ' Handle the error.
        DeleteGroup = False
    End If
End Function

```

## Retrieving a Group by Name

The following function retrieves a group by name:

```

Public Function GetGroupByName(ByVal strGroupName As String) As Object
    Dim objBTGroup As SwbemObject
    On Error Resume Next
    Set GetGroupByName = Nothing
    Set GetGroupByName = g_objService.Get(GROUP_
        NAMESPACE & ".NAME="" & _
                                strGroupName & """)
    If Err <> 0 Then
        ' Handle the error.
    End If
End Function

```

## Retrieving All Groups

The following function retrieves all groups:

```

Public Function GetAllGroups() As SwbemObjectSet
    Dim objBTGroup As SwbemObject

    On Error Resume Next
    Set GetAllGroups = Nothing
    Set objBTGroup = g_objService.Get(GROUP_NAMESPACE)
    Set GetAllGroups = objBTGroup.Instances_
    If Err <> 0 Then
        ' Handle the error.
    End If
End Function

```

## Working with the Management Database

The code examples in this section are useful when working with the BizTalk Messaging Management database. The management database stores information for all server configurations, including group and server settings, and receive functions.

This section presents functions that create the management database and retrieve the management database.

### Creating the Management Database

The following function creates the management database:

```

Public Function CreateMgmtDB(ByVal strMgmtDbLogon As String, _
                            ByVal strMgmtDBPassword As String, _
                            ByVal strMgmtDBServer As String, _
                            ByVal strMgmtDBDatabase As String, _
                            ByVal strLocalServer As String) As Boolean

    Dim objBTSMgmt As SwbemObject
    Dim objBTSMgmtInstance As SwbemObject
    On Error Resume Next

    CreateMgmtDB = True

```

```

Set objBTSMgmt = g_objService.Get(GROUP_NAMESPACE)
Set objBTSMgmtInstance = objBTGroup.SpawnInstance_

objBTSMgmtInstance.MgmtDbLogon = strMgmtDbLogon
objBTSMgmtInstance.MgmtDBPassword = strMgmtDBPassword
objBTSMgmtInstance.MgmtDbServer = strMgmtDBServer
objBTSMgmtInstance.MgmtDbDatabase = strMgmtDBDatabase
objBTSMgmtInstance.localserver = strLocalServer
objBTSMgmtInstance.Put_ (wbemChangeFlagCreateOnly)
If Err <> 0 Then
    ' Handle the error.
    CreateMgmtDB = False
End If
End Function

```

## Retrieving the Management Database

The following function retrieves the management database:

```

Public Function GetMgmtDB(ByVal strLocalServer As String) As SwbemObject
    Dim objBTSMgmt As SwbemObject
    Dim objSet_BTSMgmt As SwbemObjectSet
    Dim objBTSMgmtInstance As SwbemObject

    On Error Resume Next
    Set GetMgmtDB = Nothing
    Set objBTSMgmt = g_objService.Get(MGMT_NAMESPACE)
    Set objSet_BTSMgmt = objBTSMgmt.Instances_
    If objSet_BTSMgmt.Count <> 1 Then
        ' Handle the error.
        Exit Function
    End If

    Set GetMgmtDB = objSet_BTSMgmt.Item(MGMT_NAMESPACE & _
        ".LocalServer="" & strLocalServer & """)
End Function

```

## Working with Receive Services

The code examples in the section are useful when working with receive services. You create receive services to process data.

This section presents functions that create a File receive service, delete a File receive service, retrieve a receive service by name, retrieve all receive services, and retrieve all receive services by group.

### Creating a File Receive Service

The following function creates a receive service:

```

Public Function CreateReceiveService(ByVal strRecvSvcName As String, _
    ByVal strGroupName As String, _
    ByVal strProcessingServer As String, _
    ByVal strFileMask As String, _
    ByVal fProtocolType As ProtocolType, _
    ByVal strPollingLoc As String, _
    Optional ByVal strPassword As String, _
    Optional ByVal strUsername As String, _
    Optional ByVal strDocumentName As String, _
    Optional ByVal strSourceID As String, _
    Optional ByVal strSourceQualifier As String, _
    Optional ByVal strDestinationID As String, _
    Optional ByVal strDestinationQualifier As String, _
    Optional ByVal lOpenness As Integer, _
    Optional ByVal lPassthrough As Integer, _

```

```

Optional ByVal strChannelName As String, _
Optional fDisabled As Boolean, _
Optional ByVal strEnvelopeName As String, _
Optional ByVal strComment As String, _
Optional ByVal strPreProcessor As String) _
As Boolean

```

```

Dim objBTSRecvSvc As SwbemObject
Dim objBTSRecvSvcInstance As SwbemObject

```

```

On Error Resume Next
CreateReceiveService = True
Set objBTSRecvSvc = g_objService.Get(RECVSVC_NAMESPACE)
Set objBTSRecvSvcInstance = objBTSRecvSvc.SpawnInstance_

```

```

objBTSRecvSvcInstance.Name = strRecvSvcName
objBTSRecvSvcInstance.groupName = strGroupName
objBTSRecvSvcInstance.Comment = strComment
objBTSRecvSvcInstance.FileNameMask = strFileMask
objBTSRecvSvcInstance.ProcessingServer = strProcessingServer
objBTSRecvSvcInstance.ProtocolType = fProtocolType
objBTSRecvSvcInstance.PollingLocation = strPollingLoc
objBTSRecvSvcInstance.password = strPassword
objBTSRecvSvcInstance.UserName = strUsername
objBTSRecvSvcInstance.DocumentName = strDocumentName
objBTSRecvSvcInstance.SourceID = strSourceID
objBTSRecvSvcInstance.SourceQualifier = strSourceQualifier
objBTSRecvSvcInstance.DestinationID = strDestinationID
objBTSRecvSvcInstance.DestinationQualifier = strDestinationQualifier
objBTSRecvSvcInstance.EnvelopeName = strEnvelopeName
objBTSRecvSvcInstance.DisableReceiveFunction = fDisabled
objBTSRecvSvcInstance.PreProcessor = strPreProcessor

```

```

If lOpenness <> 0 Then
    objBTSRecvSvcInstance.OpennessFlag = lOpenness
End If

```

```

If lPassthrough <> 0 Then
    objBTSRecvSvcInstance.IsPassThrough = lPassthrough
End If

```

```

If strChannelName <> "" Then
    objBTSRecvSvcInstance.ChannelName = strChannelName
End If

```

```

objBTSRecvSvcInstance.Put_ (wbemChangeFlagCreateOnly)

```

```

If Err <> 0 Then
    ' Handle the error.
    CreateReceiveService = False
End If

```

```

End Function

```

## Deleting a File Receive Service

The following function deletes a receive service:

```

Public Function DeleteReceiveSvc(ByVal strRecvSvcName As String) _
As Boolean

On Error Resume Next
DeleteReceiveSvc = True
Call g_objService.Delete(RECVSVC_NAMESPACE & ".NAME=""" & _
strRecvSvcName & """)

If Err <> 0 Then
    ' Handle the error.
    DeleteReceiveSvc = False

```

```
End If
End Function
```

### Retrieving a Receive Service by Name

The following function retrieves a receive service by name:

```
Public Function GetReceiveFunctionByName(ByVal strRecvFunction _
                                         As String) _
                                         As SWbemObject
    On Error Resume Next
    Set GetReceiveFunctionByName = Nothing
    Set GetReceiveFunctionByName =
        g_objService.Get(RECVSVC_NAMESPACE & _
                        ".NAME=""" & strRecvFunction & """)
    If Err <> 0 Then
        ' Handle the error.
    End If
End Function
```

### Retrieving All Receive Services

The following function retrieves all receive services:

```
Public Function GetAllReceiveServices() As SWbemObjectSet
    Dim objBTSRecvSvc As SWbemObject

    On Error Resume Next
    Set GetAllReceiveServices = Nothing
    Set objBTSRecvSvc = g_objService.Get(RECVSVC_NAMESPACE)
    Set GetAllReceiveServices = objBTSRecvSvc.Instances_
    If Err <> 0 Then
        ' Handle the error.
    End If
End Function
```

### Retrieving All Receive Services by Group

The following function retrieves all receive services by group:

```
Public Function GetAllReceiveSvcsByGroup(ByVal strGroupName As String)
    Dim strWMIQuery As String

    On Error Resume Next
    strWMIQuery = "select * from " & RECVSVC_NAMESPACE & _
                " where groupname= '" & strGroupName & "'"
    Set GetAllReceiveSvcsByGroup =
        g_objService.ExecQuery(strWMIQuery)
    If Err <> 0 Then
        ' Handle the error.
    End If
End Function
```

## Working with Servers

The code examples in this section are useful when working with servers. A server in a server group hosts the appropriate BizTalk

Messaging Services functionality to manage document exchange between other servers and applications that are external to the BizTalk server group.

This section presents functions that create a server, delete a server, start a server, stop a server, retrieve a server by name, retrieve all servers, and retrieve all servers by group.

### Creating a Server

The following function creates a server:

```
Public Function CreateServer(ByVal strServerName As String, _
                            ByVal strGroupName As String, _
                            ByVal lMaxWorkerThreadsPerProcessor As Long, _
                            ByVal lSchedulerWaitTime As Double) As Boolean

    Dim objBTSSvr As SwbemObject
    Dim objBTSSvrInstance As SwbemObject

    On Error Resume Next
    CreateServer = True
    Set objBTSSvr = g_objService.Get(SERVER_NAMESPACE)
    Set objBTSSvrInstance = objBTSSvr.SpawnInstance_

    objBTSSvrInstance.Name = strServerName
    objBTSSvrInstance.groupName = strGroupName
    objBTSSvrInstance.MaxWorkerThreadsPerProcessor = _
        lMaxWorkerThreadsPerProcessor
    objBTSSvrInstance.SchedulerWaitTime = lSchedulerWaitTime
    Call objBTSSvrInstance.Put_(wbemChangeFlagCreateOnly)
    If Err <> 0 Then
        ' Handle the error.
        CreateServer = False
    End If
End Function
```

### Deleting a Server

The following function deletes a server:

```
Public Function DeleteServer(ByVal strServerName As String) As Boolean

    On Error Resume Next
    DeleteServer = True
    Call g_objService.Delete(SERVER_NAMESPACE & ".NAME=""" & _
        & strServerName & """"")

    If Err <> 0 Then
        ' Handle the error.
        DeleteServer = False
    End If
End Function
```

### Starting a Server

The following function will start a server:

```
Public Function StartServer(ByVal strServerName As String) As Boolean
    Dim strWMIPath As String
    Dim objBTSSvrs As SwbemObject

    On Error Resume Next
    StartServer = True
    strWMIPath = SERVER_NAMESPACE & ".NAME=""" & strServerName & """"
```

```

Set objBTSSvrs = g_objService.ExecMethod(strWMIPath, "StartServer")
If Err <> 0 And Hex(Err) <> "80070420" Then
    ' Handle the error.
    StartServer = False
Else
    Err.Clear
End If
End Function

```

Note that if **Err** is not equal to 0, and the hexadecimal value of the error is not equal to 80070420, then the service was already running.

### Stopping a Server

The following function will stop a server:

```

Public Function StopServer(ByVal strServerName As String) As Boolean
    Dim strWMIPath As String
    Dim objBTSSvrs As SwbemObject

    On Error Resume Next
    StopServer = True
    strWMIPath = SERVER_NAMESPACE & ".NAME=""" & strServerName & """"
    Set objBTSSvrs = g_objService.ExecMethod(strWMIPath, "StopServer")
    If Err <> 0 And Hex(Err) <> "80070426" Then
        ' Handle the error.
        StopServer = False
    Else
        Err.Clear
    End If
End Function

```

Note that if **Err** is not equal to 0, and the hexadecimal value of the error is not equal to 80070426, then the service was not running.

### Retrieving a Server by Name

The following function will retrieve a server by name:

```

Public Function GetServerByName(ByVal strServerName As String) _
    As SwbemObject

    On Error Resume Next
    Set GetServerByName = Nothing
    Set GetServerByName = g_objService.Get(SERVER_NAMESPACE & ".NAME=""" _
        & strServerName & """" )

    If Err <> 0 Then
        ' Handle the error.
    End If
End Function

```

### Retrieving All Servers

The following function retrieves all servers:

```

Public Function GetAllServers() As SwbemObjectSet
    Dim objBTSSvrs As SwbemObject

    On Error Resume Next
    Set objBTSSvrs = g_objService.Get(SERVER_NAMESPACE)
    Set GetAllServers = objBTSSvrs.Instances_

```

```
If Err <> 0 Then
    ' Handle the error.
End If
End Function
```

## Retrieving All Servers by Group

The following function retrieves all servers by group:

```
Public Function GetAllServersByGroup(ByVal strGroupName As String) _
    As SWbemObjectSet
    Dim strWMIQuery As String
    On Error Resume Next
    strWMIQuery = "select * from " & SERVER_NAMESPACE & "
        " where groupname= '" & strGroupName & "'"
    Set GetAllServersByGroup = g_objService.ExecQuery(strWMIQuery)
    If Err <> 0 Then
        ' Handle the error.
    End If
End Function
```

## Working with Queues

The code examples in this section are useful when working with queues. Queues are used to contain incoming and outgoing documents that are in various stages of routing and processing in BizTalk Server.

This section presents functions that retrieve queues by group and retrieve all queues.

### Retrieving Queues by Group

This section illustrates functions that retrieve the Work, Retry, Suspended, or Scheduled queue by group.

The Work queue contains documents that are currently being processed by BizTalk Server. The following function retrieves the Work queue by group:

```
Public Function GetWorkQByGroup(ByVal strGroupName As String) _
    As SWbemObjectSet
    Set GetWorkQByGroup = GetXXXXQByGroup(strGroupName, WORKQ_NAMESPACE)
End Function
```

The Retry queue contains documents that are being resubmitted for delivery and documents that are waiting for reliable messaging receipts. The following function retrieves the retry queue by group:

```
Public Function GetRetryQByGroup(ByVal strGroupName As String) _
    As SWbemObjectSet
    Set GetRetryQByGroup = GetXXXXQByGroup(strGroupName, RETRYQ_NAMESPACE)
End Function
```

The Suspended queue contains work items that have failed processing for a variety of reasons, including parsing errors, serialization errors, and failed transmissions. The following function retrieves the suspended queue by group:

```
Public Function GetSuspendedQByGroup(ByVal strGroupName As String) _
    As SWbemObjectSet
    Set GetSuspendedQByGroup = GetXXXXQByGroup(strGroupName, _
        SUSPENDEDQ_NAMESPACE)
End Function
```

The Scheduled queue contains work items that have been processed by BizTalk Server and are waiting for transmission. The following function retrieves the scheduled queue by group:

```
Public Function GetScheduledQByGroup(ByVal strGroupName As String) _
    As SwbemObjectSet
    Set GetScheduledQByGroup = GetXXXXQByGroup(strGroupName, _
        SCHEDULEDQ_NAMESPACE)
End Function
```

The following helper function is used by the above functions to retrieve a given queue by group:

```
Public Function GetXXXXQByGroup(ByVal strGroupName As String, _
    ByVal QueueNameSpace As String) _
    As SwbemObjectSet

    Dim strWMIQuery As String
    On Error Resume Next

    strWMIQuery = "select * from " & QueueNameSpace & _
        " where group= "" & strGroupName & """"
    Set GetXXXXQByGroup = g_objService.ExecQuery(strWMIQuery)
    If Err <> 0 Then
        ' Handle the error.
    End If
End Function
```

## Retrieving All Queues

The following function retrieves all queues:

```
Public Function GetAllQueues() As SwbemObjectSet
    Dim objBTQueue As SwbemObject

    On Error Resume Next
    Set GetAllQueues = Nothing
    Set objBTQueue = g_objService.Get(Queue_NAMESPACE)
    Set GetAllQueues = objBTQueue.Instances_
    If Err <> 0 Then
        ' Handle the error.
    End If
End Function
```

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