Executive Summary

Over the years, IT environments have become more complex and more heterogeneous due to diverse customer needs and rapid innovation in the IT industry. Many government and enterprise customers require integration with legacy systems to maintain critical business and operational processes.

To address this issue, Microsoft delivers interoperability by design.

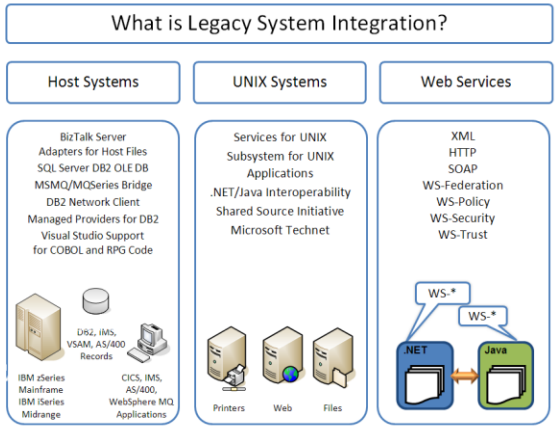
Microsoft's approach to interoperability increases the value of IT solutions by helping customers integrate legacy data and business logic into new applications or business processes without having to "rip and replace" code or make costly application rewrites.

What is Legacy System Integration?

It's all about getting the most from existing IT resources while taking advantage of next generation technologies. Legacy system integration is:

- **Supporting connected IT systems** including IBM DB2, IBM zSeries mainframe and iSeries midrange computers, Novell NetWare and GroupWise systems, Oracle Fusion, SAP mySAP, and Sun ONE.
- **Providing technology solutions** for extending legacy data, directory management, identity authentication, message queues, and Web services implementations.
- **Improving business efficiencies** with products such as Microsoft® Host Integration Server, BizTalk® Server, Visual Studio®, Windows Vista™, and Windows Server®.

Providing tools for developers including Microsoft ADO.NET–based managed providers for DB2, Visual Studio support for COBOL and RPG, and Web services integration.



Microsoft Supports Legacy System Integration

For customers who depend on legacy systems, Microsoft delivers system integration four ways:

- **Products:** Providing innovative features and technologies such as managed data providers for DB2, MSMQ-MQSeries Bridge for host systems, and Windows® support for POSIX standards in UNIX systems.
- **Community:** Working together with customers, partners, and competitors to develop cross-platform solutions that meet customers' shared interoperability needs, promote technology innovation, and promote competition in the IT industry.
- **Access:** Licensing technology assets to and from other companies and offering key Microsoft technologies including Office Open XML file formats, Virtual Hard Disk (VHD) Image Format Specification, and 38 Web services standards under the Open Specification Promise.
- **Standards:** Supporting industry and technical standards for data formats and messaging protocols and actively participating with leading standards-setting organizations to promote technology adoption.

Microsoft Supports Standards

- **Microsoft products and technologies support hundreds of technical standards and specifications** such as DRDA, FTP, HTTP, IP, LU 6.2 protocol, SNA, SOAP, TCP, UDP, Unicode, X.509, and XML.
- **Microsoft is actively engaged with more than 100 national and international standards-setting organizations** including ECMA, ETSI, OASIS, OMA, IEEE, IETF, ISO/IEC JTC1, ITU, and W3C.
- **Microsoft engineers have authored or co-authored dozens of industry standards and specifications** such as SOAP, WSDL, WS-Addressing, WS-MetadataExchange, WS-Policy, WS-Security, and WS-Trust.
- **Microsoft is working with industry** to define a new generation of software and Web services based on eXtensible Markup Language (XML).

Working with What You Have

- By integrating host systems and legacy applications, customers can capitalize on existing IT investments, maintain complex and highly-customized business processes, and reduce total cost of ownership (TCO).
- Windows includes a subsystem for UNIX-based applications (SUA) that resides on top of the Windows kernel. SUA provides the basic infrastructure required to run UNIX-based applications and scripts on a computer running Windows.
- Microsoft supports asynchronous message queuing, which allows Microsoft Message Queuing to interoperate with other message queuing systems such as IBM WebSphere MQ (formerly MQSeries).
- Microsoft cofounded the Web Services Interoperability (WS-I) Organization with BEA Systems, IBM, Intel, Fujitsu, Hewlett-Packard, Oracle, and SAP to promote Web services standards in the IT industry.

For More Information, Visit:

- Microsoft and IBM Interoperability
  http://www.microsoft.com/interop/partner/ibm.mspx
- Microsoft Host Integration Server
  http://www.microsoft.com/hiserver/default.mspx
- Microsoft and Novell Interoperability
  http://www.microsoft.com/interop/partner/novell.mspx
- Windows Services for UNIX
  http://www.microsoft.com/technet/interopmigration/unix/sfu/default.mspx
- Subsystem for UNIX-based Applications
  http://technet2.microsoft.com/WindowsServer/en/library/695ac415-d314-45df-b464-4c80ddc2b3bc1033.mspx
- Learn more www.microsoft.com/interop

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Customer Use Cases	*Microsoft Solutions*	*Standards Supported in Microsoft Products*	*For More Information, Visit*
Connect .NET–connected applications with IBM mainframe and AS/400 systems	**Microsoft Host Integration Server** provides enterprise-scale reliability and interoperability for many IBM systems via a variety of protocols and APIs. Likewise, IBM supplies SDKs and connector software to connect to its various "big system" assets. All of these connector mechanisms continue to work from .NET–connected applications.	DRDA, HTTP, IP, Kerberos protocol, LU 6.2 protocol, OLE DB, SNA, SOAP, SSL, TCP, TLS, UDP, WS-I Basic Profile, WS-*, X.509, XML	1) http://www.microsoft.com/hiserver/evaluation/features/default.mspx 2) http://msdn2.microsoft.com/en-us/library/ms964002.aspx
Enable identity authentication and management for enterprise environments	**Microsoft Identity Integration Server (MIIS)** provides a single, integrated view of a user across the enterprise. MIIS supports more than 20 account repositories including LDAP directories, databases, proprietary stores, and flat files. MIIS Management Agents can be used to connect with different directory services and applications such as IBM DB2, IBM Tivoli Directory Server, Lotus Notes, Novell eDirectory, and IBM RACF.	Kerberos protocol, LDAP, WS-I Profiles, WS-Security	1) http://technet2.microsoft.com/WindowsServer/en/library/92ffb876-99aa-451f-8182-3013bc39d6a41033.mspx
Enable host single sign-on scenarios	**Microsoft Host Integration Server and Microsoft BizTalk Server** support an extension of Windows-based enterprise security integration called Enterprise Single Sign-On (SSO). Enterprise SSO provides user account and password mapping and caching, single sign-on to multiple Windows domains and host security systems, and password synchronization to simplify account administration. Enterprise SSO offers a means to efficiently map accounts across Windows-based Active Directory® services and host systems or line-of-business applications for one-to-one and many-to-one associations.	DRDA, HTTP, IP, Kerberos protocol, LU 6.2 protocol, SNA, SOAP, TCP, WS-*, X.509, XML,	1) http://download.microsoft.com/download/C/6/5/C65FF9FD-0ED7-47F6-91AB-000E6265EA5B/Enterprise_SSO_Whitepaper.doc
Connect Microsoft SQL Server® to IBM DB2 databases	**Microsoft SQL Server database software** offers mature connectivity and interoperability with DB2 via OLE DB. SQL Server Integration Services enables data migration or data synchronization between SQL Server and DB2. Heterogeneous views allow SQL Server to expose DB2 data within SQL Server. SQL Server Analysis Services can directly access DB2 data even when SQL Server is not the primary data store.	HTTP, IP, OLE DB, SOAP, TCP, WS-*, XML	1) http://www.microsoft.com/sql/prodinfo/overview/default.mspx
Integrate BizTalk Server with host applications using IBM WebSphere MQ	**BizTalk Server** provides a range of adapters to connect BizTalk Server with host applications, host files, and DB2 databases. These adaptors allow Windows-based systems to share data and manage message queues with and perform transactions against databases on IBM mainframe and AS/400 systems.	FTP, HTTP, SOAP, WS-*, XML	1) http://www.microsoft.com/biztalk/evaluation/adapter/default.mspx
Support for Fortran, RPG, and COBOL	**The Visual Studio development system** provides a professional, integrated development environment for class-level architecture and software design and supports more than 30 different programming languages including Fortran, RPG, COBOL, Sybase, Perl, J#, C#, C++, and Microsoft Visual Basic®.	C# CLI, Visual Basic .NET	1) http://msdn.microsoft.com/vstudio/
Connect to SQL Server from IBM WebSphere Application Server (WAS)	**Microsoft SQL Server** provides JDBC drivers that enable any Java application, application server, or Java-enabled applet to access SQL Server 2000 and SQL Server 2005 databases. The SQL Server 2005 JDBC driver has been tested against all major application servers including BEA WebLogic, IBM WebSphere, JBoss, and Sun.	JDBC 3.0, JTA, SQL, TDS 7.2, XA Protocol	1) http://msdn.microsoft.com/data/jdbc/default.aspx
Compile and run UNIX applications on servers running Windows	**Subsystem for UNIX-based Applications (SUA)** is a source-compatibility subsystem for compiling and running custom UNIX-based applications on a computer running a Windows server-class operating system. In SUA, UNIX applications can be made to interoperate with Windows with little or no change to the original source code. SUA provides an operating system for Portable Operating System Interface (POSIX) processes and provides a complete UNIX environment. SUA also supports case-sensitive file names, job control, compilation tools, and the use of over 300 UNIX commands, utilities, and shell scripts.	HTTP, IP, IPSec, FTP, LDAP, PKI, POSIX standards, S/MIME, SSL, TCP, Telnet, TLS, XML	1) http://technet2.microsoft.com/WindowsServer/en/library/695ac415-d314-45df-b464-4c80ddc2b3bc1033.mspx
Connect to IBM DB2 databases using managed code	**Microsoft Host Integration Server** can connect to IBM DB2 databases using ADO.NET-based managed providers that employ languages such as C#, Visual Basic .NET, and J#. Microsoft offers an ADO.NET provider for DB2 that uses the non-managed, existing OLE DB driver shipped by IBM with the DB2 server. Microsoft also provides an OLE DB driver for connecting to DB2 over SNA networks that can be used with managed code.	C# CLI, LU 6.2 protocol, OLE DB, SNA, XML	1) http://msdn.microsoft.com/library/default.asp?url=/library/en-us/his_2004main/htm/his_dg_db2_managed_provider_guide_wvbo.asp
Integrate Novell NetWare environments with Microsoft technologies	**Microsoft Windows Services for NetWare (SFN)** delivers a comprehensive set of interoperability utilities that help Novell customers more easily adopt, administer, and synchronize their network environment with Microsoft technologies such as the Microsoft Windows Server 2003 operating system and Microsoft Exchange Server 2003.	DNS, HTTP, IP, IPX, Kerberos protocol, LDAP, NBIPX, PKI, SAP, TCP, Token Ring, SPX, SSL, X.509	1) http://www.microsoft.com/windowsserver2003/sfn/default.mspx 2) http://www.microsoft.com/interop/partner/novell.mspx
Integrate UNIX environments with Microsoft technologies	**Windows Services for UNIX (SFU)** provides a full range of cross-platform services for integrating Windows with UNIX-based environments. Customers can use SFU as a migration tool, for cross-platform system development, to integrate heterogeneous UNIX-based and Windows-based enterprise networks, or to run production UNIX applications on the Windows platform. SFU incorporates network file system (NFS) client and server capabilities and provides user authentication integration, including password synchronization between UNIX and Windows domains using either Network Information Service (NIS) or Active Directory.	FTP, HTTP, IP, IPSec, LDAP, PKI, POSIX standards, S/MIME, SSL, TCP, Telnet, TLS, XML	1) http://www.microsoft.com/technet/interopmigration/unix/sfu/default.mspx 2) http://www.microsoft.com/technet/interopmigration/unix.mspx
Integrate message queues between a host system and .NET-based environments	**Microsoft .NET managed code** can connect directly to WebSphere MQ and can put, get, or query messages on those queues. These direct connections occur via well-tested and mature Microsoft ActiveX® connectors for WebSphere MQ, published by IBM. Other options include using .NET Framework classes to directly access message queues or using bridging technologies.	C# CLI, Visual Basic .NET	1) http://msdn.microsoft.com/vstudio/java/interop/chap9.pdf

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