Microsoft System Center 2012 R2

System Center 2012 R2 Service Manager Documentation

Microsoft Corporation

Published: July 15, 2014

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Applies To

System Center 2012 - Service Manager

System Center 2012 Service Pack 1 (SP1) - Service Manager

System Center 2012 R2 Service Manager

Feedback

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Revision History

Release Date	Changes
October 17, 2013	Original release of this guide.
November 1, 2013	Minor updates to this guide.
July 15, 2014	System Requirements for System Center 2012 R2 Service Manager have been moved to a new location: System Requirements for System Center 2012 R2

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What's New in System Center 2012 for Service Manager

System Center 2012 Service Pack 1 (SP1) – Service Manager, and System Center 2012 R2 Service Manager have a number of new capabilities and changes outlined in this document. Each version of Service Manager has its own section covering what is new.

What's New

- What's New in System Center 2012 SP1 - Service Manager
- What's New in System Center 2012 R2 Service Manager

What's New in System Center 2012 SP1 - Service Manager

In System Center 2012 SP1, Service Manager provides bug fixes and new features. The following list summarizes the new functionality in Service Manager.

We urge you to read the Release Notes for System Center 2012 SP1 - Service Manager for details about known issues.

Chargeback

Chargeback helps you apply cloud-based pricing on Virtual Machine Manager (VMM) fabric and show that information to customers in order to minimize virtual machine oversubscription and underutilization. Chargeback illustrates how you can use System Center 2012 Service Pack 1 (SP1) in a cross-platform environment where you use multiple Service Manager components to achieve your business goals.

In Service Manager, chargeback consists of a new node in the Administration workspace, new OLAP data cubes, and sample Excel reports.

Improved Operations Manager Integration

An System Center 2012 – Operations Manager SP1 agent is automatically installed as part of Service Manager SP1. After Setup completes, you must manually configure the agent for use with the Operations Manager management server. The agent is compatible with System Center Operations Manager 2007 R2, System Center 2012 – Operations Manager, and System Center 2012 – Operations Manager SP1.

To validate that the Operations Manager Agent was installed, open Control Panel and verify that the Operations Manager Agent is present. To manually configure the Operations Manager agent, see Configuring Agents.

SQL Server 2012 Support

All databases used by Service Manager are supported on all editions of SQL Server 2012.

Windows Server 2012 and Windows 8 Support

All Service Manager roles, except the Self-Service Portal SharePoint web parts, are supported on all editions of Windows Server 2012.

Windows 8 is supported for the Service Manager console and for end-users accessing the Self-Service Portal.

What's New in System Center 2012 R2 Service Manager

System Center 2012 R2 Service Manager was updated for System Center 2012 R2 with minor bug fixes. No new functionality or new features were added in this release. However, System Center 2012 R2 Service Manager does add support the following operating systems:

- Windows Server 2012 R2
- Windows 8.1

For details about known issues that could affect you before you install Service Manager, read the Release Notes for Service Manager in System Center 2012 R2. Planning and deployment information is at Planning for System Center 2012 - Service Manager and Deploying System Center 2012 - Service Manager.

You can read about the fixes included in System Center 2012 R2 Service Manager at Thomas Ellermann's blog.

Planning for System Center 2012 - Service Manager

Welcome to the System Center 2012 – Service Manager Planning Guide. This guide helps you understand the hardware and software requirements as well as software roles you need to prepare for Service Manager before your deploy it in your company or organization. Also in this guide are general guidelines that can help you plan for the better hardware and software performance and scalability.

After you've read the planning information in this guide, you should read the Deployment Guide for System Center 2012 – Service Manager to fully understand the steps needed to deploy Service Manager and get it configured for use.

Planning Guide Topics

- Planning for System Center 2012 - Service Manager Deployment

Describes the pieces that make up Service Manager, such as the Service Manager management server, the Service Manager database, the data warehouse management server, the data warehouse databases, and the Service Manager console. This section also describes the hardware and software requirements, the databases created by Service Manager, and the port numbers used by Service Manager.

- Preparing for System Center 2012 - Service Manager Deployment

  Describes how to prepare a computer to host Service Manager. For example, the topics in this section describe how to uninstall a previous version of Service Manager and how to make sure that SQL Server Reporting Services (SSRS) is installed. They also describe the account considerations for you to consider.

- Planning for Performance and Scalability in System Center 2012 - Service Manager

  Describes the issues that affect performance and scalability in Service Manager. Also suggests best practices to achieve good performance using suggested hardware configurations.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Deployment Guide for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

Downloadable Documentation

You can download a copy of this technical documentation from the Microsoft Download Center. Always use the TechNet library for the most up-to-date information.

Planning for System Center 2012 - Service Manager Deployment

For System Center 2012 – Service Manager, several deployment options are available, and three options are presented in this guide.

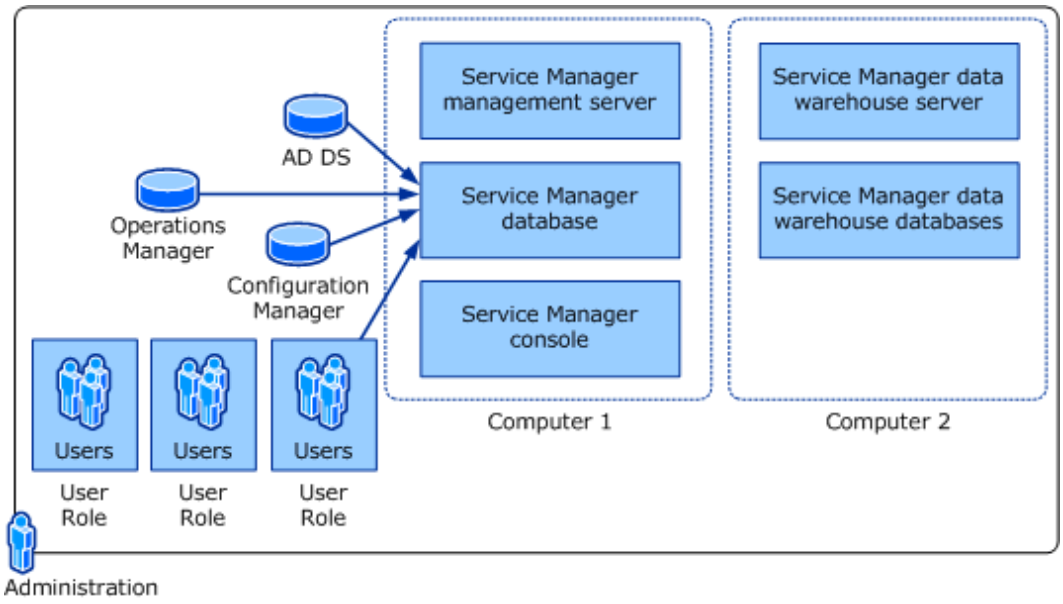
The first deployment option uses one physical computer and one virtual computer. The physical computer hosts the Service Manager management server, the Service Manager database, and the data warehouse databases, and it also hosts the virtual server. The virtual computer hosts the data warehouse management server. This deployment is used primarily for lightweight or first-impression evaluation of Service Manager. No scalability or performance estimates are available for this scenario.

A second deployment option requires the use of two computers. The first computer hosts the Service Manager management server and the Service Manager database. The second computer hosts the data warehouse management server and the data warehouse databases. If you do not

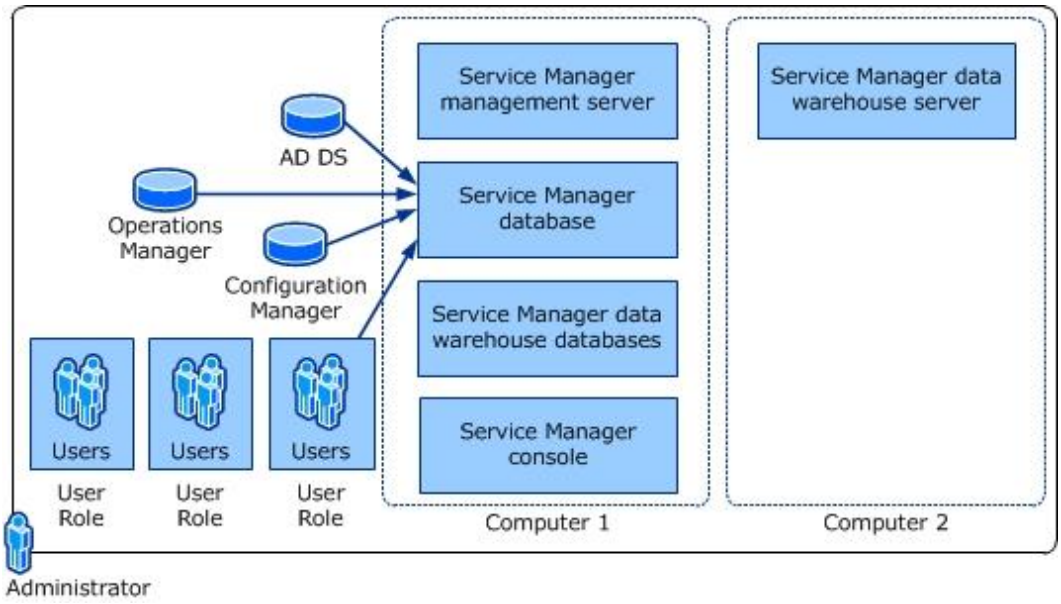
need reporting services, you can—at an absolute minimum—install Service Manager on one computer that hosts both the Service Manager management server and the Service Manager database.

A third deployment option maximizes performance and scalability by using four computers. Two computers host the management servers, and the remaining two computers host the databases. The computers hosting the databases are the only two computers in this scenario that require the installation of Microsoft SQL Server 2008.

You might decide that, for the evaluation phase, you will choose the option to install Service Manager on two computers. After installing Service Manager in the lab, you can import data from Active Directory Domain Services (AD DS) and System Center Configuration Manager, and then you can import data and alerts from Operations Manager. You would then configure User Roles within Service Manager and, if necessary, manually add users that were not imported from AD DS. The following illustration represents an overview of this installation and initial configuration.



You can limit the number of SQL Server licenses that you need by placing all of the Service Manager databases on the same computer, as shown in the following illustration.



You continue the deployment process by creating several templates; configuring initial parameters; creating queues, lists, and groups; and then creating a management pack to save these custom objects.

After the evaluation phase is complete, you might install Service Manager in a production environment and select the deployment scenario in which Service Manager is installed on four computers.

Multiple Service Manager Management Servers and One Data Warehouse

The Service Manager management server and its associated Service Manager database make up a Service Manager management group. The data warehouse management server and its associated databases make up a data warehouse management group. After deploying Service Manager, you will register the Service Manager management group with the data warehouse management group.

In your enterprise, you might create multiple Service Manager management groups. You can centralize reporting for multiple Service Manager management groups by registering multiple Service Manager management groups with a single data warehouse management group. For more information, see How to Run the Data Warehouse Registration Wizard.

Planning for Deployment Topics

- System Center 2012 - Service Manager Parts

  Describes the six major parts of a Service Manager installation.
- SQL Server Requirements for System Center 2012 - Service Manager

Describes the two SQL Server roles that are used by Service Manager, SQL Server Analysis Services (SSAS) and SQL Server Reporting Services (SSRS).

- System Center 2012 - Service Manager Evaluation, Retail, and Select Editions

  Describes the retail and select editions of Service Manager and what effect selecting the 180-day evaluation installation has on these two editions.

- Supported Configurations for System Center 2012 - Service Manager

  Describes the hardware and software requirements for Service Manager. Specific considerations about the software that you need to install to support Service Manager are included.

- Operations Manager Considerations in System Center 2012 - Service Manager

  Describes information that you need to know if you are planning to deploy Service Manager in an environment that hosts Operations Manager 2007.

- Language Support for System Center 2012 - Service Manager

  Describes the languages that are supported in Service Manager.

- Databases Created by System Center 2012 - Service Manager

  Describes the four databases that will be created as a result of deploying Service Manager.

- Port Assignments for System Center 2012 - Service Manager

  Describes the TCP/IP ports that Service Manager uses.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Deployment Guide for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

System Center 2012 - Service Manager Parts

There are six major parts of a System Center 2012 – Service Manager installation, as described in the following table.

Service Manager part	Description
Service Manager management server	Contains the main software part of a Service Manager installation. You can use the Service Manager management server to manage incidents, changes, users, and tasks.
Service Manager database	The database that contains Service Manager configuration items (CI) from the IT Enterprise;

Service Manager part	Description
	work items, such as incidents, change requests, and the configuration for the product itself. This is the Service Manager implementation of a Configuration Management Database (CMDB).
Data warehouse management server	The computer that hosts the server piece of the data warehouse.
Data warehouse databases	Databases that provide long-term storage of the business data that Service Manager generates. These databases are also used for reporting.
Service Manager console	The user interface (UI) piece that is used by both the help desk analyst and the help desk administrator to perform Service Manager functions, such as incidents, changes, and tasks. This part is installed automatically when you deploy a Service Manager management server. In addition, you can manually install the Service Manager console as a stand-alone part on a computer.
Self-Service Portal	A web-based interface into Service Manager.

Important
All computers that host any part of Service Manager must be domain joined.

SQL Server Requirements for System Center 2012 - Service Manager

Microsoft® SQL Server® hosts the databases that System Center 2012 – Service Manager creates. In addition, Service Manager requires SQL Server Analysis Services (SSAS) to work with Microsoft Online Analytical Processing (OLAP) cubes. SQL Server Reporting Services (SSRS) is required to support Service Manager reporting.

All SQL Server requirements are listed at SQL Server and SQL Server editions are listed at Operating System and Database Edition Support.

Note
Service Manager 2012 with no service pack is supported on SQL Server 2008 R2 without a service pack. Service Manager 2012 SP1 requires SQL Server 2008 R2 SP1 or later.

Service Manager does not support setting the MultiSubnetFailover parameter. This parameter is not used in Service Manager connection strings.

SQL Server 2012 Standard and Enterprise Editions

SQL Server 2012 is available in Standard, Enterprise, and Business Intelligence editions. Service Manager will function with all editions. However, there are additional features available in SQL Server 2012 Enterprise that can enhance your experience with the Service Manager data warehouse:

- **Analysis Services Files**: In the Enterprise and Business Intelligence editions of SQL Server 2012, you can decide where Analysis Services database files will be stored. In the Standard edition, there is only one default location for the files.
- **Cube Processing**: In the Enterprise and Business Intelligence editions, cubes are processed incrementally each night. In the Standard edition, the entire cube is processed each night and therefore, the amount of processing time required will increase as more data is accumulated. Cubes can still be queried when being processed however, reporting performance will be reduced.
- **Measure Group Partitions**: In the Enterprise and Business Intelligence editions, measure groups are partitioned on a monthly basis, instead of as one large partition. This reduces the amount of time it takes to process the partition.
- **PowerPivot**: In the Enterprise and Business Intelligence editions, you can use Microsoft SQL Server PowerPiviot for SharePoint.

You must make your decision to use either the Standard, Enterprise, or Business Intelligence editions of SQL Server 2012 before you install Service Manager. It is possible to use a combination of editions for the Service Manager database and use a different edition for the data warehouse databases.

For more information comparing SQL Server editions, see SQL Server 2012 Editions.

Note

Service Manager was tested using the Standard and Enterprise editions of SQL Server 2012.

For information about the specific versions of SQL Server that are supported in Service Manager see Software Requirements for System Center 2012 - Service Manager.

SQL Server 2008 R2 Standard and Enterprise Editions

SQL Server 2008 R2 is available in both Standard and Enterprise editions. Service Manager will function with both editions. However, there are additional features available in SQL Server 2008 Enterprise that can enhance your experience with the Service Manager data warehouse:

- **Analysis Services Files**: In the Enterprise edition of SQL Server 2008, you can decide where Analysis Services database files will be stored. In the Standard edition, there is only one default location for the files.

- **Cube Processing**: In the Enterprise edition, cubes are processed incrementally each night. In the Standard edition, the entire cube is processed each night and therefore, the amount of processing time required will increase as more data is accumulated. Cubes can still be queried when being processed however, reporting performance will be reduced.
- **Measure Group Partitions**: In the Enterprise edition, measure groups are partitioned on a monthly basis, instead of as one large partition. This reduces the amount of time it takes to process the partition.
- **PowerPivot**: In the Enterprise edition, you can use Microsoft SQL Server PowerPiviot for SharePoint.

You must make your decision to use either the Standard or Enterprise editions of SQL Server 2008 before you install Service Manager. It is possible to use SQL Server 2008 Standard for the Service Manager database and use SQL Server 2008 Enterprise for the data warehouse databases.

For more information comparing SQL Server editions, see Microsoft SQL Server 2008 Enterprise and Standard Feature Compare. (Adobe Reader is required.)

Note
Service Manager was tested using both the Standard and Enterprise editions of SQL Server 2008. No other editions of SQL Server are supported.

For information about the specific versions of SQL Server that are supported in Service Manager see Software Requirements for System Center 2012 - Service Manager.

Allow Updates

To either install or upgrade Service Manager, computers running SQL Server that host databases must be configured to allow updates. If updates are not allowed, Service Manager Setup will not complete and the following error message will appear at the **Create database** stage of the installation:

"An error occurred while executing a customer action: _ExecuteSqlScripts. This upgrade attempt has failed before permanent modifications were made. Upgrade has successfully rolled back to the original state of the system. Once the corrections are made, you can retry upgrade for this role."

You can check the status of **allow updates** on SQL Server by executing the following stored procedure from within SQL Server Management Studio:

```
sp_configure 'allow updates'
```

In the results table, examine the value for "run_value". If the value of "run value" is 1, set it back to 0 with the following stored procedure, and then run Setup again.

```
sp_configure 'allow updates',0 reconfigure with override
```

AlwaysOn Availability Groups Considerations for Service Manager Databases

SQL Server AlwaysOn Availability Groups functionality is supported by all versions of System Center 2012 – Service Manager for the default server instance. However, SQL AlwaysOn Availability Groups functionality is not supported for a named instance.

When considering SQL Server AlwaysOn Availability Groups for the Service Manager database or the DWDataMart, you should determine whether availability replica should support either or both of the following active-secondary capabilities:

- Read-only connection access which enables read-only connections to the replica to access and read its databases when it is running as a secondary replica.
- Performing backup operations on its databases when it is running as a secondary replica.

For more information about installing Service Manager with AlwaysOn availability groups on TechNet.

For more information about AlwaysOn Availability Groups, see AlwaysOn Availability Groups (SQL Server).

System Center 2012 - Service Manager Evaluation, Retail, and Select Editions

System Center 2012 – Service Manager is available as both a retail edition and a select edition. Both editions offer the same functionality. The retail edition is purchased separately, and it includes a product key that you enter during setup. The select edition is delivered as part of a Microsoft Volume Licensing plan, and a product key is not required.

During setup of the retail edition of System Center 2012 – Service Manager, you have the option of performing the installation without a product key and instead installing Service Manager as an evaluation edition. The evaluation edition times out 180 days after installation. If you start with an evaluation version of Service Manager and you rerun Setup and install the retail edition or select edition, and you decide to use the existing databases that you created originally, your installation will time out after the original expiration date.

The following table describes the interactions between the various editions of Service Manager.

If you started with …	And then rerun Setup to install …	Will the new installation time out?
Evaluation Edition	Retail Edition	Yes
Evaluation Edition	Select Edition	Yes
Retail Edition	Evaluation Edition	No
Retail Edition	Select Edition	No
Select Edition	Retail Edition	No

Supported Configurations for System Center 2012 - Service Manager

This section includes information about the hardware and software requirements for System Center 2012 – Service Manager. Service Manager has been tested up to the workload described in this topic, based on the recommended hardware requirements in this guide. This environment contains one Service Manager management server supporting 80 to 100 concurrent Service Manager consoles. High-performance storage using 15,000-RPM SCSI drives is used on the database servers.

The hardware and software requirements described in this section are based on the following system environment and conditions:

- Up to 20,000 users, with up to 40 to 50 IT analysts providing concurrent support. Up to 50,000 users and up to 80 to 100 IT analysts can be supported if 32 gigabytes (GB) of memory is installed on the servers running Microsoft SQL Server.
- Up to 20,000 supported computers, assuming up to 10 to 12 configuration items (installed software, software updates, and hardware components) per computer. Up to 50,000 computers can be supported if 32 GB of memory is installed on the servers running SQL Server.
- 5,000 incidents per week with three months of retention, for a total of 60,000 incidents in the Service Manager database for the 20,000-computer configuration, and 2.5 times that for the 50,000-computer configuration.
- 1,000 change requests a week with three months of retention, for a total of 12,000 change requests in the Service Manager database for the 20,000-computer configuration, and 2.5 times that for the 50,000-computer configuration.

Using a slow storage subsystem or insufficient memory can reduce Service Manager performance significantly.

Supported Configuration Topics

- Hardware Requirements for System Center 2012 - Service Manager

  Describes the hardware requirements for Service Manager.
- Software Requirements for System Center 2012 - Service Manager

  Describes the software requirements for Service Manager.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Deployment Guide for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

Hardware Requirements for System Center 2012 - Service Manager

This topic describes the hardware requirements for System Center 2012 – Service Manager.

Hardware Requirements

The following table lists the recommended hardware requirements for the individual parts of Service Manager. These computers can be physical servers or virtual servers.

For System Center 2012 SP1 only: The hardware requirements for Service Manager in System Center 2012 Service Pack 1 (SP1) are unchanged from its initial release.

Hardware requirements table

Service Manager database	8-core 2.66 gigahertz (GHz) CPU 8 gigabytes (GB) of RAM for 20,000 users, 32 GB of RAM for 50,000 users (See the Hardware Performance section in this guide.) 80 GB of available disk space RAID Level 1 or Level 10 drive*
Service Manager management server	4-Core 2.66 GHz CPU 8 GB of RAM (See the Hardware Performance section in this guide.) 10 GB of available disk space
Service Manager console	2-core 2.0 GHz CPU 4 GB of RAM 10 GB of available disk space
Data warehouse management server	4-Core 2.66 GHz CPU 8 GB of RAM (See the Hardware Performance section in this guide.) When a data warehouse management group and SQL Server Analysis Services are hosted on a single server, it should contain at least 16 GB RAM. 10 GB of available disk space
Data warehouse databases	8-core 2.66 GHz CPU 8 GB of RAM for 20,000 users, 32 GB of RAM for 50,000 users (See the Hardware Performance section in this guide.) 400 GB of available disk space RAID Level 1 or Level (1+0) drive

Self-Service Portal: Web Content Server with SharePoint Web Parts	8-Core 2.66 GHz CPU 8-core, 64-bit CPU for medium deployments 16 GB of RAM for 20,000 users, 32 GB of RAM for 50,000 users (See the Hardware Performance section in this guide.) 80 GB of available hard disk space

* For more information, see RAID levels and Microsoft SQL Server.

** Hardware requirements are based on SharePoint specifications. For more information, see Hardware and Software Requirements (SharePoint Server 2010).

Software Requirements for System Center 2012 - Service Manager

This topic describes the software requirements for Service Manager in System Center 2012, System Center 2012 Service Pack 1 (SP1), and System Center 2012 R2 Service Manager. Where applicable to a specific Service Manager version, items are noted accordingly.

Software Requirements

All software requirements for System Center 2012 R2 Service Manager are listed at System Requirements for System Center 2012 R2.

All software requirements for System Center 2012 Service Pack 1 (SP1) are listed at System Requirements for System Center 2012 SP1.

The software requirements for System Center 2012 – Service Manager with no service pack are the same as System Center 2012 R2 Service Manager, except that System Center 2012 – Service Manager is not supported on Windows Server 2012 or where noted. Additional requirements and related information is shown in the following table and sections.

Note

The Service Manager management server and data warehouse management server must be installed on the 64-bit edition of the Windows operating system. The Service Manager console can be installed on both the 32-bit and 64-bit editions of Windows.

Service Manager 2012 with no service pack is supported on SQL Server 2008 R2 without a service pack, however it is not supported with SQL Server 2012. Service Manager 2012 SP1 and System Center 2012 R2 Service Manager require SQL Server 2008 R2 SP1 or later.

Software requirements table

Service Manager management server	In addition to the System Requirements for System Center 2012 R2, the Service Manager management server requires: • ADO.NET Data Services Update for .NET Framework 3.5 SP1 for

	Windows Server 2008 R2 • SQL Server 2008 R2 Native Client or SQL Server 2012 Native client • Microsoft Report Viewer Redistributable, which is available with the Service Manager media. For more information, see How to Install the Microsoft Report Viewer Redistributable Security Update in the Deployment Guide for System Center 2012 – Service Manager.
Data warehouse management server	In addition to the System Requirements for System Center 2012 R2, the data warehouse management server requires: • SQL Server 2008 R2 Native Client or SQL Server 2012 Native client
Service Manager or data warehouse databases	In addition to the System Requirements for System Center 2012 R2, the Service Manager or data warehouse databases require: • SQL Server Reporting Services (SSRS) • The SQL Server and Analysis Services collation settings must be the same for the computers hosting the Service Manager database, data warehouse database, analysis services database, and Reporting Services database. • For Service Manager in System Center 2012 SP1 and System Center 2012 R2 Service Manager: SQL Server 2012 Analysis Management Objects, which are part of the SQL Server 2012 Feature Pack, are required regardless of the SQL Server version that you use • For System Center 2012 only: SQL Server 2008 R2 Analysis Management Objects
Service Manager console	In addition to the System Requirements for System Center 2012 R2, the Service Manager console requires: • Microsoft Report Viewer Redistributable, which is available with the System Center 2012 – Service Manager media. For more information, see How to Install the Microsoft Report Viewer Redistributable Security Update in the Deployment Guide for System Center 2012 – Service Manager.

	• You must have Microsoft Excel 2007 or later installed in order view OLAP data cubes on the computer running the Service Manager console. • ADO.NET Data Services Update for .NET Framework 3.5 SP1 for Windows Server 2008 R2. * • For Service Manager in System Center 2012 SP1 and System Center 2012 R2 Service Manager: SQL Server 2012 Analysis Management Objects are required regardless of the SQL Server version that you use • For System Center 2012 only: SQL Server 2008 R2 Analysis Management Objects
Self-Service Portal: Web Content Server	In addition to the System Requirements for System Center 2012 R2, the Self-Service Portal Web Content Server requires: • Microsoft Internet Information Services (IIS) 7 with IIS 6 metabase compatibility installed. • A Secure Sockets Layer (SSL) certificate can be used on the IIS server that hosts the Self-Service Portal. • For Service Manager in System Center 2012 SP1 and System Center 2012 R2 Service Manager: SQL Server 2012 Analysis Management Objects are required regardless of the SQL Server version that you use • For System Center 2012 only: SQL Server 2008 R2 Analysis Management Objects
Self-Service Portal: SharePoint Web Parts	One of the following versions of Microsoft SharePoint: • Microsoft SharePoint Foundation 2010 • Microsoft SharePoint Server 2010 • Microsoft SharePoint 2010 for Internet Sites Enterprise • If your Service Manager database uses SQL Server 2012, then you must have Service Pack 1 or later applied to your SharePoint 2010 installation. Software requirements for SharePoint Web Parts for the Self-Service Portal are based on Microsoft SharePoint Server 2010 specifications. For more information, see Hardware and Software

	Requirements (SharePoint Server 2010). You must install the English language pack in non-English SharePoint installations so that the Self-Service Portal installs correctly. **Note** Windows Server 2012 and Windows Server 2012 R2 are supported on the server hosting the SharePoint Web Parts with SharePoint 2010 SP2. SharePoint 2013 is not supported on the server hosting the SharePoint Web Parts.
Excel Services in SharePoint Server 2010	Excel Services in SharePoint Server 2010 is required for hosting dashboards for advanced analytical reports. For more information about installing and configuring Excel Services, see Configure Excel Services for a BI test environment.
Computers accessing the Self-Service Portal	All Self-Service Portal web console requirements are listed at Self-Service Web Console Support
SQL Server Reporting Services	In a deployment topology where the computer hosting SSRS is not on the same computer that hosts the data warehouse management server, you have to add **Microsoft.EnterpriseManagement.Reporting.Code** to the global assembly cache. For more information, see **Manual Steps to Configure the Remote SQL Server Reporting Services** in the Service Manager for System Center 2012 Deployment Guide.

* For more information about the ADO.NET Data Service Update, see ADO.NET Data Services Update for .NET Framework 3.5 SP1 for Windows 7 and Windows Server 2008 R2.

Microsoft SQL Server 2008

To download trial software of the English versions of either Microsoft SQL Server 2008 Standard Edition or SQL Server 2008 Enterprise Edition, see SQL Server 2008.

To download SP1 for SQL Server 2008, see SQL Server 2008 Service Pack 1.

To download the trial software for the English version of SQL Server 2008 R2, see SQL Server 2008 R2.

To download Service Pack 1 for Microsoft SQL Server 2008 R2, see Microsoft® SQL Server® 2008 R2 Service Pack 1

Use the following configuration with SQL Server 2008 SP1:

- SQL Server full-text search: Full-text search must be selected during installation on the computers running SQL Server that will host the Service Manager and data warehouse databases. For more information about FTS, see SQL Server 2008 Full-Text Search: Internals and Enhancements.
- SQL Server configured to use case-insensitive databases.
- Service Account configured in accordance with your organization's requirements.
- The SQL Server Reporting Services (MSSQLSERVER) service, configured and running. For more information about how to configure the MSSQLSERVER service, see How to: Verify a Reporting Services Installation.
- For this release, make sure that you use the same collation in SQL Server and Analysis Services on the computers that host the Service Manager database, the data warehouse database, and the analysis services database. For more information about SQL Server collations, see Using SQL Server Collations.

If your SQL Server installation is using the default collation (SQL_Latin1_General_CP1_CI_AS), a warning message appears, stating that the collation is not one of the supported collations for Service Manager and that an unsupported collation can cause unpredictable behavior in multilingual environments.

Caution

Support for languages other than English in Service Manager is not possible when you are using the collation SQL_Latin1_General_CP1_CI_AS. If later you decide to support multiple languages using a different collation, you have to reinstall SQL Server. There are no issues with using the SQL_Latin1_General_CP1_CI_AS collation with the English-only installations of Service Manager. SQL_Latin1_General_CP1_CI_AS is supported despite the warning message in setup. It is generally used for installations where the Service Manager databases will share a SQL Server instance with other System Center components which must be installed on SQL_Latin1_General_CP1_CI_AS. If Service Manager will be installed on its own SQL Server instance, it is recommended to use the newer and more complete collation Latin1_General_100_CP1_CI_AS. For more information about language support, see Language Support for System Center 2012 - Service Manager.

You can define the collation when you install SQL Server. During Setup, on the **Server Configuration** page, click the **Collation** tab, and then click **Customize** for both the **Database Engine** and **Analysis Services** entries.

Microsoft SQL Server 2012

To download trial software of the English versions of Microsoft SQL Server 2012, see the SQL Server 2012 Trial page on the Microsoft web site.

Other considerations for SQL Server 2012 are similar to SQL Server 2008. For more information about SQL Server, see Microsoft SQL Server 2008.

SQL Server Reporting Services

When you install SSRS, select the option to install the native mode default configuration. For more information, see Considerations for Installing Reporting Services.

Do not use the same SSRS instance that you are using for Service Manager with any other System Center components.

SQL Server Analysis Services

SQL Server Analysis Services (SSAS) is required for Service Manager.

Microsoft .NET Framework 3.5 SP1

Microsoft .NET Framework 3.5 SP1 is required for running Service Manager. Microsoft .NET Framework 3.5 SP1 is included with the Service Manager installation media.

Microsoft .NET Framework 4

The Self-Service Portal for Service Manager consists of two parts, a web content server and SharePoint Web Parts. The web content server requires Microsoft .NET Framework 4. To download .NET Framework 4, see Microsoft .NET Framework 4 (Web Installer).

Microsoft SharePoint Server 2010

The Self-Service Portal for Service Manager consists of two parts, a web content server and a SharePoint website. You must install SharePoint Web Parts on a computer that hosts SharePoint Server 2010. A link to download SharePoint Server 2010 is on the Service Manager Prerequisites page in Setup, or you can download an evaluation copy of SharePoint Server 2010 at Download Microsoft SharePoint Server 2010.

Important

You must install the English language pack in non-English SharePoint installations so that the Self-Service Portal installs correctly.

Windows PowerShell 2.0

Windows PowerShell 2.0 is required for Service Manager. You enable Windows PowerShell 2.0 in Windows Server 2008 using Service Manager. For more information see How to: Enable Windows PowerShell

Microsoft SQL Server Analysis Management Objects

For Service Manager in System Center 2012 SP1 and System Center 2012 R2 Service Manager: The Service Manager console requires Microsoft SQL Server 2012 Analysis Management Objects (AMOs), which are part of the SQL Server 2012 Feature Pack, so that it can work with SSAS. Microsoft AMOs are also required for the web content server (part of the Self-Service Portal). Two different setup files are available for installing Microsoft AMOs, based on the microprocessor architecture that you are using, as indicated in the following list:

SQL Server 2012 Analysis Management Objects X86

SQL Server 2012 Analysis Management Objects X64

For System Center 2012 only: The Service Manager console requires Microsoft Analysis Management Objects (AMOs) so that it can work with SSAS. Microsoft AMOs are also required for the web content server (part of the Self-Service Portal). Three different setup files are available for installing Microsoft AMOs, based on the microprocessor architecture that you are using, as indicated in the following list:

x86 Package

x64 Package

IA-64 Package

Internet Information Services

When you install the IIS role, you must select the ASP.NET, Basic Authentication, and Windows Authentication options.

Operations Manager

Service Manager has the capability to import alerts and configuration items from your Operations Manager 2007 environment. You must have Operations Manager 2012, Operations Manager 2007 SP1, or Operations Manager 2007 R2 installed to work with Service Manager.

Important

You cannot use Operations Manager 2007 SP1 to monitor Service Manager management servers. You must use Operations Manager 2007 R2 or Operations Manager 2012.

If you plan to install both Service Manager and Operations Manager 2007 in the same environment, see Operations Manager Considerations in System Center 2012 - Service Manager.

You can create a data mart for Operations Manager.

Configuration Manager

Service Manager can import configuration items from your Microsoft System Center Configuration Manager 2007 environment. You must have Configuration Manager 2007 SP1, Configuration Manager 2007 R2, or Configuration Manager 2012 installed to work with Service Manager.

Network Requirements

In Service Manager, you can view external content from within knowledge articles. To view external content, computers that host the Service Manager console must have Internet access, either directly or through a proxy server.

SMTP Server

You must have access to a Simple Mail Transfer Protocol (SMTP) server to use the Notification feature and for incident creation through email.

Windows Safe Mode

Service Manager does not operate and the services used by Service Manager do not start if Windows Server 2008 is running in safe mode. If you attempt to start the Service Manager services manually while in safe mode, the services fail to start and an error is written into the event log.

See Also

Supported Configurations for System Center 2012 - Service Manager

Operations Manager Considerations in System Center 2012 - Service Manager

This topic contains information to be aware of when you are combining Operations Manager and Service Manager.

Management Group Names Must be Unique

When you deploy both a Service Manager and data warehouse management server, you are asked to provide a management group name. You are also asked to provide a management group name when you deploy Operations Manager. The management group names that you use for the Service Manager management group, the data warehouse management group, and the Operations Manager management group must be unique.

Important

If Operations Manager and Service Manager share the same management group name, you will have to reinstall the Service Manager management server. Because it is not possible to rename a management group, you will either have to completely reinstall Service Manager with a different management group name or choose not to manage your Service Manager installation with Operations Manager.

Database Collations

You must use the same supported language collations if you intend to import data from Operations Manager into Service Manager. However, this is true only for the OperationsManager database in Operations Manager and the SM DWStagingAndConfig database when you create an Operations Manager Data Source for the data warehouse. Specifically, this appears in the Service Manager console as a Data Warehouse Data Source. This does not affect either the System Center Operations Manager to System Center Service Manager Configuration Item connector or the System Center Operations Manager to System Center Service Manager Alert Incident connector.

For more information about the SQL Server collation setting that might impact installation requirements in System Center 2012 Service Pack 1 (SP1) when you use Operations Manager and Service Manager, see Clarification on SQL Server Collation Requirements for System Center 2012.

Note

If you have databases with collations that do not match, then you cannot use the Operations Manager to Service Manager data warehouse connector which imports alerts from the OperationsManager database in Operations Manager to the Service Manager DWStagingAndConfig database.

Service Manager Compatibility With Other System Center Components

You can use any supported database collation of any System Center component with any supported collation of Service Manager.

Operations Manager Compatibility

This section describes the compatibility between Operations Manager 2007 R2, System Center 2012 – Operations Manager and System Center 2012 – Service Manager SP1.

System Center Operations Manager 2007 R2

System Center Operations Manager 2007 R2 is supported by Service Manager and Service Manager SP1 for connectors and agents. However, System Center Operations Manager 2007 R2 is not supported for data source registration. Only corresponding System Center versions are supported when you register a data source in the Data Warehouse workspace.

Because upgrading to System Center 2012 – Service Manager SP1 is not supported, you must remove Operations Manager 2007 R2 agents from the Service Manager and data warehouse management servers before you install. System Center 2012 – Service Manager SP1 includes a System Center 2012 – Operations Manager SP1 agent and it is automatically installed when you deploy Service Manager. After Service Manager Setup completes, you must manually configure the agent to communicate with the Operations Manager management server.

System Center 2012 – Operations Manager

System Center 2012 – Operations Manager is supported by Service Manager and Service Manager SP1 for connectors and agents. However, only corresponding System Center versions are supported when you register a data source in the Data Warehouse workspace.

System Center 2012 – Operations Manager agents were not supported with System Center 2012 – Service Manager. However, the agent that is automatically installed by System Center 2012 – Service Manager SP1 is compatible with System Center 2012 – Operations Manager and System Center 2012 – Operations Manager SP1. After Service Manager Setup completes, you must manually configure the agent to communicate with the Operations Manager management server.

To validate that the Operations Manager Agent was installed, open **Control Panel** and verify that the Operations Manager Agent is present. To manually configure the Operations Manager agent, see Configuring Agents.

Operations Manager Agents with the Self-Service Portal and Service Manager console

If you want to monitor a server that will host Self-Service Portal components or the Service Manager console that does not already host other Service Manager roles, then you should deploy the Operations Manager agent to the server before you install the Self-Service portal or the Service Manager console. After you've installed either, you should give special consideration to removing the portal or Self Service console. If an Operations Manager agent is installed on the server that hosts the portal or console and you remove the either, then the Operations Manager agent is also removed.

If you have already installed the portal or console to a server that does not host other Service Manager roles, and you want to deploy an Operations Manager agent to it, then the agent deployment will fail. However, you can prevent agent deployment failure by using the following procedure to back up, remove, and restore the Service Manager product registry key.

To back up, remove, and restore the Service Manager product registry key

1. Export the Service Manager key from HKEY_CLASSES_ROOT\Installer\Products\<ServiceManagerGUID>. You can find the key by searching at the Products node for Data equal to Service Manager.
2. Delete the registry key.
3. Deploy the Operations Manager agent to the server.
4. Import the key you exported from step 2.

Language Support for System Center 2012 - Service Manager

It is assumed in this guide that you are installing System Center 2012 – Service Manager on a computer where no previous version of Service Manager is installed. For information about upgrading Service Manager, see the Upgrade Guide for Service Manager 2012 - System Center.

Including English, System Center 2012 – Service Manager supports a total of 21 languages. There are some search-related issues with six languages: Czech, Danish, Finnish, Greek, Polish, and Turkish. For more information about these issues, see the section "Search Issues" in this topic.

Setting your Windows locale on a computer that hosts a Service Manager console to one of the supported languages results in Service Manager being displayed in that language. In addition to the languages that Service Manager supports, you must also consider the ability to search and sort data in the Service Manager databases. The ability to search and sort data in a specific language is defined by the collation settings in Microsoft SQL Server. For more information about SQL Server collations, see the section "Microsoft SQL Server 2008 with SP1" in Supported Configurations for System Center 2012 - Service Manager in this guide.

The information in the following table represents the approved collations and the locale identifiers that were tested for Service Manager. In the list of collations in this table, “CI” indicates case-insensitive, and “AS” indicates accent-sensitive.

Windows locale	Collation
English	Latin1_General_100_CI_AS
English	SQL_Latin1_General_CP1_CI_AS
English	Latin1_General_CI_AS
Chinese_PRC	Chinese_Simplified_Pinyin_100_CI_AS
Chinese (Traditional, Taiwan)	Chinese_Traditional_Stroke_Count_100_CI_AS
Czech (Czech Republic)	Czech_100_CI_AS
Danish (Denmark)	Danish_Norwegian_CI_AS

Windows locale	Collation
Dutch (Netherlands)	Latin1_General_100_CI_AS
Finnish (Finland)	Finnish_Swedish_100_CI_AS
French	French_100_CI_AS
German_Standard	Latin1_General_100_CI_AS
Greek (Greece)	Greek_100_CI_AS
Hungarian	Hungarian_100_CI_AS
Italian_Standard	Latin1_General_100_CI_AS
Japanese	Japanese_XJIS_100_CI_AS
Korean	Korean_100_CI_AS
Norwegian (Bokmål, Norway)	Norwegian_100_CI_AS
Polish (Poland)	Polish_100_CI_AS
Portuguese (Brazil)	Latin1_General_100_CI_AS
Portuguese (Portugal)	Latin1_General_100_CI_AS
Russian	Cyrillic_General_100_CI_AS
Spanish_Modern_Sort	Modern_Spanish_100_CI_AS
Swedish (Sweden)	Finnish_Swedish_100_CI_AS
Turkish (Turkey)	Turkish_100_CI_AS

Search Issues

This section describes search issues, sort issues, and word-break issues with some of the languages that are supported in Service Manager.

Greek, Czech, and Finnish Languages

For these languages, full-text search is not supported in SQL Server 2008. Therefore, sorting and searching activities in these languages do not function correctly.

Danish, Polish, and Turkish Languages

Full-text search does not function in SQL Server 2008 or SQL Server 2008 R2 for these languages. You can load a licensed third-party word breaker that enables full-text search to function correctly. If you have Service Manager consoles using the Danish, Polish, or Turkish languages, regardless of the language collation that you have selected for your SQL Server installation, you have to install a third-party word breaker.

For more information, see the following links for the version of SQL Server that you are using:

- SQL Server 2008
- SQL Server 2008 R2

Turkish Language

None of the Turkish collations is supported in Service Manager. The Latin1_General_100_CI_AS collation was used for testing with the Turkish language. As a result, some search and sort operations in Service Manager will be affected for some Turkish characters.

Databases Created by System Center 2012 - Service Manager

Before starting the installation of System Center 2012 – Service Manager, you may want to meet with your SQL Server administration team and discuss the impact that Service Manager will have on your computers running SQL Server—specifically, the databases that will be created. The databases that are created by a deployment of Service Manager are listed in the following table.

Service Manager parts	Database name	Contents
Service Manager database	Service Manager	Configuration Items, Work Items, Incidents
Service Manager data warehouse	DWStagingAndConfig DWRepository DWDataMart DWASDataBase OMDWDataMart CMDWDataMart	These first three databases make up the data warehouse. The extract process populates the DWStagingAndConfig database, which is transformed into a proper format in the DWRepository database, which, through the load process, becomes the content for the DWDataMart database. The DWASDatabase is used by SQL Server Analysis Services (SSAS) and stores Microsoft Online Analytical Processing (OLAP) cubes. The OMDWDataMart and CMDWDataMart databases are for collecting data from Operations Manager and Configuration Manager, respectively.

Important

For this release, Service Manager does not support case-sensitive instance names. Setup will display a warning if you attempt to install Service Manager on a case-sensitive instance of Microsoft SQL Server.

Port Assignments for System Center 2012 - Service Manager

As part of your security infrastructure, you may want to keep track of port numbers that are used throughout your System Center 2012 – Service Manager environment. And while, in this release, these port numbers are not configurable, you can review the following table that lists port numbers that are used between the parts of Service Manager. You will want to ensure that these firewall ports are opened on computers that host Service Manager.

Port Assignments

Service Manager piece A	Port number and direction	Service Manager piece B
Service Manager console	5724 --->	Service Manager management server*
Service Manager console	5724 --->	Data warehouse management server
Service Manager management server	1433 --->	Remote Service Manager database
Service Manager management server	5724 --->	Data warehouse server
Service Manager management server	5724 --->	Operations Manager 2007 Alert and CI connectors
Service Manager management server	389 --->	Active Directory Connector
Service Manager management server	1433 --->	Configuration Manager Connector
Data warehouse management server	1433 --->	Remote data warehouse database server
Data warehouse management server	1433 --->	Remote Service Manager database server
Data warehouse management server	2383 --->	SQL Server Analysis Services**
SQL reporting service server	1433 --->	Remote data warehouse database server

Service Manager piece A	Port number and direction	Service Manager piece B
Web browser	80 --->	SQL Server Reporting Services (SSRS)
Web browser	[setup***] --->	SharePoint Web Parts server
Web browser	[setup***] --->	Web content server
Web content server	1433 --->	Service Manager database

* Includes initial Service Manager management server and subsequent Service Manager management servers

** Port 2383 is the default port for SQL Server Analysis Services (SSAS). However, the port number can be changed. For more information, see Configure Windows Firewall for Analysis Services Access.

*** The port number that is used between the browser and the SharePoint Web Parts server and the web content server is configured during installation of the Self-Service Portal.

Preparing for System Center 2012 - Service Manager Deployment

Before you start the deployment of System Center 2012 – Service Manager, you create a group of users in Active Directory Domain Services (AD DS), and you create or identify a domain account that will be used during the Setup process. Make sure that the domain account is a member of the appropriate groups that are necessary for proper operation of Service Manager For more information see Account Considerations for Running Setup in this guide. Keep the following in mind when you are installing Service Manager and Operations Manager on the same server:

- Operations Manager 2007 or System Center 2012 – Operations Manager can share the database server with Service Manager.
- For System Center 2012 Only: An Operations Manager 2007 R2 agent and the Service Manager management server can coexist on the same server if you install the agent first and then install either the Service Manager or data warehouse management server.
- For System Center 2012 SP1 only: You must remove an Operations Manager 2007 R2 agent before you run Service Manager Setup. A System Center 2012 – Operations Manager SP1 agent is automatically installed as part of Service Manager SP1. After Setup completes, you must manually configure the agent for use with the Operations Manager management server. The agent is compatible with System Center Operations Manager 2007 R2, System Center 2012 – Operations Manager, and System Center 2012 – Operations Manager SP1.

  To validate that the Operations Manager Agent was installed, open Control Panel and verify that the Operations Manager Agent is present. To manually configure the Operations Manager agent, see Configuring Agents.

- You can install both the Operations Manager 2007 R2 console and the Service Manager console on the same computer. The order in which you install the consoles does not matter.
- Do not attempt to use the same SQL Server Reporting Services (SSRS) instance for both Operations Manager and Service Manager.

Preparing for Deployment Topics

- Account Considerations for Running Setup

  Provides information about the accounts that are required to run Setup and that you must provide during the setup of Service Manager.
- How to Prepare Computers for Service Manager Deployment

  Describes the steps to take to prepare a computer before running Setup for Service Manager.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Deployment Guide for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

Account Considerations for Running Setup

Before running Setup for System Center 2012 – Service Manager, review the Account Used for Running Setup topic in this guide to make sure that the requirements that are needed to install Service Manager have been met. During Setup, you will be prompted to provide domain users or groups for various Service Manager functions. Review the Accounts Required During Setup topic to make sure that you are ready for the setup process.

Account Considerations for Running Setup Topics

- Account Used for Running Setup

  Describes how to ensure needed account requirements are met.
- Accounts Required During Setup

  Describes how to ensure accounts are ready for the Setup process.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Deployment Guide for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

Account Used for Running Setup

This topic describes the permissions that you need when you are installing a Service Manager management server and Service Manager console databases and when you are registering the Service Manager management group with the data warehouse management group in System Center 2012 – Service Manager.

Note
The account that you use to run Setup is automatically made an administrator in Service Manager.

Service Manager Management Server

You need the following permissions when you are installing a Service Manager management server:

- Local administrator on the computer that you run Setup on
- Local administrator on the computer that will host the Service Manager database if it is on a remote computer
- Logged-on user must be a domain account
- The Sysadmin SQL Server role on the SQL Server instance where the Service Manager database is being created

Service Manager Console

You need the following permissions when you are installing the Service Manager console:

- Local administrator on the computer that you run Setup on

Data Warehouse Management Server

You need the following permissions when you are installing the data warehouse management server:

- Local administrator on the computer that you run Setup on
- Local administrator on the computer that will host the data warehouse database if it is on a remote computer
- Logged-in user must be a domain account
- The Content Manager role in SQL Server Reporting Services (SSRS) at the site level (root)
- The Sysadmin SQL Server role on the SQL Server instance where the data warehouse database is being created

SQL Server Reporting Services

You need the following permissions when you are installing SSRS:

- Permissions to place a binary file into the \Program Files\Microsoft SQL Server\<Instance Name>\Reporting Services\ReportServer\Bin folder on the computer hosting the data warehouse management server

Registering Service Manager with the Data Warehouse

You need the following permissions when you are registering Service Manager with the data warehouse:

- The Sysadmin or security admin SQL Server role on the instance that is hosting the Service Manager database
- The Sysadmin or security admin SQL Server role on the instance that is hosting the data warehouse database
- Membership in the Service Manager Administrators user role on the Service Manager management server
- Membership in the Service Manager Administrators user role on the data warehouse management server

Accounts Required During Setup

You will have to provide credentials for the accounts in the following table during the installation of the System Center 2012 – Service Manager and data warehouse management servers.

Note
The user accounts and group accounts that are required for the installation of Service Manager must reside in the Users organizational unit (OU) in Active Directory Domain Services (AD DS).

Accounts That You Provide During the Installation of a Service Manager Management Server

Account	Permissions	How it is used in Service Manager
Management group administrators	• Must be a domain user or group. **Important** The user account that is logged into the computer during installation of an initial Service Manager management server is automatically added to this group.	• Added to the Service Manager Administrators user role.
Service Manager services account	• Must be a domain user or group. • Must be member of local administrators.	• Becomes the Operational System Account. • Assigned to the logon account for the System Center Data Access

Account	Permissions	How it is used in Service Manager
		Service. • Assigned to the logon account for System Center Management Configuration service. • Becomes a member of the sdk_users and configsvc_users database roles for the Service Manager database. • If you change the credentials for these two services, make sure that the new account has a SQL Login in the ServiceManager database and that this account is a member of the Builtin\Administrators group.
Workflow account	• Must be a domain user or group. • Must have permissions to send email and must have a mailbox on the Simple Mail Transfer Protocol (SMTP) server (required for the E-mail Incident feature). • Must be member of the Users local security group. • Must be made a member of the Service Manager Administrators user role for email notifications for function properly.	• This account is used for all workflows and is made a member of the Service Manager Workflows user role.

Security Best Practices for Accounts

When you are assigning Active Directory accounts for use with Service Manager Run As Accounts, it is a best practice to use service accounts. We strongly recommend against using Active Directory user accounts that are associated with individual people.

For more information about security best practices, download a copy of the Windows Server 2008 Security Guide, which is now part of the Windows Server 2008 Security Compliance Management Toolkit and The Services and Service Accounts Security Planning Guide.

Accounts That You Provide During the Installation of the Data Warehouse Management Server

Account	Permissions	How it is used in Service Manager
Management group administrators	• Must be a domain user or group.	• Added to the data warehouse administrators user role.
Service Manager services account	• Must be a domain user or group. • Must be member of local administrators on the data warehouse management server. • Must be the same account that you used for the Service Manager management server services account.	• Becomes the data warehouse system Run As account. • Assigned to the ServiceManager SDK Service account. • Assigned to ServiceManager Config account. • Becomes a member of the sdk_users and configsvc_users database roles for the DWDataMart database. • Becomes a member of the db_datareader database role for the DWRepository database. • Becomes a member of the configsvc_users database role for the Service Manager database.
Reporting account	• Must be a domain account.	• Used by SQL Server Reporting Services (SSRS) to access the DWDataMart database to get data for reporting. • Becomes a member of the db_datareader database role for the DWDataMart database.

Account	Permissions	How it is used in Service Manager
		• Becomes a member of the reportuser database role for the DWDatamart database.
Analysis Services account	• Must be a domain account.	• Used to communicate with datamarts. • Account is added as an administrator role in the Analysis Services server database (DWASDataBase) for database processing and cube reading.

Registering the Service Manager Management Group with the Data Warehouse Management Group

As part of the installation process, you register the Service Manager management group with the data warehouse management group. During this process, you will be prompted to provide credentials. The account credentials that you provide must be a domain account. Furthermore, you will have to provide an account with the following permissions:

- Must be a member of the Administrator user role in both the Service Manager and data warehouse management groups.
- Must be a member of the users local administrator group on the data warehouse management server.

Accounts Required for Creating Connectors

When you are creating connectors, you are asked for credentials that the connector will use to perform its function. The following table outlines the permissions that this account will need, and it describes best practices for high security.

Operations Manager 2007 Alert Connector

Permissions	Best practices
• Must be a domain account. • Must be a member of the Users local security group on the Service Manager management server. • Must be an Operations Manager 2007 Administrator.	Domain account specifically created for this purpose that is only in the Users local security group and in an Administrator user role in Operations Manager and in an Advanced Operator user role in Service Manager.

Operations Manager 2007 CI Connector

Permissions	Best practices
• Must be a domain account. • Must be a member of the Users local security group on the management server. • Must be an Operations Manager 2007 Operator.	Domain account specifically created for this purpose that is only in the Users local security group and in an Operator user role in Operations Manager and in an Advanced Operator user role in Service Manager.

Active Directory Connector

Permissions	Best practices
• Must be a domain account. • Must be a member of the Users local security group on the Service Manager management server. • Must have permissions to bind to the domain controller that the connector will read data from. • Needs generic read rights on the objects that are being synchronized into the Service Manager database from AD DS.	Domain account specifically created for this purpose that is only in the Users local security group and in an Advanced Operator user role in Service Manager and has read-only permissions in AD DS.

Configuration Manager 2007 Connector

Permissions	Best practices
• Must be a domain account. • Must be a member of the Users local security group on the Service Manager management server.	Domain account specifically created for this purpose that is only in the Users local security group, must be a member of the smsdbrole_extract and db_datareader on the System Center Configuration Manager database, and is in an Advanced Operator user role in Service Manager.

How to Prepare Computers for Service Manager Deployment

Use the following procedures to prepare computers for deployment of System Center 2012 – Service Manager.

To prepare computers for Service Manager deployment

1. Make sure that no Operations Manager 2007 parts are installed on the computers that will host either Service Manager or the data warehouse.

2. Create an Active Directory group of users that will be assigned to the role of Service Manager administrators of both the data warehouse and Service Manager management groups. For example, create the group **SM_Admins**.

   Note
   This group of users must be in the same domain that Service Manager is in. Users from any other domain—even child domains—are not supported.

3. Create the accounts that are necessary for Service Manager. For information about the account that is used to run Setup and for the accounts you will have to provide during the setup of Service Manager, see Account Considerations for Running Setup.

   Note
   Service Manager accounts must be in the same domain that Service Manager is in. Accounts from any other domain—even child domains—are not supported.

4. Make sure that the Structured Query Language (SQL) instances that are used for Service Manager databases are using port number 1433.
5. If you are installing the databases on a remote computer running Microsoft SQL Server, the user who is running Setup must be a domain user with local administrator permissions on the SQL Server computer.
6. On computers that will host the Service Manager console, under **Internet Options**, **Local Area Network (LAN) Settings**, select **Bypass proxy server for local addresses**.
7. Open a browser, and then enter the following two URLs:
   - http://<computer hosting SSRS>/reports
   - http://<computer hosting SSRS>/reportserver

   If either connection attempt fails or returns an error—for example, **HTTP Error 404.0 Not Found**—complete the steps in the procedure “To configure the reporting server.” Otherwise, continue with the installation of Service Manager.

To configure the reporting server

1. By using an account that has administrator rights, log on to the computer that will host SQL Server Reporting Services (SSRS).
2. Click **Start**, point to **Programs**, point to **Microsoft SQL Server 2008**, point to **Configuration Tools**, and then click **Reporting Services Configuration Manager**.
3. In the **Reporting Services Configuration Connection** dialog box, make sure that the information in **Server Name** and **Report Server Instance** is correct, and then click **Connect**.
4. In the **Connect** pane, click **Web Service URL**.
5. In the **Report Server Web Service Virtual Directory** area, in the **Virtual Directory** text box, make sure that the entry is **ReportServer**, and then click **Apply**.
6. In the **Connect** pane, click **Report Manager URL**.
7. In the **Report Manager Site Identification** area, in the **Virtual Directory** text box, make sure that the entry reads **Reports**, and then click **Apply**.

8. In the **Connect** pane, click the top entry (<server>\<instance>).
9. In the **Current Report Server** area, click **Stop**, and then click **Start**.

Planning for Performance and Scalability in System Center 2012 - Service Manager

This section describes general performance and scalability planning guidance for System Center 2012 – Service Manager. While Service Manager is built to meet a performance standard on minimum recommended hardware, the hardware requirements for your specific scenario may be higher or lower than the generalized guidelines presented here. This section also describes considerations for Service Manager software.

Service Manager is a three-tiered application, consisting of a database, a data access module, and a console:

- Every Service Manager deployment topology—from the largest to smallest—includes all three tiers, whether physically or virtually.
- The smallest deployment topology that is supported requires two servers, either physical servers or virtual servers. The largest deployment topology contains more than four servers.
- The servers host the Service Manager console and Service Manager database on the management server. The data warehouse management server hosts the Service Manager data warehouse.

Service Manager Sizing Helper Tool

The Service Manager Sizing Helper tool can help you size the hardware and software pieces that you will deploy using the details in this guide. The tool is included in the Service Manager job aids documentation set (SM_job_aids.zip).

Specifically, the sizing tool:

1. Helps to give you an idea of the type of hardware, such as individual computers, CPUs, free and used hard drive space, and RAID level, that is needed for different usage and deployment scenarios. Usage is indicated by the number of configuration items in the Service Manager database, work items per month, and days of data in the data warehouse.
2. Provides topology diagrams for each scenario. The diagrams map the hardware to scenarios such as single-physical-server, two-server, four-server, and more-than-four-server scenarios.
3. Helps you calculate free and used hard drive space that is necessary for a scenario, based on your input. The calculation is an estimate, not a fixed value that you must meet.

Planning for Performance and Scalability Topics

- Hardware Performance

  Contains general guidelines to consider when you are planning for Service Manager hardware performance.

- Service Manager Performance

  Contains general guidelines to consider when you are planning for Service Manager software performance.
- Configurations for Deployment Scenarios

  Describes hardware and software configurations for Service Manager deployment scenarios.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Deployment Guide for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

Hardware Performance

An important part of System Center 2012 – Service Manager performance depends on a hardware configuration and deployment topology that is planned to handle the needs of your organization. The following sections provide general guidelines to consider when you are planning for adequate hardware performance.

Hardware Performance

The following are the hardware bottlenecks that are most noticeable in Service Manager, with a significant load and amount of data in the Service Manager database:

1. The most common bottleneck is memory and I/O on the computer that is running Microsoft SQL Server. If you have the resources, investing in more memory and a faster I/O subsystem to improve SQL Server I/O will achieve better performance.
2. If you expect to have many consoles connecting to a management server, you can improve performance to handle peak load by investing in additional CPUs and memory for the management server or by installing a secondary Service Manager management server.

Be aware of the recommended minimum hardware for each role, as described in this document.

The Role of Virtual Machines

Many organizations use virtual machines to host Windows Server applications. Service Manager server roles, such as the management server and data warehouse server, are no exceptions. The use of virtual machines might range from all server roles being virtualized to some other combination of virtual and physical computers.

We do not recommend any specific virtual-to-physical-computer ratio because the needs of your organization are inherently unique. However, the minimum hardware requirements for each software role apply to physical computers. If you decide to virtualize a software role, you should plan to ensure that you have additional hardware resources for each virtual computer.

Database servers are vulnerable to poor performance on virtual machines if the following planning guidance is not followed:

- Running SQL Server 2008 in a Hyper-V Environment (SQL2008inHyperV2008.docx).
- You should never use dynamic disks on virtual machines that are intended to host SQL Server. Use fixed-size virtual hard drives or pass-through.
- Hyper-V allows only four virtual CPUs per guest, which might constrain the Service Manager server if you have many consoles.

Service Manager Baseline Test Results

Service Manager has been baseline-tested for performance and scalability using various deployment scenarios with the minimum recommended hardware in the form of physical computers. More specifically, the scenarios were tested with databases prepopulated and Service Manager consoles creating and updating Incidents and Change Requests in a loop.

The database was prepopulated with information for two tests:

- Test 1 consisted of 20,000 computers, 20,000 users, and all the necessary configuration items, which were approximately 250,000 configuration items totaling approximately 2.5 million rows in the database. Test 1 also included 40 active Service Manager consoles.
- Test 2 consisted of 50,000 computers, 50,000 users, and related configuration items, which was approximately 700,000 configuration items totaling 6 million rows in the database. Test 2 also included 80 active Service Manager consoles.

The tests delivered the following results:

- To meet the response-time goals for the 50,000-computer configuration, the SQL Server memory had to be increased from 8 gigabytes (GB) to 32 GB.
- During testing, 200 incidents and 50 change requests for the 20,000-computer configuration and 500 Incidents and 125 Change Requests for the 50,000-computer configuration were generated each hour, with three to four notification subscriptions and templates being processed for each incident and change request.
- Typically, in the baseline testing, workflows, such as notification subscription processing and template application, ran within one minute of each work item being generated.

If your organization plans to have fewer than 20,000 supported computers and consoles and fewer workflows, your Service Manager performance should be acceptable, even if some of the Service Manager roles are hosted on virtual computers.

However, if you plan to add additional supported computers in the Service Manager database, you should plan to increase the amount of RAM for the Service Manager database server beyond the minimum requirements listed in this document. For example, in the baseline test 8 GB of RAM was installed in the Service Manager database server that contained records for 20,000 computers. Afterward, you should add 8 GB of RAM for each increment of 10,000 of computers that you plan to support. For example, for 50,000 computers plan for 32 GB of RAM. During testing of the 50,000-computer configuration with 32 GB of RAM installed on the computer running SQL Server, performance was improved to a state where there was no longer any decreased effect compared to testing of the configuration before additional computers were added.

Network latency was also tested in the baseline. Network latency was introduced between the Service Manager console and the Service Manager management server.

Note
The Service Manager database server and Service Manager management servers should be on a low-latency LAN; network latency between the Service Manager database server and the Service Manager management server may lead to significant degradation of Service Manager performance.

The tests also delivered the following results:

- Where network latency was less than 100 milliseconds (msec), overall Service Manager console response times were found good.
- Where network latency was 150 to 200 msec, performance was noted as usable, with up to a 40-percent degradation in response time in some scenarios. With latency between 150 to 200 msec, you should plan to evaluate the key scenarios for your organization and determine if Remote Desktop Connection (RDC) is a better option.

  Note
  Expanding service maps in the Service Manager console was slow with any amount of latency.
- When network latency exceeded 200 msec, overall Service Manager console response times were observed as poor. If your latency exceeds 200 msec, you should plan to use RDC or another similar remote access solution for operational tasks. However, because occasional administrative tasks are less common you might not need remote access for them.

Service Manager Performance

Performance for System Center 2012 – Service Manager server roles and features is affected by different factors. Generally, there are three areas where positive and negative performance is most noticeable in Service Manager:

- Service Manager console responsiveness. This is the length of time it takes from the moment you take some sort of action in the console until it completes.
- Data insertion time for connectors. This is how long it takes for Service Manager to import data when a connector synchronizes.
- Workflow completion time. This is the length of time it takes for workflows to automatically apply some kind of action.

Connector Performance

Connector initial synchronization can take a significant amount of time, for example, 8 to 12 hours for a large initial synchronization with System Center Configuration Manager. As a connector synchronizes initially, you can expect performance to suffer for all Service Manager server roles and processes during this time. This occurs because of the way that data is inserted sequentially into the Service Manager database, which is a Microsoft SQL Server database. Although you cannot hasten the connector's initial synchronization process, you can plan for the initial

synchronization and ensure that the synchronization process completes well before Service Manager is put into production.

When the initial synchronization is complete, Service Manager continues synchronizing the differences, which does not have a measurable impact on performance.

Workflow Performance

Workflows are automatic processes that occur. They include sending email notifications, the next step of a change request activating, and automatically applying a template.

Workflow performance considerations include the following:

- Normally, workflows start and finish within one minute. When Service Manager server roles are under a heavy workload, workflows do not complete as quickly as normal.
- In addition, when you create new workflows, such as a new notification subscription, additional load is placed on the system. As the number of new workflows that you create increases, the time it takes for each workflow to run also increases.

When the system is under a heavy load—if, for example, a large number of new incidents are being created and each incident generates many workflows—performance might be negatively affected.

Workflow performance in System Center 2012 – Service Manager has improved from System Center Service Manager 2010 because the new ManagmentHostKeepAlive management pack has increased workflow processing responsiveness so that almost all workflows process within one minute.

Group, Queue, and User Role Impact on Performance

You should plan for groups and user roles early. You should create groups sparingly and create them for the smallest scope possible. Then, you should initially populate your database with data from Active Directory Domain Services (AD DS), System Center Configuration Manager, and System Center Operations Manager before you create your groups.

Often, administrators create groups to make sure that users have access to specified groups only. For example, in one scenario you might want to create a subset of incidents, such as incidents that affect computers that are used by human resource personnel. In this scenario, you might want only specific personnel to be able to view or modify the group of Sensitive Servers. Then, to enable this type for access, you would need to create a group for all users and a group for sensitive computers and then ensure that a security role has access to both the All Users and the Sensitive Servers groups. Inevitably, creating a group containing all users results in performance impact because Service Manager frequently checks to determine if there are changes to the group. This check occurs once every 30 seconds, by default. For a very large group, checking for the changes creates a heavy load on the system, and it may slow down response time considerably.

Solution 1: You can manually specify how often Service Manager checks for group changes by modifying a registry key. For example, if you change the group check frequency from 30 seconds to 10 minutes, you significantly increase performance. However, queues and service level

objectives are special kinds of groups that use the same group calculation polling interval. So, increasing the value of the polling interval will result in longer times for queue and service level objective calculations.

Caution
Incorrectly editing the registry may severely damage your system. Before making changes to the registry, you should back up any valued data on the computer.

To manually specify the group change check interval

1. Run Regedit, and navigate to HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\System Center\2012\Common\.
2. Create a new DWORD value named **GroupCalcPollingIntervalMilliseconds**.
3. For its value, specify the interval in milliseconds. The result is multiplied by 6. For example, to set the interval to 10 minutes, type **600000**.
4. Restart the System Center Management service.

Note
For System Center 2012 R2 Service Manager, the System Center Management service was renamed to Microsoft Monitoring Agent.

Solution 2: You can use a Windows PowerShell script to add objects of a type, such as “Users”, to a user role. Essentially, an analyst who is logged on in this role can access all objects that have a type equal to “User”. If you use this method, you eliminate the need for a very large group (“All Users”) and the expensive check that Service Manager performs to determine this group membership. On the Service Manager management server, you can run the following Windows PowerShell script to add the “user” type to a role “RoleName”. You will have to modify this example script for your environment.

To run a Windows PowerShell script to add objects to a user role

- Modify the following script as necessary, and then run it:

```
#
# Insert a "type" scope in a role
# Syntax:
#   AddTypeToRoleScope -server "put_server_name_here" -RoleName "put display name of the role here" -TypeToAdd "put display name of the type to add to scope here"
#
# Note:  This is a simple demonstration script without error checking.
#

# set script parameter defaults
```

```
param ([String]$Server = "localhost", [String]$RoleName="My Analyst Role",
[String]$TypeToAdd="User")



$a = [reflection.assembly]::LoadWithPartialName("Microsoft.EnterpriseManagement.Core")


$m = new-object Microsoft.EnterpriseManagement.EnterpriseManagementGroup $Server


# Get Type object
#   Note:  If you need to get a list of all available classes related to (for example)
"User",   use this command:
#               $m.EntityTypes.GetClasses() | ?{ $_.Name -like '*user*'} | %{ $_.Name}
#
$type = $m.EntityTypes.GetClasses() | ?{ $_.DisplayName -eq $TypeToAdd}


# Get role object, and insert the type GUID into scope
$role = $m.Security.GetUserRoles()  | ?{ $_.DisplayName -eq $RoleName}
$role.Scope.Objects.Add($type.Id)
$role.Update()


#
# Get the value from the database again and validate it is there
if ( $role.scope.objects.Contains($type.Id) ) {
    write-host *** Successfully set the scope for role `" $role.DisplayName`" and it now
contains all instances of $type.DisplayName `( $type.Name `)
} else {
    write-host "There was an error trying to insert the scope into the role."
}
```

View Performance

When you create views, plan on using “typical” classes in the system whenever possible. Most object classes—for example, Incident Management—have two types: “typical” and “advanced”. The typical object type contains simple references to a small subset of data that is related to an item. The advanced type contains many complex references to data that are related to an item.

Typical types are simple projections; advanced types are complex projections. Most advanced object types are used to populate different fields in forms that you would not normally want to see displayed in a view. Whenever you create a view based on an advanced object type and when you open the view, Service Manager queries the database and a large amount of data is read. However, very little of the retrieved data is actually displayed or used.

If you encounter performance problems with the views that you have defined when you use advanced object types in views, switch to using typical types. Or alternatively, you can create your own projection types that contain only the data you need to base a view upon. For more information, see the Creating Views That Use Related Property Criteria (Type Projections) : Software Views Example blog post blog entry on the SCSM Engineering Team Blog.

Service Manager Database Performance

Performance of the Service Manager database is directly affected by various factors, including the number of concurrent Service Manager consoles that are reading or writing data, the group change check interval, and data that is inserted by connectors. More information is available in this document. Here are a few key points:

- You should have a minimum of 8 gigabytes (GB) of RAM for the management server that hosts the Service Manager database in so that you can have an acceptable response time in typical scenarios.
- You should have at least 8 CPU cores on the computer hosting the Service Manager database.
- You can achieve better database performance by segregating log files and data files to separate physical disks, if possible. You can achieve further benefits by moving your tempdb to a different physical RAID drive than that of the Service Manager database. Use a RAID 1+0 disk system to host your Service Manager database, if possible.
- Performance can be negatively affected if the Service Manager database is created with a smaller size and it is set to autogrow, especially by small increments.

See the Service Manager Sizing Helper tool that is included in the Service Manager job aids documentation set (SM_job_aids.zip) for help in assessing the size of the database, and create the database with a size that is closer to the final size. This will help performance by reducing the amount of times the database has to autogrow.

Similarly, all the other best practices for a high-performing database are applicable, as well. For example, if you can take advantage of a superior disk subsystem, you can benefit from splitting up the groups of tables on respective filegroups and moving them to a different physical drives.

Service Manager Management Server Performance

Performance of the Service Manager management server is primarily affected by the number of active concurrent Service Manager consoles. Because all Service Manager roles interact with the management server, consider adding additional management servers if you plan to have a large number of concurrent consoles. You should have 8 GB of RAM for the management server. You should have at least 4 CPU cores per management server, assuming that you have 10 to 12 active consoles per CPU core.

Service Manager Console Performance

Performance of the Service Manager console is primarily affected by the number of forms that your analysts typically have open and the amount of data that is retrieved by views. You should have 4 GB of RAM on the computer where the Service Manager console is installed. If you have views that retrieve a large amount of data, you will need additional RAM. You should have at least a 4-core CPU for the computer where the Service Manager console is installed. Because the Service Manager console is an end user application, we recommend that you restart it if you see excessive resource consumption. The Service Manager console aggressively caches information in memory, which can contribute to overall memory usage.

Service Manager Data Warehouse Database Performance

Performance of the data warehouse is directly affected by various factors, including the number of concurrent Service Manager management servers sending data, volume of data stored or the data retention period, rate of data change, and the extraction, transformation, and load (ETL) frequency. The amount of data that is stored in the data warehouse increases over time. Ensuring that you archive unnecessary data is important. Another factor that affects data warehouse performance is the BatchSize setting of ETL processes.

You can achieve better performance by segregating log files and data files to separate physical disks. However, you should avoid placing more than one log file per disk. Similarly, you can achieve better throughput by putting the tempdb on a different physical disk than the other databases. Lastly, you can benefit by placing the different databases on their respective physical disks, as well. Use a RAID 1+0 disk system to host your data warehouse, if possible. You should generally have a minimum of 8 GB of RAM for the computer where the data warehouse databases are installed. If you have additional data warehouse data sources from Operations Manager or Configuration Manager you should increase the amount of RAM for the databases. You will benefit from more memory on the computer running SQL Server that hosts the data warehouse, and even more so if the Datamart and Repository databases are on the same server. However, if you have 4,000 or fewer computers in your deployment topology, 4 GB is sufficient. You should have at least 8 CPU cores in the computer where the data warehouse database is installed. Additional cores will help both ETL and report performance.

Performance can be negatively affected if all the databases in the system are created with a smaller size and set to autogrow, especially by small increments. See the Service Manager Sizing Helper tool that is included in the Service Manager job aids documentation set (SM_job_aids.zip) to assess the size of the database and create the database with a size that is closer to the final size, which will help performance by reducing the amount of times that the database has to autogrow.

Service Manager includes built-in support for filegroups. You can benefit from this by placing the filegroups on separate hard drives. For more information about filegroup best practices, see the SQL Server documentation.

Service Manager Data Warehouse Server Performance

Performance of the data warehouse server is affected by the number of Service Manager management servers that are registered to the data warehouse, the size of your deployment, and the number of data sources. You should generally have a minimum of 8 GB of RAM for the data warehouse server. However, performance will benefit by having additional memory for advanced deployment scenarios where more than one Service Manager management server inserts data into the data warehouse. If you must trade off performance, your highest priority should be for memory for the computer running SQL Server. You should have at least 8 CPU cores to prevent performance problems.

Self-Service Portal Performance

The Self-Service Portal is designed for easy access to incident and service request filing. It is not designed to handle thousands of users simultaneously.

Performance testing for the Self-Service Portal was focused on typical “Monday morning” scenarios—specifically, to ensure that on Monday morning hundreds of users can log in within a span of 5 to 10 minutes and open incidents with acceptable (less than 4-to-5 second) response times. This goal was achieved with the minimum hardware recommended in this document.

Service-Level Objective Performance

There is no specific number of service-level objectives that Service Manager supports. For example, if an organization typically has few incidents, it can support more service-level objectives than it might otherwise be capable of. However, a larger incident volume might necessitate either fewer service-level objectives or a scale-out of additional hardware and software, as appropriate. We recommend that you create no more than five service-level objectives for a typical 50,000-computer Service Manager configuration. You could possibly create more service-level objectives. However, because conditions vary greatly from organization to organization, Microsoft cannot provide a concrete recommendation for the number of service-level objectives that you should not exceed. If your deployment configuration suffers from poor performance as a result of the number of service-level objectives, we recommend that you scale out using the next-larger deployment scenario, as described in the Configurations for Deployment Scenarios section of this guide.

Configurations for Deployment Scenarios

For performance and scalability planning purposes, we recommend that you plan your deployment topology for System Center 2012 – Service Manager using scenarios that we have tested. While these are not firm guidelines, Microsoft has tested deployment topologies using these scenarios and found that each configuration achieves satisfactory performance.

Test and Small Deployment Scenarios

The test and small deployment scenarios contain only two servers and support 100 to 2,000 computers. In these configurations, a single physical computer hosts a virtual server.

Test Scenario

In this scenario, we recommend the following Service Manager roles and hardware as described.

Service Manager roles:

- One computer with a Service Manager management server, a Service Manager database, SharePoint server/site and web content server (WCS), and Service Manager console.
- One data warehouse server. The Self-Service Portal should be placed on a computer other than the one hosting the data warehouse.

Hardware configuration:

- 8-core 2.66 GHz CPU
- 16 GB RAM (5 GB for each virtual computer and 1 GB for the host computer)
- 100 GB of available disk space

This configuration was tested with the following load.

Description	Value
Number of Supported End Users	Up to 500
Number of Computers in the Service Manager database	500
Number of New Incidents per Month for each computer	2
Number of New Change Requests per Month	20
Number of Concurrent Consoles	2
Is the Self-Service Portal Installed?	Yes
Is the Active Directory Connector Enabled?	Yes
Is the Configuration Manager Connector Enabled?	Yes
Is the Operations Manager Connector Enabled?	Yes

Small Scenario

In this scenario, we recommend the following hardware, configured for roles and hardware as described.

Service Manager roles:

- One computer with a management server, Service Manager database, and Service Manager console.
- One data warehouse server. The Self-Service Portal should be placed on a physical host or on a virtual computer other than the computer hosting the data warehouse.

Hardware configuration:

- 8-core 2.66 GHz CPU
- 16 GB RAM (5 GB for each virtual computer and 1 GB for the host computer)
- 100 GB of available disk space, which does not include the .vhd file disk space requirements on the host computer

This configuration was tested with the following load.

Description	Value
Number of Supported End Users	501 to 2,000
Number of Computers in the Service Manager database	2,000
Number of New Incidents per Month for each computer	2
Number of New Change Requests per Month	100
Number of Concurrent Consoles	10
Is the Self-Service Portal Installed?	Yes
Is the Active Directory Connector Enabled?	Yes
Is the Configuration Manager Connector Enabled?	Yes
Is the Operations Manager Connector Enabled?	Yes

Medium Scenario

The medium deployment scenario contains two servers and supports 2,001 to 5,000 computers. In this configuration, two physical computers host the Service Manager management server and Service Manager data warehouse management server.

We recommend the following hardware, configured for roles and hardware as described.

Hardware configuration for the Service Manager management server:

- 4-core 2.66 GHz CPU
- 8 GB RAM
- 2 disk RAID 1

Hardware configuration for the Service Manager data warehouse management server:

- 4-core 2.66 GHz CPU
- 8 GB RAM
- 2 disk RAID 1

Hardware configuration for the Self-Service Portal with web content server with SharePoint Web Parts:

- 8-core, 64-bit CPU
- 16 - 32 GB RAM, depending on the size of the expected database
- 80 GB of available hard disk space

This configuration was tested with the following load.

Description	Value
Number of Supported End Users	2,001 to 5,000
Number of Computers in the Service Manager database	3,000
Number of New Incidents per Month for each computer	2
Number of New Change Requests per Month	150
Number of Concurrent Consoles	15 to 30
Is the Self-Service Portal Installed?	Yes
Is the Active Directory Connector Enabled?	Yes
Is the Configuration Manager Connector Enabled?	Yes
Is the Operations Manager Connector Enabled?	Yes

Large Deployment Scenario

The large deployment scenario contains four servers and supports 5,001 to 20,000 computers. In this large configuration, four physical computers host server roles.

In this scenario, we recommend the following hardware, configured for roles and hardware as described.

Hardware configuration for the Service Manager management server:

- 4-core 2.66 GHz CPU
- 8 GB RAM
- 2 disk RAID 1
- 10 GB of available hard disk space

Hardware configuration for the Service Manager data warehouse management server:

- 4-core 2.66 GHz CPU
- 8 GB RAM

- 2 disk RAID 1
- 10 GB of available hard disk space

Hardware configuration for the Service Manager database server:

- 8-core 2.66 GHz CPU
- 8 - 32 GB RAM, depending on the size of the expected database
- 4 RAID 1+0 disk drives for data
- 2 RAID 1 disk drives for logs

Hardware configuration for the Service Manager data warehouse database server:

- 8-core 2.66 GHz CPU
- 8 GB RAM
- 4 RAID 1+0 disk drives for data
- 2 RAID 1 disk drives for logs
- 80 GB of available hard disk space

Hardware configuration for the Self-Service Portal with web content server:

- 4-core 2.66 GHz CPU
- 8 - 16 GB RAM, depending on the size of the expected database
- 1 GB of available hard disk space

Hardware configuration for the Self-Service Portal with SharePoint web parts:

- 4-Core 2.66 GHz CPU
- 8 GB RAM
- 80 GB of available hard disk space

This configuration was tested with the following load.

Description	Value
Number of Supported End Users	5,001 to 20,000
Number of Computers in the Service Manager database	20,000
Number of New Incidents per Month for each computer	2
Number of New Change Requests per Month	2,000
Number of Concurrent Consoles	40 to 60
Is the Self-Service Portal Installed?	Yes
Is the Active Directory Connector Enabled?	Yes
Is the Configuration Manager Connector Enabled?	Yes

Description	Value
Is the Operations Manager Connector Enabled?	Yes

Advanced Deployment Scenario

The advanced deployment scenario contains more than four servers and supports more than 20,000 computers. Each additional management server can host up to 60 Service Manager consoles.

In this scenario, we recommend the following hardware, configured for roles and hardware as described.

Hardware configuration for the Service Manager management server:

- 4-core 2.66 GHz CPU
- 8 GB RAM
- 2 disk RAID 1
- 10 GB of available hard disk space

Hardware configuration for each additional Service Manager management server:

- 4-core 2.66 GHz CPU
- 8 GB RAM
- 2 RAID 1 disk drives

Hardware configuration for the Service Manager data warehouse management server:

- 4-core 2.66 GHz CPU
- 8 GB RAM
- 2 RAID 1 disk drives
- 10 GB of available hard disk space

Hardware configuration for the Service Manager database server:

- 8-core 2.66 GHz CPU
- 8 GB RAM to 32 GB RAM, depending on the expected size of the database
- 4 RAID 1+0 disk drives for data
- 2 RAID 1 disk drives for logs

Hardware configuration for the Service Manager data warehouse database server:

- 8-core 2.66 GHz CPU
- 8 - 16 GB RAM, depending on the size of the expected database
- 4 RAID 1+0 disk drives for data
- 2 RAID 1 disk drives for logs

Hardware configuration for the Self-Service Portal with web content server:

- 4-core 2.66 GHz CPU
- 8 - 16 GB RAM, depending on the size of the expected database

- 1 GB of available hard disk space

Hardware configuration for the Self-Service Portal with SharePoint web parts:

- 4-core 2.66 GHz CPU
- 8 GB RAM
- 80 GB of available hard disk space

Hardware configuration for each Service Manager console:

- 2-core 2.0 GHz CPU
- 4 GB RAM
- 10 GB of available hard disk space

This configuration was tested with the following load.

Description	Value
Number of Supported End Users	More than 20,000
Number of Computers in the Service Manager database	20,000 to 50,000 or more
Number of New Incidents per Month for each computer	2
Number of New Change Requests per Month	2,000 or more
Number of Concurrent Consoles	60 to 100
Is the Self-Service Portal Installed?	Yes
Is the Active Directory Connector Enabled?	Yes
Is the Configuration Manager Connector Enabled?	Yes
Is the Operations Manager Connector Enabled?	Yes

Deploying System Center 2012 - Service Manager

This guide helps you deploy System Center 2012 – Service Manager in one of several different scenarios. The scenarios range from a simple, one-computer scenario to a four-computer scenario that is designed to support production-type environments. In addition, this guide shows you how to register a Service Manager management group with the Service Manager data warehouse so that you can generate reports. You have the option of deploying the Self-Service

Portal so you can provide access to Service Manager through a web browser. To improve performance and provide for redundancy, you can deploy additional secondary Service Manager management servers.

Note
It is assumed in this guide that you are installing Service Manager on a computer where no previous version of Service Manager is installed. For information about upgrading System Center 2012 – Service Manager, see the Upgrade Guide for System Center 2012 – Service Manager.

This guide also describes how to find and read the Setup log if you encounter issues when you deploy Service Manager. And, finally, information about backing up Service Manager management server encryption keys is included. After you run Setup, the Encryption Key Backup and Restore Wizard starts automatically.

Deployment Guide Topics

- **Before You Deploy Service Manager**

  Contains preliminary information you must consider before you can deploy Service Manager.
- Turkish Language Collations

  Describes a potential problem with the installation of a Service Manager database that is not supported on a computer running SQL Server that uses a Turkish language collation.
- Prerequisite Checker for System Center 2012 - Service Manager

  Describes the prerequisite checker that runs as a part of the setup procedure.
- Deployment Scenarios for System Center 2012 - Service Manager

  Describes how to deploy Service Manager in one-server, two-server, and four-server topologies.
- Guidance for Installing System Center 2012 - Service Manager on Virtual Machines

  Provides information that you have to consider when you install Service Manager in a Hyper-V virtual environment.
- **Registering with the Service Manager Data Warehouse to Enable Reporting**

  Describes how to run the Data Warehouse Registration Wizard to register the Service Manager management group with the Service Manager data warehouse management server. Registering with the data warehouse makes it possible for you to run reports.
- **Deploying Additional Service Manager Management Servers**

  Describes how to install additional Service Manager management servers to improve performance.
- Deployment Considerations with a Disjointed Namespace

  Describes additional steps you must take when you deploy either an additional Service Manager management server or Self-Service Portal in an environment with a disjoint namespace.
- Self-Service Portal for System Center 2012 - Service Manager

Describes how to deploy and troubleshoot the Service Manager Self-Service Portal.

- Guidance for Load Balancing System Center 2012 - Service Manager

  Describes how you can configure Windows Server 2008 Network Load Balancing with Service Manager.

- Completing Deployment by Backing Up the Encryption Key

  Describes how to use the Encryption Key Backup or Restore Wizard to back up and restore encryption keys.

- Indexing Non-English Knowledge Articles

  Describes how to resolve an indexing issue in SQL Server 2008 Service Pack 1 (SP1) in an environment where you create, or plan to create, knowledge articles in any language other than English.

- **Troubleshooting Service Manager Deployment Issues**

  Describes the logs files that are created when you install Service Manager and how you can use these logs to troubleshoot deployment issues.

- **Deploying Service Manager from a Command Line**

  Describes how to deploy Service Manager using command-line parameters.

- Appendix A - Command-Line Option Error Codes

  Lists error codes used in command-line installation.

- Appendix B - Guidance for Moving the Service Manager and Data Warehouse Databases

  Provides prescriptive and how-to guidance about moving Service Manager databases.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Deployment Guide for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

Downloadable Documentation

You can download a copy of this technical documentation from the Microsoft Download Center. Always use the TechNet library for the most up-to-date information.

Before You Deploy System Center 2012 - Service Manager

Before you start the deployment process, prepare your environment for System Center 2012 – Service Manager, as described in the Planning Guide for Service Manager for System Center 2012. The Planning Guide contains information about the various parts of Service Manager, the

hardware and software requirements, the port assignments, and the information about the accounts you must use to deploy Service Manager. The Planning Guide also contains information about the accounts that you need to create for use with Service Manager.

In addition, you have to install the Authorization Manager hotfix and the Microsoft Report Viewer Redistributable security update before you start Service Manager deployment.

Install the Authorization Manager Hotfix (KB975332)

If the Service Manager management server, data warehouse management server, or the Self-Service Portal lose connection to the SQL Server databases—even briefly—the connection is not automatically re-established. The Windows team recently released a hotfix to address this issue. It is extremely import that this hotfix be installed on your computers that host a Service Manager management server, data warehouse management server, or the Self-Service Portal. For more information, see How to Download and Install the Authorization Manager Hotfix.

Note

The Authorization Manager hotfix was included with Windows Server 2008 R2 with Service Pack 1 (SP1). If you are installing Service Manager on a computer running Windows Server 2008 R2 with SP1, you already have the Authorization Manager hotfix installed.

Install the Microsoft Report Viewer Redistributable Security Update (KB971119)

During installation of a Service Manager management server or Service Manager console, the prerequisite checker checks to see whether the security update for Microsoft Report Viewer 2008 Service Pack 1 Redistributable Package has been installed. If you have not installed this security update, you will have the opportunity to do so during the installation. As an alternative, you can deploy this security hotfix before starting the installation of Service Manager. For more information, see How to Install the Microsoft Report Viewer Redistributable Security Update.

Before you deploy topics

- How to Download and Install the Authorization Manager Hotfix

  Describes how to download and install the Authorization Manager hotfix.
- How to Install the Microsoft Report Viewer Redistributable Security Update

  Describes how to install the Microsoft Report Viewer Redistributable Security Update.

How to Download and Install the Authorization Manager Hotfix

The Authorization Manager hotfix is included with Windows Server 2008 R2 with Service Pack 1 (SP1). Therefore, if you are using Windows Server 2008 R2 with SP1, you can disregard this topic.

You can obtain the Authorization Manager hotfix (KB975332) by connecting to a website and requesting an email containing download instructions. This hotfix is available for both 32-bit and 64-bit operating systems and for both the Windows Server 2008 with SP1 operating system and the Windows Server 2008 R2 operating system. The type of files that you are allowed to download is determined when you connect to the website to request an email. Therefore, you should connect to the website from the computer that hosts the Service Manager parts. Use the following steps to download and install the Authorization Manager hotfix.

Install this hotfix on computers that host the following Service Manager parts:

- Service Manager management server or servers
- Data warehouse management server
- Self-Service Portal

Note
The installation of this hotfix on the Service Manager and data warehouse management servers requires a computer restart.

To download the Authorization Manager hotfix

1. On the computer that hosts the Service Manager management server or data warehouse management server, open a browser and connect to article 975332 in the Microsoft Knowledge Base. Users and applications cannot access authorization rules that are stored in Authorization Manager.
2. On the knowledge base article page, click **View and request hotfix downloads**.
3. Read the **Agreement for Microsoft Services** terms and conditions, and if applicable, click **I Accept**.
4. On the **Hotfix Request** page, select the appropriate link based on your operating system, as shown in the following table.

Operating System	Web Page Link
Windows Server 2008 with SP1	Windows Vista
Windows Server 2008 R2	Windows 7/Windows Server 2008 R2

5. On the **Hotfix Request** page, enter your email address, type the characters in the CAPTCHA image, and then click **Request hotfix**.
6. In the email that you receive, you are provided with a URL. Click the URL to start the download and save the file to your computer.

To install the Authorization Manager hotfix

1. Open Windows Explorer, locate the folder where you downloaded the hotfix, and then double-click the file to extract the hotfix files.
2. Double-click the file that you extracted.

3. In the **Windows Update Standalone Installer** dialog box, click **OK**.
4. On the **Installation complete** page, on the computers that host the Service Manager and data warehouse management servers, click **Restart Now**.

To verify the installation of the Authorization Manager hotfix

1. On the Windows desktop, open the Control Panel.
2. In the **Control Panel** window, double-click **Programs and Features**.
3. In the **Programs and Features** window, in the **Tasks** area, click **View installed updates**.
4. Scroll through the list and locate **Microsoft Windows**, and then confirm that **Hotfix for Microsoft Windows (KB975332)** is listed.

How to Install the Microsoft Report Viewer Redistributable Security Update

You can use the following procedure to install the Microsoft Report Viewer Redistributable security update for a deployment of System Center 2012 – Service Manager.

Note
If your system is configured to use a language other than English, you must manually install the Report Viewer Language Pack for that language. You can download the Microsoft Report Viewer Redistributable 2008 SP1 Language Pack from the Microsoft Download Center.

To install the Microsoft Report Viewer Redistributable security update

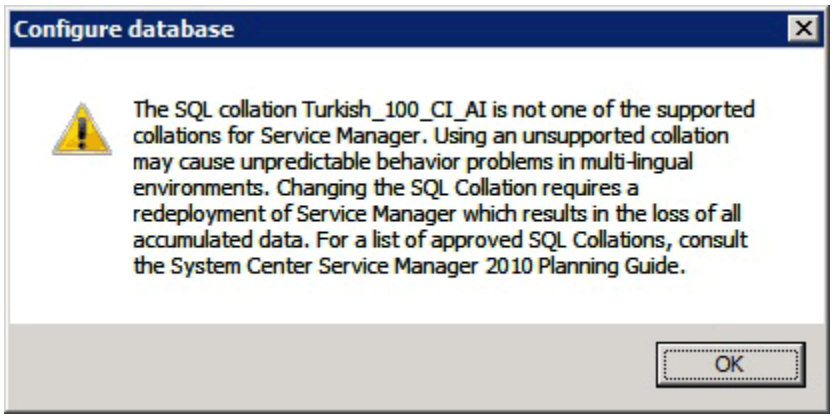
1. On the computer that will host a Service Manager management server, open Windows Explorer.
2. Locate the drive that contains the Service Manager installation media, and then open the Prerequisites folder
3. Double-click the **ReportViewer** file.
4. On the **Welcome to Microsoft Report Viewer Redistributable 2008 (KB971119) Setup** page, click **Next**.
5. On the **License Terms** page, read the Microsoft Software License Terms, and, if applicable, click **I have read and accept the license terms**, and then click **Install**.
6. On the **Setup Complete** page, click **Finish**.

Turkish Language Collations

This topic applies only if you are considering deploying a Service Manager database or data warehouse database to a SQL Server that has been configured to use a Turkish language collation.

For this release of System Center 2012 – Service Manager, the installation of a Service Manager database is not supported on a computer running SQL Server that uses a Turkish language collation. This is true for both the Service Manager and data warehouse databases. If you specify a computer running SQL Server that contains a Turkish language collation during the deployment of a Service Manager database, the following warning message appears.

Turkish language collation warning message



If you encounter this warning message during the deployment of any of the Service Manager databases, click **OK**. On the **Database Configuration** page, in the **Database server** box, type the name of a computer that is hosting an installation of SQL Server that is configured with a non-Turkish collation, and then press the TAB key. When **Default** appears in the **SQL Server instance** box, click **Next**.

For more information about the collations that are supported in System Center 2012 – Service Manager, see "Language Support for Service Manager for System Center 2012" in the Planning Guide for System Center 2012 – Service Manager.

Prerequisite Checker for System Center 2012 - Service Manager

During installation, System Center 2012 – Service Manager Setup performs prerequisite checks for software and hardware requirements and returns one of the three following states:

- **Success**: Setup finds that all software and hardware requirements are met, and installation proceeds.
- **Warning**: Setup finds that all software requirements are met, but the computer does not meet minimum hardware requirements. Or, the requirements for optional software are missing. Installation proceeds.

- **Failure**: At least one software or hardware requirement is not met, and installation cannot proceed. An **Installation cannot continue** message appears.

Note

On the **Installation cannot continue** screen, there is no option to restart the prerequisite checker. You must click **Cancel** to restart the installation process. Make sure that the computer meets all hardware and software requirements before you run Setup again.

Deployment Scenarios for System Center 2012 - Service Manager

System Center 2012 – Service Manager provides for many deployment scenarios. However, remember that you cannot deploy a Service Manager management server and a data warehouse management server on the same computer. In fact, Setup prevents you from installing both on a single server. The reason has to do with Service Manager architecture of the data warehouse, overall performance, and usage of the Operations Manager health service. The data warehouse was designed for quick data retrieval and hosting both the Service Manager management server and the data warehouse management server on a single server will negatively impact performance for both. Additionally, a single server doesn't scale out as Service Manager usage and data storage grow.

You will also specify the server that hosts SQL Server Reporting Services (SSRS). Do not attempt to use the same SSRS instance for both Operations Manager and Service Manager.

This deployment guide describes the following three deployment scenarios: installing Service Manager on one computer, installing Service Manager on two computers, and installing Service Manager on four computers.

Note

The collation settings for Microsoft SQL Server must be the same for the computers that host the Service Manager database, the computers that host the data warehouse databases, and the computers that host the Reporting Services database. If you intend to import data from Operations Manager, then the database collations must match between Service Manager and Operations Manager.

While we do not recommend it (for performance reasons), if you want to host the Service Manager management server and the Self-Service Portal on the same computer, you must deploy the Service Manager management server before you deploy the Self-Service Portal.

Performing an upgrade from previous versions of Service Manager to Service Manager Community Technology Preview 1 (CTP1) is not supported. Furthermore, for this release, Service Manager setup installs files in predefined folders that might already exist if you have a previous version of Service Manager installed.

The user installing Service Manager has access to the Service Connection Point (SCP) object of Service Manager in the Active Directory. This SCP stores the information about the service.

Client applications, such as Service Manager, can connect to services using the SCP. For more information about service connection points, see Publishing Services in Active Directory.

Deployment Scenario Topics

- **Installing Service Manager on a Single Computer (Minimum Configuration)**

  Describes how to install Service Manager on a single computer. This scenario requires you to use a virtual machine for the data warehouse management server. This scenario is useful for evaluation purposes.

- **Installing Service Manager on Two Computers**

  Describes how to install Service Manager on two computers. This scenario is useful for testing Service Manager in a lab environment.

- **Installing Service Manager on Four Computers**

  Describes how to install Service Manager on four computers. This scenario is useful in a production environment, and it maximizes performance and scalability.

- Manual Steps to Configure the Remote SQL Server Reporting Services

  Describes how to manually configure SSRS in situations where SSRS is not on the same server as the data warehouse management server.

- Manual Steps to Prepare Upgraded SQL Server

  Describes how to manually configure an upgraded version of SQL Server 2012 to enable SQL Server Reporting Services.

- How to Create and Deploy Server Images of Service Manager

  Describes how to create and deploy server images of Service Manager.

Other Resources for This Component

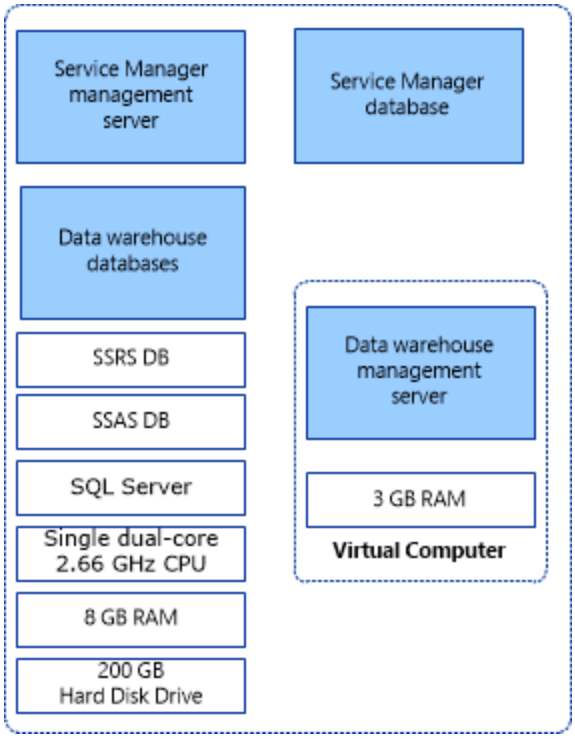
- TechNet Library main page for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager

Installing Service Manager on a Single Computer (Minimum Configuration)

If you want to evaluate System Center 2012 – Service Manager and you have a minimal amount of hardware available, install Service Manager on one computer. A sample single-computer configuration is shown in figure 1. This configuration will not support a production environment, and no scalability or performance estimates are provided. Because you cannot install both the Service Manager management server and the data warehouse management server on the same computer, use Hyper-V to create a virtual computer to host the data warehouse management server. For more information about the hardware requirements for Hyper-V, see Hyper-V Server 2008 R2 system requirements.

To install Service Manager on a single computer, start with a physical computer that is running Windows Server 2008 and Hyper-V, and make sure that the CPU on the physical computer is compatible with Hyper-V. Of the 8 gigabytes (GB) of RAM on the host computer, 3 GB is used for the virtual computer that hosts the data warehouse management server. Make sure that at least 200 GB of free space is available on the hard disk drive.

Figure 1: Single-computer installation in which you use a physical computer that is running Windows Server 2008 and Hyper-V



If your organization's best practice guidelines do not allow you to install applications on a Hyper-V host, you can create a second virtual computer to host the Service Manager management server, the Service Manager database, and the data warehouse databases. Use the following procedures to install Service Manager on a single computer.

Installing Service Manager on a single computer topics

- How to Install Service Manager on a Single Computer

  Describes how to install Service Manager on a single computer.
- How to Validate the Single-Computer Installation

  Describes how to validate the installation.

Other resources for this component

- TechNet Library main page for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager

How to Install Service Manager on a Single Computer

To install System Center 2012 – Service Manager on a single computer, you install the Service Manager management server, database, and console on the computer. Then, you install the data warehouse on a virtual machine on the same computer.

During Setup, you will be prompted to provide credentials for the following accounts:

- Management group administrator
- Service Manager account
- Workflow account

For more information about the permissions that these accounts require, see "Accounts Required During Setup" in the Planning Guide for System Center 2012 – Service Manager. Before you start, make sure that Microsoft SQL Server 2008 is installed on the computer.

To install the Service Manager management server, database, and console

1. Log on to the physical computer by using an account that has administrative credentials.
2. On the Service Manager installation media, double-click the **Setup.exe** file.
3. On the **Microsoft System Center 2012** page, click **Service Manager management server**.
4. On the **Product registration** page, type information in the boxes. In the **Product key** boxes, type the product key that you received with Service Manager, or alternatively, select **Install as an evaluation edition (180 day trial)**. Read the Microsoft Software License Terms, and, if applicable, click **I have read, understood, and agree with the terms of the license agreement**, and then click **Next**.
5. On the **Installation location** page, verify that sufficient free disk space is available, and then click **Next**. If necessary, click **Browse** to change the location in which the Service Manager management server will be installed.
6. On the **System check results** page, make sure that the prerequisite check passed or at least passed with warnings, and then click **Next**.

   If the prerequisite checker determines that the Microsoft Report Viewer Redistributable has not been installed, click **Install Microsoft Report Viewer Redistributable**. After the Microsoft Report Viewer Redistributable 2008 (KB971119) Setup Wizard completes, click **Check prerequisites again**.
7. On the **Configure the Service Manager database** page, Service Manager checks the current computer to see if an instance of SQL Server exists. By default, if an instance is found, Service Manager creates a new database in the existing instance. If an instance is displayed, click **Next**.

   Important
   A warning message appears if you are using the default collation

(SQL_Latin1_General_CP1_CI_AS). Support for multiple languages in Service Manager is not possible when you are using the default collation. If later you decide to support multiple languages using a different collation, you have to reinstall SQL Server. See “Microsoft SQL Server 2008 with SP1” in the Planning Guide for System Center 2012 – Service Manager.

8. On the **Configure the Service Manager management group** page, complete these steps:
   a. In the **Management group name** box, type a unique name for the management group.

      Important
      Management group names must be unique. Do not use the same management group name when you deploy a Service Manager management server and a Service Manager data warehouse management server. Furthermore, do not use the management group name that is used for Operations Manager.

   b. Click **Browse**, enter the user account or group to which you want to give Service Manager administrative credentials, and then click **Next**.
9. On the **Configure the account for Service Manager services** page, click **Domain account**; specify the user name, password, and domain for the account; and then click **Test Credentials**. After you receive a “The credentials were accepted” message, click **Next**.
10. On the **Configure the Service Manager workflow account** page, click **Domain account**; specify the user name, password, and domain for the account; and then click **Test Credentials**. After you receive a “The credentials were accepted” message, click **Next**.
11. On the **Help improve System Center Service Manager** page, indicate your preference for participation in the Customer Experience Improvement Program. As an option, click **Tell me more about the program**, and then click **Next**.
12. On the **Use Microsoft Update to help keep your computer secure and up-to-date** page, indicate your preference for using Microsoft Update to check for Service Manager updates. If you want Windows Update to check for updates, select **Initiate machine wide Automatic update**. Click **Next**.
13. On the **Installation summary** page, click **Install**.
14. On the **Setup completed successfully** page, we recommend that you leave **Open the Encryption Backup or Restore Wizard** selected, and then click **Close**. For more information about backing up the encryption key, see Completing Deployment by Backing Up the Encryption Key.

To install the data warehouse

1. Log on to the virtual machine by using an account that has administrative credentials.
2. On the Service Manager installation media, double-click the **Setup.exe** file.
3. On the **Microsoft System Center 2012** page, click **Service Manager data warehouse**

management server.

4. On the **Product registration** page, type information in the boxes. In the **Product key** boxes, type the product key you received with Service Manager, or as an alternative, select **Install as an evaluation edition (180 day trial**. Read the Microsoft Software License Terms, and, if applicable, click **I have read, understood, and agree with the terms of the license agreement**, and then click **Next**.
5. On the **Installation location** page, verify that sufficient free disk space is available, and then click **Next**. If necessary, click **Browse** to change the location in which the Service Manager data warehouse management server will be installed.
6. On the **System check results** page, make sure that the prerequisite check passed or at least passed with warnings, and then click **Next**.
7. On the **Configure data warehouse databases** page, in the **Database server** box, type the computer name of the physical computer that will host the data warehouse databases, and then press the TAB key. When **Default** is displayed in the **SQL Server instance** box, click **Next**.

   Important
   A warning message appears if you are using the default collation (SQL_Latin1_General_CP1_CI_AS). Support for multiple languages in Service Manager is not possible when you are using the default collation. If later you decide to support multiple languages using a different collation, you have to reinstall SQL Server. For more information, see “Microsoft SQL Server 2008 with SP1” in the Planning Guide for System Center 2012 – Service Manager.
8. On the **Configure additional data warehouse datamarts** page, Service Manager will check the current computer to see if an instance of SQL Server exists. By default, if an instance is found, Service Manager creates a new database in the existing instance. If an instance appears, click **Next**.
9. On the **Configure the data warehouse management group** page, complete these steps:
   a. In the **Management group name** box, type a unique name for the group.

      Important
      Management group names must be unique. Do not use the same management group name when you deploy a Service Manager management server and a Service Manager data warehouse management server. Furthermore, do not use the management group name that is used for Operations Manager.
   b. Click **Browse**, enter the user account or group to which you want to give Service Manager administrative credentials, and then click **Next**.
10. On the **Configure the reporting server for the data warehouse** page, Service Manager will use the existing computer if SQL Server Reporting Services (SSRS) is present. Accept the defaults, and then click **Next**.

    Note

The URL that you are presented with might not be in the form of a fully qualified domain name (FQDN). If the URL as presented cannot be resolved in your environment, configure SQL Server Reporting URLs so that the FQDN is listed in the **Web service URL** field. For more information, see How to: Configure a URL (Reporting Services Configuration).

11. On the **Configure the account for Service Manager services** page, select a domain account; click **Domain account**; specify the user name, password, and domain for the account; and then click **Test Credentials**. After you receive a "The credentials were accepted" message, click **Next**.
12. On the **Configure the reporting account** page, specify the user name, password, and domain for the account, and then click **Test Credentials**. After you receive a "The credentials were accepted" message, click **Next**.
13. On the **Configure Analysis Service for OLAP cubes** page, click **Next**.
14. On the **Configure Analysis Services credential** page, select a domain account; click **Domain account**; specify the user name, password, and domain for the account; and then click **Test Credentials**. After you receive a "The credentials were accepted" message, click **Next**.

    Note
    The account that you specify here must have administrator rights on the computer that hosts SSRS.
15. On the **Help improve System Center Service Manager** page, indicate your preference for participation in the Customer Experience Improvement Program. As an option, click **Tell me more about the program**, and then click **Next**.
16. On the **Use Microsoft Update to help keep your computer secure and up-to-date** page, indicate your preference for using Microsoft Update to check for Service Manager updates. Select **Initiate machine wide Automatic update** if you want Windows Update to check for updates. Click **Next**.
17. On the **Installation summary** page, click **Install**.
18. On the **Setup completed successfully** page, we recommend that you leave **Open the Encryption Backup or Restore Wizard** selected, and then click **Close**. For more information about backing up the encryption key, see Completing Deployment by Backing Up the Encryption Key.

How to Validate the Single-Computer Installation

You can use the following procedures to validate the single-computer installation of System Center 2012 – Service Manager.

To validate the Service Manager management server installation

1. On the physical computer that hosts the Service Manager management server, verify that the Program Files\Microsoft System Center 2012\Service Manager\ folder exists.

2. Run **services.msc**, and then verify that the following services are installed, that they have a status of **Started**, and that the startup type is **Automatic**:
   - **System Center Data Access Service**
   - **System Center Management**

     Note
     For System Center 2012 R2 Service Manager, the System Center Management service was renamed to Microsoft Monitoring Agent.
   - **System Center Management Configuration**

To validate the Service Manager console installation

1. On the physical computer, click **Start**, click **All Programs**, click **Microsoft System Center**, and then click **Service Manager Console**.
2. The first time that you run the Service Manager console, the **Connect to Service Manager Server** dialog box appears. In the **Server name** box, enter the computer name of the server that hosts the Service Manager management server.
3. The Service Manager console successfully connects to the Service Manager management server and starts.

To validate the data warehouse management server installation

- On the virtual machine, run **services.msc**, and verify that the following services are installed:
  - **System Center Data Access Service**
  - **System Center Management**

    Note
    For System Center 2012 R2 Service Manager, the System Center Management service was renamed to Microsoft Monitoring Agent.
  - **System Center Management Configuration**

To validate the Service Manager database

1. On the physical computer, click **Start**, click **All Programs**, click **Microsoft SQL Server 2008**, and then click **SQL Server Management Studio**.
2. In the **Connect to Server** dialog box, follow these steps:
   a. In the **Server Type** list, select **Database Engine**.
   b. In the **Server Name** list, select the name of the computer that hosts the Service Manager database.
   c. In the **Authentication** list, select **Windows Authentication**, and then click **Connect**.
3. In the **Object Explorer** pane, expand **Databases**.
4. Verify that the **ServiceManager** database is listed.
5. Exit Microsoft SQL Server Management Studio.

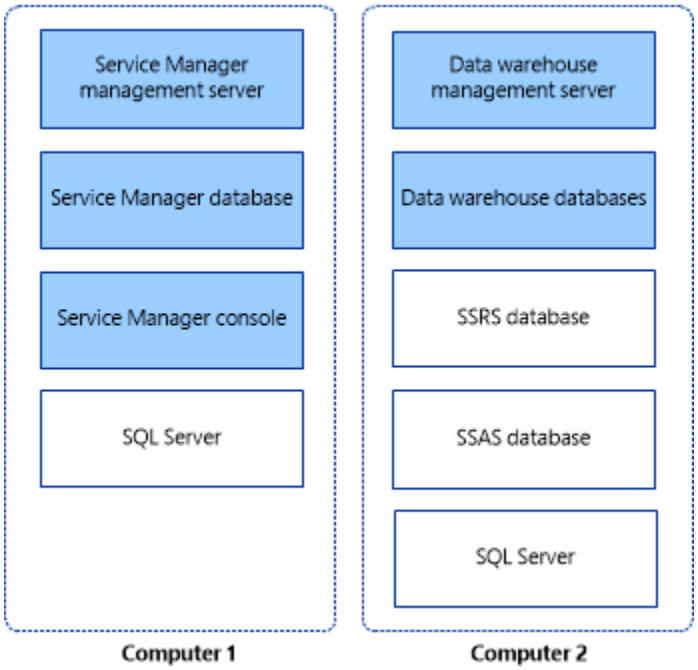
To validate the data warehouse installation

1. On the physical computer that hosts the data warehouse databases, click **Start**, click **All Programs**, click **Microsoft SQL Server 2008**, and then click **SQL Server Management Studio**.
2. In the **Connect to Server** dialog box, complete these steps:
   a. In the **Server Name** list, type the computer name of the computer hosting Service Manager data warehouse databases. For this example, type **localhost**.
   b. In the **Authentication** list, select **Windows Authentication**, and then click **Connect**.
3. In the **Object Explorer** pane, expand **Databases**.
4. Verify that the **DWDataMart**, **DWRepository**, and **DWStagingAndConfig** databases are listed.
5. In the **Object Explorer** pane, click **Connect**, and then click **Analysis Services**.
6. In the **Server Name** list, type the computer name for the computer hosting the Service Manager data warehouse database. In this example, type **localhost**.
7. In the **Object Explorer** pane, expand the new entry for Analysis Services, and then expand **Databases**.
8. Verify that the **DWASDataBase** database is listed.
9. Exit Microsoft SQL Server Management Studio.

Installing Service Manager on Two Computers

If you want to evaluate System Center 2012 – Service Manager and its reporting capabilities in a lab environment, we recommend that you install the Service Manager management server and data warehouse management server on two computers. The first computer hosts the Service Manager management server and the Service Manager database. The second computer hosts the data warehouse management server and the data warehouse databases. This deployment topology is shown in figure 2.

Figure 2: An installation on two physical computers



Important

For this release, Service Manager does not support case-sensitive instance names. Setup will display a warning if you attempt to install Service Manager on a case-sensitive instance of Microsoft SQL Server.

Installing Service Manager on two computers

- How to Install the Service Manager Management Server (Two-Computer Scenario)

  Describes how to install the Service Manager management server, Service Manager database, and Service Manager console.
- How to Install the Service Manager Data Warehouse (Two-Computer Scenario)

  Describes how to install the data warehouse management server and the data warehouse database.
- How to Validate the Two-Computer Installation

  Describes how to validate the installation.

How to Install the Service Manager Management Server (Two-Computer Scenario)

As the first step in the two-computer installation process, install the Service Manager management server, the Service Manager database, and the Service Manager console on one of the two computers.

During setup, you will be prompted to provide credentials for the following accounts:

- Management group administrator

- Service Manager services account
- Service Manager workflow account

For more information about the permissions that these accounts require, see "Accounts Required During Setup" in the Planning Guide for System Center 2012 - Service Manager.

To install the Service Manager management server, Service Manager database, and console

1. Log on to the computer that will host the Service Manager management server by using an account that has administrative rights.
2. On the Service Manager installation media, double-click the **Setup.exe** file.
3. On the **Service Manager Setup Wizard** page, click **Service Manager management server**.
4. On the **Product registration** page, type information in the boxes. In the **Product key** boxes, type the product key that you received with Service Manager, or as an alternative, select **Install as an evaluation edition (180 day trial**. Read the Microsoft Software License Terms, and, if applicable, click **I have read, understood, and agree with the terms of the license agreement**, and then click **Next**.
5. On the **Installation location** page, verify that sufficient free disk space is available, and then click **Next**. If necessary, click **Browse** to change the location in which the Service Manager management server will be installed.
6. On the **System check results** page, make sure that the prerequisite check passed or at least passed with warnings, and then click **Next**.

   If the prerequisite checker determines that the Microsoft Report Viewer Redistributable has not been installed, click **Install Microsoft Report Viewer Redistributable**. After the Microsoft Report Viewer Redistributable 2008 (KB971119) Setup Wizard completes, click **Check prerequisites again**.
7. On the **Configure the Service Manager database** page, Service Manager will check the current computer to see if an instance of SQL Server exists. By default, if an instance is found, Service Manager creates a new database in the existing instance. If an instance appears, click **Next**.

   Important
   A warning message appears if you are using the default collation (SQL_Latin1_General_CP1_CI_AS). Support for multiple languages in Service Manager is not possible when you are using the default collation. If later you decide to support multiple languages using a different collation, you have to reinstall SQL Server. See "Microsoft SQL Server 2008 with SP1" in the Planning Guide for System Center 2012 - Service Manager.
8. On the **Configure the Service Manager management group** page, complete these steps:
   a. In the **Management group name** box, type a unique name for the management group.

Important
Management group names must be unique. Do not use the same management group name when you deploy a Service Manager management server and a Service Manager data warehouse management server. Furthermore, do not use the management group name that is used for Operations Manager.

b. Click **Browse**, enter the user account or group to which you want to give Service Manager administrative rights, and then click **Next**.

9. On the **Configure the account for Service Manager services** page, click **Domain account**; specify the user name, password, and domain for the account; and then click **Test Credentials**. After you receive a "The credentials were accepted" message, click **Next**.
10. On the **Configure the Service Manager workflow account** page, click **Domain account**; specify the user name, password, and domain for the account; and then click **Test Credentials**. After you receive a "The credentials were accepted" message, click **Next**.
11. On the **Help improve System Center Service Manager** page, indicate your preference for participation in the Customer Experience Improvement Program. As an option, click **Tell me more about the program**, and then click **Next**.
12. On the **Use Microsoft Update to help keep your computer secure and up-to-date** page, indicate your preference for using Microsoft Update to check for Service Manager updates. If you want Windows Update to check for updates, select **Initiate machine wide Automatic update**. Click **Next**.
13. On the **Installation summary** page, click **Install**.
14. On the **Setup completed successfully** page, we recommend that you leave **Open the Encryption Backup or Restore Wizard** selected, and then click **Close**. For more information about backing up the encryption key, see Completing Deployment by Backing Up the Encryption Key.

How to Install the Service Manager Data Warehouse (Two-Computer Scenario)

As the second step in the two-computer installation process for System Center 2012 – Service Manager, deploy the data warehouse management server and the data warehouse databases on the second computer. During Setup, you will be prompted to provide credentials for the following accounts:

- Management group administrator
- Service Manager services account
- Reporting account

For more information about the permissions that these accounts require, see "Accounts Required During Setup" in the Planning Guide for System Center 2012 - Service Manager. Before you

start, make sure that Microsoft SQL Server Reporting Services (SSRS) is installed in the default instance of Microsoft SQL Server.

To install a data warehouse management server and data warehouse databases

- Log on to the computer by using an account that has administrative rights.
- On the Service Manager installation media, double-click the **Setup.exe** file.
- On the **Service Manager Setup Wizard** page, click **Service Manager data warehouse management server**.
- On the **Product registration** page, type information in the boxes. In the **Product key** boxes, type the product key that you received with Service Manager, or as an alternative, select **Install as an evaluation edition (180 day trial**. Read the Microsoft Software License Terms, and, if applicable, click **I have read, understood, and agree with the terms of the license agreement**, and then click **Next**.
- On the **Installation location** page, verify that sufficient free disk space is available, and then click **Next**. If necessary, click **Browse** to change the location in which the Service Manager data warehouse management server will be installed.
- On the **System check results** page, make sure that prerequisites passed or at least passed with warnings, and then click **Next**.
- On the **Configure data warehouse databases** page, Service Manager checks the computer you are using to see if it can host the data warehouse databases. For this configuration, confirm that the database server is the computer on which you are installing the data warehouse management server, and then click **Next**.

  Important
  A warning message appears if you are using the default collation (SQL_Latin1_General_CP1_CI_AS). Support for multiple languages in Service Manager is not possible when you are using the default collation. If later you decide to support multiple languages using a different collation, you have to re-install SQL Server. See “Microsoft SQL Server 2008 with SP1” in the Planning Guide for System Center 2012 - Service Manager.
- On the **Configure additional data warehouse datamarts** page, Service Manager checks the current computer to see if an instance of SQL Server exists. By default, if an instance is found, Service Manager creates a new database in the existing instance. If an instance appears, click **Next**.
- On the **Configure the data warehouse management group** page, complete these steps:

  a. In the **Management group name** box, type a unique name for the group.

  Important
  Management group names must be unique. Do not use the same management group name when you deploy a Service Manager management server and a Service Manager data warehouse management server. Furthermore, do not use the management group name that is used for

Operations Manager.

b. Click **Browse**, enter the user account or group to which you want to give Service Manager administrative rights, and then click **Next**.

- On the **Configure the reporting server for the data warehouse** page, Service Manager will use the existing computer if SQL Server Reporting Services is present. Accept the defaults, and then click **Next**.

  Note
  The URL that you are presented with might not be in the form of a fully qualified domain name (FQDN). If the URL as presented cannot be resolved in your environment, configure SQL Server Reporting URLs so that the FQDN is listed in the **Web service URL** field. For more information see How to: Configure a URL (Reporting Services Configuration).

- On the **Configure the account for Service Manager services** page, click **Domain account**; specify the user name, password, and domain for the account; and then click **Test Credentials**. After you receive a "The credentials were accepted" message, click **Next**.
- On the **Configure the reporting account** page, specify the user name, password, and domain for the account, and then click **Test Credentials**. After you receive a "The credentials were accepted" message, click **Next**.
- On the **Configure Analysis Service for OLAP cubes** page, click **Next**.
- On the **Configure Analysis Services credential** page, select a domain account; click **Domain account** specify the user name, password, and domain for the account; and then click **Test Credentials**. After you receive a "The credentials were accepted" message, click **Next**.

  Note
  The account that you specify here must have administrator rights on the computer hosting SSRS.

- On the **Help improve System Center Service Manager** page, indicate your preference for participation in the Customer Experience Improvement Program. As an option, click **Tell me more about the program**, and then click **Next**.
- On the **Use Microsoft Update to help keep your computer secure and up-to-date** page, indicate your preference for using Microsoft Update to check for Service Manager updates. If you want Windows Update to check for updates, select **Initiate machine wide Automatic update**. Click **Next**.
- On the **Installation summary** page, click **Install**.
- On the **Setup completed successfully** page, we recommend that you leave **Open the Encryption Backup or Restore Wizard** selected, and then click **Close**. For more information about backing up the encryption key, see Completing Deployment by Backing Up the Encryption Key.

How to Validate the Two-Computer Installation

You can use the following procedures to validate the two-computer installation of System Center 2012 – Service Manager. In these procedures, the *first computer* is the computer on which you installed the Service Manager management server, the Service Manager database, and Service Manager console. The *second computer* is the computer that hosts the data warehouse management server and the data warehouse databases.

To validate the Service Manager management server installation

- On the first computer, verify that the Program Files\Microsoft System Center\Service Manager 2012 folder exists.
- Run **services.msc**, and then verify that the following services are installed, that they have a status of **Started**, and that the startup type is **Automatic**:
  - System Center Data Access Service
  - System Center Management Configuration

To validate the Service Manager console installation

1. On the first computer, click **Start**, click **All Programs**, click **Microsoft System Center**, and then click **Service Manager Console**.
2. The first time that you run the Service Manager console, the **Connect to Service Manager Server** dialog box appears. In the **Server name** box, enter the computer name of the server that hosts the Service Manager management server.
3. The Service Manager console successfully connects to the Service Manager management server.

To validate the data warehouse management server installation

- On the second computer, run **services.msc**, and verify that the following services are installed:
  - System Center Data Access Service
  - System Center Management Configuration

To validate the Service Manager database

1. On the first computer, click **Start**, click **All Programs**, click **Microsoft SQL Server 2008**, and then click **SQL Server Management Studio**.
2. In the **Connect to Server** dialog box, complete these steps:
   a. In the **Server Name** list, type the computer name for the computer that hosts the Service Manager database. In this example, type **localhost**.
   b. In the **Authentication** list, select **Windows Authentication**, and then click **Connect**.
3. In the **Object Explorer** pane, expand **Databases**.
4. Verify that the **ServiceManager** database is listed.
5. Exit Microsoft SQL Server Management Studio.

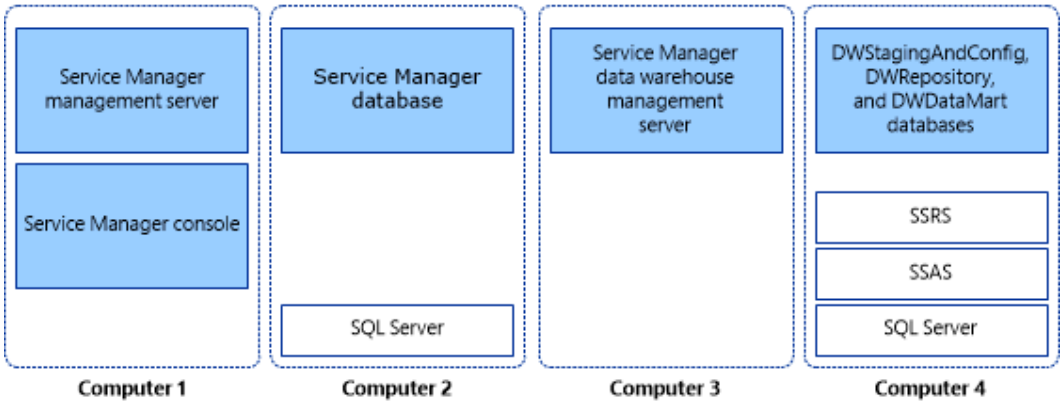
To validate the data warehouse installation

1. On the second computer, click **Start**, click **All Programs**, click **Microsoft SQL Server 2008**, and then click **SQL Server Management Studio**.
2. In the **Connect to Server** dialog box, complete these steps:
   a. In the **Server Name** list, type the computer name for the computer that hosts the Service Manager data warehouse database. In this example, type **localhost**.
   b. In the **Authentication** list, select **Windows Authentication**, and then click **Connect**.
3. In the **Object Explorer** pane, expand **Databases**.
4. Verify that the **DWDataMart**, **DWRepository**, and **DWStagingAndConfig** databases are listed.
5. In the **Object Explorer** pane, click **Connect**, and then click **Analysis Services**.
6. In the **Server Name** list, type the computer name for the computer hosting the Service Manager data warehouse database. In this example, type **localhost**.
7. In the **Object Explorer** pane, expand the new entry for Analysis Services, and then expand **Databases**.
8. Verify that the **DWASDataBase** database is listed.
9. Exit Microsoft SQL Server Management Studio.

Installing Service Manager on Four Computers

When you are ready to move System Center 2012 – Service Manager into a production environment, or if you want to maximize performance and scalability, you can consider an installation topology in which each part of the Service Manager installation resides on its own computer. This topology requires the use of four computers, as shown in figure 3.

Figure 3: Four-computer topology



In this deployment scenario, you install Microsoft SQL Server only on the computers that hosts databases (computers 2 and 4). You install SQL Server Reporting Services (SSRS) and

SQL Server Analysis Services (SSAS) on the computer that hosts the data warehouse databases (computer 4).

Installing Service Manager on four computers

- How to Install the Service Manager Management Server (Four-Computer Scenario)

  Describes how to install the Service Manager management server and Service Manager database.
- How to Install the Service Manager Data Warehouse (Four-Computer Scenario)

  Describes how to install the data warehouse management server and data warehouse databases.
- How to Validate the Four-Computer Installation

  Describes how to validate the installation of Service Manager and the configuration of SSRS.

Important
For this release, Service Manager does not support case-sensitive instance names. Setup will display a warning if you attempt to install Service Manager on a case-sensitive instance of Microsoft SQL Server.

How to Install the Service Manager Management Server (Four-Computer Scenario)

The following procedure describes how to install the System Center 2012 – Service Manager management server, the Service Manager database, the data warehouse management server, data warehouse databases, and the Service Manager console in a four-computer topology. You start the deployment process by installing the Service Manager management server and the Service Manager console on one computer and the Service Manager database on a second computer. Before you start, make sure that Microsoft SQL Server 2008 is installed on the computer that will host the Service Manager database.

During Setup, you will be prompted to provide credentials for the following accounts:

- Management group administrator
- Service Manager services account
- Service Manager workflow account

For more information about the permissions that these accounts require, see "Accounts Required During Setup" in the Planning Guide for System Center 2012 - Service Manager.

To install the Service Manager management server, Service Manager database, and console

1. Log on to the computer that will host the Service Manager management server by using an account that has administrative rights.
2. On the System Center Service Manager installation media, double-click the **Setup.exe** file.

3. On the **Service Manager Setup Wizard** page, click **Service Manager management server**.
4. On the **Product registration** page, in the **Product key** boxes, type the product key that you received with Service Manager, or as an alternative, select **Install as an evaluation edition (180 day trial)**. Read the Microsoft Software License Terms, and, if applicable, click **I have read, understood, and agree with the terms of the license agreement**, and then click **Next**.
5. On the **Installation location** page, verify that sufficient free disk space is available. If necessary, click **Browse** to change the location of where the Service Manager management server will be installed. Click **Next**.
6. On the **System check results** page, make sure that the prerequisite check passed or at least passed with warnings.

   If the prerequisite checker determines that the Microsoft Report Viewer Redistributable has not been installed, click **Install Microsoft Report Viewer Redistributable**. After the Microsoft Report Viewer Redistributable 2008 (KB971119) Setup Wizard completes, click **Check prerequisites again**. Click **Next**.
7. On the **Configure the Service Manager database** page, in the **Database server** field, type the name of the computer that will host the Service Manager database, and press the TAB key. Ensure that **SQL Server instance** box is set to the desired SQL Server instance and that **Create a new database** is selected, and then click **Next**. For example, type **Computer 2** in the **Database server** box.

   Important
   A warning message appears if you are using the default collation (SQL_Latin1_General_CP1_CI_AS). Support for multiple languages in Service Manager is not possible when you are using the default collation. If later you decide to support multiple languages using a different collation, you have to reinstall SQL Server. See "Microsoft SQL Server 2008 with SP1" in the Planning Guide for Service Manager for System Center 2012 .
8. On the **Configure the Service Manager management group** page, complete these steps:
   a. In the **Management group name** box, type a unique name for the group name.

      Important
      Management group names must be unique. Do not use the same management group name even when you are deploying a Service Manager management server and a Service Manager data warehouse management server. Furthermore, do not use the management group name that is used for Operations Manager.

   b. In the **Management group administrators** areas, click **Browse**, enter the user or group that you want to be the Service Manager administrator, and then click **Next**. For example, select the group Woodgrove\SM_Admins.
9. On the **Configure the account for Service Manager services** page, click **Domain account**; specify the user name, password, and domain for the account; and then click

Test Credentials. After you receive a “The credentials were accepted” message, click **Next**.

10. On the **Configure the Service Manager workflow account** page, click **Domain account**; specify the user name, password, and domain for the account; and then click **Test Credentials**. After you receive a “The credentials were accepted” message, click **Next**.
11. On the **Help improve System Center Service Manager** page, indicate your preference for participation in the Customer Experience Improvement Program. As an option, click **Tell me more about the program**, and then click **Next**.
12. On the **Use Microsoft Update to help keep your computer secure and up-to-date** page, indicate your preference for using Microsoft Update to check for Service Manager updates. If you want Windows Update to check for updates, select **Initiate machine wide Automatic update**. Click **Next**.
13. On the **Installation summary** page, click **Install**.
14. On the **Setup completed successfully** page, we recommend that you leave **Open the Encryption Backup or Restore Wizard** selected, and then click **Close**. For more information about backing up the encryption key, see Completing Deployment by Backing Up the Encryption Key.

How to Install the Service Manager Data Warehouse (Four-Computer Scenario)

To start deployment of the System Center 2012 – Service Manager data warehouse and data warehouse databases, install the data warehouse management server on one computer (for example, computer 3), and all of the data warehouse databases on another computer (for example, computer 4).

During Setup, you will be prompted to provide credentials for the following accounts:

- Management group administrator
- Service Manager services account
- Reporting account
- Analysis Services account

For more information about the permissions that these accounts require, see "Accounts Required During Setup" in the Planning Guide for Service Manager for System Center 2012 .

The data warehouse databases include the following three databases: DWStagingAndConfig, DWRepository, and DWDataMart. The first two databases, DWStagingAndConfig and DWRepository, must reside on the same instance of Microsoft SQL Server. The DWDataMart database can reside on a separate instance of SQL Server. The optional OMDWDataMart and CMDWDataMart databases can reside together or separately on their own instances of Microsoft SQL Server.

To install a data warehouse management server

1. Because, in this scenario, the computer that hosts SQL Server Reporting Services (SSRS) is not the same computer that hosts the data warehouse management server, you have to prepare the computer that will remotely host SSRS for Service Manager. See Manual Steps to Configure the Remote SQL Server Reporting Services before continuing with this procedure.
2. Log on to the computer that will host the data warehouse management server by using an account that has administrator rights. For example, run Setup on Computer 3.
3. On the System Center Service Manager installation media, double-click the **Setup.exe** file.
4. On the **Service Manager Setup Wizard** page, click **Service Manager data warehouse management server**.
5. On the **Product registration** page, in the **Product key** boxes, type the product key that you received with Service Manager, or as an alternative, select **Install as an evaluation edition (180 day trial)**. Read the Microsoft Software License Terms, and, if applicable, click **I have read, understood, and agree with the terms of the license agreement**, and then click **Next**.
6. On the **Installation location** page, verify that sufficient free disk space is available, and then click **Next**. If necessary, click **Browse** to change the location where the Service Manager management server will be installed.
7. On the **System check results** page, verify that prerequisites passed or at least passed with warnings, and then click **Next**.
8. On the **Configure the data warehouse databases** page, click **Staging and Configuration**. In the **Database server** box, type the computer name of the computer that will host the two data warehouse databases. For example, type **Computer 4**, and then press the TAB key. Verify that **Default** appears in the **SQL Server instance** box.

   Important
   A warning message appears if you are using the default collation (SQL_Latin1_General_CP1_CI_AS). Support for multiple languages in Service Manager is not possible when you are using the default collation. If later you decide to support multiple languages using a different collation, you have to reinstall SQL Server. See “Microsoft SQL Server 2008 with SP1” in the Planning Guide for System Center 2012 – Service Manager.
9. In the list of the three databases, select **Data Mart**. In the **Database server** box, type the computer name of the server that will host the Data Mart database. For example, type **Computer 4**, and then press the TAB key. When **Default** appears in the **SQL Server instance** box, click **Next**.
10. On the **Configure additional data warehouse datamarts** page, complete these steps:
    a. Click **OM Data mart**. In the **Database server** box, type the computer name of the computer that will host the Operations Manager data mart database. For example, type **Computer 4**, and then press the TAB key.
    b. Click **CM Data mart**. In the **Database server** box, type the computer name of the computer that will host the CM data mart database. For example, type **Computer 4**,

and then press the TAB key.

c. Click **Next**.

11. On the **Configure the data warehouse management group** page, complete these steps:

    a. In the **Management group name** box, type a unique name for the group name.

    Caution
    Management group names must be unique. Do not use the same management group name even when deploying a Service Manager management server and a Service Manager data warehouse management server. Furthermore, do not use the management group name that is used for Operations Manager. All data warehouse management group names have the prefix DW_.

    b. Click **Browse**, enter the user or group that you want to be the Service Manager administrator, and then click **Next**.

    Note
    The group Domain\Administrators is not allowed as a management group administrator.

12. On the **Configure the reporting server for the data warehouse** page, follow these steps:

    a. In the **Report server** box, enter the name of the computer that will host the reporting server. In this example, this will be the computer that hosts the data warehouse database, enter **Computer 4**, and then press the TAB key.

    Note
    The URL that you are presented with might not be in the form of a fully qualified domain name (FQDN). If the URL as presented cannot be resolved in your environment, you will need to configure SQL Server Reporting URLs so that the FQDN is listed in the **Web service URL** field. For more information see the TechNet article Configure a URL (http://go.microsoft.com/fwlink/p/?LinkId=230712).

    b. Verify that **Default** is displayed in the **Report server instance** box.

    c. Because you followed the procedure “Manual Steps to Configure the Remote SQL Server Reporting Services” in the Deployment Guide for System Center 2012 – Service Manager (http://go.microsoft.com/fwlink/p/?LinkID=209670), select the **I have taken the manual steps to configure the remote SQL Server Reporting Services as described in the Service Manager Deployment Guide** check box, and then click **Next**.

13. On the **Configure the account for Service Manager services** page, click **Domain account**, specify the user name, password, and domain for the account, and then click **Test Credentials**. After you receive a **The credentials were accepted** message, click **Next**.

For example, enter the account information for the domain user SM_Acct.

14. On the **Configure the reporting account** page, specify the user name, password, and domain for the account, and then click **Test Credentials**. After you receive a **The credentials were accepted** message, click **Next**.
15. On the **Configure Analysis Service for OLAP cubes** page, in the **Database server** box, type the computer name of the server that will host the Analysis Services database, and then press the TAB key. When **Default** appears in the **SQL Server instance** box, click **Next**. For example, type **Computer 4** in the **Database server** box.

    Warning
    If you are installing SQL Server Analysis Services on a computer other than the computer hosting the data warehouse management server and there is a firewall in your environment, you must make sure that the proper firewall ports are opened. For more information, see the topic Port Assignments for Service Manager 2012 in the Planning Guide for System Center 2012 – Service Manager.
16. On the **Configure Analysis Services credential** page, select a domain account, click **Domain account**, specify the user name, password, and domain for the account, and then click **Test Credentials**. After you receive a **The credentials were accepted** message, click **Next**.

    Note
    The account you specify here must have administrator rights on the computer hosting SQL Server Analysis Services.
17. On the **Help improve System Center Service Manager** page, indicate your preference for participation in the Customer Experience Improvement Program. Optionally, click **Tell me more about the program**, and then click **Next**.
18. On the **Use Microsoft Update to help keep your computer secure and up-to-date** page, indicate your preference for using Microsoft Update to check for Service Manager updates. Select **Initiate machine wide Automatic update** if you want Windows Update to check for updates. Click **Next**.
19. On the **Installation summary** page, click **Install**.
20. On the **Setup completed successfully** page, we recommend that you leave **Open the Encryption Backup or Restore Wizard** selected, and then click **Close**. For more information about backing up the encryption key, see Completing Deployment by Backing Up the Encryption Key.

How to Validate the Four-Computer Installation

The procedures in this topic describe how to validate the four-computer installation of System Center 2012 – Service Manager.

Step 1: Validate the Installation of the Management Server and Database

To validate a Service Manager management server installation

1. On the computer hosting the Service Manager management server, verify that a Program Files\Microsoft System Center 2012\Service Manager folder exists.
2. Run **services.msc**, and then verify that the following services are installed, that they have the status of **Started**, and that the startup type is **Automatic**:
   - System Center Data Access Service
   - System Center Management

     Note
     For System Center 2012 R2 Service Manager, the System Center Management service was renamed to Microsoft Monitoring Agent.
   - System Center Management Configuration

To validate the Service Manager console installation

1. On the first computer, click **Start**, click **All Programs**, click **Microsoft System Center**, and then click **Service Manager Console**.
2. The first time that you run the Service Manager console, the **Connect to Service Manager Server** dialog box appears. In the **Server name** box, enter the computer name of the server that is hosting the Service Manager management server.
3. The Service Manager console successfully connects to the Service Manager management server.

To validate the Service Manager database

1. On the computer hosting the Service Manager database, click **Start**, click **All Programs**, click **Microsoft SQL Server 2008**, and then click **SQL Server Management Studio**.
2. In the **Connect to Server** dialog box, select the following:
   a. In the **Server Type** list, select **Database Engine**.
   b. In the **Server Name** list, select the server name for your Service Manager database. For example, select **Computer 2**.
   c. In the **Authentication** list, select **Windows Authentication**, and then click **Connect**.
3. In the **Object Explorer** pane, expand **Databases**.
4. Verify that the **ServiceManager** database is listed.
5. Exit **Microsoft SQL Server Management Studio**.

Step 2: Validate the Installation of the Data Warehouse Management Server and Database

To validate a data warehouse management server installation

- On the computer hosting the data warehouse management server (the server you ran Setup on), run **services.msc**, and verify that the following services have been installed:

- System Center Data Access Service
- System Center Management

  Note
  For System Center 2012 R2 Service Manager, the System Center Management service was renamed to Microsoft Monitoring Agent.
- System Center Management Configuration

To validate data warehouse databases

1. On the computer hosting the data warehouse management databases, click **Start**, click **All Programs**, click **Microsoft SQL Server 2008**, and then click **SQL Server Management Studio**.
2. In the **Connect to Server** dialog box, select the following:
   a. In the **Server Type** list, select **Database Engine**.
   b. In the **Server Name** list, select the server and instance for your Service Manager data warehouse database. For example, select **Computer 4**.
   c. In the **Authentication** list, select **Windows Authentication**, and then click **Connect**.
3. In the **Object Explorer** pane, expand **Databases**.
4. Verify that the **DWStagingAndConfig** and **DWRepository** databases are listed.
5. On the computer hosting SQL Server Reporting Services (SSRS), click **Start**, click **All Programs**, click **Microsoft SQL Server 2008**, and then click **SQL Server Management Studio**.
6. In the **Connect to Server** dialog box, select the following:
   a. In the **Server Type** list, select **Database Engine**.
   b. In the **Server Name** list, select the server and instance for your Service Manager data warehouse database. For example, select **Computer 4**.
   c. In the **Authentication** list, select **Windows Authentication**, and then click **Connect**.
7. In the **Object Explorer** pane, expand **Databases**.
8. Verify that the **DWDataMart** database is listed.
9. In the **Object Explorer** pane, click **Connect**, and then click **Analysis Services**.
10. In the **Server Name** list, type the computer name for the computer hosting the Service Manager data warehouse database. In this example, type **localhost**.
11. In the **Object Explorer** pane, expand the new entry for Analysis Services, and then expand **Databases**.
12. Verify that the **DWASDataBase** database is listed.
13. Exit Microsoft SQL Server Management Studio.

Manual Steps to Configure the Remote SQL Server Reporting Services

During deployment of the Service Manager data warehouse management server, you can specify the server to which Microsoft SQL Server Reporting Services (SSRS) will be deployed. During setup, the computer that is hosting the data warehouse management server is selected by default. If you specify a different computer to host SSRS, you are prompted to follow this procedure to prepare the server. Preparing the remote computer to host SSRS involves the following steps, which are covered in detail in this section:

- Copy Microsoft.EnterpriseManagement.Reporting.Code.dll from the Service Manager installation media to the computer that is hosting SSRS.
- Add a code segment to the rssrvpolicy configuration file on the computer that is hosting SSRS.
- Add an Extension tag to the existing Data segment in the rsreportserver configuration file on the same computer.

If you used the default instance of SQL Server, use Windows Explorer to drag Microsoft.EnterpriseManagement.Reporting.Code.dll (which is located in the Prerequisites folder on your Service Manager installation media) to the folder \Program Files\Microsoft SQL Server\MSRS10.MSSQLSERVER\Reporting Services\ReportServer\Bin on the computer that is hosting SSRS. If you did not use the default instance of SQL Server, the path of the required folder is \Program Files\Microsoft SQL Server\MSRS10.<INSTANCE_NAME>\Reporting Services\ReportServer\Bin. In the following procedure, the default instance name is used.

To copy the Microsoft.EnterpriseManagement.Reporting.Code.dll file

1. On the computer that will host the remote SSRS, open an instance of Windows Explorer.
2. Perform one of the following steps based on which version of SQL Server 2008 you are using:
    a. For SQL Server 2008 Service Pack 1 (SP1), locate the folder \Program Files\Microsoft SQL Server\MSRS10.MSSQLSERVER\Reporting Services\ReportServer\Bin.
    b. For SQL Server 2008 R2, locate the folder \Program Files\Microsoft SQL Server\MSRS10_50.MSSQLSERVER\Reporting Services\ReportServer\Bin.
3. Start a second instance of Windows Explorer, locate the drive that contains the Service Manager installation media, and then open the Prerequisites folder.
4. In the Prerequisites folder, click **Microsoft.EnterpriseManagement.Reporting.Code.dll**, and drag it to the folder that you located in either step 2a or step 2b.

To add a code segment to the rssrvpolicy.config file

1. On the computer that will be hosting SSRS, locate the file rssrvpolicy.config in the following folder:
    a. For SQL Server 2008 SP1, locate \Program Files\Microsoft SQL Server\MSRS10.MSSQLSERVER\Reporting Services\ReportServer.

b. For SQL Server 2008 R2, locate \Program Files\Microsoft SQL Server\MSRS10_50.MSSQLSERVER\Reporting Services\ReportServer.

2. Using an XML editor of your choice (such as Notepad), open the rssrvpolicy.config file.
3. Scroll through the rssrvpolicy.config file and locate the **<CodeGroup>** code segments. The following code shows an example of a **<CodeGroup>** segment.

```
<CodeGroup
   class="UnionCodeGroup"
   version="1"
   PermissionSetName="FullTrust">
   <IMembershipCondition
      class="UrlMembershipCondition"
      version="1"
      Url="$CodeGen$/*"
   />
</CodeGroup>
```

4. Add the following **<CodeGroup>** segment in its entirety in the same section as the other **<CodeGroup>** segments.

```
<CodeGroup
   class="UnionCodeGroup"
   version="1"
   PermissionSetName="FullTrust"
   Name="Microsoft System Center Service Manager Reporting
Code Assembly"
   Description="Grants the SCSM Reporting Code assembly full
trust permission.">
   <IMembershipCondition
      class="StrongNameMembershipCondition"
      version="1"

PublicKeyBlob="00240000048000009400000006020000002400005253413
1000400000100010 0B5FC90E7027F67871E773A8FDE8938C81DD402BA65B
9201D60593E96C492651E889CC13F1415EBB53FAC1131AE0BD333C5EE6021
672D9718EA31A8AEBD0DA0072F25D87DBA6FC90FFD598ED4DA35E44C398C4
54307E8E33B8426143DAEC9F596836F97C8F74750E5975C64E2189F45DEF4
6B2A2B1247ADC3652BF5C308055DA9"
/>
```

```
</CodeGroup>
```

5. Save the changes and close the XML editor.

To add an Extension tag to the Data segment in the rsreportserver.conf file

1. On the computer hosting SSRS, locate the file rsreportserver.config in the following folder:
   a. For SQL Server 2008 SP1, locate \Program Files\Microsoft SQL Server\MSRS10.MSSQLSERVER\Reporting Services\ReportServer.
   b. For SQL Server 2008 R2, locate \Program Files\Microsoft SQL Server\MSRS10_50.MSSQLSERVER\Reporting Services\ReportServer.
2. Using an XML editor of your choice (such as Notepad), open the rsreportserver.config file.
3. Scroll through the rsreportserver.config file and locate the **<Data>** code segment. There is only one **<Data>** code segment in this file.
4. Add the following **Extension** tag to the **<Data>** code segment where all the other **Extension** tags are:

```
<Extension Name="SCDWMultiMartDataProcessor"
Type="Microsoft.EnterpriseManagement.Reporting.MultiMartConne
ction, Microsoft.EnterpriseManagement.Reporting.Code" />
```

5. Save the changes and close the XML editor.

Manual Steps to Prepare Upgraded SQL Server

If you upgrade SQL Server 2008 R2 to SQL 2012 after Service Manager SP1 installation, you must manually copy the Microsoft.EnterpriseManagement.Reporting.Code.dll file in order for SQL Server Reporting Services (SSRS) to function properly.

To copy the Microsoft.EnterpriseManagement.Reporting.Code.dll file

1. On the computer that is hosting SSRS, open an instance of Windows Explorer.
2. Open <InstallationDrive>:\Program Files\Microsoft SQL Server\MSRS11.MSSQLSERVER\Reporting Services\ReportServer\bin and copy the Microsoft.EnterpriseManagement.Reporting.Code.dll file from the Prerequisites folder on your Service Manager installation media folder.

How to Create and Deploy Server Images of Service Manager

You can use the information in this topic to create a system image that contains Windows server, SQL Server, and Service Manager for use as a template that you can apply to new servers. Follow the basic steps below to prepare the image. You can modify them, as needed for your

environment. For more information about the Windows System Preparation Tool, What is Sysprep?

Note

Details about installing SQL Server using a configuration file are not covered in this topic. For more information about using a configuration file to install SQL Server, see Install SQL Server 2012 Using a Configuration File.

Afterward, modify and save the sample CMD file below to create your own customized version and then run the file.

To prepare the server for imaging

1. Install Windows Server on the new server.
2. Install SQL Server in *Prepare for imaging* mode. This installs the binary files, but does not configure SQL server.

   Note

   SQL server is unusable at this point.
3. Copy the SQL Server installation files to a temporary location on the server. For example, c:\Runonce\ SQLFULL_ENU.
4. Copy the System Center 2012 Service Manager installation files to a temporary location on the server. For example, c:\Runonce\SCSM.
5. Save the example CMD file shown below and customize it for your environment, where necessary. This file will run SQL Server setup to complete the SQL Server installation and then run an unattended installation of Service Manager. Save this file to a temporary location such as C:\Runonce\FirstRun.cmd.
6. Run the System Preparation Tool (Sysprep) with the /generalize command to generalize the server.
7. Capture the Windows installation with ImageX, by creating a reference images with which to install servers with the same hardware configuration.
8. Create a Windows Unattend.xml file to customize Windows when the image is booted and have it run FirstRun.cmd.

To create a CMD file that completes image installation

- Copy the following sample and modify it, as needed.

```
@echo off


set ServiceAccountDomain=contoso
set ServiceAccountName=Administrator
set ServiceAccountPassword=P@$$word
```

```
echo Finalizing SQL installation...
start /wait c:\RunOnce\SQLFULL_ENU\setup.exe
/ConfigurationFile=c:\RunOnce\SQL2012Complete.ini

echo Installing additional SQL features...
start /wait c:\RunOnce\SQLFULL_ENU\setup.exe
/ConfigurationFile=c:\RunOnce\SQL2012Shared.ini

echo Installing System Center Service Manager...
start /wait C:\RunOnce\SCSM\setup.exe /Install:Server
/AcceptEula /RegisteredOwner:SCSM
/RegisteredOrganization:Microsoft /CreateNewDatabase
/SqlServerInstance:%computername%
/ManagementGroupName:%computername%
/AdminRoleGroup:%ServiceAccountDomain%\%ServiceAccountName%
/ServiceRunUnderAccount:%ServiceAccountDomain%\%ServiceAccoun
tName%\%ServiceAccountPassword%
/WorkflowAccount:%ServiceAccountDomain%\%ServiceAccountName%\
%ServiceAccountPassword%
/CustomerExperienceImprovementProgram:Yes
/EnableErrorReporting:Yes /silent
```

See Also

Deployment Scenarios for System Center 2012 - Service Manager

Guidance for Installing System Center 2012 - Service Manager on Virtual Machines

This topic provides guidance that you have to consider when you install System Center 2012 – Service Manager in a Hyper-V virtual environment. If you are installing Microsoft SQL Server into an environment without Hyper-V, consult your vendor's documentation for guidance regarding the use of SQL Server.

Deploying SQL Server in a Virtual Environment

Before you deploy SQL Server in a Hyper-V environment, see Running SQL Server 2008 in a Hyper-V Environment. Keep the following in mind when you prepare a virtual environment for SQL Server:

- Using a dynamic virtual hard drive (VHD) can decrease performance. We do not recommend using a VHD.
- Allocate at least two virtual CPUs for the instance of SQL Server.
- Do not allocate more virtual CPUs than the number of available logical CPUs.
- If you observe a drop in Service Manager performance in a virtual environment, check CPU and memory utilization on the virtual machines that are hosting the instance of SQL Server and the Service Manager management server. If CPU utilization is near 100 percent, either allocate additional virtual CPUs or reduce the number of concurrent Service Manager console sessions.

Memory

The amount of memory you have in your logical computer and the amount of memory you allocate to each virtual machine are critical. If you deploy an instance of SQL Server, Service Manager management server, and Service Manager console to the same virtual machine, the memory requirements are cumulative. You need enough memory to meet the requirements of each part of Service Manager. In this environment, 8 gigabytes (GB) of memory is the minimum recommended amount.

Deploying Service Manager Databases in a Virtual Environment

In this release, if you are installing Service Manager and data warehouse databases on virtual machines, we recommend that you use one virtual machine for the Service Manager database and another virtual machine for the data warehouse databases. Furthermore, each virtual machine should be configured for two CPUs.

Configure Windows PowerShell to Run in System Center 2012 - Service Manager

Before you can run commands in the Windows PowerShell command-line interface in System Center 2012 – Service Manager, you must set execution policy to RemoteSigned and import the data warehouse cmdlet module.

The Service Manager cmdlets are implemented in the following two modules:

- **System.Center.Service.Manager**. This module is imported automatically every time a Service Manager Windows PowerShell session is opened.
- **Microsoft.EnterpriseManagement.Warehouse.Cmdlets**. This module must be imported manually.

Cmdlets in Authoring Tool Workflows

When you use the Service Manager SP1 version of the Authoring tool to create a workflow, then custom scripts using Windows PowerShell cmdlets called by the workflow fail. This is due to a problem in the Service Manager MonitoringHost.exe.config file.

To work around this problem, update the MonitoringHost.exe.config XML file using the following steps.

1. Navigate to %ProgramFiles%\Microsoft System Center 2012\Service Manager\ or the location where you installed Service Manager.
2. Edit the MonitoringHost.exe.config file and add the section in italic type from the example below in the corresponding section of your file. You must insert the section before <publisherPolicy apply="yes" />.
3. Save your changes to the file.
4. Restart the System Center Management service on the Service Manager management server.

```
<?xml version="1.0"?><configuration>  <configSections>    <section name="uri"
type="System.Configuration.UriSection, System, Version=2.0.0.0, Culture=neutral,
PublicKeyToken=b77a5c561934e089" />  </configSections>  <uri>    <iriParsing
enabled="true" />  </uri>    <runtime>    <assemblyBinding xmlns="urn:schemas-microsoft-
com:asm.v1">      <dependentAssembly>        <assemblyIdentity
name="Microsoft.Mom.Modules.DataTypes" publicKeyToken="31bf3856ad364e35"
/>        <publisherPolicy apply="no" />        <bindingRedirect oldVersion="6.0.4900.0"
newVersion="7.0.5000.0"
/>      </dependentAssembly>      <dependentAssembly>        <assemblyIdentity
name="Microsoft.EnterpriseManagement.HealthService.Modules.WorkflowFoundation"
publicKeyToken="31bf3856ad364e35" />        <publisherPolicy apply="no"
/>        <bindingRedirect oldVersion="6.0.4900.0" newVersion="7.0.5000.0"
/>      </dependentAssembly>
<dependentAssembly>

<assemblyIdentity name="Microsoft.EnterpriseManagement.Modules.PowerShell"
publicKeyToken="31bf3856ad364e35" />

<bindingRedirect oldVersion="6.0.4900.0" newVersion="7.0.5000.0" />

</dependentAssembly>
       <publisherPolicy apply="yes" />      <probing privatePath=""
/>    </assemblyBinding>    <gcConcurrent enabled="true" />  </runtime></configuration>
```

In This Section

How to Set Execution Policy

Describes how to set execution policy to RemoteSigned.

How to Import the Data Warehouse Cmdlet Module

Describes how to manually import the data warehouse Windows PowerShell cmdlets.

How to Set Execution Policy

Use the following procedure to set execution policy to RemoteSigned in System Center 2012 – Service Manager. This is necessary to enable the importation of the Service Manager cmdlet modules, automatically or manually.

You have to run this command only once on the computer where you intend to use Windows PowerShell cmdlets for Service Manager.

To set execution policy

1. On the computer where you want to run Windows PowerShell, click **Start**, click **All Programs**, click **Microsoft System Center 2012**, click **Service Manager**, and then click **Service Manager Shell**.
2. At the Windows PowerShell prompt, type the following command, and then press ENTER:

   ```
   Set-ExecutionPolicy –force RemoteSigned
   ```
3. Type **exit**, and then press ENTER to close the **Administrator: Windows PowerShell** window.

How to Import the Data Warehouse Cmdlet Module

To be able to use the data warehouse cmdlets in System Center 2012 – Service Manager, you must first manually import the Windows PowerShell data warehouse cmdlets module for Service Manager. You can import the data warehouse cmdlets module on the Service Manager management server, the data warehouse management server, or both.

To import the data warehouse cmdlets module

1. On a management server, open a Service Manager Windows PowerShell session. Or, on a data warehouse management server open a Windows PowerShell session.

   Ensure that the Windows PowerShell prompt is at the Service Manager installation folder.
2. At the Windows PowerShell command prompt, type the following command, and then press ENTER:

   ```
   import-module
   ".\Microsoft.EnterpriseManagement.Warehouse.Cmdlets.psd1"
   ```
3. Type **exit**, and then press ENTER to close the **Administrator: Windows PowerShell** window.

Registering with the Service Manager Data Warehouse to Enable Reporting

After you have deployed the Service Manager management servers and data warehouse management servers, for reporting to function you must run the Data Warehouse Registration Wizard. This wizard registers the Service Manager management group with the data warehouse management group. It also deploys management packs from the Service Manager management server to the data warehouse management server.

The management pack deployment process can take several hours to complete. It is a best practice not to turn off any Service Manager computers or stop any Service Manager services during this time. During this registration process, you can continue to use the Service Manager console to perform any Service Manager functions that you want.

To ensure that reporting data will be available, use the procedures in the following topics to register the data warehouse and deploy the management packs.

Registering with the Service Manager Data Warehouse to Enable Reporting topics

- How to Run the Data Warehouse Registration Wizard

  Describes how to run the data warehouse registration wizard.
- How to Determine When Data Warehouse Registration Is Complete

  You have to allow enough time for the management pack deployment process to complete. This topic describes how to determine when management pack deployment is complete.

How to Run the Data Warehouse Registration Wizard

You can use the following steps in System Center 2012 – Service Manager to use the Data Warehouse Registration Wizard to register with the Service Manager data warehouse.

To run the Data Warehouse Registration wizard

1. By using an account that is a member of the Service Manager and data warehouse management administrators group, log on to the computer that hosts the Service Manager console.
2. In the Service Manager console, select **Administration**.
3. In the **Administration** pane, expand **Administration**.
4. In the **Administration** view, in the **Register with Service Manager's Data Warehouse** area, click **Register with Service Manager Data Warehouse**.
5. In the Data Warehouse Registration wizard, on the **Before You Begin** page, click **Next**.
6. On the **Data Warehouse** page, in the **Server name** box, type the *fully qualified domain name* (FQDN) of the computer hosting the data warehouse management server, and

then click **Test Connection**. If the test is successful, click **Next**.

7. On the **Credentials** page, you can accept the default entry in the **Run as account** list, and then click **Next**, or you can enter credentials from a user or group of your own choosing.

   Important
   The account that you specify will be assigned administrative credentials on the Service Manager management server, and it will be granted Read permission on the Service Manager database. You can specify different credentials from other Service Manager management groups when you are registering with the data warehouse.

8. On the **Summary** page, click **Create**.
9. On the **Completion** page, when **The data warehouse registration succeeded** appears, click **Close**.
10. A dialog box states that the report deployment process is not finished. This is to be expected. On the **System Center Service Manager** dialog box, click **OK**.
11. In a few minutes, after you close the Data Warehouse Registration Wizard, the **Data Warehouse** button will be added to the Service Manager console. In the Service Manager console, click the arrow at the lower right corner of the Service Manager console buttons, and then click **Show More Buttons**.

You can use a Windows PowerShell command to complete this task. For information about how to use Windows PowerShell to register Service Manager management groups with the data warehouse, see Add-SCDWMgmtGroup.

How to Determine When Data Warehouse Registration Is Complete

Several management packs are imported during the data warehouse registration process in System Center 2012 – Service Manager. Data warehouse registration is complete when all of the management packs have been imported. You will have to determine when that process is complete by using the following procedure.

To determine when management pack deployment has completed

1. Start the Service Manager console.
2. In the Service Manager console, select **Data Warehouse**.
3. In the **Data Warehouse** pane, expand **Data Warehouse**, and then click **Data Warehouse Jobs**.
4. In the **Data Warehouse Jobs** pane, click **MPSyncJob**.
5. In the **MPSyncJob** details pane, in the **Synchronization Job Details** list, scroll to the right to view the **Status** column, and then click **Status** to alphabetically sort the status column.

6. Scroll through the **Status** list. The management pack deployment process is complete when the status for all of the management packs is **Associated** or **Imported**. Make sure that there is no status of either **Pending Association** or **Failed** in the status list. In the **Data Warehouse Jobs** pane, the status of the **MPSyncJob** will have changed from **Running** to **Not Started** when the registration process is complete. This deployment process can take up to two hours to complete.
7. Use the following steps to periodically refresh the **Data Warehouse Job** pane to monitor the progress of the registration process:
   a. In the **Tasks** pane, under **Data Warehouse Jobs**, click **Refresh**.
   b. In the **Data Warehouse Jobs** pane, click **MPSyncJob**.
   c. In the **MPSyncJob** details pane, in the **Synchronization Job Details** list, scroll to the right to view the **Status** column, and then click **Status** to alphabetically sort the status column.
8. After the management packs have been deployed (as determined in step 6), make sure that the following five data warehouse jobs appear in the **Data Warehouse Jobs** pane:
   - Extract_<Service Manager management group name>
   - Extract_<data warehouse management group name>
   - Load.Common
   - Transform.Common
   - MPSyncJob

   Note
   If these five data warehouse jobs do not appear, complete the following steps:
   a. In the **Data Warehouse Jobs** pane, click **MPSyncJob**.
   b. In the **Tasks** pane, under **Synchronization**, click **Resume**.
   c. Determine whether management pack deployment is complete by repeating steps 4through 6.

Deploying Additional Service Manager Management Servers

You can deploy additional Service Manager management servers to load-balance additional Service Manager consoles or as part of your disaster recovery strategy.

This section describes how you can install additional Service Manager management servers. The additional Service Manager management servers can improve performance in a high-use environment.

Management Servers

You create a management server when you click **Service Manager management server** in the Service Manager Setup Wizard. The initial Service Manager management server hosts data access, workflow services, and authorization services.

Initial and Additional Management Servers

When you run Setup for the first time, you install the initial Service Manager management server and define the management group for your installation. The initial management server handles all of the workflows in your Service Manager environment. Any additional Service Manager management servers that you deploy are used to load-balance additional Service Manager console connections. With this release of Service Manager, we recommend that you deploy an additional Service Manager management server for every 40 to 50 Service Manager consoles that you intend to deploy.

To associate your additional Service Manager management servers with the initial Service Manager management server and management group, you must specify the Service Manager database that you used for your initial Service Manager management server.

Disjoint Namespace Considerations

If you are installing an additional management server in an environment with a disjointed namespace, see Deployment Considerations with a Disjointed Namespace.

Installing additional management server topics

- How to Install an Additional Management Server

  Describes how to install an additional Service Manager management server.

How to Install an Additional Management Server

The following procedure shows how to install an additional management server in System Center 2012 – Service Manager. You must deploy the initial Service Manager management server and Service Manager database before deploying an additional management server.

Note

You must be a member of the Service Manager Administrators user role to install an additional Service Manager management server.

To install an additional management server

1. By using an account that has administrator rights and that is also a member of the Service Manager management group administrators, log on to the computer that will host the additional Service Manager management server.
2. On the System Center 2012 – Service Manager installation media, double-click the

Setup.exe file.

3. On the **Service Manager Setup Wizard** page, click **Service Manager management server**.
4. On the **Product registration** page, type information in the boxes. In the **Product key** boxes, type the product key you received with Service Manager, or as an alternative, select **Install as an evaluation edition (180 day trial)?**. Read the Microsoft Software License Terms, and, if applicable, click **I have read, understood, and agree with the terms of the license agreement**, and then click **Next**.
5. On the **Installation location** page, verify that sufficient free disk space is available, and then click **Next**. If necessary, click **Browse** to change the location where the additional Service Manager management server will be installed.
6. On the **System check results** page, make sure that the prerequisite check passed or at least passed with warnings, and then click **Next**.

   If the prerequisite checker determines that the Microsoft Report Viewer Redistributable has not been installed, click **Install Microsoft Report Viewer Redistributable**. After the Microsoft Report Viewer Redistributable 2008 (KB971119) Setup Wizard completes, click **Check perquisites again**.
7. On the **Configure the Service Manager database** page, in the **Database server** box, type the name of the computer that hosts the Service Manager database that you used for your initial Service Manager management server, and then press the TAB key. When the name of the instance appears in the **SQL Server instance** box, click **Use an existing database**. For example, type **Computer 2** in the **Database server** box.
8. Click the **Database** list, select the database name for the Service Manager database (the default name is **ServiceManager**), and then click **Next**.
9. On the **Configure the Service Manager management group** page, verify that the management group name and management group administrators boxes have been populated. Click **Next**.
10. On the **Configure the account for Service Manager services** page, click **Domain account**; specify the user name, password, and domain for the account; and then click **Test Credentials**. After you receive a “The credentials were accepted” message, click **Next**. For example, enter the account information for the domain user SM_Acct, and then click **Next**.
11. On the **Help improve System Center Service Manager** page, indicate your preference for participation in the Customer Experience Improvement Program. As an option, click **Tell me more about the program**, and then click **Next**.
12. On the **Use Microsoft Update to help keep your computer secure and up-to-date** page, indicate your preference for using Microsoft Update to check for Service Manager updates. If you want Windows Update to check for updates, select **Initiate machine wide Automatic update**. Click **Next**.
13. On the **Installation summary** page, click **Install**.
14. On the **Setup completed successfully** page, we recommend that you leave **Open the Encryption Backup or Restore Wizard** selected, and then click **Close**. For more information about backing up the encryption key, see Completing Deployment by Backing

Up the Encryption Key.

Deployment Considerations with a Disjointed Namespace

In System Center 2012 – Service Manager, Setup might fail when you deploy either an additional Service Manager management server or an additional Self-Service Portal in an environment where a disjoint namespace exists. This problem can occur if the Setup program is unable to resolve the principal name of the computer that is hosting the Service Manager management server. For more information, see the Microsoft TechNet article Disjoint Namespace.

We recommend that you complete the following procedures before installing either an additional Service Manager management server or an additional Self-Service Portal in an environment where a disjoint namespace exists. The first procedure shows you how to determine the principal name of your Service Manager management server. The second procedure guides you in editing the hosts file on the computer that hosts either the additional Service Manager management server or the additional Self-Service Portal.

To determine the principal name of the Service Manager management server

1. Start a Service Manager console.
2. In the Service Manager console, click **Configuration Items**.
3. In the **Configuration Items** pane, expand **Configuration Items**, expand **Computers**, and then click **All Windows Computers**.
4. In the **All Windows Computers** pane, click the computer that hosts the Service Manager management server.
5. In the **Tasks** pane, under the name of the computer, click **Edit**.
6. In the **Computer - <computer name>** window, observe that there is an **Extensions** tab at the top of the form. The **Extensions** tab appears only when you view a Service Manager management server.
7. In the **General** tab in the form, in the **Computer Identity** area, the **Principal name** box shows the principal name that you will use in the following procedure.
8. Click **Close** to close the form.
9. At a command prompt, ping the Service Manager management server. You must have the IP address of the Service Manager management server for the following procedure.

To edit the hosts file

1. On the computer that hosts either the additional Service Manager management server or the additional Self-Service Portal, start Windows Explorer, and then locate the %Systemroot%\System32\Drivers\Etc folder.
2. Open the hosts file with Notepad by typing **notepad hosts**, and then press ENTER.
3. At the end of the hosts file, add an entry starting with the IP address of the Service

Manager management server followed by its principal name.

4. Save and close the hosts file.
5. You can now start the setup procedure for either an additional Service Manager management server or an additional Self-Service Portal.

Self-Service Portal for System Center 2012 - Service Manager

The Self-Service Portal provides web-based access to the features of System Center 2012 – Service Manager. This section describes how you can deploy the Self-Service Portal, and it includes information for configuring Secure Sockets Layer (SSL).

Self-Service Portal for System Center 2012 - Service Manager Topics

- Self-Service Portal Deployment Scenarios for System Center 2012 - Service Manager

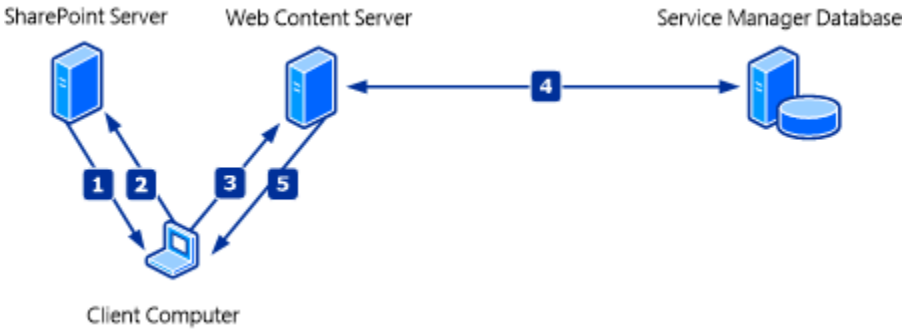
  Describes how to deploy the Self-Service Portal.
- SSL Certificates for the Self-Service Portal

  Describes what you need to know about using certificates with the Self-Service Portal.

Self-Service Portal Deployment Scenarios for System Center 2012 - Service Manager

The Self-Service Portal in System Center 2012 – Service Manager is a SharePoint website that is accompanied by a set of Microsoft Silverlight applications. The Self-Service Portal consists of two elements: a SharePoint website and a web content server. The SharePoint website is accompanied by a set of applications that are built with Silverlight. The SharePoint environment provides a foundation on which the portal can be customized. It also provides a set of building blocks for extending the features that users can access through a web browser.

The web content server is a Web Application that forms the interface between the Silverlight application and the Service Manager database. The web content server provides a path for data from the Service Manager database to the Silverlight-based application that is running in the browser. A basic Self-Service Portal setup is shown in the following diagram.



The flow of data is as follows:

1. The client accesses the Self-Service Portal with a browser by specifying the URL for the SharePoint server.
2. The SharePoint server returns Silverlight code that creates a web page containing the basic framework of the Self-Service Portal and also the URL for the web content server computer. The URL for the web content server computer was defined when you installed the Self-Service Portal.
3. The client computer, which is now running the Silverlight code, makes a connection to the web content server computer using the URL in step 2.
4. The web content server computer reads and writes data to the Service Manager database. The computer name for the Service Manager database was defined when you installed the web content server.
5. The web content server computer returns the data that makes up the center pane on the Self-Service Portal page.

The computers that host the Self-Service Portal parts require various software components. For a complete list of requirements of Self-Service Portal parts, see Software Requirements for System Center 2012 - Service Manager.

Important

This release of the Self-Service Portal is not compatible with—nor is upgrade possible from—the Self-Service Portal in System Center Service Manager 2010 or System Center Service Manager 2010 Service Pack 1 (SP1). You must uninstall System Center Service Manager 2010 or System Center Service Manager 2010 SP1 Self-Service Portal before you deploy the Self-Service Portal in System Center 2012 – Service Manager.

The SharePoint server hosts the web parts for the Self-Service Portal. We recommend that you use Secure Sockets Layer (SSL) for your Self-Service Portal installation. You must use the same http protocol (http or https) for both the web content server and for the SharePoint website.

During setup you select certificates based on the certificate's Subject name. You might encounter a situation in which you have more than one certificate with the same Subject name and you might not be able to determine exactly which certificate to select. In this situation, select any valid certificate. After the Self-Service Portal is installed, you can specify the certificate by using Internet Information Services (IIS) Manager.

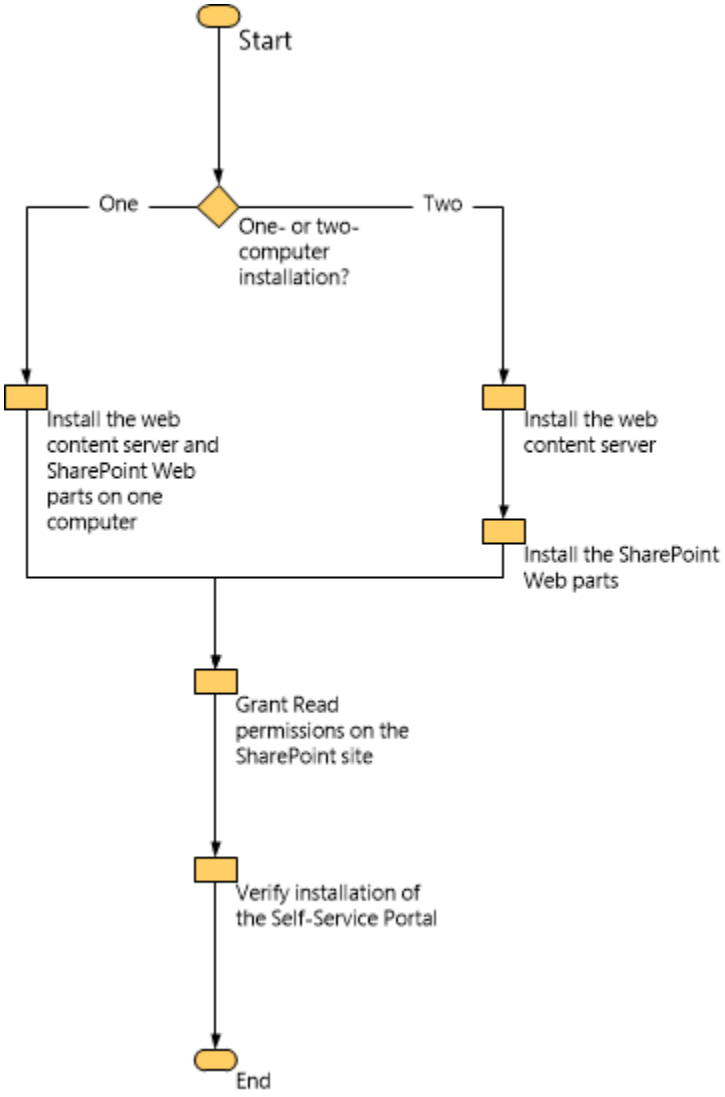
Note

You must use trusted certificates with the Self-Service Portal. Failure to use trusted certificates will result in a blank page being displayed on the Self-Service Portal.

If you want to install the SharePoint Parts on port 80, you must first move the default website in IIS to a different port—for example, port 8080—and then install the SharePoint Web Parts on port 80.

During setup of the web content server, ASP.NET might be unavailable to other websites or web applications. This issue, if it occurs, lasts only a few seconds.

The steps for installing the Self-Service Portal are outlined in the following flowchart.



Self-Service Portal Deployment topics

- How to Install the Web Content Server

Provides step-by-step instructions for installation of the web content server.

- How to Install SharePoint Web Parts for the Self-Service Portal

  Provides step-by-step instructions for installation of the SharePoint Web Parts server.
- How to Install Both the Web Content Server and SharePoint Web Parts on One Computer

  Provides step-by-step instructions for installation of both the web content server and the SharePoint Web Parts server on one computer.
- How to Grant Permissions on the SharePoint Site

  Provides step-by-step instructions for granting permissions to the SharePoint Parts website.
- How to Configure User Authentication for the SharePoint Site

  Provides step-by-step instructions for configuring user authentication for the SharePoint site.
- How to Verify the Installation of the Self-Service Portal

  Provides step-by-step instructions to start a browser and verify the installation of the Self-Service Portal.
- How to Configure the Default IIS Website Port

  Describes how to configure the default website in IIS to a different port—for example, port 8080—so that you can install the SharePoint website on port 80.

How to Install the Web Content Server

Use the following procedure to install the Self-Service Portal web content server in System Center 2012 – Service Manager.

To install the web content server

1. Using the Operational Database Account, log on to the computer that will host the Self-Service Portal.
2. On the System Center 2012 – Service Manager installation media, double-click the **Setup.exe** file.
3. On the **Service Manager Setup Wizard** page, click **Service Manager web portal**.
4. On the **Portal Parts** page, click **Web Content Server**, and then click **Next**.
5. On the **Product registration** page, read the Microsoft Software License Terms, and, if applicable, click **I have read, understood, and agree with the terms of the license agreement**, and then click **Next**.
6. On the **Installation location** page, verify that sufficient free disk space is available, and then click **Next**. If necessary, click **Browse** to change the installation location of the web content server.

   Note
   We recommend that you install the Self-Service Portal in the default location. Installing the Self-Service Portal in another location will require that you make configuration changes in Internet Information Services (IIS).
7. On the **System check results** page, make sure that the prerequisite check passed or at

least passed with warnings, and then click **Next**.

8. On the **Configure the Service Manager self-service portal name and port** page, do the following:
   a. In the **Web site name** text box, accept the default name, or type a new name.
   b. In the **Port** text box, accept the default port, or type a new port.
   c. In the **SSL certificate** list, select the Secure Sockets Layer (SSL) certificate that you want to use with the Self-Service Portal, and then click **Next**.

   Note
   We strongly recommend the use of SSL. If you are using a self-signed certificate, make sure that the certification authority (CA) that issues the certificate has been added to the Trusted Root Certification Authorities store. You must use the same HTTP protocol (HTTP or HTTPS) with both portal parts.
9. On the **Select the Service Manager database** page, do the following:
   a. In the **Database server** text box, type the name of the computer that hosts the Service Manager database, and then press TAB.
   b. In the **SQL Server instance** list, select the instance name for the Service Manager database. (**Default** is the default selection.)
   c. In the **Database** list, select the database that hosts the Service Manager database. (**ServiceManager** is the default database name.)
   d. Click **Next**.
10. On the **Configure account for the Service Manager self-service portal** page, click **Domain account**.

    Note
    Make sure that the credentials you enter here are for the sdk_users users role on the SQL Server that is hosting the Service Manager database.
11. Specify the user name, password, and domain for the Service Manager services account that you specified during installation of Service Manager. For example, enter the account information for the SM_Acct domain user.
12. Click **Test Credentials**. After you verify that you received a “The credentials were accepted message,” click **Next**.
13. On the **Help improve System Center Service Manager** page, indicate your preference for participation in the Customer Experience Improvement Program. As an option, click **Tell me more about the program**, and then click **Next**.
14. On the **Use Microsoft Update to help keep your computer secure and up-to-date** page, indicate your preference for using Microsoft Update to check for Service Manager updates. If you want Windows Update to check for updates, select **Initiate machine wide Automatic update**. Click **Next**.
15. On the **Installation summary** page, click **Install**.
16. On the **Setup completed successfully** page, we recommend that you leave **Open the Encryption Backup or Restore Wizard** selected, and then click **Close**. For more information about backing up the encryption key, see Completing Deployment by Backing

Up the Encryption Key.

See Also

How to Install SharePoint Web Parts for the Self-Service Portal

How to Install SharePoint Web Parts for the Self-Service Portal

The home page for the Self-Service Portal in System Center 2012 – Service Manager is on the SharePoint Web Parts server. We recommend that you use Secure Sockets Layer (SSL) and install the SharePoint Web Parts using port 443.

When you installed Internet Information Services (IIS), the default website was configured to use port 80. If you want to install the SharePoint Web Parts on port 80, you must first move the default website in IIS to a different port—for example, port 8080—and then install the SharePoint Web Parts on port 80.

You can use this information to share Excel workbooks using SharePoint. For an example, see Configure Excel Services for a BI test environment.

Use the following procedure to install the SharePoint Web Parts server.

To install the SharePoint Web Parts server

1. Using the Operational Database Account, log on to the computer that will host the Self-Service Portal.
2. On the System Center 2012 – Service Manager installation media, double-click the **Setup.exe** file.
3. On the **Service Manager Setup Wizard** page, click **Service Manager web portal**.
4. On the **Portal Parts** page, click **SharePoint Web Parts**.
5. On the **Product registration** page, read the Microsoft Software License Terms, and, if applicable, click **I have read, understood, and agree with the terms of the license terms**, and then click **Next**.
6. On the **System check results** page, make sure that the prerequisite check passed or at least passed with warnings, and then click **Next**.
7. On the **Configure the Service Manager SharePoint site** page, complete these steps:
   a. In the **SSL certificate** list, select the Secure Sockets Layer (SSL) certificate that you want to use with the Self-Service Portal, and then click **Next**.
   b. In the **Port** text box, accept the default port, or type a new port. For example, type **443**.
   c. In the **URL** text box, type the URL for the web content server in the form of http://<computername>:<port> or https://<computername>:<port>.
   d. Click in any of the other text boxes, and then click **Next**.

   Note
   We strongly recommend the use of SSL. If you are using a self-signed certificate, make sure that the certification authority (CA) that issues the certificate has been

added to the Trusted Root Certification Authorities store. You must use the same HTTP protocol (HTTP or HTTPS) with both portal parts.

8. On the **Configure the account for the Service Manager SharePoint app pool** page, type a domain user and password, and then click **Test Credentials**. After you verify that you received a “The credentials were accepted” message, click **Next**.
9. On the **Help improve System Center Service Manager** page, indicate your preference for participation in the Customer Experience Improvement Program. As an option, click **Tell me more about the program**, and then click **Next**.
10. On the **Use Microsoft Update to help keep your computer secure and up-to-date** page, indicate your preference for using Microsoft Update to check for Service Manager updates. If you want Windows Update to check for updates, select **Initiate machine wide Automatic update**. Click **Next**.
11. On the **Installation summary** page, click **Install**.
12. On the **Setup completed successfully** page, click **Close**.

See Also

How to Grant Permissions on the SharePoint Site

How to Install Both the Web Content Server and SharePoint Web Parts on One Computer

When you are installing the web content server and SharePoint Web Parts on the same computer in System Center 2012 – Service Manager, you must install both components at the same time. After one component has been installed, you will not be able to run Setup again to install the other component.

Use the following procedure to install both the web content server and SharePoint Web Parts for the Self-Service Portal on the third computer.

To install the Self-Service Portal on one computer

1. Using the Operational Database Account, log on to the computer that will host the Self-Service Portal.
2. On the System Center 2012 – Service Manager installation media, double-click the **Setup.exe** file.
3. On the **Microsoft System Center Service Manager Setup Wizard** page, click **Service Manager Web portal**.
4. On the **Portal Parts** page, click **Web Content Server**, click **SharePoint Web Parts**, and then click **Next**.
5. On the **Product registration** page, read the Microsoft Software License Terms, and, if applicable, click **I have read, understood, and agree with the terms of the license terms**, and then click **Next**.
6. On the **Installation location** page, verify that sufficient free disk space is available, and then click **Next**. If necessary, click **Browse** to change the installation location of the

Service Manager management server.

Note
We recommend that you install the Self-Service Portal in the default location. Installing the Self-Service Portal in another location will require that you make configuration changes in Internet Information Services (IIS).

7. On the **System check results** page, make sure that the prerequisite check passed or at least passed with warnings, and then click **Next**.
8. On the **Configure the Service Manager Self-Service Portal name and port** page, do the following:
   a. In the **Website name** text box, accept the default name, or type a new name.
   b. In the **Port** text box, accept the default port, or type a new port.
   c. In the **SSL certificate** list, select the Secure Sockets Layer (SSL) certificate that you want to use with the Self-Service Portal, and then click **Next**.

Note
We strongly recommend the use of SSL. If you are using a self-signed certificate, make sure that the certification authority (CA) that issues the certificate has been added to the Trusted Root Certification Authorities store. You must use the same HTTP protocol (HTTP or HTTPS) with both portal parts.

9. On the **Select the Service Manager database** page, do the following:
   a. In the **Database server** text box, type the name of the computer that hosts the Service Manager database, and then press TAB.
   b. In the **SQL Server instance** list, select the instance name for the Service Manager database. (**Default** is the default SQL Server instance.)
   c. In the **Database** list, select the database that hosts the Service Manager database. (**ServiceManager** is the default database name.)
   d. Click **Next**.
10. On the **Configure the account for the Service Manager Self-Service Portal** page, click **Domain account**.
11. Specify the user name, password, and domain for the Service Manager services account that you specified during installation of Service Manager. For example, enter the account information for the SM_Acct domain user.
12. Click **Test Credentials**. After you verify that you received a “The credentials were accepted” message, click **Next**.
13. On the **Configure the Service Manager SharePoint Web site** page, do the following:
   a. In the **Web site name** text box, accept the default name, or type a new name.
   b. In the **SSL certificate** list, select the SSL certificate that you want to use with the Self-Service Portal.
   c. In the **Port** text box, accept the default port, or type a new port.

Note
This is the port number that will be used for accessing the Self-Service

Portal.

d. In the **Database server** text box, type the name of the computer that hosts the SharePoint database, and then press TAB. For example, select the default entry for the computer on which you are installing the SharePoint website.

e. In the **SQL Server instance** list, select the instance name for the SharePoint database. (**Default** is the default SQL Server instance.)

f. In the **Database name** text box, accept the default database name, or type a new name

g. Click **Next**.

14. On the **Configure the account for Service Manager SharePoint application pool** page, type a domain user and password, and then click **Test Credentials**. After you verify that you received a "The credentials were accepted" message, click **Next**.
15. On the **Help improve System Center Service Manager** page, indicate your preference for participation in the Customer Experience Improvement Program. As an option, click **Tell me more about the program**, and then click **Next**.
16. On the **Installation summary** page, click **Install**.
17. On the **Setup completed successfully** page, click the link to test the URL for the Self-Service Portal. Make a note of this URL, and then click **Close**.

How to Grant Permissions on the SharePoint Site

Use the following procedure to grant permissions to the Self-Service Portal SharePoint site in System Center 2012 – Service Manager.

To grant permissions on the Self-Service Portal SharePoint site

1. Log on to the computer that hosts the SharePoint Web site with administrative credentials.
2. Open a browser and connect to the SharePoint site at http://localhost:<port>/_layouts/settings.aspx.
3. In the upper left area of the web page, click **Site Actions**, and then click **Site Permissions**.
4. On the SharePoint ribbon, click **Grant Permissions**.
5. In the **Grant Permissions** box, in the **Users/Groups** box, type the Active Directory name for the users or user groups to whom you want to grant access.
6. In the **Grant Permissions** area, click **Read – Can view pages and list items and download documents**, and then click **OK**.
7. Close the browser.

See Also

How to Verify the Installation of the Self-Service Portal

How to Configure User Authentication for the SharePoint Site

The option to **Sign in as Different User** has been removed from the Service Manager SharePoint site template file included in System Center 2012 – Service Manager. You should not enable this option in SharePoint site template files because using the option can result in a submitted user request having an incorrect affected user.

If you want to support multiple users on a computer, you should use the following procedure to configure user authentication in the browser that you use to connect to the Self-Service Portal SharePoint site in System Center 2012 – Service Manager. Afterward, you should notify your end-users that they should use the **Sign Out** option when they are done using the Self-Service Portal.

To configure user authentication for the Self-Service Portal SharePoint site

1. Log on to the computer that hosts the SharePoint Web site with the user credentials of an end-user who will submit requests by using the Self-Service Portal.
2. Open Internet Explorer and then click **Tools**.
3. Select **Internet Options** and then click the **Security** tab.
4. Click **Trusted Sites** and then **Custom Level**.
5. Under **User Authentication** select **Prompt for user name and password** and then click **OK**.

See Also

Self-Service Portal Deployment Scenarios for System Center 2012 - Service Manager

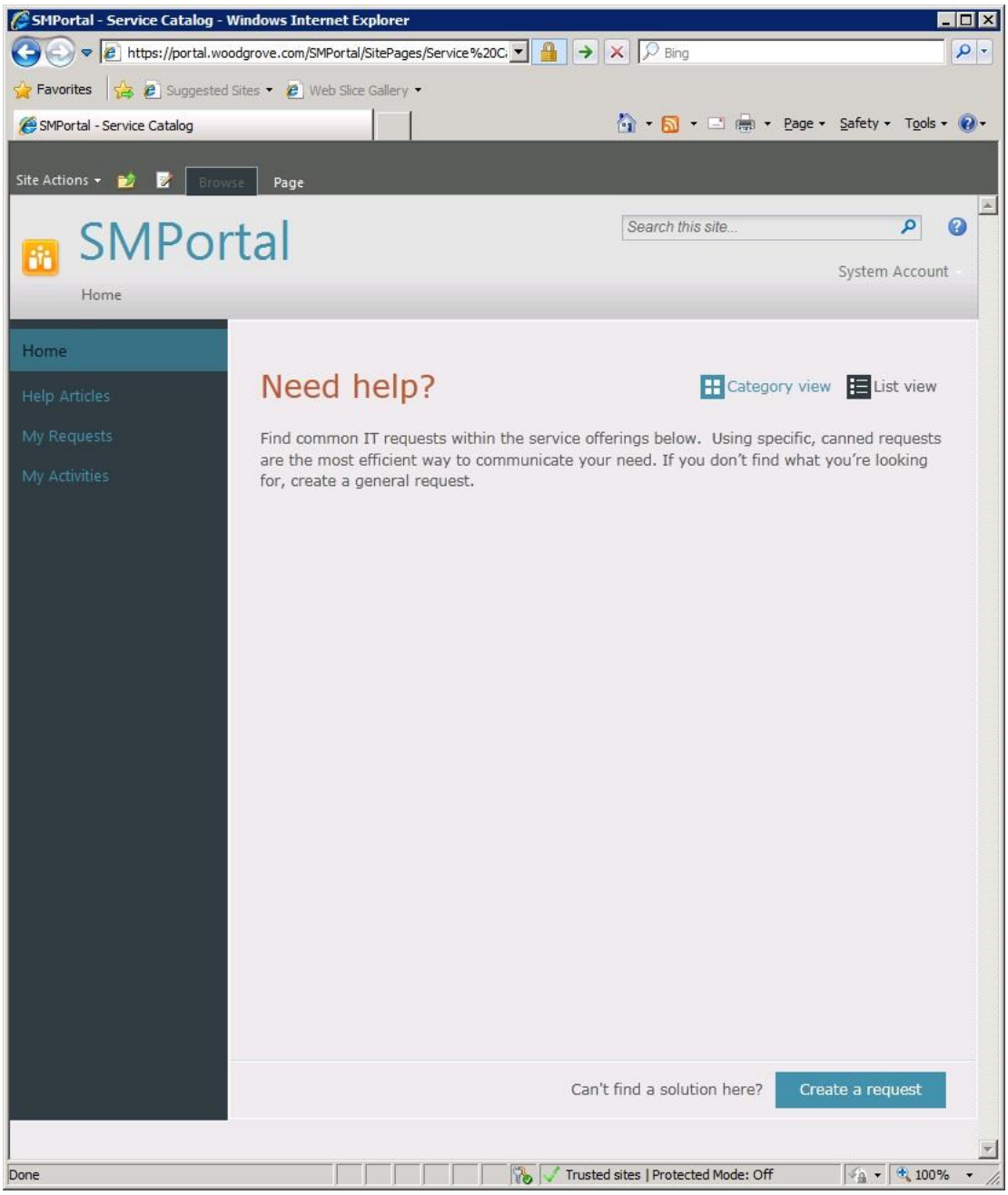
How to Verify the Installation of the Self-Service Portal

The default portal name for the Self-Service Portal in System Center 2012 – Service Manager is SMPortal. Use the following procedure to verify the installation of the Self-Service Portal.

To verify the installation of the Self-Service Portal

1. On the computer hosting the SharePoint Web site, open Internet Explorer.
2. In the address line, type one of the following:
   a. http://localhost:<port>/SMPortal (if you are not using Secure Sockets Layer (SSL))
   b. https://localhost:<port>/SMPortal (if you are using SSL)

   Where <port> is the port number that is defined when the SharePoint Parts server is installed.
3. The default home page for the Self-Service Portal should appear as shown in the following illustration.



How to Configure the Default IIS Website Port

When you installed Internet Information Services (IIS), the default website was configured to use port 80. The SharePoint Web Parts is the home page for the Self-Service Portal. If you want to install the SharePoint Web Parts on port 80, you must first move the default website in IIS to a different port—for example, port 8080—and then install the SharePoint Web Parts on port 80.

Use the following procedure to move the IIS default website to port 8080 so that you can install the SharePoint website on port 80.

To configure the default IIS website to use port 8080

1. On the Windows desktop, click **Start**, click **Administrative Tools**, and then click **Internet Information Services (IIS) Manager**.
2. In **Internet Information Services (IIS) Manager**, in the **Connections** pane, expand the computer name, expand **Sites**, and then click **Default Web Site**.
3. In the **Actions** pane, under **Edit Site**, click **Bindings**.
4. In the **Site Bindings** dialog box, click the **http** entry, and then click **Edit**.
5. In the **Edit Site Binding** dialog box, in **Port**, type **8080**, and then click **OK**.
6. In the **Site Bindings** dialog box, click **Close**.
7. In the **Actions** pane, under **Manage Web Site**, click **Stop**, and then click **Start**.

SSL Certificates for the Self-Service Portal

We strongly recommend using Secure Sockets Layer (SSL) certificates with the Self-Service Portal in System Center 2012 – Service Manager. The Self-Service Portal consists of two parts, a Microsoft SharePoint website server and a web content server. When you are using SSL on the Self-Service Portal, you should use SSL certificates on both parts.

When a client connects to the Self-Service Portal, they are connecting to the SharePoint website server. The framework of the portal is delivered to the client from the SharePoint website server. The SharePoint server instructs the browser to download the Silverlight components from the web content server. The Silverlight components then contact the Windows Communication Foundation (WCF) service on the web content server. You define the URL for the web content server when you are deploying the SharePoint website server, and it is this web content server URL that is delivered to the client.

If there is a certificate-related problem when a client is establishing an SSL connection to the Self-Service Portal, a certificate warning appears. For example, if the name the client that is typed for the URL does not match the computer name on the certificate, a name mismatch warning appears. The client has the option to continue with the connection. However, if there is a certificate-related error when the client's computer attempts to download Silverlight components from the web content server, there is no opportunity to manually respond to the certificate warning. The result is that part of the Self-Service Portal web page appears blank.

Therefore, you should be aware of the following when you are working with SSL certificates:

- The certificates that you use for the Self-Service Portal must be issued from a Certification Authority that is trusted by the client.
- The name on the certificate for the SharePoint website server must match the URL that your users enter into the browser. For example, if the user types the URL https://portal/SMPortal,

then the certificate must have been issued to portal and not, for example, portal.woodgrove.com.

- The name on the certificate for the web content server must match the name that you entered when you deployed the SharePoint website server.

The default port for SSL is 443. So that your users do not have to enter a port number in the browser when they connect to the Self-Service Portal, you should specify port 443 when you deploy the SharePoint website server. Because users never enter the URL for the web content server (remember, the web content server URL is delivered to the client when users connect to the SharePoint website server), you can use a port other than 443 (for example, port 444) for the SSL port on the web content server. If you deploy both the SharePoint website server and web content server on the same computer, you be prompted to specify the options for the web content server first; then, you install the SharePoint website server. Therefore, the first time that you are prompted to enter a port number, it will be for the web content server, and you should not use port 443 if you plan to install the SharePoint website server on the same computer. During deployment, the second port number that you are asked to provide will be for the SharePoint website server, and that is when we recommend using port 443.

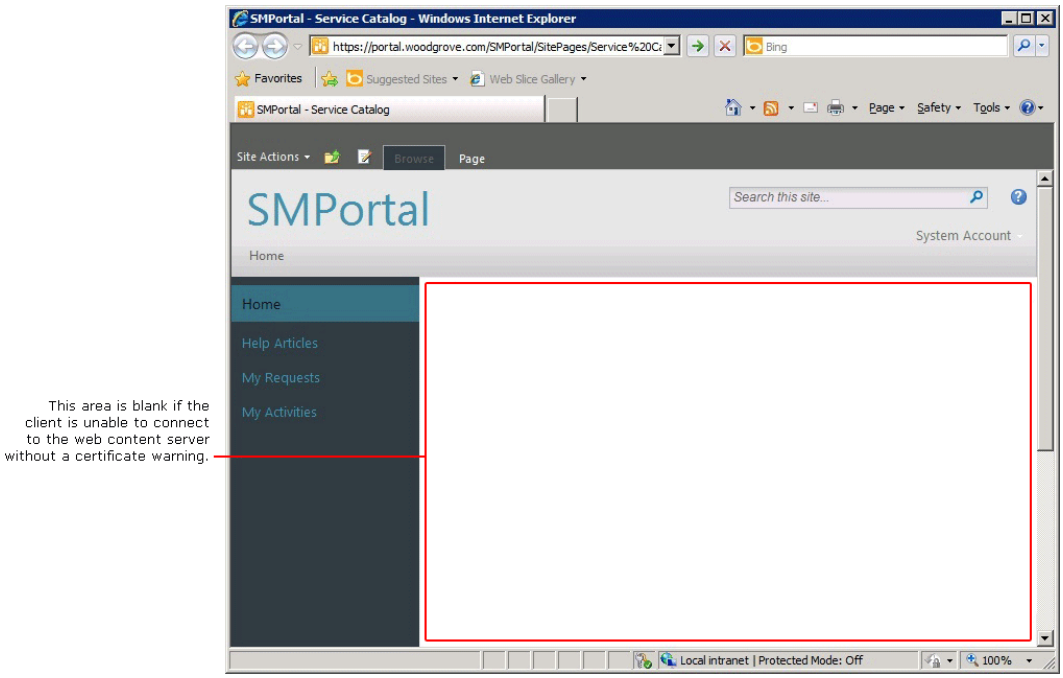
If you are deploying both the SharePoint website server and web content server on the same computer, you need only one certificate. That one certificate will work for both ports. If you are deploying the SharePoint website server and web content server on different servers (which is recommended in a production environment), you will need one certificate for each computer.

Certificates are labeled by their subject name, and subject names on certificates do not have to be unique. During Service Manager setup, certificates are listed by their subject name. Therefore, during deployment of the Self-Service Portal, it is possible that you will be presented with multiple certificates with the same name. If you pick the second certificate in the list of certificates that are available to use, there is a possibility that Service Manager might use the first one in the list. This can be especially problematic when the client is attempting to connect to the web content server, because there is no opportunity for manual intervention. To resolve this issue, you can change the certificate in Internet Information Services (IIS) Manager.

The following sections expand on the steps you can take to solve SSL-related problems that you might encounter with the Self-Service Portal.

Certificate “Issued to” Name

The address that you type into the browser to connect to the SharePoint website and the address of the web content server that was defined in the SharePoint website *must each match the “Issued to” name on their associated certificate or certificates*. When you connect to the SharePoint website, if the address that you type in the browser does not match the “Issued to” name on the certificate, you will see a Certificate Warning and the background in the browser's address line will be red. If the web content server address that was configured in the SharePoint website does not match the “Issued to” name on the certificate, the center frame in the browser will be blank, as shown in the following illustration.



Name Mismatch on the SharePoint Website

If the address that you type in the browser when you connect to the SharePoint website does not match the “Issued to” address in the certificate, you have the following options:

- Continue past the warning and continue
- Change the name in the address line in the browser to match the “Issued to” name on the certificate
- Obtain a new certificate where the “Issued to” name matches the address that you want to enter in the browser

Name Mismatch for the Web Content Server

If the address for the web content server that is configured on the SharePoint website does not match the “Issued to” address in the certificate on the web content server, the center frame in the Self-Service Portal will be blank. In this case, you have the following options:

- Obtain a new certificate for the web content server that matches the URL that is configured on the SharePoint website
- Configure the address for the web content server that is stored on the SharePoint website to match the “Issued to” name on the certificate that is used for the web content server

Certificate Must Be Trusted

Make sure that the Certification Authority (CA) that issued your certificates is listed in the Trusted Root Certification Authority store for the clients accessing the site. For information about determining whether a certificate is trusted, see How to Examine Properties of a Certificate.

SSL Certificates for the Self-Service Portal Topics

- How to Examine Properties of a Certificate

  Describes how to learn what the “Issue to” name is for a certificate, determine whether the certificate is trusted, and determine the certificate thumbprint.

- How to Reconfigure the Web Content Server URL

  Describes the procedure to use if you are using a different certificate for the web content server than the certificate that you originally selected during installation.

- How to Select a Certificate for Web Content Server Use

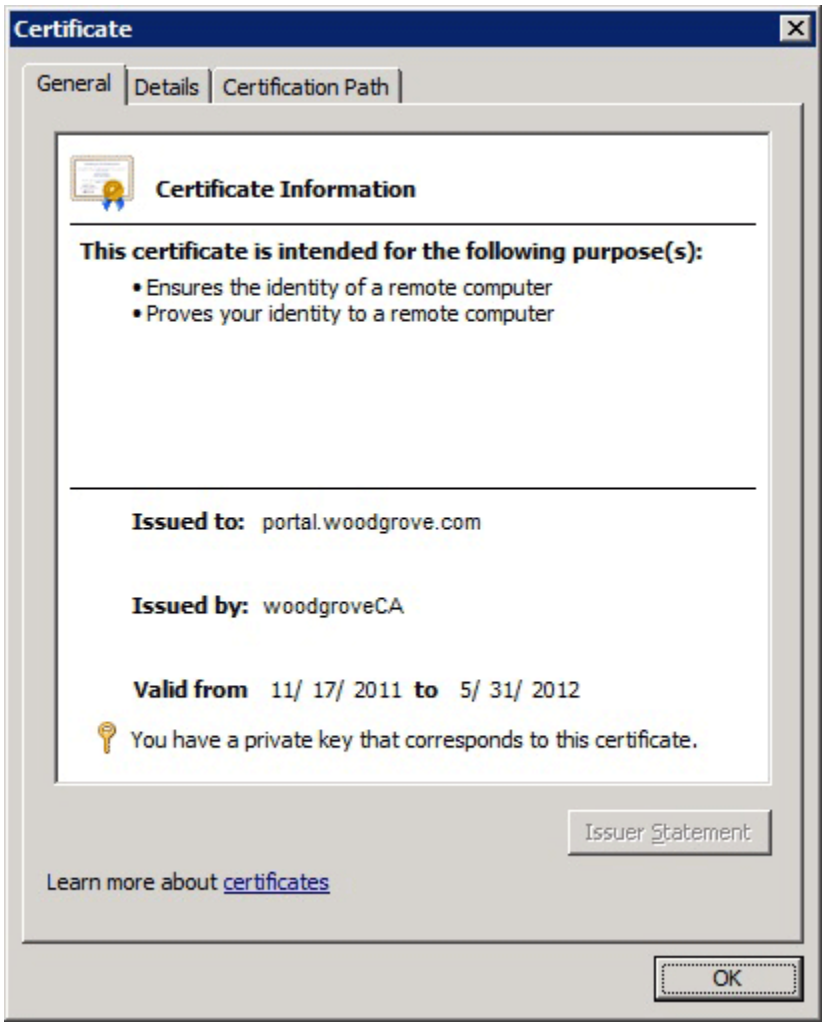
  Describes how to select the certificate that is used for the web content server.

- How to Connect Directly to the Web Content Server Using a Browser

  Describes how to use a browser to connect to the web content server and test a certificate.

How to Examine Properties of a Certificate

Use this procedure to examine the properties of a certificate you use with the Self-Service Portal in System Center 2012 – Service Manager. Make sure that the URL you use for the Self-Service Portal matches the name on the certificate, and make sure that the certification authority (CA) that issued the certificate is a trusted CA. This gives you the opportunity to make sure that the URL you specify for the Self-Service Portal does not result in any certificate warnings or blank frames in the browser. In this example, the computer is in Woodgrove National Bank. The fully qualified domain name (FQDN) for the computer is portal.woodgrove.com. The CA that issued the certificate is woodgroveCA. Note the Issued to” and “Issued by” fields in the following illustration.



To view the properties of a certificate, you add the Certificates snap-in to the Microsoft Management Console (MMC). When you examine the certificate, the value in the “Issued to” field represents the URL that you must use when you are accessing the SharePoint website server, and the value in the “Issued to” field must match the URL that the your browser will use to connect to the web content server. The value in the “Issued by” field represents the CA that issued this certificate, and it must trace back to the trusted root.

You can also use this procedure to determine the thumbprint of a certificate.

To examine the properties of a certificate

1. Log on to the computer where you want to examine a certificate with administrator privileges.
2. Click **Start**, in **Search programs and files** type **mmc**, and then press Enter.
3. In the **Console1** window, click **File**, and then click **Add/Remove Snap-in**.
4. In **Add or Remove Snap-ins**, click **Certificates**, and then click **Add**.

5. In the **Certificates** snap-in, click **Computer account**, and then click **Next**.
6. In **Select Computer**, make sure that **Local computer** is selected, and then click **Finish**.
7. In **Add or Remove Snap-ins**, click **OK**.
8. In the **Console1** window, expand **Certificates (Local Computer)**, expand **Personal**, and then click **Certificates**.
9. In the **Issued To** pane, double-click the certificate that you want to use for the Self-Service Portal. Examine the **Issued to** and **Issued by** fields.
10. Click **OK**.
11. In the **Console1** window, expand **Trusted Root Certification Authorities**, and then click **Certificates**.
12. In the **Issued To** pane, make sure that the CA that issued your certificate is listed here.

To determine the thumbprint of a certificate

1. If you have not done so already, create a certificate snap-in, as described in steps 1 through 8 in the previous procedure.
2. In the **Issued To** pane, double-click the certificate that you want to examine.
3. In the **Certificate** dialog box, click **Details**.
4. In the **Show** list, click **Properties Only**.
5. Copy the thumbprint and use it to define the certificate that you want to use.
6. Click **OK** to close the **Certificate** dialog box.

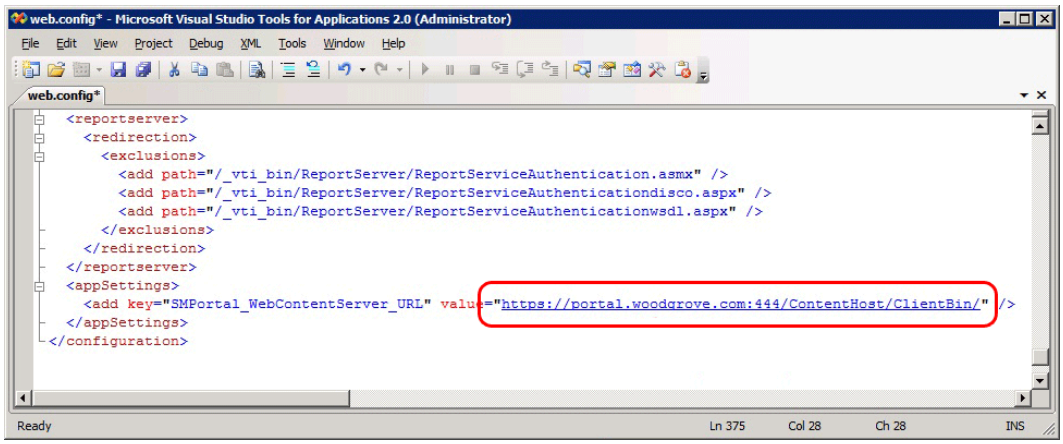
See Also

SSL Certificates for the Self-Service Portal

How to Reconfigure the Web Content Server URL

When you use certificates with the Self-Service Portal in System Center 2012 – Service Manager, you can use this procedure to change the web content server URL. For example, you may have installed the web content server only to find that the URL you used for the web content server results in a certificate warning. While resolving the certificate warning issue—for example, for a name mismatch—you may find that you are going to use a different URL to connect to the web content server. In this case, you must open a web.config file on both the SharePoint website server and web content server and update the URL.

In this example, the computer is in Woodgrove National Bank, and the fully qualified domain name (FQDN) for the computer is portal.woodgrove.com. When the web content server was installed, Secure Sockets Layer (SSL) and port 444 were used. (Port 443 was saved for the SharePoint website.) Now, the web.config file is edited using the URL https://portal.woodgrove.com:444/ContentHost/ClientBin/, as shown in the following illustration. (This image is of the web.config file on a SharePoint website server.)



To reconfigure the web content server URL on the SharePoint website server

1. Log on to the computer that hosts the SharePoint website server with administrator privileges.
2. Using Windows Explorer, navigate to the folder location where you installed the SharePoint website server. The default location is <drive>:\\intetpub\wwwroot\wss\VirtualDirectories\Service Manager Portal.
3. Right-click the web.config file, and open it with the editor of your choice, for example, Notepad.
4. Scroll to the bottom of the web.config file, locate the <appSettings> area, and then locate the <add key=…> line.
5. Edit the URL in the value= section to match the new URL that you want to use for the web content server.
6. Close the editor and save your changes.

To reconfigure the web content server URL on the web content server

1. Log on to the computer that hosts the web content server with administrator privileges.
2. Using Windows Explorer, navigate to the folder location where you installed the web content server. The default is <drive>:\\inetpub\wwwroot\System Center Service Manager Portal\ContentHost.
3. Right-click the file web.config, and then open it with the editor of your choice, for example, Notepad.
4. Scroll to the bottom of the web.config file, locate the <appSettings> area, and then locate the <add key=…> line.
5. Edit the URL in the value= section to match the new URL that you want to use for the web content server.
6. Close the editor and save your changes.

See Also

SSL Certificates for the Self-Service Portal

How to Select a Certificate for Web Content Server Use

In order for content from the web content server to display properly in the Self-Service Portal, the URL that is used to connect with the web content server must match the name on the web content server certificate. A potential solution to a certificate name mismatch problem is to change the certificate that is used by the web content server. Use the following procedure to select an alternative Secure Sockets Layer (SSL) certificate for use with the computer that is hosting the web content server.

In order to use the procedure, you must already have a certificate issued from a certification authority.

To select a certificate for web content server use

1. Log on to the computer that hosts the web content server with administrative privileges.
2. Click **Start**, point to **Administrative Tools**, and then click **Internet Information Services (IIS) Manager**.
3. In **Internet Information Services (IIS) Manager**, in the **Connections** pane, expand the computer name, expand **Sites**, and then click **SCSMWebContentServer**.

   Note
   SCSMWebContentServer is the default name used during setup of the Self-Service Portal.
4. In the **Actions** pane, under **Edit Site**, click **Bindings**.
5. In **Site Bindings**, select the port that you used for the SCSMWebContentServer then click **Edit**.
6. In **Edit Site Binding**, click the **SSL certificate** list, and then select the new certificate that you want to use.

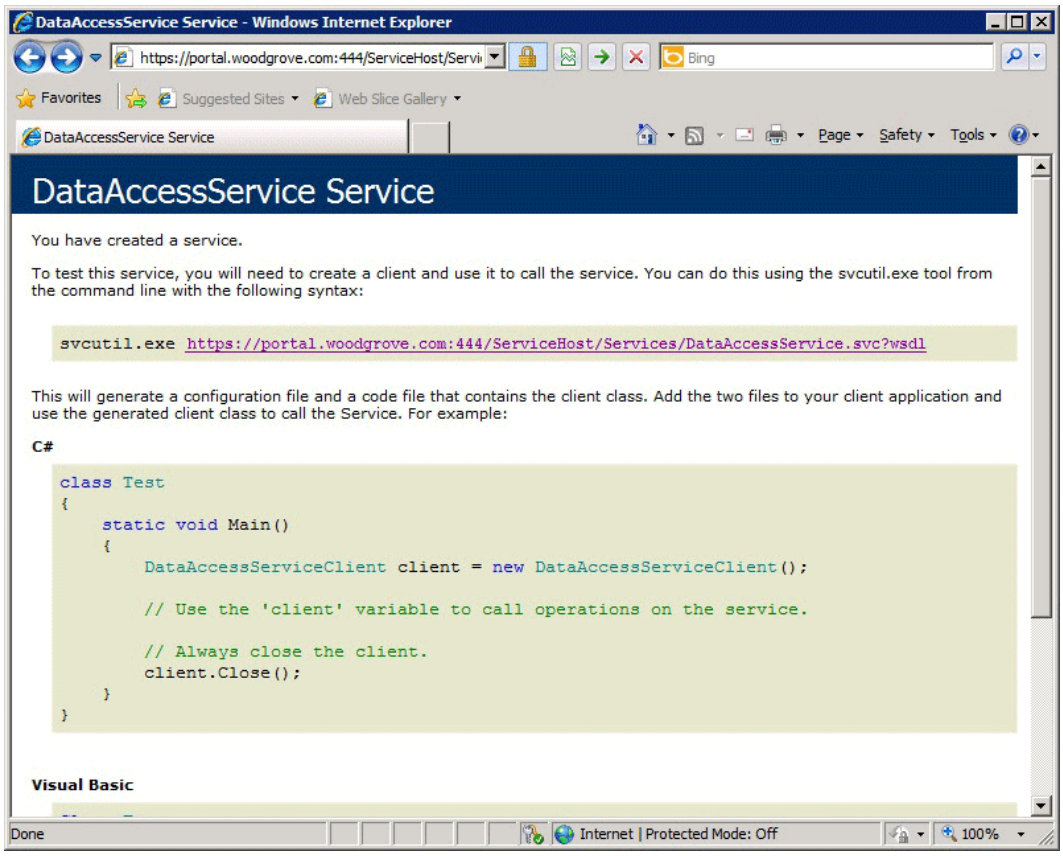
See Also

SSL Certificates for the Self-Service Portal

How to Connect Directly to the Web Content Server Using a Browser

When you use certificates with the Self-Service Portal in System Center 2012 – Service Manager, you can use this procedure to connect directly to the web content server using a browser. This gives you the opportunity to make sure that the URL you specify for the web content server does not result in any certificate warnings.

In this example, the computer is in Woodgrove National Bank, and the fully qualified domain name (FQDN) for the computer is portal.woodgrove.com. When the web content server was installed, Secure Sockets Layer (SSL) and port 444 were used. (Port 443 was saved for the SharePoint website.) The browser appears as shown in the following illustration.



To connect directly to the web content server with a browser

1. On any computer on the network, open Internet Explorer.
2. In the address line, type the URL that you want to use for the test. For this example, type **https://portal.woodgrove.com:444/ServiceHost/Services/DataAccessService.svc**.
3. Examine the resulting web page for the following:
   a. The web page loaded with no certificate warnings.
   b. The background in the address bar is white (indicating no certificate errors).
   c. The web page looks very similar to the previous illustration.
4. Make a note of this URL that you used successfully, and use this URL as the URL for the web content server when you deploy the SharePoint website. In this example, the URL for the web content server is **https://portal.woodgrove.com:444**.

See Also

SSL Certificates for the Self-Service Portal

Guidance for Load Balancing System Center 2012 - Service Manager

This section describes how you can load-balance Service Manager management servers and the Self-Service Portal in System Center 2012 – Service Manager.

Load Balancing Topics

- Load-Balancing Service Manager Management Servers

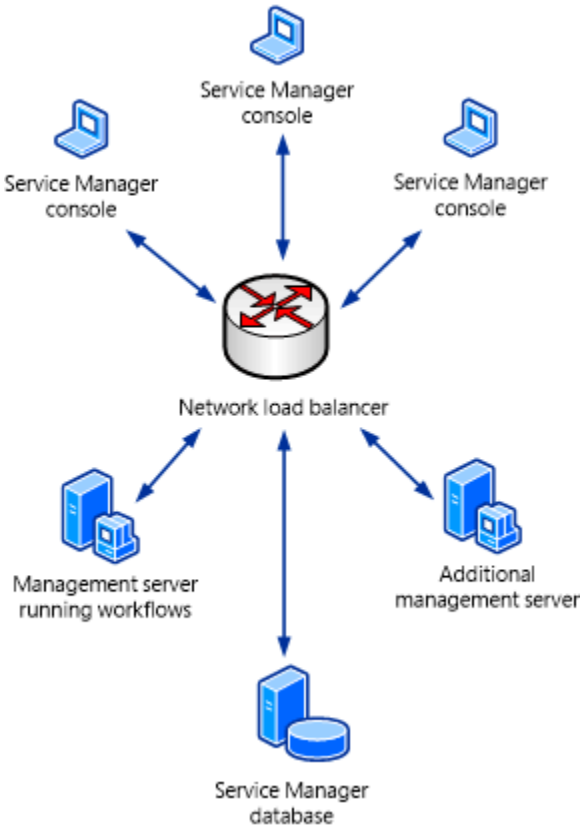
  Describes how to load-balance two or more Service Manager management servers.
- Load-Balancing the Self-Service Portal

  Describes how to load-balance the Self-Service Portal.

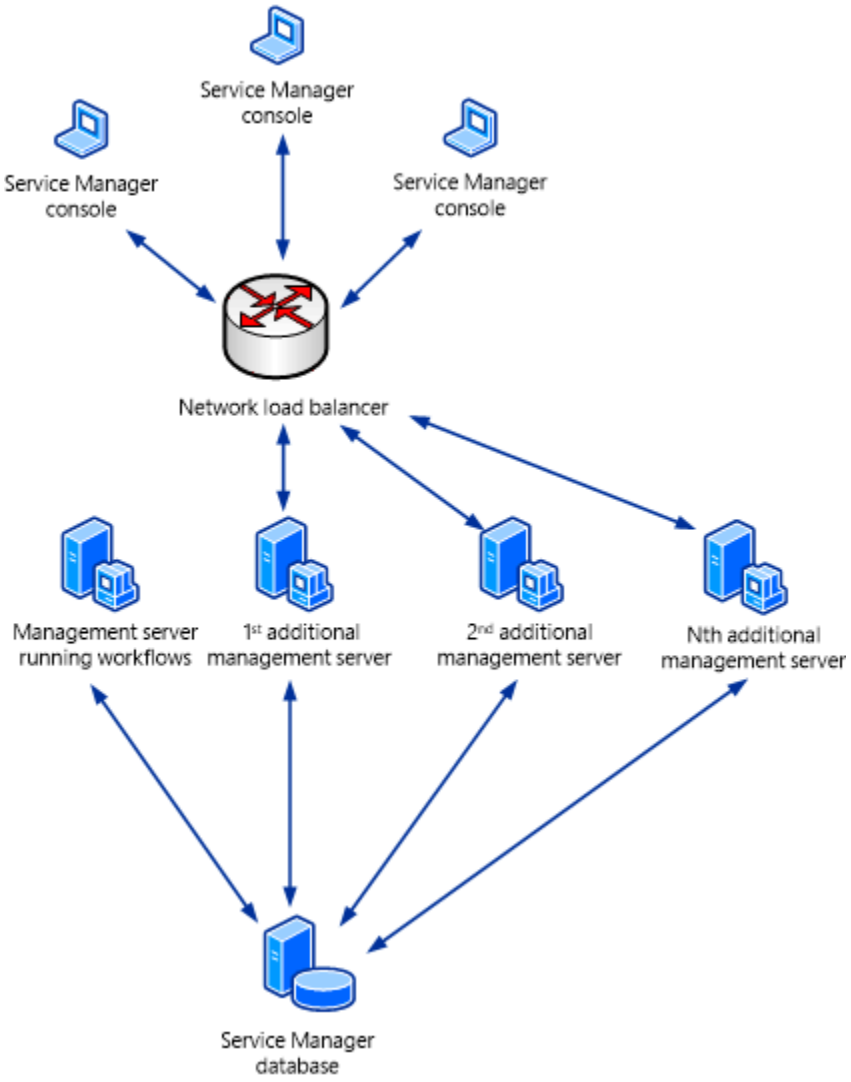
Load-Balancing Service Manager Management Servers

You can use network Load Balancing (NLB) in Windows Server 2008 to configure a pool of computers so that they take turns responding to requests. In System Center 2012 – Service Manager, the initial Service Manager management server that you deploy is the server that processes workflows. You can deploy additional management servers to provide failover for a failed initial management server and to provide load balancing for handling Service Manager console. For more information about Windows Server 2008 NLB, see the Network Load Balancing Deployment Guide. For more information about additional Service Manager management servers, see **Deploying Additional Service Manager Management Servers**.

As a minimum, you have to deploy an initial Service Manager management server—the management server that hosts the workflow processes—and at least one additional Service Manager management server. In an environment of this kind that consists of two Service Manager management servers, configure NLB to use both management servers, as shown in the following illustration.



If you deploy two or more additional Service Manager management servers, you can isolate the initial Service Manager management server from the NLB pool. This reduces the workload on the initial Service Manager management server, resulting in better workflow performance. It also load-balances all of the Service Manager consoles across the remaining Service Manager management servers. This scenario is shown in the following illustration.



Load-Balancing the Self-Service Portal

This topic describes how to configure the Self-Service Portal in a load balancing environment. There are two computers in a Self-Service Portal deployment, the SharePoint computer and the web content server (WCS). The SharePoint computer provides two basic functions; it generates the framework of the web page you see in the Self-Service Portal and it delivers the Silverlight code required for the Self-Service Portal to function. The WCS computer reads and writes data to the Service Manager database and generates the content you see in the center pane of the Self-Service Portal.

Of the two computers in the Self-Service Portal, the WCS computer performs most of the work and we recommend that you first consider load balancing this computer.

Load Balancing the WCS Computer

To create a load balancing environment for the WCS, you deploy multiple computers running Internet Information Services (IIS) and install WCS on each computer. If you are using Secure Socket Layer (SSL), which is recommended, you deploy a certificate with the same name to each computer. When you deploy the SharePoint computer, instead of specifying the URL for the WCS, you specify the URL for the node that is responsible for load balancing. If you are deploying a load balancing environment to an existing Self-Service Portal installation, you will need to edit the web.config file on the SharePoint and WCS computer and specify the URL for the load balancing node there. See the topic How to Configure the Self-Service Portal for Web Content Server Load Balancing.

Load Balancing the SharePoint Computer

Information about how to load balance the SharePoint computers is available at Multiple servers for a three-tier farm (SharePoint Server 2010). Be sure that you edit the web.config file on the SharePoint servers to configure the URL for the either the web content server or the web content server load balancing node. See the procedure "To define the WCS load balancing URL on the SharePoint website server" in this guide.

How to Configure the Self-Service Portal for Web Content Server Load Balancing

When a user starts a browser and connects to the Self-Service Portal in System Center 2012 – Service Manager, he or she is actually connecting to the SharePoint website server. The SharePoint website server delivers the framework for the Self-Service Portal, but it also delivers the URL for the web content server. In a web content server load-balancing environment, you want the SharePoint website server to deliver the URL for the web content server load-balancing node, not the URL for a specific web content server. If you are installing a new Self-Service Portal, you can specify the web content server load-balancing URL during setup. If you added web content server load-balancing to an existing Self-Service Portal installation, you can use the following procedure to reconfigure the URL for the web content server.

You will edit two files, one on the computer that hosts the SharePoint server and one on the computer that hosts the web content servers.

To define the web content server load-balancing URL on the SharePoint website server

1. Log on to the computer that hosts the SharePoint website server with administrator privileges.
2. Using Windows Explorer, navigate to the folder location where you installed the SharePoint website server. The default location is <drive>:\\intetpub\wwwroot\wss\VirtualDirectories\Service Manager Portal.
3. Right-click the Web.config file, and open it with the editor of your choice, for example, Notepad.
4. Scroll to the bottom of the Web.config file, locate the <appSettings> area, and then locate

the <add key=…> line.

5. Edit the URL in the value= section to match the new URL that you want to use for the web content server load-balancing node.
6. Close the editor, and save your changes.

To reconfigure the web content server URL on the web content servers

1. Log on to the computer that hosts each of the web content servers with administrator privileges.
2. Using Windows Explorer, navigate to the folder location where you installed the web content server. The default location is <drive>:\\inetpub\wwwroot\System Center Service Manager Portal\ContentHost.
3. Right-click the Web.config file, and then open it with the editor of your choice, for example, Notepad.
4. Scroll to the bottom of the Web.config file, locate the <appSettings> area, and then locate the <add key=…> line.
5. Edit the URL in the value= section to match the new URL that you want to use for the web.config load-balancing node.
6. Close the editor, and save your changes.

Completing Deployment by Backing Up the Encryption Key

When you deployed your System Center 2012 – Service Manager management server and database, an encryption key was created so that data between the Service Manager and data warehouse management servers and their associated databases could be encrypted. When you deployed the Self-Service Portal, an encryption key was created so that data between the Self-Service Portal and the Service Manager database could be encrypted.

Your disaster recovery strategy depends on you backing up the encryption keys as soon as you complete the Service Manager installation. After you back up the encryption keys and store them in a safe location, you can recover from software or hardware failures on the Service Manager management servers, data warehouse management servers, and Self-Service Portal.

Use the Encryption Key Backup or Restore Wizard and the following procedures to back up and restore encryption keys on the Service Manager management servers and Self-Service Portal. This wizard is located on the Service Manager installation media in the Tools\SecureStorageBackup folder.

To back up the encryption key

1. Log on to the computer that hosts the Service Manager management server, data warehouse management server, or Self-Service Portal by using an account that is a member of the Administrators group.

2. In Windows Explorer, open the Tools\SecureStorageBackup folder on the installation media.
3. Right-click **SecureStorageBackup.exe**, and then click **Run as administrator** to start the Encryption Key Backup or Restore Wizard.
4. On the **Introduction** page, click **Next**.
5. On the **Backup or Restore?** page, select **Backup the Encryption Key**, and then click **Next**.
6. On the **Provide a Location** page, type the path and file name for the encryption key. For example, if you want to specify the file name SMBackupkey.bin as the encryption key and save the key on the server MyServer in the Backup folder, type **\\MyServer\Backup\SMBackupkey.bin**, and then click **Next**.
7. On the **Provide a Password** page, type a password that contains at least eight characters in the **Password** box. In the **Confirm Password** box, re-enter the same password, and then click **Next**.

   Note

   Recovery of the password is not possible if it is lost or forgotten.
8. After you receive the message “Secure Storage Backup Complete,” click **Finish**.

To restore the encryption key

1. Log on to the computer that hosts the Service Manager management server, data warehouse management server, or Self-Service Portal by using an account that is a member of the Administrators group.
2. In Windows Explorer, open the Tools\SecureStorageBackup folder on the installation media.
3. Right-click **SecureStorageBackup.exe**, and then click **Run as administrator** to start the Encryption Key Backup or Restore Wizard.
4. On the **Introduction** page, click **Next**.
5. On the **Backup or Restore?** page, select **Restore the Encryption Key**, and then click **Next**.
6. On the **Provide a Location** page, type the path and file name for the encryption key. For example, if you want to specify the file name SMBackupkey.bin for the encryption key and save the key on the server MyServer in the Backup folder share, type **\\MyServer\Backup\SMBackupkey.bin**, and then click **Next**.
7. On the **Provide a Password** page, type the password that you used to back up the encryption key in the **Password** box. In the **Confirm Password** box, re-enter the same password, and then click **Next**.
8. After you receive the message, **Secure Storage Key Restore Complete**, click **Finish**.

Indexing Non-English Knowledge Articles

If you have existing knowledge articles or are planning to create knowledge articles in any language other than English, use the following procedure to resolve an indexing issue in Microsoft SQL Server 2008 with Service Pack 1 (SP1). This issue deals with non-English characters that are used in only the Analyst Content and the Internal Content fields in a knowledge article. You must perform this procedure on the computer that hosts the System Center 2012 – Service Manager database. You have two tasks to perform. The first is to edit the registry, and the second is to run a series of SQL Server query commands on the Service Manager database.

Caution

Incorrectly editing the registry might severely damage your system; therefore, before making changes to the registry, back up any valued data on the computer.

You need three pieces of information for this procedure:

- This globally unique identifier (GUID): E2403E98-663B-4DF6-B234-687789DB8560
- The GUID of the .rtf file that you will discover in the following procedure
- The location of the file rtffil.dll, typically, C:\Windows\System32

For this procedure, it is assumed that the file rtffil.dll is located in the C:\Windows\System32 folder.

To edit the registry

1. On the computer hosting the Service Manager database, log on to the computer as a user with administrative credentials.
2. On the Windows desktop, click **Start**, and then click **Run**.
3. In the **Run** dialog box, in the **Open** box, type **regedit**, and then click **OK**.
4. If the default instance was selected during Setup, in the **Registry Editor** window, expand **HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft SQL Server\MSSQL10.MSSQLSERVER\MSSearch\Filters\.rtf**.

   Note

   If the default instance was not selected during setup, the **MSSQL10.MSSQLSERVER** node will be different.
5. In the right pane, double-click **Default**.
6. In the **Edit String** dialog box, in the **Value data** box, make note of the GUID that you find here. This is the GUID of the rtf. file that you will use in step 8. Replace this value with the provided GUID, E2403E98-663B-4DF6-B234-687789DB8560. Make sure that open and close brackets surround this GUID. Click **OK**.
7. In the registry tree, above the **Filters** node that you are currently in, is the **CLSID** node. Expand **CLSID**.
8. In the left pane of the registry editor, locate the GUID that you saved from step 6. Right-click this node, and then click **Rename**.

9. Rename this node by using the provided GUID, E2403E98-663B-4DF6-B234-687789DB8560. Make sure that open and close brackets surround the GUID.
10. In the right pane, double-click the **Default** key.
11. In the **Edit String** dialog box, in the **Value data** box, type the path of the file rtffilt.dll. For example, type **c:\windows\system32\rtffilt.dll**, and then click **OK**.
12. Verify that the data entry for the **ThreadingModel** key is set to **Both**.
13. Close the Registry Editor.

To run the SQL Server commands

1. On the computer hosting the Service Manager database, on the Windows desktop, click **Start**, click **All Programs**, click **Microsoft SQL Server 2008**, and then click **SQL Server Management Studio**.
2. In the **Connect to Server** dialog box, perform the following:
   a. In the **Server Type** list, select **Database Engine**.
   b. In the **Server Name** list, select the server and instance for your Service Manager database.
   c. In the **Authentication** list, select **Windows Authentication**, and then click **Connect**.
3. In the **Object Explorer** pane, expand **Databases**, and then click **ServiceManager**.
4. In the toolbar, click **New Query**.
5. In the center pane, type the following commands, and then click **Execute**.

```
exec sp_fulltext_service 'verify_signature', 0
go
exec sp_fulltext_service 'update_languages'
go
exec sp_fulltext_service 'restart_all_fdhosts'
go
```

6. In the **Messages** tab, verify that the message “Command(s) completed successfully” appears.

To verify changing the .rtf filter

1. On the computer hosting the Service Manager database, on the Windows desktop, click **Start**, click **All Programs**, click **Microsoft SQL Server 2008**, and then click **SQL Server Management Studio**.
2. In the **Connect to Server** dialog box, perform the following:
   a. In the **Server Type** list, select **Database Engine**.
   b. In the **Server Name** list, select the server and instance for your Service Manager database.
   c. In the **Authentication** list, select **Windows Authentication**, and then click **Connect**.

3. In the **Object Explorer** pane, expand **Databases**, and then click **ServiceManager**.
4. In the toolbar, click **New Query**.
5. In the center pane, type the following, and then click **Execute**:

```
select * from sys.fulltext_document_types where document_type
= '.rtf'
```

6. The results pane shows the following results:

document_type	.rtf
class_id	E2403E98-663B-4DF6-B234-687789DB8560
path	C:\Windows\System32\Rtffilt.dll

Troubleshooting System Center 2012 - Service Manager Deployment Issues

An installation log file is captured during the installation of System Center 2012 – Service Manager. After Service Manager is running, various events are captured in the Windows Event Log. In addition, there are some Windows PowerShell commands that you can use to help troubleshoot data warehouse jobs. For more information, see "Troubleshoot Data Warehouse Jobs" in the Administrator's Guide for System Center 2012 – Service Manager.

Installation Log Files

A log file, SCSMInstall.log, captures the progress of the installation. You can use this log file to troubleshoot a failed installation. You can find this log file in the %temp% folder. To troubleshoot installation problems, you can open the log files and search for a line that reads **Return Value 3**. If you find such a line in the log file, look above this line for any indication that a particular step failed.

Event Logs

Service Manager event logs are located in Event Viewer, in the **Application and Service Logs** folder, in the **Microsoft** folder, and then listed as **Operations Manager**.

Create Database error

During setup, when you were configuring Service Manager or data warehouse databases, you were given the opportunity to specify how much disk space to allocate for each database. The default setting is 2,000 megabytes (MB) (2 gigabytes (GB)). In addition to the disk space that is required for the database, Service Manager sets aside additional space for file groups and log

files. The additional space that is required for the file groups and log files can be equal to the space that is required for the database.

If there is insufficient disk space available, a message appears, indicating that an error occurred during execution of a custom action: _CreateDatabase. The installation stops before permanent changes are made. If you examine the Service Manager setup log, you find the following string:

```
Additional Error Description : MODIFY FILE encountered operating system error 112(There
is not enough space on the disk.) while attempting to expand the physical file
```

You have to either increase the amount of free disk space that is available or reduce the amount of space that Service Manager allocates for the database, and then attempt the installation again. If you are installing Service Manager in a nonproduction environment, you can specify as little as 500 MB for the database.

Troubleshooting deployment topics

- How to Troubleshoot a Data Warehouse Job

  Describes how to troubleshoot data warehouse jobs.

How to Troubleshoot a Data Warehouse Job

In System Center 2012 – Service Manager, after the Data Warehouse Registration Wizard is complete and after Reporting becomes available in the Service Manager console, you can start running reports. If you encounter a problem with reports (for example, the incident management report you run does not show the current data), you can use Windows PowerShell cmdlets to troubleshoot the problem. For example, you can use the following procedure to determine whether a transform job failed, and you can evaluate any error messages that the transform job created.

To troubleshoot data warehouse jobs by using Windows PowerShell cmdlets

1. On the computer that hosts the data warehouse management server, click **Start**, click **All Programs**, click **Accessories**, and then click **Windows PowerShell**.
2. Right-click **Windows PowerShell**, and then click **Run as administrator**.
3. At the Windows PowerShell command prompt, type the following command, and then press ENTER:

   ```
   Import-Module
   .\Microsoft.EnterpriseManagement.Warehouse.Cmdlets.psd1
   ```

4. Type the following command, and then press ENTER:

   ```
   Get-SCDWJob
   ```

5. Review the output, and locate any job with a status of "Failed."
6. Type the following command, and then press ENTER. In the command, specify the data warehouse job that failed as the value of the *JobName* parameter.

```
Get-SCDWJobModule -JobName Transform.Common
```

7. In the output, locate a status of "Failed," and then review the **Error Message** column for more information about why the data warehouse job failed.
8. When you are ready to retry the failed job, type the following command, and then press ENTER:

```
Resume-SCDWJob -JobName Transform.Common
```

Deploying Service Manager from a Command Line

This section describes how to deploy System Center 2012 – Service Manager using command-line parameters. For easier reading, the command-line examples in this guide list each command-line parameter on its own line. If you copy these examples, you must remove the carriage returns/line-feeds (CRs/LFs) from each line before you can run the commands.

Note

The **/silent** parameter must be the last parameter used in a command-line install.

In this guide, the command-line arguments that you provide are delineated by brackets: []. For example, you provide the Registered Owner's name **[owners name]** and Registered Organization's name **[company name]** as shown in the following example:

```
Setup.exe
/Install:Datawarehouse
/RegisteredOwner:[owners name]
/RegisteredOrganization:[company name]
/Silent
```

If your command-line argument contains a space—for example, **[owners name]**—enclose the argument in double quotation marks. For example, if you use **Garret Young** as the argument for the **RegisteredOwner** command-line parameter, type the name as shown in the following example:

```
/RegisteredOwner:"Garret Young"
```

Some of the command-line parameters that are used for the Operations Manager and Configuration Manager data marts define Structured Query Language (SQL) path statements as command-line arguments. You must define the drive name and make sure that the path that is listed in this guide is the correct path for your version of Microsoft SQL Server. The examples in this guide are correct for SQL Server 2008, as shown in the following example:

```
/OMDataMartDatabaseLogFilePath:[drive name]\Program Files\Microsoft SQL
Server\MSSQL10.MSSQLSERVER\MSSQL\DATA
```

The following is an example of the same command-line argument that you would use for SQL Server 2008 R2.

```
/OMDataMartDatabaseLogFilePath:[drive name]\Program Files\Microsoft SQL
Server\MSSQL10_50.MSSQLSERVER\MSSQL\DATA
```

For additional information about command-line parameters, type **setup.exe /?**. The parameters in the following table are optional.

/ProductKey	If this parameter is omitted, Service Manager is installed as an evaluation edition with an evaluation period of 180 days.
/Installpath	If this parameter is omitted, Service Manager is installed in the default folder and path: [drive name]:\Program Files\Microsoft System Center\Service Manager 2012.
/ServiceRunUnderAccount	If this parameter is omitted, the local system account is used.
/WorkflowAccount	If this parameter is omitted, the local system account is used.

Before you run the command line

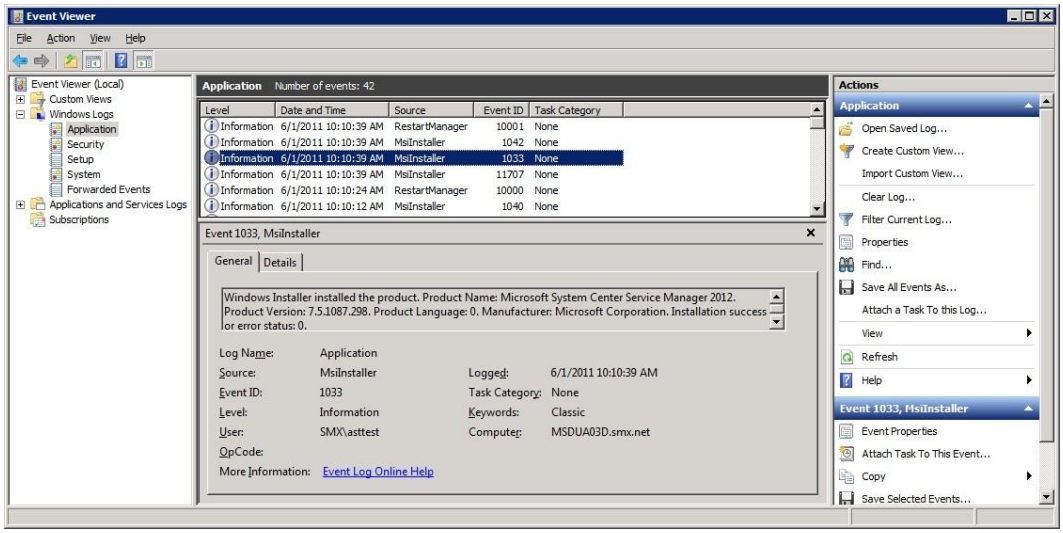
To help prevent an installation failure, perform the following steps on the computer where you will be installing Service Manager:

1. Run the UI-based Setup up to the point where you run the prerequisite checker. Make sure that the prerequisite checker passes, or at least passes with a warning.
2. On the computer where you will be installing the reporting server, make sure that the SQL Server Reporting Services (SSRS) service has started.
3. If you are going to deploy the Reporting Server on a computer other than the computer hosting the data warehouse management server, make sure that you have completed the procedure in Manual Steps to Configure the Remote SQL Server Reporting Services.

Determining When Installation Is Complete

When installation of either the Service Manager management server or the data warehouse management server is complete, an event with Event ID 1033 is written into the Application Event log, as shown in the following illustration.

Event Viewer



If you use the **start /w** command when you are using setup.exe, the command window will remain open when Setup completes, giving you the opportunity to examine any return codes.

Checking Error Codes

When the command-line Setup is complete, the command prompt appears. You can view the error code that was returned by typing **echo %errorlevel%**. An error code of 0 means that the installation was successful. The error codes that could be returned by the command-line installation are listed in Appendix A - Command-Line Option Error Codes in this guide.

The command-line installation will not check the database name that you supply to see if it already exists. If you supply a database name that already exists, the command-line installation will fail and a -1 will be returned as an error code.

Deploying Service Manager from a Command Line Topics

- How to Deploy a Service Manager Management Server Using the Command Line

  Describes how to install a Service Manager management server using the command line.
- How to Deploy a Data Warehouse Management Server Using the Command Line

  Describes how to install a data warehouse management server using the command line.
- How to Deploy a Service Manager Console Using the Command Line

  Describes how to install a Service Manager console using the command line.
- How to Deploy the Service Manager Self-Service Portal Using the Command Line

  Describes how to install the Self-Service Portal using the command line.

How to Deploy a Service Manager Management Server Using the Command Line

You can use the following command-line procedures to deploy the Service Manager management server and the Service Manager database in System Center 2012 – Service Manager.

To deploy the Service Manager management server and database on one computer

1. Log on to the computer where you want to install the Service Manager console using administrative credentials.
2. Open the command window.
3. At the command prompt, change directories to the location of the Service Manager installation media, and then type the following:

```
Start /Wait
Setup.exe
/Install:Server
/AcceptEula:[YES/NO]
/RegisteredOwner:[owner name]
/RegisteredOrganization:[company name]
/ProductKey:[25-character product key]
/CreateNewDatabase
/ManagementGroupName:[management group name]
/AdminRoleGroup:[domain\account name]
/ServiceRunUnderAccount:[domain\account name\password]
/WorkflowAccount:[domain\account name\password]
/CustomerExperienceImprovementProgram:[YES/NO]
/EnableErrorReporting:[YES/NO]

/Silent
```

See Also

Deploying Service Manager from a Command Line

How to Deploy a Data Warehouse Management Server Using the Command Line

Use the following procedures to deploy a Service Manager data warehouse and databases, including the Operations Manager and Configuration Manager data mart databases, in System Center 2012 – Service Manager.

Deploying the Data Warehouse

Use the following procedures to deploy the data warehouse with the Operations Manager and Configuration Manager data mart databases. If you want to install the data warehouse management server and data warehouse databases on the same computer, use the same computer name that you are running Setup on for all instances of **[computer name]**. If you want to deploy the databases on a separate computer, adjust the **[computer name]** entries accordingly.

The **/AnalysisServerDatabaseDataFilePath** is optional, and if it is not used, the default path will be used.

The DWStagingAndConfig database and the DWRepository database must reside on the same instance. Make sure that you specify the same computer and instance for the **/StgConfigSqlServerInstance** and **/RepositorySqlServerInstance** command-line options.

To deploy the data warehouse management server, data warehouse databases, and optional data marts

1. Log on to the computer where you want to install the Service Manager console using administrative credentials.
2. Open a command window.

   Note
   You must run the command prompt with administrative credentials.
3. At the command prompt, change directories to the location of the Service Manager installation media, and then type the following:

```
Start /Wait
Setup.exe
/Install:Datawarehouse
/AcceptEula:[YES/NO]
/RegisteredOwner:[owner name]
/RegisteredOrganization:[company name]
/ProductKey:[25-character product key]
/CreateNewDatabase
/AdminRoleGroup:[domain\account name]
/StgConfigSqlServerInstance:[computer name]
/RepositorySqlServerInstance:[computer name]
/DataMartSqlServerInstance:[computer name]
/ReportingServer:[computer name]
/ReportingWebServiceURL:"http://[computer
name]:80/ReportServer"
/ServiceRunUnderAccount:[domain\account name\password]
/DatasourceAccount:[domain\account name\password]
/CustomerExperienceImprovementProgram:[YES/NO]
```

```
/EnableErrorReporting:[YES/NO]
/ManagementGroupName:DW_improvement
/OMDataMartSqlServerInstance:[computer name]
/CMDataMartSqlServerInstance:[computer name]
/AnalysisServerInstance:[computer name]
/AnalysisServerDatabaseDataFilePath:[path to analysis
database]
/ASRunUnderAccount:[domain\account name\password]
/Silent
```

See Also

Deploying Service Manager from a Command Line

How to Deploy a Service Manager Console Using the Command Line

Use the following command-line procedure to deploy the Service Manager console in System Center 2012 – Service Manager.

To deploy the Service Manager console

1. Log on to the computer where you want to install the Service Manager console using administrative credentials.
2. Open a command window.
3. At the command prompt, change directories to the location of the Service Manager installation media, and then type the following:

```
Start /Wait
Setup.exe
/Install:Console
/AcceptEula:[YES/NO]
/RegisteredOwner:[owner name]
/RegisteredOrganization:[company name]
/ProductKey:[25-character product key]
/Installpath:[drive name]\Program Files\Microsoft System
Center\Service Manager 2012
/CustomerExperienceImprovementProgram:[YES/NO]
/EnableErrorReporting:[YES/NO]

/Silent
```

See Also

Deploying Service Manager from a Command Line

How to Deploy the Service Manager Self-Service Portal Using the Command Line

Use the following command-line procedures to deploy the web content server and the SharePoint website for the Service Manager Self-Service Portal in System Center 2012 – Service Manager on separate computers.

Deploying the Web Content Server

Use the following procedure to deploy the web content server on a computer.

To deploy the web content server

1. Log on to the computer where you want to install the Service Manager console using administrative credentials.
2. Open the command window.
3. At the command prompt, change directories to the location of the Service Manager installation media, and then type the following:

```
Start /Wait
Setup.exe
/Install:Portal
/AcceptEula:[YES/NO]
/RegisteredOwner:[owner name]
/RegisteredOrganization:[company name]
/ProductKey:[25-character product key]
/PortalWebSiteName:[Self-service portal name]
/PortalWebSitePort:[Port number]
/PortalWebSiteCertificate:[SSL Certificate]
/PortalAccount:[domain\account name\password]
/UseExistingDatabase:[ComputerName:DB Name]
/CustomerExperienceImprovementProgram:[YES/NO]
/EnableErrorReporting:[YES/NO]
/Silent
```

Deploying the SharePoint Website

Use the following procedure to deploy the SharePoint website on another computer.

To deploy the SharePoint website

1. Log on to the computer where you want to install the Service Manager console using

administrative credentials.

2. Open the command window.
3. At the command prompt, change directories to the location of the Service Manager installation media, and then type the following:

```
Start /Wait
Setup.exe

/Install:Portal
/AcceptEula:[YES/NO]

/RegisteredOwner:[owner name]

/RegisteredOrganization:[company name]

/ProductKey:[25-character product key]

/SpPortalWebSiteName:[SharePoint Site Name]

/SpPortalWebSitePort:[Port number]

/SpPortalWebSiteCertificate:[SSL Certificate]

/CreateSpPortalDatabase:[YES/NO]

/SpPortalAppPoolAccount:[domain\account name\password]
/CustomerExperienceImprovementProgram:[YES/NO]

/EnableErrorReporting:[YES/NO]
/Silent
```

Deploying the Web Content Server and the SharePoint Website on the Same Computer

Use the following command-line procedure to deploy both Self-Service Portal elements—the web content server and the SharePoint website—on the same computer.

Deploy the web content server and the SharePoint website on the same computer

1. Log on to the computer where you want to install the Service Manager console using administrative credentials.
2. Open the command window.
3. At the command prompt, change directories to the location of the Service Manager installation media, and then type the following:

```
Start /Wait
Setup.exe

/Install:Portal
/AcceptEula:[YES/NO]

/RegisteredOwner:[owner name]

/RegisteredOrganization:[company name]

/ProductKey:[25-character product key]

/PortalWebSiteName:[Self-service portal name]

/PortalWebSitePort:[Port number]

/PortalWebSiteCertificate:[SSL Certificate]

/PortalAccount:[domain\account name\password]

/UseExistingDatabase:[ComputerName:DB Name]

/SpPortalWebSiteName:[SharePoint Site Name]

/SpPortalWebSitePort:[Port number]

/SpPortalWebSiteCertificate:[SSL Certificate]

/CreateSpPortalDatabase:[YES/NO]
```

```
/SpPortalAppPoolAccount:[domain\account name\password]
/CustomerExperienceImprovementProgram:[YES/NO]

/EnableErrorReporting:[YES/NO]
/Silent
```

See Also

Deploying Service Manager from a Command Line

Appendix A - Command-Line Option Error Codes

The following is a list of the error codes that are used in the command-line installation of System Center 2012 – Service Manager.

Error code	Error
-16	PreUpgradeCheckFailed
-15	InvalidCommandLine
-14	FailedPrerequisiteChecks
-1	Failed
0	Successful
200	DuplicateDataLogPath
201	DuplicatedCMDB
202	EnterValidDatabaseServer
203	FailedToGetCaseSensitiveAccount
204	FailedToValidateMgmtGrp
205	FullTextSearchNotInstalled
206	InstallPathAccessDenied
207	InstallPathCreateDirectory
208	InstallPathTooLong
209	InvalidCMDB
210	InvalidDatabaseConfiguration

Error code	Error
211	InvalidDatabaseSize
212	InvalidDataLogPath
213	InvalidDwServer
214	InvalidInstallPath
215	InvalidPrereqResultFile
216	InvalidProductKey
217	InvalidReportServerConfig
218	InvalidSCSM
219	InvalidSmAdminGroup
220	InvalidSqlInstance
221	InvalidSqlServiceState
222	InvalidToInstalleScsm
223	InvCharInMG
224	MgmtGrpRegistryExist
225	MissingSetupFiles
226	NotEnoughFreeSpace
227	NotEnoughFreeSpaceOnSqlServer
228	NotLocalAdminOnSqlServer
229	NotWin2k8x64Machine
230	NotVistaSP2OrAboveMachine
231	NullDatabaseName
232	NullMG
233	NullSMAdmin
234	OldDwDatabaseExist
235	orMessageBoxTitle
236	PrimarySdkServerEmpty
237	RequiredFreeDiskSpace
238	RequiredFreeDiskSpaceForDataFile

Error code	Error
239	RequiredFreeDiskSpaceForLogFile
240	ScomAgentInstalled
241	ScomServerInstalled
242	ScsmComponentsInstalled
243	SelectCMDB
244	SelectSqlServerInstance
245	ServerAccessDenied
246	ServerNotFound
247	SetupAlreadyRunning
248	SetupCancelByUser
249	SetupCrashMsg
250	SetupFailedAt
251	SetupFailedWithMsior
252	SqlAccessDenied
253	SsrsInvalidWebUrl
254	SsrsNeedSecureUrl
255	SsrsNotInstalledOn
256	TestCredentialsFailed
257	TestCredentialsNotLocalAdmin
258	TooLongDatabaseName
259	TooLongMG
260	UnableToNavogateFolderOnRemoteServer
261	UncDataLogPath
262	UnsupportedSQL
263	UserNotSysAdmin
264	FaildToConnectAD
265	ScsmSameVersionInstalled
266	InvalidWebSiteName

Error code	Error
267	InvCharInWebSiteName
268	TooLongWebSiteName
269	InvalidWebSitePort
270	WebSiteNameInUse
271	WebSitePortInUse
272	DWServerInstalled
273	SMServerInstalled
274	SMConsoleInstalled
275	SMPortalInstalled
276	IISNotConfigured
277	FailedToConnectToAD
278	SmAdminIsDomainAdministrators
279	InvalidRegisteredOwner
280	InvalidRegisteredOrganization
281	IIS7RoleNotEnable
282	Not64BitSetup
283	DatabaseSqlStoreNotFound
284	ScomUIInstalled
285	InvalidDatabaseName
286	InvalidCMDBVersion
287	UNCPathExpected
288	DataDirectoryDoesNotExist
289	AnalysisServicesNotInstalled
290	DuplicatedASDatabaseID
3010	SuccessfulNeedReboot

Appendix B - Guidance for Moving the Service Manager and Data Warehouse Databases

After you have deployed Service Manager, you might need to move the Service Manager or data warehouse databases from one computer running Microsoft SQL Server to another for reasons such as the following:

- You need to replace hardware that is experiencing issues and that is no longer considered reliable.
- You need to add additional hardware to improve scalability and performance.
- You need to move a database and log file to a different volume because of space or performance reasons.
- You need to change hardware that is leased and is due to expire soon.
- You need to change or upgrade hardware to comply with new hardware standards.
- You initially installed multiple Service Manager components on a single server, and you need to distribute some components to other servers.
- You need to restore functionality in a failure scenario.

If you want the move the data warehouse database, and if you have installed Service Manager within the last 90 days, it might be easier for you to unregister the data warehouse, install a new data warehouse, and register the new database. If the data has not been groomed from the Service Manager database, there will be no data loss in the data warehouse database because it will be synchronized. By default, the grooming interval for work items is 90 days from the last time a work item was modified. Using this process is much simpler than using the following guidance, which details how to move your databases from one server to another and requires many steps.

Moving databases

For procedures about how to move databases from one computer running SQL Server to another, see the following topics:

- Moving the Service Manager Database

  Describes how to move the Service Manager database from one computer running SQL Server to a new computer running SQL Server.
- Moving Data Warehouse Databases

  Describes how to move Service Manager data warehouse databases to new computers running SQL Server.

See also

- System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager

Moving the Service Manager Database

You must use the following high-level steps to move the Service Manager database.

Note
These steps link to content in the Service Manager Upgrade Guide.

1. Stop the System Center services on all the management servers, as described in How to Stop Service Manager Services on the Secondary Management Server.
2. Back up the Service Manager database, as described in How to Back Up the Production Service Manager Database.
3. Restore the Service Manager database on the target computer that is running Microsoft SQL Server, as described in How to Restore the Service Manager Database in the Lab Environment.
4. Configure the Service Manager database, as described in How to Prepare the Service Manager Database in the Lab Environment.

   Important
   Do not perform step 17 in the procedure for configuring tables.
5. Configure the registry on all the management servers that will access the new SQL Server instance, by using the following steps:
   a. Open Registry Editor.
   b. Browse to **HKEY_LOCAL_MACHINE\Software\Microsoft\System Center\2010\Common\Database**.
   c. Configure two keys: one for the server name (DatabaseServerName) and one for the database name (DatabaseName). Set values to the new server name and database name, if they are different from the original values.
6. Start the System Center services on all the management servers, as described in How to Start Service Manager Services on the Secondary Management Server.
7. Install another Service Manager database that has a different name on the same computer that is running SQL Server, by installing another Service Manager management server and choosing to create a new database. This step will populate the master database with error message text so that if an error occurs in the future, the error message can describe the specific problem instead of displaying generic text. After the database is installed, you can drop it from the computer that is running SQL Server and uninstall the additional, temporary management server.

See Also

Appendix B - Guidance for Moving the Service Manager and Data Warehouse Databases

Moving Data Warehouse Databases

The following high-level steps are required to move the Data Warehouse databases. Each step in this list links to an associated procedure later in this document.

1. Locate user accounts and instances of SQL Server

2. Stop Service Manager services
3. Back up the data warehouse databases
4. Take the data warehouse databases offline
5. Restore the data warehouse databases on the new computer running SQL Server
6. Prepare the data warehouse databases on the new database server
7. Update data warehouse management Server with the new database server name
8. Update the data sources on the reporting server
9. Update the data sources for the Analysis Services
10. Start Service Manager Services on the data warehouse management server

Important

After you move the **DWStagingAndConfig** and **DWRepository** databases, they have to be restored on the same instance of SQL Server. Restoring them on a separate instances of SQL Server is not supported.

The collation on the new instance of SQL Server has to match the collation of the original instances of SQL Server where the data warehouse databases were originally hosted.

Locate user accounts and instances of SQL Server

Use the following procedures to locate the user accounts and instances of SQL Server that are used by the data warehouse management server.

To identify the SQL Server database and instance names used by the data warehouse management server

1. Log on to the data warehouse management server as a user with administrative credentials.
2. On the Windows desktop, click **Start**, and then click **Run**.
3. In the **Run** dialog box, in the **Open** box, type **regedit**, and then click **OK**.
4. In the Registry Editor window, expand **HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\System Center\2010\Common\Database**, and then make note of the following registry values:

   DatabaseName

   DatabaseServerName

   DataMartDatabaseName

   DataMartSQLInstance

   RepositoryDatabaseName

   RepositorySQLInstance

   StagingDatabaseName

   StagingSQLInstance

   OMDataMartDatabaseName

OMDataMartSQLInstance

CMDataMartDatabaseName

CMDataMartSQLInstance

To identify the reporting server and instance names used by data warehouse management server

1. Log on to the data warehouse management server as a user with administrative credentials.

   On the Windows desktop, click **Start**, and then click **Run**.

   In the **Run** dialog box, in the **Open** box, type **regedit**, and then click **OK**.

   In the Registry Editor window, expand **HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\System Center\2010\Common\Reporting**, and then make note of the following registry values:

   Server

   ServerInstance

   WebServiceURL

To identify the service account used by the data warehouse management server

1. On the Windows desktop, click **Start**, and then click **Run**.
2. In the **Run** dialog box, in the **Open** box, type **services.msc**, and then click **OK**.
3. Locate the service System Center Data Access Service, and double-click it.
4. In the **Properties** window, click the **Log On** tab.
5. Make a note of the user account name under **This account:**.
6. Repeat Steps 3 through 5 for the **System Center Management Configuration** service.

To identify the reporting account used by the data warehouse management server

1.

   Note

   The account that is configured by using the names in the following data sources in SQL Server Reporting Services is called the **Reporting account**.

   Log on to the server with SQL Server Reporting Services that are hosting the Service Manager reports.

   Note

   In this procedure, you will use values that you noted in To identify the reporting server and instance names used by data warehouse management server.

2. In SQL Server Reporting Services, click **Start**, click **All Programs**, click the program group for the version of SQL Server you are running, click **Configuration Tools**, and then click **Reporting Services Configuration Manager**.

3. In the **Reporting Services Configuration Connection** dialog box, connect to the **SQL Reporting instance** that you noted in a previous procedure.
4. In **Reporting Services Configuration Manager**, click **Reporting Manager URL**.
5. On the **Reporting Manager URL** page, click the hyperlink that resembles http://<Servername>:portnumber/Reports to open it in your web browser.
6. Open the **System Center** folder and then open the **Service Manager** folder.
7. Click the **DWDataMart** data source and make a note of the **User name** value under **Credentials stored securely in the report server**.
8. In your browser, click **Back** to return to the **Service Manager** folder.
9. Click the **DWStagingAndConfig** data source and make a note of the **User name** value under **Credentials stored securely in the report server**.
10. In your browser, click **Back** to return to the **Service Manager** folder.
11. Click the **ConfigurationManager** data source and make a note of the **User name** value under **Credentials stored securely in the report server**.
12. In your browser, click **Back** to return to the **Service Manager** folder.
13. Click the **MultiMartDatasource** data source and make a note of the **User name** value under **Credentials stored securely in the report server**.
14. In your browser, click **Back** to return to the **Service Manager** folder.
15. Click the **OperationsManager** data source and make a note of the **User name** value under **Credentials stored securely in the report server**.
16. Close the browser window.

To identify the OLAP Account used by the data warehouse management server

1. Log on to the Service Manager server, click **Start**, click **All Programs**, click **Microsoft System Center 2012**, click **Service Manager**, and then click **Service Manager Shell**.
2. In the Windows PowerShell command prompt, copy the following command, and then press ENTER.

   Note
   Replace <DWServerName> with the name of your data warehouse management server.

```
$class= get-scclass –Name
Microsoft.SystemCenter.ResourceAccessLayer.ASResourceStore –
ComputerName <DWServerName>

$OLAPServer= get-scclassinstance –class $class –ComputerName
<DWServerName>

$OLAPServer.Server
```

   Note
   The $OLAPServer.Server cmdlet returns the name of the OLAP server that is hosting the DWASDataBase, and it contains the OLAP Account.

3. On a server where you have **SQL Server Management Studio** installed, do the following:
    a. Open SQL Server Management Studio.
    b. In the **Connect to Server** window, select **Analysis Services** in the **Server type** list.
    c. In the **Server name** list, type or select the name you noted from the output of the $OLAPServer.Server cmdlet in previous step, and then click **Connect**.
    d. In the **Object Explorer** pane, expand **Databases**, and then expand the **DWASDataBase** OLAP database.
    e. Expand the **Data Sources** folder, and then double-click **CMDataMart**.
    f. In the **Data Source Properties – CMDataMart** dialog box, note the value of **Connection String**.
    g. Under **Security Settings**, click **Impersonation Account**, and then click the properties button (…), to open the **Impersonation Information** dialog box.
    h. In the **Impersonation Information** dialog box, note the user name.
    i. Click **Cancel** twice to close the dialog boxes.
    j. Repeat the steps above to note the Connection string and the User name for the DWDataMart and OMDataMart databases.

Stop Service Manager services

Use the following procedure to stop the Service Manager services on the data warehouse management server.

To stop Service Manager services on the data warehouse management server

1. In the **Run** dialog box, in the **Open** text field, type **services.msc**, and then click **OK**.
2. In the **Services** window, in the **Services (Local)** pane, locate the following three services, and for each one, click **Stop**:
    a. System Center Data Access Service
    b. System Center Management

        Note
        For System Center 2012 R2 Service Manager, the System Center Management service was renamed to Microsoft Monitoring Agent.

    c. System Center Management Configuration

Back up the data warehouse databases

Use the following procedure to back up the data warehouse databases on the original computer running SQL Server.

To back up the data warehouse databases

1. Log on to the original computer running SQL Server that is hosting the data warehouse

databases, and open **SQL Server Management Studio**.

2. In the **Connect to Server** dialog box, follow these steps:
   a. In the **Server Type** list, select **Database Engine**.
   b. In the **Server Name** list, select the server name for your data warehouse database.
   c. In the **Authentication** list, select **Windows Authentication**, and then click **Connect**.
3. In the **Object Explorer** pane, expand **Databases**.
4. Right-click the **DWStagingAndConfig** database, click **Tasks**, and then click **Back Up**.
5. In the **Back Up Database** dialog box, type a path and a file name in the **Destination on disk** text box, and then click **OK**.

   Important
   The destination location must have enough available free disk space to store the backup files.
6. Click **OK** in the **Back Up Database** dialog box to start the back up.
7. Repeat these steps for the DWRepository, CMDWDataMart, OMDWDataMart, and DWDataMart databases.

Take the data warehouse databases offline

Use the following procedure to take the data warehouse databases offline on the original computer running SQL Server.

To take the data warehouse databases offline

1. Log on to the original computer running SQL Server that is hosting the data warehouse databases, and open **SQL Server Management Studio**.
2. In the **Connect to Server** dialog box, follow these steps:
   a. In the **Server Type** list, select **Database Engine**.
   b. In the **Server Name** list, select the server name for your data warehouse database.
   c. In the **Authentication** list, select **Windows Authentication**, and then click **Connect**.
3. In the **Object Explorer** pane, expand **Databases**.
4. Right-click the **DWStagingAndConfig** database, click **Tasks**, and then click **Take Offline**.
5. In the **Take database offline** dialog box, click **Close**.
6. Repeat the previous steps for the DWRepository, CMDWDataMart, OMDWDataMart, and DWDataMart databases.

Restore the data warehouse databases on the new computer running SQL Server

Use the following procedure to restore the data warehouse databases on the new computer running SQL Server.

To restore the data warehouse databases

1. On the new computer running SQL Server, open **SQL Server Management Studio**.
2. In the **Connect to Server** dialog box, follow these steps:
   a. In the **Server Type** list, select **Database Engine**.
   b. In the **Server Name** list, select the server name for your Service Manager services database.
   c. In the **Authentication** list, select **Windows Authentication**, and then click **Connect**.
3. In the **Object Explorer** pane, right-click the **Databases** folder, and then click **Restore Database**.
4. In the **Restore Database** dialog box, under the **To a point in time** text box, retain the default, **Most recent possible**, or select a specific date and time by clicking the browse button to open the **Point in Time Restore** dialog box.
5. To specify the source and location of the backup sets to restore, click **From Device**.
6. Click **Browse** to open the **Specify Backup** dialog box.
7. In the **Backup media** list box, select one of the listed device types. To select more devices for the Backup location, click **Add**.
8. In the **Select the backup sets to restore** grid, select the backups to restore. (This grid displays the backups that are available for the specified location.)
9. On the **General** page, the name of the restoring database appears in the **To database** list. Select the **DWStagingAndConfig** database from the list.
10. In the **Restore options** panel, select **Overwrite the existing database**.
11. In the **Restore the database files as** options panel, verify that the original database file name and path are correct.
12. For the **Recovery state** option, select **Leave the databases ready to use by rolling back the uncommitted transactions. Additional transaction logs cannot be restored (RESTORE WITH RECOVERY)**.
13. Click **OK** to restore the database.
14. Repeat the previous steps for the DWRepository, CMDWDataMart, OMDWDataMart, and DWDataMart databases.

Prepare the data warehouse databases on the new database server

Use the following three procedures to prepare the data warehouse databases on the new database server:

1. To configure the DWStagingAndConfig database on the new computer running SQL Server
2. To configure the service account database permissions
3. To configure the DWStagingAndConfig tables

To configure the DWStagingAndConfig database on the new computer running SQL Server

1. On the new computer running SQL Server, open **SQL Server Management Studio**.
2. In the **Connect to Server** dialog box, follow these steps:
   a. In the **Server Type** list, select **Database Engine**.
   b. In the **Server Name** list, select the name of the new computer running SQL Server that hosts the **DWStagingAndConfig** database.
   c. In the **Authentication** list, select **Windows Authentication**, and then click **Connect**.
3. In the **Object Explorer** pane, expand **Databases**, and then click **DWStagingAndConfig**.
4. In the toolbar, click **New Query**.
5. In the center pane, copy the following command, and then click **Execute**.

```
sp_configure 'clr enabled', 1
go
reconfigure
go
```

6. In the center pane, remove the command you typed in the previous step, copy the following command, and then click **Execute**.

```
ALTER DATABASE DWStagingAndConfig SET SINGLE_USER WITH
ROLLBACK IMMEDIATE
```

7. In the center pane, remove the command you typed in the previous step, copy the following command, and then click **Execute**.

```
ALTER DATABASE DWStagingAndConfig SET ENABLE_BROKER
```

8. In the center pane, remove the command you typed in the previous step, type the following command, and then click **Execute**.

```
ALTER DATABASE DWStagingAndConfig SET MULTI_USER
```

To configure the service account database permissions

1. In the **Object Explorer** pane, expand **Security**, and then expand **Logins**. Right-click **Logins**, and then click **New Login**.
2. Click **Search**.
3. Type the user name by using the domain\user name format for the data warehouse service account, click **Check Names**, and then click **OK**.

   Note
   If the Data Access Account is running as LocalSystem, use the format <domain\computername$> in SQL Logins, where <computername> is the name of the management server.

4. In the **Select a page** pane, click **User Mapping**.
5. In the **Users mapped to this login** area, in the **Map** column, select the row that represents the name of the DWStagingAndConfig database. DWStagingAndConfig is the default database name.

6. In the **Database role membership for: DWStagingAndConfig** area, ensure that the following entries are selected:
    - **configsvc_users**
    - **db_accessadmin**
    - **db_datareader**
    - **db_datawriter**
    - **db_ddladmin**
    - **db_securityadmin**
    - **dbmodule_users**
    - **public**
    - **sdk_users**
    - **sql_dependency_subscriber**
    - **db_owner**
7. In the **Database role membership for: DWRepository** area, ensure that the following entries are selected:
    - **db_owner**
    - **public**
8. In the **Database role membership for: DWDataMart** area, ensure that the following entries are selected:
    - **db_owner**
    - **public**
9. Click **OK**.
10. In the **Object Explorer** pane, expand **Security**, and then expand **Logins**.
11. Right-click **Logins**, and then **click New Login**.
12. Click **Search**.
13. Type the user name in the domain\user name format for the reporting account, click **Check Names**, and then click **OK**.
14. In the **Select a page** pane, click **User Mapping**.
15. In the **Users mapped to this login** area, in the **Map** column, select the row that represents the name of the DWStagingAndConfig. DWStagingAndConfig is the default database name.
16. In **the Database role membership for: DWStagingAndConfig** area, ensure that the following entries are selected:
    - **db_datareader**
    - **public**
17. In the **Database role membership for: DWRepository** area, ensure that the following entries are selected:
    - **db_datareader**
    - **public**

- **reportuser**

18. In the **Database role membership for: DWDataMart** area, ensure that the following entries are selected:
    - **db_datareader**
    - **public**
    - **reportuser**
19. In the **Database role membership for: OMDWDataMart** area, ensure that the following entries are selected:
    - **db_datareader**
    - **public**
    - **reportuser**
20. In the **Database role membership for: CMDWDataMart** area, ensure that the following entries are selected:
    - **db_datareader**
    - **public**
    - **reportuser**
21. Click **OK**.
22. In the **Object Explorer** pane, expand **Security**, and then expand **Logins**.
23. Right-click **Logins**, and then click **New Login**.
24. Click **Search**.
25. Type the user name in the domain\user name format for the **OLAP account**, click **Check Names**, and then click **OK**.
26. In the **Select a page** pane, click **User Mapping**.
27. In the **Database role membership for: DWDataMart** area, ensure that the following entries are selected:
    - **db_datareader**
    - **public**
    - **reportuser**
28. In the **Database role membership for: OMDWDataMart** area, ensure that the following entries are selected:
    - **db_datareader**
    - **public**
    - **reportuser**
29. In the **Database role membership for: CMDWDataMart** area, ensure that the following entries are selected:
    - **db_datareader**
    - **public**
    - **reportuser**
30. Click **OK**.

To configure the DWStagingAndConfig tables

1. In the **Object Explorer** pane, expand **Databases**, expand **DWStagingAndConfig**, and then expand **Tables**.
2. Right-click **dbo.MT_Microsoft$SystemCenter$ManagementGroup**, and then click **Edit Top 200 Rows**.
3. In the center pane, locate the column **SQLServerName_ 43FB076F_7970_4C86_6DCA_8BD541F45E3A**, and then in the first row of the column, type the name of the new computer running SQL Server that is hosting the DWStagingAndConfig database. In the case of named instances, type **ComputerName\InstanceName**.
4. Right-click **dbo. MT_Microsoft$SystemCenter$ResourceAccessLayer$SqlResourceStore**, and then click **Edit Top 200 Rows**.
5. Update the column **Server_48B308F9_CF0E_0F74_83E1_0AEB1B58E2FA** for rows representing DWStagingAndConfig, DWRepository, CMDWDataMart, OMDWDataMart, and DWDataMart by typing the name of the new computer running SQL Server that is hosting the respective databases. In the case of named instances, type **ComputerName\InstanceName**.
6. Right-click **dbo.MT_Microsoft$SystemCenter$ResourceAccessLayer$CMDBResourceStore**, and then click **Edit Top 200 Rows**.
7. In the center pane, locate the column **Server_48B308F9_CF0E_0F74_83E1_0AEB1B58E2FA**, and in the first row of the column, type the name of the new computer running SQL Server that is hosting the DWStagingAndConfig database. In the case of named instances, type **ComputerName\InstanceName**.
8. Right-click **LFX.DataSource**, and then click **Edit Top 200 Rows**.
9. In the center pane, locate the **DataSourceAddress** column, and in the first row of the column, locate the entry that starts with **Data Source = <server name>; Initial Catalog = DWStagingAndConfig; Persist Security Info=False**. Replace **<server name>** with the name of the new computer running SQL Server.
10. Ensure that the values you typed were saved by querying the tables specified in the previous steps.
11. Close **Microsoft SQL Server Management Studio**.

Update data warehouse management Server with the new database server name

Use the following procedure to update the data warehouse management server to use the new database server name.

To update the data warehouse management server to use the new database server name

1. Log on to the computer as a user with administrative credentials.
2. On the Windows desktop, click **Start**, and then click **Run**.
3. In the **Run** dialog box, in the **Open** box, type **regedit**, and then click **OK**.

   Caution
   Incorrectly editing the registry might severely damage your system; therefore, before making changes to the registry, back up any valued data on the computer.
4. In the Registry Editor window, expand **HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\System Center\2010\Common\Database**.
5. In the right pane, double-click **DatabaseServerName**.
6. In the **Edit String** box, in the **Value data** box, type the name of the new computer running SQL Server that hosts the DWStagingAndConfig database. If you are using a named instance of SQL Server, use the Computer Name\Instance name format.
7. Click **OK**.
8. Repeat the previous steps for the registry values to reflect the new name of the computer running SQL Server for the DWDataMart, OMDWDataMart, CMDWDataMart, DWRepository, and DWStagingAndConfig databases.
   - DataMartSQLInstance
   - RepositorySQLInstance
   - StagingSQLInstance
   - OMDataMartSQLInstance
   - CMDataMartSQLInstance

Update the data sources on the reporting server

Use the following procedure to update data sources on the reporting server to point to the new computer running SQL Server.

To update the data sources on the reporting server

1. Log on to the Service Manager reporting server, and start **Reporting Services Configuration Manager**.
2. In the **Reporting Services Configuration Connection** dialog box, connect to the correct reporting server instance as noted in the section To identify the reporting server and instance name used by data warehouse management server.
3. In the Reporting Services Configuration Manager list, select **Report Manager URL**.
4. On the **Report Manager URL** page, click the hyperlink that resembles **http://<Servername>:portnumber/Reports** to open the **Reports** home page in your Internet browser.

5. On the home page, open the **System Center** folder, and then open the **Service Manager** folder.
6. Open the list of Service Manager items, and then click the **DWDataMart** data source.
7. In the **Connection string** box, the string resembles `data source=<server name>;initial catalog=DWDataMart`. Replace the existing name of the computer running SQL Server by typing the name of the new computer running SQL Server.
8. Go back to the previous Service Manager folder webpage, and click the **DWStagingAndConfig** data source.
9. In the **Connection string** box, the string resembles `data source=<server name>;initial catalog= DWStagingAndConfig`. Replace the existing name of the computer running SQL Server by typing the name of the new computer running SQL Server.
10. Go back to the previous Service Manager folder webpage and click the **ConfigurationManager** data source.
11. In the **Connection string** box, the string resembles `data source=<server name>;initial catalog= CMDWDataMart`. Replace the existing name of the computer running SQL Server by typing the name of the new computer running SQL Server.
12. Go back to the previous Service Manager folder webpage and click the **MultiMartDatasource** data source.
13. In the **Connection string** box, the string resembles `<root><source id='DWDataMart' connectionString='Data Source=<Server name>;Initial Catalog=DWDataMart;Integrated Security=True' /><source id='OMDataMart' connectionString='Data Source=<Server name>;Initial Catalog=OMDWDataMart;Integrated Security=True' /><source id='CMDataMart' connectionString='Data Source=<Server name>;Initial Catalog=CMDWDataMart;Integrated Security=True' /></root>`. Replace the existing name of the computer running SQL Server by typing the name of the new computer running SQL Server.
14. Go back to the previous Service Manager folder webpage and click the **Operations Manager** data source.
15. In the **Connection string** box, the string resembles `data source=<server name>;initial catalog= OMDWDataMart`. Replace the existing name of the computer running SQL Server by typing the name of the new computer running SQL Server.
16. Close your web browser.

Update the data sources for the Analysis Services

Use the following procedure to update the connection strings for the data sources on the server that hosts the Analysis Services database.

To update the data sources for the Analysis services

1. Log on to the server that hosts the SQL Server Analysis Services database.
2. Open **SQL Server Management Studio**.
3. In the **Connect to Server** dialog box, in the **Server Type** list, select **Analysis Services**.
4. In the **Server name** list, type the server name that you received as output from the

$OLAPServer.Server cmdlet. (You noted this information in the To identify the OLAP Account used by the data warehouse management server section earlier in this topic.)

5. In the **Object Explorer** pane, expand **Databases**, and then expand **DWASDataBase**.
6. Expand **Data Sources**, and then double-click **CMDataMart**.
7. In the **Data Source Properties – CMDataMart** dialog box, select **Connection string Provider=SQLNCLI10.1;Data Source=<servername>;Integrated Security=SSPI;Initial Catalog=CMDWDataMart**.
8. Replace <servername> with the name of the computer running SQL Server that hosts the CMDWDataMart database.
9. You need to re-enter the impersonation account password when you've completed updating the Data Source server. Select the ellipsis button to the right of **ImpersonateAccount** and then add the password in the **Impersonation Information** dialog box. Click **OK** to accept the changes.
10. Repeat the previous steps to update the connection strings for the DWDataMart and OMDataMart data sources.

Start Service Manager Services on the data warehouse management server

Use the following procedure to start the Service Manager services on the data warehouse management server.

To start Service Manager services on the data warehouse management server

1. In the **Run** dialog box, in the **Open** text field, type **services.msc**, and then click **OK**.
2. In the **Services** window, in the **Services (Local)** pane, locate the following three services, and for each one, click **Start**:
   a. System Center Data Access Service
   b. System Center Management

      Note
      For System Center 2012 R2 Service Manager, the System Center Management service was renamed to Microsoft Monitoring Agent.

   c. System Center Management Configuration

See also

Appendix B - Guidance for Moving the Service Manager and Data Warehouse Databases

Upgrading to System Center 2012 - Service Manager

This guide will show you how to upgrade from System Center Service Manager 2010 to System Center 2012 – Service Manager.

Warning

If you are planning to upgrade two or more System Center products, you must first consult the guide Upgrade Sequencing for System Center 2012 R2. The order in which you perform product upgrades is important. Failure to follow the correct upgrade sequence might result in product failure for which no recovery options exist. The affected System Center products are:

1. Orchestrator
2. Service Manager
3. Data Protection Manager (DPM)
4. Operations Manager
5. Configuration Manager
6. Virtual Machine Manager
7. App Controller

You can only upgrade to System Center 2012 – Service Manager from one of the two following products:

- Service Manager 2010 Service Pack 1 (SP1) Cumulative Update 3 (CU3) (version 7.0.6555.115
- System Center 2012 – Service Manager Release Candidate (version 7.5.1464.0.0).

Important

It is assumed in this guide that you are performing an *upgrade* to System Center 2012 – Service Manager. For information about installing System Center 2012 – Service Manager on a computer where no previous version of Service Manager exists, see the Deployment Guide for System Center 2012 – Service Manager.

Upgrade topics

- Upgrade Planning for System Center 2012 - Service Manager

  Describes factors that you must consider before you start the System Center 2012 – Service Manager upgrade.
- Setting Up a Service Manager 2010 Lab Environment with Production Data

  Describes how to setup System Center Service Manager 2010 in a lab environment using production data.
- Upgrade to System Center 2012 - Service Manager

Describes the steps that you must take to upgrade System Center 2012 – Service Manager to System Center 2012 – Service Manager.

- After Upgrading to System Center 2012 - Service Manager

  Describes the steps that you must take after you have applied the System Center 2012 – Service Manager upgrade.

- Failed Upgrade in System Center 2012 - Service Manager

  Describes the steps you can take if an upgrade fails.

Downloadable Documentation

You can download a copy of this technical documentation from the Microsoft Download Center. Always use the TechNet library for the most up-to-date information.

Upgrade Planning for System Center 2012 - Service Manager

This guide outlines the procedures necessary to upgrade from either Service Manager 2010 Service Pack 1 CU3 or System Center 2012 – Service Manager RC to System Center 2012 – Service Manager.

In a non-production environment, an in-place upgrade from System Center 2012 – Service Manager RC to System Center 2012 – Service Manager is supported. In a production environment, an upgrade of Service Manager is not supported. If you want to run System Center 2012 – Service Manager in a production environment, you must begin with a new installation of Service Manager.

An in-place upgrade is an upgrade of all Service Manager parts on the same hardware. Other approaches, such as side-by-side upgrades or rolling upgrades, are not supported.

Upgrading from Service Manager 2010 Service Pack 1 CU3 to System Center 2012 – Service Manager requires more preparation. We recommend that you install Service Manager 2010 Service Pack 1 CU3 in a lab environment and then replicate your production databases into the lab. You then perform an upgrade the new installation in the lab, and once that has proven successful, perform the same upgrade to Service Manager 2010 Service Pack 1 CU3 in the production environment.

Evaluation, Retail, and Select Versions

The release of System Center Service Manager 2010 SP1 CU3 was available in three different versions:

- Evaluation version (180-day time-out)
- Retail version
- Select license version

The release of System Center Service Manager 2010 RC was available only as an evaluation edition.

System Center 2012 – Service Manager available as an Evaluation version (180-day time-out) or Select License edition. The following upgrade paths are supported from System Center Service Manager 2010 SP1 CU3 to and System Center 2012 – Service Manager RC to System Center 2012 – Service Manager

Current Version	Upgraded Version	Status
Service Manager 2010 SP1 CU3 Eval	System Center 2012 – Service Manager Eval	Evaluation period remains unchanged
Service Manager 2010 SP1 CU3 Select	System Center 2012 – Service Manager Select	Licensed
Service Manager 2010 SP1 CU3 Retail	System Center 2012 – Service Manager Select	Licensed
System Center 2012 – Service Manager RC Eval	System Center 2012 – Service Manager Eval	Evaluation period remains unchanged
System Center 2012 – Service Manager RC Eval	System Center 2012 – Service Manager Select	Licensed

Note
Upgrading from an evaluation version of System Center Service Manager 2010 SP1 CU3 or from System Center 2012 – Service Manager RC to an evaluation version of System Center 2012 – Service Manager *does not* extend the 180-day evaluation period.

Installation Location

The default folder for installing System Center 2012 – Service Manager is \Program Files\Microsoft System Center\Service Manager 2012. However, when you perform the upgrade to System Center 2012 – Service Manager, Service Manager will be installed in the folder that Service Manager 2010 SP1 used:

\Program Files\Microsoft System Center\Service Manager 2010.

Language Support

This release of System Center 2012 – Service Manager represents an ongoing progression of support for various languages. In System Center Service Manager 2010, you used the Latin1_General_100_CI_AS collation for the Turkish language. System Center 2012 – Service Manager supports the Turkish_100_CI_AS collation. However, in an upgrade from System Center Service Manager 2010 to System Center 2012 – Service Manager RC, the

collation that is used for the Turkish language (Latin1_General_100_CI_AS) will be carried forward to System Center 2012 – Service Manager RC.

Hardware Requirements for System Center 2012 – Service Manager

All hardware requirements for System Center 2012 – Service Manager are fully documented in Planning for System Center 2012 - Service Manager. System Center 2012 – Service Manager will function on the same hardware that you used for Service Manager 2010 SP1 CU3. Service Manager 2010 SP1 CU3 supported up to 20,000 users, System Center 2012 – Service Manager can support up to 50,000 users. Support for more users requires more RAM for the computers that host the Service Manager and data warehouse management servers.

Software Requirements for System Center 2012 – Service Manager

All software requirements for System Center 2012 – Service Manager are fully documented in Planning for System Center 2012 - Service Manager. Software requirements for the Service Manager console have changed since the release of System Center Service Manager 2010 SP1 CU3. The Service Manager console is no longer compatible with Windows XP, and computers using Windows Vista must have Service Pack 2 (SP2) applied. In addition, the Service Manager console can now be installed on computers running Windows 7 Professional with SP1 and Windows 7 Ultimate with SP1.

The Service Manager and data warehouse management servers, along with the Self-Service Portal is supported with Windows Server 2008 R2 SP1. If you are using Windows Server 2008 R2, you must apply SP1 before upgrading to System Center 2012 – Service Manager.

Note

The Service Manager and data warehouse management servers are no longer supported on Windows Server 2008.

Additional software requirements for System Center 2012 – Service Manager include the following:

- Windows PowerShell 2.0
- SQL Server Analysis Services (SSAS)
- SQL Server 2008 R2 Native Client
- ADO.NET Data Services Update for .NET Framework 3.5 SP1
- Microsoft Analysis Management Objects (AMOs)
- Microsoft Silverlight 4
- Microsoft .NET Framework 4

Note

For System Center 2012 SP1 only: On servers running Windows Server 2012, the Service Manager Portal SharePoint site requires ASP.NET 4.5 for the Web Server role, not ASP.NET 4.5 for the .NET Framework 4.5 feature. You can install ASP.NET 4.5 using the Add Roles and Features wizard by selecting Server Roles and then navigate through Web Server (IIS), Web Server, Application Development and then select ASP.NET 4.5.

- Microsoft SharePoint 2010

Windows PowerShell 2.0

System Center 2012 – Service Manager requires the Windows PowerShell 2.0 command-line interface for the Service Manager management server and data warehouse management server. For the Service Manager console, you can use either Windows PowerShell 1.0 or 2.0. If you are running Windows Server 2008 R2, Windows Server Developer Preview, or Windows 7, you already have Windows PowerShell 2.0 installed. If you are running Windows Server 2008 or Windows Vista (for your Service Manager console computers), you must install Windows PowerShell 2.0 manually.

Windows PowerShell 2.0 is now part of Windows Management Framework. For more information, see Windows Management Framework Core package.

Note
You must restart your computer after you install Windows PowerShell 2.0.

All other software requirements for System Center 2012 – Service Manager are the same as for System Center Service Manager 2010 SP1. For more information, see "System Requirements for Service Manager" in the System Center Service Manager 2010 SP1 Planning Guide.

SQL Server 2008 R2 Native Client

Three different setup files are available for installing Microsoft SQL Server 2008 R2 Native Client based on the microprocessor architecture that you are using, as indicated in the following list:

- x86 Package
- x64 Package
- IA-64 Package

SQL Server Analysis Services

For data warehouse reporting, System Center 2012 – Service Manager requires SSAS so that it can work with online analytical processing (OLAP) cubes.

ADO.NET Data Services Update for .NET Framework 3.5 SP1

This update is required for both the Service Manager and data warehouse management servers, Service Manager console, and for the computers hosting the Service Manager and data warehouse databases. For more information about the ADO.NET Data Services Update, see

ADO.NET Data Services Update for .NET Framework 3.5 SP1 for Windows 7 and Windows Server 2008 R2.

Microsoft Analysis Management Objects

The Service Manager console requires Microsoft AMOs so that it can work with SSAS. Three different setup files are available for installing Microsoft AMOs, based on the microprocessor architecture that you are using:

x86 Package

x64 Package

IA-64 Package

Microsoft Silverlight 4

The Self-Service Portal has been completely redesigned for System Center 2012 – Service Manager RC. An upgrade of the Self-Service Portal in Service Manager 2010 SP1 is not possible. Client computers that access the new Self-Service Portal through a browser require the installation of Microsoft Silverlight 4. To download Microsoft Silverlight 4, see Get Microsoft Silverlight.

Microsoft SharePoint 2010

The redesigned Self-Service Portal in System Center 2012 – Service Manager requires SharePoint 2010.

Testing the Upgrade in a Lab Environment

We recommend that you test the upgrade of System Center Service Manager 2010 SP1 to System Center 2012 – Service Manager in a lab environment.

Upgrade Order and Timing

The order of your upgrades is important. Perform the upgrade steps in the following order:

1. Backup your databases and your management packs. See the topics "Backing Up Service Manager Databases" and "Backing Up Unsealed Management Packs" in the Disaster Recovery Guide for System Center 2012 – Service Manager.
2. Start with the data warehouse management server. You will be stopping the data warehouse jobs, and you will not be able to start them again until after you have completed the upgrade.
3. After the upgrade to the data warehouse management server is complete, upgrade the initial Service Manager management server. If you created more than one Service Manager management server, the initial Service Manager management server is the first one that you created.
4. Upgrade the Service Manager consoles and any additional Service Manager management servers.
5. Restart the data warehouse jobs.

6. Deploy the new Self-Service Portal.

The timing of your upgrades is also important. After you upgrade your data warehouse management server, you must both update the Service Manager management server and deploy the new Self-Service Portal. The MPSync job on a System Center 2012 – Service Manager data warehouse will not work with either the Service Manager management server or Self-Service Portal from Service Manager 2010. After you upgrade your initial Service Manager management server, you must be prepared to upgrade your Service Manager console or Service Manager consoles, additional Service Manager management servers, and Self-Service Portal at the same time.

Operations Manager Compatibility

This section describes the compatibility between Operations Manager 2007 R2, System Center 2012 – Operations Manager and System Center 2012 – Service Manager.

System Center Operations Manager 2007 R2

Operations Manager 2007 R2 agents must be removed from the Service Manager and data warehouse management servers before you attempt an upgrade. You can redeploy the agent after the upgrade. Upgrading Service Manager computers in the presence of an Operations Manager 2007 R2 console is supported.

System Center 2012 – Operations Manager

System Center 2012 – Operations Manager agents are not supported with System Center 2012 – Service Manager. Upgrading Service Manager computers in the presence of an System Center 2012 – Operations Manager console is supported.

Database Impacts

With System Center 2012 – Service Manager, you have the option to install Operations Manager and Configuration Manager data marts. Selecting this option will result in additional space requirements on the hard disk drive for the two databases, as well as associated file groups and log files.

Backing Up Service Manager Before Upgrading

Before you start any upgrade, we recommend that you back up your Service Manager and data warehouse databases and the encryption key. If you have already backed up your databases and encryption key, you can continue to run the upgrade. Otherwise, review the backup procedures in the Disaster Recovery Guide for System Center 2012 – Service Manager before you continue the upgrade.

Registering with the Service Manager Data Warehouse

If you have installed a data warehouse management server in your environment, as part of the upgrade process, you must be able to view the status of the data warehouse jobs. You cannot perform this task if you have not registered with the Service Manager data warehouse. If the **Data Warehouse** button is not visible in the Service Manager console, complete the procedure in "Registering with the Service Manager Data Warehouse to Enable Reporting" in the Deployment Guide for System Center 2012 – Service Manager RC.

Encryption Keys

When you have finished running Setup to either install or upgrade to System Center 2012 – Service Manager, you are prompted to open the Encryption Backup or Restore Wizard. The encryption keys that were created for System Center Service Manager 2010 work with System Center 2012 – Service Manager SP1. If you have previously backed up the encryption keys, no additional action is required. If you never backed up the encryption keys, use the Encryption Key Backup or Restore Wizard to back up the encryption keys on the Service Manager management servers.

Upgrading the Self-Service Portal

If you are upgrading from System Center 2012 – Service Manager Release Candidate (RC) to System Center 2012 – Service Manager, you can perform an in-place upgrade from the Self-Service Portal in System Center 2012 – Service Manager RC to the Self-Service Portal in System Center 2012 – Service Manager.

If you are upgrading from System Center Service Manager 2010 Service Pack 1 (SP1) Cumulative Update 3 (CU3), the System Center Service Manager 2010 Self-Service Portal is not compatible with the System Center 2012 – Service Manager Self-Service Portal. After your upgrade is complete, you will create a new Self-Service Portal.

See Also

Upgrade Planning for System Center 2012 - Service Manager

Service Manager Connectors

Any connectors that you created with System Center Service Manager 2010 Service Pack 1 (SP1) will continue to function after you upgrade to System Center 2012 – Service Manager. The following is the list of connectors that you could have created with Service Manager 2010 SP1:

- Active Directory Domain Services
- System Center Configuration Manager 2007 SP1
- System Center Configuration Manager 2007 R2
- Operations Manager 2007 R2

You may notice that these connectors continue to synchronize after you upgrade to System Center 2012 – Service Manager. System Center 2012 – Service Manager supports connectors for System Center Operations Manager 2012 and Microsoft System Center 2012 Configuration Manager. You have to create new connectors to import data from these two products.

After you have verified that the new connectors for Operations Manager for System Center 2012 and System Center 2012 Configuration Manager are functioning properly, you can disable the connectors to Operations Manager 2007 and Configuration Manager 2007. The data that was captured by the older connectors will remain in the Service Manager database.

For more information, see “Using Connectors to Import Data into Service Manager” in the Administrator's Guide for System Center 2012 - Service Manager.

Remote SQL Server Reporting Services

When you installed System Center Service Manager 2010, you may have specified a different computer to host Microsoft SQL Server Reporting Services (SSRS) than the computer that hosted the data warehouse management server. If, in your environment, SSRS is remote from the data warehouse management server, you must use the following procedures to prepare the computer that hosts SSRS for the upgrade:

- Copy Microsoft.EnterpriseManagement.Reporting.Code.dll from the Service Manager installation media to the computer that is hosting SSRS.
- Add an Extension tag to the existing Data segment in the rsreportserver configuration file on the same computer.

If you used the default instance of SQL Server, use Windows Explorer to drag Microsoft.EnterpriseManagement.Reporting.Code.dll (which is located in the Prerequisites folder on your Service Manager installation media) to the folder \Program Files\Microsoft SQL Server\MSRS10.MSSQLSERVER\Reporting Services\ReportServer\Bin on the computer that is hosting SSRS. If you did not use the default instance, the path of the required folder is \Program Files\Microsoft SQL Server\MSRS10.<INSTANCE_NAME>\Reporting Services\ReportServer\Bin. In the following procedure, the default instance name is used.

To copy the Microsoft.EnterpriseManagement.Reporting.Code.dll file

1. On the computer that will host the remote SSRS, open an instance of Windows Explorer.
2. Perform one of the following steps, depending on which version of SQL Server 2008 you are using:
   a. For SQL Server 2008 SP1, locate the folder \Program Files\Microsoft SQL Server\MSRS10.MSSQLSERVER\Reporting Services\ReportServer\Bin.
   b. For SQL Server 2008 R2, locate the folder \Program Files\Microsoft SQL Server\MSRS10_50.MSSQLSERVER\Reporting Services\ReportServer\Bin.
3. Start a second instance of Windows Explorer, locate the drive that contains the Service Manager installation media, and then open the Prerequisites folder.
4. In the Prerequisites folder, click **Microsoft.EnterpriseManagement.Reporting.Code.dll**

and drag it to the folder that you located in either step 2a or step 2b.

To add an Extension tag to the Data segment in the rsreportserver.conf file

1. On the computer that is hosting SSRS, locate the file rsreportserver.config in the following folder:
   a. For SQL Server 2008 SP1, locate \Program Files\Microsoft SQL Server\MSRS10.MSSQLSERVER\Reporting Services\ReportServer
   b. For SQL Server 2008 R2, locate \Program Files\Microsoft SQL Server\MSRS10_50.MSSQLSERVER\Reporting Services\ReportServer
2. Using an XML editor of your choice (such as Notepad), open the rsreportserver.config file.
3. Scroll through the rsreportserver.config file, and locate the **<Data>** code segment. There is only one **<Data>** code segment in this file.
4. Add the following **Extension** tag to the **<Data>** code segment where all the other **Extension** tags are:

```
<Extension Name="SCDWMultiMartDataProcessor"
Type="Microsoft.EnterpriseManagement.Reporting.MultiMartConne
ction, Microsoft.EnterpriseManagement.Reporting.Code" />
```

5. Save the changes, and close the XML editor.

Setting Up a Service Manager 2010 Lab Environment with Production Data

This section explains how to create a lab environment and populate it with production data so that upgrades can be performed and tested before an actual upgrade in the production environment. The procedures in this section show you how to configure System Center Service Manager 2010 Service Pack 1 (SP1) Cumulative Update 3 (CU3) in a lab environment with production data. You then perform an in-place upgrade to System Center 2012 – Service Manager. It is important to follow the steps in this section in sequence.

1. How to Install an Additional Management Server in the Production Service Manager Management Group
2. Install any cumulative updates that you installed on the Primary Management server on the Secondary Management Server.
3. How to Copy the Workflow Assembly Files
4. How to Disable Service Manager Connectors in the Production Environment
5. How to Disable Email Notifications in the Production Environment
6. Disable all workflows in the production environment that you do not want to be running in the lab environment.
7. How to Stop Service Manager Services on the Secondary Management Server

8. How to Back Up the Production Service Manager Database
9. How to Enable Service Manager Connectors in the Production Environment
10. How to Enable Email Notifications in the Production Environment
11. Enable all workflows in the Production Service Manager environment that you disabled in step 6.
12. How to Restore the Service Manager Database in the Lab Environment
13. How to Prepare the Service Manager Database in the Lab Environment
14. If possible, block communications to SQL from the Secondary Management server to the Production ServiceManager Database server.
15. How to Start Service Manager Services on the Secondary Management Server
16. Verify that the lab environment works. Try to open the console on the Secondary Management server and see if you can connect to the console. Confirm that the Data Warehouse and Reporting do not appear. After you confirm that this works, complete the rest of the steps.
17. How to Promote a Secondary Management Server in a Lab Environment
18. How to Enable the Connectors in the Lab Environment

    Note
    Do not enable or delete the Operations Manager alert connector in the lab environment. This will cause the alert connector in the production environment to fail.
19. If you want to test the email notification and incoming email functionality, use a separate SMTP instance to send emails to eliminate flooding the inboxes of users with test emails. To test the incoming email feature, you can point to a test share and drop the eml files into this share when you are ready to test.
20. How to Install a New Data Warehouse Server in the Lab Environment
21. How to Register the Data Warehouse Server in the Lab Environment
22. Back up this lab environment; for example, back up the database and encryption keys and VM Snapshots This gives you the ability to recover in case the upgrade fails.
23. If you are able to successfully complete all the previous steps, you are ready to attempt the in-place upgrade.
24. Test everything. Document any discrepancies and fixes. Send feedback through the MS Connect web site.
25. Backup this Service Manager lab environment; for example, back up the database and encryption keys and VM Snapshots This gives you the ability to recover in case the upgrade fails.
26. The lab environment is now ready for System Center 2012 – Service Manager in-place upgrade.

How to Install an Additional Management Server in the Production Service Manager Management Group

The following procedure shows how to install an additional management server. You must deploy the initial Service Manager management server and Service Manager Database before deploying an additional management server.

Tip

You must be a member of the Service Manager Administrators user role in order to install an additional Service Manager management server.

In Service Manager 2010, when you install a secondary management server, data retention settings are reset. Before you install a secondary management server, make a note of data retention settings. After you have installed the additional management server, adjust the data retention settings to their original values.

To install an additional management server

1. By using an account that has administrator rights and that is also a member of the Service Manager Management group administrators, log on to the computer that will host the additional Service Manager Management server.
2. On the System Center Service Manager 2010 installation media, double-click Setup.exe.
3. On the **Microsoft System Center Service Manager 2010** page, click **Install a Service Manager Management server**.
4. On the **Product registration** page, type information in the boxes. In the **Product key** boxes, type the product key you received with Service Manager, or alternatively, select **Install as an evaluation edition (180 day trial)?**. Read the Microsoft Software License Terms, and, if applicable, click **I have read, understood, and agree with the terms of the license agreement**, and then click **Next**.
5. On the **Installation location** page, verify that sufficient free disk space is available, and then click **Next**. If necessary, click **Browse** to change the location where the additional Service Manager Management server will be installed.
6. On the **System check results** page, make sure that the prerequisite check passed or at least passed with warnings, and then click **Next**.
    a. If the prerequisite checker determines that the Microsoft Report Viewer Redistributable has not been installed, click **Install Microsoft Report Viewer Redistributable**. After the **Microsoft Report Viewer Redistributable 2008 (KB971119) Setup** wizard completes, click **Check perquisites again**.
7. On the **Configure the Service Manager Database** page, in the **Database server** box, type the name of the computer that hosts the Service Manager database that you used for your initial Service Manager Management server, and then press TAB. When the name of the instance displays in the **SQL Server instance** box, click **Use an existing database**. For example, type **Computer 2** in the **Database server** box.
8. Click the **Database** list, select the database name for the Service Manager database (the default name is ServiceManager), and then click **Next**.

9. On the **Configure the Service Manager Management group** page, verify that the management group name and management group administrators boxes have been populated. Click **Next**.
10. On the **Configure the Account for Service Manager Services** page, click **Domain account**, specify the user name, password, and domain for the account, and then click **Test Credentials**. After you receive a **The credentials were accepted** message, click **Next**. For example, enter the account information for the domain user SM_Acct, and then click **Next**.

    Note
    The user name and password you provide here must be the same ones used for the Service Manager account on the data warehouse management server.
11. On the **Help improve System Center** page, indicate your preference for participation for both the Customer Experience Improvement Program and Error Reporting. Optionally, click **Tell me more about the program**, and then click **Next**.
12. On the **Use Microsoft Update to help keep your computer secure and up-to-date** page, indicate your preference for using Microsoft Update to check for Service Manager updates, and then click **Next**.
13. On the **Installation summary** page, click **Install**.
14. On the **Setup completed successfully** page, we recommend that you leave **Open the Encryption Backup or Restore Wizard** selected, and then click **Close**.

How to Copy the Workflow Assembly Files

Use the following procedure to copy the workflow assembly files from the Service Manager Installation folder on the primary management server to the secondary management server that you created in the previous procedure.

To copy the workflow assembly files

1. On the computer that is running the Service Manager Primary Server role, browse to the Service Manager Installation folder for example, C:\Program Files\Microsoft System Center\Service Manager 2010 copy the workflow files.
2. On the computer that is running the Service Manager Secondary server; browse to the Service Manager Installation folder; for example, C:\Program Files\Microsoft System Center\Service Manager 2010. Paste the copied workflow files into this folder.

    Note
    You must place the workflow assembly files in the Service Manager installation folder. This is very important step if you want to test the custom workflows that depend on workflow assembly files. Failure to copy these files would lead to failed custom workflows in the lab environment.

How to Disable Service Manager Connectors in the Production Environment

Use the following procedure to disable the Service Manager connectors in the production environment.

To disable an Active Directory connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Connectors** pane, select the Active Directory connector that you want to disable.
4. In the **Tasks** pane, under the connector name, click **Disable**.
5. In the **Disable Connector** dialog box, click **OK**.

To disable an Operations Manager connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Connectors** pane, select the Operations Manager connector that you want to disable.
4. In the **Tasks** pane, under the connector name, click **Disable**.
5. In the **Disable Connector** dialog box, click **OK**.

To disable a Configuration Manager connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Connectors** pane, select the Configuration Manager connector that you want to disable. For example, click **Configuration Manager connector to SEA**.
4. In the **Tasks** pane, under the connector name, click **Disable**.

   Note
   If you disable a connector while it is synchronizing data, the synchronization process may not stop. However, a disabled connector will not import any new data from a Configuration Manager database from that point forward.

How to Disable Email Notifications in the Production Environment

Use the following procedure to disable incoming and outbound E-mail notifications in the production environment.

To disable the outbound E-mail notifications

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Notifications**, and then click **Channels**.
3. In the **Channels** pane, click **E-Mail Notification Channel**.
4. In the **Tasks** pane, under **E-Mail Notification Channel**, click **Properties** to open the **Configure E-Mail Notification Channel** dialog box.
5. Clear the **Enable e-mail notifications** check box.

To disable incoming E-mail notifications

1. In the Service Manager console, select **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Settings**.
3. In the **Settings** pane, double-click **Incident Settings**.
4. In the Incident **Settings** dialog box, click **Incoming E-mail**.
5. Clear **Turn on incoming e-mails processing**, and then click **OK**.

How to Stop Service Manager Services on the Secondary Management Server

Use the following procedure to stop the Service Manager services.

To stop the Service Manager services

1. In the **Run** dialog box, in the **Open** text field, type **services.msc**, and then click **OK**.
2. In the **Services** window, in the **Services (Local)** pane, locate the following three services and for each one, click **Stop**:
   a. System Center Data Access Service
   b. System Center Management
   c. System Center Management Configuration
3. Open Windows Explorer.
4. Locate the folder \Program Files\Microsoft System Center\Service Manager 2010.
5. Delete the **Health Service State** folder and all of its contents.

How to Back Up the Production Service Manager Database

Use the following procedure to back up the production Service Manager database.

To back up the Service Manager database

1. After connecting to the appropriate instance of the Microsoft SQL Server Database Engine, in Object Explorer, click the server name to expand the server tree.

2. Expand **Databases**, and depending on the database, either select a user database or expand **System Databases** and select a system database.
3. Right-click the database, point to **Tasks**, and then click **Back Up**. The Back Up Database dialog box appears.
4. In the **Database** list box, verify the database name. You can optionally select a different database from the list.
5. You can perform a database backup for any recovery model (FULL, BULK_LOGGED, or SIMPLE).
6. In the **Backup type** list box, select **Full**.

   Note
   After creating a full database backup, you can create a differential database backup. For more information, see How to: Create a Differential Database Backup (SQL Server Management Studio).
7. Optionally, you can select **Copy Only Backup** to create a copy-only backup. A copy-only backup is a SQL Server backup that is independent of the sequence of conventional SQL Server backups. For more information, see Copy-Only Backups.

   Note
   When the **Differential** option is selected, you cannot create a copy-only backup.
8. For **Backup component**, click **Database**.
9. Either accept the default backup set name suggested in the **Name** text box, or enter a different name for the backup set.
10. Optionally, in the **Description** text box, enter a description of the backup set.
11. Specify when the backup set will expire and can be overwritten without explicitly skipping verification of the expiration data.

    Note
    For more information about backup expiration dates, see BACKUP (Transact-SQL).
12. Choose the type of backup destination by clicking **Disk** or **Tape**. To select the paths of up to 64 disk or tape drives containing a single media set, click **Add**. The selected paths are displayed in the **Backup to** list box.
13. To view or select the advanced options, click **Options** in the **Select a page** pane.
14. Select an Overwrite Media option, by clicking either **Back up to the existing media set** or **Back up to a new media set, and erase all existing backup sets**.
15. In the Reliability section, select either **Verify backup when finished** or **Perform checksum before writing to media**, and then optionally select **Continue on checksum error**. For more information, see Detecting and Coping with Media Errors During Backup and Restore

How to Enable Service Manager Connectors in the Production Environment

Use the following procedure to enable the Service Manager connectors in the production environment.

To enable an Active Directory connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Connectors** pane, select the Active Directory connector that you want to enable.
4. In the **Tasks** pane, under the connector name, click **Enable**.

To enable an Operations Manager connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Connectors** pane, select the Operations Manager connector that you want to enable.
4. In the **Tasks** pane, under the connector name, click **Enable**.
5. In the **Enable Connector** dialog box, click **OK**.

To enable a Configuration Manager connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Connectors** pane, select the Configuration Manager connector that you want to enable. For example, click **Configuration Manager connector to SEA**.
4. In the **Tasks** pane, under the connector name, click **Enable**.

How to Enable Email Notifications in the Production Environment

Use the following procedure to enable incoming and outbound E-mail notifications in the production environment.

To enable the outbound E-mail notifications

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Notifications**, and then click **Channels**.
3. In the **Channels** pane, click **E-Mail Notification Channel**.
4. In the **Tasks** pane, under **E-Mail Notification Channel**, click **Properties** to open the **Configure E-Mail Notification Channel** dialog box.

5. Select **Enable e-mail notifications**.

To enable incoming E-mail notifications

1. In the Service Manager console, select **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Settings**.
3. In the **Settings** pane, double-click **Incident Settings**.
4. In the Incident **Settings** dialog box, click **Incoming E-mail**.
5. Select **Turn on incoming e-mails processing**, and then click **OK**.

How to Restore the Service Manager Database in the Lab Environment

Use the following procedure to restore the production Service Manager database.

To restore the Service Manager database

1. After connecting to the appropriate instance of the Microsoft SQL Server Database Engine, in Object Explorer, click the server name to expand the server tree.
2. Expand **Databases**, and depending on the database, either select a user database or expand **System Databases** and select a system database.
3. Right-click the database, point to **Tasks**, and then click **Restore**. The Back Up Database dialog box appears.
4. Click **Database**, which opens the **Restore Database** dialog box
5. On the **General** page, the name of the restoring database appears in the **To database** list box. To create a new database, enter its name in the list box.
6. In the **To a point in time** text box, either retain the default (Most recent possible) or select a specific date and time by clicking the browse button which opens the **Point in Time Restore** dialog box. For more information, see How to: Restore to a Point in Time (SQL Server Management Studio).
7. To specify the source and location of the backup sets to restore, click either **From database** or **From device**.
8. In the **Select the backup sets to restore** grid, select the backups to restore. For more information see Restore Database (General Page).
9. To view or select the advanced options, click **Options** in the **Select a page pane**.
10. In the **Restore options** panel, choose one of the following options most appropriate for your situation:
    - Overwrite the existing database
    - Preserve the replication settings
    - Prompt before restoring each backup
    - Restrict access to the restored database

For more information, see Restore Database (Options Page)

11. Optionally, you can restore the database to a new location by specifying a new restore destination for each file in **Restore the database files as**. For more information see Restore Database (Options Page).
12. In the **Recovery state** panel, select one of the following options most appropriate for your environment:
    - **Leave the database ready to use by rolling back the uncommitted transactions. Additional transaction logs cannot be restored. (RESTORE WITH RECOVERY)**

      Note
      Choose this option only if you are restoring all of the necessary backups at this time.
    - **Leave the database non-operational, and do not roll back the uncommitted transactions. Additional transaction logs can be restored. (RESTORE WITH NORECOVERY)**
    - **Leave the database in read-only mode. Undo uncommitted transactions, but save the undo actions in a standby file so that recovery effects can be reverted. (RESTORE WITH STANDBY)**

    For more information see Restore Database (Options Page).

How to Prepare the Service Manager Database in the Lab Environment

Use the following procedure to prepare the Service Manager database in the lab environment. Perform this procedure on the computer that is hosting the Service Manager database that is being used by the secondary management server, the management server in your lab environment.

To configure the database

1. On the computer hosting the Service Manager database for the secondary management server, click **Start**, click **All Programs**, click **Microsoft SQL Server 2008 R2**, and then click **SQL Server Management Studio**.
2. In the **Connect to Server** dialog box, follow these steps:
   a. In the **Server Type** list, select **Database Engine**.
   b. In the **Server Name** list, select the server name for your Service Manager or data warehouse databases.
   c. In the **Authentication** list, select **Windows Authentication**, and then click **Connect**.
3. In the **Object Explorer** pane, expand **Databases**, and then click **ServiceManager**.
4. In the toolbar, click **New Query**.
5. In the center pane, type the following commands, and then click **Execute**.

```
sp_configure 'clr enabled', 1
go
reconfigure
go
```

6. In the center pane, remove the commands you typed in the previous step, type the following commands, and then click **Execute**.

```
ALTER DATABASE ServiceManager SET SINGLE_USER WITH ROLLBACK
IMMEDIATE
```

7. In the center pane, remove the commands you typed in the previous step, type the following commands, and then click **Execute**.

```
ALTER DATABASE ServiceManager SET ENABLE_BROKER
```

8. In the center pane, remove the commands you typed in the previous step, type the following commands, and then click **Execute**.

```
ALTER DATABASE ServiceManager SET MULTI_USER
```

To configure the service account

1. In the **Object Explorer** pane, expand **Security**, and then expand **Logins**.
2. Right-click **Logins**, and then click **New Login**
3. Perform the following procedures in the **Login – New** wizard:
   a. Click **Search**.
   b. Type the username (domain\username) for the service account for Service Manager database in the lab environment, click **Check Names**, and then click **OK**.

      Note
      If the Data Access Account is running as LocalSystem, use the format <domain\computername$> in SQL Logins, where <computername> is the name of the management server.

   c. In the **Select a page** pane, click **User Mapping**.
   d. In the **Users mapped to this login** area, in the **Map** column, click the row that represents the name of the Service Manager database (**ServiceManager** is the default database name).
   e. In the **Database role membership for: ServiceManager** area, make sure that the following entries are selected:
      - **configsvc_users**
      - **db_accessadmin**
      - **db_datareader**
      - **db_datawriter**
      - **db_ddladmin**
      - **db_securityadmin**

- **dbmodule_users**
- **public**
- **sdk_users**
- **sql_dependency_subscriber**

f. Click **Ok**

To configure Service Manager tables

1. In the **Object Explorer** pane, expand **Databases**, expand **ServiceManager**, and then expand **Tables**.
2. Right-click **dbo.MT_Microsoft$SystemCenter$ManagementGroup**, and then click **Edit Top 200 Rows**.
3. In the center pane, locate the column **SQLServerName_ 48B308F9_CF0E_0F74_83E1_0AEB1B58E2FA**.
4. In the first row and second rows of this column, type the computer name of the computer hosting the Service Manager database in the lab environment. In the case of named instances, type computer name\instance name.
5. Right-click **dbo. MT_Microsoft$SystemCenter$ResourceAccessLayer$SqlResourceStore**, and then click **Edit Top 200 Rows**.
6. In the center pane, locate the column **Server_48B308F9_CF0E_0F74_83E1_0AEB1B58E2FA**.
7. In the first row of this column, type the computer name of the computer hosting the SQL Server for the Service Manager database in the lab environment. In the case of named instances, type computer name\instance name.
8. Right-click **LFX.DataSource**, and then click **Edit Top 200 Rows**.
9. In the center pane, locate the column **DataSourceAddress**.
10. In the first row of this column, locate the entry that starts with **Data Source = <server name>; Initial Catalog = ServiceManager; Persist Security Info=False**. Type the name of the computer hosting SQL Server in the lab environment in place of **<server name>**.
11. Right-click **dbo. MT_Microsoft$SystemCenter$ResourceAccessLayer$SdkResourceStore**, and then click **Edit Top 200 Rows**.
12. In the center pane, locate the column **Server_48B308F9_CF0E_0F74_83E1_0AEB1B58E2FA**.
13. In all of the rows in this column, type the name of the computer hosting the Service Manager management server in the lab environment.
14. Right-click **[dbo].[MT_Microsoft$SystemCenter$ResourceAccessLayer$CmdbResourceStore]**, and then click **Edit Top 200 Rows**.
15. In all rows update the column **Server_48B308F9_CF0E_0F74_83E1_0AEB1B58E2FA**, type the name of the SQL computer hosting the Service Manager database in the lab

environment

16. In the toolbar, click **New Query**.
17. In the center pane, type the following command, and then click **Execute**.

```
Delete from
dbo.MT_Microsoft$SystemCenter$ResourceAccessLayer$DwSdkResour
ceStore
```

18. Close **Microsoft SQL Server Management Studio**.

How to Edit the Registry on the Service Manager Management Server in the Lab Environment

Use the following procedure to edit the registry on the Service Manager management server in the lab environment

Caution
Incorrectly editing the registry might severely damage your system; therefore, before making changes to the registry, back up any valued data on the computer.

To edit the registry

1. On the computer hosting the Service Manager management server in the lab environment, log on to the computer as a user with administrative credentials.
2. On the Windows desktop, click **Start**, and then click **Run**.
3. In the **Run** dialog box, in the **Open** box, type **regedit**, and then click **OK**.
4. in the **Registry Editor** window, expand **HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\System Center\2010\Common\Database**
5. In the right pane, double-click **DatabaseServerName**.
6. In the **Edit String** box, in the **Value data** box, type the name of the computer hosting the Service Manager database SQL Server in the lab environment. If you are using a named instance of SQL Server, use the Computer Name\Instance name format.
7. Click **OK**, and then close the Registry Editor.

How to Start Service Manager Services on the Secondary Management Server

Use the following procedure to start the Service Manager services.

To Start Service Manager Services

1. On the Windows desktop, click **Start**, and then click **Run**.

2. In the **Run** dialog box, in the **Open** field, type **services.msc**, and then click **OK**.
3. In the **Services** window, in the **Services (Local)** pane, locate the following three services and for each one, click **Start**:
   - System Center Data Access Service
   - System Center Management
   - System Center Management Configuration

How to Promote a Secondary Management Server in a Lab Environment

Use the following procedure to promote the secondary management server.

To promote the secondary management server

1. On the secondary management server, do the following:
   a. Close the Service Manager console.
   b. On the Windows desktop, click **Start**, and then click **Run**.
   c. In the **Run** dialog box, in the **Open** text field, type **services.msc**, and then click **OK**.
   d. In the **Services** window, in the **Services (Local)** pane, locate the following three services and for each one, click **Stop**:
      - System Center Data Access Service
      - System Center Management
      - System Center Management Configuration
   e. Leave the **Services** window open.
   f. Open Windows Explorer. Locate the \Program Files\Microsoft System Center\Service Manager 2010 folder.
   g. In this folder, delete the Health Service State folder and all of its contents.
2. Do the following on the ServiceManager database on the Test SQL Server instance:
   a. On the Windows desktop, click **Start**, point to **Programs**, point **to Microsoft SQL Server 2008**, and then click **SQL Server Management Studio**.
   b. In the Connect to Database Engine dialog box, follow these steps:
      i. In the **Server name** box, type the name of the server that hosts the ServiceManager database.
      ii. In the **Authentication** box, select **Windows Authentication**.
      iii. Click **Connect**.
   c. In the **Object Explorer** pane, expand **Databases**, and then click **ServiceManager**.
   d. On the toolbar, click **New Query**.
   e. In the **SQLQuery1.sql** pane (center pane), type the following, where <FQDN of your server> is the FQDN of the management server that you are promoting:

EXEC p_PromoteActiveWorkflowServer '<FQDN of your server>'

On the toolbar, click **Execute**.

f. At the bottom of the **SQLQuery1.sql** pane (center pane), observe that **Query executed successfully** is displayed.

g. Exit Microsoft SQL Server Management Studio.

3. Do the following on the secondary management server:
   a. On the Windows desktop, click **Start**, and then click **Run**.
   b. In the **Run** dialog box, in the **Open** field, type **services.msc**, and then click **OK**.
   c. In the **Services** window, in the **Services (Local)** pane, locate the following three services and for each one, click **Start**.
      - System Center Data Access Service
      - System Center Management
      - System Center Management Configuration

Your secondary management server is now the primary management server for the management group.

How to Enable the Connectors in the Lab Environment

Use the following procedure to enable the Service Manager connectors in the lab environment. In this procedure, you will not be enabling the Operations Manager connector.

Warning

Do not enable or delete the Operations Manager alert connector in the lab environment. Doing so will cause the alert connector in the production environment to fail.

To enable an Active Directory connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Connectors** pane, select the Active Directory connector that you want to enable.
4. In the **Tasks** pane, under the connector name, click **Enable**.

To enable a Configuration Manager connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Connectors** pane, select the Configuration Manager connector that you want to enable. For example, click **Configuration Manager connector to SEA**.
4. In the **Tasks** pane, under the connector name, click **Enable**.

How to Install a New Data Warehouse Server in the Lab Environment

Use the following procedure to install a new data warehouse server in the lab environment.

To install a data warehouse management server and data warehouse databases

1. Log on to the computer by using an account that has administrative rights.
2. On the Service Manager installation media, double-click the **Setup.exe** file.
3. On the **Microsoft System Center Service Manager 2010** page, click **Install a Service Manager data warehouse management server**.
4. On the **Product registration** page, type information in the boxes. In the **Product key** boxes, type the product key you received with Service Manager, or alternatively, select **Install as an evaluation edition (180 day trial)?.** Read the Microsoft Software License Terms, and, if applicable, click **I have read, understood, and agree with the terms of the license agreement**, and then click **Next**.
5. On the **Installation location** page, verify that sufficient free disk space is available, and then click **Next**. If necessary, click **Browse** to change the location in which the Service Manager data warehouse management server will be installed.
6. On the **System check results** page, make sure that prerequisites passed or at least passed with warnings, and then click **Next**.
7. On the **Configure data warehouse databases** page, Service Manager checks the computer you are using to see if it can host the data warehouse databases. For this configuration, confirm that the database server is the computer on which you are installing the data warehouse management server, and then click **Next**.

   Warning
   A warning message appears if you are using the default collation (SQL_Latin1_General_CP1_CI_AS). Support for multiple languages in Service Manager is not possible when you are using the default collation. If later you decide to support multiple languages using a different collation, you have to re-install SQL Server. See “Microsoft SQL Server 2008 with SP1” in the System Center Service Manager 2010 SP1 Planning Guide (http://go.microsoft.com/fwlink/?LinkId=207215).
8. On the **Configure the data warehouse management group** page, follow these steps:
   a. In the **Management group name** box, type a unique name for the group.

      Warning
      Management group names must be unique. Do not use the same management group name when you deploy a Service Manager management server and a Service Manager data warehouse management server. Furthermore, do not use the management group name that is used for Operations Manager.
   b. Click **Browse**, enter the user account or group to which you want to give Service

Manager administrative rights, and then click **Next**.

9. Service Manager will use the existing computer if SQL Server Reporting Services is present. On the **Configure the reporting server for the data warehouse** page, accept the defaults, and then click **Next**.
10. On the **Configure the account for Service Manager services** page, click **Domain account**, specify the user name, password, and domain for the account, and then click **Test Credentials**. After you receive a **The credentials were accepted** message, click **Next**.
11. On the **Configure the reporting account** page, specify the user name, password, and domain for the account, and then click **Test Credentials**. After you receive a **The credentials were accepted** message, click **Next**.
12. On the **Help improve System Center** page, indicate your preference for participation in the Customer Experience Improvement Program and in Error Reporting. Optionally, click **Tell me more about the program**, and then click **Next**.
13. On the **Use Microsoft Update to help keep your computer secure and up-to-date** page, indicate your preference for using Microsoft Update to check for Service Manager updates, and then click **Next**.
14. On the **Installation summary** page, click **Install**.

To validate a data warehouse management server installation

1. On the computer hosting the data warehouse management server (the server you ran Setup on), run services.msc, and verify that the following services have been installed:
   - System Center Data Access Service
   - System Center Management
   - System Center Management configuration
2. On the computer hosting the data warehouse databases, click **Start**, point to **Programs**, point to **Microsoft SQL Server 2008**, and then click **SQL Server Management Studio**.
3. In the **Connect to Server** dialog box, select the following:
   a. In the **Server Type** list, select **Database Engine**.
   b. In the Server Name list, select the server and instance for your Service Manager data warehouse database. For example, select **Computer 4**.
   c. In the **Authentication** list, select **Windows Authentication**, and then click **Connect**.
4. In the **Object Explorer** pane, expand **Databases**.
5. Verify that the **DWDataMart**, **DWRepository**, and **DWStagingAndConfig** databases are listed.

How to Register the Data Warehouse Server in the Lab Environment

Use the following procedure to register the newly installed data warehouse server with the lab Service Manager environment.

To register a data warehouse

1. Log on to the computer that hosts the Service Manager console. Use an account that is a member of the Service Manager and data warehouse management administrators group.
2. In the Service Manager console, click **Administration**.
3. In the **Administration** pane, expand **Administration**.
4. In the **Administration** view, in the **Register with Service Manager's Data Warehouse** area, click **Register with Service Manager Data Warehouse**.
5. In the Data Warehouse Registration wizard, on the **Before You Begin** page, click **Next**.
6. On the **Data Warehouse** page, in the **Server name** box, type the fully qualified domain name of the computer hosting the data warehouse management server, and then click **Test Connection**. If the test is successful, click **Next**.
7. On the **Credentials** page, you can accept the default entry in the **Run as account** list, and then click **Next**, or you can enter credentials from a user or group of your own choosing.

   Important
   The account you specify will be assigned administrative credentials on the Service Manager management server and granted Read permission on the Service Manager database. You can specify different credentials from other Service Manager management groups when registering with the data warehouse.
8. On the **Summary** page, click **Create**.
9. On the **Completion** page, when **The data warehouse registration succeeded** is displayed, click **Close**.
10. A dialog box states that the report deployment process has not finished. This is to be expected. On the **System Center Service Manager** dialog box, click **OK**.
11. In a few minutes, after closing the Data Warehouse Registration wizard, the **Data Warehouse** button will be added to the Service Manager console. In the Service Manager console, click the arrow at the lower right corner of the Service Manager console buttons, and then click **Show More Buttons**.

You can use a Windows PowerShell command to complete this task. For information about how to use Windows PowerShell to register Service Manager management groups with the data warehouse, see Add-SCDWMgmtGroup (http://go.microsoft.com/fwlink/?LinkId=203096).

To validate the data warehouse registration process

1. On the computer hosting the data warehouse management server, on the Windows desktop, click **Start**, point to **Programs**, point to **Windows PowerShell 1.0**, right-click **Windows PowerShell**, and then click **Run as administrator**.
2. At the Windows PowerShell command prompt, type the following commands, and then press ENTER:

```
Set-ExecutionPolicy RemoteSigned
Import-Module
.\Microsoft.EnterpriseManagement.Warehouse.Cmdlets.psd1
```

3. Type the following command, and then press ENTER.

```
Get-SCDWMgmtGroup
```

4. If registration was successful, a table with two rows of data is displayed. One row displays data for the data warehouse management group, and a second row displays data for the Service Manager management group. If registration fails, only the data for the data warehouse management group is displayed.

Determine when the deployment is complete

Because you need to allow enough time for the management pack deployment process to be completed, you will have to determine when that process is complete. You can use the following procedure in System Center Service Manager 2010 to determine when the process is complete.

To determine when management pack deployment has completed

1. Start the Service Manager console.
2. In the Service Manager console, click **Data Warehouse**.
3. In the **Data Warehouse** pane, expand **Data Warehouse**, and then click **Data Warehouse Jobs**.
4. In the **Data Warehouse Jobs** pane, click **MPSyncJob**.
5. In the **Tasks** pane, under **Synchronization**, click **Details**.
6. In the **MP Sync Job** dialog box, scroll to the right and examine the **Status** column.

   Note
   In the **MP Sync Job** dialog box, click **Status** to alphabetically sort the status column.
7. Scroll through the **Status** list. The management pack deployment process is complete when **Associated** or **Imported** is listed in the status column for all of the management packs. Make sure that there is no status of either **Pending Association** or **Failed** in the status list. In the **Data Warehouse Jobs** pane, the status of the **MPSyncJob** will have changed from **Running** to **Not Started**. This deployment process can take up to two hours to complete.

8. To refresh the **MP Sync Job** dialog box:
   a. Press **OK** to close the dialog box.
   b. In the **Tasks** pane, in the **Data Warehouse Jobs** area, click **Refresh**.
   c. In the **Data Warehouse Jobs** pane, click **MPSyncJobs**.
   d. In the **Tasks** pane, under **Synchronization**, click **Details**.
9. After the management packs have been deployed (as determined in step 7), make sure that the following 5 data warehouse jobs are displayed in the **Data Warehouse Jobs** pane:
   - Extract_<Service Manager management group name>
   - Extract_<data warehouse management group name>
   - Load.Common
   - Transform.Common
   - MPSyncJob
10. If these 5 data warehouse jobs are not displayed, perform the following procedure:
    a. In the **Data Warehouse Jobs** pane, click **MPSyncJob**.
    b. In the **Tasks** pane, under **Synchronization**, click **Resume**.
    c. Assess if management pack deployment has completed by returning to step 4 above.

Upgrade to System Center 2012 - Service Manager

You cannot start an upgrade to System Center 2012 – Service Manager if any data warehouse jobs or workflows are running. You can use the procedures in this section to stop the data warehouse job schedules and wait for them to complete before you upgrade the data warehouse management server. Before you upgrade the Service Manager management server, stop the Self-Service Portal, if it is installed, and then wait 10 minutes to let any running workflows finish before you start the upgrade.

Complete the procedures in the following table to upgrade System Center Service Manager 2010 SP1 to System Center 2012 – Service Manager.

Task	Description
How to Prepare Service Manager 2010 SP1 for Upgrade to System Center - 2012 Service Manager	Describes how to stop data warehouse jobs and how to suspend the Self-Service Portal.
How to Upgrade to System Center 2012 - Service Manager	Describes how to upgrade the data warehouse management server, the Service Manager management server, and the Self-Service Portal.

How to Prepare Service Manager 2010 SP1 for Upgrade to System Center - 2012 Service Manager

This topic describes how to prepare your System Center Service Manager 2010 Service Pack 1 (SP1) environment for an upgrade to System Center 2012 – Service Manager. To do this, perform the following procedures for upgrading the data warehouse management server:

1. List the data warehouse jobs that are running.
2. Disable the data warehouse job schedules.
3. Confirm that the data warehouse jobs have stopped running.
4. Stop the Self-Service Portal.

When the data warehouse jobs have completed, start the upgrade of the data warehouse management server.

After the data warehouse has been upgraded, perform the following procedures on the first Service Manager management server:

1. Wait 10 minutes, and then start the upgrade of the Service Manager management server.

To list the data warehouse jobs by using Windows PowerShell cmdlets

1. On the computer that hosts the data warehouse management server, click **Start**, click **All Programs**, click **Accessories**, click **Windows PowerShell**, right-click **Windows PowerShell**, and then click **Run as administrator**.
2. Type the following commands, and then press ENTER after each command:

```
Set-ExecutionPolicy –force RemoteSigned
cd 'C:\Program Files\Microsoft System Center 2012\Service Manager'
Import-Module .\Microsoft.EnterpriseManagement.Warehouse.Cmdlets.psd1



Get-SCDWJob
```

3. A list of the data warehouse jobs appears. Use this list in the next procedure, "To disable data warehouse job schedules by using Windows PowerShell cmdlets."

To disable data warehouse job schedules by using Windows PowerShell cmdlets

1. Type the following commands, and then press ENTER after each command:

```
Disable-SCDWJobSchedule –JobName Extract_<data warehouse management group name>
Disable-SCDWJobSchedule –JobName Extract_<Service Manager management group name>
Disable-SCDWJobSchedule –JobName Transform.Common
```

```
Disable-SCDWJobSchedule –JobName Load.Common
Disable-SCDWJobSchedule –JobName DWMaintenance
Disable-SCDWJobSchedule –JobName MPSyncJob
Start-SCDWJob –JobName MPSyncJob
```

The last command to start the **MPSyncJob** will enable the extraction, transformation, and load (ETL) jobs to run to completion. After that, because all the schedules have been disabled, the jobs will stop. To close the Windows PowerShell window, type **exit**.

To confirm that the data warehouse jobs have stopped running

1. In the Service Manager console, click **Data Warehouse**.
2. In the **Data Warehouse** pane, expand **Data Warehouse**, and then click **Data Warehouse Jobs**.
3. In the **Data Warehouse Jobs** pane, observe the **Status** column for each data warehouse job. When the status for each job is listed as **Not Started**, proceed to the next procedure to stop the Self-Service Portal. If no Self-Service Portal exists in your environment, you can start the upgrade process in How to Upgrade to System Center 2012 - Service Manager.

To stop the Self-Service Portal (only required for in-place upgrades of the Service Manager 2010 Self-Service Portal)

1. On the computer that hosts the Self-Service Portal, on the Windows desktop, click **Start**, point to **Programs**, point to **Administrative Tools**, and then click **Internet Information Services (IIS) Manager**.
2. In the **Internet Information Services (IIS) Manager** window, in the **Connections** pane, right-click the name of your computer, and then click **Stop**.
3. Wait about 10 minutes before starting the upgrade process, as described in How to Upgrade to System Center 2012 - Service Manager.

How to Upgrade to System Center 2012 - Service Manager

You can use the following procedures to upgrade your Service Manager environment to System Center 2012 – Service Manager. These procedures include steps for upgrading the data warehouse management server, the Service Manager management server, and the Service Manager console.

Data Warehouse Management Server

Use the following procedure to upgrade the data warehouse management server.

Important

Make sure that you have stopped the data warehouse jobs before you continue. For more information, see How to Prepare Service Manager 2010 SP1 for Upgrade to System Center - 2012 Service Manager.

To upgrade the data warehouse management server

1. Log on to the computer that will host the data warehouse management server by using an account that is a member of the Administrators group. This account must also be a local administrator.
2. On the Service Manager installation media, double-click the **Setup.exe** to start the Service Manager Setup Wizard.
3. On the **Microsoft System Center 2012** page, click **Upgrade Service Manager data warehouse management server**.
4. On the **Prepare for upgrade** page, select the two items indicating that you have read the appropriate sections in the System Center 2012 – Service Manager Upgrade Guide, and then click **Next**.
5. On the **Product registration** page, type the appropriate information in the boxes. Read the Microsoft Software License Terms; if applicable, click **I have read, understood, and agree with the terms of the license agreement**; and then click **Next**.
6. On the **System check results** page, ensure that the prerequisite check passed or at least passed with warnings, and then click **Next**.
7. On the **Configure Analysis Service for OLAP cubes** page, in the **Database server** box, type the computer name of the server that will host the SQL Server Analysis Services (SSAS) database, and then press the Tab key. When **Default** appears in the **SQL Server instance** box, click **Next**.

   Important
   If you are installing SSAS on a computer other than the computer that hosts the data warehouse management server and there is a firewall in your environment, you must make sure that the proper firewall ports are opened. For more information, see “Port Assignments for System Center 2012 - Service Manager” in the Planning Guide for System Center 2012 - Service Manager.
8. On the **Configure Analysis Services credential** page, specify the user name, password, and domain for the account, and then click **Test Credentials**. After you receive a message saying “The credentials were accepted,” click **Next**.
9. On the **Help improve System Center** page, indicate your preference for participation in the Customer Experience Improvement Program and in Error Reporting. As an option, click **Tell me more about the program**, and then click **Next**.
10. On the **Use Microsoft Update to help keep your computer secure and up-to-date** page, indicate your preference for using Microsoft Update to check for Service Manager updates, and then click **Next**.
11. On the **Configuration Summary** page, read the information that is provided, and, if it is accurate, click **Install**.
12. On **The upgrade was completed successfully** page, if you have already backed up the

encryption key, clear the **Open the Encryption Backup or Restore Wizard** check box, and then click **Close**.

Service Manager Management Server

Use the following procedure to upgrade the Service Manager management server.

To upgrade the Service Manager management server

1. Log on to the computer that will host the Service Manager management server by using an account that is a member of the Administrators group.
2. On the Service Manager installation media, double-click the **Setup.exe** to start the Service Manager Setup Wizard.
3. On the **Microsoft System Center 2012** page, click **Upgrade Service Manager management server**.
4. On the **Prepare for upgrade** page, select the two items indicating that you have read the appropriate sections in the Upgrade Guide for System Center 2012 – Service Manager, and then click **Next**.
5. On the **Product registration** page, type the appropriate information in the boxes. Read the Microsoft Software License Terms, and, if applicable, click **I have read, understood, and agree with the terms of the license agreement**, and then click **Next**.
6. On the **System check results** page, ensure that the prerequisite check passed or at least passed with warnings, and then click **Next**.
7. On the **Configuration Summary** page, read the information that is provided, and, if it is accurate, click **Install**.
8. On the **The upgrade was completed successfully** page, if you have already backed up the encryption key, clear the **Open the Encryption Backup or Restore Wizard** check box, and then click **Close**.

Service Manager Console

Use the following procedure to upgrade the Service Manager console.

To upgrade the Service Manager Console

1. Log on to the computer that will host the Service Manager console by using an account that is a member of the Administrators group.
2. On the Service Manager installation media, double-click the **Setup.exe** to start the Service Manager Setup Wizard.
3. On the **Microsoft System Center 2012** page, click **Upgrade Service Manager console**.
4. On the **Prepare for upgrade** page, select the two items indicating that you have read the appropriate sections in the Upgrade Guide for System Center 2012 – Service Manager, and then click **Next**.
5. On the **Product registration** page, read the Microsoft Software License Terms, and, if applicable, click **I have read, understood, and agree with the terms of the license**

agreement, and then click **Next**.

6. On the **System check results** page, ensure that the prerequisite check passed or at least passed with warnings, and then click **Next**.
7. On the **Configuration Summary** page, read the information that is provided, and, if it is accurate, click **Install**.
8. On **The upgrade was completed successfully** page, click **Close**.

After Upgrading to System Center 2012 - Service Manager

This topic describes how to restart the Data Access service if it fails to start after an upgrade to System Center 2012 – Service Manager. After the upgrade, you will also have to start the Service Manager workflows and restart the data warehouse jobs. This topic also describes how to stop and then start SQL Server Reporting Services (SSRS) after an upgrade.

Restart the Data Access Service and Workflows on the Data Warehouse Management Server

If necessary, use the following procedures to restart the service and workflows.

To restart the Data Access service

1. On the computer that hosts the data warehouse management server, on the Windows desktop, click **Start**, and then click **Run**.
2. In the **Run** dialog box, in **Open**, type **services.msc**, and then click **OK**.
3. In the **Services** window, in the **Services (Local)** pane, right-click **System Center Data Access Service**, and then click **Start**.

To start Service Manager workflows

1. On the computer that hosts the Service Manager management server, on the Windows desktop, click **Start**, and then click **Run**.
2. In the **Run** dialog box, in **Open**, type **services.msc**, and then click **OK**.
3. In the **Services** window, in the **Services (Local)** pane, right-click **System Center Management**, and then click **Start**.

Restart Data Warehouse Jobs

After you upgrade the data warehouse management server, you might need to restart the data warehouse (extraction, transformation, and load (ETL)) jobs. You can use the following procedure to restart the data warehouse jobs. In this procedure, you enable data warehouse job schedules by using Windows PowerShell cmdlets.

To restart data warehouse jobs

1. On the computer that hosts the data warehouse management server, click **Start**, point to **Programs**, point to **Accessories**, click **Windows PowerShell**, right-click **Windows PowerShell**, and then click **Run as administrator**.
2. Type the following commands and then press Enter after each command.

   Note
   It is assumed in the following command examples that Service Manager was installed in its default location on the C: drive. If necessary, change directories to the location where you installed Service Manager.

   ```
   cd 'C:\Program Files\Microsoft System Center\Service Manager 2010'
   import-module $PWD/Microsoft.EnterpriseManagement.Warehouse.Cmdlets.psd1
   Get-SCDWJob
   Enable-SCDWJobSchedule -JobName Extract_<data warehouse management group name>
   Enable-SCDWJobSchedule -JobName Extract_<Service Manager management group name>
   Enable-SCDWJobSchedule -JobName Transform.Common
   Enable-SCDWJobSchedule -JobName Load.Common
   Enable-SCDWJobSchedule -JobName DWMaintenance
   Enable-SCDWJobSchedule -JobName MPSyncJob
   Start-SCDWJob -JobName MPSyncJob
   ```

   The last command, **Start-SCDWJob – JobName MPSyncJob**, will enable the ETL jobs to run.

Stop and Then Start SSRS

After you perform an upgrade to System Center 2012 – Service Manager, use the following procedure to stop and then start SSRS.

To stop and then start SSRS

1. On the computer that hosts SSRS, on the Windows desktop, click **Start**, and then click **Run**.
2. In the **Run** dialog box, type **services.msc**, and then click **OK**.
3. In the **Services** window, in the **Services (Local)** pane, right-click **SQL Server Reporting Services**, and then click **Stop**.

4. In the **Services** window, in the **Services (Local)** pane, right-click **SQL Server Reporting Services**, and then click **Start**.

Failed Upgrade in System Center 2012 - Service Manager

An upgrade to System Center 2012 – Service Manager might not complete successfully. There are five phases of the upgrade where a failure might occur. The steps that you take to recover from a failed upgrade depend on the phase in which the failure occurs:

- Failure occurs during the prerequisite check.
- Failure occurs during predicted checks.
- Failure occurs in an unpredictable manner before permanent changes are made to a management server.
- Failure occurs in an unpredictable manner after permanent changes are made to a management server.
- Failure occurs in an unpredictable manner after permanent changes are made to the database.

The upgrade might also fail as a result of Configuration service Startup timing out.

Failure Occurs During a Prerequisite Check

Before the installation of System Center 2012 – Service Manager begins, a prerequisite check is made for certain requirements. If a condition is found in which Service Manager will continue to function, you receive a warning. Warnings are identified with an explanation point (!) in a yellow triangle. Conditions that have been identified as a Warning will not prevent you from installing System Center 2012 – Service Manager.

If a condition is found that is an absolute requirement for System Center 2012 – Service Manager, a failure indication appears. Failure indications are identified with an X in a red circle.

If either a warning or a failure indication appears, you can either cancel the installation and make the necessary changes, or make the appropriate changes and then click **Check prerequisites again** and continue with the installation. All failure conditions must be corrected before the installation or upgrade can proceed.

Failure Occurs During Predicted Checks

After any failures that were identified during the prerequisite check are corrected, pressing **Next** on the **Prerequisites** page starts the upgrade or installation of System Center 2012 – Service Manager. The system checks for the following conditions during the installation or upgrade process:

- The data warehouse database that you specified exists.

- The computer running SQL Server that you specified is not running SQL Server 2008 Service Pack 1 (SP1), SQL Server 2008 Service Pack 2 (SP2). SQL Server 2008 R2.
- The hard disk drive that you specified for a database has at least 1 GB of free space.
- The System Center Data Access service can log on with the set of credentials that you supplied.
- The System Center Management Configuration service can log on with the set of credentials you supplied.
- There is enough free disk space to install the upgraded files.
- Setup can access the file location for the Service Manager installation.

If failures occur during these types of checks, you can make the appropriate changes. For example, specify a hard disk location with sufficient space, and then on the Warning page, click **Retry** to continue the installation.

Failure Occurs in an Unpredictable Manner Before Permanent Changes Are Made to the Management Server

During an installation or upgrade of System Center 2012 – Service Manager, an error may occur. If the error occurs before any permanent changes are made to the Service Manager management server or data warehouse management server—for example, before changes are made to the Structured Query Language (SQL) database or before management packs are imported—the error message that appears includes a **Retry** button. In these situations, you can correct the issue and then retry the installation or upgrade.

Failure Occurs in an Unpredictable Manner After Permanent Changes Are Made to the Management Server

If an error occurs after permanent changes are made to the Service Manager management server or data warehouse management server—for example, after changes are made to the SQL database or after management packs are imported—the error message that appears does not include a **Retry** button. In this situation, you must reinstall the original version of the affected management server.

In any case, you need the backup of the encryption key. For the Service Manager management server, the encryption key is available only if you made a backup before you started the upgrade. For more information, see "Back Up the Encryption Key in Service Manager 2010 SP1" in the Disaster Recovery Guide for System Center 2012 – Service Manager.

Failure Occurs in an Unpredictable Manner After Permanent Changes Are Made to a Database

If an error occurs after permanent changes have been made—for example, after management packs are imported or any other time data is written into a database—the error message that appears does not include a **Retry** button.

At this point your only option is to click **Close** and begin a disaster recovery process to restore your databases. This recovery is possible only if you backed up your databases before you started the upgrade process. For more information, see "Backing Up Service Manager 2010 SP1 Databases" in the Disaster Recovery Guide for System Center 2012 – Service Manager.

The Upgrade Fails as a Result of Configuration Service Startup Timing Out

On some computers, Service Manager Setup fails and rolls back if it cannot start the System Center Management Configuration service in a timely fashion. If this problem occurs, you might see the following entries in the install log:

```
CAStartServices: Attempting to start service. OMCFG


CAStartServices: StartService failed. Error Code: 0x8007041D.


ConfigureSDKConfigService: CAStartServices failed. Error Code: 0x8007041D. OMCFG
```

Error 0x8007041D indicates that the service did not respond to the start or control request in a timely fashion. In addition, the following event may be logged in the System Event log:

```
Log Name:      System

Source:        Service Control Manager

Event ID:      7009

Task Category: None

Level:         Error

Keywords:      Classic

User:          N/A

Description:

A timeout was reached (30000 milliseconds) while waiting for the System Center Management
Configuration service to connect.
```

This problem occurs because a .NET Framework 2.0 managed assembly that has an Authenticode signature takes longer than usual to load. The signature is always verified when the .NET Framework 2.0 managed assembly that has an Authenticode signature is loaded. In addition, the .NET Framework 2.0 managed assembly may take longer than usual to load because of various other settings. For example, the .NET Framework 2.0 managed assembly may take longer than usual to load because of the network configuration.

For additional information about the cause of this problem, see Knowledgebase Article 936707 in the Microsoft Knowledge Base.

For information about possible workaround procedures, see How to Work Around Configuration Service Startup Issues

How to Work Around Configuration Service Startup Issues

There are two workaround procedures that you can use to try to resolve the issue in which an upgrade to System Center 2012 – Service Manager fails as a result of Configuration service Startup timing out. You can:

- Disable signature verification on the computer that is running Setup.
- Increase the service time-out setting on the computer that is running Setup.

To disable signature verification

1. On the computer that is running Setup, edit the Microsoft.Mom.ConfigServiceHost.exe.config file, which is located in the Program Files\Microsoft System Center\Service Manager 2010 folder.
2. In the **<runtime></runtime>** section, add **<generatePublisherEvidence enabled="false"/>**.
3. Save the changes to the file.
4. Attempt the upgrade again.

To increase the service time-out setting

1. On the computer that is running Setup, create the following registry value to increase the service time-out period:

   ```
   HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control
   ServicesPipeTimeout
   DWORD
   200000
   ```

   Caution
   Incorrectly editing the registry may severely damage your system. Before making changes to the registry, you should back up any valued data on the computer.

   Note
   You may have to increase this value further if the service still fails to start. The value in this example is in milliseconds. For additional details about the registry key, see article 922918 in the Microsoft Knowledge Base.
2. Start the computer again.
3. Attempt the upgrade again.

Upgrading System Center 2012 - Service Manager to System Center 2012 SP1

This guide will show you how to upgrade from System Center 2012 – Service Manager to Service Manager in System Center 2012 Service Pack 1 (SP1).

Warning

If you are planning to upgrade two or more System Center components, it is imperative that you first consult the guide Upgrade Sequencing for System Center 2012 SP1. The order in which you perform component upgrades is important. Failure to follow the correct upgrade sequence might result in component failure for which no recovery options exist. The affected System Center components are:

1. Orchestrator
2. Service Manager
3. Data Protection Manager (DPM)
4. Operations Manager
5. Configuration Manager
6. Virtual Machine Manager
7. App Controller

You can only upgrade to System Center 2012 Service Pack 1 (SP1) from System Center 2012 – Service Manager (version 7.5.1561.0.0)

Important

It is assumed in this guide that you are performing an *upgrade* to System Center 2012 Service Pack 1 (SP1). For information about installing System Center 2012 – Service Manager on a computer where no previous version of Service Manager exists, see the Deploying System Center 2012 – Service Manager.

Upgrade topics

- Upgrade Planning for System Center 2012 SP1 - Service Manager

  Describes factors that you must consider before you start the Service Manager upgrade.
- Setting Up a Service Manager 2012 Lab Environment with Production Data

  Describes how to setup Service Manager in a lab environment using production data.
- Upgrade to System Center 2012 SP1 - Service Manager

  Describes the steps that you must take to upgrade System Center 2012 to System Center 2012 SP1.
- After Upgrading to System Center 2012 SP1 - Service Manager

  Describes the steps that you must take after you have applied the Service Manager upgrade.
- Failed Upgrade in System Center 2012 SP1 - Service Manager

Describes the steps you can take if an upgrade fails.

Downloadable Documentation

You can download a copy of this technical documentation from the Microsoft Download Center. Always use the TechNet library for the most up-to-date information.

Upgrade Planning for System Center 2012 SP1 - Service Manager

This guide outlines the procedures necessary to upgrade to System Center 2012 Service Pack 1 (SP1).

An in-place upgrade from Service Manager to Service Manager SP1 is supported. An in-place upgrade is an upgrade of all Service Manager parts on the same hardware. Other approaches, such as side-by-side upgrades or rolling upgrades, are not supported.

Upgrading to Service Manager SP1 requires preparation. We recommend that you install Service Manager in a lab environment and then replicate your production databases into the lab. You then perform an upgrade of the new installation in the lab, and once that has proven successful, perform the same upgrade to Service Manager SP1 in the production environment.

Evaluation and Select Versions

The release of System Center 2012 – Service Manager was available in two different versions:

- Evaluation version (180-day time-out)
- Select license version

Service Manager SP1 is available as an Evaluation version (180-day time-out) or Select License edition. The following upgrade paths are supported to Service Manager SP1.

Current Version	Upgraded Version	Status
System Center 2012 – Service Manager Eval	System Center 2012 – Service Manager SP1 Eval	Evaluation period remains unchanged
System Center 2012 – Service Manager Select	System Center 2012 – Service Manager SP1 Select	Licensed

Note

Upgrading from an evaluation version of Service Manager to an evaluation version of Service Manager SP1 *does not* extend the 180-day evaluation period.

Installation Location

The default folder for installing Service Manager and Service Manager SP1 is \Program Files\Microsoft System Center\Service Manager 2012. However, when you perform the upgrade to Service Manager SP1, the software is installed in the folder that Service Manager previously used. If Service Manager 2010 was previously upgraded to System Center 2012 – Service Manager, then the following folder might be used:

\Program Files\Microsoft System Center\Service Manager 2010.

Language Support

This release of Service Manager SP1 represents an ongoing progression of support for various languages. In System Center Service Manager 2010, you used the Latin1_General_100_CI_AS collation for the Turkish language. Service Manager and Service Manager SP1 supports the Turkish_100_CI_AS collation. However, if you upgraded from System Center Service Manager 2010 to System Center 2012 – Service Manager, the collation that was used for the Turkish language (Latin1_General_100_CI_AS) would have been carried forward to System Center 2012 – Service Manager, and will be when you upgrade to System Center 2012 – Service Manager SP1.

Hardware Requirements for System Center 2012 – Service Manager SP1

System Center 2012 – Service Manager SP1 will function on the same hardware that you used for System Center 2012 – Service Manager.

All hardware requirements for System Center 2012 – Service Manager SP1 are fully documented in Hardware Requirements for System Center 2012 - Service Manager.

Software Requirements for System Center 2012 – Service Manager SP1

To upgrade to System Center 2012 Service Pack 1 (SP1) SP1, you must first apply Cumulative Update 2 for System Center 2012 – Service Manager.

System Center 2012 – Service Manager SP1 has the same software requirements for the Service Manager console that System Center Service Manager 2010 does, except for the new requirement of Microsoft SQL Server 2012 Analysis Management Objects (AMO). Microsoft SQL Server 2012 AMO is supported on SQL Server 2008 and SQL Server 2012. In addition, the Service Manager console can now be installed on computers running Windows 8 and Windows Server 2012.

The Service Manager and data warehouse management servers, along with the Self-Service Portal, is supported with Windows Server 2012.

All software requirements for System Center 2012 – Service Manager SP1 are fully documented in Software Requirements for System Center 2012 – Service Manager.

Preventing MPSync Jobs From Failing

Before Upgrade

Description: A problem with the upgrade process causes MPSync job to fail after the upgrade is complete. To prevent this problem from occurring before you upgrade, you must run the SQL script below on the DWRepository database to get the actual SQL scripts that drop and add a constraint on the primary key in fact tables in the DWRepository database to correct the problem. Additionally, transform and load jobs might also fail. This error can occur because of erroneous database grooming.

```
;WITH FactName
AS (
       select w.WarehouseEntityName from etl.WarehouseEntity w
       join etl.WarehouseEntityType t on w.WarehouseEntityTypeId =
t.WarehouseEntityTypeId
       where t.WarehouseEntityTypeName = 'Fact'
),FactList
AS (
    SELECT  PartitionName, p.WarehouseEntityName,
            RANK() OVER ( PARTITION BY p.WarehouseEntityName ORDER BY PartitionName ASC )
AS RK
    FROM    etl.TablePartition p
       join FactName f on p.WarehouseEntityName = f.WarehouseEntityName
)
, FactPKList
AS (
    SELECT  f.WarehouseEntityName, a.TABLE_NAME, a.COLUMN_NAME, b.CONSTRAINT_NAME, f.RK,
            CASE WHEN b.CONSTRAINT_NAME = 'PK_' + f.WarehouseEntityName THEN 1 ELSE 0 END
AS DefaultConstraints
    FROM    FactList f
    JOIN    INFORMATION_SCHEMA.KEY_COLUMN_USAGE a ON f.PartitionName = a.TABLE_NAME
    JOIN    INFORMATION_SCHEMA.TABLE_CONSTRAINTS b ON a.CONSTRAINT_NAME =
b.CONSTRAINT_NAME AND b.CONSTRAINT_TYPE = 'Primary key'
)
, FactWithoutDefaultConstraints
AS (
    SELECT  a.*
    FROM    FactPKList a
```

```
    LEFT JOIN FactPKList b ON b.WarehouseEntityName = a.WarehouseEntityName AND
b.DefaultConstraints = 1
    WHERE   b.WarehouseEntityName IS NULL AND a.RK = 1
)
, FactPKListStr
AS (
    SELECT  DISTINCT f1.WarehouseEntityName, f1.TABLE_NAME, f1.CONSTRAINT_NAME,
F.COLUMN_NAME AS PKList
    FROM    FactWithoutDefaultConstraints f1
    CROSS APPLY (
                    SELECT  '[' + COLUMN_NAME + '],'
                    FROM    FactWithoutDefaultConstraints f2
                    WHERE   f2.TABLE_NAME = f1.TABLE_NAME
                    ORDER BY COLUMN_NAME
                FOR
                   XML PATH('')
                ) AS F (COLUMN_NAME)
)
SELECT  'ALTER TABLE [dbo].[' + f.TABLE_NAME + '] DROP CONSTRAINT [' + f.CONSTRAINT_NAME
+ ']' + CHAR(13) + CHAR(10) +
        'ALTER TABLE [dbo].[' + f.TABLE_NAME + '] ADD CONSTRAINT [PK_' +
f.WarehouseEntityName + '] PRIMARY KEY NONCLUSTERED (' + SUBSTRING(f.PKList, 1,
LEN(f.PKList) -1) + ')' + CHAR(13) + CHAR(10)
FROM    FactPKListStr f
```

Workaround 1: If you have already upgraded and you do not have problems with transform or load job failures but do have a management pack deployment failure, then follow the steps in the Before Upgrade section. In addition, after the default primary keys have been restored, restart the failed management pack deployment in the Service Manager console by navigating to the Data Warehouse workspace and then select Management Pack.

Workaround 2: If you have upgraded and you have problems with transform or load job failures, then determine if the SystemDerivedMp.Microsoft.SystemCenter.Datawarehouse.Base management pack exists in the DWStagingAndConfig database by running the following query.

```
select * from ManagementPack where mpname like
'%SystemDerivedMp.Microsoft.SystemCenter.Datawarehouse.Base%'
```

If the management pack does not exist, you need to restore your database to a state prior to upgrade. To restore your database, perform the following steps.

1. Perform disaster recovery steps for the database backups.
2. Disable the MPSyncJob schedule.
3. Restore all the missing primary keys in the DWRepository manually. You can drop and recreate the primary key using the SQL script from the Before Upgrade section.
4. Restart the failed base management pack deployment using the Service Manager console.

Testing the Upgrade in a Lab Environment

We recommend that you test the upgrade to System Center 2012 – Service Manager SP1 in a lab environment.

Upgrade Order and Timing

The order of your upgrades is important. Perform the upgrade steps in the following order:

1. Backup your databases and your management packs. See the topics "Backing Up Service Manager Databases" and "Backing Up Unsealed Management Packs" in the Disaster Recovery Guide for System Center 2012 – Service Manager.
2. Start with the data warehouse management server. You will be stopping the data warehouse jobs, and you will not be able to start them again until after you have completed the upgrade.
3. After the upgrade to the data warehouse management server is complete, upgrade the initial Service Manager management server. If you created more than one Service Manager management server, the initial Service Manager management server is the first one that you created.
4. Upgrade the Service Manager consoles and any additional Service Manager management servers.
5. Restart the data warehouse jobs.
6. Deploy the new Self-Service Portal.

The timing of your upgrades is also important. After you upgrade your data warehouse management server, you must both update the Service Manager management server and deploy the new Self-Service Portal. After you upgrade your initial Service Manager management server, you must be prepared to upgrade your Service Manager console or Service Manager consoles, additional Service Manager management servers, and Self-Service Portal at the same time.

Operations Manager Compatibility

This section describes the compatibility between Operations Manager 2007 R2, System Center 2012 – Operations Manager and System Center 2012 – Service Manager SP1.

System Center Operations Manager 2007 R2

Operations Manager 2007 R2 agents must be removed from the Service Manager and data warehouse management servers before you attempt an upgrade. System Center 2012 –

Service Manager SP1 includes a System Center 2012 – Operations Manager SP1 agent and it is automatically installed when you upgrade. After Service Manager Setup completes, you must manually configure the agent to communicate with the Operations Manager management server.

To validate that the Operations Manager Agent was installed, open Control Panel and verify that the Operations Manager Agent is present. To manually configure the Operations Manager agent, see Configuring Agents.

You can upgrade Service Manager servers in the presence of an Operations Manager 2007 R2 console.

System Center 2012 – Operations Manager

System Center 2012 – Operations Manager agents were not supported with System Center 2012 – Service Manager. However, the agent that is automatically installed by System Center 2012 – Service Manager SP1 is compatible with System Center 2012 – Operations Manager and System Center 2012 – Operations Manager SP1. After Service Manager Setup completes, you must manually configure the agent to communicate with the Operations Manager management server.

To validate that the Operations Manager Agent was installed, open Control Panel and verify that the Operations Manager Agent is present. To manually configure the Operations Manager agent, see Configuring Agents.

You can upgrade Service Manager servers in the presence of an System Center 2012 – Operations Manager console.

Database Impacts

With System Center 2012 – Service Manager SP1, you have the option to install Operations Manager and Configuration Manager data marts. Selecting this option will result in additional space requirements on the hard disk drive for the two databases, as well as associated file groups and log files.

Backing Up Service Manager Before Upgrading

Before you start any upgrade, we recommend that you back up your Service Manager and data warehouse databases and the encryption key. If you have already backed up your databases and encryption key, you can continue to run the upgrade. Otherwise, review the backup procedures in the Disaster Recovery Guide for System Center 2012 – Service Manager before you continue the upgrade.

Registering with the Service Manager Data Warehouse

If you have installed a data warehouse management server in your environment, as part of the upgrade process, you must be able to view the status of the data warehouse jobs. You cannot perform this task if you have not registered with the Service Manager data warehouse. If the **Data Warehouse** button is not visible in the Service Manager console, complete the procedure in

"Registering with the Service Manager Data Warehouse to Enable Reporting" in the Deployment Guide for System Center 2012 – Service Manager.

Encryption Keys

When you have finished running Setup to either install or upgrade to System Center 2012 – Service Manager SP1, you are prompted to open the Encryption Backup or Restore Wizard. If you have previously backed up the encryption keys, no additional action is required. If you never backed up the encryption keys, use the Encryption Key Backup or Restore Wizard to back up the encryption keys on the Service Manager management servers.

Authoring Tool Workflows

When you use the Service Manager SP1 version of the Authoring tool to create a workflow, then custom scripts using Windows PowerShell cmdlets called by the workflow fail. This is due to a problem in the Service Manager MonitoringHost.exe.config file.

To work around this problem, update the MonitoringHost.exe.config XML file using the following steps.

1. Navigate to %ProgramFiles%\Microsoft System Center 2012\Service Manager\ or the location where you installed Service Manager.
2. Edit the MonitoringHost.exe.config file and add the section in italic type from the example below in the corresponding section of your file. You must insert the section before <publisherPolicy apply="yes" />.
3. Save your changes to the file.
4. Restart the System Center Management service on the Service Manager management server.

```
<?xml version="1.0"?>

<configuration>

  <configSections>

    <section name="uri" type="System.Configuration.UriSection, System, Version=2.0.0.0,
Culture=neutral, PublicKeyToken=b77a5c561934e089" />

  </configSections>

  <uri>

    <iriParsing enabled="true" />

  </uri>

  <runtime>

    <assemblyBinding xmlns="urn:schemas-microsoft-com:asm.v1">

      <dependentAssembly>

        <assemblyIdentity name="Microsoft.Mom.Modules.DataTypes"
publicKeyToken="31bf3856ad364e35" />
```

```
        <publisherPolicy apply="no" />
        <bindingRedirect oldVersion="6.0.4900.0" newVersion="7.0.5000.0" />
      </dependentAssembly>
      <dependentAssembly>
        <assemblyIdentity
name="Microsoft.EnterpriseManagement.HealthService.Modules.WorkflowFoundation"
publicKeyToken="31bf3856ad364e35" />
        <publisherPolicy apply="no" />
        <bindingRedirect oldVersion="6.0.4900.0" newVersion="7.0.5000.0" />
      </dependentAssembly>
  <dependentAssembly>
         <assemblyIdentity name="Microsoft.EnterpriseManagement.Modules.PowerShell"
publicKeyToken="31bf3856ad364e35" />
        <bindingRedirect oldVersion="6.0.4900.0" newVersion="7.0.5000.0" />
     </dependentAssembly>
      <publisherPolicy apply="yes" />
      <probing privatePath="" />
    </assemblyBinding>
    <gcConcurrent enabled="true" />
  </runtime>
</configuration>
```

Upgrading the SP1 Self-Service Portal

When you upgrade from System Center 2012 – Service Manager, you perform an in-place upgrade of the Self-Service Portal.

Service Manager Connectors

Any connectors that you created with System Center 2012 – Service Manager will continue to function after you upgrade to System Center 2012 – Service Manager SP1. For more information, see “Using Connectors to Import Data into Service Manager” in the Administering System Center 2012 - Service Manager.

Remote SQL Server Reporting Services

When you installed System Center 2012 – Service Manager, you may have specified a different computer to host Microsoft SQL Server Reporting Services (SSRS) than the computer that

hosted the data warehouse management server. If, in your environment, SSRS is remote from the data warehouse management server, you must use the following procedures to prepare the computer that hosts SSRS for the upgrade:

- Copy Microsoft.EnterpriseManagement.Reporting.Code.dll from the Service Manager installation media to the computer that is hosting SSRS.
- Add an Extension tag to the existing Data segment in the rsreportserver configuration file on the same computer.

If you used the default instance of SQL Server, use Windows Explorer to drag Microsoft.EnterpriseManagement.Reporting.Code.dll (which is located in the Prerequisites folder on your Service Manager installation media) to the folder \Program Files\Microsoft SQL Server\MSRS10.MSSQLSERVER\Reporting Services\ReportServer\Bin on the computer that is hosting SSRS. If you did not use the default instance, the path of the required folder is \Program Files\Microsoft SQL Server\MSRS10.<INSTANCE_NAME>\Reporting Services\ReportServer\Bin. In the following procedure, the default instance name is used.

To copy the Microsoft.EnterpriseManagement.Reporting.Code.dll file

1. On the computer that will host the remote SSRS, open an instance of Windows Explorer.
2. Locate the folder \Program Files\Microsoft SQL Server\MSRS10_50.MSSQLSERVER\Reporting Services\ReportServer\Bin.
3. Start a second instance of Windows Explorer, locate the drive that contains the Service Manager installation media, and then open the Prerequisites folder.
4. In the Prerequisites folder, click **Microsoft.EnterpriseManagement.Reporting.Code.dll** and drag it to the folder that you located in step 2.

To add an Extension tag to the Data segment in the rsreportserver.conf file

1. On the computer that is hosting SSRS, locate the file rsreportserver.config in the following folder:

   \Program Files\Microsoft SQL Server\MSRS10_50.MSSQLSERVER\Reporting Services\ReportServer
2. Using an XML editor of your choice (such as Notepad), open the rsreportserver.config file.
3. Scroll through the rsreportserver.config file, and locate the **<Data>** code segment. There is only one **<Data>** code segment in this file.
4. Add the following **Extension** tag to the **<Data>** code segment where all the other **Extension** tags are:

   ```
   <Extension Name="SCDWMultiMartDataProcessor"
   Type="Microsoft.EnterpriseManagement.Reporting.MultiMartConne
   ction, Microsoft.EnterpriseManagement.Reporting.Code" />
   ```
5. Save the changes, and close the XML editor.

Setting Up a Service Manager 2012 Lab Environment with Production Data

This section explains how to create a lab environment and populate it with production data so that upgrades can be performed and tested before an actual upgrade in the production environment. The procedures in this section show you how to configure System Center 2012 – Service Manager in a lab environment with production data. You then perform an in-place upgrade to System Center 2012 – Service Manager SP1. It is important to follow the steps in this section in sequence.

1. How to Install an Additional Management Server in the Production Service Manager Management Group
2. Install any cumulative updates that you installed on the Primary Management server on the Secondary Management Server.
3. How to Copy the Workflow Assembly Files
4. How to Disable Service Manager Connectors in the Production Environment
5. How to Disable Email Notifications in the Production Environment
6. Disable all workflows in the production environment that you do not want to be running in the lab environment.
7. How to Stop Service Manager Services on the Secondary Management Server
8. How to Back Up the Production Service Manager Database
9. How to Enable Service Manager Connectors in the Production Environment
10. How to Disable Email Notifications in the Production Environment
11. Enable all workflows in the Production Service Manager environment that you disabled in step 6.
12. How to Restore the Service Manager Database in the Lab Environment
13. How to Prepare the Service Manager Database in the Lab Environment
14. If possible, block communications to SQL from the Secondary Management server to the production Service Manager Database server.
15. How to Start Service Manager Services on the Secondary Management Server
16. Verify that the lab environment works. Try to open the console on the Secondary Management server and see if you can connect to the console. Confirm that the Data Warehouse and Reporting do not appear. After you confirm that this works, complete the rest of the steps.
17. How to Promote a Secondary Management Server in a Lab Environment
18. How to Enable the Connectors in the Lab Environment

    Note
    Do not enable or delete the Operations Manager alert connector in the lab environment. This will cause the alert connector in the production environment to fail.
19. If you want to test the email notification and incoming email functionality, use a separate SMTP instance to send emails to eliminate flooding the inboxes of users with test emails. To

test the incoming email feature, you can point to a test share and drop the eml files into this share when you are ready to test.

20. How to Install a New Data Warehouse Server in the Lab Environment
21. How to Register the Data Warehouse Server in the Lab Environment
22. Back up this lab environment; for example, back up the database and encryption keys and VM Snapshots This gives you the ability to recover in case the upgrade fails.
23. If you are able to successfully complete all the previous steps, you are ready to attempt the in-place upgrade.
24. Test everything. Document any discrepancies and fixes. Send feedback through the MS Connect web site.
25. Backup the Service Manager lab environment; for example, back up the database and encryption keys and VM Snapshots This gives you the ability to recover in case the upgrade fails.
26. The lab environment is now ready for System Center 2012 – Service Manager SP1 in-place upgrade.

How to Install an Additional Management Server in the Production Service Manager Management Group

The following procedure shows how to install an additional management server. You must deploy the initial Service Manager management server and Service Manager Database before deploying an additional management server.

Tip

You must be a member of the Service Manager Administrators user role in order to install an additional Service Manager management server.

In System Center 2012 – Service Manager, when you install a secondary management server, data retention settings are reset. Before you install a secondary management server, make a note of data retention settings. After you have installed the additional management server, adjust the data retention settings to their original values.

To install an additional management server

1. By using an account that has administrator rights and that is also a member of the Service Manager Management group administrators, log on to the computer that will host the additional Service Manager Management server.
2. On the System Center 2012 – Service Manager installation media, double-click Setup.exe.
3. On the **Microsoft System Center 2012 Service Manager** page, click **Install a Service Manager Management server**.
4. On the **Product registration** page, type information in the boxes. In the **Product key** boxes, type the product key you received with Service Manager, or alternatively, select **Install as an evaluation edition (180 day trial)?**. Read the Microsoft Software License Terms, and, if applicable, click **I have read, understood, and agree with the terms of**

the license agreement, and then click **Next**.

5. On the **Installation location** page, verify that sufficient free disk space is available, and then click **Next**. If necessary, click **Browse** to change the location where the additional Service Manager Management server will be installed.
6. On the **System check results** page, make sure that the prerequisite check passed or at least passed with warnings, and then click **Next**.
    a. If the prerequisite checker determines that the Microsoft Report Viewer Redistributable has not been installed, click **Install Microsoft Report Viewer Redistributable**. After the **Microsoft Report Viewer Redistributable 2008 (KB971119) Setup** wizard completes, click **Check perquisites again**.
7. On the **Configure the Service Manager Database** page, in the **Database server** box, type the name of the computer that hosts the Service Manager database that you used for your initial Service Manager Management server, and then press TAB. When the name of the instance displays in the **SQL Server instance** box, click **Use an existing database**. For example, type **Computer 2** in the **Database server** box.
8. Click the **Database** list, select the database name for the Service Manager database (the default name is ServiceManager), and then click **Next**.
9. On the **Configure the Service Manager Management group** page, verify that the management group name and management group administrators boxes have been populated. Click **Next**.
10. On the **Configure the Account for Service Manager Services** page, click **Domain account**, specify the user name, password, and domain for the account, and then click **Test Credentials**. After you receive a **The credentials were accepted** message, click **Next**. For example, enter the account information for the domain user SM_Acct, and then click **Next**.

    Note
    The user name and password you provide here must be the same ones used for the Service Manager account on the data warehouse management server.
11. On the **Help improve System Center** page, indicate your preference for participation for both the Customer Experience Improvement Program and Error Reporting. Optionally, click **Tell me more about the program**, and then click **Next**.
12. On the **Use Microsoft Update to help keep your computer secure and up-to-date** page, indicate your preference for using Microsoft Update to check for Service Manager updates, and then click **Next**.
13. On the **Installation summary** page, click **Install**.
14. On the **Setup completed successfully** page, we recommend that you leave **Open the Encryption Backup or Restore Wizard** selected, and then click **Close**.

How to Copy the Workflow Assembly Files

Use the following procedure to copy the workflow assembly files from the Service Manager Installation folder on the primary management server to the secondary management server that you created in the previous procedure.

To copy the workflow assembly files

1. On the computer that is running the Service Manager Primary Server role, browse to the Service Manager Installation folder for example, C:\Program Files\Microsoft System Center 2012\Service Manager copy the workflow files (*workflow*.dll).
2. On the computer that is running the Service Manager Secondary server; browse to the Service Manager Installation folder; for example, C:\Program Files\Microsoft System Center 2012\Service Manager. Paste the copied workflow files into this folder. You should overwrite any existing files.

   Note
   You must place the workflow assembly files in the Service Manager installation folder. This is very important step if you want to test the custom workflows that depend on workflow assembly files. Failure to copy these files would lead to failed custom workflows in the lab environment.

How to Disable Service Manager Connectors in the Production Environment

Use the following procedure to disable the Service Manager connectors in the production environment.

To disable a connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Connectors** pane, select the connector that you want to disable.
4. In the **Tasks** pane, under the connector name, click **Disable**.
5. In the **Disable Connector** dialog box, click **OK**.

How to Disable Email Notifications in the Production Environment

Use the following procedure to disable incoming and outbound E-mail notifications in the production environment.

To disable the outbound E-mail notifications

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Notifications**, and then click **Channels**.
3. In the **Channels** pane, click **E-Mail Notification Channel**.
4. In the **Tasks** pane, under **E-Mail Notification Channel**, click **Properties** to open the **Configure E-Mail Notification Channel** dialog box.
5. Clear the **Enable e-mail notifications** check box.

To disable incoming E-mail notifications

1. In the Service Manager console, select **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Settings**.
3. In the **Settings** pane, double-click **Incident Settings**.
4. In the Incident **Settings** dialog box, click **Incoming E-mail**.
5. Clear **Turn on incoming e-mails processing**, and then click **OK**.

How to Stop Service Manager Services on the Secondary Management Server

Use the following procedure to stop the Service Manager services.

To stop the Service Manager services

1. In the **Run** dialog box, in the **Open** text field, type **services.msc**, and then click **OK**.
2. In the **Services** window, in the **Services (Local)** pane, locate the following three services and for each one, click **Stop**:
    a. System Center Data Access Service
    b. System Center Management
    c. System Center Management Configuration
3. Open Windows Explorer.
4. Locate the folder \Program Files\Microsoft System Center 2012\Service Manager.
5. Delete the **Health Service State** folder and all of its contents.

How to Back Up the Production Service Manager Database

Use the following procedure to back up the production Service Manager database in Microsoft SQL Server 2008 R2.

To back up the Service Manager database

1. After connecting to the appropriate instance of the Microsoft SQL Server Database Engine, in Object Explorer, click the server name to expand the server tree.
2. Expand **Databases**, and depending on the database, either select a user database or expand **System Databases** and select a system database.
3. Right-click the database, point to **Tasks**, and then click **Back Up**. The Back Up Database dialog box appears.
4. In the **Database** list box, verify the database name. You can optionally select a different database from the list.
5. You can perform a database backup for any recovery model (FULL, BULK_LOGGED, or SIMPLE).
6. In the **Backup type** list box, select **Full**.

   Note
   After creating a full database backup, you can create a differential database backup. For more information, see How to: Create a Differential Database Backup (SQL Server Management Studio).
7. Optionally, you can select **Copy Only Backup** to create a copy-only backup. A copy-only backup is a SQL Server backup that is independent of the sequence of conventional SQL Server backups. For more information, see Copy-Only Backups.

   Note
   When the **Differential** option is selected, you cannot create a copy-only backup.
8. For **Backup component**, click **Database**.
9. Either accept the default backup set name suggested in the **Name** text box, or enter a different name for the backup set.
10. Optionally, in the **Description** text box, enter a description of the backup set.
11. Specify when the backup set will expire and can be overwritten without explicitly skipping verification of the expiration data.

    Note
    For more information about backup expiration dates, see BACKUP (Transact-SQL).
12. Choose the type of backup destination by clicking **Disk** or **Tape**. To select the paths of up to 64 disk or tape drives containing a single media set, click **Add**. The selected paths are displayed in the **Backup to** list box.
13. To view or select the advanced options, click **Options** in the **Select a page** pane.
14. Select an Overwrite Media option, by clicking either **Back up to the existing media set** or **Back up to a new media set, and erase all existing backup sets**.
15. In the Reliability section, select either **Verify backup when finished** or **Perform checksum before writing to media**, and then optionally select **Continue on checksum error**. For more information, see Detecting and Coping with Media Errors During Backup and Restore

How to Enable Service Manager Connectors in the Production Environment

Use the following procedure to enable the Service Manager connectors in the production environment.

To enable a connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Connectors** pane, select the connector that you want to enable.
4. In the **Tasks** pane, under the connector name, click **Enable**.

How to Enable Email Notifications in the Production Environment

Use the following procedure to enable incoming and outbound E-mail notifications in the production environment.

To enable the outbound E-mail notifications

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Notifications**, and then click **Channels**.
3. In the **Channels** pane, click **E-Mail Notification Channel**.
4. In the **Tasks** pane, under **E-Mail Notification Channel**, click **Properties** to open the **Configure E-Mail Notification Channel** dialog box.
5. Select **Enable e-mail notifications**.

To enable incoming E-mail notifications

1. In the Service Manager console, select **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Settings**.
3. In the **Settings** pane, double-click **Incident Settings**.
4. In the Incident **Settings** dialog box, click **Incoming E-mail**.
5. Select **Turn on incoming e-mails processing**, and then click **OK**.

How to Restore the Service Manager Database in the Lab Environment

Use the following procedure to restore the production Service Manager database using Microsoft SQL Server 2008 R2.

To restore the Service Manager database

1. After connecting to the appropriate instance of the Microsoft SQL Server Database Engine, in Object Explorer, click the server name to expand the server tree.
2. Expand **Databases**, and depending on the database, either select a user database or expand **System Databases** and select a system database.
3. Right-click the database, point to **Tasks**, and then click **Restore**. The Back Up Database dialog box appears.
4. Click **Database**, which opens the **Restore Database** dialog box
5. On the **General** page, the name of the restoring database appears in the **To database** list box. To create a new database, enter its name in the list box.
6. In the **To a point in time** text box, either retain the default (Most recent possible) or select a specific date and time by clicking the browse button which opens the **Point in Time Restore** dialog box. For more information, see How to: Restore to a Point in Time (SQL Server Management Studio).
7. To specify the source and location of the backup sets to restore, click either **From database** or **From device**.
8. In the **Select the backup sets to restore** grid, select the backups to restore. For more information see Restore Database (General Page).
9. To view or select the advanced options, click **Options** in the **Select a page pane**.
10. In the **Restore options** panel, choose one of the following options most appropriate for your situation:
    - Overwrite the existing database
    - Preserve the replication settings
    - Prompt before restoring each backup
    - Restrict access to the restored database

    For more information, see Restore Database (Options Page)
11. Optionally, you can restore the database to a new location by specifying a new restore destination for each file in **Restore the database files as**. For more information see Restore Database (Options Page).
12. In the **Recovery state** panel, select one of the following options most appropriate for your environment:
    - **Leave the database ready to use by rolling back the uncommitted transactions. Additional transaction logs cannot be restored. (RESTORE WITH RECOVERY)**

      Note
      Choose this option only if you are restoring all of the necessary backups at this time.
    - **Leave the database non-operational, and do not roll back the uncommitted transactions. Additional transaction logs can be restored. (RESTORE WITH NORECOVERY)**
    - **Leave the database in read-only mode. Undo uncommitted transactions, but**

save the undo actions in a standby file so that recovery effects can be reverted. (RESTORE WITH STANDBY)

For more information see Restore Database (Options Page).

How to Prepare the Service Manager Database in the Lab Environment

Use the following procedure to prepare the Service Manager database in the lab environment. Perform this procedure on the computer that is hosting the Service Manager database that is being used by the secondary management server, the management server in your lab environment.

To configure the database

1. On the computer hosting the Service Manager database for the secondary management server, click **Start**, click **All Programs**, click **Microsoft SQL Server 2008 R2**, and then click **SQL Server Management Studio**.
2. In the **Connect to Server** dialog box, follow these steps:
   a. In the **Server Type** list, select **Database Engine**.
   b. In the **Server Name** list, select the server name for your Service Manager or data warehouse databases.
   c. In the **Authentication** list, select **Windows Authentication**, and then click **Connect**.
3. In the **Object Explorer** pane, expand **Databases**, and then click **ServiceManager**.
4. In the toolbar, click **New Query**.
5. In the center pane, type the following commands, and then click **Execute**.

```
sp_configure 'clr enabled', 1
go
reconfigure
go
```

6. In the center pane, remove the commands you typed in the previous step, type the following commands, and then click **Execute**.

```
ALTER DATABASE ServiceManager SET SINGLE_USER WITH ROLLBACK
IMMEDIATE
```

7. In the center pane, remove the commands you typed in the previous step, type the following commands, and then click **Execute**.

```
ALTER DATABASE ServiceManager SET ENABLE_BROKER
```

8. In the center pane, remove the commands you typed in the previous step, type the following commands, and then click **Execute**.

```
ALTER DATABASE ServiceManager SET MULTI_USER
```

To configure the service account

1. In the **Object Explorer** pane, expand **Security**, and then expand **Logins**.
2. Right-click **Logins**, and then click **New Login**
3. Perform the following procedures in the **Login – New** wizard:
   a. Click **Search**.
   b. Type the username (domain\username) for the service account for Service Manager database in the lab environment, click **Check Names**, and then click **OK**.

      Note
      If the Data Access Account is running as LocalSystem, use the format <domain\computername$> in SQL Logins, where <computername> is the name of the management server.

   c. In the **Select a page** pane, click **User Mapping**.
   d. In the **Users mapped to this login** area, in the **Map** column, click the row that represents the name of the Service Manager database (**ServiceManager** is the default database name).
   e. In the **Database role membership for: ServiceManager** area, make sure that the following entries are selected:
      - **configsvc_users**
      - **db_accessadmin**
      - **db_datareader**
      - **db_datawriter**
      - **db_ddladmin**
      - **db_securityadmin**
      - **dbmodule_users**
      - **public**
      - **sdk_users**
      - **sql_dependency_subscriber**
   f. Click **Ok**

To configure Service Manager tables

1. In the **Object Explorer** pane, expand **Databases**, expand **ServiceManager**, and then expand **Tables**.
2. Right-click **dbo.MT_Microsoft$SystemCenter$ManagementGroup**, and then click **Edit Top 200 Rows**.
3. In the center pane, locate the column **SQLServerName_ 48B308F9_CF0E_0F74_83E1_0AEB1B58E2FA**.
4. In the first row and second rows of this column, type the computer name of the computer hosting the Service Manager database in the lab environment. In the case of named

instances, type computer name\instance name.

5. Right-click **dbo.MT_Microsoft$SystemCenter$ResourceAccessLayer$SqlResourceStore**, and then click **Edit Top 200 Rows**.
6. In the center pane, locate the column **Server_48B308F9_CF0E_0F74_83E1_0AEB1B58E2FA**.
7. In the first row of this column, type the computer name of the computer hosting the SQL Server for the Service Manager database in the lab environment. In the case of named instances, type computer name\instance name.
8. Right-click **LFX.DataSource**, and then click **Edit Top 200 Rows**.
9. In the center pane, locate the column **DataSourceAddress**.
10. In the first row of this column, locate the entry that starts with **Data Source = <server name>; Initial Catalog = ServiceManager; Persist Security Info=False**. Type the name of the computer hosting SQL Server in the lab environment in place of **<server name>**.
11. Right-click **dbo.MT_Microsoft$SystemCenter$ResourceAccessLayer$SdkResourceStore**, and then click **Edit Top 200 Rows**.
12. In the center pane, locate the column **Server_48B308F9_CF0E_0F74_83E1_0AEB1B58E2FA**.
13. In all of the rows in this column, type the name of the computer hosting the Service Manager management server in the lab environment.
14. Right-click **[dbo].[MT_Microsoft$SystemCenter$ResourceAccessLayer$CmdbResourceStore]**, and then click **Edit Top 200 Rows**.
15. In all rows update the column **Server_48B308F9_CF0E_0F74_83E1_0AEB1B58E2FA**, type the name of the SQL computer hosting the Service Manager database in the lab environment
16. In the toolbar, click **New Query**.
17. In the center pane, type the following command, and then click **Execute**.

```
Delete from
dbo.MT_Microsoft$SystemCenter$ResourceAccessLayer$DwSdkResour
ceStore
```

18. Close **Microsoft SQL Server Management Studio**.

How to Start Service Manager Services on the Secondary Management Server

Use the following procedure to start the Service Manager services.

To Start Service Manager Services

1. On the Windows desktop, click **Start**, and then click **Run**.
2. In the **Run** dialog box, in the **Open** field, type **services.msc**, and then click **OK**.
3. In the **Services** window, in the **Services (Local)** pane, locate the following three services and for each one, click **Start**:
   - System Center Data Access Service
   - System Center Management
   - System Center Management Configuration

How to Promote a Secondary Management Server in a Lab Environment

Use the following procedure to promote the secondary management server.

To promote the secondary management server

1. On the secondary management server, do the following:
   a. Close the Service Manager console.
   b. On the Windows desktop, click **Start**, and then click **Run**.
   c. In the **Run** dialog box, in the **Open** text field, type **services.msc**, and then click **OK**.
   d. In the **Services** window, in the **Services (Local)** pane, locate the following three services and for each one, click **Stop**:
      - System Center Data Access Service
      - System Center Management
      - System Center Management Configuration
   e. Leave the **Services** window open.
   f. Open Windows Explorer. Locate the \Program Files\Microsoft System Center 2012\Service Manager folder.
   g. In this folder, delete the Health Service State folder and all of its contents.
2. Do the following on the ServiceManager database on the Test SQL Server instance:
   a. On the Windows desktop, click **Start**, point to **Programs**, point **to Microsoft SQL Server 2008**, and then click **SQL Server Management Studio**.
   b. In the Connect to Database Engine dialog box, follow these steps:
      i. In the **Server name** box, type the name of the server that hosts the ServiceManager database.
      ii. In the **Authentication** box, select **Windows Authentication**.
      iii. Click **Connect**.
   c. In the **Object Explorer** pane, expand **Databases**, and then click **ServiceManager**.
   d. On the toolbar, click **New Query**.
   e. In the **SQLQuery1.sql** pane (center pane), type the following, where <FQDN of your

server> is the FQDN of the management server that you are promoting:

EXEC p_PromoteActiveWorkflowServer '<FQDN of your server>'

On the toolbar, click **Execute**.

f. At the bottom of the **SQLQuery1.sql** pane (center pane), observe that **Query executed successfully** is displayed.

g. Exit Microsoft SQL Server Management Studio.

3. Do the following on the secondary management server:

a. On the Windows desktop, click **Start**, and then click **Run**.

b. In the **Run** dialog box, in the **Open** field, type **services.msc**, and then click **OK**.

c. In the **Services** window, in the **Services (Local)** pane, locate the following three services and for each one, click **Start**.

- System Center Data Access Service
- System Center Management
- System Center Management Configuration

Your secondary management server is now the primary management server for the management group.

How to Enable the Connectors in the Lab Environment

Use the following procedure to enable the Service Manager connectors in the lab environment. In this procedure, you will not be enabling the Operations Manager connector.

Warning

Do not enable or delete the Operations Manager alert connector in the lab environment. Doing so will cause the alert connector in the production environment to fail.

To enable a connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Connectors** pane, select the connector that you want to enable.
4. In the **Tasks** pane, under the connector name, click **Enable**.

How to Install a New Data Warehouse Server in the Lab Environment

Use the following procedure to install a new data warehouse server in the lab environment.

To install a data warehouse management server and data warehouse databases

1. Log on to the computer by using an account that has administrative rights.
2. On the Service Manager installation media, double-click the **Setup.exe** file.
3. On the **Microsoft System Center Service Manager 2012** page, click **Install a Service Manager data warehouse management server**.
4. On the **Product registration** page, type information in the boxes. In the **Product key** boxes, type the product key you received with Service Manager, or alternatively, select **Install as an evaluation edition (180 day trial)?.** Read the Microsoft Software License Terms, and, if applicable, click **I have read, understood, and agree with the terms of the license agreement**, and then click **Next**.
5. On the **Installation location** page, verify that sufficient free disk space is available, and then click **Next**. If necessary, click **Browse** to change the location in which the Service Manager data warehouse management server will be installed.
6. On the **System check results** page, make sure that prerequisites passed or at least passed with warnings, and then click **Next**.
7. On the **Configure data warehouse databases** page, Service Manager checks the computer you are using to see if it can host the data warehouse databases. For this configuration, confirm that the database server is the computer on which you are installing the data warehouse management server, and then click **Next**.

   Warning
   A warning message appears if you are using the default collation (SQL_Latin1_General_CP1_CI_AS). Support for multiple languages in Service Manager is not possible when you are using the default collation. If later you decide to support multiple languages using a different collation, you have to re-install SQL Server. See “Microsoft SQL Server 2008 with SP1” in the Planning for System Center 2012 - Service Manager.
8. On the **Configure the data warehouse management group** page, follow these steps:
   a. In the **Management group name** box, type a unique name for the group.

      Warning
      Management group names must be unique. Do not use the same management group name when you deploy a Service Manager management server and a Service Manager data warehouse management server. Furthermore, do not use the management group name that is used for Operations Manager.

   b. Click **Browse**, enter the user account or group to which you want to give Service Manager administrative rights, and then click **Next**.
9. Service Manager will use the existing computer if SQL Server Reporting Services is present. On the **Configure the reporting server for the data warehouse** page, accept the defaults, and then click **Next**.
10. On the **Configure the account for Service Manager services** page, click **Domain account**, specify the user name, password, and domain for the account, and then click **Test Credentials**. After you receive a **The credentials were accepted** message, click

Next.

11. On the **Configure the reporting account** page, specify the user name, password, and domain for the account, and then click **Test Credentials**. After you receive a **The credentials were accepted** message, click **Next**.
12. On the **Help improve System Center** page, indicate your preference for participation in the Customer Experience Improvement Program and in Error Reporting. Optionally, click **Tell me more about the program**, and then click **Next**.
13. On the **Use Microsoft Update to help keep your computer secure and up-to-date** page, indicate your preference for using Microsoft Update to check for Service Manager updates, and then click **Next**.
14. On the **Installation summary** page, click **Install**.

To validate a data warehouse management server installation

1. On the computer hosting the data warehouse management server (the server you ran Setup on), run services.msc, and verify that the following services have been installed:
   - System Center Data Access Service
   - System Center Management
   - System Center Management configuration
2. On the computer hosting the data warehouse databases, click **Start**, point to **Programs**, point to **Microsoft SQL Server 2008**, and then click **SQL Server Management Studio**.
3. In the **Connect to Server** dialog box, select the following:
   a. In the **Server Type** list, select **Database Engine**.
   b. In the Server Name list, select the server and instance for your Service Manager data warehouse database. For example, select **Computer 4**.
   c. In the **Authentication** list, select **Windows Authentication**, and then click **Connect**.
4. In the **Object Explorer** pane, expand **Databases**.
5. Verify that the **DWDataMart**, **DWRepository**, and **DWStagingAndConfig** databases are listed.

How to Register the Data Warehouse Server in the Lab Environment

Use the following procedure to register the newly installed data warehouse server with the lab Service Manager environment.

To register a data warehouse

1. Log on to the computer that hosts the Service Manager console. Use an account that is a member of the Service Manager and data warehouse management administrators group.
2. In the Service Manager console, click **Administration**.
3. In the **Administration** pane, expand **Administration**.

4. In the **Administration** view, in the **Register with Service Manager's Data Warehouse** area, click **Register with Service Manager Data Warehouse**.
5. In the Data Warehouse Registration wizard, on the **Before You Begin** page, click **Next**.
6. On the **Data Warehouse** page, in the **Server name** box, type the fully qualified domain name of the computer hosting the data warehouse management server, and then click **Test Connection**. If the test is successful, click **Next**.
7. On the **Credentials** page, you can accept the default entry in the **Run as account** list, and then click **Next**, or you can enter credentials from a user or group of your own choosing.

   Important
   The account you specify will be assigned administrative credentials on the Service Manager management server and granted Read permission on the Service Manager database. You can specify different credentials from other Service Manager management groups when registering with the data warehouse.
8. On the **Summary** page, click **Create**.
9. On the **Completion** page, when **The data warehouse registration succeeded** is displayed, click **Close**.
10. A dialog box states that the report deployment process has not finished. This is to be expected. On the **System Center Service Manager** dialog box, click **OK**.
11. In a few minutes, after closing the Data Warehouse Registration wizard, the **Data Warehouse** button will be added to the Service Manager console. In the Service Manager console, click the arrow at the lower right corner of the Service Manager console buttons, and then click **Show More Buttons**.

You can use a Windows PowerShell command to complete this task. For information about how to use Windows PowerShell to register Service Manager management groups with the data warehouse, see Add-SCDWMgmtGroup (http://go.microsoft.com/fwlink/?LinkId=203096).

To validate the data warehouse registration process

1. On the computer hosting the data warehouse management server, start Windows PowerShell with administrative credentials.
2. At the Windows PowerShell command prompt, type the following commands, and then press ENTER:

```
Set-ExecutionPolicy RemoteSigned

Import-Module
.\Microsoft.EnterpriseManagement.Warehouse.Cmdlets.psd1
```

3. Type the following command, and then press ENTER.

```
Get-SCDWMgmtGroup
```

4. If registration was successful, a table with two rows of data is displayed. One row displays data for the data warehouse management group, and a second row displays data for the Service Manager management group. If registration fails, only the data for the data warehouse management group is displayed.

Determine when the deployment is complete

Because you need to allow enough time for the management pack deployment process to be completed, you will have to determine when that process is complete. You can use the following procedure in Service Manager to determine when the process is complete.

To determine when management pack deployment has completed

1. Start the Service Manager console.
2. In the Service Manager console, click **Data Warehouse**.
3. In the **Data Warehouse** pane, expand **Data Warehouse**, and then click **Data Warehouse Jobs**.
4. In the **Data Warehouse Jobs** pane, click **MPSyncJob**.
5. In the **Tasks** pane, under **Synchronization**, click **Details**.
6. In the **MP Sync Job** dialog box, scroll to the right and examine the **Status** column.

   Note
   In the **MP Sync Job** dialog box, click **Status** to alphabetically sort the status column.
7. Scroll through the **Status** list. The management pack deployment process is complete when **Associated** or **Imported** is listed in the status column for all of the management packs. Make sure that there is no status of either **Pending Association** or **Failed** in the status list. In the **Data Warehouse Jobs** pane, the status of the **MPSyncJob** will have changed from **Running** to **Not Started**. This deployment process can take up to two hours to complete.
8. To refresh the **MP Sync Job** dialog box:
   a. Press **OK** to close the dialog box.
   b. In the **Tasks** pane, in the **Data Warehouse Jobs** area, click **Refresh**.
   c. In the **Data Warehouse Jobs** pane, click **MPSyncJobs**.
   d. In the **Tasks** pane, under **Synchronization**, click **Details**.
9. After the management packs have been deployed (as determined in step 7), make sure that the following 5 data warehouse jobs are displayed in the **Data Warehouse Jobs** pane:
   - Extract_<Service Manager management group name>
   - Extract_<data warehouse management group name>
   - Load.Common
   - Transform.Common

- MPSyncJob

10. If these 5 data warehouse jobs are not displayed, perform the following procedure:
    a. In the **Data Warehouse Jobs** pane, click **MPSyncJob**.
    b. In the **Tasks** pane, under **Synchronization**, click **Resume**.
    c. Assess if management pack deployment has completed by returning to step 4 above.

Upgrade to System Center 2012 SP1 - Service Manager

You cannot start an upgrade to System Center 2012 – Service Manager SP1 if any data warehouse jobs or workflows are running. You can use the procedures in this section to stop the data warehouse job schedules and wait for them to complete before you upgrade the data warehouse management server. Before you upgrade the Service Manager management server, stop the Self-Service Portal, if it is installed, and then wait 10 minutes to let any running workflows finish before you start the upgrade.

Complete the procedures in the following table to upgrade to System Center 2012 – Service Manager SP1.

Task	Description
How to Prepare Service Manager 2012 for Upgrade to SP1	Describes how to stop data warehouse jobs and how to suspend the Self-Service Portal.
How to Upgrade to System Center 2012 SP1 - Service Manager	Describes how to upgrade the data warehouse management server, the Service Manager management server, and the Self-Service Portal.

How to Prepare Service Manager 2012 for Upgrade to SP1

This topic describes how to prepare your System Center 2012 – Service Manager environment for an upgrade. To do this, perform the following procedures for upgrading the data warehouse management server:

1. List the data warehouse jobs that are running.
2. Disable the data warehouse job schedules.
3. Confirm that the data warehouse jobs have stopped running.

When the data warehouse jobs have completed, start the upgrade of the data warehouse management server.

After the data warehouse has been upgraded, perform the following procedures on the first Service Manager management server:

1. Wait 10 minutes, and then start the upgrade of the Service Manager management server.

To list the data warehouse jobs by using Windows PowerShell cmdlets

1. On the computer that hosts the data warehouse management server, click **Start**, click **All Programs**, click **Microsoft System Center 2012**, and then click **Service Manager Shell**.
2. Type the following commands, and then press ENTER after each command:

```
Set-ExecutionPolicy –force RemoteSigned
cd 'C:\Program Files\Microsoft System Center 2012\Service Manager'
Import-Module .\Microsoft.EnterpriseManagement.Warehouse.Cmdlets.psd1

Get-SCDWJob
```

3. A list of the data warehouse jobs appears. Use this list in the next procedure, "To disable data warehouse job schedules by using Windows PowerShell cmdlets."

To disable data warehouse job schedules by using Windows PowerShell cmdlets

1. Type the following commands, and then press ENTER after each command:

```
Disable-SCDWJobSchedule –JobName Extract_<data warehouse management group name>
Disable-SCDWJobSchedule –JobName Extract_<Service Manager management group name>
Disable-SCDWJobSchedule –JobName Transform.Common
Disable-SCDWJobSchedule –JobName Load.Common
Disable-SCDWJobSchedule –JobName DWMaintenance
Disable-SCDWJobSchedule –JobName MPSyncJob
Start-SCDWJob –JobName MPSyncJob
```

   The last command to start the **MPSyncJob** will enable the extraction, transformation, and load (ETL) jobs to run to completion. After that, because all the schedules have been disabled, the jobs will stop. To close the Windows PowerShell window, type **exit**.

To confirm that the data warehouse jobs have stopped running

1. In the Service Manager console, click **Data Warehouse**.
2. In the **Data Warehouse** pane, expand **Data Warehouse**, and then click **Data Warehouse Jobs**.
3. In the **Data Warehouse Jobs** pane, observe the **Status** column for each data warehouse job. When the status for each job is listed as **Not Started**, proceed to the next procedure to stop the Self-Service Portal. If no Self-Service Portal exists in your

environment, you can start the upgrade process in How to Upgrade to System Center 2012 SP1 - Service Manager.

To prevent MPSync jobs from failing

- Run the SQL script below on the DWRepository database to get the SQL scripts that drop and add a constraint on the primary key in fact tables in the DWRepository database to correct the problem

```
;WITH FactName
AS (
       select w.WarehouseEntityName from etl.WarehouseEntity
w
       join etl.WarehouseEntityType t on
w.WarehouseEntityTypeId = t.WarehouseEntityTypeId
       where t.WarehouseEntityTypeName = 'Fact'
),FactList
AS (
    SELECT  PartitionName, p.WarehouseEntityName,
            RANK() OVER ( PARTITION BY p.WarehouseEntityName
ORDER BY PartitionName ASC ) AS RK
    FROM    etl.TablePartition p
       join FactName f on p.WarehouseEntityName =
f.WarehouseEntityName
)
, FactPKList
AS (
    SELECT  f.WarehouseEntityName, a.TABLE_NAME,
a.COLUMN_NAME, b.CONSTRAINT_NAME, f.RK,
            CASE WHEN b.CONSTRAINT_NAME = 'PK_' +
f.WarehouseEntityName THEN 1 ELSE 0 END AS DefaultConstraints
    FROM    FactList f
    JOIN    INFORMATION_SCHEMA.KEY_COLUMN_USAGE a ON
f.PartitionName = a.TABLE_NAME
    JOIN    INFORMATION_SCHEMA.TABLE_CONSTRAINTS b ON
a.CONSTRAINT_NAME = b.CONSTRAINT_NAME AND b.CONSTRAINT_TYPE =
'Primary key'
)
```

```
, FactWithoutDefaultConstraints
AS (
    SELECT  a.*
    FROM    FactPKList a
    LEFT JOIN FactPKList b ON b.WarehouseEntityName =
a.WarehouseEntityName AND b.DefaultConstraints = 1
    WHERE   b.WarehouseEntityName IS NULL AND a.RK = 1
)
, FactPKListStr
AS (
    SELECT  DISTINCT f1.WarehouseEntityName, f1.TABLE_NAME,
f1.CONSTRAINT_NAME, F.COLUMN_NAME AS PKList
    FROM    FactWithoutDefaultConstraints f1
    CROSS APPLY (
                    SELECT  '[' + COLUMN_NAME + '],'
                    FROM    FactWithoutDefaultConstraints f2
                    WHERE   f2.TABLE_NAME = f1.TABLE_NAME
                    ORDER BY COLUMN_NAME
                FOR
                   XML PATH('')
                ) AS F (COLUMN_NAME)
)
SELECT  'ALTER TABLE [dbo].[' + f.TABLE_NAME + '] DROP
CONSTRAINT [' + f.CONSTRAINT_NAME + ']' + CHAR(13) + CHAR(10)
+
        'ALTER TABLE [dbo].[' + f.TABLE_NAME + '] ADD
CONSTRAINT [PK_' + f.WarehouseEntityName + '] PRIMARY KEY
NONCLUSTERED (' + SUBSTRING(f.PKList, 1, LEN(f.PKList) -1) +
')' + CHAR(13) + CHAR(10)
FROM    FactPKListStr f
```

How to Upgrade to System Center 2012 SP1 - Service Manager

You can use the following procedures to upgrade your Service Manager environment to System Center 2012 – Service Manager SP1. These procedures include steps for upgrading the data warehouse management server, the Service Manager management server, and the Service Manager console.

Data Warehouse Management Server

Use the following procedure to upgrade the data warehouse management server.

Important
Make sure that you have stopped the data warehouse jobs before you continue. For more information, see How to Prepare Service Manager 2012 for Upgrade to SP1.

To upgrade the data warehouse management server

1. Log on to the computer that will host the data warehouse management server by using an account that is a member of the Administrators group. This account must also be a local administrator.
2. On the Service Manager installation media, double-click the **Setup.exe** to start the Service Manager Setup Wizard.
3. On the **Microsoft System Center 2012** page, click **Upgrade Service Manager data warehouse management server**.
4. On the **Prepare for upgrade** page, select the two items indicating that you have read the appropriate sections in the System Center 2012 – Service Manager Upgrade Guide, and then click **Next**.
5. On the **Product registration** page, type the appropriate information in the boxes. Read the Microsoft Software License Terms; if applicable, click **I have read, understood, and agree with the terms of the license agreement**; and then click **Next**.
6. On the **System check results** page, ensure that the prerequisite check passed or at least passed with warnings, and then click **Next**.
7. On the **Configure Analysis Service for OLAP cubes** page, in the **Database server** box, type the computer name of the server that will host the SQL Server Analysis Services (SSAS) database, and then press the Tab key. When **Default** appears in the **SQL Server instance** box, click **Next**.

   Important
   If you are installing SSAS on a computer other than the computer that hosts the data warehouse management server and there is a firewall in your environment, you must make sure that the proper firewall ports are opened. For more information, see “Port Assignments for System Center 2012 - Service Manager” in the Planning Guide for System Center 2012 - Service Manager.
8. On the **Configure Analysis Services credential** page, specify the user name, password, and domain for the account, and then click **Test Credentials**. After you

receive a message saying “The credentials were accepted,” click **Next**.

9. On the **Help improve System Center** page, indicate your preference for participation in the Customer Experience Improvement Program and in Error Reporting. As an option, click **Tell me more about the program**, and then click **Next**.
10. On the **Use Microsoft Update to help keep your computer secure and up-to-date** page, indicate your preference for using Microsoft Update to check for Service Manager updates, and then click **Next**.
11. On the **Configuration Summary** page, read the information that is provided, and, if it is accurate, click **Install**.
12. On **The upgrade was completed successfully** page, if you have already backed up the encryption key, clear the **Open the Encryption Backup or Restore Wizard** check box, and then click **Close**.

Service Manager Management Server

Use the following procedure to upgrade the Service Manager management server.

To upgrade the Service Manager management server

1. Log on to the computer that will host the Service Manager management server by using an account that is a member of the Administrators group.
2. On the Service Manager installation media, double-click the **Setup.exe** to start the Service Manager Setup Wizard.
3. On the **Microsoft System Center 2012** page, click **Upgrade Service Manager management server**.
4. On the **Prepare for upgrade** page, select the two items indicating that you have read the appropriate sections in the Upgrade Guide for System Center 2012 – Service Manager, and then click **Next**.
5. On the **Product registration** page, type the appropriate information in the boxes. Read the Microsoft Software License Terms, and, if applicable, click **I have read, understood, and agree with the terms of the license agreement**, and then click **Next**.
6. On the **System check results** page, ensure that the prerequisite check passed or at least passed with warnings, and then click **Next**.
7. On the **Configuration Summary** page, read the information that is provided, and, if it is accurate, click **Install**.
8. On the **The upgrade was completed successfully** page, if you have already backed up the encryption key, clear the **Open the Encryption Backup or Restore Wizard** check box, and then click **Close**.

Service Manager Console

Use the following procedure to upgrade the Service Manager console.

To upgrade the Service Manager Console

1. Log on to the computer that will host the Service Manager console by using an account that is a member of the Administrators group.
2. On the Service Manager installation media, double-click the **Setup.exe** to start the Service Manager Setup Wizard.
3. On the **Microsoft System Center 2012** page, click **Upgrade Service Manager console**.
4. On the **Prepare for upgrade** page, select the two items indicating that you have read the appropriate sections in the Upgrade Guide for System Center 2012 – Service Manager, and then click **Next**.
5. On the **Product registration** page, read the Microsoft Software License Terms, and, if applicable, click **I have read, understood, and agree with the terms of the license agreement**, and then click **Next**.
6. On the **System check results** page, ensure that the prerequisite check passed or at least passed with warnings, and then click **Next**.
7. On the **Configuration Summary** page, read the information that is provided, and, if it is accurate, click **Install**.
8. On **The upgrade was completed successfully** page, click **Close**.

After Upgrading to System Center 2012 SP1 - Service Manager

This topic describes how to restart the Data Access service if it fails to start after an upgrade to System Center 2012 – Service Manager SP1. After the upgrade, you will also have to start the Service Manager workflows and restart the data warehouse jobs. This topic also describes how to stop and then start SQL Server Reporting Services (SSRS) after an upgrade.

Restart the Data Access Service and Workflows on the Data Warehouse Management Server

If necessary, use the following procedures to restart the service and workflows.

To restart the Data Access service

1. On the computer that hosts the data warehouse management server, on the Windows desktop, click **Start**, and then click **Run**.
2. In the **Run** dialog box, in **Open**, type **services.msc**, and then click **OK**.
3. In the **Services** window, in the **Services (Local)** pane, right-click **System Center Data Access Service**, and then click **Start**.

To start Service Manager workflows

1. On the computer that hosts the Service Manager management server, on the Windows desktop, click **Start**, and then click **Run**.

2. In the **Run** dialog box, in **Open**, type **services.msc**, and then click **OK**.
3. In the **Services** window, in the **Services (Local)** pane, right-click **System Center Management**, and then click **Start**.

Restart Data Warehouse Jobs

After you upgrade the data warehouse management server, you might need to restart the data warehouse (extraction, transformation, and load (ETL)) jobs. You can use the following procedure to restart the data warehouse jobs. In this procedure, you enable data warehouse job schedules by using Windows PowerShell cmdlets.

To restart data warehouse jobs

1. On the computer that hosts the data warehouse management server, click **Start**, point to **Programs**, point to **Accessories**, click **Windows PowerShell**, right-click **Windows PowerShell**, and then click **Run as administrator**.
2. Type the following commands and then press Enter after each command.

   Note
   It is assumed in the following command examples that Service Manager was installed in its default location on the C: drive. If necessary, change directories to the location where you installed Service Manager.

```
cd 'C:\Program Files\Microsoft System Center 2012\Service Manager'

import-module $PWD/Microsoft.EnterpriseManagement.Warehouse.Cmdlets.psd1

Get-SCDWJob

Enable-SCDWJobSchedule –JobName Extract_<data warehouse management group name>

Enable-SCDWJobSchedule –JobName Extract_<Service Manager management group name>

Enable-SCDWJobSchedule –JobName Transform.Common

Enable-SCDWJobSchedule –JobName Load.Common

Enable-SCDWJobSchedule –JobName DWMaintenance

Enable-SCDWJobSchedule –JobName MPSyncJob

Start-SCDWJob –JobName MPSyncJob
```

   The last command, **Start-SCDWJob – JobName MPSyncJob**, will enable the ETL jobs to run.

Stop and Then Start SSRS

After you perform an upgrade to System Center 2012 – Service Manager SP1, use the following procedure to stop and then start SSRS.

To stop and then start SSRS

1. On the computer that hosts SSRS, on the Windows desktop, click **Start**, and then click **Run**.
2. In the **Run** dialog box, type **services.msc**, and then click **OK**.
3. In the **Services** window, in the **Services (Local)** pane, right-click **SQL Server Reporting Services**, and then click **Stop**.
4. In the **Services** window, in the **Services (Local)** pane, right-click **SQL Server Reporting Services**, and then click **Start**.

Failed Upgrade in System Center 2012 SP1 - Service Manager

An upgrade to System Center 2012 – Service Manager SP1 might not complete successfully. There are five phases of the upgrade where a failure might occur. The steps that you take to recover from a failed upgrade depend on the phase in which the failure occurs:

- Failure occurs during the prerequisite check.
- Failure occurs during predicted checks.
- Failure occurs in an unpredictable manner before permanent changes are made to a management server.
- Failure occurs in an unpredictable manner after permanent changes are made to a management server.
- Failure occurs in an unpredictable manner after permanent changes are made to the database.

The upgrade might also fail as a result of Configuration service Startup timing out.

Failure Occurs During a Prerequisite Check

Before the installation of System Center 2012 – Service Manager SP1 begins, a prerequisite check is made for certain requirements. If a condition is found in which Service Manager SP1 will continue to function, you receive a warning. Warnings are identified with an explanation point (!) in a yellow triangle. Conditions that have been identified as a Warning will not prevent you from installing.

If a condition is found that is an absolute requirement, a failure indication appears. Failure indications are identified with an X in a red circle.

If either a warning or a failure indication appears, you can either cancel the installation and make the necessary changes, or make the appropriate changes and then click **Check prerequisites**

again and continue with the installation. All failure conditions must be corrected before the installation or upgrade can proceed.

Failure Occurs During Predicted Checks

After any failures that were identified during the prerequisite check are corrected, pressing **Next** on the **Prerequisites** page of the wizard starts the upgrade or installation of System Center 2012 – Service Manager. The system checks for the following conditions during the installation or upgrade process:

- The data warehouse database that you specified exists.
- The computer running SQL Server that you specified is not running SQL Server 2008 Service Pack 1 (SP1), SQL Server 2008 Service Pack 2 (SP2). SQL Server 2008 R2.
- The hard disk drive that you specified for a database has at least 1 GB of free space.
- The System Center Data Access service can log on with the set of credentials that you supplied.
- The System Center Management Configuration service can log on with the set of credentials you supplied.
- There is enough free disk space to install the upgraded files.
- Setup can access the file location for the Service Manager installation.

If failures occur during these types of checks, you can make the appropriate changes. For example, specify a hard disk location with sufficient space, and then on the Warning page, click **Retry** to continue the installation.

Failure Occurs in an Unpredictable Manner Before Permanent Changes Are Made to the Management Server

During an installation or upgrade of System Center 2012 – Service Manager SP1, an error may occur. If the error occurs before any permanent changes are made to the Service Manager management server or data warehouse management server—for example, before changes are made to the Structured Query Language (SQL) database or before management packs are imported—the error message that appears includes a **Retry** button. In these situations, you can correct the issue and then retry the installation or upgrade.

Failure Occurs in an Unpredictable Manner After Permanent Changes Are Made to the Management Server

If an error occurs after permanent changes are made to the Service Manager management server or data warehouse management server—for example, after changes are made to the SQL database or after management packs are imported—the error message that appears does not include a **Retry** button. In this situation, you must reinstall the original version of the affected management server.

In any case, you need the backup of the encryption key. For the Service Manager management server, the encryption key is available only if you made a backup before you started the upgrade.

For more information, see "Back Up the Encryption Key in Service Manager" in the Disaster Recovery Guide for System Center 2012 – Service Manager.

Failure Occurs in an Unpredictable Manner After Permanent Changes Are Made to a Database

If an error occurs after permanent changes have been made—for example, after management packs are imported or any other time data is written into a database—the error message that appears does not include a **Retry** button.

At this point your only option is to click **Close** and begin a disaster recovery process to restore your databases. This recovery is possible only if you backed up your databases before you started the upgrade process. For more information, see "Backing Up Service Manager Databases" in the Disaster Recovery Guide for System Center 2012 – Service Manager.

The Upgrade Fails as a Result of Configuration Service Startup Timing Out

On some computers, Service Manager Setup fails and rolls back if it cannot start the System Center Management Configuration service in a timely fashion. If this problem occurs, you might see the following entries in the install log:

```
CAStartServices: Attempting to start service. OMCFG


CAStartServices: StartService failed. Error Code: 0x8007041D.


ConfigureSDKConfigService: CAStartServices failed. Error Code: 0x8007041D. OMCFG
```

Error 0x8007041D indicates that the service did not respond to the start or control request in a timely fashion. In addition, the following event may be logged in the System Event log:

```
Log Name:      System

Source:        Service Control Manager

Event ID:      7009

Task Category: None

Level:         Error

Keywords:      Classic

User:          N/A

Description:

A timeout was reached (30000 milliseconds) while waiting for the System Center Management

Configuration service to connect.
```

This problem occurs because a .NET Framework 2.0 managed assembly that has an Authenticode signature takes longer than usual to load. The signature is always verified when the .NET Framework 2.0 managed assembly that has an Authenticode signature is loaded. In addition, the .NET Framework 2.0 managed assembly may take longer than usual to load because of various other settings. For example, the .NET Framework 2.0 managed assembly may take longer than usual to load because of the network configuration.

For additional information about the cause of this problem, see Knowledgebase Article 936707 in the Microsoft Knowledge Base.

For information about possible workaround procedures, see How to Work Around Configuration Service Startup Issues

How to Work Around Configuration Service Startup Issues

There are two workaround procedures that you can use to try to resolve the issue in which an upgrade to System Center 2012 – Service Manager SP1 fails as a result of Configuration service Startup timing out. You can:

- Disable signature verification on the computer that is running Setup.
- Increase the service time-out setting on the computer that is running Setup.

To disable signature verification

1. On the computer that is running Setup, edit the Microsoft.Mom.ConfigServiceHost.exe.config file, which is located in the Program Files\Microsoft System Center 2012\Service Manager folder.
2. In the **<runtime></runtime>** section, add **<generatePublisherEvidence enabled="false"/>**.
3. Save the changes to the file.
4. Attempt the upgrade again.

To increase the service time-out setting

1. On the computer that is running Setup, create the following registry value to increase the service time-out period:

   ```
   HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control
   ServicesPipeTimeout
   DWORD
   200000
   ```

   Caution
   Incorrectly editing the registry may severely damage your system. Before making changes to the registry, you should back up any valued data on the computer.

Note

You may have to increase this value further if the service still fails to start. The value in this example is in milliseconds. For additional details about the registry key, see article 922918 in the Microsoft Knowledge Base.

2. Start the computer again.
3. Attempt the upgrade again.

Upgrading System Center 2012 - Service Manager SP1 to System Center 2012 R2

This guide will show you how to upgrade from Service Manager in Microsoft System Center 2012 Service Pack 1 (SP1) to Service Manager in System Center 2012 R2.

Warning

If you are planning to upgrade two or more System Center products, you must first consult the guide Upgrade Sequencing for System Center 2012 R2. The order in which you perform product upgrades is important. Failure to follow the correct upgrade sequence might result in product failure for which no recovery options exist. The affected System Center products are:

1. Orchestrator
2. Service Manager
3. Data Protection Manager (DPM)
4. Operations Manager
5. Configuration Manager
6. Virtual Machine Manager
7. App Controller

You can only upgrade to Service Manager in System Center 2012 R2 from Service Manager in System Center 2012 SP1 (version 7.5.2905.0).

Important

This guide assumes that you are performing an *upgrade* to Service Manager in System Center 2012 R2. For information about installing System Center 2012 – Service Manager on a computer where no previous version of Service Manager exists, see Deploying System Center 2012 – Service Manager.

Upgrade topics

- Upgrade Planning for System Center 2012 R2 - Service Manager

Describes factors that you must consider before you start the Service Manager upgrade.

- Setting Up a Service Manager 2012 Lab Environment with Production Data

  Describes how to set up Service Manager in a lab environment by using production data.
- Upgrade to System Center 2012 R2 - Service Manager

  Describes the steps that you must take to upgrade System Center 2012 to System Center 2012 SP1.
- After Upgrading to System Center 2012 R2 - Service Manager

  Describes the steps that you must take after you have applied the Service Manager upgrade.
- Failed Upgrade in System Center 2012 R2 - Service Manager

  Describes the steps that you can take if an upgrade fails.

Downloadable documentation

You can download a copy of this technical documentation from the Microsoft Download Center. Always use the TechNet library for the most up-to-date information.

Upgrade Planning for System Center 2012 R2 - Service Manager

This guide outlines the procedures that are necessary to upgrade to Service Manager in System Center 2012 R2.

An in-place upgrade from Service Manager in System Center 2012 Service Pack 1 (SP1) to Service Manager in System Center 2012 R2 is supported. An in-place upgrade is an upgrade of all Service Manager parts on the same hardware. Other approaches, such as side-by-side upgrades or rolling upgrades, are not supported.

Upgrading to Service Manager in System Center 2012 R2 requires preparation. We recommend that you install Service Manager in a lab environment and then replicate your production databases into the lab. You can then perform an upgrade of the new installation in the lab. After you confirm that the upgrade in the lab environment is successful, you can perform the same upgrade to Service Manager SP1 in the production environment.

Evaluation and Select versions

The release of Service Manager in System Center 2012 SP1 was available in two versions: Evaluation and Select. Service Manager in System Center 2012 R2 is available in the same versions. The following upgrade paths are supported to Service Manager in System Center 2012 R2.

Current version	Upgraded version	Status
Service Manager in System	Service Manager in System	Evaluation period remains

Current version	Upgraded version	Status
Center 2012 SP1 Evaluation	Center 2012 R2 Evaluation	unchanged (180 days)
Service Manager in System Center 2012 SP1 Select	Service Manager in System Center 2012 R2 Select	Licensed

Note
Upgrading from an Evaluation version of Service Manager in System Center 2012 SP1 to an Evaluation version of Service Manager in System Center 2012 R2 does not extend the 180-day evaluation period.

Installation location

The default folder for installing Service Manager, Service Manager SP1, and Service Manager in System Center 2012 R2 is \Program Files\Microsoft System Center\Service Manager 2012. However, when you perform the upgrade to Service Manager in System Center 2012 R2, the software is installed in the folder that Service Manager previously used. If System Center Service Manager 2010 was previously upgraded to Service Manager in System Center 2012 SP1, the folder might be \Program Files\Microsoft System Center\Service Manager 2010.

Language support

This release of Service Manager SP1 represents an ongoing progression of support for various languages. In System Center Service Manager 2010, you used the Latin1_General_100_CI_AS collation for the Turkish language. Service Manager, Service Manager SP1, and Service Manager in System Center 2012 R2 support the Turkish_100_CI_AS collation. However, if you upgraded previously from System Center Service Manager 2010 to System Center 2012 – Service Manager, the collation that was used for the Turkish language (Latin1_General_100_CI_AS) was carried forward to System Center 2012 – Service Manager and will be carried forward again when you upgrade to Service Manager in System Center 2012 R2.

Hardware requirements for Service Manager in System Center 2012 R2

Service Manager in System Center 2012 R2 will function on the same hardware that you used for System Center 2012 – Service Manager SP1.

Hardware requirements for Service Manager in System Center 2012 R2 are fully documented in Hardware Requirements for System Center 2012 - Service Manager.

Software requirements for Service Manager in System Center 2012 R2

To upgrade to Service Manager in System Center 2012 R2, you must first apply Cumulative Update 2 for System Center 2012 – Service Manager SP1.

Service Manager in System Center 2012 R2 has the same software requirements for the Service Manager console that System Center Service Manager 2010 SP1 has. In addition, the Service Manager console can now be installed on computers that are running the Windows Server® 2012 R2 operating system.

The Service Manager and data warehouse management servers, along with the Self-Service Portal, are supported with Windows Server 2012 R2.

Software requirements for Service Manager in System Center 2012 R2 are fully documented in Software Requirements for System Center 2012 – Service Manager.

Testing the upgrade

We recommend that you test the upgrade to Service Manager in System Center 2012 R2 in a lab environment.

Upgrade order and timing

The order of your upgrades is important. Perform the upgrades by using the following steps:

1. Back up your databases and your management packs. See the topics "Backing Up Service Manager Databases" and "Backing Up Unsealed Management Packs in Service Manager" in the Disaster Recovery Guide for System Center 2012 – Service Manager.
2. Upgrade the data warehouse management server. You must stop the data warehouse jobs, and you will not be able to start them again until after you have completed the upgrade.
3. After the upgrade to the data warehouse management server is complete, upgrade the initial Service Manager management server. If you created more than one Service Manager management server, the initial Service Manager management server is the first one that you created.
4. Upgrade the Service Manager consoles and any additional Service Manager management servers.
5. Restart the data warehouse jobs.
6. Deploy the new Self-Service Portal.

The timing of your upgrades is also important. After you upgrade your data warehouse management server, you must both upgrade the Service Manager management server and deploy the new Self-Service Portal. After you upgrade your initial Service Manager management server, you must be prepared to upgrade your Service Manager console or Service Manager consoles, additional Service Manager management servers, and the Self-Service Portal at the same time.

Operations Manager compatibility

This section describes the compatibility between System Center Operations Manager 2007 R2, System Center 2012 – Operations Manager, and Service Manager in System Center 2012 R2.

System Center Operations Manager 2007 R2

Operations Manager 2007 R2 agents must be removed from the Service Manager and data warehouse management servers before you attempt an upgrade. Service Manager in System Center 2012 R2 includes a System Center 2012 R2 Operations Manager agent, and it is automatically installed when you upgrade. After Service Manager Setup finishes, you must manually configure the agent to communicate with the Operations Manager management server.

To validate that the Operations Manager agent was installed, open Control Panel and verify that the agent is present. To manually configure the Operations Manager agent, see Configuring Agents.

You can upgrade Service Manager servers in the presence of an Operations Manager 2007 R2 console.

System Center 2012 – Operations Manager and System Center 2012 R2 Operations Manager

System Center 2012 – Operations Manager agents were not supported with System Center 2012 – Service Manager. However, the agent that Service Manager automatically installs in System Center 2012 R2 is compatible with System Center 2012 – Operations Manager, System Center 2012 – Operations Manager SP1, and System Center 2012 R2 Operations Manager. After Service Manager Setup finishes, you must manually configure the agent to communicate with the Operations Manager management server.

To validate that the Operations Manager agent was installed, open Control Panel and verify that the agent is present. To manually configure the Operations Manager agent, see Configuring Agents.

You can upgrade Service Manager servers in the presence of a System Center 2012 – Operations Manager console.

Database impacts

In Service Manager in System Center 2012 R2, you have the option to install Operations Manager and Configuration Manager data marts. Selecting this option will require additional space on the hard disk drive for the two databases, in addition to associated file groups and log files.

Backing up Service Manager before upgrading

Before you start any upgrade, we recommend that you back up your Service Manager and data warehouse databases and the encryption key. If you have already backed up your databases and encryption key, you can continue to run the upgrade. Otherwise, review the backup procedures in

the Disaster Recovery Guide for System Center 2012 – Service Manager before you continue the upgrade.

Registering with the Service Manager data warehouse

If you have installed a data warehouse management server in your environment, as part of the upgrade process, you must be able to view the status of the data warehouse jobs. You cannot perform this task until you register with the Service Manager data warehouse. If the **Data Warehouse** button is not visible in the Service Manager console, complete the procedure in "Registering with the Service Manager Data Warehouse to Enable Reporting" in the Deployment Guide for System Center 2012 – Service Manager.

Encryption keys

When you have finished running Setup to either install or upgrade to Service Manager in System Center 2012 R2, you are prompted to open the Encryption Key Backup or Restore Wizard. If you have previously backed up the encryption keys, no additional action is required. If you never backed up the encryption keys, use the Encryption Key Backup or Restore Wizard to back up the encryption keys on the Service Manager management servers.

Authoring Tool workflows

When you use the System Center 2012 R2 version of the Authoring Tool in Service Manager to create a workflow, custom scripts that the workflow calls will fail if they use Windows PowerShell cmdlets. This failure is due to a problem in the MonitoringHost.exe.config XML file in Service Manager.

To work around this problem, update the MonitoringHost.exe.config file by using the following steps:

1. Browse to %ProgramFiles%\Microsoft System Center 2012\Service Manager\ or the location where you installed Service Manager.
2. In the MonitoringHost.exe.config file, add the section in italic type from the following example in the corresponding section of your file. You must insert the section before `<publisherPolicy apply="yes" />`.
3. Save your changes to the file.
4. Restart the System Center Management service on the Service Manager management server.

   Note
   For System Center 2012 R2 Service Manager, the System Center Management service was renamed to Microsoft Monitoring Agent.

```
<?xml version="1.0"?>

<configuration>

  <configSections>
```

```
    <section name="uri" type="System.Configuration.UriSection, System, Version=2.0.0.0,
Culture=neutral, PublicKeyToken=b77a5c561934e089" />
  </configSections>
  <uri>
    <iriParsing enabled="true" />
  </uri>
  <runtime>
    <assemblyBinding xmlns="urn:schemas-microsoft-com:asm.v1">
      <dependentAssembly>
        <assemblyIdentity name="Microsoft.Mom.Modules.DataTypes"
publicKeyToken="31bf3856ad364e35" />
        <publisherPolicy apply="no" />
        <bindingRedirect oldVersion="6.0.4900.0" newVersion="7.0.5000.0" />
      </dependentAssembly>
      <dependentAssembly>
        <assemblyIdentity
name="Microsoft.EnterpriseManagement.HealthService.Modules.WorkflowFoundation"
publicKeyToken="31bf3856ad364e35" />
        <publisherPolicy apply="no" />
        <bindingRedirect oldVersion="6.0.4900.0" newVersion="7.0.5000.0" />
      </dependentAssembly>
  <dependentAssembly>
         <assemblyIdentity name="Microsoft.EnterpriseManagement.Modules.PowerShell"
publicKeyToken="31bf3856ad364e35" />
        <bindingRedirect oldVersion="6.0.4900.0" newVersion="7.0.5000.0" />
     </dependentAssembly>
      <publisherPolicy apply="yes" />
      <probing privatePath="" />
    </assemblyBinding>
    <gcConcurrent enabled="true" />
  </runtime>
</configuration>
```

Upgrading the R2 Self-Service Portal

When you upgrade from System Center 2012 – Service Manager Service Pack 1 (SP1) to System Center 2012 R2 Service Manager, you perform an in-place upgrade of the Self-Service Portal.

Service Manager Connectors

Any connectors that you created by using System Center 2012 – Service Manager Service Pack 1 (SP1) will continue to function after you upgrade to Service Manager in System Center 2012 R2. For more information, see “Using Connectors to Import Data into System Center 2012 - Service Manager” in Administering System Center 2012 - Service Manager.

Remote SQL Server Reporting Services

When you installed System Center 2012 – Service Manager Service Pack 1 (SP1), you may have specified a different computer to host Microsoft SQL Server Reporting Services than the computer that hosted the data warehouse management server. If, in your environment, Reporting Services is remote from the data warehouse management server, you must use the following procedures to prepare the computer that hosts Reporting Services for the upgrade:

- Copy Microsoft.EnterpriseManagement.Reporting.Code.dll from the Service Manager installation media to the computer that is hosting Reporting Services.
- Add an Extension tag to the existing Data segment in the rsreportserver configuration file on the same computer.

If you used the default instance of SQL Server, use Windows Explorer to drag Microsoft.EnterpriseManagement.Reporting.Code.dll (which is located in the Prerequisites folder on your Service Manager installation media) to the \Program Files\Microsoft SQL Server\MSRS10.MSSQLSERVER\Reporting Services\ReportServer\Bin folder on the computer that is hosting Reporting Services. If you did not use the default instance, the path of the required folder is \Program Files\Microsoft SQL Server\MSRS10.*INSTANCE_NAME*\Reporting Services\ReportServer\Bin. The following procedure uses the default instance name.

To copy the Microsoft.EnterpriseManagement.Reporting.Code.dll file

1. On the computer that will host the remote instance of Reporting Services, open an instance of Windows Explorer.
2. Locate the \Program Files\Microsoft SQL Server\MSRS10_50.MSSQLSERVER\Reporting Services\ReportServer\Bin folder.
3. Open a second instance of Windows Explorer, locate the drive that contains the Service Manager installation media, and then open the Prerequisites folder.
4. In the Prerequisites folder, click **Microsoft.EnterpriseManagement.Reporting.Code.dll** and drag it to the folder that you located in step 2.

To add an Extension tag to the Data segment in the rsreportserver.config file

1. On the computer that is hosting Reporting Services, locate the rsreportserver.config file in the \Program Files\Microsoft SQL Server\MSRS10_50.MSSQLSERVER\Reporting Services\ReportServer folder.
2. In an XML editor of your choice (such as Notepad), open the rsreportserver.config file.
3. Scroll through the rsreportserver.config file and locate the **<Data>** code segment. This file contains only one **<Data>** code segment.
4. Add the following **Extension** tag to the **<Data>** code segment where all the other **Extension** tags are.

```
<Extension Name="SCDWMultiMartDataProcessor"
Type="Microsoft.EnterpriseManagement.Reporting.MultiMartConne
ction, Microsoft.EnterpriseManagement.Reporting.Code" />
```

5. Save the changes, and then close the XML editor.

Setting Up a Service Manager 2012 Lab Environment with Production Data

This section explains how to create a lab environment and populate it with production data so that you can perform and test an upgrade before you perform the upgrade in the production environment. The linked procedures in this section describe how to configure System Center 2012 – Service Manager Service Pack 1 (SP1) in a lab environment with production data. You then perform an in-place upgrade to Service Manager in System Center 2012 R2. It is important to follow the steps in this section in sequence.

1. How to Install an Additional Management Server in the Production Service Manager Management Group
2. On the secondary management server, install any cumulative updates that you installed on the primary management server.
3. How to Copy the Workflow Assembly Files
4. How to Disable Service Manager Connectors in the Production Environment
5. How to Disable Email Notifications in the Production Environment
6. Disable all workflows in the production environment that you do not want to be running in the lab environment.
7. How to Stop Service Manager Services on the Secondary Management Server
8. How to Back Up the Production Service Manager Database
9. How to Enable Service Manager Connectors in the Production Environment
10. How to Enable Email Notifications in the Production Environment
11. Enable all workflows in the production environment that you disabled in step 6.
12. How to Restore the Service Manager Database in the Lab Environment
13. How to Prepare the Service Manager Database in the Lab Environment

14. If possible, block communications to SQL from the secondary management server to the production Service Manager database server.
15. How to Start Service Manager Services on the Secondary Management Server
16. Verify that the lab environment works. Try to start the console on the secondary management server and determine whether you can connect to the console. Confirm that data warehouse and reporting do not appear.
17. How to Promote a Secondary Management Server in a Lab Environment
18. How to Enable the Connectors in the Lab Environment

    Note
    Do not enable or delete the System Center Operations Manager alert connector in the lab environment. This will cause the alert connector in the production environment to fail.
19. If you want to test the email notification and incoming email functionality, use a separate Simple Mail Transfer Protocol (SMTP) instance to send email messages to eliminate flooding the inboxes of users with test email. To test the incoming email feature, you can point to a test share and drop the eml files into this share when you are ready to test.
20. How to Install a New Data Warehouse Server in the Lab Environment
21. How to Register the Data Warehouse Server in the Lab Environment
22. Back up this lab environment. For example, back up the database and encryption keys and the virtual machine snapshots. This gives you the ability to recover if the upgrade fails.
23. Attempt the in-place upgrade of Service Manager in System Center 2012 R2.
24. Test everything. Document any discrepancies and fixes. Send feedback through the Microsoft Connect website.

How to Install an Additional Management Server in the Production Service Manager Management Group

The following procedure describes how to install an additional management server. You must deploy the initial Service Manager management server and Service Manager database before you can deploy an additional management server.

Tip
To install an additional Service Manager management server, you must be a member of the Service Manager Administrators user role.

When you install a secondary management server, Service Manager resets data retention settings. Before you install a secondary management server, note the data retention settings. After you install the additional management server, adjust the data retention settings to their original values.

To install an additional management server

1. By using an account that has administrator rights and that is also a member of the Service Manager Management group administrators, log on to the computer that will host

the additional Service Manager management server.

2. In the System Center 2012 R2 Service Manager installation media, double-click **Setup.exe**.
3. On the **Microsoft System Center 2012 R2 Service Manager** page, click **Install a Service Manager Management server**.
4. On the **Product registration** page, type information in the boxes. In the **Product key** boxes, type the product key that you received with Service Manager, or alternatively, select **Install as an evaluation edition (180 day trial)?**. Read the Microsoft Software License Terms, and, if applicable, click **I have read, understood, and agree with the terms of the license agreement**, and then click **Next**.
5. On the **Installation location** page, verify that sufficient free disk space is available, and then click **Next**. If necessary, click **Browse** to change the location where the additional Service Manager management server will be installed.
6. On the **System check results** page, make sure that the prerequisite check passed or at least passed with warnings, and then click **Next**.

   If the prerequisite check determines that the Microsoft Report Viewer Redistributable has not been installed, click **Install Microsoft Report Viewer Redistributable**. After the Microsoft Report Viewer Redistributable 2008 (KB971119) Setup wizard finishes, click **Check prerequisites again**.
7. On the **Configure the Service Manager Database** page, in the **Database server** box, type the name of the computer that hosts the Service Manager database that you used for your initial Service Manager management server (for example, **Computer 2**), and then press the Tab key. When the name of the instance appears in the **SQL Server instance** box, click **Use an existing database**.
8. Click the **Database** list, select the database name for the Service Manager database (the default name is ServiceManager), and then click **Next**.
9. On the **Configure the Service Manager Management group** page, verify that the boxes for management group name and management group administrators have been populated. Click **Next**.
10. On the **Configure the Account for Service Manager Services** page, click **Domain account**, specify the user name (for example, SM_Acct), password, and domain for the account, and then click **Test Credentials**. After you receive a **The credentials were accepted** message, click **Next**.

    Note
    The user name and password that you provide here must be the same ones that you used for the Service Manager account on the data warehouse management server.
11. On the **Help improve System Center** page, indicate your preference for participation for both the Customer Experience Improvement Program and Error Reporting. Optionally, click **Tell me more about the program**, and then click **Next**.
12. On the **Use Microsoft Update to help keep your computer secure and up-to-date** page, indicate your preference for using Microsoft Update to check for Service Manager

updates, and then click **Next**.

13. On the **Installation summary** page, click **Install**.
14. On the **Setup completed successfully** page, we recommend that you leave **Open the Encryption Backup or Restore Wizard** selected, and then click **Close**.

How to Copy the Workflow Assembly Files

Use the following procedure to copy the workflow assembly files from the Service Manager installation folder on the primary management server to the secondary management server that you created in the previous procedure.

To copy the workflow assembly files

1. On the computer that is running the Service Manager Primary Server role, browse to the Service Manager installation folder (for example, C:\Program Files\Microsoft System Center 2012\Service Manager) and copy the workflow files (*workflow*.dll).
2. On the computer that is running the Service Manager secondary server, browse to the Service Manager installation folder (for example, C:\Program Files\Microsoft System Center 2012\Service Manager) and paste the copied workflow files into this folder. You should overwrite any existing files.

   Note
   You must place the workflow assembly files in the Service Manager installation folder. This is an important step if you want to test the custom workflows that depend on workflow assembly files. Failure to copy these files would lead to failed custom workflows in the lab environment.

How to Disable Service Manager Connectors in the Production Environment

Use the following procedure to disable the Service Manager connectors in the production environment.

To disable a connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Connectors** pane, select the connector that you want to disable.
4. In the **Tasks** pane, under the connector name, click **Disable**.
5. In the **Disable Connector** dialog box, click **OK**.

How to Disable Email Notifications in the Production Environment

Use the following procedure to disable outgoing and incoming email notifications in the production environment.

To disable outgoing email notifications

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Notifications**, and then click **Channels**.
3. In the **Channels** pane, click **E-Mail Notification Channel**.
4. In the **Tasks** pane, under **E-Mail Notification Channel**, click **Properties** to open the **Configure E-Mail Notification Channel** dialog box.
5. Clear the **Enable e-mail notifications** check box.

To disable incoming email notifications

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Settings**.
3. In the **Settings** pane, double-click **Incident Settings**.
4. In the **Incident Settings** dialog box, click **Incoming E-mail**.
5. Clear the **Turn on incoming e-mails processing** check box, and then click **OK**.

How to Stop Service Manager Services on the Secondary Management Server

Use the following procedure to stop the Service Manager services.

To stop the Service Manager services

1. In the **Run** dialog box, in the **Open** box, type **services.msc**, and then click **OK**.
2. In the **Services** window, in the **Services (Local)** pane, locate the following services and for each one, click **Stop**:
    a. System Center Data Access Service
    b. System Center Management
    c. System Center Management Configuration
3. Open Windows Explorer.
4. Locate the folder \Program Files\Microsoft System Center 2012\Service Manager.
5. Delete the Health Service State folder and all of its contents.

How to Back Up the Production Service Manager Database

Use the following procedure to back up the production Service Manager database in Microsoft SQL Server 2008 R2. Steps might differ for Microsoft SQL Server 2012.

To back up the Service Manager database

1. After you connect to the appropriate instance of the Microsoft SQL Server Database Engine, in Object Explorer, click the server name to expand the server tree.
2. Expand **Databases**, and depending on the database, either select a user database or expand **System Databases** and select a system database.
3. Right-click the database, point to **Tasks**, and then click **Back Up**. The **Back Up Database** dialog box appears.
4. In the **Database** list, verify the database name. You can optionally select a different database from the list.
5. You can perform a database backup for any recovery model (FULL, BULK_LOGGED, or SIMPLE).
6. In the **Backup type** list, select **Full**.

   Note
   After you create a full database backup, you can create a differential database backup. For more information, see Create a Differential Database Backup (SQL Server).
7. Optionally, you can select **Copy Only Backup** to create a copy-only backup. A copy-only backup is a SQL Server backup that is independent of the sequence of conventional SQL Server backups. For more information, see Copy-Only Backups (SQL Server).

   Note
   When the **Differential** option is selected, you cannot create a copy-only backup.
8. For **Backup component**, click **Database**.
9. Either accept the default name that is suggested in the **Name** box for the backup set, or enter a different name for the backup set.
10. Optionally, in the **Description** box, enter a description of the backup set.
11. Specify when the backup set will expire and when it can be overwritten without explicitly skipping verification of the expiration data.

    Note
    For more information about backup expiration dates, see BACKUP (Transact-SQL).
12. Choose the type of backup destination by clicking **Disk** or **Tape**. To select the paths of up to 64 disk or tape drives that contain a single media set, click **Add**. The selected paths appear in the **Backup to** list.
13. To view or select the advanced options, in the **Select a page** pane, click **Options**.
14. Select an Overwrite Media option by clicking either **Back up to the existing media set**

or **Back up to a new media set, and erase all existing backup sets**.

15. In the **Reliability** section, select either **Verify backup when finished** or **Perform checksum before writing to media**, and then optionally select **Continue on checksum error**. For more information, see Possible Media Errors During Backup and Restore (SQL Server).

How to Enable Service Manager Connectors in the Production Environment

Use the following procedure to enable the Service Manager connectors in the production environment.

To enable a connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Connectors** pane, select the connector that you want to enable.
4. In the **Tasks** pane, under the connector name, click **Enable**.

How to Enable Email Notifications in the Production Environment

Use the following procedure to enable outgoing and incoming email notifications in the production environment.

To enable outgoing email notifications

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Notifications**, and then click **Channels**.
3. In the **Channels** pane, click **E-Mail Notification Channel**.
4. In the **Tasks** pane, under **E-Mail Notification Channel**, click **Properties** to open the **Configure E-Mail Notification Channel** dialog box.
5. Select the **Enable e-mail notifications** check box.

To enable incoming email notifications

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Settings**.
3. In the **Settings** pane, double-click **Incident Settings**.
4. In the **Incident Settings** dialog box, click **Incoming E-mail**.
5. Select the **Turn on incoming e-mails processing** check box, and then click **OK**.

How to Restore the Service Manager Database in the Lab Environment

Use the following procedure to restore the production Service Manager database by using Microsoft SQL Server 2008 R2. Steps might differ for Microsoft SQL Server 2012.

To restore the Service Manager database

1. After you connect to the appropriate instance of the SQL Server Database Engine, in Object Explorer, click the server name to expand the server tree.
2. Expand **Databases**, and depending on the database, either select a user database or expand **System Databases** and select a system database.
3. Right-click the database, point to **Tasks**, and then click **Restore**. The **Back Up Database** dialog box appears.
4. Click **Database**, which opens the **Restore Database** dialog box.
5. On the **General** page, the name of the restoring database appears in the **To database** list. To create a new database, enter its name in the list.
6. In the **To a point in time** box, either retain the default (**Most recent possible**) or select a specific date and time by clicking the **Browse** button to open the **Point in Time Restore** dialog box. For more information, see How to: Restore to a Point in Time (SQL Server Management Studio).
7. To specify the source and location of the backup sets to restore, click either **From database** or **From device**.
8. In the **Select the backup sets to restore** grid, select the backups to restore. For more information, see Restore Database (General Page).
9. To view or select the advanced options, in the **Select a page** pane, click **Options**.
10. In the **Restore options** pane, in the following list of options, select the one that is most appropriate for your situation:
    - **Overwrite the existing database**
    - **Preserve the replication settings**
    - **Prompt before restoring each backup**
    - **Restrict access to the restored database**

    For more information, see Restore Database (Options Page).
11. Optionally, you can restore the database to a new location by specifying a new restore destination for each file in **Restore the database files as**. For more information, see Restore Database (Options Page).
12. In the **Recovery state** pane, in the following list of options, select the one that is most appropriate for your environment:
    - **Leave the database ready to use by rolling back the uncommitted transactions. Additional transaction logs cannot be restored. (RESTORE WITH RECOVERY)**

Note
Select this option only if you are restoring all of the necessary backups at this time.

- **Leave the database non-operational, and do not roll back the uncommitted transactions. Additional transaction logs can be restored. (RESTORE WITH NORECOVERY)**
- **Leave the database in read-only mode. Undo uncommitted transactions, but save the undo actions in a standby file so that recovery effects can be reverted. (RESTORE WITH STANDBY)**

For more information, see Restore Database (Options Page).

How to Prepare the Service Manager Database in the Lab Environment

Use the following procedure to prepare the Service Manager database in the lab environment. Perform this procedure on the computer that is hosting the Service Manager database that the secondary management server (the management server in your lab environment) is using.

To configure the database

1. On the computer that is hosting the Service Manager database for the secondary management server, click **Start**, click **All Programs**, click **Microsoft SQL Server 2008 R2**, and then click **SQL Server Management Studio**.
2. In the **Connect to Server** dialog box, perform the following steps:
   a. In the **Server Type** list, select **Database Engine**.
   b. In the **Server Name** list, select the server name for your Service Manager or data warehouse databases.
   c. In the **Authentication** list, select **Windows Authentication**, and then click **Connect**.
3. In the **Object Explorer** pane, expand **Databases**, and then click **ServiceManager**.
4. On the toolbar, click **New Query**.
5. In the center pane, type the following commands, and then click **Execute**.

```
sp_configure 'clr enabled', 1
go
reconfigure
go
```

6. In the center pane, remove the commands that you typed in the previous step, type the following commands, and then click **Execute**.

```
ALTER DATABASE ServiceManager SET SINGLE_USER WITH ROLLBACK
IMMEDIATE
```

7. In the center pane, remove the commands that you typed in the previous step, type the following commands, and then click **Execute**.

```
ALTER DATABASE ServiceManager SET ENABLE_BROKER
```

8. In the center pane, remove the commands that you typed in the previous step, type the following commands, and then click **Execute**.

```
ALTER DATABASE ServiceManager SET MULTI_USER
```

To configure the service account

1. In the **Object Explorer** pane, expand **Security**, and then expand **Logins**.
2. Right-click **Logins**, and then click **New Login**.
3. Perform the following procedures in the Login – New wizard:
   a. Click **Search**.
   b. Type the user name (in the format *domain**username*) for the service account for the Service Manager database in the lab environment, click **Check Names**, and then click **OK**.

      Note
      If the Data Access Account is running as LocalSystem, use the format *domain**computername*$ in SQL Logins, where *computername* is the name of the management server.

   c. In the **Select a page** pane, click **User Mapping**.
   d. In the **Users mapped to this login** area, in the **Map** column, click the row that represents the name of the Service Manager database. (ServiceManager is the default database name.)
   e. In the **Database role membership for: ServiceManager** area, make sure that the following entries are selected:
      - **configsvc_users**
      - **db_accessadmin**
      - **db_datareader**
      - **db_datawriter**
      - **db_ddladmin**
      - **db_securityadmin**
      - **dbmodule_users**
      - **public**
      - **sdk_users**
      - **sql_dependency_subscriber**
   f. Click **OK**.

To configure Service Manager tables

1. In the **Object Explorer** pane, expand **Databases**, expand **ServiceManager**, and then

expand **Tables**.

2. Right-click **dbo.MT_Microsoft$SystemCenter$ManagementGroup**, and then click **Edit Top 200 Rows**.
3. In the center pane, locate the column **SQLServerName_ 48B308F9_CF0E_0F74_83E1_0AEB1B58E2FA**.
4. In the first row and second row of this column, type the computer name of the computer that is hosting the Service Manager database in the lab environment. In the case of named instances, type *computername******instance name*.
5. Right-click **dbo. MT_Microsoft$SystemCenter$ResourceAccessLayer$SqlResourceStore**, and then click **Edit Top 200 Rows**.
6. In the center pane, locate the column **Server_48B308F9_CF0E_0F74_83E1_0AEB1B58E2FA**.
7. In the first row of this column, type the computer name of the computer that is hosting Microsoft SQL Server for the Service Manager database in the lab environment. In the case of named instances, type *computer name******instance name*.
8. Right-click **LFX.DataSource**, and then click **Edit Top 200 Rows**.
9. In the center pane, locate the column **DataSourceAddress**.
10. In the first row of this column, locate the entry that starts with **Data Source = <server name>; Initial Catalog = ServiceManager; Persist Security Info=False**. Type the name of the computer that is hosting SQL Server in the lab environment in place of **<server name>**.
11. Right-click **dbo. MT_Microsoft$SystemCenter$ResourceAccessLayer$SdkResourceStore**, and then click **Edit Top 200 Rows**.
12. In the center pane, locate the column **Server_48B308F9_CF0E_0F74_83E1_0AEB1B58E2FA**.
13. In all of the rows in this column, type the name of the computer that is hosting the Service Manager management server in the lab environment.
14. Right-click **[dbo].[MT_Microsoft$SystemCenter$ResourceAccessLayer$CmdbResourceStore]**, and then click **Edit Top 200 Rows**.
15. In all rows, update the column **Server_48B308F9_CF0E_0F74_83E1_0AEB1B58E2FA**, and then type the name of the computer that is running SQL Server and hosting the Service Manager database in the lab environment.
16. On the toolbar, click **New Query**.
17. In the center pane, type the following command, and then click **Execute**.

```
Delete from
dbo.MT_Microsoft$SystemCenter$ResourceAccessLayer$DwSdkResour
ceStore
```

18. Close Microsoft SQL Server Management Studio.

How to Start Service Manager Services on the Secondary Management Server

Use the following procedure to start the Service Manager services.

To start Service Manager services

1. On the Windows desktop, click **Start**, and then click **Run**.
2. In the **Run** dialog box, in the **Open** box, type **services.msc**, and then click **OK**.
3. In the **Services** window, in the **Services (Local)** pane, locate the following services and for each one, click **Start**:
   - System Center Data Access Service
   - System Center Management
   - System Center Management Configuration

How to Promote a Secondary Management Server in a Lab Environment

Use the following procedure to promote the secondary management server.

To promote the secondary management server

1. On the secondary management server, perform the following steps:
   a. Close the Service Manager console.
   b. On the Windows desktop, click **Start**, and then click **Run**.
   c. In the **Run** dialog box, in the **Open** box, type **services.msc**, and then click **OK**.
   d. In the **Services** window, in the **Services (Local)** pane, locate the following services and for each one, click **Stop**:
      - System Center Data Access Service
      - System Center Management
      - System Center Management Configuration
   e. Leave the **Services** window open.
   f. Open Windows Explorer.
   g. Locate the \Program Files\Microsoft System Center 2012\Service Manager folder.
   h. Delete the Health Service State folder and all of its contents.
2. On the ServiceManager database that is on the Test SQL Server instance, perform the following steps:
   a. On the Windows desktop, click **Start**, point to **Programs**, point to **Microsoft SQL Server 2008**, and then click **SQL Server Management Studio**.
   b. In the **Connect to Database Engine** dialog box, perform the following steps:
      i. In the **Server name** box, type the name of the server that hosts the

ServiceManager database.

ii. In the **Authentication** box, select **Windows Authentication**.

iii. Click **Connect**.

c. In the **Object Explorer** pane, expand **Databases**, and then click **ServiceManager**.

d. On the toolbar, click **New Query**.

e. In the **SQLQuery1.sql** pane (center pane), type the following, where *FQDN of your server* is the fully qualified domain name of the management server that you are promoting:

EXEC p_PromoteActiveWorkflowServer '*FQDN of your server* **'**

f. On the toolbar, click **Execute**.

g. At the bottom of the **SQLQuery1.sql** pane (center pane), observe that **Query executed successfully** is displayed.

h. Exit Microsoft SQL Server Management Studio.

3. On the secondary management server, perform the following steps:

a. On the Windows desktop, click **Start**, and then click **Run**.

b. In the **Run** dialog box, in the **Open** box, type **services.msc**, and then click **OK**.

c. In the **Services** window, in the **Services (Local)** pane, locate the following services and for each one, click **Start**:

- System Center Data Access Service
- System Center Management
- System Center Management Configuration

Your secondary management server is now the primary management server for the management group.

How to Enable the Connectors in the Lab Environment

Use the following procedure to enable the Service Manager connectors in the lab environment. In this procedure, you will not be enabling the System Center Operations Manager connector.

Warning

Do not enable or delete the Operations Manager alert connector in the lab environment. Doing so will cause the alert connector in the production environment to fail.

To enable a connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Connectors** pane, select the connector that you want to enable.
4. In the **Tasks** pane, under the connector name, click **Enable**.

How to Install a New Data Warehouse Server in the Lab Environment

Use the following procedure to install a new data warehouse management server in the lab environment.

To install a data warehouse management server and data warehouse databases

1. Log on to the computer by using an account that has administrative rights.
2. On the Service Manager installation media, double-click the **Setup.exe** file.
3. On the **Microsoft System Center Service Manager 2012 R2** page, click **Install a Service Manager data warehouse management server**.
4. On the **Product registration** page, type information in the boxes. In the **Product key** boxes, type the product key that you received with Service Manager, or alternatively, select **Install as an evaluation edition (180 day trial)?**. Read the Microsoft Software License Terms, and, if applicable, click **I have read, understood, and agree with the terms of the license agreement**, and then click **Next**.
5. On the **Installation location** page, verify that sufficient free disk space is available, and then click **Next**. If necessary, click **Browse** to change the location in which the Service Manager data warehouse management server will be installed.
6. On the **System check results** page, make sure that prerequisites passed or at least passed with warnings, and then click **Next**.
7. On the **Configure data warehouse databases** page, Service Manager checks your computer to determine whether the computer can host the data warehouse databases. For this configuration, confirm that the database server is the computer on which you are installing the data warehouse management server, and then click **Next**.

   Warning
   A warning message appears if you are using the default collation (SQL_Latin1_General_CP1_CI_AS). Support for multiple languages in Service Manager is not possible when you are using the default collation. If later you decide to support multiple languages by using a different collation, you must reinstall Microsoft SQL Server. For more information, see “Microsoft SQL Server 2008 with SP1” in Planning for System Center 2012 - Service Manager.
8. On the **Configure the data warehouse management group** page, perform the following steps:
   a. In the **Management group name** box, type a unique name for the group.

      Warning
      Names of management groups must be unique. Do not use the same management group name when you deploy a Service Manager management server and a Service Manager data warehouse management server. Furthermore, do not use the management group name that is used for System Center Operations Manager.

b. Click **Browse**, enter the user account or group to which you want to give Service Manager administrative rights, and then click **Next**.

9. Service Manager will use the existing computer if SQL Server Reporting Services is present. On the **Configure the reporting server for the data warehouse** page, accept the defaults, and then click **Next**.
10. On the **Configure the account for Service Manager services** page, click **Domain account**, specify the user name, password, and domain for the account, and then click **Test Credentials**. After you receive a **The credentials were accepted** message, click **Next**.
11. On the **Configure the reporting account** page, specify the user name, password, and domain for the account, and then click **Test Credentials**. After you receive a **The credentials were accepted** message, click **Next**.
12. On the **Help improve System Center** page, indicate your preference for participation in the Customer Experience Improvement Program and in Error Reporting. Optionally, click **Tell me more about the program**, and then click **Next**.
13. On the **Use Microsoft Update to help keep your computer secure and up-to-date** page, indicate your preference for using Microsoft Update to check for Service Manager updates, and then click **Next**.
14. On the **Installation summary** page, click **Install**.

To validate the installation of a data warehouse management server

1. On the computer that is hosting the data warehouse management server (the server on which you ran Setup), run services.msc, and verify that the following services have been installed:
   - System Center Data Access Service
   - System Center Management

     Note
     For System Center 2012 R2 Service Manager, the System Center Management service was renamed to Microsoft Monitoring Agent.
   - System Center Management configuration
2. On the computer that is hosting the data warehouse databases, click **Start**, point to **Programs**, point to **Microsoft SQL Server 2008**, and then click **SQL Server Management Studio**.
3. In the **Connect to Server** dialog box, select the following:
   a. In the **Server Type** list, select **Database Engine**.
   b. In the **Server Name** list, select the server and instance for your Service Manager data warehouse database. For example, select **Computer 4**.
   c. In the **Authentication** list, select **Windows Authentication**, and then click **Connect**.
4. In the **Object Explorer** pane, expand **Databases**.
5. Verify that the DWDataMart, DWRepository, and DWStagingAndConfig databases are listed.

How to Register the Data Warehouse Server in the Lab Environment

Use the following procedure to register the newly installed data warehouse server with the lab Service Manager environment.

To register a data warehouse

1. Log on to the computer that hosts the Service Manager console. Use an account that is a member of the Service Manager and data warehouse management administrators group.
2. In the Service Manager console, click **Administration**.
3. In the **Administration** pane, expand **Administration**.
4. In the **Administration** view, in the **Register with Service Manager's Data Warehouse** area, click **Register with Service Manager Data Warehouse**.
5. In the Data Warehouse Registration wizard, on the **Before You Begin** page, click **Next**.
6. On the **Data Warehouse** page, in the **Server name** box, type the fully qualified domain name of the computer that is hosting the data warehouse management server, and then click **Test Connection**. If the test is successful, click **Next**.
7. On the **Credentials** page, you can accept the default entry in the **Run as account** list, and then click **Next**, or you can enter credentials from a user or group of your own choosing.

   Important
   The account that you specify will be assigned administrative credentials on the Service Manager management server and granted Read permission on the Service Manager database. You can specify different credentials from other Service Manager management groups when you are registering with the data warehouse.
8. On the **Summary** page, click **Create**.
9. On the **Completion** page, when **The data warehouse registration succeeded** appears, click **Close**.
10. A dialog box states that the report deployment process has not finished. In the **System Center Service Manager** dialog box, click **OK**.
11. In a few minutes, after you close the Data Warehouse Registration wizard, the **Data Warehouse** button appears in the Service Manager console. In the Service Manager console, click the arrow at the lower-right corner of the Service Manager console buttons, and then click **Show More Buttons**.

You can use a Windows PowerShell command to complete this task. For information about how to use Windows PowerShell to register Service Manager management groups with the data warehouse, see Add-SCDWMgmtGroup (http://go.microsoft.com/fwlink/?LinkId=203096).

To validate the data warehouse registration process

1. On the computer that is hosting the data warehouse management server, start Windows PowerShell by using administrative credentials.
2. At the Windows PowerShell command prompt, type the following commands, and then press Enter.

```
Set-ExecutionPolicy RemoteSigned
Import-Module
.\Microsoft.EnterpriseManagement.Warehouse.Cmdlets.psd1
```

3. Type the following command, and then press Enter.

```
Get-SCDWMgmtGroup
```

4. If registration was successful, a table that contains two rows of data appears. One row displays data for the data warehouse management group, and the other row displays data for the Service Manager management group. If registration fails, only the data for the data warehouse management group appears.

Determine when the deployment is complete

The process of deploying management packs can take up to two hours to finish. You can use the following procedure in Service Manager to determine when the deployment is complete.

To determine when management pack deployment is complete

1. Start the Service Manager console.
2. In the Service Manager console, click **Data Warehouse**.
3. In the **Data Warehouse** pane, expand **Data Warehouse**, and then click **Data Warehouse Jobs**.
4. In the **Data Warehouse Jobs** pane, click **MPSyncJob**.
5. In the **Tasks** pane, under **Synchronization**, click **Details**.
6. In the **MP Sync Job** dialog box, scroll to the right and examine the **Status** column.

   Note
   In the **MP Sync Job** dialog box, click **Status** to alphabetically sort the **Status** column.
7. Scroll through the **Status** column. The management pack deployment is complete when **Associated** or **Imported** is listed in the **Status** column for all of the management packs. Make sure that no status of **Pending Association** or **Failed** appears in the column. In the **Data Warehouse Jobs** pane, the status of the **MPSyncJob** has changed from **Running** to **Not Started**.
8. To refresh the **MP Sync Job** dialog box:

a. Click **OK** to close the dialog box.
b. In the **Tasks** pane, in the **Data Warehouse Jobs** area, click **Refresh**.
c. In the **Data Warehouse Jobs** pane, click **MPSyncJob**.
d. In the **Tasks** pane, under **Synchronization**, click **Details**.

9. After the management packs have been deployed (as you determined in step 7), make sure that the following data warehouse jobs appear in the **Data Warehouse Jobs** pane:
   - Extract_*Service Manager management group name*
   - Extract_*data warehouse management group name*
   - Load.Common
   - Transform.Common
   - MPSyncJob
10. If these data warehouse jobs do not appear, perform the following steps:
    a. In the **Data Warehouse Jobs** pane, click **MPSyncJob**.
    b. In the **Tasks** pane, under **Synchronization**, click **Resume**.
    c. Assess whether management pack deployment has finished by returning to step 7 in this procedure.

Upgrade to System Center 2012 R2 - Service Manager

You cannot start an upgrade to Service Manager in System Center 2012 R2 if any data warehouse jobs or workflows are running. You can use the procedures in this section to stop the schedules for data warehouse jobs and wait for them to finish before you upgrade the data warehouse management server. Before you upgrade the Service Manager management server, stop the Self-Service Portal, if it is installed, and then wait 10 minutes to let any running workflows finish before you start the upgrade.

Warning
The data warehouse stops working after upgrading Service Manager in System Center 2012 SP1 to System Center 2012 R2 due to a Data Warehouse fact entity upgrade.

To prevent this issue from occurring, run the following SQL script for each of the following data warehouse databases: DW Repository, DW DataMart, CM DataMart, and OM DataMart. If this workaround is applied after data warehouse upgrade, resume the failed management pack upgrade process deploy captured in the list of Data Warehouse Management Packs from the Service Manager console.

```
IF OBJECT_ID('tempdb..#PKFixQueries') IS NOT NULL

    DROP TABLE #PKFixQueries


;WITH FactName
```

```
AS (
        SELECT  w.WarehouseEntityName
        FROM    etl.WarehouseEntity w
        JOIN    etl.WarehouseEntityType t ON w.WarehouseEntityTypeId =
t.WarehouseEntityTypeId
        WHERE   t.WarehouseEntityTypeName = 'Fact'
),FactList
AS (
    SELECT  PartitionName, p.WarehouseEntityName
    FROM    etl.TablePartition p
    JOIN    FactName f ON p.WarehouseEntityName = f.WarehouseEntityName
)
, FactWithPK
AS (
    SELECT  f.WarehouseEntityName, f.PartitionName, b.CONSTRAINT_NAME, a.COLUMN_NAME
    FROM    FactList f
    JOIN    INFORMATION_SCHEMA.KEY_COLUMN_USAGE a ON f.PartitionName = a.TABLE_NAME
    JOIN    INFORMATION_SCHEMA.TABLE_CONSTRAINTS b ON a.CONSTRAINT_NAME =
b.CONSTRAINT_NAME AND b.CONSTRAINT_TYPE = 'Primary key'
)
, FactWithDefaultOrNoPK
AS (
    SELECT  DISTINCT f.WarehouseEntityName, f.PartitionName
            , 'PK_' + f.WarehouseEntityName AS DefaultPKConstraint
            , 'PK_' + f.PartitionName AS NewPKConstraint
    FROM    FactList f
    LEFT JOIN    FactWithPK pkf ON pkf.WarehouseEntityName = f.WarehouseEntityName AND
pkf.PartitionName = f.PartitionName
    WHERE   pkf.WarehouseEntityName IS NULL OR pkf.CONSTRAINT_NAME = 'PK_' +
f.WarehouseEntityName
)
, FactPKList
AS (
    SELECT  DISTINCT f.WarehouseEntityName, f.COLUMN_NAME
```

```
    FROM    FactWithPK f
)
, FactPKListStr
AS (
    SELECT  DISTINCT f1.WarehouseEntityName, F.COLUMN_NAME AS PKList
    FROM    FactPKList f1
    CROSS APPLY (
                    SELECT  '[' + COLUMN_NAME + '],'
                    FROM    FactPKList f2
                    WHERE   f2.WarehouseEntityName = f1.WarehouseEntityName
                    ORDER BY COLUMN_NAME
                    FOR XML PATH('')
                ) AS F (COLUMN_NAME)
)
SELECT  f.PartitionName,
        '----------------------------- [' + f.PartitionName + '] ------------------------
-----' + CHAR(13) +
        'IF OBJECT_ID(''[' + f.DefaultPKConstraint + ']'') IS NOT NULL' + CHAR(13) +
        'BEGIN' + CHAR(13) +
        '  ALTER TABLE [dbo].[' + f.PartitionName + '] DROP CONSTRAINT [' +
f.DefaultPKConstraint + ']' + CHAR(13) +
        'END' + CHAR(13) + CHAR(13) +
        'IF OBJECT_ID(''[' + f.NewPKConstraint + ']'') IS NULL' + CHAR(13) +
        'BEGIN' + CHAR(13) +
        '  ALTER TABLE [dbo].[' + f.PartitionName + '] ADD CONSTRAINT [' +
f.NewPKConstraint + '] PRIMARY KEY NONCLUSTERED (' + SUBSTRING(pk.PKList, 1,
LEN(pk.PKList) -1) + ')' + CHAR(13) +
        'END' AS Query
INTO    #PKFixQueries
FROM    FactWithDefaultOrNoPK f
JOIN    FactPKListStr pk ON pk.WarehouseEntityName = f.WarehouseEntityName

DECLARE @PartitionName NVARCHAR(MAX), @Query NVARCHAR(MAX)
WHILE EXISTS (SELECT 1 FROM #PKFixQueries)
```

```
BEGIN
    SELECT  TOP 1
            @PartitionName = PartitionName,
            @Query = Query
    FROM    #PKFixQueries

    PRINT   @Query
    EXEC(@Query)

    DELETE  #PKFixQueries
    WHERE   PartitionName = @PartitionName
END
```

Complete the procedures in the following table to upgrade to Service Manager in System Center 2012 R2.

Task	Description
How to Prepare Service Manager 2012 SP1 for Upgrade to R2	Describes how to stop data warehouse jobs and how to stop the Self-Service Portal.
How to Upgrade to System Center 2012 R2 - Service Manager	Describes how to upgrade the data warehouse management server, the Service Manager management server, and the Self-Service Portal.

How to Prepare Service Manager 2012 SP1 for Upgrade to R2

This topic describes how to prepare your System Center 2012 – Service Manager Service Pack 1 (SP1) environment for an upgrade to System Center 2012 R2 Service Manager. To do this, perform the following procedures:

1. List the data warehouse jobs that are running.
2. Disable the schedules for data warehouse jobs.
3. Confirm that the data warehouse jobs have stopped running.

When the data warehouse jobs have stopped running, start the upgrade of the data warehouse management server. After you update the data warehouse management server, wait 10 minutes, and then start the upgrade of the Service Manager management server.

To list the data warehouse jobs by using Windows PowerShell cmdlets

1. On the computer that hosts the data warehouse management server, click **Start**, click **All Programs**, click **Microsoft System Center 2012**, and then click **Service Manager Shell**.
2. Type the following commands, and then press Enter after each command.

```
Set-ExecutionPolicy –force RemoteSigned
cd 'C:\Program Files\Microsoft System Center 2012\Service Manager'
Import-Module .\Microsoft.EnterpriseManagement.Warehouse.Cmdlets.psd1

Get-SCDWJob
```

3. A list of the data warehouse jobs appears. Use this list to disable data warehouse job schedules by using Windows PowerShell cmdlets.

To disable data warehouse job schedules by using Windows PowerShell cmdlets

- Type the following commands, and then press Enter after each command.

```
Disable-SCDWJobSchedule –JobName Extract_<data warehouse management group name>
Disable-SCDWJobSchedule –JobName Extract_<Service Manager management group name>
Disable-SCDWJobSchedule –JobName Transform.Common
Disable-SCDWJobSchedule –JobName Load.Common
Disable-SCDWJobSchedule –JobName DWMaintenance
Disable-SCDWJobSchedule –JobName MPSyncJob
Start-SCDWJob –JobName MPSyncJob
```

  The last command to start the **MPSyncJob** will enable the extraction, transformation, and loading (ETL) jobs to run to completion. After that, because all the schedules have been disabled, the jobs will stop. To close the Windows PowerShell window, type `exit`.

To confirm that the data warehouse jobs have stopped running

1. In the Service Manager console, click **Data Warehouse**.
2. In the **Data Warehouse** pane, expand **Data Warehouse**, and then click **Data Warehouse Jobs**.
3. In the **Data Warehouse Jobs** pane, observe the **Status** column for each data warehouse job. When the status for each job is listed as **Not Started**, proceed to the next procedure to stop the Self-Service Portal. If no Self-Service Portal exists in your environment, you can start the upgrade process as described in How to Upgrade to System Center 2012 R2 - Service Manager.

How to Upgrade to System Center 2012 R2 - Service Manager

You can use the following procedures to upgrade your System Center 2012 Service Pack 1 (SP1) - Service Manager environment to Service Manager in System Center 2012 R2. These procedures include steps for upgrading the data warehouse management server, the Service Manager management server, and the Service Manager console. If you use the chargeback feature, ensure that use the “To prepare for chargeback” procedure to prepare your Service Manager management server.

Data warehouse management server

Use the following procedure to upgrade the data warehouse management server.

Important
Make sure that you have stopped the data warehouse jobs before you continue. For more information, see How to Prepare Service Manager 2012 SP1 for Upgrade to R2.

To upgrade the data warehouse management server

1. Log on to the computer that will host the data warehouse management server by using an account that is a member of the Administrators group. This account must also be a local administrator.
2. On the Service Manager installation media, double-click the **Setup.exe** file to start the Service Manager Setup Wizard.
3. On the **Microsoft System Center 2012 R2** page, click **Upgrade Service Manager data warehouse management server**.
4. On the **Prepare for upgrade** page, select the two items that indicate that you have read the appropriate sections in the System Center 2012 – Service Manager Upgrade Guide, and then click **Next**.
5. On the **Product registration** page, type the appropriate information in the boxes. Read the Microsoft Software License Terms, and, if applicable, click **I have read, understood, and agree with the terms of the license agreement**, and then click **Next**.
6. On the **System check results** page, ensure that the prerequisite check passed or at least passed with warnings, and then click **Next**.
7. On the **Configure Analysis Service for OLAP cubes** page, in the **Database server** box, type the computer name of the server that will host the Microsoft SQL Server Analysis Services database, and then press the Tab key. When **Default** appears in the **SQL Server instance** box, click **Next**.

   Important
   If you are installing Analysis Services on a computer other than the computer that hosts the data warehouse management server and a firewall exists in your environment, you must make sure that the proper firewall ports are opened. For more information, see Port Assignments for System Center 2012 - Service Manager.

8. On the **Configure Analysis Services credential** page, specify the user name, password, and domain for the account, and then click **Test Credentials**. After you receive a message that says that the credentials were accepted, click **Next**.
9. On the **Help improve System Center** page, indicate your preference for participation in the Customer Experience Improvement Program and in Error Reporting. Optionally, click **Tell me more about the program**, and then click **Next**.
10. On the **Use Microsoft Update to help keep your computer secure and up-to-date** page, indicate your preference for using Microsoft Update to check for Service Manager updates, and then click **Next**.
11. On the **Configuration Summary** page, if the information that appears is accurate, click **Install**.
12. On the **The upgrade was completed successfully** page, if you have already backed up the encryption key, clear the **Open the Encryption Backup or Restore Wizard** check box, and then click **Close**.

Service Manager management server

Use the following procedures to upgrade the Service Manager management server and prepare it for chargeback.

To upgrade the Service Manager management server

1. Log on to the computer that will host the Service Manager management server by using an account that is a member of the Administrators group.
2. On the Service Manager installation media, double-click the **Setup.exe** file to start the Service Manager Setup Wizard.
3. On the **Microsoft System Center 2012 R2** page, click **Upgrade Service Manager management server**.
4. On the **Prepare for upgrade** page, select the two items that indicate that you have read the appropriate sections in the System Center 2012 – Service Manager Upgrade Guide, and then click **Next**.
5. On the **Product registration** page, type the appropriate information in the boxes. Read the Microsoft Software License Terms, and, if applicable, click **I have read, understood, and agree with the terms of the license agreement**, and then click **Next**.
6. On the **System check results** page, ensure that the prerequisite check passed or at least passed with warnings, and then click **Next**.
7. On the **Configuration Summary** page, if the information that appears is accurate, click **Install**.
8. On the **The upgrade was completed successfully** page, if you have already backed up the encryption key, clear the **Open the Encryption Backup or Restore Wizard** check box, and then click **Close**.

To prepare for chargeback

1. On the server running System Center 2012 R2 Virtual Machine Manager, copy the

following management packs from their installed location, by default *InstallationDrive*:\Program Files\Microsoft System Center 2012 R2\Virtual Machine Manager\ManagementPacks to a folder on the server running the Service Manager management server.

- Microsoft.SystemCenter.VirtualMachineManager.PRO.Library (3.2.7510.0)
- Microsoft.SystemCenter.VirtualMachineManager.PRO.V2.Library (3.2.7510.0)
- Microsoft.SystemCenter.VirtualMachineManager.Pro.2008.Library (3.2.7510.0)
- Microsoft.SystemCenter.VirtualMachineManager.Library (3.2.7510.0)
- Microsoft.SystemCenter.VirtualMachineManager.2012.Discovery (3.2.7510.0)

2. Start the Service Manager console and navigate to **Administration**, **Management Packs**.
3. **Import** the management packs that you copied to the Service Manager management server.

Service Manager Console

Use the following procedure to upgrade the Service Manager console.

To upgrade the Service Manager Console

1. Log on to the computer that will host the Service Manager console by using an account that is a member of the Administrators group.
2. On the Service Manager installation media, double-click the **Setup.exe** file to start the Service Manager Setup Wizard.
3. On the **Microsoft System Center 2012 R2** page, click **Upgrade Service Manager console**.
4. On the **Prepare for upgrade** page, select the two items that indicate that you have read the appropriate sections in the System Center 2012 – Service Manager Upgrade Guide, and then click **Next**.
5. On the **Product registration** page, read the Microsoft Software License Terms, and, if applicable, click **I have read, understood, and agree with the terms of the license agreement**, and then click **Next**.
6. On the **System check results** page, ensure that the prerequisite check passed or at least passed with warnings, and then click **Next**.
7. On the **Configuration Summary** page, if the information that appears is accurate, click **Install**.
8. On **The upgrade was completed successfully** page, click **Close**.

After Upgrading to System Center 2012 R2 - Service Manager

This topic describes the actions you need to take after you upgrade to System Center 2012 R2 Service Manager, including the following sections:

1. How to restart the System Center Data Access Service service if it fails to start after upgrading
2. How to start the Service Manager workflows and restart the data warehouse jobs
3. How to stop and then start Microsoft SQL Server Reporting Services after an upgrade
4. How to prepare for chargeback reports after upgrading

Restart the Data Access Service service and Service Manager workflows on the data warehouse management server

If necessary, use the following procedures to restart the service and workflows.

To restart the Data Access Service service

1. On the computer that hosts the data warehouse management server, on the Windows desktop, click **Start**, and then click **Run**.
2. In the **Run** dialog box, in **Open**, type **services.msc**, and then click **OK**.
3. In the **Services** window, in the **Services (Local)** pane, right-click **System Center Data Access Service**, and then click **Start**.

To start Service Manager workflows

1. On the computer that hosts the Service Manager management server, on the Windows desktop, click **Start**, and then click **Run**.
2. In the **Run** dialog box, in **Open**, type **services.msc**, and then click **OK**.
3. In the **Services** window, in the **Services (Local)** pane, right-click **System Center Management**, and then click **Start**.

   Note
   For System Center 2012 R2 Service Manager, the System Center Management service was renamed to Microsoft Monitoring Agent.

Restart data warehouse jobs

After you upgrade the data warehouse management server, you might need to restart the data warehouse (extraction, transformation, and loading [ETL]) jobs. You can use the following procedure to restart the data warehouse jobs. In this procedure, you enable data warehouse job schedules by using Windows PowerShell® cmdlets.

To restart data warehouse jobs

1. On the computer that hosts the data warehouse management server, click **Start**, point to **Programs**, point to **Accessories**, click **Windows PowerShell**, right-click **Windows PowerShell**, and then click **Run as administrator**.
2. Type the following commands, and then press Enter after each command.

   Note
   The following command examples assume that Service Manager was installed in its default location on the C: drive. If necessary, change directories to the location where you installed Service Manager.

   ```
   cd 'C:\Program Files\Microsoft System Center 2012\Service Manager'
   import-module $PWD/Microsoft.EnterpriseManagement.Warehouse.Cmdlets.psd1
   Get-SCDWJob
   Enable-SCDWJobSchedule -JobName Extract_<data warehouse management group name>
   Enable-SCDWJobSchedule -JobName Extract_<Service Manager management group name>
   Enable-SCDWJobSchedule -JobName Transform.Common
   Enable-SCDWJobSchedule -JobName Load.Common
   Enable-SCDWJobSchedule -JobName DWMaintenance
   Enable-SCDWJobSchedule -JobName MPSyncJob
   Start-SCDWJob -JobName MPSyncJob
   ```

   The last command, **Start-SCDWJob – JobName MPSyncJob**, enables the ETL jobs to run.

Stop and then start SQL Server Reporting Services

After you perform an upgrade to Service Manager in System Center 2012 R2, use the following procedure to stop and then start SQL Server Reporting Services.

To stop and then start SQL Server Reporting Services

1. On the computer that hosts SQL Server Reporting Services, on the Windows desktop, click **Start**, and then click **Run**.
2. In the **Run** dialog box, type **services.msc**, and then click **OK**.
3. In the **Services** window, in the **Services (Local)** pane, right-click **SQL Server Reporting Services**, and then click **Stop**.
4. In the **Services** window, in the **Services (Local)** pane, right-click **SQL Server Reporting Services**, and then click **Start**.

Prepare for chargeback reports

When you try to use chargeback after you have upgraded to Service Manager, your Operations Manager CI connector might stop synchronizing new Virtual Machine Manager objects, such as VMM clouds, if the VMM Server was upgraded to System Center 2012 R2 Virtual Machine Manager. This occurs because Service Manager does not have the correct version of the VMM management packs.

Additionally, installing chargeback report files to the System Center 2012 R2 Operations Manager management server might fail after you upgrade System Center 2012 R2 Service Manager because the Dependencies folder does not contain the required management pack files.

Use the following procedures to prepare for chargeback reports.

To prepare Service Manager for chargeback reports

1. On the server running System Center 2012 R2 Virtual Machine Manager, copy the following management packs from their installed location, by default *InstallationDrive*:\Program Files\Microsoft System Center 2012 R2\Virtual Machine Manager\ManagementPacks, to a folder on the server running the Service Manager management server.
   - Microsoft.SystemCenter.VirtualMachineManager.PRO.Library
   - Microsoft.SystemCenter.VirtualMachineManager.PRO.V2.Library
   - Microsoft.SystemCenter.VirtualMachineManager.Pro.2008.Library
   - Microsoft.SystemCenter.VirtualMachineManager.Library
   - Microsoft.SystemCenter.VirtualMachineManager.2012.Discovery
2. Start the Service Manager console and navigate to **Administration**, **Management Packs**.
3. **Import** the management packs that you copied to the Service Manager management server.

To prepare Operations Manager for chargeback reports

1. On the server running System Center 2012 R2 Virtual Machine Manager, copy the following management packs from their installed location, by default *InstallationDrive*:\Program Files\Microsoft System Center 2012 R2\Virtual Machine Manager\ManagementPacks, to a folder on the Operations Manager management server.
   - Microsoft.SystemCenter.VirtualMachineManager.PRO.Library
   - Microsoft.SystemCenter.VirtualMachineManager.PRO.V2.Library
   - Microsoft.SystemCenter.VirtualMachineManager.Pro.2008.Library
   - Microsoft.SystemCenter.VirtualMachineManager.Library
   - Microsoft.SystemCenter.VirtualMachineManager.2012.Discovery
2. Start the Operations Manager console and navigate to **Administration**, **Management Packs**.

3. Import the management packs that you copied to the Service Manager management server and then in the **Online Catalog Connection** dialog box, click **Yes** to search the catalog for dependencies that might not be available locally.

Failed Upgrade in System Center 2012 R2 - Service Manager

An upgrade to Service Manager in System Center 2012 R2 might not finish successfully. The steps that you take to recover from a failed upgrade depend on the phase of the upgrade in which the failure occurs:

- Failure occurs during the prerequisite check.
- Failure occurs during predicted checks.
- Failure occurs in an unpredictable manner before permanent changes are made to a management server.
- Failure occurs in an unpredictable manner after permanent changes are made to a management server.
- Failure occurs in an unpredictable manner after permanent changes are made to a database.

The upgrade might also fail because startup of the System Center Management Configuration service times out.

Failure occurs during the prerequisite check

Before the installation of Service Manager in System Center 2012 R2 begins, the system conducts a prerequisite check for certain requirements. If the system finds a condition in which Service Manager in System Center 2012 R2 will continue to function, you receive a warning. Warnings are identified with an exclamation point (!) in a yellow triangle. Conditions that the system has identified as a warning will not prevent you from installing Service Manager.

If the system finds a condition that is an absolute requirement, a failure indication appears. Failure indications are identified with an X in a red circle.

If either a warning or a failure indication appears, you can either cancel the installation and make the necessary changes, or make the appropriate changes and then click **Check prerequisites again** and continue with the installation. You must correct all failure conditions before the installation or upgrade can proceed.

Failure occurs during predicted checks

After you correct any failures that the system identified during the prerequisite check, you can click **Next** on the **Prerequisites** page of the wizard to start the upgrade or installation of Service Manager. The system checks for the following conditions during the installation or upgrade process:

- The data warehouse database that you specified exists.

- The computer running Microsoft SQL Server that you specified is not running Microsoft SQL Server 2008 Service Pack 1 (SP1), SQL Server 2008 Service Pack 2 (SP2), or SQL Server 2008 R2.
- The hard disk drive that you specified for a database has at least 1 gigabyte (GB) of free space.
- The System Center Data Access Service service can log on with the set of credentials that you supplied.
- The System Center Management Configuration service can log on with the set of credentials that you supplied.
- There is enough free disk space to install the upgraded files.
- Setup can access the file location for the Service Manager installation.

If failures occur during these types of checks, you can make the appropriate changes. For example, you can specify a hard disk location that has sufficient space, and then on the **Warning** page, click **Retry** to continue the installation.

Failure occurs in an unpredictable manner before permanent changes are made to a management server

If an error occurs before permanent changes are made to the Service Manager management server or data warehouse management server—for example, before changes are made to the Structured Query Language (SQL) database or before management packs are imported—the error message that appears includes a **Retry** button. In this situation, you can correct the issue and then retry the installation or upgrade.

Failure occurs in an unpredictable manner after permanent changes are made to a management server

If an error occurs after permanent changes are made to the Service Manager management server or data warehouse management server—for example, after changes are made to the SQL database or after management packs are imported—the error message that appears does not include a **Retry** button. In this situation, you must reinstall the original version of the affected management server.

In any case, you need the backup of the encryption key. For the Service Manager management server, the encryption key is available only if you made a backup before you started the upgrade. For more information, see How to Back Up the Encryption Key in Service Manager.

Failure occurs in an unpredictable manner after permanent changes are made to a database

If an error occurs after permanent changes have been made to a database—for example, after management packs are imported or any other time that data is written into the database—the error message that appears does not include a **Retry** button.

At this point, your only option is to click **Close** and begin a disaster recovery process to restore the database. This recovery is possible only if you backed up the database before you started the upgrade process. For more information, see Backing Up Service Manager Databases.

Upgrade fails because Management Configuration service startup times out

On some computers, Service Manager Setup fails and rolls back if it cannot start the System Center Management Configuration service in a timely fashion. If this problem occurs, you might see the following entries in the installation log.

```
CAStartServices: Attempting to start service. OMCFG


CAStartServices: StartService failed. Error Code: 0x8007041D.


ConfigureSDKConfigService: CAStartServices failed. Error Code: 0x8007041D. OMCFG
```

Error 0x8007041D indicates that the service did not respond to the start or control request in a timely fashion. In addition, the following event may be logged in the System Event log.

```
Log Name:      System

Source:        Service Control Manager

Event ID:      7009

Task Category: None

Level:         Error

Keywords:      Classic

User:          N/A

Description:

A timeout was reached (30000 milliseconds) while waiting for the System Center Management
Configuration service to connect.
```

This problem occurs because a Microsoft .NET Framework 2.0 managed assembly that has an Authenticode signature takes longer than usual to load. The signature is always verified when the .NET Framework 2.0 managed assembly that has an Authenticode signature is loaded. In addition, the .NET Framework 2.0 managed assembly may take longer than usual to load because of various other settings. For example, the .NET Framework 2.0 managed assembly may take longer than usual to load because of the network configuration.

For additional information about the cause of this problem, see FIX: A .NET Framework 2.0 managed application that has an Authenticode signature takes longer than usual to start.

For information about possible workaround procedures, see How to Work Around Configuration Service Startup Issues.

How to Work Around Configuration Service Startup Issues

If an upgrade to Service Manager in System Center 2012 R2 fails because startup of the System Center Management Configuration service times out, you can try to resolve the issue by using one of the following workaround procedures:

- Disable signature verification on the computer that is running Setup.
- Increase the service time-out setting on the computer that is running Setup.

To disable signature verification

1. On the computer that is running Setup, open the Microsoft.Mom.ConfigServiceHost.exe.config file, which is located in the Program Files\Microsoft System Center 2012\Service Manager folder.
2. In the `<runtime></runtime>` section, add `<generatePublisherEvidence enabled="false"/>`.
3. Save the changes to the file.
4. Attempt the upgrade again.

To increase the service time-out setting

1. On the computer that is running Setup, create the following registry value to increase the service time-out period.

   ```
   HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control
   ServicesPipeTimeout
   DWORD
   200000
   ```

   Caution
   Incorrectly editing the registry may severely damage your system. Before you make changes to the registry, you should back up any valued data on the computer.

   Note
   You may have to increase this value further if the service still fails to start. The value in this example is in milliseconds. For additional details about the registry key, see A service does not start, and events 7000 and 7011 are logged in Windows Server 2003, Windows Server 2008, and Windows Server 2008 R2.
2. Restart the computer.
3. Attempt the upgrade again.

Administering System Center 2012 - Service Manager

Welcome to the Administrator's Guide for Microsoft System Center 2012 – Service Manager. This guide describes concepts that are important to Service Manager administrators, and it includes procedures that Service Manager administrators must perform to configure Service Manager. These procedures are typically performed one time after Service Manager is deployed. The procedures in this guide help you configure Service Manager to match the policies and requirements defined by your organization.

Administrator's Guide Topics

- Using Management Packs in System Center 2012 - Service Manager

  Provides information about how to create, import, and export management packs in Service Manager.
- Using Connectors to Import Data into System Center 2012 - Service Manager

  Describes how to import data into Service Manager by using connectors.
- Configuration Items in System Center 2012 - Service Manager

  Describes how to manage configuration items in Service Manager.
- Configuring Incident Management in System Center 2012 - Service Manager

  Describes how to set configuration settings that streamline the creation of incidents in Service Manager.
- Configuring Service Level Management in System Center 2012 - Service Manager

  Provides an overview of how to configure service-level management in Service Manager.
- Configuring Workflows in System Center 2012 - Service Manager

  Describes how to create and use workflows in Service Manager.
- Configuring Change and Activity Management in System Center 2012 - Service Manager

  Describes how to streamline change and activity management in Service Manager.
- Configuring Release Management in System Center 2012 - Service Manager

  Describes how to configure settings and workflows for release management.
- Configuring Desired Configuration Management to Generate Incidents in System Center 2012 - Service Manager

  Describes how to configure Service Manager to create incidents based on desired configuration management reports from System Center Configuration Manager 2007.
- Configuring System Center 2012 - Service Manager Notifications

  Describes how to configure notifications in Service Manager.
- Using the Service Catalog in System Center 2012 - Service Manager

  Provides an overview of how to use the service catalog in Service Manager.

- Using Groups, Queues, and Lists in System Center 2012 - Service Manager

  Describes how to use groups to manage configuration items, use queues to manage work items, and use lists to customize forms in Service Manager.
- Using Runbooks in System Center 2012 - Service Manager

  Describes how to use runbooks in Service Manager and System Center 2012 - Orchestrator to automate procedures.
- Installing and Configuring Chargeback Reports in System Center 2012 - Service Manager

  Describes how to install and configure chargeback reports.
- User Interface Customization in System Center 2012 - Service Manager

  Describes how to use unsealed management packs to edit the properties of views, list items, or templates.
- Managing User Roles in System Center 2012 - Service Manager

  Provides an overview of user roles and describes how to use user roles to define a scope of activities that can be performed in Service Manager.
- Managing Run As Accounts in System Center 2012 - Service Manager

  Describes how to change the Operational System and Workflow Run As accounts.
- Managing Knowledge Articles in System Center 2012 - Service Manager

  Describes how to create and search for knowledge articles.
- Configuring and Using the System Center 2012 - Service Manager Cmdlets for Windows PowerShell

  Describes how to use the Service Manager cmdlets for Windows PowerShell.
- Managing the Data Warehouse in System Center 2012 - Service Manager

  Describes how to view, schedule, and troubleshoot extract, transform, and load (ETL) jobs.
- Managing the System Center 2012 - Service Manager Self-Service Portal

  Describes how to customize the portal home page, add navigational links, and how to configure concurrent sessions and calls in the Self-Service Portal.
- Using Service Manager Tasks to Troubleshoot Computer Problems

  Describes how to use tasks to troubleshoot computer problems.
- To Configure System Center 2012 - Service Manager CEIP Settings

  Describes how to configure Customer Experience Improvement Program (CEIP) settings in Service Manager.
- Appendix A - List of User Role Profiles in System Center 2012 - Service Manager

  Lists the user role profiles.
- Appendix B - Mapping Active Directory Domain Services Attributes to Properties in System Center 2012 - Service Manager

  Describes the mapping of data that is imported by Active Directory Connector to Service Manager properties.
- Appendix C - Mapping System Center 2012 - Service Manager Properties to Configuration Manager Database Views

Describes the mapping of data that is imported by Configuration Manager Connector to Service Manager properties.

- Appendix D - System Center 2012 - Service Manager Registry Keys

  Describes registry settings for System Center 2012 – Service Manager.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

Downloadable Documentation

You can download a copy of this technical documentation from the Microsoft Download Center. Always use the TechNet library for the most up-to-date information.

Using Management Packs in System Center 2012 - Service Manager

There are two types of management packs: sealed management packs and unsealed management packs. A sealed management pack cannot be modified, but an unsealed management pack can be modified.

Unsealed management packs are used to extend System Center 2012 – Service Manager with the information that you must have to implement all or part of a service management process. You can use unsealed management packs to store the custom objects that you create. For example, you can store the objects you create during your testing or evaluation process in an unsealed management pack. Then, you can export that unsealed management pack to a file and then import the file to another environment, such as a production environment. You can also import the same management pack into multiple environments to ensure configuration consistency across Service Manager deployments, and to increase efficiency.

Note

Only unsealed management packs can be re-imported.

An unsealed management pack is an .xml file that contains classes, workflows, views, forms, reports, and knowledge articles. Items such as groups, queues, tasks, templates, connectors, and list items are stored in a management pack, but items such as incidents, change requests, computers, and other instances of classes are not stored in a management pack.

By default, Service Manager contains several pre-imported, sealed management packs that enable core Service Manager features, such as incident management and change management. Also, by default, Service Manager contains the **Default Management Pack** management pack, in which you can store new items that you create. Additionally, Service Manager contains several pre-imported, unsealed management packs that enable optional features. You can delete

unsealed management packs, which might result in the loss of some views, rules, or lists. However, the removal of these optional features will not prevent Service Manager from functioning. You should consider exporting a management pack before you delete it. You can import the management pack later if you need the optional features in a management pack that you deleted.

To use a management pack, import it into Service Manager. The management pack is stored in a .xml, .mp, or a .mpb file that you can import by using the Service Manager console.

For more information about management packs key concepts, management packs best practices and other management packs related topics, see Management Packs: Working with Management Packs.

Using Management Packs Topics

- How to Create a Management Pack File

  Describes how to create a management pack file.
- How to Export a Management Pack

  Describes how to export a management pack.
- How to Import a Management Pack

  Describes how to import a management pack by using the Service Manager console.
- How to Import the Operations Manager Alert Cube Management Pack

  Describes how to import the Operations Manager Alert Cube management pack manually.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

How to Create a Management Pack File

You can use the following procedures to create a management pack file in System Center 2012 – Service Manager. After you create the management pack file, you can use it to store objects that you create.

For more information about how to create and customize management packs, see Management Packs: Working with Management Packs.

To create a management pack file

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Management Packs**.

3. In the **Tasks** pane, under **Management Packs**, click **Create Management Pack**.
4. In the **Create Management Pack** dialog box, enter a name, such as **Sample Management Pack**, and then enter a description for the new management pack. Click **OK**.

To validate the creation of a management pack file

- In the Service Manager console, open the **Management Packs** view, and verify that the new management pack appears in the **Management Packs** pane.

You can use Windows PowerShell commands to complete these tasks, as follows:

- For information about how to use Windows PowerShell to create a new management pack, see New-SCSMManagementPack.
- For information about how to use Windows PowerShell to seal a management pack, preventing it from being modified, see Protect-SCSMManagementPack.
- For information about how to use Windows PowerShell to remove management packs, see Remove-SCSMManagementPack.

How to Export a Management Pack

After you create a management pack in System Center 2012 – Service Manager, you can export the unsealed management pack as a file to back up any customizations in the management pack. The exported management pack is a valid XML-formatted file. After you export an unsealed management pack, you can later import it to restore the objects that the management pack contains.

When you export a sealed management pack, from the Service Manager console or by using the Windows PowerShell cmdlet Export-SCSMManagementPack, Service Manager generates an equivalent, unsealed management pack and stores it as a .XML file on the hard drive. You can then edit this management pack file to increase the version of the management pack, and re-seal it so it can be re-imported into Service Manager.

Use the following procedures to export an unsealed management pack and then validate the export.

To export a management pack

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Management Packs**.
3. In the **Management Packs** pane, select the management pack that you want to export.
4. In the **Tasks** pane, under the name of the management pack that you want to export, click **Export**.
5. In the **Browse For Folder** dialog box, select a location for the file, and then click **OK**.

Note
You cannot change the default name of the management pack file.

To validate the export of a management pack

- In Windows Explorer, ensure that you can locate the management pack file.

You can use Windows PowerShell commands to complete this task. For information about how to use Windows PowerShell to export a management pack as a valid XML-formatted file that you can later import into Service Manager or Operations Manager, see Export-SCSMManagementPack.

See Also

How to Import a Management Pack

How to Import a Management Pack

Before you can use a management pack in System Center 2012 – Service Manager, you must import the management pack by using one of the following methods:

- Use the Service Manager console, as described in this topic.
- Use the **Import-SCSMManagementPack** cmdlet from the Service Manager module for Windows PowerShell. For more information about this cmdlet, see Import-SCSMManagementPack.

When you reimport a sealed management pack, the version of the new management pack must be greater than the version of the initial management pack. The imported, sealed management pack must pass backward-compatibility verification, and then the objects of the new management pack and the objects of the initial management pack are merged. When you reimport an unsealed management pack, the objects from the new management pack overwrite the objects from the initial management pack.

If the management pack that you want to import depends on other management packs, multi-select the dependent management packs and import them in a single operation. Service Manager will import the management packs in the correct dependency order.

Use the following procedure to import a single management pack, or a management pack bundle (.mpb file name extension), by using the Service Manager console. For more information about working with custom management packs, sealed and unsealed management packs, and bundling management packs, see the Authoring Guide for System Center 2012 – Service Manager.

To import a management pack by using the Service Manager console

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Management Packs**.
3. In the **Tasks** pane, under **Management Packs**, click **Import**.

4. In the **Select Management Packs to Import** dialog box, select the management pack file, and then click **Open**.
5. In the **Import Management Packs** dialog box, click **Add**.
6. After you have added all the management packs that you want to import, click **Import**, and then click **OK**.

To validate the import of a management pack

- In the Service Manager console, select the **Management Packs** view, and ensure that the intended management packs appear in the **Management Packs** list.

You can use Windows PowerShell commands to complete these and other related tasks, as follows:

- For information about how to use Windows PowerShell to import a management pack, see Import-SCSMManagementPack.
- For information about how to use Windows PowerShell to test the validity of a management pack, see Test-SCSMManagementPack.
- For information about how to use Windows PowerShell to retrieve objects that represent management packs that have been imported, see Get-SCSMManagementPack.

How to Import the Operations Manager Alert Cube Management Pack

By default, System Center 2012 – Service Manager does not automatically import the System Center Alert Management Cube management pack when you register Operations Manager as a data source.

Instead you must manually create a data source for Operations Manager. For more information, see How to Register the System Center Data Warehouse to Operations Manager. Afterward, use the following procedure to import the management pack.

To import the Operations Manager alert cube management pack

1. In the Service Manager console, click **Data Warehouse**, click **Management Packs**, and confirm that **System Center Datawarehouse Operations Manager Library** is listed.
2. On the Data Warehouse Management Server, type the following Windows PowerShell commands to manually import the management pack. (This example assumes that Service Manager is on drive C and that you installed Service Manager using the default path).

```
cd 'C:\Program Files\Microsoft System Center 2012\Service
Manager'
cd.\PowerShell
Import-Module .\System.Center.Service.Manager.psd1
Import-SCSMManagementPack ..\AlertCube.mpb
```

Using Connectors to Import Data into System Center 2012 - Service Manager

You can use System Center 2012 – Service Manager connectors to import data as configuration items from Active Directory Domain Services (AD DS), System Center Configuration Manager, System Center 2012 - Orchestrator, System Center 2012 – Virtual Machine Manager (VMM), and System Center Operations Manager. In addition, you can import alerts from Operations Manager, and you can configure these alerts to automatically generate incidents in Service Manager. You can also import data from comma-separated value (CSV) files into the Service Manager database.

Using Connectors to Import Data Topics

- Effects of Deleting a Connector on Configuration Items

  Describes the effects of deleting a connector.
- Importing Data from Active Directory Domain Services

  Describes how to create, synchronize, and disable or enable an Active Directory connector.
- Importing Data and Alerts from System Center Operations Manager

  Describes how to create, synchronize, edit, disable or enable an Operations Manager alert or configuration item (CI) connector.
- Importing Data from System Center Configuration Manager

  Describes how to create a connector to System Center Configuration Manager and how to customize configuration management to extend the hardware information that is collected.
- Importing Runbooks from System Center Orchestrator 2012

  Describes how to import runbooks from System Center Orchestrator.
- Importing Data from System Center Virtual Machine Manager

  Describes how to import VMM objects into the Service Manager database.
- Using a CSV File to Import Data into Service Manager

  Describes how to import data into Service Manager by using a CSV file.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

Effects of Deleting a Connector on Configuration Items

Many of the configuration items that are found in the System Center 2012 – Service Manager database are the result of the data that is imported by using connectors. Therefore, if a connector is deleted, the configuration items that are associated with that connector will also be deleted, except where the configuration item is related to an active incident or change request. If more than one connector defines a configuration item, the configuration item will be deleted when all of the contributing connectors are deleted.

If you are creating a new connector to replace an existing connector, create the new connector first, and then synchronize the new connector before deleting the old connector.

Tip

You can use a Windows PowerShell command to remove a connector from Service Manager. For more information, see Remove-SCSMConnector.

Importing Data from Active Directory Domain Services

This section provides an overview of using a connector to import data from Active Directory Domain Services (AD DS) into System Center 2012 – Service Manager. This section also describes how to create, synchronize, and enable or disable an Active Directory connector.

Importing Data from Active Directory Domain Services Topics

- About Importing Data from Active Directory Domain Services

  Provides an overview of how to use a connector to import data from AD DS.
- How to Create an Active Directory Connector

  Describes how to create an Active Directory connector.
- How to Synchronize an Active Directory Connector

  Describes how to synchronize the data in AD DS with the Service Manager database.
- How to Disable and Enable an Active Directory Connector

  Describes how to enable or disable an Active Directory connector.
- How to Import Data from Other Domains

  Describes how to import data from domains other than the domain in which Service Manager resides.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

About Importing Data from Active Directory Domain Services

The Service Manager database in System Center 2012 – Service Manager contains information about your enterprise, and it is used by all the parts of your service management structure. You can use an Active Directory connector to add users, groups, printers, and computers (and only these object types) as configuration items into the Service Manager database.

Note

If the same user name exists in two different organizational units (OUs) within the Active Directory domain, Service Manager cannot import both user accounts, and an event is logged in the System Center Operations Manager application log.

In addition, when you configure an Active Directory connector to import data from an Active Directory group, you can select an option to automatically add users from the Active Directory group. When they are selected, any users that are added to the Active Directory group will be automatically added to the Service Manager database. If those users are removed from the Active Directory group, they will remain in the Service Manager database; however, they will reside in the Deleted Items group.

When you have created an Active Directory connector, **Select objects** in the connector cannot be updated. Instead, you create security groups in Active Directory that map to User Roles in Service Manager. For example, you can create a Security Group in Active Directory Domain Services (AD DS), named Incident Resolvers. In Service Manager, you can assign this security group to the Incident Resolvers user role. When you create the Active Directory connector and you select **Automatically add users of AD Groups imported by this connector**, when a user who is a member of the Incident Resolvers security group starts the Service Manager console, they will be granted Incident Resolver rights and permissions.

If you are importing data from several OUs or subdomains, you have the option of creating a Lightweight Directory Access Protocol (LDAP) query that specifies computers, printers, users, or user groups to import with the connector. For example, an LDAP filter of all objects that are in either Dallas or Austin and that have the first name of John looks like `(&(givenName=John)(|(l=Dallas)(l=Austin)))`. You can test your queries, and all errors must be corrected before you can configure the Active Directory connector. For more information about LDAP queries, see Search Filter Syntax.

If you must later perform maintenance operations on the Service Manager database, you can temporarily disable the connector and suspend the importation of data. Later, you can resume the importation of data by re-enabling the connector.

When you import a large number of users from AD DS) or from System Center Configuration Manager, CPU utilization might increase to 100 percent. You will notice this on one core of the CPU. For example, if you import 20,000 users, CPU utilization might remain high for up to an hour. You can mitigate this issue by creating connectors and importing the users into Service Manager before you deploy the product in your enterprise and by scheduling connector synchronization during off hours. Installing Service Manager on a computer that has a multi-core CPU also minimizes the impact of importing a large number of users.

See Also

How to Create an Active Directory Connector

How to Disable and Enable an Active Directory Connector

How to Synchronize an Active Directory Connector

How to Import Data from Other Domains

Appendix B - Mapping Active Directory Domain Services Attributes to Properties in System Center 2012 - Service Manager

How to Create an Active Directory Connector

You can use the following procedures in System Center 2012 – Service Manager to create, validate, and confirm the status of an Active Directory connector to import objects from Active Directory Domain Services (AD DS).

To create an Active Directory connector and to import objects from AD DS

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Tasks** pane, under **Connectors**, click **Create Connector**, and then click **Active Directory Connector**.
4. Complete these steps in the Active Directory Connector Wizard:
   a. On the **Before You Begin** page, click **Next**.
   b. On the **General** page, in the **Name** box, type a name for the new connector. Make sure that the **Enable this connector** check box is selected, and then click **Next**.
   c. On the **Domain or organizational unit** page, select **Use the domain: <domain name>**. Or, select **Let me choose the domain or OU**, and then click **Browse** to choose a domain or an organizational unit (OU) in your environment.
   d. In the **Credentials** area, click **New**.
   e. In the **Run As Account** dialog box, in the **Display name** box, enter a name for the Run As account. In the **Account** list, select **Windows Account**. Enter the credentials for an account that has rights to read from AD DS, and then click **OK**. On the **Domain or organizational unit** page, click **Test Connection**.

      Note
      Special characters (such as the ampersand [&]) in the **User Name** box are not supported.

   f. In the **Test Connection** dialog box, make sure that **The connection to the server was successful** is displayed, and then click **OK**. On the **Domain or organizational unit** page, click **Next**.
   g. On the **Select objects**, do the following:
      i. Select **All computers, printers, users, and user groups** to import all items or,
      ii. Select **Select individual computers, printers, users or user groups** to import only the selected items or,

iii. Select **Provide LDAP query filters for computers, printers, users, or user groups** if you want to create your own Lightweight Directory Access Protocol (LDAP) query.

If you want new users that are added to any groups you import to be added automatically to Service Manager, select **Automatically add users of AD Groups imported by this connector**, and then click **Next**.

h. On the **Summary** page, make sure that the settings are correct, and then click **Create**.

i. On the **Completion** page, make sure that you receive the following confirmation message:

"Active Directory connector successfully created."

Then, click **Close**.

Note
Depending on the amount of data that is imported, you might have to wait for the import to be completed.

To validate the creation of an Active Directory connector

1. In the **Connectors** pane, locate the Active Directory connector that you created. You might have to wait for a minute before the connector appears.
2. In the **Connectors** pane, review the **Status** column for a status of **Finished Success**.
3. In the **Configuration Items** pane, expand **Configuration Items**. Expand **Computers** and **All Windows Computers**, and verify that the intended computers from AD DS appear in the **All Windows Computers** pane. Expand **Printers**, expand **All Printers**, and then verify that the intended printers from AD DS appear in the **All Printers** pane.
4. In the Service Manager console, click **Configuration Items**. In the **Configuration Items** pane, click **Users**, and then verify that the intended users and user groups from AD DS appear in the **Users** pane.

To confirm the status of an Active Directory connector

- View the columns in the **Connector** pane; the columns contain information about the start time, the finish time, the status, and the percentage of imported configuration items.

You can use a Windows PowerShell command to create a new Service Manager Active Directory connector. For information about how to use Windows PowerShell to create a new Service Manager Active Directory connector, see New-SCADConnector.

How to Synchronize an Active Directory Connector

To ensure that the System Center 2012 – Service Manager database is up to date, the Active Directory connector synchronizes with Active Directory Domain Services (AD DS) every hour

after the initial synchronization. However, you can use the following procedure to manually synchronize the connector and validate that it is synchronized.

To manually synchronize an Active Directory connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Connectors** pane, select the Active Directory connector that you want to synchronize.
4. In the **Tasks** pane, under the name of the connector, click **Synchronize Now**.

   Note
   Depending on the amount of data that is imported, you might have to wait for the import to be completed.

To validate that an Active Directory connector synchronized

1. In the Service Manager console, click **Configuration Items**.
2. In the **Configuration Items** pane, expand **Printers**, and then click **All Printers**. Verify that any new printers in AD DS appear in the middle pane.
3. Expand **Computers**, and then click **All Windows Computers**. Verify that any new computers in AD DS appear in the middle pane.
4. In the Service Manager console, click **Configuration Items**.
5. In the **Configuration Items** pane, click **Users**. Verify that any new users and groups in AD DS appear in the middle pane.

How to Disable and Enable an Active Directory Connector

You can use the following procedure to disable or enable an Active Directory connector in System Center 2012 – Service Manager and validate its change in status.

To disable an Active Directory connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Connectors** pane, select the Active Directory connector that you want to disable.
4. In the **Tasks** pane, under the connector name, click **Disable**.
5. In the **Disable Connector** dialog box, click **OK**.

To enable an Active Directory connector

1. In the Service Manager console, click **Administration**, and then click **Connectors**.
2. In the **Connectors** pane, select the Active Directory connector that you want to enable.

3. In the **Tasks** pane, under the connector name, click **Enable**.
4. In the **Enable Connector** dialog box, click **OK**.

To validate the status change of an Active Directory connector

1. After you enable or disable an Active Directory connector, wait for about 30 seconds. Then, in the Service Manager console, click **Administration**, and then click **Connectors**.
2. In the middle pane, locate the connector for which you have changed status, and then verify the value in the **Enabled** column.

You can use Windows PowerShell commands to complete these tasks and other related tasks, as follows:

- For information about how to use Windows PowerShell to start a Service Manager connector, see Start-SCSMConnector.
- For information about how to use Windows PowerShell to retrieve connectors that are defined in Service Manager and view their status, see Get-SCSMConnector.
- For information about how to use Windows PowerShell to update properties of a Service Manager connector, see Update-SCSMConnector.

How to Import Data from Other Domains

You can import data from domains other than the domain in which System Center 2012 – Service Manager resides. For example, Service Manager is installed in domain A (where the fully qualified domain name [FQDN] is a.woodgrove.com), and you want to import data from domain B (where the FQDN is b.woodgrovetest.net). In this scenario, you must think about how to specify the data source path and how to specify the Run As account.

In domain B, either identify an existing service account or create a new one for this purpose. This service account must be a domain account and must be able to read from Active Directory Domain Services.

Next, in Service Manager, create a new Active Directory connector in the Active Directory Connector Wizard. Follow these steps on the **Domain or organizational unit** page.

To specify the data source path and Run As account

1. Use the appropriate method, according to where the domains are located:
   - If the two domains are in the same forest, in the **Server Information** area, select **Let me choose the domain or OU**, and then click **Browse** to select the domain and organizational unit (OU).
   - If the two domains are in different forests, in the **Server Information** area, select **Let me choose the domain or OU**, and then type the domain and OU in the box. For example, type **LDAP://b.woodgrovetest.net/OU=<OU Name>,DC=b,DC=woodgrovetest,DC=net**.
2. In the **Credentials** area, click **New**.

3. In the **Run As Account** dialog box, in the **User name**, **Password**, and **Domain** boxes, type the credentials for the service account from the b.woodgrovetest.net domain.

   Note
   If the two domains are in different forests, you must type the domain name in the **User name** box. For example, type **b.woodgrovetest.net\<user name>**.

Importing Data and Alerts from System Center Operations Manager

If your organization uses System Center Operations Manager to monitor systems in your enterprise, the agents that are deployed gather information about configuration items that are discovered, and, as problems are detected, System Center Operations Manager generates alerts. Two connectors for Operations Manager are available in System Center 2012 – Service Manager: the configuration item (CI) connector that imports objects that are discovered by Operations Manager into the Service Manager database, and an alert connector that can create incidents based on alerts.

System Center Operations Manager collects information about many different types of objects, such as hard disk drives and Web sites. To import objects that are discovered by Operations Manager, Service Manager requires a list of class definitions for these objects; the list of definitions is in the System Center Operations Manager management packs. Therefore, you must import some System Center Operations Manager management packs into Service Manager. When you install Service Manager, a set of System Center Operations Manager management packs for common objects and the required Windows PowerShell scripts are copied to your Service Manager installation folder. For more information, see How to Import Management Packs for System Center Operations Manager Configuration Item Connectors. If you have installed additional management packs in Operations Manager, and you want to add the data from those additional management packs to Service Manager, you can modify the configuration item (CI) connector to add the additional management packs. For more information, see How to Edit a System Center Operations Manager Connector.

The Windows Azure management pack for Operations Manager 2007 R2 is supported in this release of Service Manager. This means that if an alert from Windows Azure is generated in Operations Manager 2007 R2, Service Manager will recognize the alert and an incident can be created.

Importing Data and Alerts from Operations Manager Topics

- How to Import Management Packs for System Center Operations Manager Configuration Item Connectors

  Describes how to import the management packs necessary for the System Center Operations Manager CI connectors.
- How to Create a System Center Operations Manager Connector

Describes how to create a System Center Operations Manager connector and import CIs and alerts from Operations Manager 2007.

- How to Synchronize a System Center Operations Manager Connector

  Describes how to synchronize a System Center Operations Manager connector to reflect changes that you made in Operations Manager.

- How to Disable and Enable a System Center Operations Manager Connector

  Describes how to disable and enable a System Center Operations Manager connector to pause or resume data synchronization.

- How to Edit a System Center Operations Manager Connector

  Describes how to edit properties for a System Center Operations Manager connector.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

How to Import Management Packs for System Center Operations Manager Configuration Item Connectors

For the System Center Operations Manager configuration item (CI) connector to function correctly, you have to import a set of management packs into System Center 2012 – Service Manager. The management packs and the Windows PowerShell script that you need to import the management packs are in the Service Manager installation folder. The default installation folder is \Program Files\Microsoft System Center\Service Manager 2012\Operations Manager Management Packs and System Center 2012 - Operations Manager Management Packs. Use the following procedures to import the management packs into Service Manager.

To import Operations Manager 2007 management packs for an Operations Manager CI connector

1. On the computer that is hosting the Service Manager management server, on the Windows desktop, click **Start**, point to **Programs**, point to **Windows PowerShell 1.0**, right click **Windows PowerShell**, and then click **Run as administrator**.
2. In Windows PowerShell, type the following command, and then press ENTER:

   ```
   Get-ExecutionPolicy
   ```
3. Review the output and note the current execution policy setting.
4. Type the following commands, and then press ENTER after each command:

   ```
   Set-ExecutionPolicy Unrestricted
   Set-Location \"Program Files\Microsoft System Center
   2012\Service Manager\Operations Manager Management Packs"
   ```

5. Type the following command, and then press ENTER:

   ```
   .\installOMMPs.ps1
   ```

   This command starts the Windows PowerShell script that installs the management packs. Wait for the management packs to be imported.
6. Change the execution policy back to the value that you noted in step 3. For example, type the following command to set the execution policy to Restricted, and then press ENTER:

   ```
   Set-ExecutionPolicy Restricted
   ```
7. To exit Windows PowerShell, type the following command, and then press ENTER:

   ```
   Exit
   ```

To import System Center 2012 - Operations Manager management packs for an Operations Manager CI connector

1. On the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Management Packs**.
3. In the **Tasks** pane, under **Management Packs**, click **Import**.
4. In the **Select Management Packs to Import** box, point to the drive where Service Manager is installed, and then point to Program Files\Microsoft System Center\Service Manager 2012\Operations Manager 2012 Management Packs.
5. To the right of the **File name** box, select the file type **MP files (*.mp)**.
6. In the list of files, select all of the management packs, and then click **Open**.
7. In **Import Management Packs**, select all of the management packs, and then click **Import**.
8. When the import process is complete, the message “The management pack was imported successfully” will appear.
9. Click **OK**.

How to Create a System Center Operations Manager Connector

In System Center 2012 – Service Manager, there are two types of connectors for System Center Operations Manager. You use the first type of connector, the alert connector, to automatically generate incidents that are based on Operations Manager alerts. You use the second type of connector, the configuration item (CI) connector, to import discovered objects from Operations Manager as configuration items into the Service Manager database. You can use the following procedures to create both connectors, validate them, and confirm their creation.

Note

For the Operations Manager CI connector to function correctly, you have to import a set of management packs into Service Manager. For more information, see How to Import

Management Packs for System Center Operations Manager Configuration Item Connectors.

Alerts that are generated by Operations Manager and that are sent to Service Manager do not contain user information. Therefore, when you open an incident in Service Manager, the **Affected User** box will be empty. You will not be able to save the incident form until you select an affected user. We recommend that you create a special user in Service Manager specifically for this purpose. For more information about how to create a special user, see How to Manually Create Configuration Items. This user is the user that you will assign to the **Affected User** field for all incidents created by Operations Manager.

You have the option of defining Service Manager templates that run when alerts of certain types are received. If you decide to add an alert routing rule, you can configure Service Manager to use a particular template based on alert criteria such, as priority or severity, as described in the following procedure.

There are two phases for creating the Alert connector. The first part involves creating the Alert connector on the Service Manager management server. The second part requires that you start the Operations Manager console and set up a subscription for the newly created connector. The subscription you create must be unique for the Alert connector; no connector that is created to point to Operations Manager should have a subscription that overlaps with another Operations Manager internal connector. Both phases are described in the following procedure.

To create an Operations Manager alert connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Tasks** pane, under **Connectors**, click **Create Connector**, and then click **Operations Manager Alert Connector**.
4. Complete the following steps to complete the Operations Manager Alert Connector Wizard:
   a. On the **Before You Begin** page, click **Next**.
   b. On the **General** page, in the **Name** box, type a name for the new connector. Make sure that the **Enable** check box is selected, and then click **Next**. Make a note of this name; you will need this name in step 7 of this procedure.
   c. On the **Server Details** page, in the **Server name** box, type the name of the server that is hosting the Operations Manager root management server. Under **Credentials**, click **New**.
   d. In the **Run As Account** dialog box, in the **Display name** box, type a name for this Run As account. In the **Account** list, select **Windows Account**.
   e. In the **User Name**, **Password**, and **Domain** fields, type the credentials for the Run As account, and then click **OK**. For more information about the permissions that are required for this Run As account, see Accounts Required During Setup in the Planning Guide for System Center 2012 - Service Manager.
   f. On the **Server Details** page, click **Test Connection**. If you receive the following

confirmation message, click **OK**, and then click **Next**:

"The connection to the server was successful."

g. On the **Alert Routing Rules** page, click **Add**.

h. In the **Add Alert Routing Rule** dialog box, create a name for the rule, select the template that you want to use to process incidents created by an alert, and then select the alert criteria that you want to use. Click **OK**, and then click **Next**.

i. On the **Schedule** page, select **Close alerts in Operations Manager when incidents are resolved or closed** or **Resolve incidents automatically when the alerts in Operations Manager are closed**, click **Next**, and then click **Create**.

5. Start the Operations Manager console.
6. Use the appropriate method, based on the version of Operations Manager 2007 you are using:
   - In Operations Manager 2007 Service Pack 1 (SP1), in the **Administration** pane, click **Product Connectors**.
   - In Operations Manager 2007 R2 and in System Center 2012 - Operations Manager, in the **Administration** pane, click **Product Connectors**, and then click **Internal Connectors**.
7. In the **Connectors** pane, click the name of the alert connector that you specified in step 4b.
8. In the **Actions** pane, click **Properties**.
9. In the **Alert Sync: <name of connector>** dialog box, click **Add**.
10. In the **Product Connector Subscription Wizard** dialog box, on the **General** page, in the **Subscription Name** box, type the name for this subscription. For example, type **All Alerts**, and then click **Next**.
11. On the **Approve groups** page, click **Next**.
12. On the **Approve targets** page, click **Next**.
13. On the **Criteria** page, click **Create**.
14. In the **Alert Sync:<name of connector>** dialog box, click **OK**.

To validate the creation of an Operations Manager alert connector

- Confirm that the connector you created is displayed in the Service Manager console in the **Connectors** pane.
- Confirm that incidents are created in Service Manager from alerts in Operations Manager.

To create an Operations Manager CI connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Tasks** pane, under **Connectors**, click **Create Connector**, and then click **Operations Manager CI Connector**.

4. Complete the following steps to complete the Operations Manager CI Connector Wizard:
   a. On the **General** page, in the **Name** box, type a name for the new connector. Make sure that the **Enable** check box is selected, and then click **Next**.
   b. On the **Server Details** page, in the **Server name** box, type the name of the server that is hosting the Operations Manager root management server.
   c. Use one of the following methods to enter credentials:
      - Under **Credentials**, select the Run As account you created for the alert connector, and then go to step 4d.
      - Under **Credentials**, click **New**. In the **User name**, **Password**, and **Domain** boxes, type the credentials for the Run As account, and then click **OK**. For more information about the permissions that are required for this Run As account, see Accounts Required During Setup in the Deployment Guide for System Center 2012 - Service Manager.
   d. On the **Server Details** page, click **Test Connection**. If you receive the following confirmation message, click **OK**, and then click **Next**:

      "The connection to the server was successful."
   e. On the **MP Selection** page, click **Select all**, or select the management packs that define the configuration items you want to import, and then click **Next**.
   f. On the **Schedule** page, click **Next**, and then click **Create**.

To validate the creation of an Operations Manager CI connector

- Confirm that the objects that Operations Manager discovered are listed as configuration items in Service Manager.

To confirm the status of an Operations Manager connector

- View the columns in the **Connector** pane; the columns contain information about the start time, the finish time, the status, and the percentage of import completion.

You can use a Windows PowerShell command to complete these tasks, as follows:

- For information about how to use Windows PowerShell to create a new Operations Manager alert connector in Service Manager, see New-SCOMAlertConnector.
- For information about how to use Windows PowerShell to create an alert rule to be used with an Operations Manager 2007 alert connector in Service Manager, see New-SCSMAlertRule.
- For information about how to use Windows PowerShell to create a new Operations Manager 2007 CI connector in Service Manager, see New-SCOMConfigurationItemConnector.
- For information about how to use Windows PowerShell to retrieve connectors that are defined in Service Manager and to view their status, see Get-SCSMConnector.

How to Synchronize a System Center Operations Manager Connector

When you create a System Center Operations Manager alert connector for System Center 2012 – Service Manager, it polls Operations Manager every 30 seconds. When you create an Operations Manager configuration item (CI) connector, it synchronizes data from Operations Manager every day at the time you specified in the configured schedule. However, you can use the following procedure to manually synchronize either type of connector.

Note

The **Start Time** and **Finish Time** values are not updated when an alert connector is synchronized. These values are only updated when alert data is transferred between Operations Manager 2007 and Service Manager.

To manually synchronize an Operations Manager connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Connectors** pane, select the Operations Manager connector that you want to synchronize.
4. In the **Tasks** pane, under the connector name, click **Synchronize Now**.
5. In the **Synchronize Now** dialog box, click **OK**.

To validate Operations Manager connector synchronization

1. In the Service Manager console, click **Configuration Items**.
2. In the **Configuration Items** pane, expand **Computers**, and then click **All Windows Computers**. Verify that any new computers that were discovered in Operations Manager appear in the **All Windows Computers** pane.

How to Disable and Enable a System Center Operations Manager Connector

You can use the following procedures to disable or enable a System Center Operations Manager connector for System Center 2012 – Service Manager and validate the changes.

For example, after you configure an Operations Manager connector, if you must perform maintenance operations on the Service Manager database, you can temporarily disable the connector and suspend the data import. You can resume the data import by re-enabling the connector.

For more information about how to delete a product connector from System Center Operations Manager, see Removing an Old Product Connector on Kevin Holman's System Center blog.

To disable an Operations Manager connector

1. In the Service Manager console, click **Administration**.

2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Connectors** pane, select the Operations Manager connector that you want to disable.
4. In the **Tasks** pane, under the connector name, click **Disable**.
5. In the **Disable Connector** dialog box, click **OK**.

To enable an Operations Manager connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Connectors** pane, select the Operations Manager connector that you want to enable.
4. In the **Tasks** pane, under the connector name, click **Enable**.
5. In the **Enable Connector** dialog box, click **OK**.

To validate the status change of an Operations Manager connector

1. Wait 30 seconds. Then, in the Service Manager console, click **Administration**, and then click **Connectors**.
2. In the **Connectors** pane, locate the connector for which you have changed the status, and verify the value in the **Enabled** column.

You can use Windows PowerShell commands to complete these tasks and other related tasks, as follows:

- For information about how to use Windows PowerShell to start a Service Manager connector, see Start-SCSMConnector.
- For information about how to use Windows PowerShell to retrieve connectors that are defined in Service Manager and view their status, see Get-SCSMConnector.
- For information about how to use Windows PowerShell to update the properties of a Service Manager connector, see Update-SCSMConnector.

How to Edit a System Center Operations Manager Connector

After you install a System Center Operations Manager alert connector and configuration item (CI) connector, you can edit the connectors. For example, you can use the following procedure to add more management packs to the CI connector.

To edit an Operations Manager CI connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Connectors** pane, select the Operations Manager connector that you want to edit.
4. In the **Tasks** pane, under the connector name, click **Properties**.

5. In the **Edit** dialog box, in the left pane, click **Management Packs**.
6. In the **Management Packs** pane, click **Refresh**.
7. In the **Credentials** dialog box, enter the credentials to connect to Operations Manager, and then click **OK**.
8. In the **Management Packs** list, select the management packs that define the configuration items that you want to import, and then click **OK**.

Importing Data from System Center Configuration Manager

This section describes how to create, configure, disable, and enable a Configuration Manager connector, and how to customize the Configuration Manager extended SMS_def.mof file for collecting hardware information. You use the connector to import data from System Center Configuration Manager into System Center 2012 – Service Manager.

You have an option to create a connector for either System Center Configuration Manager 2007 or System Center 2012 - Configuration Manager. The connector for System Center 2012 - Configuration Manager recognizes User-device Affinity and Mobile Devices and synchronizes them in the Service Manager database.

Importing Data from Configuration Manager Topics

- About Importing Data from System Center Configuration Manager

  Provides an overview of how to import data from Configuration Manager by using a connector.
- How to Create a Configuration Manager Connector

  Describes how to create a Configuration Manager connector and import data from Configuration Manager.
- How to Disable and Enable a Configuration Manager Connector

  Describes how to disable and enable a Configuration Manager connector to pause and resume data import from Configuration Manager.
- How to Synchronize a Configuration Manager Connector

  Describes how to synchronize the data in Configuration Manager with the Service Manager database.
- How to Configure a Configuration Manager Connector for an Extended SMS_def.mof File

  Describes how to customize the default Configuration Manager 2007 SMS_def.mof file to extend the hardware information that is collected.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager

- Operations Guide for System Center 2012 – Service Manager

About Importing Data from System Center Configuration Manager

You can import data from the System Center Configuration Manager site database into the System Center 2012 – Service Manager database. This automatically creates and populates configuration items for the hardware and software that you want to manage in Service Manager. After you import data from System Center Configuration Manager, you can attach the respective configuration items to relevant incidents, and the information in the configuration items will be available to analysts working on the incident.

Note

Service Manager imports data from Microsoft System Center Configuration Manager 2007 with Service Pack 1 (SP1), Microsoft System Center Configuration Manager 2007 R2, or System Center 2012 - Configuration Manager.

By using a Configuration Manager connector, you can import configuration baselines from System Center Configuration Manager and then use these configuration baselines to automatically generate incidents for noncompliant configuration items. For more information about this option, see **How to Configure Desired Configuration Management to Generate Incidents**.

For information about Microsoft Operations Framework (MOF) implementation of change and configuration, see Position of the Change and Configuration SMF Within the MOF IT Service Lifecycle.

Complete the Data Warehouse Registration Process

Before you create the Configuration Manager connector, you must make sure that the Data Warehouse Registration process is complete. For more information, see How to Determine When Data Warehouse Registration Is Complete in the Deployment Guide for System Center 2012 - Service Manager.

Additional Data in System Center 2012 - Configuration Manager

Additional data in System Center 2012 - Configuration Manager includes User-Device Affinity (UDA), Mobile Device Data, and Software Request Data. UDA data from System Center 2012 - Configuration Manager more accurately determines who the primary user of a computer or device is. The UDA data collected by the Service Manager System Center 2012 - Configuration Manager connector is used to populate the UsesComputer and PrimaryUser information in the Service Manager database.

Mobile device data for Windows Phones, Windows Mobile Phones, and Nokia devices will be collected by the Service Manager Configuration Manager connector. Data from other mobile devices such as iPhone, BlackBerry, and Android-based phones will be collected when you are using the Configuration Manager Exchange Server connector. For more information about the Exchange connector, see What's New in Configuration Manager 2012. Mobile device data will be imported into the Service Manager database as configuration items, and it can be associated with work items, incident management, and change management.

Software request data will be used in support of self-service software request integration with System Center 2012 - Configuration Manager. The administrative category data from Configuration Manager will be used to select which Service Request templates to apply when creating a request from the Self-Service Portal.

Schedule

You can configure the Configuration Manager connector to update the Service Manager database on a recurring schedule. You can also temporarily suspend the importation of data from Configuration Manager by disabling the connector. For example, you can disable the connector when maintenance is performed on the Configuration Manager site database because you know that the maintenance process temporarily creates inaccurate data. When appropriate, you can re-enable the connector and resume importing data.

Extended Hardware Inventory with Configuration Manager 2007

In System Center Configuration Manager 2007, you can extend the hardware inventory by collecting an inventory of additional Windows Management Instrumentation (WMI) classes, additional WMI class attributes, registry keys, and other customizations to accommodate your organization's requirements. For more information about extending the hardware inventory in Configuration Manager 2007, see How to Extend Hardware Inventory.

If you have extended the hardware inventory in Configuration Manager 2007, you must create a new Configuration Manager 2007 Connector management pack in Service Manager to collect the extended hardware inventory. This new management pack can contain only the information required to collect the extended hardware inventory from Configuration Manager 2007, or it can consist of everything from the original Configuration Manager 2007 Connector management pack plus the new extended hardware inventory. For information about creating a new connector management pack, see **Configure a Configuration Manager Connector for an Extended SMS_DEF.MOF File**.

Importing Software Configuration Items

You can import software configuration items with the Configuration Manager Connector by importing the following asset intelligence reporting classes in System Center Configuration Manager. These classes should be enabled in Configuration Manager before you configure the Configuration Manager connector in Service Manager. For more information about enabling Asset Intelligence in Configuration Manager, see How to Enable Asset Intelligence.

- SMS_InstalledSoftware
- SMS_SystemConsoleUsage
- SMS_SystemConsoleUser
- SoftwareLicensingService
- SoftwareLicensingProduct

If software for a particular computer does not appear in the **All Software** view in the Configuration Items workspace, you should review the Operations Manager event log on the

Service Manager primary management server. You should look for events with sources of OpsMgr Connector and Lfx Service to determine if there are any errors.

See Also

How to Configure a Configuration Manager Connector for an Extended SMS_def.mof File

How to Create a Configuration Manager Connector

How to Disable and Enable a Configuration Manager Connector

Appendix C - Mapping System Center 2012 - Service Manager Properties to Configuration Manager Database Views

How to Create a Configuration Manager Connector

You can use the following procedures to create a connector to import data from Microsoft System Center Configuration Manager 2007 with Service Pack 1 (SP1) or System Center 2012 - Configuration Manager into System Center 2012 – Service Manager and confirm the status of the connector.

Important

Before you can create the Configuration Manager connector, you have to verify that System Center Configuration Manager is installed in your environment, and you have to turn on Windows User Account Control (UAC). For more information about UAC, see User Account Control.

To create a Configuration Manager connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Tasks** pane, under **Connectors**, click **Create Connector**, and then click **Configuration Manager Connector**. The System Center Configuration Manager Connector Wizard starts.
4. On the **Before You Begin** page, click **Next**.
5. On the **General** page, do the following:
   a. In the **Name** box, type a name for the new connector. For example, type **Configuration Manager Connector to Seattle**.
   b. In the **Description** box, type a description for the new connector. For example, type **A Configuration Manager connector to site Seattle**.
   c. Make sure that the **Enabled** check box is selected, and then click **Next**.
6. On the **Select Management Pack** page, in the **Management Pack** list, select either **System Center Configuration Manager Connector Configuration** or **System Center Configuration Manager 2012 Connector Configuration**, and then click **Next**.
7. On the **Connect to System Center Configuration Manager Database** page, do the following:
   a. In the **Database Server Name** box, type the server name of the server that is hosting

the System Center Configuration Manager site database and the database named instance, if applicable. For example, at the hypothetical Woodgrove Bank, you might type **woodgrove\instance1** if the System Center Configuration Manager database is on a named instance of Microsoft SQL Server, or type **woodgrove** if the database is on a default instance of SQL Server.

b. In the **Database Name** box, type the name of the System Center Configuration Manager site database. For example, type **SMS_CM1**.

c. In the **Credentials** area, select a Run As account, or create a new Run As account. The user account that you specify as the Run As account must be a member of the smsdbrole_extract and the db_datareader groups for the Configuration Manager site database.

d. In the **Credentials** area, click **Test Connection**.

e. In the **Credentials** dialog box, in the **Password** box, type the password for the account, and then click **OK**.

f. In the **Test Connection** dialog box, if you receive the following confirmation message, click **OK**:

The connection to the server was successful.

g. Click **Next**.

8. On the **Collections** page, select the appropriate collection, and then click **Next**.
9. On the **Schedule** page, in the **Synchronize** list, set the frequency and time of synchronization, and then click **Next**.
10. On the **Summary** page, confirm the connector settings you made, and then click **Create**.
11. On the **Confirmation** page, make sure that you receive the following confirmation message:

"You have successfully completed the System Center Configuration Manager Connector Wizard."

Then, click **Close**.

Note

The System Center Configuration Manager Connector Wizard may take several hours to import data from System Center Configuration Manager.

To validate the creation of a Configuration Manager connector

1. Confirm that the Configuration Manager connector that you created is displayed in the **Connectors** pane.
2. In the Service Manager console, click **Configuration Items**. In the **Configuration Items** pane, expand **Configuration Items**, expand **Computers**, and then click **All Windows Computers**. Verify that the intended computers from Configuration Manager 2007 appear in the **All Windows Computers** pane.
3. In the middle pane, double-click a newly imported computer. Verify that the appropriate computer details appear in the computer form.

To confirm the status of a Configuration Manager connector

- View the columns in the **Connector** pane; the columns contain information about the start time, the finish time, the status, and the percentage of completion.

You can use a Windows PowerShell command to create a new Configuration Manager 2007 connector. For information about how to use Windows PowerShell to create a new Configuration Manager 2007 connector in Service Manager, see New-SCCMConnector.

How to Disable and Enable a Configuration Manager Connector

You can use the following procedures to disable or enable a System Center Configuration Manager connector and validate the status of the change.

To disable a Configuration Manager connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Connectors** pane, select the Configuration Manager connector that you want to disable. For example, click **Configuration Manager connector to SEA**.
4. In the **Tasks** pane, under the connector name, click **Disable**.

   Note
   If you disable a connector while it is synchronizing data, the synchronization process may not stop. However, a disabled connector will not import any new data from a Configuration Manager database from that point forward.

To enable a Configuration Manager connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Connectors** pane, select the Configuration Manager connector that you want to enable. For example, click **Configuration Manager connector to SEA**.
4. In the **Tasks** pane, under the connector name, click **Enable**.

To validate the status change of a Configuration Manager connector

1. After you disable or enable the connector, wait 30 seconds. Then, in the Service Manager console, click **Administration**, and then click **Connectors**.
2. In the **Connectors** pane, locate the connector for which you have changed status, and verify the value in the **Enabled** column.
3. If you enabled the connector, verify that the connector resumes synchronization according to the schedule. If you disabled the connector, verify that the connector no longer synchronizes according to the schedule.

You can use Windows PowerShell commands to complete these tasks and other related tasks, as follows:

- For information about how to use Windows PowerShell to start a Service Manager connector, see Start-SCSMConnector.
- For information about how to use Windows PowerShell to retrieve connectors that are defined in Service Manager and view their status, see Get-SCSMConnector.
- For information about how to use Windows PowerShell to update the properties of a Service Manager connector, see Update-SCSMConnector.

How to Synchronize a Configuration Manager Connector

To ensure that the System Center 2012 – Service Manager database is up to date, the System Center Configuration Manager 2007 connector synchronizes with Configuration Manager every day after the initial synchronization. However, you can use the following procedures to synchronize the connector manually and validate that the connector synchronized.

To manually synchronize a Configuration Manager connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Connectors** pane, select the Configuration Manager connector that you want to synchronize.
4. In the **Tasks** pane, under the name of the connector, click **Synchronize Now**.

   Note
   Depending on the amount of data that is imported, you might have to wait for the import to be completed.

To validate that a Configuration Manager connector synchronized

1. In the Service Manager console, click **Configuration Items**.
2. In the **Configuration Items** pane, expand **Computers**, and then click **All Windows Computers**. Verify that any new computers in Configuration Manager 2007 appear in the middle pane.

How to Configure a Configuration Manager Connector for an Extended SMS_def.mof File

Microsoft System Center Configuration Manager 2007 hardware inventory collects and then provides system information, such as available disk space, processor type, and operating system, about each computer in the Configuration Manager 2007 hierarchy. In Configuration Manager

2007, users can customize the default Configuration Manager 2007 SMS_def.mof file to extend the hardware inventory information that is collected.

When you create a Configuration Manager connector in Service Manager, you can select the default System Center Configuration Manager Connector Configuration management pack that must be used for that connector. By using the default management pack, the connector imports hardware, software, and desired configuration management information for the computers that are in the system.

If the Configuration Manager 2007 SMS_def.mof file has been extended to collect additional hardware inventory data, which you also want to import into Service Manager, you must create a new custom management pack that defines that additional data. Then, you have to create a new Configuration Manager connector and configure it to use the new custom management pack.

Importing Extended Hardware Inventory Data from Configuration Manager

To import extended hardware inventory data from Configuration Manager 2007, you must author a custom Configuration Manager 2007 connector management pack. There are two approaches to implementing a custom Configuration Manager connector:

- Create a custom Configuration Manager connector management pack that defines the extended data that you want to import and then create two connectors. Configure one connector to use the default System Center Configuration Manager Connector Configuration management pack to import the data that is defined by default. Configure the second connector to use the custom management pack to import the additional extended data.
- Customize the default System Center Configuration Manager Connector Configuration management pack to also include the additional extended data. Create a single connector that is configured to use the custom management pack to import all the information that you must have.

This topic provides the information that you must have to implement the first approach that is described earlier. It provides the details that you must have so that you can develop a custom Configuration Manager connector management pack that imports the extended hardware inventory from Configuration Manager 2007.

The high-level steps to importing extended hardware inventory data are as follows:

1. Create a custom Configuration Manager Connector Configuration management pack with the definitions for the extended data.
2. Import the custom management pack into Service Manager. After you import the management pack, Service Manager processes the directives in the management pack to create staging tables and to run any install Structured Query Language (SQL) scripts, as defined in the management pack.
3. Create a Configuration Manager connector and configure it to use the custom management pack.
4. The Configuration Manager connector imports the data.

Working with a Custom Configurations Manager Connector Management Pack

Consider the following tips when you are working with a custom Configurations Manager Connector management pack:

- Semantic errors in the connector configuration templates in the management pack do not prevent the management pack from being imported, and they are logged to the event log. In this case, you must delete the management pack, correct the errors, and reimport the management pack.
- After creating a Configuration Manager connector, you cannot modify its management pack selection. Instead, you must delete that connector and then create a new one with the desired management pack selection.
- To ensure a successful deletion of a management pack, you must delete any connectors that are configured to use the management pack that you want to delete and then delete the management pack.

  When you delete a custom Configurations Manager Connector management pack, Service Manager tries to delete all related staging tables that were created during the management pack import. Then, Service Manager runs any scripts that are defined in the **Uninstall** section of the management pack.
- Unlike other management packs, the custom Configuration Manager 2007 Connector management pack cannot be versioned. Importing a later version of the management pack will succeed. However, the connector configuration in the management pack will be ignored, or it might cause validation errors that are logged to the event log.

Creating a Custom Configuration Manager Connector Configuration Management Pack

A custom Configuration Manager Connector Configuration management pack is similar in structure to the default Configuration Manager Connector management pack. It must contain the two object templates **DataProvider** and **DataConsumer** that specify how the data should be imported and applied.

DataProvider Section

The **DataProvider** section provides information, such as which data to import, that you must have when you are importing data from Configuration Manager 2007 into the staging tables of **LinkingFramework**. The **DataProvider** section includes the queries that run on the Configuration Manager 2007 site database; directives for staging table creation; custom SQL scripts; and information that is relevant for incremental synchronization, such as watermarking and batching.

DataConsumer Section

The **DataConsumer** section provides information about reading the data from staging tables and writing it to the **ServiceManager** database's instances space, such as **Entities** or **Relationships**. The **DataConsumer** section includes queries that run on the staging tables; mapping to the Service Manager type system; custom SQL scripts; and information that is relevant for incremental synchronization, such as watermarking and batching.

Structure of the DataProvider and DataConsumer Object Templates Sections

Basically, the **DataProvider** and the **DataConsumer** are object templates that are targeted to a projection type. The following code shows the general structure of the **DataProvider** and the **DataConsumer** sections:

```
<TypeProjection ID="System.LinkingFramework.DataConnector.Projection"
Accessibility="Public" Type="System.LinkingFramework.DataConnector">
          <Component Alias="DataTable"
Path="$Context/Path[Relationship='System.LinkingFramework.ConnectorEmbedsTables'
TypeConstraint='System.LinkingFramework.DataTable']$">
            <Component Alias="Field"
Path="$Context/Path[Relationship='System.LinkingFramework.TableEmbedsFields']$" />
          </Component>
          <Component Alias="DataCollection"
Path="$Context/Path[Relationship='System.LinkingFramework.ConnectorEmbedsCollections'
TypeConstraint='System.LinkingFramework.DataCollection']$" />
 </TypeProjection>
```

In this code, **DataTable**, **Field**, and **DataCollection** are defined as follows:

- **DataTable**. The smallest data unit that is defined for data transfer. It is a declaration of what data to retrieve from the external data source. It also defines dependencies between different data tables and when data batching, watermarking, and grooming have finished.
- **Field**. A single column in a data table.
- **DataCollection**. A set of data tables to be transferred in one data transfer job or session. It defines which data tables are included in this data collection.

Properties in the Custom Management Pack

The following table provides the details about each property in the custom Configuration Manager Connector Configuration management pack. Use these guidelines when you create the custom management pack.

Property	Expected value	Validation after import
ID	For both **DataProvider** and **DataConsumer** templates—as indicated in the sample	Yes
DataConnector Properties		
DataConnectorName	For both **DataProvider** and **DataConsumer** templates—identical	Yes

Property	Expected value	Validation after import
	to the values in the sample	
IsProvider	In **DataProvider** template—True In **DataConsumer** template—False	Yes
SolutionName	A comment. For example, it can indicate the type of the imported data.	An attempt to import a management pack in which the solution name is already being used; it causes an error that is logged to the event log.
Entrypoint, EntryAssembly & WinformUIAssembly	Identical to the value in the sample	
InstallSQLScripts section	SQL scripts that must run after the staging tables are set up. They are usually used in the **DataConsumer** template to configure views that display data from the staging tables. Everything that is enclosed between the <Script></Script> tags is expected to be valid SQL script. Therefore, for comments, you must use the '/*' and the '*/' multi-line comment delimiters instead of the standard XML comment tags.	Not validated. Use custom table names to ensure that this does not cause overwriting or changing any tables except the ones that are declared in the management pack.
UnInstallSQLScripts section	SQL scripts that must run after you delete the Configuration Manager Connector	Not validated. Use custom table names to ensure that this does not cause overwriting or changing any tables except the tables that are declared in the management pack.

Property	Expected value	Validation after import
	management pack in the Service Manager console. Everything that is enclosed between the <Script></Script> tags is expected to be valid SQL script. Therefore, for comments, you must use the '/*' and the '*/' multi-line comment delimiters instead of the standard XML comment tags.	
DisableParallelProcessing	True	
DataTable Properties		
DataName	The table from which to import data. It is used in the user interface (UI) and not used in queries.	
StageTableName	The name of the staging table. It must be unique.	An attempt to import a management pack, in which the table name is already being used, causes an error to be logged to the event log.
WatermarkField	The name of the **rowversion** column	
WatermarkType	Possible values are: • 0—Indicates **DateTime** type • 1—Indicates the **Timestamp** type • (-1)—Indicates no watermarking, in which case **WatermarkField** becomes optional	Other types of watermarking are not supported.

Property	Expected value	Validation after import
BatchIdField	The name of the column that has good selectivity; used to separate incremental data into batches when importing to staging tables	
BatchIdType	Possible values are: • 0—Int • (-1)—No batching, in which case **BatchIdField** becomes optional	Integer column
BatchIdSize	The size of the batch, if batching is used. A high number indicates that much data is being read or written at the same time. The recommended value is 500.	Integer column
UseCache	True	
GroomType	Possible values are: • 1—The data in staging tables can be groomed after it is transferred to the Service Manager database. • 2—The data in staging tables is groomed only after it is marked as deleted in the Configuration Manager database and	

Property	Expected value	Validation after import
	has also been deleted in the Service Manager database because of the Service Manager connector synchronization.	

QueryString	The actual query that Configuration Manager 2007 uses to retrieve the requested data. The query must be of the form:
	`SELECT …`
	`FROM …`
	`WHERE …`
	`ORDER BY …`
	The WHERE clause can contain the "$COLLECTIONLIST" token. During synchronization, this token is replaced by the collections that are specified in the System Center Configuration Manager Connector Wizard.
	The data that is exposed by Configuration Manager 2007 SCCM_Ext.* views is supported for import. This data can be extended by using standard
		Not validated. All queries have an Lfx_Status column with value "U" or "D," indicating whether the row represents an Update or a Delete operation.

Property	Expected value	Validation after import
	sms_def.mof extensions or by using noidmifs. Other tables are not supported. Notably, subqueries are not supported, but joins to other tables are supported.	
CollectionName	A name for a group of data tables; this name must be unique. Tables in the same collection cannot depend on each other.	An attempt to import a management pack, in which the collection name is already being used, causes an error to be logged to the event log.
PrimaryKeyName	A section that declares the unique primary key name for the staging table.	An attempt to import a management pack, in which the key name is already being used, causes an error to be logged to the event log.
DependOnDataTable	The name or names of **DataTable** that must be synchronized first before this one. Typically, this is used to synchronize the staging table before the system reads it in the Consumer view. If you are using multiple collections, dependency should be expressed only between tables in different collections.	Not validated
DataField Properties		
Name, Type, AllowNull	These are required fields for any column	Not validated

Property	Expected value	Validation after import
	type. Supported types are **int**, **nvarchar**, **datetime** and **xml**.	
PrimaryKeyACs, PrimaryKeyPosition	If part of primary key, indicates the position from the left in the primary key. Lfx adds two internal use columns (Lfx_Status, Lfx_SourceId) to the PK at the end.	
Collation	DATABASE_DEFAULT	Not validated
DataCollection Properties		
DataCollectionName	Must be identical to what is referenced by a **DataTable** property	An attempt to import a management pack, in which the collection name is already being used, causes an error to be logged to the event log.
StagingName	In DataProvider template—DefaultCache In DataConsumer template—Not present	Not validated
DataTables	Comma-separated value (CSV) list of tables referencing this collection	

Settings	In **DataProvider** template—Not present
	In **DataConsumer** template—Indicates type mapping
		Escaped XML with following syntax:
		`<TypeName>Microsoft.Windows.Computer</TypeName>`
		`<MPName>Microsoft.Windows.Library</MPName>`
		`<MPVersion>version of MP</MPVersion>`
		`<MPToken>token for MP</MPToken>`

Sample of Custom Configuration Manager Connector Configuration Management Packs

The following are schema definitions and Configuration Manager Connector management pack samples that import data from the Configuration Manager 2007 SCCM_Ext.vex_GS_PC_BIOS view.

Refer to the table earlier in this topic for more information about the properties of these management packs. Use an XML editor, such as the editor in Microsoft Visual Studio, to modify these samples to fit your import scenarios.

Importing Data from a Hosted Class

When you are specifying a class that is hosted, the view in the **DataConsumer** template should include columns for the key property of the parent class. In this sample, the class that contains the BIOS information is hosted under a computer.

In this example, the Configuration Manager Connector Configuration management pack has two collections in the **DataProvider** and in the **DataConsumer** sections, one for importing the computers data and the second to import the BIOS data.

Class Definition

```
<ManagementPack xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsl="http://www.w3.org/1999/XSL/Transform" ContentReadable="true"
SchemaVersion="1.1" OriginalSchemaVersion="1.1">
  <Manifest>
    <Identity>
      <ID>SampleBIOSMP</ID>
      <Version>1.0.0.0</Version>
    </Identity>
    <Name>BIOS Class MP</Name>
    <References>
      <Reference Alias="System">
        <ID>System.Library</ID>
        <Version>7.0.5229.0</Version>
        <PublicKeyToken>31bf3856ad364e35</PublicKeyToken>
      </Reference>
      <Reference Alias="Windows">
        <ID>Microsoft.Windows.Library</ID>
        <Version>7.0.5229.0</Version>
        <PublicKeyToken>31bf3856ad364e35</PublicKeyToken>
      </Reference>
```

```
    </References>
  </Manifest>
  <TypeDefinitions>
    <EntityTypes>
      <ClassTypes>
        <ClassType ID="HostedCustomClass" Accessibility="Public"
Base="System!System.ConfigItem" Hosted="true" Abstract="false">
            <Property ID="SerialNumber" Type="string" Key="true"/>
        </ClassType>
      </ClassTypes>
      <RelationshipTypes>
        <RelationshipType ID="Microsoft.Windows.ComputerHostsBIOS" Accessibility="Public"
Base="System!System.Hosting">
          <Source ID="Computer" Type="Windows!Microsoft.Windows.Computer" />
          <Target ID="BIOSClass" Type="HostedCustomClass" />
        </RelationshipType>
      </RelationshipTypes>
    </EntityTypes>
  </TypeDefinitions>
</ManagementPack>
```

Configuration Manager Connector Configuration management pack

```
<ManagementPack xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsl="http://www.w3.org/1999/XSL/Transform" ContentReadable="true"
SchemaVersion="1.1" OriginalSchemaVersion="1.1">
  <Manifest>
    <Identity>
      <ID>CnfgMgrBiosSample</ID>
      <Version>7.0.5229.0</Version>
    </Identity>
    <Name>CnfgMgrBiosSample</Name>
    <References>
      <Reference Alias="System">
        <ID>System.Library</ID>
        <Version>7.0.5229.0</Version>
```

```
        <PublicKeyToken>31bf3856ad364e35</PublicKeyToken>
      </Reference>
      <Reference Alias="LFX">
        <ID>ServiceManager.LinkingFramework.Library</ID>
        <Version>7.0.5229.0</Version>
        <PublicKeyToken>31bf3856ad364e35</PublicKeyToken>
      </Reference>
    </References>
  </Manifest>
  <Templates>
    <ObjectTemplate
ID="DataProvider.Microsoft.EnterpriseManagement.ServiceManager.Connector.Sms"
TypeID="LFX!System.LinkingFramework.DataConnector.Projection">
      <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataConnector']/DataConnectorNa
me$">
          Microsoft_EnterpriseManagement_ServiceManager_Connector_Sms
      </Property>
      <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataConnector']/IsProvider$">
          True
      </Property>
      <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataConnector']/SolutionName$">
SampleBIOS</Property>
      <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataConnector']/EntryPoint$">
          Microsoft.EnterpriseManagement.ServiceManager.Connector.Sms.SmsConnector
      </Property>
      <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataConnector']/EntryAssembly$"
>
          Microsoft.EnterpriseManagement.ServiceManager.Connector.Sms,
          Version="7.0.5000.0",
          Culture=neutral,
```

```
          PublicKeyToken="31bf3856ad364e35"
      </Property>
      <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataConnector']/WinFormUIAssemb
ly$">
          Microsoft.EnterpriseManagement.ServiceManager.Connector.Sms.SmsConnector,
          Microsoft.EnterpriseManagement.ServiceManager.Connector.Sms,
Version="7.0.5000.0", Culture=neutral,
          PublicKeyToken="31bf3856ad364e35"
      </Property>
      <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataConnector']/InstallSQLScrip
ts$"></Property>
      <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataConnector']/DisableParallel
Process$">
          True
      </Property>

      <Object
Path="$Context/Path[Relationship='LFX!System.LinkingFramework.ConnectorEmbedsTables'
SeedRole='Source' TypeConstraint='LFX!System.LinkingFramework.DataTable']$">
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/DataName$">SCCM_Ext
.Sample_vex_R_System</Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/StageTableName$">Sa
mple_SMS_vex_R_System</Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/WatermarkField$">S.
[rowversion]</Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/WatermarkType$">1</
Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/BatchIdField$">S.[R
esourceID]</Property>
```

```
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/BatchIdType$">0</Pr
operty>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/BatchIdSize$">2000<
/Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/UseCache$">true</Pr
operty>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/GroomType$">2</Prop
erty>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/QueryString$"><![CD
ATA[
                            SELECT S.ResourceID,
                                S.ChangeAction as Lfx_Status,
                                S.Netbios_Name0,
                                S.Resource_Domain_OR_Workgr0
                            FROM SCCM_Ext.vex_R_System S
                            INNER JOIN SCCM_Ext.vex_FullCollectionMembership CM
                                ON S.ResourceID = CM.ResourceID
                            INNER JOIN SCCM_Ext.vex_Collection C
                                ON C.CollectionID = CM.CollectionID
                            WHERE ((S.ChangeAction = 'U' AND S.Client_Type0 != 3 AND
S.Hardware_ID0 IS NOT NULL)
                                  OR S.ChangeAction = 'D')
                                  AND $COLLECTIONLIST
                            ORDER BY S.rowversion
                    ]]>
</Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/CollectionName$">BI
OSComputers</Property>
```

```
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/PrimaryKeyName$">[S
ample_SMS_PK_v_R_SYSTEM]</Property>
        <Object
Path="$Context/Path[Relationship='LFX!System.LinkingFramework.TableEmbedsFields'
SeedRole='Source' TypeConstraint='LFX!System.LinkingFramework.Field']$">
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Name$">[ResourceID]</Pr
operty>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Type$">Int</Property>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/AllowNull$">false</Prop
erty>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/PrimaryKeyPosition$">0<
/Property>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/PrimaryKeyAcs$">true</P
roperty>
        </Object>
        <Object
Path="$Context/Path[Relationship='LFX!System.LinkingFramework.TableEmbedsFields'
SeedRole='Source' TypeConstraint='LFX!System.LinkingFramework.Field']$">
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Name$">Netbios_Name0</P
roperty>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Type$">NVarChar</Proper
ty>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Size$">64</Property>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Collation$">DATABASE_DE
FAULT</Property>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/AllowNull$">true</Prope
rty>
```

```
        </Object>
        <Object
Path="$Context/Path[Relationship='LFX!System.LinkingFramework.TableEmbedsFields'
SeedRole='Source' TypeConstraint='LFX!System.LinkingFramework.Field']$">
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Name$">Resource_Domain_
OR_Workgr0</Property>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Type$">NVarChar</Proper
ty>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Size$">255</Property>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Collation$">DATABASE_DE
FAULT</Property>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/AllowNull$">true</Prope
rty>
        </Object>
      </Object>

      <Object
Path="$Context/Path[Relationship='LFX!System.LinkingFramework.ConnectorEmbedsTables'
SeedRole='Source' TypeConstraint='LFX!System.LinkingFramework.DataTable']$">
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/DataName$">SCCM_Ext
.Sample_vex_GS_COMPUTER_SYSTEM</Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/StageTableName$">Sa
mple_SMS_vex_GS_COMPUTER_SYSTEM</Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/WatermarkField$">CS
.[rowversion]</Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/WatermarkType$">1</
Property>
```

```
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/BatchIdField$">CS.[
ResourceID]</Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/BatchIdType$">0</Pr
operty>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/BatchIdSize$">2000<
/Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/UseCache$">true</Pr
operty>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/GroomType$">2</Prop
erty>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/QueryString$"><![CD
ATA[
                            SELECT CS.ResourceID,
                                    CS.GroupKey,
                                    CS.ChangeAction as Lfx_Status,
                                    CS.Name0,
                                    CS.Domain0
                            FROM SCCM_Ext.vex_GS_COMPUTER_SYSTEM CS
                            INNER JOIN SCCM_Ext.vex_FullCollectionMembership CM
                                ON CS.ResourceID = CM.ResourceID
                            INNER JOIN SCCM_Ext.vex_Collection C
                                ON C.CollectionID = CM.CollectionID
                            WHERE $COLLECTIONLIST
                            ORDER BY CS.rowversion
                    ]]>
</Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/CollectionName$">BI
OSComputers</Property>
```

```
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/PrimaryKeyName$">[S
ample_SMS_PK_v_GS_COMPUTER_SYSTEM]</Property>
        <Object
Path="$Context/Path[Relationship='LFX!System.LinkingFramework.TableEmbedsFields'
SeedRole='Source' TypeConstraint='LFX!System.LinkingFramework.Field']$">
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Name$">[ResourceID]</Pr
operty>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Type$">Int</Property>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/AllowNull$">false</Prop
erty>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/PrimaryKeyPosition$">0<
/Property>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/PrimaryKeyAcs$">true</P
roperty>
        </Object>
        <Object
Path="$Context/Path[Relationship='LFX!System.LinkingFramework.TableEmbedsFields'
SeedRole='Source' TypeConstraint='LFX!System.LinkingFramework.Field']$">
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Name$">[GroupKey]</Prop
erty>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Type$">Int</Property>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/AllowNull$">false</Prop
erty>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/PrimaryKeyPosition$">1<
/Property>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/PrimaryKeyAcs$">true</P
roperty>
```

```
        </Object>
        <Object
Path="$Context/Path[Relationship='LFX!System.LinkingFramework.TableEmbedsFields'
SeedRole='Source' TypeConstraint='LFX!System.LinkingFramework.Field']$">
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Name$">[Name0]</Propert
y>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Type$">NVarChar</Proper
ty>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Size$">64</Property>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Collation$">DATABASE_DE
FAULT</Property>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/AllowNull$">true</Prope
rty>
        </Object>
        <Object
Path="$Context/Path[Relationship='LFX!System.LinkingFramework.TableEmbedsFields'
SeedRole='Source' TypeConstraint='LFX!System.LinkingFramework.Field']$">
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Name$">[Domain0]</Prope
rty>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Type$">NVarChar</Proper
ty>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Size$">32</Property>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Collation$">DATABASE_DE
FAULT</Property>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/AllowNull$">true</Prope
rty>
        </Object>
```

```
      </Object>

      <Object
Path="$Context/Path[Relationship='LFX!System.LinkingFramework.ConnectorEmbedsTables'
SeedRole='Source' TypeConstraint='LFX!System.LinkingFramework.DataTable']$">
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/DataName$">SCCM_Ext
.vex_GS_PC_BIOS</Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/StageTableName$">Sa
mple_SMS_vex_GS_PC_BIOS</Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/WatermarkField$">S.
[rowversion]</Property>
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Property>
        <Property
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esourceID]</Property>
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operty>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/BatchIdSize$">2000<
/Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/UseCache$">true</Pr
operty>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/GroomType$">2</Prop
erty>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/QueryString$"><![CD
ATA[
                    SELECT S.ChangeAction as Lfx_Status,
                    S.ResourceID,
```

```
                    S.BatchingKey,
                    S.GroupKey,
                    S.SerialNumber0
                    FROM SCCM_Ext.vex_GS_PC_BIOS S
                    INNER JOIN SCCM_Ext.vex_FullCollectionMembership CM
                      ON S.ResourceID = CM.ResourceID
                    INNER JOIN SCCM_Ext.vex_Collection C
                      ON C.CollectionID = CM.CollectionID
                    WHERE C.ChangeAction = 'U' AND CM.ChangeAction = 'U' AND
$COLLECTIONLIST
                    ORDER BY S.rowversion
                  ]]>
        </Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/CollectionName$">Sa
mple_SMS_PROVIDER_BIOS_COLLECTION</Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/PrimaryKeyName$">[S
ample_SMS_PK_v_GS_BIOS1]</Property>
        <Object
Path="$Context/Path[Relationship='LFX!System.LinkingFramework.TableEmbedsFields'
SeedRole='Source' TypeConstraint='LFX!System.LinkingFramework.Field']$">
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Name$">[ResourceID]</Pr
operty>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Type$">Int</Property>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/AllowNull$">false</Prop
erty>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/PrimaryKeyPosition$">0<
/Property>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/PrimaryKeyAcs$">true</P
roperty>
```

```
        </Object>
        <Object
Path="$Context/Path[Relationship='LFX!System.LinkingFramework.TableEmbedsFields'
SeedRole='Source' TypeConstraint='LFX!System.LinkingFramework.Field']$">
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Name$">BatchingKey</Pro
perty>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Type$">Int</Property>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/AllowNull$">false</Prop
erty>
        </Object>
        <Object
Path="$Context/Path[Relationship='LFX!System.LinkingFramework.TableEmbedsFields'
SeedRole='Source' TypeConstraint='LFX!System.LinkingFramework.Field']$">
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Name$">GroupKey</Proper
ty>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Type$">Int</Property>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/AllowNull$">true</Prope
rty>
        </Object>
        <Object
Path="$Context/Path[Relationship='LFX!System.LinkingFramework.TableEmbedsFields'
SeedRole='Source' TypeConstraint='LFX!System.LinkingFramework.Field']$">
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Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Name$">SerialNumber0</P
roperty>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Type$">NVarChar</Proper
ty>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/Size$">34</Property>
```

```
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FAULT</Property>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.Field']/AllowNull$">true</Prope
rty>
        </Object>
      </Object>

      <Object
Path="$Context/Path[Relationship='LFX!System.LinkingFramework.ConnectorEmbedsCollections'
SeedRole='Source' TypeConstraint='LFX!System.LinkingFramework.DataCollection']$">
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataCollection']/DataCollection
Name$">BIOSComputers</Property>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataCollection']/StagingName$">
DefaultCache</Property>
          <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataCollection']/DataTables$">S
CCM_Ext.Sample_vex_R_System,SCCM_Ext.Sample_vex_GS_COMPUTER_SYSTEM</Property>
      </Object>
      <Object
Path="$Context/Path[Relationship='LFX!System.LinkingFramework.ConnectorEmbedsCollections'
SeedRole='Source' TypeConstraint='LFX!System.LinkingFramework.DataCollection']$">
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataCollection']/DataCollection
Name$">Sample_SMS_PROVIDER_BIOS_COLLECTION</Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataCollection']/StagingName$">
DefaultCache</Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataCollection']/DataTables$">S
CCM_Ext.vex_GS_PC_BIOS</Property>
      </Object>
    </ObjectTemplate>
```

```
    <ObjectTemplate
ID="DataConsumer.Microsoft.EnterpriseManagement.ServiceManager.Connector.Sms"
TypeID="LFX!System.LinkingFramework.DataConnector.Projection">
      <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataConnector']/DataConnectorNa
me$">
          MomStore
      </Property>
      <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataConnector']/IsProvider$">
          False
      </Property>
      <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataConnector']/SolutionName$">
SampleBIOS</Property>
      <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataConnector']/EntryPoint$">

Microsoft.EnterpriseManagement.ServiceManager.Linking.Consumer.OperationalStore.Operation
alStoreConsumer
      </Property>
      <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataConnector']/EntryAssembly$"
>
  Microsoft.EnterpriseManagement.ServiceManager.Linking.Consumer.OperationalStore,
  Version="7.0.5000.0",
  Culture=neutral,
  PublicKeyToken="31bf3856ad364e35"
      </Property>
      <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataConnector']/InstallSQLScrip
ts$"><![CDATA[
                        <Script>
                             if not object_id('[LFXSTG].[v_Sample_SMS_BIOSComputer]') is
null
                                drop view [LFXSTG].[v_Sample_SMS_BIOSComputer];
```

```
                    exec ('
                        CREATE VIEW [LFXSTG].[v_Sample_SMS_BIOSComputer] AS
                            SELECT S.Lfx_RowId,
                                   S.Lfx_SourceID,
                                   S.Lfx_Timestamp,
                                   S.Lfx_Status,
                                   CS.Name0 AS ''DisplayName'',
                                   COALESCE(CS.Name0, S.Netbios_Name0)
                            + ''.'' + COALESCE(CS.Domain0,
S.Resource_Domain_OR_Workgr0) AS ''PrincipalName''
                            FROM LFXSTG.Sample_SMS_vex_R_System S
                            INNER JOIN LFXSTG.Sample_SMS_vex_GS_COMPUTER_SYSTEM
CS
                                 ON S.ResourceID = CS.ResourceID AND
S.Lfx_SourceId = CS.Lfx_SourceId
                            WHERE S.Netbios_Name0 IS NOT NULL
                                AND S.Resource_Domain_OR_Workgr0 IS NOT NULL
                        ');
                </Script>

                <Script>
                    if not object_id('[LFXSTG].[v_Sample_BIOS]') is null
                        drop view [LFXSTG].[v_Sample_BIOS]
                    exec ('
                        CREATE VIEW [LFXSTG].[v_Sample_BIOS] AS
                            SELECT P.Lfx_RowId AS Lfx_RowId,
                                P.Lfx_SourceId,
                                P.Lfx_Timestamp AS Lfx_Timestamp,
                                P.Lfx_Status as Lfx_Status,
                                P.SerialNumber0 AS ''SerialNumber'',
                                COALESCE(CS.Name0, S.Netbios_Name0) + ''.'' +
COALESCE(CS.Domain0, S.Resource_Domain_OR_Workgr0) AS ''PrincipalName''
                            FROM [LFXSTG].Sample_SMS_vex_GS_PC_BIOS P
                            INNER JOIN [LFXSTG]. Sample_SMS_vex_R_System S
```

```
                                        ON P.ResourceID=S.ResourceID AND P.Lfx_SourceId =
S.Lfx_SourceId
                                    INNER JOIN [LFXSTG].
Sample_SMS_vex_GS_COMPUTER_SYSTEM CS
                                        ON S.ResourceID=CS.ResourceID
                                           AND S.Lfx_SourceId = CS.Lfx_SourceId
                                ')
                        </Script>
                    ]]>
        </Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataConnector']/UninstallSQLScr
ipts$"><![CDATA[
                        <Script>
                             if not object_id('[LFXSTG].[v_Sample_SMS_BIOSComputer]') is
null
                                 drop view [LFXSTG].[v_Sample_SMS_BIOSComputer];
                </Script>

                        <Script>
                             if not object_id('[LFXSTG].[v_Sample_BIOS]') IS NULL
                                 drop view [LFXSTG].[v_Sample_BIOS];
                </Script>
                    ]]>
        </Property>

      <Object
Path="$Context/Path[Relationship='LFX!System.LinkingFramework.ConnectorEmbedsTables'
SeedRole='Source' TypeConstraint='LFX!System.LinkingFramework.DataTable']$">
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/DataName$">Sample_S
MS_Computer</Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/WatermarkField$">E.
Lfx_Timestamp</Property>
```

```
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/WatermarkType$">0</
Property>
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x_RowId</Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/BatchIdType$">0</Pr
operty>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/BatchIdSize$">500</
Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/UseCache$">false</P
roperty>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/QueryString$"><![CD
ATA[
                            SELECT * FROM [LFXSTG].v_Sample_SMS_BIOSComputer E
                    ]]>
        </Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/CollectionName$">Sa
mple_SMS_Computers_COLLECTION</Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/DependOnDataTable$"
>SCCM_Ext.Sample_vex_GS_COMPUTER_SYSTEM,SCCM_Ext.Sample_vex_R_System</Property>
      </Object>


      <Object
Path="$Context/Path[Relationship='LFX!System.LinkingFramework.ConnectorEmbedsTables'
SeedRole='Source' TypeConstraint='LFX!System.LinkingFramework.DataTable']$">
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/DataName$">Sample_S
MS_BIOS_CONSUMER_VIEW</Property>
```

```
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/WatermarkField$">C.
Lfx_Timestamp</Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/WatermarkType$">0</
Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/BatchIdField$">C.Lf
x_RowId</Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/BatchIdType$">0</Pr
operty>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/BatchIdSize$">500</
Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/UseCache$">False</P
roperty>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/QueryString$"><![CD
ATA[
                        select C.* from [LFXSTG].v_Sample_BIOS C
                  ]]>
        </Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/CollectionName$">Sa
mple_SMS_BIOS_CONSUMER_COLLECTION</Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataTable']/DependOnDataTable$"
>SCCM_Ext.vex_GS_PC_BIOS, Sample_SMS_Computer</Property>
      </Object>

      <Object
Path="$Context/Path[Relationship='LFX!System.LinkingFramework.ConnectorEmbedsCollections'
SeedRole='Source' TypeConstraint='LFX!System.LinkingFramework.DataCollection']$">
```

```
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Path="$Context/Property[Type='LFX!System.LinkingFramework.DataCollection']/DataCollection
Name$">Sample_SMS_Computers_COLLECTION</Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataCollection']/DataTables$">S
ample_SMS_Computer</Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataCollection']/Settings$"><![
CDATA[
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xmlns="http://schemas.microsoft.com/sdm/servicedesk/linking/2005/09">Microsoft.Windows.Co
mputer</TypeName>
<MPName
xmlns="http://schemas.microsoft.com/sdm/servicedesk/linking/2005/09">Microsoft.Windows.Li
brary</MPName>
<MPVersion
xmlns="http://schemas.microsoft.com/sdm/servicedesk/linking/2005/09">7.0.5229.0</MPVersio
n>
<MPToken
xmlns="http://schemas.microsoft.com/sdm/servicedesk/linking/2005/09">31bf3856ad364e35</MP
Token>
]]>
</Property>
      </Object>

      <Object
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SeedRole='Source' TypeConstraint='LFX!System.LinkingFramework.DataCollection']$">
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataCollection']/DataCollection
Name$">Sample_SMS_BIOS_CONSUMER_COLLECTION</Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataCollection']/DataTables$">S
ample_SMS_BIOS_CONSUMER_VIEW</Property>
        <Property
Path="$Context/Property[Type='LFX!System.LinkingFramework.DataCollection']/Settings$"><![
CDATA[
```

```
<TypeName
xmlns="http://schemas.microsoft.com/sdm/servicedesk/linking/2005/09">HostedCustomClass</T
ypeName>
<MPName
xmlns="http://schemas.microsoft.com/sdm/servicedesk/linking/2005/09">SampleBIOSMP</MPName
>
<MPVersion
xmlns="http://schemas.microsoft.com/sdm/servicedesk/linking/2005/09">1.0.0.0</MPVersion>
        ]]>
        </Property>
      </Object>
    </ObjectTemplate>
  </Templates>
</ManagementPack>
```

Importing Runbooks from System Center Orchestrator 2012

System Center 2012 – Service Manager integrates with System Center 2012 - Orchestrator, providing the capability to synchronously invoke runbooks from within Service Manager through the use of workflows. This capability provides integration between Orchestrator automation capabilities with the Self-Service Portal, as well as business modeling capabilities. When this capability is combined with the Service Manager Service Catalog stack, it is possible to create an end-user-facing request offering with an Orchestrator runbook as part of the fulfillment process.

Activities that make up a service request can be mapped to runbook activities, which in turn are mapped to an Orchestrator runbook. For example, the parameters that are necessary for a custom start activity to invoke a runbook in Orchestrator, such as a computer name, can go into as Service Manager as objects. You start this process by importing runbook objects into the Service Manager database using an Orchestrator connector. After you import runbooks into Service Manager, they appear in the **Library** node in the Administration workspace.

Note

Make sure that you have installed the ADO.NET Data Services Update for .NET Framework 3.5 Service Pack 1 (SP1), as described in Microsoft Knowledge Base article 976127. For more information, see ADO.NET Data Services Update for .NET Framework 3.5 SP1 for Windows 7 and Windows Server 2008 R2.

Importing Runbook Topics

- How to Create an Orchestrator Connector

  Describes how to create an Orchestrator connector.
- How to Synchronize an Orchestrator Connector

Describes how to synchronize an Orchestrator connector.

- How to Disable and Enable an Orchestrator Connector

  Describes how to temporarily disable and then re-enable an Orchestrator connector.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

How to Create an Orchestrator Connector

You can use the following procedures in System Center 2012 – Service Manager to create a connector for System Center 2012 - Orchestrator and then validate the creation of the connector.

To create an Orchestrator connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Tasks** pane, under **Connectors**, click **Create Connector**, and then click **Orchestrator connector**.
4. Perform these steps to complete the Orchestrator Connector Wizard:
   a. On the **Before You Begin** page, click **Next**.
   b. On the **General** page, in the **Name** box, type a name for the new connector. Make sure that **Enable this connector** is selected, and then click **Next**.
   c. On the **Connection** page, in the **Server Information** area, type the URL of the Orchestrator Web service.
      i. Type the URL of the Orchestrator Web service in the form of http://<computer>:<port>/Orchestrator2012/Orchestrator.svc, where <computer> is the name of the computer hosting the web service and <port> is the port number where the web service is installed. (The default port number is 81.)
   d. On the **Connection** page, in the **Credentials** area, either select an existing account or click **New**, and then do the following:
      i. In the **Run As Account** dialog box, in the **Display name** box, type a name for the Run As account. In the **Account** list, select **Windows Account**. Enter the credentials for an account that has rights to connect Orchestrator, and then click **OK**. On the **Connection** page, click **Test Connection**.

         Note
         Special characters (such as the ampersand [&]) in the **User Name** box are not supported.

      ii. In the **Test Connection** dialog box, make sure that the message "The connection to the server was successful" appears, and then click **OK**. On the

Connection page, click **Next**.

e. On the **Folder** page, select a folder, and then click **Next**.

f. On the **Web Console URL** page, type the URL for the Orchestrator web console in the form of http://<computer>:port (the default port number is 82), and then click **Next**.

g. On the **Summary** page, make sure that the settings are correct, and then click **Create**.

h. On the **Completion** page, make sure that you receive the message “Orchestrator connector successfully created,” and then click **Close**.

To validate the creation of an Orchestrator connector

1. In the **Connectors** pane, locate the Orchestrator connector that you created.
2. Review the **Status** column for a status of **Finished Success**.

   Note
   Allow sufficient time for the import process to finish if you are importing a large number of runbooks.
3. In the Service Manager console, click **Library**.
4. In the **Library** pane, expand **Library**, and then click **Runbooks**.
5. Review the **Runbooks** pane, and note that your runbooks have been imported.

How to Synchronize an Orchestrator Connector

To ensure that the Service Manager database in System Center 2012 – Service Manager is up to date, the Orchestrator connector synchronizes with Service Manager on a daily basis. You can use the following procedures to synchronize the connector manually and validate that the connector synchronized.

To manually synchronize an Orchestrator connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Connectors** pane, select the Orchestrator connector that you want to synchronize.
4. In the **Tasks** pane, under the name of the connector, click **Synchronize Now**.

To validate that an Orchestrator connector synchronized

1. In the Service Manager console, click **Connectors**.
2. In the **Connectors** pane, examine the start time and finish time to determine when the synchronization process started and finished.

   Note

Synchronization events are also written to the Event log in the Applications and Services Logs/Operations Manager folder.

How to Disable and Enable an Orchestrator Connector

You can use the following procedures in System Center 2012 – Service Manager to disable or enable an Orchestrator connector and validate the status of the connector.

To disable an Orchestrator connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Connectors** pane, select the Orchestrator connector that you want to disable.
4. In the **Tasks** pane, under the connector name, click **Disable**.
5. In the **Disable Connector** dialog box, click **OK**.

To enable an Orchestrator connector

1. In the Service Manager console, click **Administration**, and then click **Connectors**.
2. In the **Connectors** pane, select the Orchestrator connector that you want to enable.
3. In the **Tasks** pane, under the connector name, click **Enable**.
4. In the **Enable Connector** dialog box, click **OK**.

To validate the status change of an Orchestrator connector

1. In the middle pane, locate the connector for which you have changed status, and then verify the value in the **Enabled** column.

Importing Data from System Center Virtual Machine Manager

You can import objects, such as VM templates, service templates, and storage classifications that are created in Virtual Machine Manager (VMM) into the Service Manager database by creating a Virtual Machine Manager connector. After you import these objects into the Service Manager database, you can use these objects, for example, when you create Request Offerings.

If, in your environment, your VMM server pushes discovery data to an Operations Manager server, you will want to create an Operations Manager CI connector. You must make sure that the VMM management pack, Microsoft.SystemCenter.VirtualMachineManager.2012.Discovery, is synchronized with the Service Manager management server. You can create the Operations Manager CI connector either before or after creating the Virtual Machine Manager connector.

Importing VMM Data Topics

- How to Create a Virtual Machine Manager Connector

  Describes how to create a Virtual Machine Manager connector.
- How to Synchronize a Virtual Machine Manager Connector

  Describes how to synchronize a Virtual Machine Manager connector.
- How to Disable and Enable a Virtual Machine Manager Connector

  Describes how to disable and enable a Virtual Machine Manager connector.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

How to Create a Virtual Machine Manager Connector

Use the following procedures in System Center 2012 – Service Manager to create a System Center Virtual Machine Manager connector and validate the creation of the connector.

To create a System Center Virtual Machine Manager connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Tasks** pane, under **Connectors**, click **Create Connector**, and then click **Virtual Machine Manager connector**.
4. Complete these steps to complete the Virtual Machine Manager Connector Wizard:
   a. On the **Before You Begin** page, click **Next**.
   b. On the **General** page, in the **Name** box, type a name for the new connector. Make sure that **Enable this connector** is selected, and then click **Next**.
   c. On the **Connection** page, in the **Server Information** area, type the same of the computer hosting Virtual Machine Manager (VMM).
   d. On the **Connection** page, in the **Credentials** area, either select an existing account or click **New**, and then do the following:
      i. In the **Run As Account** dialog box, in the **Display name** box, type a name for the Run As account. In the **Account** list, select **Windows Account**. Enter the credentials for an account that has rights to connect VMM, and then click **OK**. On the **Connection** page, click **Test Connection**.

         Note
         Special characters (such as the ampersand [&]) in the **User Name** box are not supported.
      ii. In the **Test Connection** dialog box, make sure that **The connection to the**

server was successful appears, and then click **OK**. On the **Connection** page, click **Next**.

e. On the **Summary** page, make sure that the settings are correct, and then click **Create**.

f. On the **Completion** page, make sure that you receive a “Virtual Machine Manager connector successfully created” message, and then click **Close**.

To validate the creation of a System Center Virtual Machine Manager connector

1. In the **Connectors** pane, locate the System Center Virtual Machine Manager connector that you created.
2. Review the **Status** column for a status of **Running**.

   Note
   Allow sufficient time for the import process to finish if you are importing a large number of virtual machines or clouds.
3. In the Service Manager console, click **Configuration Items**.
4. In the **Tasks** pane, click **Create Folder**.
5. In the Create New Folder Wizard, do the following:
   a. In the **Folder name** box, type a name for the folder. For example, type **Test**.
   b. In the **Management pack** area, make sure that an unsealed management pack of your choice is selected, and then click **OK**. For example, select **Service Catalog Generic Incident Request**.
6. In the **Configuration Items** pane, click the folder you just created. For example, click **Test**.
7. In the **Tasks** pane, click **Create View**.
8. In the Create View Wizard, do the following:
   a. On the **General** page, in the **Name** area, type a name for this view. For example, type **VMMTemplates**.
   b. In the **Management pack** area, make sure that an unsealed management pack of your choice is selected. For example, select **Service Catalog Generic Incident Request**.
   c. In the navigation pane of the wizard, click **Criteria**.
   d. In the **Advanced Search** area, click **Browse**.
   e. In the drop-down list (located to the right of the **Type to filter** box), select **All basic classes**.
   f. In the **Type to filter** box, type **virtual machine template**, click **Virtual Machine Template**, click **OK**, and then click **OK** to save and close the form.
9. In the **Configuration Items** pane, expand the folder you created, and then click the view you created. For example, expand **Test**, and then click **VMMTemplates**
10. In the **VMMTemplates** pane, you will see the Virtual Machine Manager templates that have been created.

How to Synchronize a Virtual Machine Manager Connector

To ensure that the Service Manager database is up to date, the Virtual Machine Manager connector synchronizes with Service Manager on a daily basis. You can use the following procedures in System Center 2012 – Service Manager to synchronize the connector manually and validate that the connector synchronized.

To manually synchronize a Virtual Machine Manager connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Connectors** pane, select the Virtual Machine Manager connector that you want to synchronize.
4. In the **Tasks** pane, under the name of the connector, click **Synchronize Now**.

To validate that a Virtual Machine Manager connector synchronized

1. In the Service Manager console, click **Connectors**.
2. In the **Connectors** pane, examine the start time and finish time to determine when the synchronization process started and finished.

   Note
   Synchronization events are also written to the Event log in the Applications and Services Logs/Operations Manager folder.

How to Disable and Enable a Virtual Machine Manager Connector

You can use the following procedures in System Center 2012 – Service Manager to disable or enable a Virtual Machine Manager connector and validate the status of the connector.

To disable a virtual Machine Manager connector

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Connectors** pane, select the Virtual Machine Manager connector that you want to disable.
4. In the **Tasks** pane, under the connector name, click **Disable**.
5. In the **Disable Connector** dialog box, click **OK**.

To enable a virtual Machine Manager connector

1. In the Service Manager console, click **Administration**, and then click **Connectors**.

2. In the **Connectors** pane, select the Virtual Machine Manager connector that you want to enable.
3. In the **Tasks** pane, under the connector name, click **Enable**.
4. In the **Enable Connector** dialog box, click **OK**.

To validate the status change of a virtual Machine Manager connector

1. In the middle pane, locate the connector for which you have changed status, and then verify the value in the **Enabled** column.

Using a CSV File to Import Data into Service Manager

This section provides an overview and procedures for importing data and configuration items into System Center 2012 – Service Manager by using comma-separated value (CSV) files.

Using a CSV File to Import Data Topics

- About Importing Data from Comma-Separated Files into Service Manager

  Describes the data and format files necessary for importing data from CSV files by using the Import from CSV feature.
- How to Import Configuration Items from a CSV File

  Describes how to import data items contained in a CSV file.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

About Importing Data from Comma-Separated Files into Service Manager

Configuration items contained in a comma-separated value (.csv) file can be imported into the Service Manager database by using the Import from CSV File feature. This feature lets you to bulk-import instances of any class type or projection type that is defined in the Service Manager database. You can use this feature to:

- Create configuration item or work item instances from data stored in a tabular format.
- Bulk-edit existing database instances.
- Populate the Service Manager database by using data exported from an external database.
- Circumvent data entry through forms when many class instances must be created at the same time.

Note

In this release, importing many complex items—for example, 5,000 computer projections—could take an hour or more. During this time, Service Manager continues to function.

Two files are required to import a set of instances by using the Import from CSV File feature:

1. A data file that consists of a series of comma-delimited object instances. The data file must end with the .csv file name extension.
2. A format file that specifies the class type or projection type of the instances present in the data file. Every instance in the data file is assumed to be of this kind. The format file also specifies (1) the subset of properties and, for projections, specifies components. They are being imported for the indicated type, and (2) the order in which those properties appear as columns in the associated data file. The format file must have the same file name as the csv file that it describes, and it must end with the .xml file name extension.

Creating the Data File

For example, you receive a spreadsheet that contains information about computers that you want to import into the Service Manager database. The following is a sample of the first 10 computers in the spreadsheet.

Computer Name	IP Address	Domain Name
WG-Det-1	172.30.14.21	DETROIT
WG-Det-2	172.30.14.22	DETROIT
WG-Det-3	172.30.14.23	DETROIT
WG-Dal-1	172.30.14.24	DALLAS
WG-Dal-2	172.30.14.25	DALLAS
WG-Chi-1	172.30.14.26	CHICAGO
WG-Chi-2	172.30.14.27	CHICAGO
WG-Chi-3	172.30.14.28	CHICAGO
WG-Chi-4	172.30.14.29	CHICAGO
WG-Chi-5	172.30.14.30	CHICAGO

The first step is to convert the data in the table into a .csv file format. In the .csv file, you make the assumption that the first row is data, and not a header. Therefore, you remove the header line from the spreadsheet and save the results as **newcomputers.csv** as in the following example.

```
WG-Det-1, 172.30.14.21, DETROIT

WG-Det-2, 172.30.14.22, DETROIT

WG-Det-3, 172.30.14.23, DETROIT

WG-Dal-1, 172.30.14.24, DALLAS
```

```
WG-Dal-2, 172.30.14.25, DALLAS

WG-Chi-1, 172.30.14.26, CHICAGO

WG-Chi-2, 172.30.14.27, CHICAGO

WG-Chi-3, 172.30.14.28, CHICAGO

WG-Chi-4, 172.30.14.29, CHICAGO

WG-Chi-5, 172.30.14.30, CHICAGO
```

Creating the Format File

A format file is now created that is suited to import the rows that are contained in the **newcomputers.csv** file. The first step in writing the format file is identifying the class type or projection type that must be used for the instances in the .csv file. For more information about class type or projection types, see the blog post Using the CSV import feature and download the file CSVImport.docx.

For the type of data being imported, you find that the **Microsoft.Windows.Computer** class is the best suited for the object type and property set. Start by declaring the class of the object that is being imported:

```
<CSVImportFormat>
   <Class Type=”Microsoft.Windows.Computer”>
      …
   </Class>
</CSVImportFormat>
```

After scanning the list of available properties of the **Microsoft.Windows.Computer** class, select the following properties for each column in the .csv file.

Column 1	Principal Name
Column 2	IPAddress
Column 3	DomainDnsName

By using these properties, you construct the following format file. The properties are listed in the order in which they appear in the .csv file. You must save this file that has the same file name for the .csv file, but with an .xml file name extension.

```
<CSVImportFormat>
   <Class Type="Microsoft.Windows.Computer">
      <Property ID="PrincipalName"/>
      <Property ID="IPAddress"/>
      <Property ID="DomainDnsName"/>
   </Class>
```

```
</CSVImportFormat>
```

Save this file as **newcomputers.xml**.

See Also

How to Import Configuration Items from a CSV File

How to Import Configuration Items from a CSV File

Before you can import data from a comma-separated value (CSV) file in System Center 2012 – Service Manager, you have to create two files: a data file and a format file. For more information about how to create these files, see About Importing Data From Comma-Separated Files into Service Manager. You can use the following procedure to import the Newcomputers.csv file by using the Newcomputers.xml format file.

To import configuration items from a CSV file

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Connectors**.
3. In the **Tasks** pane, click **Import from CSV file**.
4. In the **Import Instances from CSV File** dialog box, do the following:
   a. Next to the **XML format file** box, click **Browse**, and then select the format file. For example, select **Newcomputers.xml**, and then click **Open**.
   b. Next to the **Data file** box, click **Browse**, and then select the data file. For example, select **Newcomputers.csv**, and then click **Open**.
5. In the **Import Instances from CSV File** dialog box, click **Import**.
6. In the **Import Instances from CSV File** dialog box, verify that the numbers next to **Items saved**, **Instances created in memory**, and **Instances committed to database** are equal to the number of rows in the data file, and then click **Close**.

You can use a Windows PowerShell command to complete this task. For information about how to use Windows PowerShell to import configuration items from a CSV file, see Import-SCSMInstance.

To validate the import of configuration items from a CSV file

1. In the Service Manager console, click **Configuration Items**.
2. In the **Configuration Items** pane, expand **Configuration Items**, expand **Computers**, and then click **All Windows Computers**.
3. In the **All Windows Computers** pane, verify that the computers in the CSV file are listed.

Configuration Items in System Center 2012 - Service Manager

Configuration items are a way to store information about services, computers, software, software updates, users and other undefined imported objects in the Service Manager database in System Center 2012 – Service Manager. You can then select configuration items when you submit forms, such as an incident form, a change request form, or a work item form.

A service is a special kind of configuration item that includes both technical and business data. It supports troubleshooting and impact analysis by showing critical dependencies, settings, and areas of responsibility to other configuration items. The key benefit of using services is that you can easily see when incidents affect configuration items because services are viewed as a map, or hierarchy, of items. A service also identifies service owners, key customers, and users. Because a service maps the relationships between configuration items and work items, you should use services to help manage work items.

You can use connectors to import a large number of configuration items from Active Directory Domain Services (AD DS), Microsoft System Center Configuration Manager 2007 Service Pack 1 (SP1), and Operations Manager 2007, or you can manually create single CIs. You can also use the Operations Manager CI connector to import distributed applications in Operations Manager as a service. For more information about importing configuration items, see About Importing Data from System Center Configuration Manager and About Importing Data from Active Directory Domain Services.

Note

When you open a view to display a large number of items—typically, more than 5,000—the view can take a few minutes to display complete results.

Configuration Items Topics

- Creating Configuration Items

  Describes how to manually create configuration items, how to create a server, and how to create a view for imported configuration items.
- Deleting Configuration Items

  Describes the two-step process required to delete configuration items.
- Managing Configuration Items

  Describes how to add, browse, and delete related configuration items and how to manually add a user.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager

- Operations Guide for System Center 2012 – Service Manager

Creating Configuration Items

This section provides an overview of configuration items, describes how to manually create computer configuration items, how to create a service, and how to create a view for imported configuration items in System Center 2012 – Service Manager.

Creating Configuration Item Topics

- About Creating Configuration Items

  Provides an overview of how to create configuration items.
- How to Manually Create Configuration Items

  Describes how to manually create computer configuration items.
- How to Create a Service

  Describes how to manually create a service from configuration items imported from connectors.
- How to Create a View for Imported Configuration Items

  Describes how to create a view to edit and examine configuration items in Service Manager that do not have associated forms.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

About Creating Configuration Items

Configuration items are a way to store information about services, computers, software, software updates, users, and other undefined imported objects in the Service Manager database in System Center 2012 – Service Manager. You can then select configuration items when you submit forms, such as an incident form, a change request form, or a work item form.

A service is a special kind of configuration item that includes both technical and business data. It supports troubleshooting and impact analysis by showing critical dependencies, settings, and areas of responsibility to other configuration items. The key benefit of using services is that you can easily see when incidents affect configuration items because services are viewed as a map, or hierarchy, of items. A service also identifies service owners, key customers, and users. Because a service maps the relationships between configuration items and work items, you should use services to help you manage work items.

You can use connectors to import a large number of configuration items from Active Directory Domain Services (AD DS), Microsoft System Center Configuration Manager 2007 Service Pack 1

(SP1), and Operations Manager 2007, or you can manually create single configuration items. You can also use the Operations Manager CI connector to import distributed applications in Operations Manager as a service. For more information about importing configuration items, see Using Connectors to Import Data into System Center 2012 - Service Manager.

How to Manually Create Configuration Items

You might have to create a configuration item to add computers that do not exist in Active Directory Domain Services (AD DS) and that are not managed by Microsoft System Center Configuration Manager 2007 with Service Pack 1 (SP1) to the System Center 2012 – Service Manager database.

Additionally, you might have to manually create a new user configuration item to be used in the **Affected User** box in incidents created by Operations Manager.

You can use the following procedures to manually create two computer configuration items. However, you can also use the same procedures to add software, printers, or software updates in Service Manager. After you add the two computers, you can identify them as a service.

To manually create a computer configuration item

1. In the Service Manager console, click **Configuration Items**.
2. In the **Configuration Items** pane, expand **Configuration Items**, and then expand **Computers**.
3. Click **All Windows Computers**. In the **Tasks** pane, under **Computers**, click **Create Computer**.
4. In the form that appears, create a configuration item for a computer, such as **Exchange01.woodgrove.com**. On the **General**, **Software**, and **Related Items** tabs, enter information about the computer.
5. Click **OK** to save the new configuration item.
6. Repeat step 3 through step 5 to create a second computer, such as **Exchange02.woodgrove.com**.

To manually create a user configuration item

1. In the Service Manager console, click **Configuration Items**.
2. In the **Configuration Items** pane, expand **Configuration Items**, and then click **Users**.
3. In the **Tasks** pane, under **Users**, click **Create User**.
4. On the **General** tab in the form, follow these steps:
    a. In the **First Name** box, type a first name. For example, for the user account that will be used to populate the **Affected User** box for all incidents created by Operations Manager, type **OMAlert**.
    b. In the **Last Name** box, type a last name. For example, for the user account that will be used to populate the **Affected User** box for all incidents created by Operations Manager, type **User**.
5. On the **Notification** tab, click **Add**, and perform the following for each notification

address that you want to add:

a. In the **User Notification** dialog box, in the **Notification address name** box, type a name you want to use for this notification.
b. In the **Notification address description** box, type a description you want to use for this notification.
c. In the **Delivery address for this notification channel** box, type the address you would use to deliver a notification. Typically, this would be an email address.
d. Click **OK**.

To validate the manually created configuration item

- Verify that the computer you added appears in the **Computers** pane.
- Verify that the user you added appears in the **Users** pane.

How to Create a Service

You can use the following procedures to create a service in System Center 2012 – Service Manager. You should create and define business services that are critical to your enterprise. When you create a service, you create service configuration items, you define their business data, and you define relationships to other configuration items.

In the first procedure, you manually create a service from configuration items that are already present in Service Manager. This is a simple example and requires little other than a few existing configuration items.

In the second procedure, you view an edit a distributed application that was imported from Operations Manager. The prerequisites for this example can be very complex, depending on the distributed applications that you have created in Operations Manager. The following are high-level steps needed to import distributed applications from Operations Manager into Service Manager as services:

1. In Operations Manager, export each management pack that contains a component for your distributed application. Ensure that you export all management pack dependencies.

   Note
   You might need to download management packs or install them from the installation folder of your Operations Manager Root Management Server.
2. In Service Manager, import the management pack that contains the distributed application and its dependences. A new, empty, business service should appear in Business Services in the Configuration Items workspace.
3. Browse to **Administration** and then **Connectors** and ensure that you refresh the list of management packs. Then, synchronize the Operations Manager configuration items connector. When synchronization is complete, the service components appear in the **Configuration Items** workspace under the business service.

Generally, you should construct service maps that are 3-5 levels deep. Components of a service map should vary from 5-20 at each level. However, the total number of components should not exceed few hundred. This recommendation depends on the complexity of the service map, but keeping the number of components lower that a few hundred still provides reasonable response times, as you navigate throughout service map tree view. While the service map tree view expansion is still in progress, even for larger tree structures, the Service Manager console remains responsive. Service maps are not designed to handle a large number of components; as a result, we recommend that you keep your service map tree structures small.

To manually create a service for an IT messaging application

1. In the Service Manager console, click **Configuration Items**.
2. In the **Configuration Items** pane, expand **Configuration Items**, and then expand **Business Services**.
3. Click **All Business Services**, and then in the **Tasks** pane, under **Business Services**, click **Create Service**.
4. In the form that appears, click the **General** tab. In the **Display Name** box, type the name of the service to create. For example, type **IT Messaging Service**.
5. In the **Classification** list, select **E-mail and Communication**. In the **Owned By Organization** box, type the person or organization that provides the service. For example, type **Exchange Team**.
6. In the **Priority** list, select **Medium**. In the **Status** list, select **In Service**.
7. Next to the **Service owner** box, click the ellipsis button (**…**). Select the user who owns the service.
8. Next to the **Service contacts** box, click **Add** to select and add users who are contacts for the service.
9. Next to the **Service customers** box, click **Add** to select and add users who are business unit customers of the service.
10. Next to the **Affected users** box, click **Add** to select and add users or groups who use the service.
11. Click the **Service Components** tab to define the items on which the service depends.
12. Click **Add Category**. In the **Choose Class** dialog box, select **Computers Group**, and then click **OK**.
13. Under **Service Components**, select **ComputersGroup**, and then click **Add Item**.
14. In the **Select Objects** dialog box, under **Filter by class**, select **Computer**. Next, select individual computers to add to the group, and then click **OK**. For example, add **Exchange01.woodgrove.com** and **Exchange02.woodgrove.com**.

    Note

    You can select only one object at a time. Do not attempt to add multiple objects.
15. In the tree, click **Service Components**, and then click **Add Category**. In the **Choose Class** dialog box, select **Other Components Group**, and then click **OK**.
16. In the tree, select **OtherComponentsGroup**, and then click **Add Item**. In the **Select**

Objects dialog box under **Filter by Class List**, select **Services**, and then select **Active Directory Topology Root**. Next, click **OK**.

17. Click the **Service Dependents** tab to define the items that use the service or that are external to the service. For example, define other configuration items or services that use the new service.
18. Click **OK** to save the new configuration item.

To view and edit a distributed application that was imported from Operations Manager

1. In the Service Manager console, click **Configuration Items**.
2. In the **Configuration Items** pane, expand **Configuration Items**, expand **Business Services**, and then click **All Business Services**.
3. In the **All Business Services** pane, click the distributed application that you created in Operations Manager.
4. In the **Tasks** pane, under the title of the distributed application, click **Edit**.
5. In the **Service Maps – <DistributedApplicationName>** dialog box, click the **Service Components** tab to view the items defined in the Operations Manager distributed application. Then, expand the **Service Components** tree three levels.
6. Select any configuration item, and then click **Open** to view or edit its properties.

To view dependent services

1. In the Service Manager console, click **Configuration Items**.
2. In the **Configuration Items** pane, expand **Configuration Items**, expand **Business Services**, and then click **All Business Services**.
3. Select the **<DistributedApplicationName>**. In the **Tasks** pane, under **DistributedApplicationName>**, click **Edit**.
4. In the form that appears, click the **Service Dependents** tab. Services that use the new service are listed. For example, **IT Messaging Service** appears in the list.
5. Click **OK**.

How to Create a View for Imported Configuration Items

You can use the following procedures in System Center 2012 – Service Manager to create a view for imported Microsoft SQL Server database configuration items and then view the items in a dynamically generated form.

You can view and edit items that were imported from a System Center Operations Manager configuration item (CI) connector. However, Service Manager does not have system-defined views or forms for some items. For example, Service Manager does not have a defined view for SQL Server databases, so you must manually create a view to see these configuration items. Although Service Manager does not have a predefined form for SQL Server databases or for

many other objects that you might have imported, you can still view any configuration item in a dynamically generated form (if you created a view for those items).

Before you use these procedures, make sure that you import the SQL Server management packs for Operations Manager 2007 and for Service Manager. Although these procedures rely on SQL Server databases imported from Operations Manager, you can use the same steps to view other imported configuration items that do not have system-defined views or forms.

To create a view for imported SQL Server database configuration items

1. In the Service Manager console, click **Configuration Items**.
2. In the **Configuration Items** pane, expand **Configuration Items**, and then click **All Windows Computers**.
3. In the **Tasks** pane, under **Computers**, click **Create View**.
4. In the **Create View** dialog box, on the **General** page, in the **Name** box, type a name for the new view. For example, type **SQL Server Databases**.
5. In the **Description** box, enter a description of the view you are creating. For example, type **This view displays SQL Server databases from Operations Manager**.
6. Expand the **Criteria** area. Next to **Search for objects of a specific class**, click **Browse**.
7. In the **Select a Class** dialog box, in the **View** list, select **All basic classes**.
8. In the **Search** box, type **SQL**, and then click the search button (blue magnifying glass).
9. In the **Class** list, select **SQL 2008 DB**, and then click **OK**.
10. Click the **Display** tab. In the **Columns to display** list, select **Database Name** and **Database Size (MB) String**, and then click **OK**.
11. Select the **SQL Server Databases** view to see the list of the imported SQL Server databases.

To view and edit imported SQL Server database configuration items

1. Select the **SQL Server Databases** view that you created, and then select any item in the list. Notice that the **Preview** pane shows detailed information about the selected item.
2. Double-click any item in the list to view the item in a dynamically generated form.
3. Optionally, you can edit various fields for the item in the same manner as you do for other configuration items.
4. Optionally, you can perform actions in the **Tasks** list, in the same manner as you do for other configuration items.
5. If you have made any changes to the item, click **OK**; otherwise, click **Cancel** to close the form.

You can use Windows PowerShell commands to display views that are defined in Service Manager. For more information, see Get-SCSMView.

Deleting Configuration Items

Deleting configuration items is a two-step process, and only members of the Advanced Operators, Authors, and Administrators user roles can initiate the Delete process in System Center 2012 – Service Manager. The first step does not delete configuration items directly. Instead, this process changes the property values of a configuration item so that the item will only be displayed in a **Deleted Items** view. The state of the configuration item is changed from Active to Pending Delete. A Service Manager administrator can later log on and permanently delete the configuration item from the Service Manager database.

Deleting Configuration Items Topics

- How to Initiate the Deletion of a Configuration Item

  Describes how to delete a configuration item.
- How to Delete or Restore a Configuration Item

  Describes how to permanently delete a configuration item.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

How to Initiate the Deletion of a Configuration Item

You can use the following procedures to initiate the deletion of a configuration item in System Center 2012 – Service Manager and validate the initiation of the deletion. Only users who are members of the Advanced Operators, Authors, or Administrators user role can initiate the deletion of a configuration item. Only users who are members of the Administrators user role can complete the deletion of a configuration item.

To initiate the deletion of a configuration item

1. Log on to a computer that hosts the Service Manager console by using a user account that is a member of the Advanced Operators, Authors, or Administrators user role.
2. In the Service Manager console, click **Configuration Items**.
3. In the **Configuration Items** pane, expand **Configuration Items**, expand **Computers**, and then click **All Windows Computers**.
4. In the **All Windows Computers** pane, click the computer to be deleted.
5. In the **Tasks** pane, under the name of the computer that you selected in the previous step, click **Delete**.
6. In the **Delete Item** dialog box, confirm your selection, and then click **Yes**.

To validate that the deletion of a configuration item has been initiated

1. In the Service Manager console, click **View**, and then click **Refresh**. Or, press F5.
2. Verify that the configuration item you selected is no longer displayed.

Note
At this point, the configuration item has been moved to a **Deleted Item** view that is only available to members of the Administrator user role. An administrator must permanently delete the configuration item.

You can use Windows PowerShell commands to complete these tasks, as follows:

- For information about how to use Windows PowerShell to initiate the deletion of a configuration item by updating the `PendingDelete` property value, see Update-SCSMClassInstance.
- For information about how to use Windows PowerShell to retrieve items that have been marked for deletion in Service Manager, see Get-SCSMDeleteditem.

See Also

How to Delete or Restore a Configuration Item

How to Delete or Restore a Configuration Item

After members of the Advanced Operators, Authors, or Administrators user roles have initiated the deletion of a configuration item, a System Center 2012 – Service Manager administrator can use the following procedures to either permanently delete the configuration item or to restore the original properties for this item. You may need to refresh the Service Manager console to update the list of configuration items.

To complete the deletion of a configuration item

1. Log on to a computer that hosts the Service Manager console by using a user account that is a member of the Administrators user role.
2. In the Service Manager console, click **Administration**.
3. In the **Administration** pane, expand **Administration**, and then click **Deleted Items**.
4. In the **Deleted Items** pane, click the configuration items that you want to permanently delete. You can use the CTRL or SHIFT keys to select multiple configuration items.
5. In the **Tasks** pane, click **Remove Items**.

Note
For this release, if you are logged in as an administrator, you will see three options in the **Tasks** pane under the name of the computer: **Delete**, **Remove Items**, and **Restore Items**. In the **Deleted Items** view, select only **Remove Items** or **Restore Items**.

6. In the **System Center Service Manager** dialog box, make sure you selected the correct

items, and then click **Yes**.

To restore a configuration item

1. Log on to a computer that hosts the Service Manager console by using a user account that is a member of the Administrators user role.
2. In the Service Manager console, click **Administration**.
3. In the **Administration** pane, expand **Administration**, and then click **Deleted Items**.
4. In the **Deleted Items** pane, click the configuration items that you want to restore to the Service Manager database. You can use the CTRL or SHIFT keys to select multiple configuration items.
5. In the **Tasks** pane, click **Restore Items**.

   Note
   For this release, if you are logged in as an administrator, you will see three options in the **Tasks** pane under the name of the computer: **Delete**, **Remove Items**, and **Restore Items**. In the **Deleted Items** view, select only **Remove Items** or **Restore Items**.
6. In the **Delete Item** dialog box, make sure that you selected the correct items, and then click **Yes**.

You can use Windows PowerShell commands to complete these tasks, as follows:

- For information about how to use Windows PowerShell to permanently remove an instance of a configuration item object, see Remove-SCSMClassInstance.
- For information about how to use Windows PowerShell to restore items that were previously marked for deletion in Service Manager, see Restore-SCSMDeleteItem.

See Also

How to Initiate the Deletion of a Configuration Item

Managing Configuration Items

You might want to associate the work item to apply the Microsoft Exchange Server 2010 with Service Pack 1 (SP1) update to the service that represents the computers that are affected by the email incident. To accomplish this, you can update the service configuration item and then add the respective work item as a related item.

Managing Configuration Item Topics

- How to Add, View, or Remove Related Configuration Item Information

  Describes how to add, browse, or delete related configuration item information.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager

- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

How to Add, View, or Remove Related Configuration Item Information

You can use the following procedures to add information, such as related work items or files, to configuration items in System Center 2012 – Service Manager. The procedures in this topic describe only how to add items, but you can follow similar steps to view or remove items.

For example, when you are troubleshooting an incident, you might discover that a relationship exists between two or more objects. A work item to apply an application service pack might be related to more than one configuration item. You might need to update the configuration items to reflect that relationship.

Similarly, work items such as incidents, problems, and change requests are often interrelated. Related work items share some commonality with each other or with a configuration item. When a work item affects a particular configuration item, they are linked.

To add information to configuration items

1. In the Service Manager console, click **Configuration Items**.
2. In the **Configuration Items** pane, expand **Configuration Items**, and then expand **Computers**.
3. Click **All Windows Computers**. In the **All Windows Computers** pane, double-click the computer to which you want to add information.
4. In the computer form, click the **Related Items** tab.

To add related services, people, and configuration items

a. In the **Configuration Items: Computers, Services, and People** area, click **Add**.
b. In the **Select Objects** dialog box, select a class from the **Filter by class** list to narrow the choices available in the **Available objects** list.
c. In the **Available objects** list, select the items that you want to add, and then click **Add**.
d. Click **OK** to close the dialog box and to add the selected items.

To add related work items

a. In the **Related work items** area, click **Add**.
b. In the **Select Objects** dialog box, select a class from the **Filter by class** list to narrow the choices available in the **Available objects** list.
c. In the **Available objects** list, select the work items that you want to add, and then click **Add**.

d. Click **OK** to close the dialog box and to add the selected work items.

To attach files

a. In the **Attached files** area, click **Add**.
b. In the **Open** dialog box, select the file that you want to add, and then click **Open**.
c. In this release, do not attempt to open an attached file before you submit the form.

5. Click **OK** to save the form.

Configuring Incident Management in System Center 2012 - Service Manager

This section provides an overview of how to configure incident management in System Center 2012 – Service Manager. This section also contains procedures that cover incident management configuration scenarios, including configuring incident settings, configuring email incident support, and creating an incident template.

Configuring Incident Management Topics

- About Configuring Incident Management in Service Manager

  Provides an overview of how to configure incident management.
- How to Set File Attachment Limits

  Describes how to set the number of files and the size of a file that can be attached to an incident.
- How to Set Parent Incident Options

  Describes how to set parent and child default actions for automatic resolution, automatic reactivation, and automatic incident status updates.
- How to Set Incident Priority

  Describes how to define the incident priority based on impact and urgency.
- How to Set Resolution Time

  Describes how to define the incident resolution time based on incident priority.
- How to Set Operations Manager Web Settings

  Describes how to specify the URL that Service Manager uses to connect to the Operations Manager 2007 web console.
- How to Configure Your Infrastructure for Email Incident Support With Exchange Server 2007

Describes how to configure Exchange Server 2007 and Simple Mail Transfer Protocol (SMTP) to let users submit incidents by sending email.

- How to Configure Your Infrastructure for Email Incident Support With Exchange Server 2007

  Describes how to configure Exchange Server 2010 and Simple Mail Transfer Protocol (SMTP) to let users submit incidents by sending email.

- How to Create Incident Templates

  Describes how to create a template that is used when you create incidents.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

About Configuring Incident Management in Service Manager

Several features in System Center 2012 – Service Manager let you streamline the creation of incidents. You can configure incident settings such as the following in Service Manager:

- Priority calculations that are based on impact and urgency
- Target resolution time
- Prefixes that are used for incident numbers
- Length of time a closed incident remains in the Service Manager database

You can create an incident template to populate certain fields for a specified incident type, such as email-related problems. Help desk personnel use templates when creating incidents. The template prepopulates some of the fields in the incident, such as the name of the support analyst who handles email-related problems.

You can configure incident management to automatically generate incidents based on desired configuration management for configuration items that are not in compliance. This works only if Microsoft System Center Configuration Manager 2007 Service Pack 1 (SP1) with desired configuration management baselines is installed in your environment.

The procedures in this section describe how to configure incidents. You can define incident priority based on impact and urgency, specify resolution times based on incident priority, create an incident template, and create a new incident based on desired configuration management.

Configuring Incident Settings

You can use the procedures in this section to configure settings for incident number prefixes, file attachment limits, incident priority calculations, resolution times, and System Center Operations Manager Web settings.

In System Center 2012 – Service Manager, all incident numbers start with "IR". However, you can change the prefix that is used for your incident numbers.

The policy at your organization might limit the number of files that can be attached to each incident to no more than five and to limit the maximum file size for each file at 500 kilobytes (KB).

Note

The maximum number of attached files and maximum file size settings that you configure also apply to the attached files in the **Related Items** tab for configuration items.

Incident priority calculation is rated on a scale from 1 to 9. A priority of 1 is the highest priority. It is based on a combination of impact and urgency. Impact and urgency settings are defined as High, Medium, or Low, and they are configured when the incident is created. The following table shows how to define the incident priority for each possible combination of impact and urgency.

Priority Calculation Table

		Impact		
		Low	Medium	High
Urgency	Low	9	8	7
	Medium	6	5	4
	High	3	2	1

The resolution time defines how much time it should take to resolve an incident. Resolution time is based on priority. Typically, you should set resolution times for higher-priority incidents. The procedures in this section describe how to set the values for file attachments, incident priority, and resolution time.

You can create a connector to import alerts and configuration items from Operations Manager. By using the Operations Manager alert connector, Service Manager can create incidents based on alerts. When you view these incidents in Service Manager, you can click a link to obtain more information about the alert or about the health state of the configuration item. Service Manager uses the Operations Manager Web console server to provide this information. Service Manager uses the URL that you specify in the Operations Manager Web setting to connect to Operations Manager.

Creating an Incident Template

You can use the procedures in this section to create incident templates in System Center 2012 – Service Manager for problems that are, for example, related to email and printers.

When an analyst at the help desk receives a call, there are many pieces of information that the analyst must gather to create an incident, such as a summary of the problem; the name of the user to whom the incident will be assigned; the impact; the urgency; and whether this is a Tier 1, 2, or 3 incident. For some systems in the enterprise, this information might already be known.

For example, if a problem occurs with the e-mail system, the incident is classified as high-impact and high-urgency, handled at a Tier 2 level, and assigned to a specific analyst. You can create an

incident template that, when it is applied to a new incident form, populates many fields in the new incident. This reduces the required time to create an incident, and it ensures accuracy and consistency.

Incident templates are also used as part of the Incident Change workflow. For example, your company might have determined that if the urgency of a printer-related problem changes from Low to High, that incident should automatically be elevated to the Tier 2 level.

You can use the procedures in this section to create two incident templates, one to create email-related incidents and another to use with the Incident Change workflow for printer-related problems.

Configuring Incident Support Through Email

Instead of placing a call to the help desk, your end-users can submit incidents by sending an email message to a dedicated email address. Several email addresses can be used, one for hardware, one for software, and one for printers. For example, when a message is sent to Helpdesk@Helpdesk.Woodgrove.com, Microsoft Exchange Server copies the message to a "drop folder" on the computer that is hosting an SMTP Server service. Service Manager monitors this share and processes the message into an incident. Service Manager parses the **From** address and attempts to match the user in the Service Manager database. If Service Manager cannot find the user in the Service Manager database, the message is moved into a "bad folder", and no incident is created. An administrator monitors the "bad folder".

The infrastructure that is required to handle incidents generated by email includes an existing server running Exchange Server or an SMTP Server and a new server that runs the SMTP service for Service Manager. For this new server, use Internet Information Services (IIS) 6.0 SMTP services (which is included with Windows Server 2008) on either the computer that is hosting the Service Manager management server or on a separate remote server.

Delegate one of the existing servers that is running Exchange Server or SMTP Server in your enterprise to route all email messages addressed to the help desk, and then configure the IIS SMTP service for use with Service Manager. Providing precise instructions for various versions of Exchange Server or SMTP Service is beyond the scope of this guide. For more information about how to set up Simple Mail Transfer Protocol (SMTP) domains for incoming and relay email, see article 260973 in the Microsoft Knowledge Base.

How to Set File Attachment Limits

Use the following procedure to limit the number and size of files that can be attached to an incident in System Center 2012 – Service Manager. In this example, set the maximum number of files to 5 and the maximum file size to 500 kilobytes (KB).

To set file attachment limits

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Settings**.

3. In the **Settings** pane, click **Incident Settings**.
4. In the **Tasks** pane, under **Incident Settings**, click **Properties**.
5. In the **Incident Settings** dialog box, click **General**.
6. Set **Maximum number of attached files** to **5**.
7. Set **Maximum size (KB)** to **500**, and then click **OK**.

To validate file attachment limits

- When you create a new incident or edit an existing one, no more than five files can be attached, and each file can be no larger than 500 KB.

How to Set Parent Incident Options

Use the following procedure to set default options for parent and child incidents in System Center 2012 – Service Manager. The default options determine whether child incidents automatically resolve, whether child incidents automatically activate, and whether child incident status automatically updates.

When choosing to automatically resolve child incidents or automatically reactivate child incidents when its parent is resolved or when its parent is reactivated, you can prompt the resolving analyst for their decision. When prompted, an analyst can choose a resolution category or activation status. Otherwise, when incidents are automatically resolved or activated, the analyst is not prompted and the changes are effectively immediately using the parent incident settings.

To automatically resolve child incidents

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Settings**.
3. In the **Settings** pane, click **Incident Settings**.
4. In the **Tasks** pane, under **Incident Settings**, click **Properties**.
5. In the **Incident Settings** dialog box, click **Parent Incident** and then choose one of the following actions:
   - If you want to automatically resolve a child incident when its parent is resolved without any analyst interaction, set **Auto resolution of child incidents** to **Automatically resolve child incidents when parent incident is resolved**, and then choose either **Same as parent incident category** or **Choose a child incident category** and a default resolution category.
   - If you want to automatically resolve a child incident when its parent is resolved and have an analyst review and verify the incident resolution category, select **Auto resolution of child incidents** to **Let the analyst decide when resolve the parent incident** and then choose either **Same as parent incident category** or **Choose a child incident category** and a default resolution category.
   - If you do not want child incidents to automatically resolve, select **Auto resolution of**

child incidents to **Do not resolve child incidents when parent incident is resolved**.

6. Click **OK**.

To automatically activate child incidents

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Settings**.
3. In the **Settings** pane, click **Incident Settings**.
4. In the **Tasks** pane, under **Incident Settings**, click **Properties**.
5. In the **Incident Settings** dialog box, click **Parent Incident**, and then choose one of the following actions:
   - If you want to automatically activate a child incident when its parent is activated without any analyst interaction, set **Auto reactivation of child incidents** to **Automatically reactivate child incidents when parent incident is reactivated**, and then choose a default reactivation status.
   - If you want to automatically resolve a child incident when its parent is resolved and have an analyst review and verify the incident reactivation status, select **Auto reactivation of child incidents** to **Automatically reactivate child incidents when parent incident is reactivated**, and then choose a default reactivation status.
   - If you do not want to automatically activate child incidents, set **Auto reactivation of child incidents** to **Do not reactivate child incidents when parent incident is reactivated**.
6. Click **OK**.

To automatically update child incident status

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Settings**.
3. In the **Settings** pane, click **Incident Settings**.
4. In the **Tasks** pane, under **Incident Settings**, click **Properties**.
5. In the **Incident Settings** dialog box, click **Parent Incident**, and then choose one of the following actions:
   - If you want to automatically update child incident status when it is linked to a parent incident, set **Status of active child incidents when linked to parent** to **Automatically change the status of active child incidents when linking to parent**, and then choose an available incident status.
   - If you do not want to automatically update child incident status, set **Status of active child incidents when linked to parent** to **Do not change the status of child incidents**.
6. Click **OK**.

How to Set Incident Priority

Use the following procedure in System Center 2012 – Service Manager to define a priority calculation table based on impact and urgency settings that are defined during the creation of an incident.

To set incident priority

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Settings**.
3. In the **Settings** pane, click **Incident Settings**.
4. In the **Tasks** pane, under **Incident Settings**, click **Properties**.
5. In the **Incident Settings** dialog box, select **Priority Calculation**.
6. For each of the High, Medium, and Low settings for both impact and urgency, select an incident priority value from 1 through 9, and then click **OK**.

To validate incident priority

- When you create a new incident or edit an existing one, the resulting priority setting must match the value that is entered in the table for a specific High, Medium, and Low setting that is defined for impact and urgency.

How to Set Resolution Time

Use the following procedure to set a resolution time based on incident priority in System Center 2012 – Service Manager.

To set resolution time

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Settings**.
3. In the **Settings** pane, click **Incident Settings**.
4. In the **Tasks** pane, under **Incident Settings**, click **Properties**.
5. In the **Incident Settings** dialog box, select **Resolution Time**.
6. For each of the priority settings of 1 through 9, specify the amount of time for incident resolution.
7. Click **OK**.

To validate resolution time

- When you create a new incident or edit an existing one, the resulting resolution times for an incident matches the values that are defined in the preceding procedures.

How to Set Operations Manager Web Settings

Use the following procedures to set the web settings of System Center Operations Manager 2007 in System Center 2012 – Service Manager and validate the settings.

To set Operations Manager web settings

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Settings**.
3. In the **Settings** pane, click **Incident Settings**.
4. In the **Tasks** pane, under **Incident Settings**, click **Properties**.
5. In the **Incident Settings** dialog box, click **Operations Manager Web Settings**.
6. In the **Web Console URL** box, type the URL of the Operations Manager 2007 web console server, and then click **OK**. For example, type **http://<servername>:51908**, where <servername> is the name of the computer hosting the web console server.

To validate Operations Manager web settings

- Make sure that you can access the web console server by entering **http://<servername>:51908** into your browser, where <servername> is the name of the computer hosting the web console server.

How to Configure Your Infrastructure for Email Incident Support With Exchange Server 2007

Use the following procedures to configure your infrastructure to support the creation of incidents through email.

To configure Exchange 2007 to route email messages

1. Open the **Exchange Management** console.
2. Expand **Organization Configuration**, and then click **Hub Transports**.
3. In the **Hub Transport** pane, click **Accepted Domain**.
4. In the **Actions** pane, click **New Accepted Domains**.
5. In the **New Accepted Domains** dialog box, create a new accepted domain of the type **Internal Relay**. In this example, you might specify the domain as ***.Helpdesk.Woodgrove.com**.
6. In the **Hub Transport** pane, click **Send Connectors**.
7. In the **Actions** pane, click **New Send Connector**.
8. In the New SMTP Send Connector Wizard, create a new send connector by using the following information:
   a. Address space = *.Helpdesk.Woodgrove.com
   b. Add Smart Host by using the IP address of the computer that will host the SMTP

Server service defined in the following procedure.

c. Set **smart host authentication settings** to **None**.

To configure the IIS SMTP Server service for Service Manager

1. On the computer that will host the SMTP Server service, on the taskbar, click **Start**, point to **Programs**, point to **Administrative Tools**, and then click **Internet Information Services (IIS) 6.0 Manager**.
2. Right-click the **Local Computer** node, click **New**, and then click **SMTP Virtual Server**.
3. In the New SMTP Virtual Server Wizard, in the **Name** box, type the name for the Simple Mail Transfer Protocol (SMTP) server, and then click **Next**. For example, type **Helpdesk.Woodgrove.com**.
4. On the **Select IP Address** page, click the drop-down list and select the IP address of the computer that is hosting the SMTP Server, and then click **Next**.
5. On the **Select Home Directory** page, click **Browse**, and then click the folder for your home directory. For example, select **C:\inetpub\mailroot**. You will create a share for this folder in the next procedure.
6. On the **Default Domain** page, type the domain name for this virtual SMTP server, and then click **Finish**. The domain name that you enter must match the domain name from step 3 in the previous procedure. For example, type **Helpdesk.Woodgrove.com**.

To create a share for the mail root folder

1. On the taskbar, click **Start**, and then click **Explore**.
2. In Windows Explorer, browse to the folder that you specified as the home directory in step 5 from the previous procedure. For example, browse to **C:\Inetpub\Mailroot**. If needed, create two subfolders, **Badmail** and **Drop**.
3. Right-click the home folder, and then click **Share**.
4. In the **File Sharing** dialog box, select the domain user that you specified for the Service Manager account, click **Contributor**, click **Share**, and then click **Done**.
5. Make sure that the **Simple Mail Transfer Protocol (SMTP)** service is set to **Automatic** and has started.

To configure incoming Email settings in Service Manager

1. In the Service Manager console, select **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Settings**.
3. In the **Settings** pane, double-click **Incident Settings**.
4. In the **Incident Settings** dialog box, click **Incoming E-mail**.
5. In the **SMTP Service drop folder location** box, type the path, share, and folder to the Drop folder. In this example, type **\\<computer_name>\mailroot\Drop**, where <computer_name> is the name of the computer that is hosting the SMTP Server service, Mailroot is the share name, and Drop is the subfolder.
6. In the **SMTP Service bad folder location** box, type the path, share, and folder to the

Badmail folder. In this example, type **\\<computer_name>\Mailroot\Badmail**, where <computer_name> is the name of the computer that is hosting the SMTP Server service, Mailroot is the share name, and Badmail is the subfolder.

7. In the **Maximum number of e-mails to process at a time** box, enter a number for the email messages that you want Service Manager to process during an email processing cycle.
8. Select the **Turn on incoming e-mails processing** check box, and then click **OK**.

How to Create Incident Templates

Use the following procedures to create two incident templates in System Center 2012 – Service Manager. The first you use to create email-related incidents, and the second you use with the Incident Change workflow for printer-related problems.

To create an email-related incident template

1. In the Service Manager console, click **Library**.
2. In the **Library** pane, expand **Library**, and then click **Templates**.
3. In the **Tasks** pane, in the **Templates** area, click **Create Template**.
4. In the **Create Template** dialog box, complete these steps:
   a. In the **Name** box, type a name for the incident template. For example, type **E-mail Incident**.
   b. In the **Description** box, type a description for the incident template. For example, type **Use this template to start all email-related incidents**.
   c. Click **Browse** to choose a class.
   d. In the **Choose Class** dialog box, click **Incident**, and then click **OK**.
   e. In the **Management Pack** list, select **Service Manager Incident Management Configuration Library**, and then click **OK**.
5. In the incident template form, complete these steps:
   a. Leave the **Affected user** box empty.
   b. Leave the **Alternate contact information** box empty. Alternate contact information for the affected user is entered when the incident is created.
   c. In the **Title** box, type a title for the template. Or, type a preface, such as **Email:**.
   d. In the **Classification Category** box, select the category that reflects the problem to report. For example, select **E-mail Problems**.
   e. Leave the **Source** box empty. The **Source** box is automatically populated when the incident is created.
   f. In the **Impact** box, select a value. For example, select **High**.

      In the **Urgency** box, select a value. For example, select **High**.
   g. In the **Support Group** box, select a tier. For example, if you want all email-related issues to be assigned to the tier 2 support group, select **Tier 2**.

h. Click **OK**.

To create a new printer-related incident template

1. In the Service Manager console, click **Library**.
2. In the **Library** pane, expand **Library**, and then click **Templates**.
3. In the **Tasks** pane, click **Create Template**.
4. In the **Create Template** dialog box, complete these steps:
   a. In the **Name** box, type a name for the incident template. For example, type **Escalate Printer Problems to Tier 2**.
   b. In the **Description** box, type a description for the incident template. For example, type **Use this template to assign high-urgency printer-related problems to tier 2**.
   c. Click **Browse** to choose a class.
   d. In the **Choose Class** dialog box, click **Incident**, and then click **OK**.
   e. In the **Management Pack** list, select **Service Manager Incident Management Configuration Library**, and then click **OK**.
5. In the incident template form, follow these steps:
   a. In the **Support Group** box, select a tier. For example, if you want all printer-related issues to be assigned to the tier 2 support group, select **Tier 2**.
   b. Click **OK**.
   c. Press F5 to refresh the **Templates** pane.

To validate that the new incident template was created

- Verify that the new incident templates are listed in the **Templates** pane.

How to Configure Your Infrastructure for Email Incident Support with Exchange Server 2010

Use the following procedures to configure your Microsoft Exchange Server 2010 infrastructure to support the creation of incidents through email.

To install and configure the SMTP server

1. Log on with administrative credentials on the server that will host the Simple Mail Transfer Protocol (SMTP) server role.

   Note
   A server running Exchange Server 2010 cannot be your SMTP server.
2. Click **Start**, navigate to **All Programs**, **Administrative Tools**, and then click **Server Manager**.
3. In Server Manager, click **Features**, and in the **Features** pane, click **Add Features**.

4. In the **Select Feature** window, click **SMTP Server**.
5. The Add Features Wizard appears. If the dependent role services are not already selected, you are prompted to add role services and features for the SMTP server. Click **Add Required Role Services**.
6. On the **Select Features** page, click **Next**.
7. On the **Web Server (IIS)** page, click **Next**.
8. On the **Select Role Service** page, click **Next**.
9. On the **Confirm Installation Selections** page, click **Install**.
10. When the **Installation Results** page appears, click **Close** to exit the wizard.

To configure the IIS SMTP server service for Service Manager

1. On the server that is hosting the SMTP server service, open **Administrative Tools**, and then click **Internet Information Services (IIS) 6.0 Manager**.
2. Expand the SMTP server until you see **SMTP Virtual Server #1**. The SMTP server might have a different name, but it appears with an email icon.
3. Right-click **SMTP Virtual Server #1**, click **Rename**, and then type the name of your server.
4. Expand **Domains**, and then rename the domain to the fully qualified domain name (FQDN) of the server or the domain name that you want to use.

   Note
   This cannot be the same domain that the server is a member of. However, it can be a child domain.

   For example, if the domain name is contoso.com, you use a server name that resembles server.contoso.com.
5. Using the server name from step 3, right-click the server name, and then click **Properties**.
6. Click the **Access** tab, and then click **Relay**.
7. On the **Relay Restrictions** tab, click **All except the list below**, click **Allow all computers which successfully authenticate to relay regardless of the list above**, and then click **OK**.
8. Click the **Delivery** tab, and then click **Advanced**.
9. In the **Advanced Delivery** window, type the values as shown here:
   a. For **Masquerade Domain**, type your root domain name, for example, **contoso.com**.
   b. For the FQDN, type your Exchange server name, for example, **exchange.contoso.com**.
   c. For **Smart host**, type your Exchange server name, for example, **exchange.contoso.com**.
   d. Click **OK**, and then click **OK** again to close the **Advanced Delivery** window.
10. Close IIS 6.0 Manager, open Windows Explorer, and navigate to <SystemDrive>:\Inetpub\Mailroot.

11. Create two child folders. Name the first folder **Badmail**, and name the second folder **Drop**.
12. Right-click the <SystemDrive>:\Inetpub\Mailroot folder, and then click **Share**.
13. For sharing permissions, select the domain user that you specified for the Service Manager account, click **Contributor**, click **Share**, and then click **Done**.
14. Restart the Simple Mail Transfer Protocol (SMTP) service, ensure that it is set to **Automatic**, and verify that it has started.

To configure Service Manager for email

1. Open the Service Manager console, and then select **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Settings**.
3. In the **Settings** pane, double-click **Incident Settings**.
4. Scroll to **Incoming E-mail**.
5. In **The SMTP Service drop folder location**, type the path, share, and folder for the Drop folder. In this example, type **\\<computer_name>\mailroot\Drop**, where **<computer_name>** is the name of the computer that is hosting the SMTP Server service, **Mailroot** is the share name, and **Drop** is the subfolder name.
6. In **SMTP Service bad folder location**, type the path, share, and folder to the Badmail folder. In this example, type **\\<computer_name>\Mailroot\Badmail** where **<computer_name>** is the name of the computer that is hosting the SMTP Server service, **Mailroot** is the share name, and **Badmail** is the subfolder name.
7. In **Maximum number of e-mails to process at a time**, type a number for the emails that you want Service Manager to process during an email processing cycle.
8. Select **Turn on incoming e-mails processing**, and then click **OK**.

To configure email notifications

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Notifications**, and then click **Channels**.
3. In the **Channels** pane, click **E-Mail Notification Channel**.
4. In the **Tasks** pane, under **E-Mail Notification Channel**, click **Properties** to open the **Configure E-Mail Notification Channel** dialog box.
5. Click **Enable e-mail notifications**, and then click **Add**.
6. In the **Add SMTP Server** dialog box, type the FQDN of the SMTP server that you want to use. For example, type **Servername.domain.com**.
7. In **Port number**, type or select the SMTP port number that you want to use. For example, select **25**.
8. Click **Add**, and in the **Add SMTP Server** dialog box, type the FQDN of the SMTP server that you want to use. For example, type **Exchange.domain.com**, and replace the information with your Exchange domain name information.
9. In **Port number**, type or select the SMTP port number that you want to use. For example, select **25**.

10. In **Authentication method**, click **Anonymous**, and then click **OK**.
11. In **Return e-mail address**, type the email address of the service account that was used during Setup. For example, type **Helpdek@Servername.domain.com**.
12. In **Retry primary after**, type or select the number of seconds that you want Service Manager to wait before trying to resend outgoing email notifications. For example, select **25**.
13. Click **OK** to close the dialog box.

To validate email notification configuration

1. In the **Channels** pane, **click E-Mail Notification Channel**.
2. In the **Tasks** pane, under **E-Mail Notification Channel**, click **Configure** to open the **Configure E-Mail Notification Channel** dialog box.
3. Confirm that the configuration you entered is correct.

Configuring Exchange 2010 for use with Service Manager

In the following procedures, you configure Exchange 2010 for use with Service Manager. You perform these procedures on the server that hosts Exchange Server 2012.

To configure the Organization Hub Transport

1. In Exchange Server, click **Organization Configuration**, and then click **Hub Transport**.
2. In the **Hub Transport** window, click the **Accepted Domains** tab.
3. In the **Actions** pane, click **New Accepted Domain**.
4. In the New Accepted Domain Wizard, on the **New Accepted Domain** page, in the **Name** box, type a descriptive name. For example, type **From SMTP Server**, and in **Accepted Domain**, type the SMTP domain name that you created for Service Manager. For example, type ***.Servername.domain.com**.
5. Click **Authoritative Domain**, and then click **New**.

To configure the Server Configuration Hub Transport

1. In Exchange Server, navigate to **Server Configuration**, and then click **Hub Transport**.
2. In the **Actions** pane, click **New Receive Connector** to open the New Receive Connector Wizard.
3. In **Name**, type a name that identifies the Service Manager SMTP server, select **Custom** for the intended use, and then click **Next**.
4. On the **Local Network Settings** page, accept the default value, leave the **FQDN** box empty, and then click **Next**.
5. On the **Remote Network Settings** page, remove the existing IP address, type the IP address of your Service Manager SMTP server, and then click **Next**.
6. On the **New Connector** page, click **New** to complete the wizard.
7. Double-click the newly created **Receive Connector** to open its properties, click the

Authentication tab, and then clear any items that are selected.

8. Click the **Permissions Groups** tab, click **only Anonymous users**, and then click **OK**.
9. To grant relay permission to anonymous connections on the new receive connector, open **Exchange Management Shell**, type the following, and then press ENTER:

```
Get-ReceiveConnector "Anonymous Relay" | Add-ADPermission -
User "NT AUTHORITY\ANONYMOUS LOGON" -ExtendedRights "Ms-Exch-
SMTP-Accept-Any-Recipient"
```

10. Close Windows PowerShell.

To configure the mail contact in Exchange

1. In Exchange Server, navigate to **Recipient Configuration**, and then click **Mail Contact**.
2. In the **Action** pane, click **New Mail Contact**.
3. In the New Mail Contact Wizard, click **New contact**, and then click **Next**.
4. In **Name**, type the name that you want to use as the Service Manager return email address, without @domain.com. For example, type **Helpdesk**.
5. In **Alias**, type the name that you want users to use as the **Email Alias** name. For example, type **Helpdesk**.
6. Edit the **External e-mail address**, and type the FQDN for the email address. For example, type **helpdesk@server.domain.com**.
7. Click **Next**, and then click **New** to complete the wizard.

To test email functionality between the SMTP server and the Exchange server

1. Using Windows Explorer on the SMTP server, create a new text file named **TESTEMAIL**.
2. Remove the TXT file name extension from the new file.
3. Right-click the TESTMAIL file, and then click **Open**.
4. When you are prompted to open the file with a program, click **Notepad**, and then click **OK**.
5. In the file, type the following using your own information, similar to the following example:

```
to:username@domain.com
from:Helpdesk@servername.domain.com
Subject:This is an email test.
This is a test
```

6. Save the file without a file name extension, and then close Notepad.
7. Copy the file to a location where you can use it in the future for testing.
8. Copy the file into the <SystemDrive>:\inetpub\mailroot\Pickup folder.

Note
The file should be removed automatically. This indicates that the Exchange

server is using it.

9. Using the user credentials for the **To** recipient that you typed previously, open Outlook and confirm that the email was received.

Configuring Service Level Management in System Center 2012 - Service Manager

This section provides an overview of how to configure service level management in System Center 2012 – Service Manager. This section also contains procedures that cover service level management configuration scenarios.

Configuring Service Level Management Topics

- About Service Level Management

  Provides an overview of how to configure service level management.
- How to Create a Calendar Item

  Describes how to create a calendar item used by a service level objective.
- How to Edit a Calendar Item

  Describes how to edit a calendar item used by a service level objective.
- How to Create SLA Metrics

  Describes how to create a service level metric used by a service level objective.
- How to Edit SLA Metrics

  Describes how to edit a service level metric used by a service level objective.
- How to Modify an SLA Metric View

  Describes how to modify a SLA metric view to customize for your preference.
- How to Create a Service Level Objective

  Describes how to create a service level objective used by incidents and service requests to measure their timeliness.
- How to Edit a Service Level Objective

  Describes how to edit a service level objective used by incidents and service requests to measure their timeliness.
- How to View SLA Information in an Incident Form

  Describes how to view incident SLA information to determine whether the incidents are near breaching or have already breached.
- How to Review Incidents with SLA Information

  Describes how to view incidents that have a service level objective associated with them.
- How to Send SLA Notification Information to the Assigned-To User

Describes how to send periodic notifications to analysts responsible for incidents when each incident is within the warning period of its service level objective.

- How to Reactivate Incidents with SLA Information

  Describes how to reactivate resolved incidents that have an associated service level objective.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

About Service Level Management

Service level management is the process that you use to measure incident and service request timeliness. In System Center 2012 – Service Manager, you create a service level item that consist of queues that correspond to each service level, plus time metrics to measure and warn for. Separately, you can also send notifications to users that occur before and after service level breach. In the Service Manager console, you manage this process in the Administration workspace using the following nodes:

- Calendar
- Metric
- Service Level Objectives

Calendar

The Calendar node is used to define work days, work hours, and holidays as a calendar item in the Service Manager console. Each calendar item is a distinct work schedule that represents time available for analysts to resolve incidents and fulfill service requests. Calendar items correspond to at least one service level objective where it is measured by a time metric, such as resolution time.

Metric

The Metric node is used to define time metrics against a calendar item, corresponding to a service level objective. A time metric is the measurement between start and end dates. There are two predefined metrics in Service Manager:

- Resolution Time
- Completion Time

The Resolution Time metric is used to measure the maximum length of time that incidents should take before they are resolved. By default, the two points in time that define Resolution Time are

the start date as the date and time that each incident is created and the end date as the date and time that each incident is resolved.

The Completion Time metric is used to measure the maximum length of time that service requests should take before they are completed. By default, the two points in time that define Completion Time are the start date as the date and time that each service request is created and the end date as the date and time that each service request is completed.

Service Level Objectives

The Service Level Objectives node is used to create relationships between a queue and a service level. It is also used to define the relationship between a calendar item and a time metric. Separately, you can also send notifications to users that occur before and after service level breach. For more information about sending notifications, see How to Send SLA Notification Information to the Assigned-To User.

See Also

How to Send SLA Notification Information to the Assigned-To User

How to Create a Calendar Item

You create a calendar item to define work days, work hours, and holidays in System Center 2012 – Service Manager. After you create a calendar item, you will use it as part of a service level objective, where it is measured against a time metric.

To create a calendar item

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Service Level Management**, and then click **Calendar**.
3. In the **Tasks** pane, under **Calendar**, click **Create Calendar**.
4. In the **Create/Edit Calendar** dialog box, in the **Title** box, type a title for the calendar. For example, type **Normal Work Calendar**.
5. In the **Time zone** list, select the time zone of your location.
6. Under **Working days and hours**, select the work days of your organization and for each selected day, type the start and end time for each day.
7. Under **Holidays**, click **Add** to define any holidays that your organization does not normally work. In the **Add Holiday** dialog box, type the name and select the date of the holiday and then click **OK** to close the dialog box.
8. Click **OK** to close the **Create/Edit Calendar** dialog box.

How to Edit a Calendar Item

You edit a calendar item in System Center 2012 – Service Manager to update work days, work hours, and holidays. After you edit a calendar item, you will use it as part of a service level objective, where it is measured against a time metric. If the calendar is already associated with a service level objective, it appears in the **Related SLA(s)** area.

Note
When you update an existing calendar item, the update is effective for incidents and service requests created afterward; however, the updates do not affect existing incidents.

To edit a calendar item

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Service Level Management**, and then click **Calendar**.
3. In the Calendar list, select an existing calendar, and then in the **Tasks** pane, under **<CalendarName>**, click **Properties**.
4. In the **Create/Edit Calendar** dialog box, modify any of the following items, as needed:
   - **Title**
   - **Time zone**
   - **Working days and hours**
   - **Holidays**
5. Click **OK** to close the **Create/Edit Calendar** dialog box.

How to Create SLA Metrics

In System Center 2012 – Service Manager you create a service level management metric, which is analogous to service level agreements (SLAs), as a time metric to measure the difference between start and end times for incidents and service requests. After you define a metric, you associate it with a service level objective. If the metric is already associated with a service level objective, it appears in the **Related SLA(s)** area.

To create a metric for incidents

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Service Level Management**, and then click **Metric**.
3. In the **Create/Edit SLA Metric** dialog box, in the **Title** box, type a title for the metric. For example, type **Incident Metric**.
4. In the **Description** box, type a description of the metric. For example, type **Time that incidents are resolved**.
5. Under **Class**, click **Browse** to open the **Select a Class** dialog box, select **Incident**, and then click **OK** to close the dialog box.

6. Click the list next to **Start date** and then select the item that you want to use to define the start date. For example, select **First assigned date**.
7. Click the list next to **End date**, and then select the item that you want to use to define the end date. For example, select **Resolved date**.
8. Click **OK** to close the **Create/Edit SLA Metric** dialog box.

To create a metric for service requests

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Service Level Management**, and then click **Metric**.
3. In the **Create/Edit SLA Metric** dialog box, in the **Title** box, type a title for the metric. For example, type **Service Request Metric**.
4. In the **Description** box, type a description of the metric. For example, type **Time that service requests are completed**.
5. Under **Class**, click **Browse** to open the **Select a Class** dialog box, select **Service Request**, and then click **OK** to close the dialog box.
6. Click the list next to **Start date**, and then select the item that you want to use to define the start date. For example, select **First assigned date**.
7. Click the list next to **End date**, and then select the item that you want to use to define the end date. For example, select **Completed date**.
8. Click **OK** to close the **Create/Edit SLA Metric** dialog box.

How to Edit SLA Metrics

In System Center 2012 – Service Manager, you edit a service level agreement (SLA) metric to update the title, start date, and end date. After you edit a metric, you associate it with a service level objective. If the metric is already associated with a service level objective, it appears in the **Related SLA(s)** area.

Note
You should avoid making changes to an SLA metric that is in use because changing it might cause performance problems. If possible, edit in-use SLA metrics during a period of minimal system use, such during as a maintenance period.

To edit an SLA metric

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Service Level Management**, and then click **Metric**.
3. In the **Metric** list, select an existing metric, and then in the **Tasks** pane, under **<MetricName>**, click **Properties**.
4. In the **Create/Edit Metric** dialog box, modify any of the following items, as needed:
   - **Title**

- **Description**
- **Start date**
- **End date**

5. Click **OK** to close the **Create/Edit Metric** dialog box.

How to Modify an SLA Metric View

In System Center 2012 – Service Manager, you can use the following procedures to customize an SLA view.

Views let you group SLA metrics that share certain criteria. However, when you personalize changes to a view, those changes are not saved. For example, you can customize the **Metrics** view, but if you change column widths, column sorting, grouping, or if you remove columns, the next time you return to the view it displays information in the same manner as it did before you personalized it.

To personalize an SLA metric view

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Service Level Management**, and then select **Metric**.
3. Right-click any view column heading to resize columns, to remove items from the results, or to change column sorting and grouping. Repeat this step until you are satisfied with the results.
4. You can also type in the **Filter** box to show results that are limited items that match what you typed.

How to Create a Service Level Objective

In System Center 2012 – Service Manager, you create a service level objective to create relationships between a queue and a service level, a calendar item and a time metric, and actions that occur before or after service level breaches. Afterward, when you view incidents or service requests and they approach their warning time, you will see a notification bar stating that the item is about to breach. You can also create periodic notifications if you want analysts to receive email for incidents or service requests that might breach their service level objective. For more information about sending notifications, see How to Send SLA Notification Information to the Assigned-To User.

In order to create a service level objective, it is easier if you have already created or defined a calendar item and an SLA metric. Additionally, the service level objective that you create is linked to a queue. The queue that you associate to a service level objective must target the same type of work item, based on its class; otherwise, the queue will not be available when you create the service level objective.

To create a service level objective

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Service Level Management**, and then click **Service Level Objective**.
3. In the **Tasks** pane, under **Service Level Objectives**, click **Create Service Level Objective**.
4. In the Create Service Level Objective Wizard, on the **Before You Begin** page, click **Next**.
5. On the **General** page, in the **Title** box, type a name for the new service level objective.
6. In the **Description** box, type a description of the service level objective.
7. Next to **Class**, click **Browse** to Open the **Select a Class** dialog box and then select a class pertinent to the type of service level objective you are creating. Normally, you should choose either **Incident** or **Service Request**.
8. Ensure that **Enabled** is selected, and then click **Next**.
9. On the **Service Level Criteria** page, select a calendar and a time metric, or you can create new ones. For more information about creating a calendar, see How to Edit a Calendar Item. For more information about creating an SLA metric, see How to Create SLA Metrics.
10. Under **Target**, specify the amount of time in hours or minutes that the work item should be completed by.
11. Under **Warning threshold**, specify the amount of time in hours or minutes before the service level is beached, which causes a warning notification in the work item notification bar, and then click **Next**.
12. On the **Summary** page confirm the choices you made, and then click **Create**.
13. On the **Completion** page, click **Close**.

See Also

How to Create a Calendar Item

How to Create SLA Metrics

How to Send SLA Notification Information to the Assigned-To User

How to Edit a Service Level Objective

In System Center 2012 – Service Manager, you can edit a service level objective to modify relationships between a queue and a service level, a calendar item and a time metric, and actions that occur before or after service level breaches. Afterward, when you view incidents or service requests and they approach their warning time, you will see a notification bar stating that the item is about to breach. You can also create periodic notifications if you want analysts to receive email for incidents or service requests that might breach their service level objective.

The service level objective that you edit is linked to a queue. If you want to modify the association of queue to a service level objective, the service level objective must target the same type of work item as the queue, based on its class; otherwise, the queue will not be available when you modify the service level objective.

To modify a service level objective

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Service Level Management**, and then click **Service Level Objective**.
3. In the **Service Level Objectives** list, select an existing service level objective, and then in the **Tasks** pane, under **<ServiceLevelObjectiveName>**, click **Properties**.
4. In the **Edit SLO** dialog box, modify any of the following items, as needed. For more information about the elements on this page, see How to Create a Service Level Objective.
   - **Title**
   - **Queues**
   - **Service Level Criteria**
5. Click **OK** to close the **Edit SLO** dialog box.

See Also

How to Create a Calendar Item

How to Create SLA Metrics

How to Create a Service Level Objective

How to View SLA Information in an Incident Form

As you are working with incidents in System Center 2012 – Service Manager, it is easy to tell when an incident's service level is about to or has been breached by viewing incidents in the **Assigned To Me** view and then looking for information in the **Service Level Target** column.

If you are already in an incident form and an incident is about to breach, a notification bar is displayed in the form while on the **General** tab stating that **One or more Service Level Objectives are about to breach.** You can view additional information about the service level status on the corresponding tab and see that the status shown is a warning.

When an incident has already been breached, no notification bar is displayed in the form while you are on the **General** tab. However, you will see breached status while you are on the **Service Level** tab if that incident's service level objective has breached.

To view warning SLA information in an incident form

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Incident Management**, and then click **Incidents with**

Service Level Warning.

3. In the **Incidents with Service Level Warning** list, select an incident, and then in the **Tasks** pane, under **<IncidentID-IncidentName>**, click **Edit**.
4. In the **<Incident IncidentID-IncidentName – Status>** form, observe the **One or more Service Level Objectives are about to breach** warning.
5. Click the **Service Level** tab, and observe the status of the incident as **Warning**. You can also see other information about the incident, most notably **Time Before SLA Breached**.
6. Click **OK** to close the incident.

To view breached SLA information in an incident form

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Incident Management**, and then click **Incidents with Service Level Breached**.
3. In the **Incidents with Service Level Breached** list, select an incident, and then in the **Tasks** pane, under **<IncidentID-IncidentName>**, click **Edit**.
4. Click the **Service Level** tab, and observe the status of the incident as **Breached**.
5. Click **OK** to close the incident.

How to Review Incidents with SLA Information

You can use the following procedure to view incidents that have a service level objective associated with them in System Center 2012 – Service Manager.

To review incidents with SLA information

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Incident Management**, and then click **Incidents with Service Level Warning** or **Incidents with Service Level Breached**.
3. In the list of incidents, notice the time that is displayed for **Service Level Target**.

How to Send SLA Notification Information to the Assigned-To User

In System Center 2012 – Service Manager, you can send notifications to analysts who are responsible for incidents when each incident is within the warning period of its service level objective. Because periodic notifications require a large amount of system resources, the following example notifies the analyst once when the service level objective goes to a warning state.

To send an SLA notification to the assigned-to user

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Notifications**, and then click **Subscriptions**.
3. In the **Tasks** pane, click **Create Subscription** to open the Create E-Mail Notification Subscription Wizard.
4. On the **Before You Begin** page, read the instructions, and then click **Next**.
5. On the **General** page, complete these steps:
    a. In the **Notification subscription name** box, type a name for the subscription for the service level objective.
    b. In the **Description** box, type a description of the subscription for the service level objective.
    c. In the **When to notify** list, select **When an object of the selected class is updated**.
    d. Next to **Targeted class** click **Browse** and then in then in the **Frequently used basic classes** list, select **All basic classes**. In the **Select a Class** dialog box, click **Service Level Instance Time Information**, and then click **OK** to close the dialog box.
    e. Keep the default management pack information, and then click **Next**.
6. On the **Group/Queue Selection** page, click **Next**.
7. On the **Additional Criteria** page, complete these steps:
    a. In the **Changed From** tab, set **[Service Level Instance Time Information] Status Does Not Equal Warning**.
    b. On the **Changed To** tab, set **[Service Level Instance Time Information] Status Equals Warning**, and then click **Next**.
8. On the **Template** page, select an email template or create a new one targeted at the Service Level Instance Time Information class. For more information about creating email notification templates, see How to Create Notification Templates. Click **Next**.
9. On the **Recipient** page, click **Add** and select the groups and users to send the notification to, and then click **Next**.
10. On the **Related Recipient** page, click **Add**, select **[WorkItem]WorkItem has Service Level Instance Information** in the left box, and then select **Primary Owner** and **Assigned To User** in the right box, and then click **Next**.
11. On the **Summary** page, review the information, and then click **Create**.
12. On the **Completion** page, click **OK** to close the wizard.

See Also

How to Create Notification Templates

How to Reactivate Incidents with SLA Information

In System Center 2012 – Service Manager, you can reactivate resolved incidents that have an associated service level objective. However, keep in mind that the original date and time that the incident was opened is preserved. Consequently, the time that elapsed while the incident was

resolved continues to apply against the service level objective—possibly resulting in the service level objective being breached.

To reactivate an incident with SLA information

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Incident Management**, and then click **All** .
3. In the **All Incidents** list, locate a resolved incident that you want to reactivate, and select it.
4. In the **Tasks** list, under **<IncidentID – IncidentTitle>**, click **Change Incident Status**, and then select **Activate**.
5. In the **Activate** box, type a comment describing why you are activating the incident, and then click **OK**.

Configuring Workflows in System Center 2012 - Service Manager

In System Center 2012 – Service Manager, a workflow is a sequence of activities that automate a business process. Workflows can, for example, update incidents when various changes occur. A workflow can automatically generate incidents when computers fall out of compliance from desired configuration management. You create a workflow that defines when and under what circumstances it will run. For example, a workflow can automatically change the support tier from a setting of 1 to 2 whenever a low-priority incident pertaining to printing problems is changed to a higher priority. Workflow activities function by the application of templates. For this example, an incident template to change the support tier to a setting of 2 must have been created previously.

You can create multiple workflows for each workflow configuration. You can enable or disable the workflow conditions. If a particular rule is disabled, the remaining rules still cause the workflow to run. If you want to completely disable a workflow, you must disable all of the rules that call the workflow.

The success or failure of a workflow is retained by Service Manager, and it is available for you to view. Two views are available. **All Results** consists of a view of all success and failure instances, and the **Errors** view displays only those instances when a workflow failed. In the **All Results** view, you can, for each instance, view the log and view the related object. When you view the log, you can examine the events that occurred when the workflow ran. When you view the related object, you see the form that this workflow acted on. The **Errors** view is limited to the most recent 250 instances. When you are viewing a failed instance, you have the same options in the **Success** view to view the log and view the related object. In addition, in the **Errors** view, you have the option to select **Retry** or **Ignore**. Selecting **Retry** causes the workflow to run again with the same parameters and removes this instance from the view. Selecting **Ignore** removes the instance from the view.

Configuring Workflow Topics

- How to Configure Incident Workflows

  Describes how to create an incident event workflow rule that changes the support tier level from 1 to 2 because of a change in incident priority.

- How to View Workflow Success or Failure

  Describes how to view the success or failure of a workflow.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

How to Configure Incident Workflows

You can use the following procedure in System Center 2012 – Service Manager to create and configure a workflow rule that will change the support tier to **Tier 2** whenever the **Urgency** property of an incident that is related to printing problems is changed to **High**. This procedure assumes that you already created an incident template to change the support tier to **Tier 2**, and it assumes that you already created the priority calculation table. For more information, see How to Set Incident Priority and "To create a new printer-related incident template" in How to Create Incident Templates.

To configure an incident workflow

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, expand **Workflows**, and then click **Configuration**.
3. In the **Configuration** pane, double-click **Incident Event Workflow Configuration**.
4. In the **Configure Incident Event Workflows** dialog box, click **Add**.
5. In the **Add Incident Event Workflow** dialog box, complete these steps:
   a. On the **Before You Begin** page, click **Next**.
   b. On the **Workflow Information** page, in the **Name** box, type a name for the workflow. For example, type **Escalates Printer Problems to Support Tier 2 when the Urgency property is changed to High**.
   c. In the **Check for events** list, select **when an object is created or when an object is updated**, make sure that the **Enabled** check box is selected, and then click **Next**.
   d. On the **Specify Event Criteria** page, click the **Changed to** tab. In the **Available Properties** list, select **Urgency**, and then click **Add**. In the **Criteria** box, select **equals**. In the list, select **High**. Then, click **Next**.
   e. On the **Select Incident Template** page, click **Apply the following template**, and then select the template you created earlier that will set the support group to **Tier 2**.

For example, select **Escalate Printer Problems to Tier 2**, and then click **Next**.

f. Optionally, in the **Select People to Notify** page, select the **Enable notification** check box, select the user to notify, and then click **Next**.

g. On the **Summary** page, review your settings, and then click **Create**.

h. On the **Completion** page, click **Close**.

6. In the **Configure Incident Event Workflows** dialog box, click **OK**.

To validate an incident workflow

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Work Items**, expand **Incident Management**, and then click **All Incidents**.
3. In the **All Incidents** pane, double-click an incident that is not currently assigned to the tier 2 support group.
4. In the **Incident Form** page, set the **Urgency** property to **High**, and then click **OK**.
5. In a few minutes, press F5. Verify that the value in the **Support Group** box changed to **Tier 2**.

You can use Windows PowerShell commands to complete these and other related tasks, as follows:

- For information about how to use Windows PowerShell to create a new workflow in Service Manager, see New-SCSMWorkflow.
- For information about how to use Windows PowerShell to retrieve configuration and status information for Service Manager workflows, see Get-SCSMWorkflowStatus.
- For information about how to use Windows PowerShell to update workflow properties, see Update-SCSMWorkflow cmdlet.
- For information about how to use Windows PowerShell to remove a workflow from Service Manager, see Remove-SCSMWorkflow.

How to View Workflow Success or Failure

Use the following procedure to view the success or failure instances of the workflows in System Center 2012 – Service Manager.

To view workflow success or failure

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, expand **Workflows**, and then click **Status**.
3. In the **Status** pane, click the workflow that you want to view. For example, click **Escalates Printer Problems to Support Tier 2 when the Urgency property is changed to High**.
4. In the **Status** results pane, click **Need attention** to view workflows that did not run

successfully. Or, click **All Instances**, and then do the following:

a. Click **View log** to view the list of events that occurred when the workflow ran.

b. Click **View related object** to view the form that was used when the workflow ran.

The status of each workflow is displayed in the **Status** column.

You can use a Windows PowerShell command to complete this task. For information about how to use Windows PowerShell to retrieve the status of workflows in Service Manager, see Get-SCSMWorkflowStatus.

Configuring Change and Activity Management in System Center 2012 - Service Manager

As part of your initial configuration of System Center 2012 – Service Manager, you have to configure settings and workflows for change and activity management. Create a change request template that you can use later when new change requests are submitted.

Configure workflows to automatically close completed change requests and send notifications to users when activities require approval. Workflows automate processes that you can use to automatically apply templates and send notifications.

A change request template is useful when you create a change request for a recurring type of issue because you can set an issue category and define a standard priority, effect, and risk level for it in the template. You can also create additional templates for other types of recurring change requests. Another benefit of creating a change request template is that users spend less time when they submit new change requests.

Configuring Change and Activity Management Topics

- How to Create Change Request Templates

  Describes how to construct a change request template to create change requests.
- How to Create a Manual Activity Template

  Describes how to create a manual activity template.
- How to Configure General Change Settings

  Describes how to configure settings that are used to specify a change request prefix and to define change request attachment limits.
- How to Configure General Activity Settings

  Describes how to configure settings that are used to specify prefixes for activities.
- How to Configure Change Management Workflows

  Describes how to configure change request conditions that can apply a change request template and send notifications.
- How to Configure Activity Management Workflows

Describes how to configure activity management conditions that can apply an activity template and send notifications.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

How to Create Change Request Templates

Use the following procedures to create two change request templates in System Center 2012 – Service Manager and then validate them. The first template is used to create change requests to modify Microsoft Exchange Server infrastructure. The second template is used to automatically change the priority of a standard change request to **Low**. For more information about how to use the second template after you create it, see How to Configure Change Management Workflows.

Change request templates store commonly used settings and apply the information to new change requests. For example, you can create a change request template that includes a number of activities. However, activities that you want to include in a change request template must have been previously created as activity templates.

Note

When you create a change request template, do not create links to configuration items or work items, and do not enter any user information. If you create a template with these objects, you cannot remove them, and you will have to re-create the template.

To create a messaging change request template

1. In the Service Manager console, click **Library**.
2. In the **Library** pane, click **Templates**.
3. In the **Tasks** pane, under **Templates**, click **Create Template**.
4. In the **Create Template** dialog box, type a name for the template in the **Name** box. For example, type **Changes to Messaging Infrastructure Template**.
5. In the **Description** box, type a description for the template.

   For example, type **Use this change template when you want to modify the messaging infrastructure**.
6. Click **Browse** to select a class.
7. In the **Select a Class** dialog box, click **Change Request**, and then click **OK**.
8. In the **Create Template** dialog box, under **Management pack**, select **Service Manager Change Management Configuration Library**, and then click **OK**.
9. In the **Change Request Template** form, on the **General** tab, in the **Description** box, type a description for the change.

For example, type **Use when modifying the Exchange Server software infrastructure**.

10. In the **Area** box, select the area that is affected by the change request. For example, expand **Hardware**, and then select **Server**.
11. In the **Priority** box, select a value. For example, select **High**.
12. In the **Impact** box, select a value. For example, select **Standard**.
13. In the **Risk** box, select a value. For example, select **Medium**.
14. Click the **Activities** tab, and then click **Add**.
15. In the **Templates** list, select **Default Review Activity**, and then click **OK** to open the review activity form.
16. In the **Title** box, type a name for the review activity. For example, type **Messaging Infrastructure Request Approval**. Then, click **Add** to add the user or group that will normally approve the change request.
17. In each open form or dialog box, click **OK**.

To create a priority-modifying template

1. In the Service Manager console, click **Library**.
2. In the **Library** pane, click **Templates**.
3. In the **Tasks** pane, click **Create Template** under **Templates**.
4. In the **Create Template** dialog box, type a name for the template in the **Name** box. For example, type **Set Standard Change Requests to Low Priority**.
5. In the **Description** box, type a description for the template.

   For example, type **Use this change template to automatically set the priority for standard change requests to Low**.
6. Click **Browse** to add a class.
7. In the **Choose Class** dialog box, click **Change Request**, and then click **OK**.
8. In the **Create Template** dialog box, under **Management pack**, select **Service Manager Change Management Configuration Library**, and then click **OK**.
9. In the **Change Request Template** form, on the **General** tab, in the **Priority** list, select **Low**.
10. Click **OK**.

To validate template creation

- Verify that the new templates were created. For example, verify that **Changes to Messaging Infrastructure Template** and **Set Standard Change Requests to Low Priority** appear in the **Templates** view. You might have to press F5 to make the new change templates appear.

How to Create a Manual Activity Template

Use the following procedures to create a manual activity template in System Center 2012 – Service Manager and then validate it. Manual activity templates help ensure that all manual activities are assigned to the person who is the activity implementer. After you create the manual activity template, you create a workflow that applies the template. For more information about how to create a workflow, see How to Configure Incident Workflows.

In the following procedure, you will create a manual activity template named "Set <named user> as the Activity Implementer". This manual activity template is used in the How to Configure Activity Management Workflows procedure.

To create a manual activity template

1. In the Service Manager console, click **Library**.
2. In the **Library** pane, click **Templates**.
3. In the **Tasks** pane, in the **Templates** area, click **Create Template**.
4. In the **Create Template** dialog box, in the **Name** box, type a name for the template. For example, type **Set <named users> as the Activity Implementer**.
5. In the **Description** box, type a description for the template.
6. Click **Browse** to choose a class.
7. In the **Choose Class** dialog box, click **Manual Activity**, and then click **OK**.
8. In the **Create Template** dialog box, under **Management pack**, select **Service Manager Activity Management Configuration Library**, and then click **OK**.
9. In the **Manual Activity Template** form, on the **General** tab, click the ellipsis button (**…**) next to **Activity Implementer**, select a user, and then click **OK**.

To validate that the template was created

- In the **Templates** view, verify that the new template was created. You might have to press F5 to make the new manual activity template appear.

How to Configure General Change Settings

Use the following procedures in System Center 2012 – Service Manager to configure settings to specify change request prefixes and to define change request file attachment limits and then validate the settings.

Note
Revising the change request prefix does not affect existing change requests.

To configure general change settings

1. In the Service Manager console, click **Administration**.

2. In the **Administration** pane, expand **Administration**, and then click **Settings**.
3. In the **Settings** pane, click **Change Request Settings**.
4. In the **Tasks** pane, in the **Change Request Settings** area, click **Properties**.
5. In the **Change Request Settings** dialog box, you can make the following changes:
   a. If you want to change the prefix code, change the default value in the **Change Request ID prefix** box.
   b. If you want to change the maximum number of files that you can attach to a change request, change the default value in the **Maximum number of attached files** box. For example, type **2**.
   c. If you want to change the maximum size of files that you attach to a change request, change the default value in the **Maximum size (KB)** box. For example, type **300**.
6. Click **OK** to close the **Change Request Settings** dialog box.

To validate change settings

1. To validate changes to the prefix code, create a new a change request, and verify that the change request IDs have the prefix that you specified.
2. To validate changes to the attachment settings, open a change request, and attempt to add a file attachment that violates the settings that you specified.

How to Configure General Activity Settings

Use the following procedure in System Center 2012 – Service Manager to configure settings to specify activity prefixes when you view activity records. You can then validate the settings. You can define these activity settings in the administrative area of the Service Manager console.

Note
Revising the activity request prefix does not affect existing activity records.

To configure general activity settings

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Settings**.
3. In the **Settings** pane, click **Activity Settings**.
4. In the **Tasks** pane, in the **Activity Settings** area, click **Properties**.
5. In the **Activity Settings** dialog box, you can make the following changes:
   - If you want to change the activity prefix code, change the default value in the **Activity prefix** box. For example, change the value to **AA**.
   - If you want to change the manual activity prefix code, change the default value in the **Manual activity prefix** box. For example, change the value to **AM**.
   - If you want to change the review activity prefix code, change the default value in the **Review activity prefix** box. For example, change the value to **AR**.

6. Click **OK** to close the **Activity Settings** dialog box.

To validate activity setting changes

- To validate changes to any prefix code, create a new change request, and then verify on the **Activities** tab that the activities have the new prefix that you specified.

How to Configure Change Management Workflows

Use the following procedures in System Center 2012 – Service Manager to set the priority of all standard change requests and then validate the change. For example, you can set the priority of all standard change requests to low. In this procedure, you create a new workflow to automate the process.

Before you can complete the steps in this procedure, you have to create the following templates:

- **Set Standard Change Requests to Low Priority**: For more information, see the procedure "To create a priority-modifying template" in How to Create Change Request Templates.
- **New Standard Change Request Received Template**: For more information, see the procedure "To create a notification template for change requests" in How to Create Notification Templates.

To create a workflow to set all standard change requests to low

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, expand **Workflows**, and then click **Configuration**.
3. In the **Configuration** pane, click **Change Request Event Workflow Configuration**.
4. In the **Tasks** pane, in the **Change Request Event Workflow Configuration** area, click **Configure Workflow Rules**.
5. In the **Configure Workflows** dialog box, click **Add**.
6. On the **Before You Begin** page of the Configure Workflows for Objects of Class Change Request Wizard, click **Next**.
7. On the **Workflow Information** page, in the **Name** box, type a name for the workflow. For example, type **Set Standard Change Request to Low Priority workflow**.
8. Optionally, in the **Description** box, you can type a description of the new workflow. For example, you can type **This workflow automatically sets the priority of a standard change request to low**.
9. In the **Check for events** list, select **When an object is created**.
10. Make sure that the **Enabled** check box is selected, and then click **Next**.
11. On the **Specify Criteria** page, on the **Changed To** tab, in the **Related classes** list, select **Change Request**.
12. In the **Available properties** list, select **Category**, and then click **Add**. In the **Criteria** area, next to the **equals** box, select **Standard**, and then click **Next**.

13. On the **Apply Template** page, select the **Apply the selected template** check box.
14. In the **Templates** list, select **Set Standard Change Requests to Low Priority**, and then click **Next**.
15. On the **Select People to Notify** page, select the **Enable notification** check box.
16. Under **User**, select **Created By User**, and under **Template**, select **New Standard Change Request Received Template**, and then click **Add**.
17. Click **Next**.
18. On the **Summary** page, click **Create**.
19. On the **Completion** page, click **Close**.
20. In the **Configure Workflows** dialog box, click **OK**.

To validate workflow creation

1. In the **Configuration** pane, select the **Change Request Event Workflow Configuration** template.
2. In the **Tasks** pane, click **Configure Workflow Rules**.
3. In the **Configure Workflows** dialog box, the **Set Standard Change Request to Low Priority workflow** workflow should appear.
4. Optionally, you can create a new change request by using the **Standard Change Request** template to verify that the priority of new requests is set to Low.
5. Notification email is sent to the user who created the change request.

How to Configure Activity Management Workflows

Use the following procedures in System Center 2012 – Service Manager to automatically assign all unassigned manual activities to a named user and then validate the creation of workflow.

Before you can complete the steps in this procedure, you have to create the following templates:

- **Set <named user> as the Activity Implementer**: For more information, see How to Create a Manual Activity Template.
- **New Activity Assigned Received Template**: For more information, see How to Create Notification Templates.

The new workflow you are about to create applies the **Set <named user> as the Activity Implementer** template, which assigns the named user all the activities that do not have a designated activity implementer. The **New Activity Assigned Received Template** sends notification to a user if the email notification channel is configured.

To create an activity management workflow

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, expand **Workflows**, and then click **Configuration**.

3. In the **Configuration** pane, click **Activity Event Workflow Configuration**.
4. In the **Tasks** pane, in the **Activity Event Workflow Configuration** area, click **Configure Workflow Rules**.
5. In the **Select a Class** dialog box, in the **Name** list, select **Manual Activity**, and then click **OK**.
6. In the **Configure Workflows** dialog box, click **Add**.
7. On the **Before You Begin** page of the **Configure workflows for objects of class Manual Activity** wizard, click **Next**.
8. On the **Workflow Information** page, in the **Name** box, type a name for the workflow. For example, type **Assign Unassigned Activities to <named user>**.
9. Optionally, in the **Description** box, you can type a description of the new workflow. For example, you can type **This workflow automatically assigns unassigned manual activities to the <named user>**.
10. In the **Check for events** list, select **When an object is created**.
11. Make sure that the **Enabled** check box is selected, and then click **Next**.
12. On the **Specify Criteria** page, on the **Changed to** tab, in the **Related classes** list, select **Manual Activity**.
13. In the **Available properties** list, select the **Stage** check box, and then click **Add**.
14. In the **Criteria** area, next to the **[Activity] Stage** box, select **equals**, select **Approve** for the value, and then click **Next**.
15. On the **Apply Template** page, make sure that **Apply the selected template** check box is selected.
16. In the **Templates** list, select **Set <named users> as the Activity Implementer**, and then click **Next**.
17. On the **Select People to Notify** page, select the **Enable notification** check box.
18. In the **User** list, select **Assigned to User**.
19. In the **Message template** list, select **New Activity Assigned Received Template**, click **Add**, and then click **Next**.
20. On the **Summary** page, click **Create**.
21. On the **Completion** page, click **Close**.
22. In the **Configure Workflows** dialog box, click **OK** to close it.

To validate workflow creation

1. In the **Administration** pane, expand **Administration**, expand **Workflows**, and then click **Status**.
2. In the **Status** pane, verify that the new workflow template titled **Assign Unassigned Activities to the <named user>** is listed.

Configuring Release Management in System Center 2012 - Service Manager

As part of your initial configuration of System Center 2012 – Service Manager, you have to configure settings and workflows for release management. The settings define the ID prefix that is assigned to release records, how many files can be attached to each release record, and the maximum size of each file. You also create a workflow to notify people when a release record affects them.

Configuring Release Management Topics

- How to Configure Release Management Settings

  Describes how to configure settings for release management.
- How to Configure Release Management Workflows for Notifications

  Describes how to configure release management workflows for notifications.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

How to Configure Release Management Settings

The System Center 2012 – Service Manager Administrator configures release management settings by using the following procedure.

Note

Revising the release record prefix does not affect existing release records.

To configure release management settings

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Settings**.
3. In the **Settings** view, click **Release Management Settings**.
4. In the **Tasks** pane, in the **Release Management Settings** area, click **Properties**.
5. In the **Release Management Settings** dialog box, you can make the following changes:
   a. If you want to change the prefix code, change the default value in the **Release Record ID prefix** box.
   b. If you want to change the maximum number of files that you can attach to a release record, change the default value in the **Maximum number of attached files** box. For example, type **2**.

c. If you want to change the maximum size of files that you attach to a release record, change the default value in the **Maximum size (KB)** box. For example, type **300**.

6. Click **OK** to close the **Release Management Settings** dialog box.

How to Configure Release Management Workflows for Notifications

You can configure notifications for release records in System Center 2012 – Service Manager by completing the following procedures. The following procedure sends a notification when a release record is created or updated.

To configure a notification for updated release records

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, expand **Workflows**, and then click **Configuration**.
3. In the **Configuration** pane, double-click **Release Record Event Workflow Configuration**.
4. In the **Configure Workflows** dialog box, click **Add**.
5. In the **Configure workflows for objects of class Release Record** dialog box, complete these steps:
   a. On the **Before You Begin** page, click **Next**.
   b. On the **Workflow Information** page, in the **Name** box, type a name for the workflow. For example, type **Updated Release Records**.
   c. In the **Description** box, type a description of what the workflow does. For example, type **This workflow notifies the assigned-to user and the created-by user when release records are updated.**
   d. In the **Check for events** list, select **When an object is created** or select **When an object is updated**, ensure that the **Enabled** check box is selected, and then click **Next**.
   e. On the **Specify Event Criteria** page, click the **Changed to** tab. Under **Related classes**, expand **Release Record**, and then select either **Assigned To User** or **Created By User**.
   f. Under **Available properties**, select **User Name**, click **Add**, and then under **Criteria**, type the user name of the person that you are basing the notification on. Repeat this step, as necessary.
   g. On the **Apply Template** page, clear **Apply the selected template**, and then click **Next**.
   h. On the **Select People to Notify** page, select **Enable notification**, then select **Assigned To User** and then click **Add**. Repeat this step for **Created By User**, and then click **Next**.
   i. On the **Summary** page, review your settings, and then click **Create**.

j. On the **Completion** page, click **Close**.

Configuring Desired Configuration Management to Generate Incidents in System Center 2012 - Service Manager

You can use the following procedure, for example, to inventory all the computers that might require an upgrade to Microsoft Exchange Server with Service Pack 1 (SP1). To do this, first define the appropriate configuration baseline in System Center Configuration Manager 2007. For more information about baselines in Configuration Manager 2007, see How to Configure Configuration Baselines for Desired Configuration Management.

In System Center 2012 – Service Manager, you must create a Configuration Manager connector to import the baseline and configure incident management to automatically generate incidents based on desired configuration management. For information about how to create a Configuration Manager connector, see About Importing Data from System Center Configuration Manager.

You can use desired configuration management in Configuration Manager 2007 to monitor software to ensure that it is compliant with defined values. For example, you can monitor software versions, security settings, and software updates. The configurations that you want to monitor are added as Configuration Manager 2007 configuration items to configuration baselines so that they can be evaluated for compliance as a group.

In Service Manager, you can import configuration baselines from Configuration Manager 2007 by using a Configuration Manager Connector. You can then configure Service Manager to create incidents for each Service Manager configuration item that reports as noncompliant against the defined values.

Use the following procedure to configure incident management to automatically generate incidents based on desired configuration management.

Configuring Desired Configuration Management Topics

- How to Configure Desired Configuration Management to Generate Incidents

  Describes how to configure incident management to automatically generate incidents based on desired configuration management.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

How to Configure Desired Configuration Management to Generate Incidents

In System Center 2012 – Service Manager, you can import configuration baselines from System Center Configuration Manager 2007 by using a Configuration Manager connector. Then, you can configure Service Manager to create incidents for each Service Manager configuration item that is reported as noncompliant against the defined values.

You can use the following procedures to configure incident management to automatically generate desired configuration management–based incidents and validate that the desired configuration management is configured.

To configure incident management to automatically generate desired configuration management–based incidents

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Workflows**, and then click **Configuration**.
3. In the **Configuration** pane, double-click **Desired Configuration Management Event Workflow Configuration**.
4. In the **Configure Desired Configuration Management Workflows** dialog box, click **Add**.
5. In the Add Desired Configuration Management Workflow Wizard, complete these steps:
   a. On the **Before You Begin** page, click **Next**.

      Note
      The **Next** button will be unavailable if a Configuration Manager connector has not been created.

   b. On the **Workflow Information** page, type a name and a description for the rule. Make sure that the **Enabled** check box is selected, and then click **Next**.
   c. On the **Select System Center Configuration Manager Configuration Items** page, expand all the configuration baselines that are listed, select the Configuration Manager 2007 configuration items that you want to include in the rule, and then click **Next**.
   d. On the **Select Incident Template** page, click **Apply the following template**, select a template for the new incidents that will be created by this rule, and then click **Next**.
   e. On the **Select People to Notify** page, select the **Enable notification** check box. Select the users who should be notified when an incident is created by this rule. For each user, specify the notification method and a template, and then click **Add**. Click **Next**.
   f. On the **Summary** page, make sure that the settings contain the information you expect, and then click **Create**.
   g. On the **Completion** page, make sure that you receive the following confirmation message, and then click **Close**:

      “Desired Configuration Management Workflow Created Successfully”

To validate that desired configuration management is configured

1. Import an out-of-compliance Service Manager configuration item that would match one of the desired configuration management rules. Then, locate the desired configuration management–based incident in Service Manager.
2. In the Service Manager console, click **Work Items**
3. In the **Work Items** pane, expand **Incident Management**, and then click **All Open DCM Incidents**.
4. In the **All Open Desired Configuration Management Incidents** pane, double-click an incident.
5. In the **Incident** form, click the **Compliance Errors** tab.
6. Verify that the correct configuration baseline and Configuration Manager 2007 configuration items are listed.

You can use Windows PowerShell commands to complete these and other related tasks, as follows:

- For information about how to use Windows PowerShell to create a desired configuration management workflow in Service Manager, see New-SCSMDCMWorkflow.
- For information about how to use Windows PowerShell to retrieve the list of all DCM workflows that are defined in Service Manager, see Get-SCSMDCMWorkflow.
- For information about how to use Windows PowerShell to update properties of a desired configuration management workflow, see Update-SCSMDCMWorkflow.
- For information about how to use Windows PowerShell to remove a desired configuration management workflow from Service Manager, see Remove-SCSMDCMWorkflow.

Configuring System Center 2012 - Service Manager Notifications

You may want to be notified by email when incidents or other changes in System Center 2012 – Service Manager. By using Service Manager, you can make sure that notifications are generated for almost any kind of change. For example, you can configure notifications to be sent to a messaging analyst when changes occur to a work item or configuration item that pertains to email problems.

Before notifications are sent, first configure each notification channel, such as the settings for Simple Mail Transfer Protocol (SMTP). Notification messages are sent based on a notification template. Therefore, you must create a notification template. You can then use the Notification Subscription Wizard to subscribe a group of users to a notification that will be sent whenever the changes that you specify occur. Finally, you can verify that a notification is sent by manually generating the change.

You must complete these steps in the order shown. For example, before you can configure a notification, the SMTP channel must be enabled.

Note

You must add the Service Manager workflow account to the Service Manager Administrators user role for notifications to function properly. See the topic “How to Add a Member to a User Role” in the Administrator’s Guide for System Center 2012 - Service Manager.

Configuring Notifications Topics

- How to Configure Notification Channels

  Describes how to set up a notification channel.
- How to Create Notification Templates

  Describes how to set up a notification template.
- How to Subscribe to Notifications

  Describes how to subscribe to a notification for yourself or for others.
- How to Verify a Notification Configuration

  Describes how to verify that notification configuration is set up correctly.
- About Substitution Strings in Notification Templates

  Describes how you can use substitution strings to insert information into notification templates.
- How to Automatically Notify Groups of Users

  Describes how to create a messaging-enabled group and a workflow to notify stakeholders when an incident is created.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator’s Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

How to Configure Notification Channels

You can use the following procedures to configure notification channels in System Center 2012 – Service Manager and validate the configuration. Notification channels are the method by which notification messages are sent to users. You use the **Configure E-Mail Notification Channel** dialog box to configure and enable email notifications that Service Manager sends to a Simple Mail Transfer Protocol (SMTP) server.

Note

In this release of Service Manager, only email notification is supported.

To configure email notifications

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Notifications**, and then click **Channels**.
3. In the **Channels** pane, click **E-Mail Notification Channel**.
4. In the **Tasks** pane, under **E-Mail Notification Channel**, click **Properties** to open the **Configure E-Mail Notification Channel** dialog box.
5. Select the **Enable e-mail notifications** check box.
6. Click **Add**. In the **Add SMTP Server** dialog box, type the fully qualified domain name (FQDN) of the SMTP server that you want to use. For example, type **Exchange01.Woodgrove.Com**.
7. In the **Port number** box, type or select the SMTP port number that you want to use. For example, select **25**.
8. In the **Authentication method** box, select either **Anonymous** or **Windows Integrated**. For example, select **Anonymous**. Then, click **OK**.
9. In the **Return e-mail address** box, type the email address of the service account that is used during setup. For example, type **smadmin@woodgrove.com**.
10. In the **Retry primary after** box, type or select the number of seconds that you want Service Manager to wait before it tries to resend outgoing email notifications. For example, select **25**.
11. Click **OK** to close the dialog box.

To validate email notification configuration

1. In the **Channels** pane, click **E-Mail Notification Channel**.
2. In the **Tasks** pane, under **E-Mail Notification Channel**, click **Properties** to open the **Configure E-Mail Notification Channel** dialog box.
3. Verify that the configuration you entered is correct.

You can use a Windows PowerShell command to complete these tasks, as follows:

- For information about how to use Windows PowerShell to set the properties of an email notification channel in Service Manager, see Set-SCSMChannel.
- For information about how to use Windows PowerShell to retrieve the Email Notification channels that are defined in Service Manager, see Get-SCSMChannel.

How to Create Notification Templates

You can use the following procedures in System Center 2012 – Service Manager to create notification templates for many types of information records or work items that Service Manager records or keeps track of, such as incidents, change requests, activities, release records, and configuration items. After you create the notification templates, you can use a notification subscription to send email messages based on the templates. The notification template determines the type and format of the messages to send.

Note

Manually copying and pasting substitution strings from other notification templates will not generally work. Therefore, you should avoid copying them to prevent errors. Instead, you can easily browse for and insert available substitution strings into any notification template that you are creating or updating. For more information about using substitution strings in notification templates, see About Substitution Strings in Notification Templates.

The following two templates are prerequisites for other procedures:

- The New Activity Assigned Received Template, which is described in the procedure "To create a notification template for a newly assigned activity," is the template that you will need for the procedure **How to Configure Activity Management Workflows**.
- The New Standard Change Request Received Template, which is described in the procedure "To create a notification template for change requests," is the template that you will need for the procedure **How to Configure Change Management Workflows**.

Note

In this release of Service Manager, notifications are sent only by email.

To create a notification template for incidents

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Notifications**, and then click **Templates**.
3. In the **Tasks** pane, under **Templates**, click **Create E-mail Template**.
4. On the **General** page of the Create E-mail Notification Template Wizard, in the **Notification template name** box, type a name. For example, type **New E-mail Incident Template**. Optionally, in the **Description** box, you can type a description for the template that you are creating.
5. Next to the **Targeted class** box, click **Browse**.
6. In the **Choose Class** dialog box, click **Incident**, and then click **OK**.
7. Make sure that an unsealed management pack of your choice is selected, and then click **Next**. For example, select the **Sample Management Pack**.
8. On the **Template Design** page, in the **Message subject** box, type a subject for the email template. For example, type **New Incident created with ID#**. Then, click **Insert**.
9. In the **Select Property** dialog box, select **ID**, and then click **Add**.
10. In the **Message body** box, type a description to indicate that a new incident was opened for an email problem.
11. Use the other default values on this page, and then click **Next**.
12. On the **Summary** page, review the settings that you have selected for the template. Then, click **Create**.
13. On the **Completion** page, click **Close**.

To create a notification template for change requests

1. In the Service Manager console, click **Administration**.

2. In the **Administration** pane, expand **Notifications**, and then click **Templates**.
3. In the **Tasks** pane, under **Templates**, click **Create E-mail Template**.
4. On the **General** page of the Create E-mail Notification Template Wizard, in the **Notification template name** box, type a name. For example, type **New Standard Change Request Received Template**. Optionally, in the **Description** box, you can type a description for the template that you are creating.
5. Next to the **Targeted class** box, click **Browse**.
6. In the **Choose Class** dialog box, click **Change Request**, and then click **OK**.
7. Make sure that an unsealed management pack of your choice is selected, and then click **Next**. For example, select the **Sample Management Pack**.
8. On the **Template Design** page, in the **Message subject** box, type a subject for the email template. For example, type **New Standard Change Request with ID#**. Then, click **Insert**.
9. In the **Select Property** dialog box, select **ID**, and then click **Add**.
10. In the **Message body** box, type a description to indicate that a new standard change request was opened.
11. Use the other default values on this page, and then click **Next**.
12. On the **Summary** page, review the settings that you have selected for the template. Then, click **Create**.
13. On the **Completion** page, click **Close**.

To create a notification template for a newly assigned activity

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Notifications**, and then click **Templates**.
3. In the **Tasks** pane, under **Templates**, click **Create E-mail Template**.
4. On the **General** page of the Create E-mail Notification Template Wizard, in the **Notification template name** box, type a name. For example, type **New Activity Assigned Received Template**. Optionally, in the **Description** box, you can type a description for the template that you are creating.
5. Next to the **Targeted class** box, click **Browse**.
6. In the **Select a Class** dialog box, click **Manual Activity**, and then click **OK**.
7. Make sure that an unsealed management pack of your choice is selected, and then click **Next**. For example, select the **Sample Management Pack**.
8. On the **Template Design** page, in the **Message subject** box, type a subject for the email template. For example, type **New Activity Assigned with ID#**. Then, click **Insert**.
9. In the **Select Property** dialog box, select **ID**, and then click **Add**.
10. In the **Message body** box, type a description to indicate that an activity has been assigned.
11. Use the other default values on this page, and then click **Next**.
12. On the **Summary** page, review the settings that you have selected for the template. Then, click **Create**.

13. On the **Completion** page, click **Close**.

To validate template creation

- Verify that the new template you created appears in the list of notification templates.

You can use Windows PowerShell commands to complete these and other related tasks, as follows:

- For information about how to use Windows PowerShell to create a new Email template in Service Manager, see New-SCSMEmailTemplate.
- For information about how to use Windows PowerShell to retrieve Email templates that are defined in Service Manager, see Get-SCSMEmailTemplate.
- For information about how to use Windows PowerShell to retrieve the content of a Service Manager Email template, see Get-SCSMEmailTemplateContent.
- For information about how to use Windows PowerShell to update properties of an Email template, see Update-SCSMEmailtemplate.
- For information about how to use Windows PowerShell to remove an Email template from Service Manager, see Remove-SCSMEmailTemplate.

See Also

About Substitution Strings in Notification Templates

How to Subscribe to Notifications

After you create a notification template, and after you have enabled at least one notification channel, you can use the following procedure in System Center 2012 – Service Manager to subscribe to notifications by using the Notification Subscription Wizard. Then, notifications will be sent when an object is created or updated or periodically when other criteria that you specify are met.

The scenarios in this topic center on the Create E-Mail Notification Subscription Wizard. The condition that you choose to notify will dynamically change the wizard pages that are available.

In the first procedure, you set up a subscription so that a messaging analyst is notified when a new incident that pertains to an email problem is opened. In the second procedure, you set up a subscription so that daily status updates are sent to the release manager while the HR web application is in development, testing, and deployment.

Note

Some notification criteria values might not change. If you want to receive a notification when a change occurs, make sure that you choose a value for an object that is likely to change. For example, the **Incident ID** for an incident does not change.

To create a notification subscription for an incident

1. In the Service Manager console, click **Administration**.

2. In the **Administration** pane, expand **Notification**, and then click **Subscriptions**.
3. In the **Tasks** pane, click **Create Subscription**.
4. On the **Before You Begin** page of the Create E-mail Notification Subscription Wizard, click **Next**.
5. On the **General** page, in the **Notification subscription name** box, type a name. For example, type **New Incident for E-mail Problem Notification Subscription**. Optionally, in the **Description** box, you can type a description for the subscription that you are creating.
6. Next to the **Targeted class** box, click **Browse**.
7. In the **When to notify** box, select **When an object of the selected class is created**.
8. In the **Choose Class** dialog box, choose a class. For example, click **Incident**. Then, click **OK**.
9. Make sure that an unsealed management pack of your choice is selected, and then click **Next**. For example, select the **Sample Management Pack**.
10. On the **Additional Criteria** page, select **Incident**. In the **Available Properties** list, select **Classification Category**, and then click **Add**.
11. On the **Additional Criteria** page, click the **Criteria** tab. In the **Criteria** area, next to **[Incident] Classification Category**, select **equals**. In the list, select **E-mail Problems**, and then click **Next**.
12. On the **Template** page, next to the **E-mail template** box, click **Select**.
13. In the **Select Objects** dialog box, in the **Templates** list, select a notification template. For example, select **New E-mail Incident Template**, click **OK**, and then click **Next**.
14. On the **Recipient** page, click **Add**.
15. In the **Select Objects** dialog box, search for the appropriate user, and then select the user. Click **Add**, click **OK**, and then click **Next**. For example, select the user account for a messaging analyst or messaging administrator.

    Note
    The notification address must be configured for the user account of the messaging analyst or messaging administrator.
16. On the **Related Recipients** page, click **Add**.
17. In the **Select Related Recipient** dialog box, search for the appropriate class, and then select the appropriate substitution string that represents the user. Click **Add**, click **OK**, and then click **Next**. For example, select additional user accounts that you want to send the notification to.
18. On the **Summary** page, review the settings that you selected for the notification subscription, and then click **Create**.
19. On the **Completion** page, click **Close**.

To create a periodic notification subscription for a release record

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Notifications**, and then click **Subscriptions**.

3. In the **Tasks** pane, click **Create Subscription**.
4. On the **Before You Begin** page of the Create E-mail Notification Subscription Wizard, click **Next**.
5. On the **General** page, in the **Notification subscription name** box, type a name. For example, type **Daily Notification for Deploy HR Web 2.0 Release Record**. Optionally, in the **Description** box, you can type a description for the subscription that you are creating. For example, type **This subscription sends a daily notification of the status for the HR Web 2.0 release record**.
6. In the **When to notify** box, select **Periodically notify when objects meet a criteria**.
7. Next to the **Targeted class** box, click **Browse**.
8. In the **Choose Class** dialog box, choose a class, and then click **OK**. For example, click **Release Record**.
9. Make sure that an unsealed management pack of your choice is selected, and then click **Next**. For example, select the **Sample Management Pack**.
10. On the **Additional Criteria** page, select **Release Record**. In the **Available Properties** list, select **Status**, and then click **Add**.
11. In the **Criteria** area, next to **[Release Record] Status**, select **does not equal**. In the list, select **Closed**, and then click **Next**.
12. On the **Recurring Notification** page under **Recurrence pattern**, select **Notify every <TimeInterval>** and then choose an interval. For example, set the recurrence pattern to every 1 day.
13. On the **Recurring Notification** page under **Range of recurrence**, select a range of recurrence or choose no end date. For example, select **No end date**.
14. On the **Template** page, next to the **E-mail template** box, click **Select**.
15. In the **Select Template** dialog box, in the **Templates** list, select a notification template that you have created for release record notifications.
16. On the **Recipient** page, click **Add**.
17. In the **Select Objects** dialog box, search for the appropriate user, and then select the user. Click **Add**, click **OK**, and then click **Next**. For example, select the user account for the release manager.

    Note
    The notification address must be configured for the user account of the messaging analyst or messaging administrator.
18. On the **Related Recipients** page, click **Add**.
19. In the **Select Related Recipient** dialog box, search for the appropriate class, and then select the appropriate substitution string that represents the user. Click **Add**, click **OK**, and then click **Next**. For example, select additional user accounts that you want to send the notification to.
20. On the **Summary** page, review the settings that you selected for the notification subscription, and then click **Create**.
21. On the **Completion** page, click **Close**.

To validate a notification subscription

- Locate the notification subscription that you created in the list of subscriptions.

You can use a Windows PowerShell command to complete these tasks and other related tasks, as follows:

- For information about how to use Windows PowerShell to create a new subscription in Service Manager, see New-SCSMSubscription.
- For information about how to use Windows PowerShell to retrieve subscriptions that are configured in Service Manager, see Get-SCSMSubscription.
- For information about how to use Windows PowerShell to update subscription properties in Service Manager, see Update-SCSMSubscription.
- For information about how to use Windows PowerShell to remove a subscription from Service Manager, see Remove-SCSMSubscription.

See Also

How to Configure Notification Channels

How to Create Notification Templates

How to Verify a Notification Configuration

You can use the following procedure in System Center 2012 – Service Manager to verify that you have correctly configured notifications. Generate the type of change that activates the notification subscription that was previously created. When you do this, the subscription generates and then sends a notification. Receipt of the notification verifies success. For example, create a test incident that generates an email notification. The notification informs the recipient that an incident was opened.

If you are verifying a recurring notification subscription, you must wait for the time interval that you set previously to elapse until the notification is sent. When the notification is received, the configuration of the notification is verified.

To verify a notification configuration

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Work Items**, expand **Incident Management**, and then click **All Open Incidents**.
3. In the **Tasks** pane, under **Incident Management**, click **Create Incident**.
4. In the **Incident <Number> New** form, enter the required information in the **Affected user**, **Title**, **Classification Category**, **Impact**, and **Urgency** boxes.
5. In the **Classification Category** list, select **E-mail Problems**, and then click **OK**.
6. Verify that an email notification that contains the information you entered in the template is received. The email title should contain the incident ID number.

About Substitution Strings in Notification Templates

Substitution strings are special tokens or system variables that are used in notification templates in System Center 2012 – Service Manager. These strings retrieve properties from an instance that is related to the instance for which the template was created. The strings then display the value in the notification email. Notification templates in Service Manager include substitution strings. Although you should avoid modifying the predefined templates, you can duplicate them and then modify the duplicates.

For example, the end user notification template includes a substitution string in the message body that represents the user's first name. If you want to add the user's last name, you can easily do so by using the **Insert** button, which is available when you edit a notification template, and then browsing the available strings that are available for the class of template that you are modifying. In this example, you would browse and then select **Affected User** and then select **Last Name** to insert the string into the template. Later, when the notification is sent to the user, his or her first and last name is included in the message as a salutation.

While this example is very simple, Service Manager includes substitution strings for almost every property that you might need to create notifications that can inform end users and other Service Manager users with very timely and relevant information. You can easily view the substitution strings that are available in Service Manager by opening an existing notification template and then, in the template design area, clicking the **Insert** button to view the classes and properties.

See Also

How to Create Notification Templates

How to Automatically Notify Groups of Users

In some scenarios, you may want to use a group rather than an individual user in System Center 2012 – Service Manager as a work item stakeholder. For example, you might want to assign an incident to a team of people, such as an initial response team that routes incidents, and then notify everyone in the initial response team that an incident has been assigned to their team.

Messaging-enabled universal security groups in Microsoft Exchange Server are the key to this task. Although you can create these groups in Exchange Server 2007, this topic describes how to accomplish this using the Exchange Server 2010 Exchange Management console for incidents. You can use the following procedures to create a messaging-enabled universal security group, create a workflow to notify stakeholders when an incident is created, and then test for success.

In Exchange Server 2007 and later versions, the **Require that all senders are authenticated** setting is enabled by default for mail-enabled universal security groups. You can modify the setting in the distribution group properties, in Mail-Flow settings, in the **Message Delivery Restrictions** dialog box. If your outgoing Simple Mail Transfer Protocol (SMTP) server specified in the Service Manager settings (Under **Administration**>**Notifications Channels**>**Edit**) is using

Anonymous as the Authentication Method (either in Service Manager or the SMTP settings), then given the above default setting in exchange, the email would not be sent out. If you have Anonymous Access configured on the SMTP side, it is necessary either to clear the **Require that all senders are authenticated** setting in exchange for the Mail Enabled Universal Security Group, or change the SMTP authentication settings (in Service Manager or the outgoing SMTP Server settings) from anonymous to Windows Integrated, so that the user is authenticated, allowing the email to be sent.

As an alternative, you can avoid using **Assigned to** and instead use **Support Group** changing as a triggering field. To set this up, create a new email notification subscription, and under additional criteria, use the following:

- Changed from: [incident] Support Group Does not equal Tier 1
- Changed to: [incident] Support Group equals Tier 1

Use whatever template you want, and add the recipient of the mailing distribution list for Tier 1. Now Tier 1 is notified whenever a ticket is set to them, even if it is done by means of a template at portal ticket creation.

Setting up one of these for each support group will ensure that all your groups are informed of incoming incidents that require their attention.

To create a messaging-enabled universal security group

1. In the Exchange Management Console, navigate to **Recipient Configuration**, right-click **Distribution Group**, and then click **New Distribution Group**.
2. On the **Introduction** page, either choose an existing universal group or create a new group.
3. On the **Group Information** page, select the **Security** group type.
4. Complete the creation of the group.
5. Add members to the group by right-clicking them, clicking **Properties**, and accessing the **Members** tab.
6. Wait for Service Manager to sync with Active Directory Domain Services (AD DS), or perform a manual Synchronization from **Administration**>**Connectors**. (Click **AD Connector**, and then click the **Synchronize Now** task on the right-hand side).
7. Once the Active Directory synchronization has completed, the newly created group will be available as a configuration item in Service Manager, and it can be selected in the user picker fields, such as **Affected User** and **Assigned To**.

To create a workflow to notify stakeholders when an incident is created

1. Navigate to **Administration**>**Workflows**>**Configuration**.
2. Double-click **Incident Event Workflow Configuration**.
3. Click **Add**, and then click **Next** on the **Before you Begin** page.
4. Give the workflow a name, such as “Incident Created – Email Stakeholders”.
5. Leave the default of **When an incident is created** in the **Check for Events** drop-down

list.

6. Select one of your custom management packs (or create one) to store the workflow in, and then click **Next**.
7. Click **Next** on the **Specify Incident Criteria** page. (We want this workflow to run when any new incident is created.)
8. Optionally, apply a template. (In this case we are creating the workflow for notification only, so we choose **Do not apply a template**.)
9. In the **Select People to Notify** dialog box, select the **Enable notification** check box. Add the appropriate users you want to notify with the appropriate templates.
10. Click Next, and then click **Create** to complete creation of the workflow.

To test the workflow and mail the enabled universal security group

1. Create an incident and assign it to the messaging-enabled universal security group that you created earlier.

See Also

Automatically Notifying Groups of Users

Using the Service Catalog in System Center 2012 - Service Manager

This section provides an overview of how to use the service catalog in System Center 2012 – Service Manager. This section also contains procedures that cover management configuration scenarios for the service catalog.

Service Catalog Topics

- About the Service Catalog

  Provides an overview of how to configure and manage the service catalog.
- How to Extend the Service Offering Categories

  Describes how to add additional categories of service offerings to the service catalog.
- How to Create a Service Offering

  Describes how to create a service offering.
- How to Create Service Request Templates for New Request Offerings

  Describes how to create offering templates that are used to create new request offerings.
- How to Create a Request Offering

  Describes how to create a new request offering.
- How to Publish a Request Offering

  Describes how to publish a request offering.
- How to Unpublish a Request Offering

Describes how to unpublish a request offering.

- How to Add Request Offerings to Service Offerings

  Describes how to add request offerings to service offerings.
- How to Create a Catalog Item Group

  Describes how to create a catalog item group and associate the group to a user role and queue.
- How to Specify a User Role for Catalog Items

  Describes how to create a user role and associate it to a catalog group a set of users.
- How to Copy Request Offerings and Service Offerings

  Describes how to copy request offerings and service offerings.
- How to Publish a Service Offering

  Describes how to publish a service offering.
- How to Create and Categorize Catalog Items in Localized Languages

  Describes how to create and categorize catalog items in localized languages.
- How to Edit a Service Offering or a Request Offering

  Describes how to edit a service offering or a request offering.
- How to Delete a Service Offering or a Request Offering

  Describes how to delete a service offering or a request offering.
- About Languages Supported by the Service Catalog

  Explains how localized languages are supported by the service catalog.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

About the Service Catalog

The service catalog is a collection of items, assistance, actions, or groupings of them that your IT staff and infrastructure provides and makes available to end users in the Self-Service Portal in System Center 2012 – Service Manager. In the Service Manager console, you create catalog items to describe these items in the Library workspace using the following nodes:

- Request Offerings
- Service Offerings

The Request Offerings node is used to create a catalog item that describes an item, assistance, or action that is available to end users. It also defines information that you want to prompt the users for and any knowledge articles that are associated with the offering.

After it is created, you can set the status of a request offering as either Draft or Published. Draft status indicates that a request offering is not published and available to the service catalog. This prevents end users from requesting the offering. When you set the request offering status to Published, it appears in the catalog where users can request it, if they have been granted access to a catalog item group that contains the request offering. It is possible to create a request offering that is not part of a service offering. In this case, the request offering appears in the Self-Service Portal under an uncategorized list view.

The Service Offerings node is used to create a catalog item that categorizes request offerings.

See Also

Using the Service Catalog in System Center 2012 - Service Manager

How to Extend the Service Offering Categories

By default, System Center 2012 – Service Manager includes only the General service offering category. However, your organization will likely need additional categories to help organize service offerings that are provided to end users through the service catalog. You can use the following procedure to add additional categories to the service catalog.

To extend the service offering categories

1. In the Service Manager console, click **Library**.
2. In the **Library** pane, click **Lists**, and then in the **Filter** box, type **offering**.
3. In the **Lists** view, select **Service Offering Category**, and then in the **Tasks** list under **Service Offering Category**, click **Properties**.
4. In the **List Properties** dialog box, add any service offering categories that you want, and then click **OK** to close the dialog box. For example, add the following categories:
   - **Data Center**
   - **Access and Security**
   - **Communication Services**
5. Click **OK** to close the **List Properties** dialog box.

See Also

Using the Service Catalog in System Center 2012 - Service Manager

How to Create a Service Offering

Service offerings are logical groups of request offerings in System Center 2012 – Service Manager. Both service offerings and their request offerings are available to Self-Service Portal users, when their status is set to Published and if end users have been assigned a corresponding Service Manager user role. Only users who have been assigned a user role that is

associated with a catalog group that contains catalog items can use the Self-Service Portal to access the service catalog.

To create a service offering

1. In the Service Manager console, select **Library**.
2. In the **Library** pane, expand **Service Catalog**, and then select **Service Offerings**.
3. In the **Tasks** pane under **Service Offerings**, click **Create Service Offering** to open the Create Service Offering Wizard.
4. On the **Before You Begin** page, read the instructions, and then click **Next**.
5. On the **General** page, complete these steps:
    a. In the **Title** box, type a title for the service offering. For example, type **Access Services**.
    b. Optionally, next to **Image**, you can either **Browse** to an image file or leave the default selection.
    c. In the **Category** list, select a category that this service offering will be a part of. For example, select **Access and Security**.
    d. In the **Language** list, either leave the default selection or select a language.
    e. In the **Overview** text box, type a short overview to describe the service offering that will be shown on the Self-Service Portal home page. For example, type **Access to AD Group, Access to Labs**.
    f. In the description box, type a description that will appear on the service offering page in the Self-Service Portal.
    g. Next to **Management pack**, select an unsealed management pack of your choice, and then click **Next**. For example, if you previously created the Sample Management Pack, select it.
6. On the **Detailed Information** page, complete these steps:
    a. In the **Service level agreement information** box, type a summary of the service level agreement (SLA) information. For example, type **The SLAs for these requests, depending on the criticality of the requests, range from 1-2 business days. For more information, click the link below.**
    b. In the first **Link for additional information** box, type a hyperlink that users can click to view additional information about the SLA for this service offering.
    c. In the **Cost information** box, type a summary of any costs associated with requests that will be grouped in this service offering.
    d. In the second **Link for additional information** box, type a hyperlink that users can click to view additional information about any costs associated with requests that will be grouped in this service offering.
    e. Click **Next**.
7. Optionally, on the **Related Services** page, add related business services associated with the service offering, and then click **Next**.
8. Optionally, on the **Knowledge Articles** page, add related knowledge articles associated

with the service offering, and then click **Next**.

9. Optionally, on the **Request Offering** page, add related request offerings associated with the service offering, and then click **Next**.
10. On **the Publish** page, in the **Offering status** list, select **Published** and set the **Offering owner** to yourself, and then click **Next**.
11. On the **Summary** page, review the information, and then click **Create**.
12. On the **Completion** page, click **Close**.

See Also

Using the Service Catalog in System Center 2012 - Service Manager

How to Create Service Request Templates for New Request Offerings

By default, System Center 2012 – Service Manager includes a number of service request templates that are based on a generic incident template. By viewing the template, you can gain an understanding of the categories of information to collect and convey to end users as they submit requests through the Self-Service Portal. You can use the following procedure to create a new service request template without using the default generic incident request template.

To create a service request template

1. In the Service Manager console, select **Library**.
2. In the **Library** pane, click **Templates**, and then in the **Tasks** lists under **Templates**, click **Create Template**.
3. In the **Create Template** dialog box, in the **Name** box, type a name for the template. For example, type **Request Membership to Group**.
4. In the **Description** box, type a description for the template. For example, type **This template is used to request membership to a group**.
5. Next to **Class**, click **Browse**, select **Service Request**, and then click **OK**.
6. Click **OK** to close the **Create Template** dialog box and open the **Service Request Template** form in template mode.
7. In the **Service Request Template** form, in the **Title** box, type **Request membership to Active Directory group**.
8. In the **Description** box, type a description of the purpose of the form. For example, type **This template is used to request membership to an Active Directory group**.
9. In the **Urgency** list, select **Medium**, and in the **Priority** list, select **Medium**.
10. In the **Source** list, select **Portal**, and then click the **Activities** tab.
11. On the **Activities** tab, click the **Add** button to open the **Select Template** dialog box, where you will add an activity.
12. Select **Default Review Activity**, and then click **OK** to close the **Select Template** dialog box and open the **Review Activity Template** dialog box.

13. In the **Title** box, type a name for the review activity. For example, type **Approval for the user Requesting Membership to AD Group**.
14. Click **Add** to open the **Reviewer** dialog box and select a user who will approve requests for this service request, and then click **OK** to close the dialog box.
15. Click **OK** to close the **Review Activity Template** form.
16. Add another activity, and then select the **Default Manual Activity** template.
17. In the **Manual Activity Template** form, in the **Title** box, type a title for the manual activity. For example, type **Add the requesting user to list of Active Directory groups in the impacted configuration items**.
18. Next to **Activity Implementer**, select a user who is responsible for the activity, and then click **OK** to close the **Manual Activity Template** form.
19. Click **OK** to close the **Service Request Template** form.

See Also

Using the Service Catalog in System Center 2012 - Service Manager

How to Create a Request Offering

Request offerings are catalog items that describe the item, assistance, or action that is available to end users in the service catalog in System Center 2012 – Service Manager. Request offerings are normally placed in logical groups of service offerings. Both service offerings and their request offerings are available to Self-Service Portal users when the status of the offerings is set to Published and if end users have been assigned a corresponding Service Manager user role. Only users who have been assigned a user role associated with a catalog group that contains catalog items can use the Self-Service Portal to access the service catalog.

You can use the following procedure to create a request offering.

To create a request offering

1. In the Service Manager console, select **Library**.
2. In the **Library** pane, expand **Service Catalog**, and then select **Request Offerings**.
3. In the **Tasks** pane under **Request Offerings**, click **Create Request Offering** to open the Create Request Offering Wizard.
4. On the **Before You Begin** page, read the instructions, and then click **Next**.
5. On the **General** page, complete these steps:
    a. In the **Title** box, type a title for the request offering. For example, type **Access to Active Directory group**.
    b. Optionally, next to **Image**, you can either **Browse** to an image file, or leave the default selection.
    c. In the **Description** text box, type a short description that describes the request offering that will appear on the Self-Service Portal page. For example, type **Use this request offering to request membership to an Active Directory Group**.

d. Under **Select template**, select **Service Request**, and then in the **Select Template** dialog box, select a template that you created previously for a service request. For example, select the **Request Membership to Group** template, and then click **OK**.

e. Next to **Management pack**, select an unsealed management pack of your choice, and then click **Next**. For example, if you previously created the Sample Management Pack, select it.

6. On the **User Prompts** page, enter questions for users or define other instructions which will appear in the Self-Service Portal when a user submits a request by completing the following steps:

   a. In the **Form instructions** box, type a summary of the information that the user must provide for the request. For example, type **Provide the information below to request membership to the Active Directory Group**

   b. Under **Enter prompts or information text**, click **Add**; in the **User Prompts or Information** box, type **Enter your cost center**; in the **Response Type** list, select **Required**; and in the **Prompt Type** list, select **Integer**.

   c. In the second **Enter Prompts or Information** box, type **Select the list of Active Directory groups that you need access to**; in the **Response Type** list, select **Required**; and in the **Prompt Type** list, select **Query Results**.

   d. In the third **Enter Prompts or Information** box, type **Enter your justification for this request**; in the **Response Type** list, select **Required**; and in the **Prompt Type** list, select **Text**.

   e. Click **Next**.

7. On the **Configure Prompts** page, configure prompts to constrain user input to ensure that users provide the information required to fulfill their requests by completing the following steps:

   a. Select the **Enter your cost center** prompt, and then click **Configure**.

   b. In the **Configure Integer Control** dialog box, select **Limit integer range**, set the **Minimum Value** to **1000** set the **Maximum Value** to **6999**, and then click **OK** to close the dialog box.

   c. Select the **Select the Active Directory groups that you want access to** prompt, and click **Configure** to open the **Configure Instance Picker** dialog box.

   d. In the **Configure Instance Picker** dialog box in the **Frequently used basic classes** list, select **All basic classes**; in the filter box, type **Active**; and then select **Active Directory Group**.

   e. Click the **Configure Criteria (optional)** tab; in the list of properties under **User**, select **Department**; and then click **Add Constraint**.

   f. In the **Criteria** box, select **Department equals**; in the **Set Token** list, click **Select token**; and then click **1. Enter your cost center: Integer**.

   g. If the condition is not set to **equals**, select **equals**.

   h. Click the **Display Columns** tab, and then select **Display Name**, **Department**, and **Last Name**.

   i. Click the **Options** tab, select **Allow the user to select multiple objects**, and then select **Add user-selected objects as affected configuration items**.

j. Click **Ok** to close the **Configure Instance Picker** dialog box, and then click **Next**.

8. On the **Map Prompts** page, associate prompts with various fields of a service request or its activities, depending on the complexity of the form and the extension of the class that you have made. Complete the following steps to associate the justification to the review activity:
   a. Select **Approval for the user requesting membership to the Active Directory group – (Review Activity)**.
   b. Next to **Description**, select the box under **Prompt Output**, and then in the list, select **3. Enter your justification: String**.
   c. Click **Next**.
9. Optionally, on the **Knowledge Articles** page you can select a knowledge article to associate with this request offering, and then click **Next**.
10. Optionally, on the **Publish** page, you can set publishing information, and then click **Next**.
11. On the **Summary** page, review the information, and then click **Create**.
12. On the **Completion** page, click **Close**.

See Also

Using the Service Catalog in System Center 2012 - Service Manager

How to Publish a Request Offering

You can publish draft request offerings in System Center 2012 – Service Manager by using the Publish task or by using a change request. When you publish a request offering by using the Publish task, no additional interaction is required, and the request offering appears in the Self-Service Portal as an uncategorized item. If you want to publish the request offering as part of a category, you must add the request offering to a service offering.

If you want to have an approval process added before publishing, you can associate the request offering to a change request. If you use a change request, you can also send email notifications as the approval process occurs.

Note
Various errors might occur if you create a request offering without mapped prompts or if you have erroneously mapped any prompts. The errors can occur after you associate a change request to the request offering and then you complete the change request. To avoid such errors, ensure that you have least one prompt in the request offering and that all prompts are mapped correctly.

You can use the following procedures to publish request offerings.

To publish draft request offerings

1. In the Service Manager console, select **Library**.
2. In the **Library** pane, expand **Service Catalog**, and then select **Draft Request Offerings**.

3. In the **Draft Request Offerings** list, select one or more request offerings, and in the **Tasks** pane under **<RequestOfferingName>**, click **Publish**.

To use a change request to publish draft request offerings

1. In the Service Manager console, select **Library**.
2. In the **Library** pane, expand **Service Catalog**, and then select **Draft Request Offerings**.
3. In the **Draft Request Offerings** list, select one or more request offerings, and in the **Tasks** pane under **<RequestOfferingName>**, click **Create Change Request to Publish**.
4. In the **Select Template** dialog box, select the **Publish Offering** change request template, and then click **OK** to open a new change request form.
5. In the **<ChangeRequestID: Publish Offerings>** form, notice that the catalog items to publish appear under **Catalog items**.
6. Click the **Activities** tab, and notice that there is a review activity and an automated activity associated with the change request. Later, when the review activity is approved, the automated activity will set the publish status to Published.
7. Click **OK** to save the change request.

See Also

Using the Service Catalog in System Center 2012 - Service Manager

How to Unpublish a Request Offering

When you unpublish a request offering in System Center 2012 – Service Manager, it is removed from the Self-Service Portal so that end users cannot request it. You can use the following procedure to unpublish a request offering.

To unpublish a request offering

1. In the Service Manager console, select **Library**.
2. In the **Library** pane, expand **Service Catalog**, and then select **Published Request Offerings**.
3. In the **Published Request Offerings** list, select one or more request offerings, and in the **Tasks** pane under **<RequestOfferingName>**, click **Unpublish**.

See Also

Using the Service Catalog in System Center 2012 - Service Manager

How to Add Request Offerings to Service Offerings

In System Center 2012 – Service Manager, service offerings are logical groups of request offerings. For a service offering to appear in the Self-Service Portal, each service offering must

have at least one request offering added to it. After a service offering and a request offering are published, it is a straightforward process to associate them as a collection.

To add request offerings to service offerings

1. In the Service Manager console, select **Library**.
2. In the **Library** pane, expand **Service Catalog**, and then select **Published Request Offerings**.
3. In the **Published Request Offerings** list, select one or more request offerings, and in the **Tasks** pane under **<RequestOfferingName>**, click **Add to Service Offering**.
4. In the **Select objects** dialog box, select the service offering that you want to associate the request offering with, click **Add**, and then click **OK** to close the dialog box.

How to Create a Catalog Item Group

Catalog item groups in System Center 2012 – Service Manager are lists of catalog items that are used to secure the service catalog and provide access to users, based on membership in a corresponding Service Manager user role. In the following procedure, you create a simple catalog item group. After you create the group, use an existing user role, or create a new user role, to provide access to catalog items that have been associated with the group.

To create a catalog item group

1. In the Service Manager console, select **Library**, and then click **Groups**.
2. In the **Tasks** pane under **Groups**, click **Create Catalog Group** to open the Create Group Wizard.
3. On the **Before You Begin** page, read the instructions, and then click **Next**.
4. On the **General** page, complete these steps:
    a. In the **Group name** box, type a name for the catalog group. For example, type **Access Request Offering Group**.
    b. In the **Group description** box, type a description for the catalog group. For example, type **This group is used to consolidate and provide security to Access Request Offering catalog items**.
    c. Next to **Management pack**, select an unsealed management pack of your choice, and then click **Next**. For example, if you previously created the Sample Management Pack, select it.
5. On the **Included Members** page, complete these steps to select catalog items and associate them with the catalog group:
    a. Click **Add** to open the **Select objects** dialog box, select one or more catalog items that you created previously, click **Add**, and then click **OK** to close the dialog box.
    b. Click **Next**.
6. Optionally, on the **Dynamic Members** page, you can select a class and specific objects,

based on the criteria that you choose, to add as members of the group, and then click **Next**.

7. Optionally, on the **Subgroups** page, you can add other groups as members of the new group that you are creating, and then click **Next**.
8. Optionally, on the **Excluded Members** page, you can select a class and specific objects, based on criteria that you choose, to exclude as members of the group, and then click **Next**.
9. On the **Summary** page, review the information, and then click **Create**.
10. On the **Completion** page, click **Close**.

See Also

Using the Service Catalog in System Center 2012 - Service Manager

How to Specify a User Role for Catalog Items

User roles in System Center 2012 – Service Manager provide access to catalog groups that contain catalog items. Both service offerings and their request offerings are available to Self-Service Portal users, when the status of the offerings is set to Published and if end users have been assigned a corresponding Service Manager user role. Only users who have been assigned a user role associated with a catalog group that contains catalog items can use the Self-Service Portal to access the service catalog. You can use the following procedure to create a user role and associate catalog items and users with the role.

To create a user role and associate it with catalog items and users

1. In the Service Manager console, select **Administration**.
2. In the **Administration** pane, expand **Security**, and then select **User Roles**.
3. In the **Tasks** pane under **User Roles**, click **Create User Role**, and then click **End User** to open the Create User Role Wizard.
4. On the **Before You Begin** page, read the instructions, and then click **Next**.
5. On the **General** page, complete these steps:
   a. In the **Name** box, type a name for the user role. For example, type **Security Offerings End User Role**.
   b. Optionally, in the **Description** box, type a description of the purpose of the user role. For example, type **This user role provides access to security offerings to end users**.
   c. Click **Next**.
6. On the **Management Packs** page, complete these steps:
   a. In **Management Packs** list, select a management pack that is used by catalog items. For example, select **Service Manager Service Request Configuration Library**.
   b. Click **Next**.
7. On the **Queues** page, there are no options that apply to security to catalog items;

therefore, click **Next**.

8. On the **Configuration Item Groups** page, there are no options that apply to security to catalog items; therefore, click **Next**.
9. On the **Catalog Item Groups** page, select **Provide access to only the selected groups**, select the groups that you want to provide access to, and then click **Next**.
10. On the **Form Templates** page, ensure that **All forms can be accessed** is selected, and then click **Next**.
11. On the **Users** page, add the users and groups that you want to provide access to, and then click **Next**.
12. On the **Summary** page, review the information, and then click **Create**.
13. On the **Completion** page, click **Close**.

How to Copy Request Offerings and Service Offerings

After you create a request offering or a service offering in System Center 2012 – Service Manager, you can copy the offering so that you can easily modify the copied offering.

You can use the following procedures to copy a request offering and a service offering. Keep in mind that if you copy a published catalog item, the published status of the copy is set to Draft.

To copy a request offering

1. In the Service Manager console, select **Library**.
2. In the **Library** pane, expand **Service Catalog**, expand **Request Offerings**, and then select **All Request Offerings**.
3. In the **All Request Offerings** list, select the request offering that you want to copy, and then in the **Tasks** pane under **<RequestOfferingName>**, click **Create a Copy** to open the **Copy Request Offering** dialog box.
4. In the dialog box, you can optionally select **Also create a copy of the template referred to in this Request Offering** to create a copy of the template.
5. Optionally, you can change the management pack where information about the copied request offering is stored or you can create a new management pack.
6. Click **OK** to close the dialog box and create the copy.
7. The copied item appears in the list, with a prefix of **Copy of**. For example, your copy might have the name **Copy of Access to Active Directory Group**.

To copy a service offering

1. In the Service Manager console, select **Library**.
2. In the **Library** pane, expand **Service Catalog**, expand **Service Offerings**, and then select **All Service Offerings**.
3. In the **All Service Offerings** list, select the service offering that you want to copy, and then in the **Tasks** pane under **<ServiceOfferingName>**, click **Create a Copy** to open the

Copy Service Offering dialog box.

4. Optionally, you can change the management pack where information about the copied service offering is stored or you can create a new management pack.
5. Click **OK** to close the dialog box and create the copy.
6. The copied item appears in the list, with a prefix of **Copy of**. For example, your copy might have the name **Copy of Access Services**.

How to Publish a Service Offering

You can publish draft service offerings in System Center 2012 – Service Manager by using the Publish task or by using a change request. When you publish a service offering by using the Publish task, the service offing must contain at least one published request offering before it appears in the Self-Service Portal. If you want to have an approval process added before publishing, you can associate the service offering with a change request. If you use a change request, you can also send email notifications as the approval process occurs.

You can use the following procedures to publish a draft service offering and then use a change request to publish it.

To publish a draft service offering

1. In the Service Manager console, select **Library**.
2. In the **Library** pane, expand **Service Catalog**, and then select **Draft Service Offerings**.
3. In the **Draft Service Offerings** list, select one or more service offerings, and in the **Tasks** pane under **<ServiceOfferingName>**, click **Publish**.

To use a change request to publish a draft service offering

1. In the Service Manager console, select **Library**.
2. In the **Library** pane, expand **Service Catalog**, and then select **Draft Service Offerings**.
3. In the **Draft Service Offerings** list, select one or more service offerings, and in the **Tasks** pane under **<ServiceOfferingName>**, click **Create Change Request to Publish**.
4. In the **Select Template** dialog box, select the **Publish Offering** change request template, and then click **OK** to open a new change request form.
5. In the **<ChangeRequestID: Publish Offerings>** form, notice that the catalog items to be published appear under **Catalog items**.
6. Click the **Activities** tab, and notice that there is a review activity and an automated activity associated with the change request. Later, when the review activity is approved, the automated activity will set the publish status to Published.
7. Click **OK** to save the change request.

How to Create and Categorize Catalog Items in Localized Languages

In System Center 2012 – Service Manager, you create and categorize catalog items for localized languages in the same manner that you do for U.S. English. The only difference is that when you create a service offering and a request offering, you do it in the localized language. By doing so, you can create catalog items in the language that is used by the end user who will submit requests. Service Manager includes catalog items that have been localized in various languages so that you can copy them and then modify them for use in your organization.

After you have created the service offering and request offerings in a localized language, users need to have the appropriate SharePoint language pack installed on the computers they use to view the Self-Service Portal. Additionally, they must select the appropriate language in the Self-Service Portal using **Site Settings** in **Site Administration** and then the appropriate selection of the default and alternate language they want to use with **Language Settings**.

To create and categorize catalog items in a localized language

1. Perform any necessary procedures in the topic How to Copy Request Offerings and Service Offerings to copy catalog items that have been localized.
2. Perform any necessary procedures in the topic How to Create a Service Offering, and ensure that you select the language of the catalog item.
3. Perform any necessary procedures in the topic How to Create Service Request Templates for New Request Offerings.
4. Perform any necessary procedures in the topic How to Create a Request Offering.
5. Perform any necessary procedures in the topic How to Add Request Offerings to Service Offerings.
6. Perform any necessary procedures in the topic How to Create a Catalog Item Group.
7. Perform any necessary procedures in the topic How to Specify a User Role for Catalog Items.
8. Perform any necessary procedures in the topics How to Publish a Request Offering and How to Publish a Service Offering.

See Also

About Languages Supported by the Service Catalog

How to Edit a Service Offering or a Request Offering

In System Center 2012 – Service Manager, request offerings are catalog items that describe the item, assistance, or action that is available to end users in the service catalog. Request offerings are normally placed in logical groups of service offerings. Both service offerings and their request offerings are available to Self-Service Portal users, when the status of the offerings is set to Published and if end users have been assigned a corresponding Service Manager user role. Only

users that have been assigned a user role that is associated with a catalog group that contains catalog items can use the Self-Service Portal to access the service catalog.

You can use the following procedures to edit a service offering or a request offering.

To edit a request offering

1. In the Service Manager console, select **Library**.
2. In the **Library** pane, expand **Service Catalog**, expand **Request Offerings**, and then select **All Request Offerings**.
3. In the **All Request Offerings** list, double-click the request offering that you want to edit.
4. In the **Edit Request Offering** form, you can edit information on the following pages:
5. On the **General** page, complete these steps:
   a. In the **Title** box, type a title for the request offering. For example, type **Access to Active Directory group**.
   b. Optionally, next to **Image**, you can either click **Browse** to find an image file or leave the default selection.
   c. In the **Description** text box, type a short description that will describe the request offering that will appear on the Self-Service Portal page. For example, type **Use this request offering to request membership to an Active Directory Group**.
6. On the **User Prompts** page, enter questions for users or define other instructions that will appear on the Self-Service Portal when a user submits a request by completing the following steps:
   a. In the **Form instructions** box, type a summary of the information that the user must provide for the request. For example, type **Provide the information below to request membership to the Active Directory Group**
   b. Under **Enter prompts or information text**, click **Add**; in the **User Prompts or Information** box, type **Enter your cost center**; in the **Response Type** list, select **Required**; and in the **Prompt Type** list, select **Integer**.
   c. In the second **Enter Prompts or Information** box, type **Select the list of Active Directory groups that you need access to**; in the **Response Type** list, select **Required**; and in the **Prompt Type** list, select **Query Results**.
   d. In the third **Enter Prompts or Information** box, type **Enter your justification for this request**; in the **Response Type** list, select **Required**; and in the **Prompt Type** list, select **Text**.
7. On the **Configure Prompts** page, configure prompts to constrain user input to ensure that users provide the information necessary to fulfill their request by completing the following steps:
   a. Select the **Enter your cost center** prompt, and then click **Configure**.
   b. In the **Configure Integer Control** dialog box, select **Limit integer range**, set the **Minimum Value** to **1000**, set the **Maximum Value** to **6999**, and then click **OK** to close the dialog box.
   c. Select the **Select the Active Directory groups that you want access to** prompt, and click **Configure** to open the **Configure Instance Picker** dialog box.

d. In the **Configure Instance Picker** dialog box in the **Frequently user basic classes** list, select **All basic classes**; in the filter box, type **Active**; and then select **Active Directory Group**.

e. Click the **Configure Criteria (optional)** tab; in the list of properties under **User**, select **Department**; and then click **Add Constraint**.

f. In the **Criteria** box, click **Department equals**; in the **Set Token** list, click **Select token**; and then click **1. Enter your cost center: Integer**.

g. If the condition is not set to **equals**, select **equals**.

h. Click the **Display Columns** tab, and then select **Display Name**, **Department**, and **Last Name**.

i. Click the **Options** tab, select **Allow the user to select multiple objects**, select **Add user-selected objects as affected configuration items**, and then select **Add the requesting user to the list of Active Directory group in the impacted configuration items (Manual Activity)**.

j. Click **Ok** to close the **Configure Instance Picker** dialog box.

8. On the **Map Prompts** page, associate prompts with various fields of a service request or its activities, depending on the complexity of the form and the extension of the class that you have made. Complete the following steps to associate a justification with the review activity:

   a. Select **Approval for the user requesting membership to the Active Directory group – (Review Activity)**.

   b. Next to **Description**, select the box under **Prompt Output**, and then in the list, select **3. Enter your justification: String**.

9. Optionally, on the **Knowledge Articles** page, you can select a knowledge article to associate with this request offering.
10. Optionally, on the **Publish** page, you can set publishing information.
11. Click **OK** to close the **Edit Request Offering** form.

To edit a service offering

1. In the Service Manager console, select **Library**.
2. In the **Library** pane, expand **Service Catalog**, expand **Service Offerings**, and then select **All Service Offerings**.
3. In the **All Service Offerings** list, double-click the service offering that you want to edit.
4. In the **Edit Service Offering** form, edit information on the following pages.
5. On the **General** page, complete these steps:

   a. In the **Title** box, type a title for the service offering. For example, type **Access Services**.

   b. Optionally, next to **Image**, you can either click **Browse** to find an image file, or leave the default selection.

   c. In the **Category** list, select a category that will be the group for this service offering. For example, select **Access and Security**.

d. In the **Language** list, either leave the default selection or select a language.

e. In the **Overview** text box, type a short overview that will describe the service offering that will appear on the Self-Service Portal home page. For example, type **Access to AD Group, Access to Labs**.

f. In the description box, type a description that will appear on the service offering page on the Self-Service Portal.

6. On the **Detailed Information** page, complete these steps:

   a. In the **Service level agreement information** box, type a summary of the service level agreement (SLA) information. For example, type **The SLAs for these requests range from 1-2 business days. For more information, click the link below.**

   b. In the first **Link for additional information** box, type a hyperlink that users can click to view additional information about the SLA for this service offering.

   c. In the **Cost information** box, type a summary of any costs associated with requests that will be grouped in this service offering.

   d. In the second **Link for additional information** box, type a hyperlink that users can click to view additional information about any costs associated with requests that will be grouped in this service offering.

7. Optionally, on the **Related Services** page, add related business services associated with the service offering.
8. Optionally, on the **Knowledge Articles** page, add related knowledge articles associated with the service offering.
9. Optionally, on the **Request Offering** page, add related request offerings associated with the service offering.
10. On the **Publish** page in the **Offering status** list, select **Published**, and then set the **Offering owner** to yourself.
11. Click **OK** to close the **Edit Service Offering** form.

How to Delete a Service Offering or a Request Offering

In System Center 2012 – Service Manager, service offerings and their request offerings are available to Self-Service Portal users, when the status of the offering is set to Published and if end users have been assigned a corresponding Service Manager user role. Only users who have been assigned a user role associated with a catalog group that contains catalog items can use the Self-Service Portal to access the service catalog. You can also delete a catalog item when it is no longer needed.

You can use the following procedures to delete a service offering or a request offering.

To delete a service offering

1. In the Service Manager console, select **Library**.
2. In the **Library** pane, expand **Service Catalog**, expand **Service Offerings**, and then select **All Service Offerings**.

3. In the **All Service Offerings** list, select the service offering that you want to delete.
4. In the **Tasks** list under **<ServiceOfferingName>**, click **Delete**.
5. In the **Delete Item** dialog box, click **Yes**.

To delete a request offering

1. In the Service Manager console, select **Library**.
2. In the **Library** pane, expand **Service Catalog**, expand **Request Offerings**, and then select **All Request Offerings**.
3. In the **All Request Offerings** list, select the request offering that you want to delete.
4. In the **Tasks** list under **<RequestOfferingName>**, click **Delete**.
5. In the **Delete Item** dialog box, click **Yes**.

About Languages Supported by the Service Catalog

The Self-Service Portal in System Center 2012 – Service Manager supports many localized languages for service offerings. The following is a list of languages that are supported in Microsoft SharePoint 2010 products and in Service Manager. These languages are supported in the Service Manager console by means of the service offering **Language** item that you select. Accordingly, after you install the appropriate SharePoint 2010 language pack on the server that hosts SharePoint 2010 and the Self-Service Portal, you can select the corresponding SharePoint Language ID in the Self-Service Portal by using **Site Settings** in **Site Administration** and then selecting the default and alternate languages that you want to use with **Language Settings**.

Note
There is an exception for East Asian languages. Specifically, in the Service Manager console you must select **Chinese (Traditional, Taiwan)** and **Chinese (Simplified)** instead of the **Chinese (Traditional)** and **Chinese (Simplified, China)** options that the Self-Service Portal and SharePoint 2010 display.

The Service Manager console supports more languages than the languages in the following table. You can use languages—that are available in the Self-Service Portal and not listed in the table—in Silverlight modules when you localize the modules in other languages and then host them outside SharePoint 2010.

Supported SharePoint Foundation 2010 and SharePoint Server 2010 Languages

SharePoint 2010 Language	SharePoint 2010 Language ID
Arabic	1025
Basque (Basque)	1069

SharePoint 2010 Language	SharePoint 2010 Language ID
Bulgarian	1026
Catalan	1027
Chinese (Simplified)	2052
Chinese (Traditional)	1028
Croatian	1050
Czech	1029
Danish	1030
Dutch	1043
English	1033
Estonian	1061
Finnish	1035
French	1036
Galician	1110
German	1031
Greek	1032
Hebrew	1037
Hindi	1081
Hungarian	1038
Italian	1040
Japanese	1041
Kazakh	1087
Korean	1042
Latvian	1062
Lithuanian	1063
Norwegian (Bokmål)	1044
Polish	1045
Portuguese (Brazil)	1046
Portuguese (Portugal)	2070

SharePoint 2010 Language	SharePoint 2010 Language ID
Romanian	1048
Russian	1049
Serbian (Latin)	2074
Slovak	1051
Slovenian	1060
Spanish	3082
Swedish	1053
Thai	1054
Turkish	1055
Ukrainian	1058

Using Groups, Queues, and Lists in System Center 2012 - Service Manager

In System Center 2012 – Service Manager, you can use groups to manage configuration items, queues to manage work items, and lists to customize forms to classify different objects, such as incidents, change requests, activities, or configuration items. Use the overview and the procedures in the following topics to help manage these items.

Groups, Queues, and Lists Topics

- About Groups, Queues, and Lists

  Provides an overview of groups, queues, and lists in Service Manager.
- How to Create a Group

  Describes how to create a group.
- How to Create a Queue

  Describes how to create a queue.
- How to Edit a Queue

  Describes how to edit a queue.
- How to Add a List Item

  Describes how to add a list item.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager

- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

About Groups, Queues, and Lists

The **Library** pane in System Center 2012 – Service Manager contains items, such as groups, queues, and lists. You can use groups to manage configuration items, and you can use queues to manage work items. You can use lists to customize forms.

Using Groups to Manage Configuration Items

In Service Manager, groups contain objects. Typically, these objects are configuration items. Groups can include collections of objects of the same class or of different classes. For example, say that you decide to create the **Exchange Servers** group. You have several methods to do this. You can create a static group, a dynamic group, or a combination of static and dynamic groups. A static group is defined by specific objects, such as "Exchange1" and "Exchange2". A dynamic group is defined by inclusion rules. Inclusion rules are based on comparing a formula to the actual property value of a configuration item. The following table shows samples of inclusion rules.

Class.Property	Operator	Value
Active Directory.Domain	Contains	Woodgrove
Windows Server.Display Name	Contains	Exchange Servers
Operating System.Display Name	Starts with	Windows Server

For example, say that you want to restrict access to Exchange servers to only specific users. To do this, you create a new group that is named **Exchange Servers** and add all Exchange servers in this environment to the group. Later, you can configure user roles to limit access to the **Exchange Servers** group to only the specific users to whom you want to grant access. You can use the **Exchange Servers** group as criteria when you configure notification subscriptions. You can also use the **Exchange Servers** group as criteria for a report parameter.

Using Queues to Manage Work Items

In Service Manager, queues are used to group similar work items that meet specified criteria, for example, all incidents that are classified by analysts as E-mail incidents. All work items in a queue must be of the same type, such as incidents, change requests, activities, or trouble tickets. Queues use membership rules to determine which work items should be included in each queue. Queue membership rules are dynamic, and they are periodically recalculated to ensure that the queue membership list is current.

You can create a queue to group work items with a specific type or with a specific priority. You can then configure user roles to limit access to that queue to only specific users.

For incident escalation, you can use queues in various ways to speed the resolution of higher priority or common incidents. For example, you can configure Incident Management to automatically escalate specific incidents to a high-priority queue

For example, you can use queues as follows:

- In notifications, you can use a queue as criteria in a subscription to specify which work items to notify about.
- In security, you can use a queue in user role configuration to limit the scope of control that groups of users have over work items.

Note

When you delete a queue, the work items that are contained in the queue are preserved. You can delete a queue only if it is in an unsealed management pack.

Using Lists to Customize Forms

You can use lists in Service Manager to classify different objects, such as incidents, change requests, activities, or configuration items. A list represents a property of an object, and it includes one or more *list items*. Each list item represents a possible value for a property.

Lists are used in forms and dialog boxes throughout the Service Manager console. Lists and list items make it possible for users to select a value from a predefined list of values. When you use lists, you can customize the console to reflect the business practices of your organization. Additionally, Service Manager contains several predefined lists, such as the **Incident Classification** list.

For example, when you are creating an incident, you notice that **Printer Problems** is an option under **Classification Category**. At your company, some standard laser printers in your accounting department might be used as specialized check-writing printers. To better route incidents, you want printer-related incidents to be categorized as being either for standard laser printers or for check-writing printers. Because lists are customizable, you can add a list item, such as **Laser Printers** and **Check-Writing Printers**, to the **Classification Category** list when you create an incident. Optionally, you can build lists as a hierarchy; for example, laser printers and check-writing printers could be listed under printers. To do this, you can add **Laser Printer** and **Check-Writing Printer** list items to the **Incident Classification** list.

About List Items

In Service Manager, several default list items exist. It is important that you not delete the default list items. Each default list item is defined by a globally unique identifier (GUID). Some of the default management packs reference these list items by their GUID. If you delete a list item, some management packs or workflows might not work.

If the name of a default list item causes an issue in your environment, you can change the display name of the existing item but leave the GUID intact. For example, you can change the name of

the **Printing Problems** default list item to *Laser Printing Problems* if that is better in your environment.

See Also

How to Create a Group

How to Create a Queue

How to Edit a Queue

How to Add a List Item

How to Create a Group

Use the following procedures in System Center 2012 – Service Manager to create a new group (such as the **Exchange Servers** group) that includes the servers in your environment that are running Microsoft Exchange Server.

Note
We recommend that you create a Configuration Manager 2007 connector before you run this procedure. For more information, see Importing Data from Configuration Manager 2007.

To create a new group

1. In the Service Manager console, click **Library**.
2. In the **Library** pane, expand **Library**, and then click **Groups**.
3. In the **Tasks** pane, under **Groups**, click **Create Group**. The Create Group Wizard starts.
4. On the **Before You Begin** page, click **Next**.
5. On the **General** page, do the following:
   a. Provide a name for the group, such as **Exchange Servers**.
   b. In the **Description** text box, type a description for the group. For example, type **All Exchange servers that require an update.**
   c. Under **Management pack**, make sure that an unsealed management pack is selected. For example, select **Service Catalog Generic Incident Request**. Then, click **Next**.
6. On the **Included Members** page, click **Add**.
7. In the **Select Objects** dialog box, in the **Filter by class** list, select a class, such as **Windows Computer**.
8. In the **Search by name** box, type the search criteria that you want to use to locate an object, and then click the filter (magnifying glass) button.
9. Select one or more items in the **Available Objects** list, and then click **Add**. For example, select all the Exchange servers in your organization.
10. Verify that the objects that you selected in the **Available Objects** list appear in the **Selected objects** list, and then click **OK**.

11. On the **Included Members** page, click **Next**.
12. Optionally, on the **Dynamic members** page, click the ellipsis (…) button to specify a type, such as **Windows Computer**, to build the dynamic members. Choose any property you want to build your criteria. For example, after you specify the **Windows Computer** type, select the **Principal Name** property, and then click **Add**. In the related text box, enter **woodgrove** so that all the computers whose principal name contains this text are included, and then click **Next**.
13. Optionally, on the **Subgroups** page, click **Add**, and then select the specific groups that you want as subgroups of this group. If any group that you want to select as a subgroup is from an unsealed management pack, that subgroup must be from the same management pack as the group that you are creating. Click **OK**, and then click **Next**.
14. Optionally, on the **Excluded Members** page, click **Add**, and then select the specific configuration items that you want to exclude from this group. Click **OK**, and then click **Next**.
15. On the **Summary** page, confirm the group settings that you made, and then click **Create**.
16. On the **Completion** page, make sure that you receive the following confirmation message, and then click **Close**:

    "The new group was created successfully."

To validate the creating of a new group

- Make sure that **Exchange Servers** appears in the **Groups** pane. If necessary, press the F5 key to refresh the Service Manager console view.

  In the **Tasks** pane, under the name of the group, click **View Group Members** to make sure that the Exchange servers appear in the **Group Members** window.

You can use a Windows PowerShell command to retrieve groups from Operations Manager and from Service Manager. For more information, see Get-SCSMGroup.

How to Create a Queue

You can create queues in System Center 2012 – Service Manager to create a grouping of related work items, such as incidents and change requests. For example, you can create a queue that you use for escalation, named **Exchange Send Problems Queue**, and then escalate that type of incident to that queue.

You can use the following procedure to create a queue.

To create a queue

1. In the Service Manager console, click **Library**.
2. In the **Library** pane, expand **Library**, and then click **Queues**.
3. In the **Tasks** pane, click **Create Queue**.
4. Complete these steps to complete the Create Queue Wizard:

a. On the **Before You Begin** page, click **Next**.
b. On the **General** page, type a name in the **Queue name** box. For example, type **Exchange Send Problems Queue**.
c. Next to the **Work item type** box, click the ellipsis button (**…**). In the **Select a Class** dialog box, select a class, such as **Incident**, and then click **OK**.
d. In the **Management pack** list, select the unsealed management pack in which you want to store the new queue definition. For example, select **Service Manager Incident Management Configuration Library**. Then, click **Next**.
e. On the **Criteria** page, build the criteria that you want to use to filter work items for the queue, and then click **Next**. Only work items that meet the specified criteria will be added to that queue.

   For example, select the **Classification Category** property in the **Available Properties** area, and then click **Add**. In the list that was just added to the **Criteria** area, in the area that is now surrounded by a red box, select **E-Mail Problems**, and then click **Next**.
f. On the **Summary** page, click **Create** to create the queue.
g. On the **Completion** page, click **Close**.

To validate the creation of a queue

1. In the Service Manager console, verify that the new queue appears in the **Queues** pane.
2. In the **Tasks** pane, click **Properties**, and then verify that the queue appears as you defined it.

You can use a Windows PowerShell command to complete this task. For information about how to use Windows PowerShell to retrieve queues that are defined in Service Manager, see Get-SCSMQueue.

How to Edit a Queue

In System Center 2012 – Service Manager, you can use the following procedure to edit a queue.

To edit a queue

1. In the Service Manager console, click **Library**.
2. In the **Library** pane, expand **Library**, and then click **Queues**.
3. In the **Queues** pane, select the queue that you want to edit, such as **Exchange Send Problems Queue**. Then, in the **Tasks** pane, click **Properties**.
4. In the **Queue Properties** dialog box, on the **General** and **Criteria** tabs, make the changes you want. For example, change the description of the queue.
5. Click **OK** to save the changes.

How to Add a List Item

In System Center 2012 – Service Manager, you can use these procedures to add a list item to an existing list and then validate it. For example, you can use this procedure to add a Laser Printer and Check-Writing Printer list item to the **Incident Classification** list.

To add list items to Service Manager lists

1. In the Service Manager console, click **Library**.
2. In the **Library** pane, click **Lists**. The **Lists** pane displays all the existing lists.
3. Select the list to which you want to add a list item. For example, select the **Incident Classification** list. In the **Tasks** pane, under **Incident Classification**, click **Properties**.
4. In the **List Properties** dialog box, click **Printing Problems**, and then click **Add Child**. Notice that a new **List Value** list item is added.

   Note
   When you click **Add Item** or **Add Child**, a **Select management pack** dialog box might appear. If this dialog box appears, select the default management pack, select another unsealed management pack, or create a new management pack.
5. Click the new **List Value** list item. In the **Name** box, type a name for the new list item. For example, type **Laser Printer**. If you want, you can optionally type a description in the **Description** box.
6. Repeat steps 4 and 5 and create a new list item with the name **Check-Writing Printer**, and then click **OK**.

To validate the addition of a new list item

1. Select the same list again, click **Properties** in the **Tasks** pane, and then verify that the new list item appears.
2. In the Service Manager console, create a new incident, and then locate the new list item in the **Classification Category** list. For example, expand **Printer Problems**, and then locate the **Laser Printer** and **Check-Writing Printer** list items.

   For more information about creating a new incident, see the topic How to Manually Create a New Incident in the Operations Guide for System Center 2012 – Service Manager.

Using Runbooks in System Center 2012 - Service Manager

Runbooks in System Center 2012 – Service Manager and System Center 2012 - Orchestrator are used to automate procedures. The following topics provide details about the purpose and use of runbooks.

Runbook Topics

- About Runbooks in Service Manager

  Provides an overview of the purpose of runbooks in Service Manager.
- How to Create a Runbook Automation Activity Template

  Describes how to create a runbook automation activity template.
- How to View a Runbook

  Describes how to view a runbook.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

About Runbooks in Service Manager

To automate processes in System Center 2012, System Center 2012 - Orchestrator uses runbooks to automate procedures. Runbooks are visual representations of the procedures. The value that runbooks have is that they help ensure that Orchestrator automation is driven and tracked from System Center 2012 – Service Manager and that Service Manager interactions with other Service Manager products and non-Microsoft systems are much easier to implement.

Additionally, the Orchestrator workflow authoring interface is available for your custom Service Manager scenarios. Runbooks are imported into Service Manager using the Orchestrator connector. After the connector is synchronized, imported runbooks appear in the **Library** workspace under the **Runbooks** node in the Service Manager console, where you can view them and also create runbook automation activity templates.

About System Center 2012 - Orchestrator

System Center 2012 - Orchestrator is an automation platform for orchestrating and integrating IT tools to drive down the cost of datacenter operations, while improving the reliability of IT processes. Orchestrator enables IT organizations to automate best practices, such as those that are found in the Microsoft Operations Framework (MOF) and Information Technology Infrastructure Library (ITIL). This is achieved through workflow processes that coordinate Service Manager and other management tools to automate incident response, change and compliance, and service-life-cycle management processes.

Through its workflow designer, Orchestrator automatically shares data and initiates tasks in System Center 2012 components, including Operations Manager, Service Manager, Virtual Machine Manager, System Center 2012 - Configuration Manager, Active Directory Domain Services (AD DS), and non-Microsoft tools. Orchestrator workflow automates IT infrastructure tasks, while Service Manager workflow provides automation of human workflow. The combined

offering ensures repeatable, consistent results by removing the latency associated with manual coordination service delivery. Service Manager and Orchestrator enable integration, efficiency, and business alignment of datacenter IT services by:

- Automating processes and enforcing best practices for incident, change, and service-life-cycle management.
- Reducing unanticipated errors and service delivery time by automating tasks across responsibility groups within your IT organization.
- Integrating System Center with non-Microsoft tools to enable interoperability across the datacenter.
- Orchestrating tasks across systems for consistent, documented, and compliant activity.

See Also

Using Runbooks in System Center 2012 - Service Manager

How to Create a Runbook Automation Activity Template

After you import runbooks into System Center 2012 – Service Manager using the Orchestrator connector from System Center 2012 - Orchestrator, you can create a runbook automation activity template to map parameters in Orchestrator to corresponding parameters in Service Manager.

As an example, you can implement a new request offering using an Orchestrator runbook to automate it. Then, you can go to the Runbooks view in the Library workspace, select a runbook, and create a runbook automation activity template. You can go to the templates view and verify that the template is created. You can then add the Orchestrator activity template to a service request template and create the request offering. You then can then map the runbook template to a different runbook with the same inputs and outputs if you find that you need to fix a problem or improve the process.

Important
If you have extended root classes such as service request or release record, then you can map runbook activity parameter to extended properties only if the runbook activity template and service request templates are saved in same management pack where the definition extension is located.

To create a runbook automation activity template

1. In the Service Manager console, click **Library**.
2. In the **Library** pane, click **Runbooks**.
3. In the **Runbooks** view, select a runbook.
4. In the **Tasks** pane, under **<RunbookName>**, click **Create Runbook Automation Activity Template** to open the **Create Template** dialog box.
5. In the **Name** box, type a name for the template.
6. Optionally, in the **Description** box, type a description for the template.
7. If necessary, select an unsealed management pack to save the template to, and then

click **OK**. You will use this management pack later to retrieve the runbook automation activity template from another work item template, such as a service request template.

8. In the Runbook Activity Template: <TemplateName> form, on the **General** tab, type information for **Title**, **Description**, **Area**, **Stage**, **Assigned To**, and **Designer**.
9. Ensure that **Is Ready for Automation** is selected.
10. Select the **Runbook** tab, and then under **Parameter Mapping**, note that the parameters from the runbook are mapped to generic properties—for example, Parameter1, Parameter2, and so on—of the runbook activity class. The **Type** column specifies whether the parameters are inputs or outputs. You can also type default values for each parameter using **Edit Mapping**.
11. For any parameter, click **Edit Mapping**.
12. Expand **Object**, and then click **Id**. This ID value will be used by the Orchestrator runbook to find the particular runbook activity that is being executed. Click **Close**.
13. Click **OK** to close the form and create the template.

How to View a Runbook

After you import runbooks from System Center 2012 - Orchestrator into System Center 2012 – Service Manager, you can open the runbook in the Service Manager console to ensure that it contains the parameters you want to use in an automation activity template in Service Manager.

Note

This procedure requires Windows Internet Explorer with Microsoft Silverlight installed.

When you view the runbook, you can perform basic actions with the runbook, such as viewing the summary, jobs, instances, and definition of the runbook. You can also start and stop the runbook.

To view a runbook

1. In the Service Manager console, select **Library**.
2. In the **Library** pane, select **Runbooks**.
3. In the **Runbooks** view, select a runbook.
4. In the **Tasks** pane under **<RunbookName>**, click **View Runbooks** to open the runbook in Internet Explorer.

See Also

Using Runbooks in System Center 2012 - Service Manager

Installing and Configuring Chargeback Reports in System Center 2012 - Service Manager

This section provides an overview of key concepts for chargeback reports in System Center 2012 – Service Manager SP1 and System Center 2012 R2 Service Manager. This section also contains procedures that you can use to install and configure chargeback reports. After you have installed and configured chargeback reports, see the installing and configuring chargeback reports, see the Managing Chargeback Reports topic in the Operations Guide for System Center 2012 – Service Manager.

Installing and Configuring Chargeback Reports Topics

- **About Chargeback Reports**

  Provides an overview of key concepts for chargeback reports.
- **Chargeback Report Requirements**

  Provides an overview of requirements that must be met before you install chargeback reports.
- **How to Install Chargeback Reports**

  Describes how to install chargeback reports.
- **How to Create or Modify a Price Sheet**

  Describes how to view and use chargeback reports.
- **How to Publish and Unpublish a Price Sheet**

  Describes how to publish and unpublish a price sheet.
- **How to Assign or Remove a Default Price Sheet for a Selected Cloud**

  Describes how to assign or remove a default price sheet for a cloud.
- **How to Override a Default Price Sheet for a Specific VMM User Role**

  Describes how to override a default price sheet for a VMM user role.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

User Interface Customization in System Center 2012 - Service Manager

The sealed management packs in Service Manager contain, among other things, views, list items, and templates. Because these items are in a sealed management pack, they cannot be edited or changed. With the release of System Center 2012 – Service Manager, you have the

option of hiding views. You can now duplicate list items and templates, saving the duplicates into an unsealed management pack, and because the duplicates are in an unsealed management pack, you can edit the properties of the list item or template using the Service Manager console.

User Interface Customization Topics

- How to Customize a View

  Describes how to customize a view.
- How to Customize a List Item

  Describes how to customize a list item.
- How to Customize a Template

  Describes how to customize a template.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

How to Customize a View

The **Failed Service Requests** view in System Center 2012 – Service Manager is in a sealed management pack. In this example, you will create a duplicate of this view, save it into an unsealed management pack, and then edit the new view by changing its name to **New Failed Service Requests**. You will finish this exercise by hiding the original Failed Service Requests view. As an administrator, you will still see the hidden view.

To customize a view

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Service Request Fulfillment**.
3. Right-click **Failed Service Requests**, and then click **Duplicate View**.
4. In the **Select management pack** dialog box, accept the default management pack, **Service Manager Service Request Configuration Library**, and then click **OK**.
5. Right-click **Failed Service Requests – Copy**, and then click **Edit View**.
6. In the Edit Failed Service Requests – Copy Wizard, in **Name**, type a new name for this view. For example, type **New Failed Service Requests**, and then click **OK**.
7. Right-click **Failed Service Requests**, and then click **Hide View**.

See Also

User Interface Customization in System Center 2012 - Service Manager

How to Customize a List Item

The items in a list in a sealed management pack in System Center 2012 – Service Manager cannot be changed. In this example, you will add a list item (phone) to the **Service Request Source** list and save it into an unsealed management pack, and then edit the new view by changing its name to **New Failed Service Requests**. You will finish this exercise by hiding the original Failed Service Requests view. As an administrator, you will still see the hidden view.

To customize a list item

1. In the Service Manager console, click **Library**.
2. In the **Library** pane, expand **Library**, and then click **Lists**.
3. In the **Lists** pane, click **Service Request Source**.
4. In the **Tasks** pane, in the **Service Request Source** area, click **Properties**.
5. In the **List Properties** dialog box, click **Add Item**.
6. In the **Select management pack** dialog box, accept the default management pack, **Service Manager Service Request Configuration Library**, and then click **OK**.
7. In the **List Properties** dialog box, click **List Value**.
8. In the **Name** field, type **Phone**, and then click **OK**.

See Also

User Interface Customization in System Center 2012 - Service Manager

How to Customize a Template

Templates in a sealed management pack in System Center 2012 – Service Manager cannot be changed. In this example, you will create a copy of the Default Service Request Template and save the copy in an unsealed management pack. You will then start a Create Template Wizard for the copy you made.

To customize a template

1. In the Service Manager console, click **Library**.
2. In the **Library** pane, expand **Library**, and then click **Templates**.
3. In the **Templates** pane, click **Default Service Request**.
4. In the **Tasks** pane, under **Default Service Request**, click **Create a Copy**.
5. In the **Select management pack** dialog box, accept the default management pack, **Service Manager Service Request Configuration Library**, and then click **OK**.
6. In the **Templates** pane, click **Copy of Default**.
7. In the **Tasks** pane, under **Copy of Default Service Request**, click **Properties**.
8. In the **Create Template** dialog box, in the **Name** field, type a new name for this template, and then click **OK**.
9. Finish the steps in the Service Request Template Wizard to customize this template for

your needs, and when you are finished, click **OK**.

Managing User Roles in System Center 2012 - Service Manager

This section provides an overview of user roles in System Center 2012 – Service Manager. It includes procedures that you can use to work with user roles.

You can find a complete list of user roles in Service Manager at Appendix A - List of User Role Profiles in System Center 2012 - Service Manager.

Managing User Roles Topics

- About User Roles

  Provides an overview of user roles.
- How to Add a Member to a User Role

  Describes how to add a member to an existing user role.
- How to Create a User Role

  Describes how to create a user role.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

About User Roles

In your organization, some employees are responsible for supporting hardware, such as portable computers and servers. Some of the employees are allowed to create and update configuration items but not delete them, whereas others are allowed to create, update, and delete configuration items.

In System Center 2012 – Service Manager, the security rights that allow users to access or update information are defined in a user role profile. A user role profile is a named collection of access rights, and it usually corresponds to an employee's business responsibilities. Each user role profile controls access to such artifacts as knowledge articles, work items (incidents, change requests), authoring, administration, and other credentials. Think of user role profiles as defining what you are allowed to do.

In the future, managers at your organization may decide to separate the group of employees who maintain configuration items into two groups: those who handle configuration items for desktop computers and those who handle configuration items for portable computers. They want to retain

these two user role profiles, one profile that can create and edit but not delete configuration items, and another profile that can create, edit, and delete configuration items. You would define these user role profiles with different scopes, one for desktops and one for portable computers. If user role profiles define what you are allowed to do, think of scopes as defining what items you are allowed to modify. The combination of a user role profile and a scope is called a user role.

Understanding User Roles in Service Manager

In Service Manager, when you click **Administration**, expand **Security**, and then click **User Roles**, a **User Roles** pane displays a list of user roles. Each of these user roles has been configured with a user role profile and an undefined scope. Because the scope is undefined for these user roles, they can exercise their user profiles on all management packs, queues, groups, tasks, views, and form templates. The following table lists the default user roles, their associated user role profiles, and scope.

User role	User role profile	Scope
Activity Implementers	Activity Implementer	Global
Administrators	Administrator	Global
Advanced Operators	Advanced Operator	Global
Change Initiators	Change Initiator	Global
End Users	End User	Global
Read-Only Operators	Read-Only Operator	Global
Authors	Author	Global
Problem Analysts	Problem Analyst	Global
Workflows	Workflow	Global
Incident Resolvers	Incident Resolver	Global
Change Managers	Change Manager	Global
Report Users	Report User	Global
Release Managers	Release Manager	Global
Service Request Analysts	Service Request Analyst	Global

Note

The Service Manager Report Users user role is available only after you register with the Service Manager data warehouse and after the Data Warehouse navigation button is available. To view the Service Manager Report Users user role, click **Data Warehouse**, expand **Security**, and then click **User Roles**.

Example

For example, say that you want to define one security access that allows users to create and edit, but not delete, configuration items and another security access that allows users to create, edit, and delete configuration items. Appendix A, at the end of this guide, lists the user role profiles and their associated artifacts. The following table shows user role profiles as they relate to configuration items.

User role profile	Create configuration items	Update configuration items	Delete configuration items
Report User	No	No	No
End User	No	No	No
Read-Only Operator	No	No	No
Activity Implementer	No	No	No
Change Initiator	No	No	No
Incident Resolver	No	No	No
Problem Analyst	No	No	No
Change Manager	No	No	No
Advanced Operator	Yes	Yes	No
Author	Yes	Yes	No
Workflow	Yes	Yes	No
Administrator	Yes	Yes	Yes

Using the previous table, you can see that the Advanced Operators user role profile can create and update, but not delete, configuration items. The Administrators user role profile can create, update, and delete configuration items. The members of the asset management team who are allowed to create and update, but not delete, configuration items are made members of the predefined Service Manager Advanced Operators profile. The members of the asset management team who are allowed to create, edit, and delete configuration items are made members of the Administrators profile.

As a best practice, assume that members of the asset management team might change. You should create two groups in Active Directory Domain Services (AD DS) and make those groups members of the Advanced Operators and Administrators profiles. Then, as members change, users are added and removed from the Active Directory group, and no changes have to be made in Service Manager.

In the future, if you break the asset management team into two groups, one for desktops and the other for laptops, you can create your own user role by using the same user role profiles, but with different scopes.

Why Some User Roles Cannot Be Created

When you are creating a user role, notice that three user roles are not available: Administrator, Report User, and Workflows. These three user roles are created and populated during Setup, and, generally speaking, these user roles are used by Service Manager. The following sections describe each of these user roles.

Administrator

The Administrator user role is global in scope; therefore, there is no reason for creating another user role of this type.

Report User

The user role, Report User, has one purpose in Service Manager: to find the computer hosting Microsoft SQL Server Reporting Services (SSRS) for the user at a Service Manager console. When a user at a Service Manager console tries to run a report, a query is made to the Service Manager management server seeking the computer that is hosting the data warehouse management server. The Service Manager console then queries the data warehouse management server seeking the name of the computer hosting SSRS. With that information, the Service Manager console connects to SSRS. The singular purpose of the user role, Report User, is to make these queries. After the Service Manager console connects to the SSRS, the credentials of the user running the console grant access as defined on the SSRS. Because of the narrow purpose of this user role, there is no reason for creating another user role.

Workflows

Workflows might have to read and write to the Service Manager database. During Setup, you are asked to provide credentials for the Workflows user role, and this user role performs the required actions on the Service Manager database. Like the user role, Report User, the narrow purpose of the Workflow user role means there is no reason for creating other user roles.

See Also

How to Add a Member to a User Role

How to Create a User Role

How to Add a Member to a User Role

In System Center 2012 – Service Manager, you can assign users to a user role to define what they can do.

In this example, you have to add members of an asset management team who can create and update, but not delete, configuration items to the user role. Looking at the “Configuration Items” section of Appendix A - List of User Role Profiles in System Center 2012 - Service Manager in

this document, you see that the Advanced Operators user role profile provides what you need regarding permissions for this team. At this time, all members of the asset management team are responsible for every asset in the company; therefore, they require unlimited scope.

Use the following procedures to add a user to the Service Manager Advanced Operators user role and then validate the assignment of the user to the user role.

To assign a user to a user role

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Security**, and then select **User Roles**.
3. In the **User Roles** pane, double-click **Advanced Operators**.
4. In the **Edit User Role** dialog box, click **Users**.
5. On the **Users** page, click **Add**.
6. In the **Select Users or Groups** dialog box, type the name of a user or group that you want to add to this user role, click **Check Names**, and then click **OK**.
7. In the **Edit User Role** dialog box, click **OK**.

To validate the assignment of a user to a user role

- Log on to the Service Manager console as one of the users assigned to the user role. Verify that you cannot access data for which you do not have access rights, as specified in the user roles.

You can use a Windows PowerShell command to view users. For information about how to use Windows PowerShell to retrieve users that are defined in Service Manager, see Get-SCSMUser.

How to Create a User Role

Use the following procedures to create a user role and assign users to that role in System Center 2012 – Service Manager and then validate the creation of the user role.

To create a user role

1. In the Service Manager console, select **Administration**.
2. In the **Administration** pane, expand **Security**, and then select **User Roles**.
3. In the **Tasks** pane under **User Roles**, select **Create User Role**, and then select the user role profile that you want to use for this user role, such as **Author**.
4. Complete the **User Role Wizard** by doing the following:
   a. On the **Before You Begin** page, click **Next**.
   b. On the **General** page, enter a name and description for this user role, and then click **Next**.
   c. On the **Management Packs** page, start to filter the scope of the data that you want to

assign access to. Select the management packs that contain the data that you want to assign access to, such as **Incident Management Library**. Click **Next**.

d. On the following pages, all the classes, queues, groups, tasks, views, and form templates that are available for the specified user role from the specified management packs, are displayed. You can select specific items on these pages to further limit the set of data that access is assigned to.

> **Important**
> The groups and the queues lists are not filtered—all groups and queues from all management packs are listed. If you select the **Select all queues** item on the **Queues** page, on the **Groups** page, **Select all Groups** is selected automatically. In addition, by default, no groups have been created. You have to create a group if you want to limit scope by group.

e. On the **Users** page, click **Add**, and use the **Select Users or Groups** dialog box to select users and user groups from Active Directory Domain Services (AD DS) for this user role, and then click **Next**.

f. On the **Summary** page, make sure that the settings are correct, and then click **Create**.

g. On the **Completion** page, make sure that **The user role was created successfully** appears, and then click **Close**.

To validate the creation of a user role

1. In the Service Manager console, verify that the newly created user role appears in the middle pane.
2. Log on to the Service Manager console as one of the users assigned to the user role. Verify that you cannot access data for which you do not have access rights, as specified in the user role.

You can use Windows PowerShell commands to complete these and other related tasks, as follows:

- For information about how to use Windows PowerShell to create a new user role in Service Manager, see New-SCSMUserRole.
- For information about how to use Windows PowerShell to retrieve user roles that are defined in Service Manager, see Get-SCSMUserRole.
- For information about how to use Windows PowerShell to set the UserRole property for a Service Manager user, see Update-SCSMUserRole.
- For information about how to use Windows PowerShell to remove a user role from Service Manager, see Remove-SCSMUserRole.

Managing Run As Accounts in System Center 2012 - Service Manager

During the setup of System Center 2012 – Service Manager, you specified credentials for the workflow and service accounts, for Microsoft SQL Server Analysis Services, and for SQL Server Reporting Services (SSRS). If, because of the configurations of password security requirements used in your organization, these passwords expire, you must update the new passwords in Service Manager. In addition, if you decide that the user names must change, you also must change them in Service Manager. This section describes how to make those changes.

It is a best practice never to delete Run As accounts from the Service Manager console. The Service Manager management pack monitors Run As accounts. At regular intervals, the Health service attempts to log on as the Run As accounts. If this fails, Event ID 7000 is invoked that causes an alert. The best way to avoid this issue is never to delete Run As accounts from the Service Manager console. You can reuse existing Run As accounts by changing their name or credentials. If you want to stop using a Run As account, you can change its credentials to Local System and change the name to something easy to remember, such as "Inactive".

Managing Run As Accounts Topics

- How to Change the User Credentials for the Operational Database Account

  Describes how to update the Operational System Run As account if the user name and password has changed.
- How to Change the Password for the Operational Database Account

  Describes how to update the Operational System Run As account if only the password has changed.
- How to Change the Workflow Run As Account Credentials

  Describes how to update the workflow account if either the user name or password has changed.
- How to Change the Credentials for SQL Server Analysis Services Account

  Describes how to update the SQL Server Analysis account if either the user name or password has changed.
- How to Change the Credentials for SQL Server Reporting Services Account

  Describes how to update the SQL Server Reporting Services account if either the user name or password has changed.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

How to Change the User Credentials for the Operational Database Account

If the user account for the Operational Database Account in System Center 2012 – Service Manager changes, you must make the following changes:

1. Add the new account to the Service Manager Administrators user role for both the Service Manager and data warehouse management servers
2. Create a SQL Server logon account for the new user on computers hosting Service Manager databases. On the computer hosting the Service Manager database, assign the new user to the skd_users and configsvc_users roles.
3. Make the new account a local administrator on the Service Manager computers.
4. Make the new user account the logon account for the Service Manager Data Access Service and Service Manager Management Configuration services, and then restart these services.

   Note
   The logon account for the Service Manager Management service is always the local system account and must not be changed.
5. Restart the Service Manager Management service.
6. Make the new user the Operational Run As account.

Use the following procedures to make these changes in Service Manager.

Important
Do not configure the Operational Database Account to use the Network Service account.

To add the user to the local administrators account

1. Add the new user as a member of the Administrators local group in Windows on the computers hosting the following:
   - Service Manager management server
   - Data warehouse management server
   - Self-Service Portal
   - Service Manager database
   - Data warehouse databases

To add the user to the Administrators user role

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, expand **Security**, and then click **User Roles**.
3. In the **User Roles** pane, click **Administrators**.
4. In the **Tasks** pane, click **Properties**.
5. In the Edit User Role Wizard, click **Users**.
6. Click **Remove** to remove the existing credentials, click **Add** and add the new credentials,

and then click **OK**.

7. In the Service Manager console, click **Data Warehouse**.
8. In the **Data Warehouse** pane, expand **Data Warehouse**, expand **Security**, and then click **User Roles**.
9. Repeat steps 3 through 6.

To change the logon account for the Service Manager Data Access Service and Service Manager Management Configuration services

1. On the computer that hosts the Self-Service Portal, on the Windows desktop, click **Start**, and then click **Run**.
2. In the **Run** dialog box, in the **Open** box, type **services.msc**, and then click **OK**.
3. In the **Services** window, in the **Services (Local)** pane, right-click **System Center Data Access Service**, and then click **Properties**.
4. In the **System Center Data Access Service Properties (Local Computer)** dialog box, click **Log On**, and then click **Browse**.
5. In the **Select User or Group** dialog box, complete these steps:
   a. Click **Locations**, in the **Locations** dialog box, click **Entire Directory**, and then click **OK**.
   b. In the **Enter the object name to select** box, type the name of the new Operational Database Account, click **Check Names**, and then click **OK**.
   c. In the **Password** and **Confirm Password** boxes, type the password for the new user, and then click **OK**.
6. Restart the Service Manager Data Access Service.
7. Right-click **System Center Management Configuration**, and then click **Properties**.
8. In the **System Center Management Configuration Properties (Local Computer)** dialog box, click **Log On**, and then click **Browse**.
9. In the **Select User or Group** dialog box, complete these steps:
   a. Click **Locations**, and in the **Locations** dialog box, click **Entire Directory**, and then click **OK**.
   b. In the **Enter the object name to select** box, type the name of the new Operational Database Account, click **Check Names**, and then click **OK**.
   c. In the **Password** and **Confirm Password** boxes, type the password for the new user, and then click **OK**.
10. Restart the Service Manager Management Configuration service.

To create a SQL Server logon

1. On the computers hosting the Service Manager and data warehouse databases, click **Start**, point to **Programs**, point to **Microsoft SQL Server 2008**, and then click **SQL Server Management Studio**.
2. In the **Connect to Server** dialog box, complete these steps:
   a. In the **Server Type** list, select **Database Engine**.

b. In the **Server Name** list, select the server name for your Service Manager or data warehouse databases.

c. In the **Authentication** list, select **Windows Authentication**, and then click **Connect**.

3. In the **Object Explorer** pane, expand **Security**, and then expand **Logins**.
4. Right-click **Logins**, and then click **New Login**.
5. In the **Login – New** dialog box, in the **Select a page** pane, click **General**, and then click **Search**.
6. In the **Select User or Group** dialog box, complete these steps:

   a. Click **Locations**, in the **Locations** dialog box, click **Entire Directory**, and then click **OK**.

   b. In the **Enter the object name to select** box, type the name of the new Operational Database Account, click **Check Names**, and then click **OK**.
7. In the **Select a page** pane, click **Server Roles**, and in the **Server roles** list, ensure that **sysadmin** and **public** are selected, and then click **OK**.

To change the Service Manager Self-Service Portal application pool account

1. On the Windows desktop, click **Start**, point to **Programs**, point to **Administrative Tools**, and then click **Internet Information Services (IIS) Manager**.
2. In the **Internet Information Services (IIS) Manager** window, in the **Connections** pane, expand the name of your computer, and then click **Application Pools**.
3. In the **Application Pools** pane, right-click **SM_AppPool**, and then click **Advanced Settings**.
4. In the **Advanced Settings** dialog box, in the **Process Model** area, click **Identity**, and then click the ellipsis (**…**) button.
5. In the **Application Pool Identity** dialog box, select **Custom account**, and then click **Set**.
6. In the **Set Credentials** dialog box, in the **User name** box, type the user name for the Operational Database Account. In the **Password** and **Confirm password** boxes, type the password for the new Operational Database Account, and then click **OK**.
7. In the **Application Pool Identity** dialog box, click **OK**.
8. In the **Advanced Settings** dialog box, click **OK**.
9. Close Internet Information Services (IIS) Manager.

To change the Operational Database Account

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, expand **Security**, and then click **Run As Accounts**.
3. In the **Run As Accounts** pane, click **Operational Database Account**.
4. In the **Tasks** pane, click **Properties**.
5. In the **Operational Database Account** page, in the **User name**, **Password**, and **Domain** boxes, type the new credentials for the Operational Database Account, and then

click **OK**.

How to Change the Password for the Operational Database Account

To change the log-on password for the Service Manager Data Access and Service Manager Management Configuration services

1. On the Windows desktop, click **Start**, and then click **Run**.
2. In the **Run** dialog box, in the **Open** box, type **services.msc**, and then click **OK**.
3. In the **Services** window, in the **Services (Local)** pane, right-click **System Center Data Access Service**, and then click **Properties**.
4. In the **System Center Data Access Service Properties (Local Computer)** dialog box, click **Log On**.
5. Type the new password in the **Password** and **Confirm Password** text boxes, and then click **OK**.
6. Restart the Service Manager Data Access Service.
7. Right-click **System Center Management Configuration**, and then click **Properties**.
8. In the **System Center Management Configuration Properties (Local Computer)** dialog box, click **Log On**.
9. Type the new password in the **Password** and **Confirm Password** text boxes, and then click **OK**.
10. Restart the System Center Management Configuration service.

How to Change the Workflow Run As Account Credentials

During setup, you defined the account to be assigned to the Service Manager Workflow Run As account. If the password for that account changes, you must update the Workflow Run As account with the new password. If you want to change the account for the Service Manager Workflow Run As account, you must change both the Workflow Run As account and the Workflow User Role.

Use the following procedures to define a new user account for the Workflow Run As account and to update a new password for the existing account.

To change the Workflow Run As account using new credentials

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, expand **Security**, and then click **Run As Accounts**.
3. In the **Run As Accounts** pane, click **Workflow Account**.

4. In the **Tasks** pane, click **Properties**.
5. In the **Workflow Account** page, in the **User name**, **Password**, and **Domain** boxes, type the new credentials for the Workflow Run As account, and then click **OK**.
6. In the **Administration** pane, click **User Roles**.
7. In the **User Roles** pane, click **Workflows**.
8. In the **Tasks** pane, click **Properties**.
9. In the Edit User Role Wizard, click **Users**.
10. Click **Remove** to remove the existing credentials, click **Add** to add the credentials you specified in step 5, and then click **OK**.

> **Important**
> Failure to configure the new account for the Workflow Run As account and User Role causes Service Manager to stop functioning.

To change the password for the Workflow Run As account credentials

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, expand **Security**, and then click **Run As Accounts**.
3. In the **Run As Accounts** pane, click **Workflow Account**.
4. In the **Tasks** pane, click **Properties**.
5. In the **Workflow Account** page, in the **Password** box, type the new password for the Workflow Run As account, and then click **OK**.

How to Change the Credentials for SQL Server Analysis Services Account

If the account that is used for the SQL Server Analysis Services account changes in System Center 2012 – Service Manager, you must also change the credentials for the account. Use the following procedure to change the credentials for the SQL Server Analysis Services account.

To change the credentials for the SQL Server Analysis Services account

1. On the computer hosting SQL Server Analysis Server (SSAS), click **Start**, click **All Programs**, click **Microsoft SQL Server 2008 R2**, and then click **SQL Server Management Studio**.
2. In the **Connect to Server** dialog box, complete these steps:
   a. In the **Server Type** list, click **Analysis Services**.
   b. In the **Server Name** list, select the server name for your Service Manager or data warehouse databases.
   c. In the **Authentication** list, select **Windows Authentication**, and then click **Connect**.

3. In **Microsoft SQL Server Management Studios**, in the **Object Explorer** pane, expand **Databases**, expand **DWASDataBase**, expand **Data Sources**, and then double-click **DWDataMart**.
4. In **Data Source Properties – DWDataMart**, under **Security Settings**, click the ellipsis button (…) next to **ImpersonateAccount**.
5. In the **Impersonation Information** window, select **Use a specific Windows user name and password**, type the credentials for the new account, and then click **OK**.
6. Click **OK** to close **Data Source Properties – DWDataMart**, and then close Microsoft SQL Server Management Studios.

How to Change the Credentials for SQL Server Reporting Services Account

If the account that is used for the SQL Server Reporting Services account changes in System Center 2012 – Service Manager, you must change the credentials for the account. Use the following procedure to change the credentials for the SQL Server Reporting Services account.

To change the credentials for the SQL Server Reporting Services account

1. On the computer hosting SQL Server Reporting Server (SSRS), start a browser, and connect to http://<server name>/reports.
2. On the **SQL Server Reporting Services Home** page, double-click **Service Manager**, and then double-click **DWStagingAndConfig**.
3. In the **Connect using** area, click **Credentials stored securely in the report server**, type the current credentials in the **User name** and **Password** boxes, and then click **Apply**.
4. In the browser tool bar, click the **Back** button to return to the **Service Manager** page.
5. Repeat steps 2 and 3 for the remaining Service Manager data sources.

Managing Knowledge Articles in System Center 2012 - Service Manager

Knowledge articles in System Center 2012 – Service Manager can help service desk analysts and end users understand and solve problems. Because any employee can search for and view knowledge articles, create knowledge articles so that end users can help themselves resolve IT problems before new work items are opened. Service desk analysts also have to link work items to knowledge articles.

Use the procedures in this section to create and search for knowledge articles.

Managing Knowledge Article Topics

- How to Create a Knowledge Article

  Describes how to create a knowledge article.
- How to Search for a Knowledge Article

  Describes how to search for a knowledge article.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

How to Create a Knowledge Article

You can use the following procedure to create a knowledge article in System Center 2012 – Service Manager. This procedure describes how to create a new example knowledge article to help users obtain the latest service pack for Windows Vista. However, you can complete these steps to create any type of knowledge article.

Note

To view external content in knowledge articles, the computer on which the Service Manager console is installed must be connected to the Internet, either directly or through a proxy server.

To create a knowledge article

1. In the Service Manager console, click **Library**.
2. In the **Library** pane, expand **Knowledge**, and then click **All Knowledge Articles**.
3. In the **Tasks** pane, under **Knowledge**, click **Create Knowledge Article**.
4. In the form that appears, on the **General** tab, in the **Knowledge article information** area, follow these steps:
   a. In the **Title** box, type a title for the knowledge article. For example, type **How to obtain Windows Vista Service Pack 2**.
   b. In the description box, type a description for the article. For example, type **You can use this article to help understand this problem and to correct the problem yourself.**
5. In the **Knowledge** form, expand the **Classification** area, and then complete these steps:
   a. In the **Keywords** box, type classification keywords that you can later search, separated by semicolons. For example, type **Windows Vista; Service; Pack; 2**.
   b. In the **Knowledge Article Owner** box, browse for and then select an owner for the knowledge article. For example, select **Phil Gibbons**.
   c. In the **Category** list, select an applicable category. For example, select **Software**.

6. Expand the **External Content** area. In the **URL** box, type the web address if the information source of the article is known. For example, type **http://support.microsoft.com/kb/935791**.
7. Expand **Internal Content**. In the box, type or paste information about how the user can apply information from the **External Content** box to fix a problem that is specific to your organization. For example, type **Visit the URL to read about how to download the latest service pack for Windows Vista**.
8. Click **OK** to save the new knowledge article.

To validate that the knowledge article was created

- Verify that the new knowledge article appears in the **All Knowledge Articles** pane.

How to Search for a Knowledge Article

You can use the following procedures to search for a knowledge article by using the Service Manager console in System Center 2012 – Service Manager. If you want to link a knowledge article to an incident or to a change request, save the incident or change request first. You can perform full-text searches when you search for knowledge articles. When you search, Service Manager queries the following fields in the knowledge search form:

- **Title**
- **Description**
- **Comments**
- **Keywords**
- **External URL**
- **Internal Content**
- **Analyst Content**

When the search is complete, Service Manager displays matches for content in the **Title**, **End-User** content, and **Analyst Content** fields. If you want to view the whole article, click **Open article to see external content**. If you type **Vista** in the search box, that exact string must exist in one of the knowledge article fields.

Note
Partial matches are not returned by a search. Therefore, when you search for a knowledge article based on a keyword, you must type the exact word. However, you can use the asterisk (*) as a wildcard character when you perform a search.

To search for a knowledge article using the Service Manager console

1. In the Service Manager console, in the search box, type a keyword or term. For example, type **Vista**.
2. Click the arrow to the right of the search box to view a list of the objects for which you

want to search, and then click **Knowledge**.

The **Knowledge Search** form displays the knowledge articles that match the search term.

To search for a knowledge article when an incident or change request form is open

1. With an incident or change request form open, in the **Tasks** pane, click **Search for Knowledge Articles**.
2. In the **Knowledge Search** form, type a search term in the **Search for** box, and then click **Go**. For example, type **Vista**.

To link a knowledge article to an incident or change request

1. In the Service Manager console, in the search box, type the keyword or term for which you want to search. For example, type **Windows Vista**.
2. Click the arrow to the right of the search box to view a list of the objects for which you want to search, and then click **Knowledge**.
3. The **Knowledge Search** form displays the knowledge articles that match the search term.
4. Select the article that you want to link, and then click **Link To**.
5. In the **Select objects** dialog box, under **Filter by class**, select either **Incident** or **Change Request**.
6. Select an incident or change request, and then click **OK**.
7. Click **OK** to close the informational message.
8. In the **Knowledge Search** form, click **Close**.

Configuring and Using the System Center 2012 - Service Manager Cmdlets for Windows PowerShell

This section provides an introduction to the System Center 2012 – Service Manager cmdlets for the Windows PowerShell command-line interface.

Before you can run any command in the Windows PowerShell command-line interface in System Center 2012 – Service Manager, you must set execution policy to RemoteSigned. Before you can run data warehouse cmdlets, you must manually import the data warehouse cmdlets module.

The Service Manager cmdlets are implemented in the following two modules:

- **System.Center.Service.Manager**. This module is imported automatically every time a Service Manager Windows PowerShell session is opened.
- **Microsoft.EnterpriseManagement.Warehouse.Cmdlets**. This module must be imported manually.

Configuring and Using Service Manager Cmdlets Topics

- How to Set Execution Policy

  Describes how to set execution policy to RemoteSigned.
- Getting Started with Service Manager Cmdlets for Windows PowerShell

  Describes how to start a Windows PowerShell session in which you can run the Service Manager cmdlets and how to get help for the cmdlets.
- How to Import the Data Warehouse Cmdlet Module

  Describes how to manually import the data warehouse Windows PowerShell cmdlets.
- List of the Service Manager Cmdlets

  Provides a list of Service Manager cmdlet modules.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

Getting Started with Service Manager Cmdlets for Windows PowerShell

Windows PowerShell is a Windows command-line shell that includes an interactive prompt and a scripting environment. Windows PowerShell uses cmdlets (pronounced "command-lets") to manipulate the Windows PowerShell objects. System Center 2012 – Service Manager includes many cmdlets that you can use to perform various Service Manager-related tasks without using the Service Manager console. For example, you can use the **Import-SCSMManagementPack** cmdlet to import a management pack.

The Service Manager cmdlets are delivered in two modules that are listed below. In Service Manager, these cmdlet modules are not installed in the typical path that is listed in the $env:PSModulePath variable. Therefore, if you run the `Get-Module -List` cmdlet, the Service Manager modules are not listed.

- Administrator cmdlets: The System.Center.Service.Manager module which contains the cmdlets that are needed for common administrative tasks.
- Data warehouse cmdlets: The Microsoft.EnterpriseManagement.Warehouse.Cmdlets module which contains the cmdlets that are needed for operating on the Service Manager data warehouse.

The data warehouse cmdlets operate on the data warehouse database, and you can run them on both the Service Manager management server or the data warehouse management server.

Data returned from Windows PowerShell command might contain more information than can be displayed in a default Windows PowerShell command window. We recommend increasing the

width of the command window: Right-click the title bar, click **Properties**, and in the **Layout** tab, set the **Screen Buffer Size** width to 120.

The following procedures help you to get started with Service Manager cmdlets.

To open a Service Manager Windows PowerShell session from the Service Manager console

1. In the Service Manager console, click **Administration**.
2. On the **Tasks** pane, click **Start PowerShell Session**.

The administrator cmdlet module is automatically pre-imported in this session.

To open a Service Manager Windows PowerShell session from Windows

1. On the computer that hosts the Service Manager management server, on the taskbar, click **Start**, point to **All Programs**, and then click **Microsoft System Center**.
2. Click **Service Manager 2012**, and then click **Service Manager Shell**.

The administrator cmdlet module is automatically pre-imported in this session.

To list all Service Manager cmdlets

1. Open a Service Manager Windows PowerShell session.
2. To list the cmdlets that are included in the administrator module, in the Service Manager Windows PowerShell session, type the following, and then press ENTER:

```
Get-Command -module System.Center.Service.Manager
```

3. To list the cmdlets that are included in the data warehouse module, in the Service Manager Windows PowerShell session, type the following, and then press ENTER:

```
Get-Command –module
Microsoft.EnterpriseManagement.Warehouse.Cmdlets
```

To get Help for a cmdlet

1. Open a Service Manager Windows PowerShell session.
2. You can now access the on-the-box Help, or you can use the **–online** parameter to access the most up-to-date online Help:
   - On-the-box Help: Type the following command. Replace <*cmdlet-name*> with the name of the cmdlet that you want to get help for, for example, **Import-SCSMManagementPack**:

     ```
     Get-help <cmdlet-name> -detailed
     ```

   - Online, up-to-date Help: Type the following command, and then press ENTER:

     ```
     Get-help <cmdlet-name> -online
     ```

     This command uses the **–online** parameter to access the latest online Help for a cmdlet. It opens a web browser and displays the online Help that is available for <*cmdlet-name*>.

List of the Service Manager Cmdlets

System Center 2012 – Service Manager supports the following Windows PowerShell cmdlets, which are implemented in two modules: the administrator module and the data warehouse module.

Administrator Cmdlets in the System.Center.Service.Manager Module

Cmdlet	Description
Add-SCSMAllowListClass	Adds the specified classes to the Allow list of classes that is used by the Service Manager Operations Manager CI Connector during synchronization.
Export-SCSMManagementPack	Exports a management pack as a valid XML-formatted file that you can later import into Service Manager or Operations Manager.
Get-SCSMAllowList	Retrieves the Allow list of classes that is used by the Service Manager Operations Manager CI Connector during synchronization.
Get-SCSMAnnouncement	Retrieves announcements that are defined in Service Manager.
Get-SCSMChannel	Retrieves the Email Notification channels that are defined in Service Manager.
Get-SCSMClass	Retrieves a class.
Get-SCSMClassInstance	Retrieves class instance objects.
Get-SCSMCommand	
Get-SCSMConnector	Retrieves connectors that are defined in Service Manager.
Get-SCSMDCMWorkflow	Retrieves the list of desired configuration management workflows that are defined in Service Manager.
Get-SCSMDeletedItem	Retrieves items that have been marked for deletion in Service Manager.
Get-SCSMDiscovery	Retrieves discovery information from Operations Manager and from Service

Cmdlet	Description
	Manager.
Get-SCSMEmailTemplate	Retrieves Email templates that are defined in Service Manager.
Get-SCSMEmailTemplateContent	Retrieves the content of Service Manager Email templates.
Get-SCSMGroup	Retrieves groups from Operations Manager and from Service Manager.
Get-SCSMManagementGroupConnection	Retrieves all management group connections, including the IsActive state of these connections. Only one connection will have its IsActive state set to True, because only one connection can be active at any time.
Get-SCSMManagementPack	Retrieves objects that represent management packs that have been imported.
Get-SCSMObjectTemplate	Retrieves an object template.
Get-SCSMPortalCMConfiguration	Retrieves the settings for the Configuration Manager that is used for software deployments on the Service Manager Self-Service Portal.
Get-SCSMPortalContactConfiguration	Retrieves the IT Contact setting that the Service Manager Self-Service Portal is configured with.
Get-SCSMPortalDeploymentProcess	Retrieves information about software deployment processes for the Service Manager Self-Service Portal.
Get-SCSMPortalSoftwarePackage	Retrieves all the software packages that are configured for deployment in the Service Manager Self-Service Portal.
Get-SCSMQueue	Retrieves queues that are defined in Service Manager.
Get-SCSMRelationship	Retrieves information about relationship objects from Operations Manager and from Service Manager.
Get-SCSMRelationshipInstance	Retrieves the instances of relationships from Operations Manager and from Service Manager.

Cmdlet	Description
Get-SCSMRunAsAccount	Retrieves Run As accounts.
Get-SCSMSetting	Retrieves configuration settings of System Center Service Manager.
Get-SCSMSubscription	Retrieves subscriptions that are configured in Service Manager.
Get-SCSMTask	Retrieves tasks that are defined in Service Manager.
Get-SCSMUser	Retrieves users that are defined in Service Manager.
Get-SCSMUserRole	Retrieves user roles that are defined in Service Manager.
Get-SCSMView	Retrieves views that are defined in Service Manager.
Get-SCSMWorkflow	Retrieves configuration information for Service Manager workflows.
Get-SCSMWorkflowStatus	Retrieves the status of workflows in Service Manager.
Import-SCSMInstance	Imports objects and relationships from a comma-separated value (.csv) file into Service Manager.
Import-SCSMManagementPack	Imports management packs.
New-SCOrchestratorConnector	
New-SCRelationshipInstance	
New-SCSMADConnector	Creates a new Active Directory connector.
New-SCSMAlertRule	Creates an alert rule to be used with an Operations Manager 2007 alert connector in Service Manager.
New-SCSMAnnouncement	Creates a new announcement in Service Manager.
New-SCSMClassInstance	Adds a class instance to the database.
New-SCSMCMConnector	Creates a new Configuration Manager 2007 connector in Service Manager.

Cmdlet	Description
New-SCSMDCMWorkflow	Creates a new desired configuration management workflow in Service Manager.
New-SCSMEmailTemplate	Creates a new Email template for Service Manager.
New-SCSMManagementGroupConnection	Creates a new connection for the specified management group. The most recent management group connection that was created is the active connection that **Get-** cmdlets use by default, in which you did not specify the **ComputerName** and **Credential**, or the **SCSession** parameters.
New-SCSMManagementPack	Creates a new management pack.
New-SCSMManagementPackBundle	Bundles individual management packs and their resources, creating a new management pack bundle.
New-SCSMOMAlertConnector	Creates a new Operations Manager alert connector in Service Manager.
New-SCSMOMConfigurationItemConnector	Creates a new Operations Manager 2007 CI connector in Service Manager.
New-SCSMPortalDeploymentProcess	Creates a software deployment process for deploying software by using the Service Manager Self-Service Portal.
New-SCSMRunAsAccount	Creates a new Run As account.
New-SCSMSubscription	Creates a new subscription in Service Manager.
New-SCSMUserRole	Creates a new user role in Service Manager.
New-SCSMWorkflow	Creates a new workflow in Service Manager.
New-SCVMMConnector	
Protect-SCSMManagementPack	Seals a management pack, preventing it from being modified.
Remove-SCSMAllowListClass	Removes the specified classes from the Allow list of classes that are used by the Operations Manager CI Connector during synchronization in Service Manager.

Cmdlet	Description
Remove-SCSMAnnouncement	Removes an announcement from Service Manager.
Remove-SCSMClassInstance	Removes an instance of a configuration item object.
Remove-SCSMConnector	Removes a connector from Service Manager.
Remove-SCSMDCMWorkflow	Removes a desired configuration management workflow from Service Manager.
Remove-SCSMEmailTemplate	Removes an Email template from Service Manager.
Remove-SCSMManagementGroupConnection	Removes a management group connection.
Remove-SCSMManagementPack	Removes management packs.
Remove-SCSMPortalDeploymentProcess	Removes a software deployment process from the Service Manager Self-Service Portal.
Remove-SCSMRunAsAccount	Removes a Run As accounts.
Remove-SCSMSubscription	Removes a subscription from Service Manager.
Remove-SCSMUserRole	Removes a user role from Service Manager.
Remove-SCSMWorkflow	Removes a workflow from Service Manager.
Reset-SCSMAllowList	Resets the Allow list of classes that is used by the Operations Manager CI Connector in Service Manager to the default Allow list.
Restore-SCSMDeletedItem	Restores items that were previously deleted in Service Manager.
Set-SCSMChannel	Sets the properties of the email notification channel in Service Manager.
Set-SCSMManagementGroupConnection	Sets the specified connection as the active connection. The active connection is the connection that is implicitly used when you run a **Get-** cmdlet without specifying **–ComputerName** and **–Credential** or **–SCSession** parameters. Only one connection can be active at any time, and by default the active connection is the last connection that was created by using the **New-SCManagementGroupConnection** cmdlet.

Cmdlet	Description
Set-SCSMPortalCMConfiguration	Sets the configuration information for the Service Manager Self-Service Portal.
Set-SCSMPortalContactConfiguration	Configures the settings of information technology (IT) contacts for the end-user of the Service Manager Self-Service Portal.
Start-SCSMConnector	Starts a Service Manager connector.
Test-SCSMManagementPack	Tests the validity of a management pack.
Update-SCSMAnnouncement	Updates the properties of an announcement for Service Manager.
Update-SCSMClassInstance	Updates property values of a configuration item class instance.
Update-SCSMConnector	Updates properties of a Service Manager connector.
Update-SCSMDCMWorkflow	Updates properties of a desired configuration management workflow.
Update-SCSMEmailTemplate	Updates properties of an Email template.
Update-SCSMPortalDeploymentProcess	Updates the properties of software deployment processes for the Self-Service Portal.
Update-SCSMPortalSoftwarePackage	Updates the properties of software packages that are configured for deployment in the Service Manager Self-Service Portal.
Update-SCSMRunAsAccount	Updates the credentials that are associated with a Run As account.
Update-SCSMSetting	Updates the configuration settings for Service Manager.
Update-SCSMSubscription	Updates subscription properties in Service Manager.
Update-SCSMUserRole	Sets the UserRole property for a Service Manager user.
Update-SCSMWorkflow	Updates workflow properties.

Data Warehouse Cmdlets in the Microsoft.EnterpriseManagement.Warehouse.Cmdlets Module

Cmdlet	Description
Disable-SCDWJob	Disables a data warehouse job to prevent it from running.
Disable-SCDWJobSchedule	The **Disable-SCDWJobSchedule** cmdlet disables a Data Warehouse job schedule, which causes the job schedule to stop initiating jobs. If the job schedule was previously enabled, disabling the job schedule retains the job schedule settings. To modify the job schedule settings, run the **Set-SCDWJobSchedule** cmdlet.
Disable-SCDWSource	
Enable-SCDWJob	Enables a Data Warehouse job so that it can run according to its schedule.
Enable-SCDWJobSchedule	The **Enable-SCDWJobSchedule** cmdlet allows Data Warehouse administrators to enable job schedules so that jobs run according to their specified schedule. To disable the job schedule, use the **Disable-SCDWJobSchedule** cmdlet.
Enable-SCDWSource	
Get-SCDWEntity	
Get-SCDWJob	Gets the job status of all recurring jobs, including extraction, transformation, and load (ETL) jobs.
Get-SCDWJobModule	Returns detailed information for the specified job. This information includes job modules that are executed as part of the job.
Get-SCDWJobSchedule	The **Get-SCDWJobSchedule** cmdlet displays scheduling information for Data Warehouse jobs. You can use the **JobName** parameter to specify a job for which to display scheduling information. Otherwise, the **Get-SCDWJobSchedule** cmdlet displays scheduling information for all Data Warehouse

Cmdlet	Description
	jobs.
Get-SCDWModule	
Get-SCDWRetentionPeriod	The Data Warehouse grooms out rows after a predefined retention period. This cmdlet gives the retention period for a particular entity in minutes. If no entity is provided, it gives back the default retention period for all entities.
Get-SCDWSource	
Get-SCDWSourceType	
Get-SCDWWatermark	
New-SCDWSourceType	To register a source with the Data Warehouse, the Datasource Type first has to be registered with the Data Warehouse. This cmdlet helps to register a new Datasource Type by importing the suitable management pack and doing the appropriate configuration changes.
Register-SCDWSource	
Set-SCDWJobSchedule	Sets the schedule for a Data Warehouse job.
Set-SCDWRetentionPeriod	
Set-SCDWSource	
Set-SCDWWatermark	
Start-SCDWJob	Starts a Data Warehouse job.
Unregister-SCDWManagememtPack	
Unregister-SCDWSource	

See Also

Configuring and Using the System Center 2012 - Service Manager Cmdlets for Windows PowerShell

Managing the Data Warehouse in System Center 2012 - Service Manager

This section provides an overview of key concepts for managing the data warehouse in System Center 2012 – Service Manager. This section also contains procedures that you can use to manage the data warehouse.

Managing the Data Warehouse Topics

- About Managing the Data Warehouse

  Provides an overview of key concepts for managing the data warehouse.
- About Data Warehouse Module Deployment

  Provides an overview of data warehouse module deployment.
- Registering Source Systems to the System Center Data Warehouse

  Provides an overview about registering source systems to the data warehouse and lists procedures describing how to accomplish associated tasks.
- How to Disable a Data Warehouse Job Schedule

  Describes how to disable data warehouse job schedules.
- How to Enable Data Warehouse Job Schedules

  Describes how to enable data warehouse job schedules.
- How to View the Status of a Data Warehouse Job

  Describes how to view the job status in the data warehouse.
- How to Stop and Start a Data Warehouse Job

  Describes how to pause and resume data warehouse jobs.
- How to Schedule a Data Warehouse Job

  Describes how to schedule data warehouse jobs.
- How to View Data Warehouse Job History

  Describes how to view the data warehouse job history.
- How to Troubleshoot a Data Warehouse Job

  Describes how to troubleshoot data warehouse jobs.
- How to Configure Microsoft SharePoint for Analytics

  Describes how to configure Microsoft SharePoint Services to prepare for analytical analysis.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

About Managing the Data Warehouse

In System Center 2012 – Service Manager, there are seven data warehouse jobs that run at various times to maintain the data warehouse, as listed in the following table.

Data warehouse job	Description
MPSyncJob	This job synchronizes all the management packs from the Service Manager source. These management packs define the content of the data warehouse. This job starts to run as soon as you register the Service Manager management group, and it takes several hours to complete on its initial run. For more information, see ”Register with Service Manager Data Warehouse” in the Deployment Guide for System Center 2012 – Service Manager.
DWMaintenance	This job performs data warehouse maintenance, such as indexing and updating statistics. This job will run automatically after the MPSyncJob has finished.
Entity (or Grooming)	Grooming functions typically involve activities on the data warehouse that remove data based on a configurable time period. **Note** For this release of Service Manager, grooming functions are handled as a workflow. Settings for this job are not configurable.
Extract	This job retrieves data from the Service Manager database. This job queries the Service Manager database for the delta data from its last run and writes this new data into the DWStagingAndConfig database in the data warehouse. There are two extract jobs in Service Manager: one for the Service Manager management group and the other for the data warehouse management group.
Transform	This job takes the raw data from the staging area and does any cleansing, reformatting, and

Data warehouse job	Description
	aggregation that is required to get it into the final format for reporting. This transformed data is written into the DWRepository database.
Load	This job queries the data from the DWRepository database and inserts it into the DWDatamart database. The DWDatamart is the database that is used for all end user reporting needs.

For more information about the extract, transform, and load (ETL) jobs, see the blog post Data Warehouse – Anatomy of Extract, Transform, Load (ETL).

In order to manage the data warehouse, which is primarily used by reporting, you must perform maintenance tasks on these jobs. For example, you can view their status, pause and resume, set a schedule, enable and disable schedules, and troubleshoot data warehouse jobs. You can perform all of these maintenance tasks by using Windows PowerShell cmdlets. In addition, you can perform some of these tasks through the Service Manager console.

During deployment, you registered the Service Manager management group as discussed in "Register Service Manager Management Group" in the Deployment Guide for System Center 2012 – Service Manager. As a result of that action, management pack deployment started and MPSyncJob started. You should not start or resume any data warehouse jobs until MPSyncJob has finished, as shown in the **Data Warehouse Jobs** pane in the Service Manager console.

In the procedures in the links in the following table, you can manage the data warehouse by using a combination of Windows PowerShell cmdlets and the Service Manager console, as appropriate, to perform tasks with data warehouse jobs.

Task	Reference
Enable and disable data warehouse jobs	How to Enable Data Warehouse Job Schedules
View data warehouse jobs status	How to View the Status of a Data Warehouse Job
Start and stop data warehouse jobs when you have to	How to Stop and Start a Data Warehouse Job
Schedule data warehouse jobs on a recurring basis	How to Schedule a Data Warehouse Job
Determine whether data warehouse jobs are running as expected	How to Troubleshoot a Data Warehouse Job

Job Schedule and Frequency

The schedule for a job defines when a job starts. Frequency refers to how often the job runs after it has started. Regardless of schedule and frequency, a job does not run unless the schedule for that job has been enabled. Except for the Entity (Grooming) job, each job has a default scheduled start time, which is midnight. The following table lists the scheduled start time, frequency, and default schedule setting.

Data warehouse job	Scheduled start time	Frequency	Enabled by default?
MPSyncJob	Midnight	Every hour	Yes
DWMaintenance	Midnight	Every hour	Yes
Extract	Midnight	Every 5 minutes	Yes
Transform	Midnight	Every 30 minutes	Yes
Load	Midnight	Every hour	Yes

In this release of Service Manager, grooming functions are handled as a workflow. Settings for this job are not configurable.

Windows PowerShell Cmdlets

The Service Manager Windows PowerShell module contains cmdlets that are used in this scenario to manage data warehouse functions on the server that hosts the data warehouse. You must run all Windows PowerShell cmdlets as an administrator. To view the Windows PowerShell Help, type the **get-help** command, followed by the name of the cmdlet for which you want help. For example, type `get-help Set-SCDWJobSchedule`. The following cmdlets are used in this scenario:

- **Get-SCDWJobSchedule**—Displays the schedule for a data warehouse job.
- **Get-SCDWJob**—Displays status for all recurring Service Manager data warehouse jobs.
- **Get-SCDWMgmtGroup**—Shows details for a management group that is registered with the data warehouse.
- **Remove-SCDWMgmtGroup**—Removes a management group from the data warehouse.
- **Set-SCDWJobSchedule**—Sets the schedule for data warehouse jobs.
- **Enable-SCDWJobSchedule**—Enables a data warehouse job schedule.
- **Disable-SCDWJobSchedule**—Disables a data warehouse job schedule. Job schedules are disabled by default.

For information about how to run Service Manager Windows PowerShell cmdlets, see Getting Started with Service Manager Cmdlets for Windows PowerShell.

Getting Started with Data Warehouse Jobs

When you register with the Service Manager data warehouse (see "Register with Service Manager Data Warehouse" in the Deployment Guide for System Center 2012 – Service Manager, the MPSyncJob starts running. This job can take several hours to complete its initial run. When this job is complete, you can see two extract jobs listed in the Data Warehouse Jobs pane. One extract job is listed as **Extract_<data warehouse management group name>**, and the other extract job is listed as **Extract_<Service Manager management group name>**. When both of these extract jobs appear, you know that the initial run of the MPSyncJob is complete and that you can now proceed with the subsequent maintenance tasks.

See Also

Managing the Data Warehouse in System Center 2012 - Service Manager

About Data Warehouse Module Deployment

Data warehouse module deployment in System Center 2012 – Service Manager starts when a Service Manager management server is registered to a data warehouse management server. The following sections describe module parts, functions, and schedule.

Management Pack Synchronization

Management pack synchronization is the process by which the data warehouse discovers what classes and relationships exist in source systems. This process is also referred to as MPSync. For every management pack that defines a class or relationship, the data warehouse creates extract job modules to retrieve the data for that class or relationship from the corresponding source. Such management packs and their associated jobs are synchronized between the systems.

Only sealed management packs, and their corresponding data, are synchronized into the data warehouse. If you alter a management pack, you must increase the version number and you cannot introduce any changes that might cause errors; otherwise, the management pack will fail to import. For example, you cannot remove classes, remove properties, or remove relationships. Similarly, you cannot change data types in unsupported ways. For example, you cannot modify a string property to become a numeric property.

By default, the MPSync Orchestration job runs every 30 minutes.

It is possible that multiple sources may refer to the same management pack. The version in the source system must be the same or higher version than that in the data warehouse, otherwise registration will fail.

It is possible to remove management packs from the data warehouse. However, keep the following points in mind:

1. Removing management packs does not delete the data from the data warehouse as it does in the Service Manager database; instead, the database view that users are granted access to is dropped.

2. If you reimport a management pack after you have removed the corresponding management pack, the historical data is exposed once again.

   Note
   Only sealed management packs are synchronized from Service Manager to the data warehouse. An exception to this is list items, also known as enumerations. Groups or queues are synchronized to the data warehouse, regardless of whether they are in a sealed or unsealed management pack. For more information about how to seal a management pack, see the blog post Sealing Management Packs.

Management packs that are imported from Service Manager are Service Manager–specific and data warehouse specific. The Service Manager management packs provide awareness of what the Service Manager database is structured like, and the data warehouse management packs drive the structure and processes of the data warehouse databases.

Report Deployment

The management pack synchronization process imports management packs from Service Manager, and it defines how those management packs shape the structure, move the data, and copy reports for the data warehouse and reporting. After those management packs are synchronized between Service Manager and the data warehouse, the data is retrieved and reports are deployed for user consumption.

Sequentially, report deployment occurs in the following process:

1. After all identified management packs are synchronized with data warehouse, management pack synchronization triggers the report deployment workflow.
2. Because the DWStagingandConfig database is the final destination of the management packs that have been synchronized, the deployment workflow queries the DWStagingandConfig database for any new or changed reports to deploy or any reports to remove.
3. The deployment workflow then publishes any new or updated reports to the SQL Server Reporting Services (SSRS) server through the SSRS web services.
4. SSRS stores the reports and appropriate metadata.
5. Schema deployment workflow is triggered by management pack synchronization.
6. Once again, information that causes schema changes is retrieved from the DWStagingandConfig database based on the newly synchronized management packs that are causing the changes.
7. Schema changes are deployed to the DWRepository database.
8. Any necessary changes to extract, transform, and load (ETL) modules are made to the DWStagingandConfig database.

Management packs that contain only Service Manager–specific information do not cause the deployment activities to execute. They are only be triggered for new data warehouse and reporting-specific elements.

Understanding the ETL Processes

After the data warehouse schema and reports are deployed, the DWDataMart database is populated with actual data for reporting purposes. This is done by the ETL processes. These three processes each serve their own specific purpose:

- **Extract** is designed specifically for processing large volumes of data from multiple sources, and it allows for moving data into an area that is built for manipulating the data.
- **Transform** is designed for optimization of complex logic and integration operations. This process is where most of the ETL work occurs.
- **Load** is designed for transferring the data that has already been processed into its target destination in a bulk manner.

One of the main reasons for having three different databases is so that you can optimize your hardware environment more easily. In high-volume environments, the DWStagingandConfig and DWRepository databases must be on computer hardware that is optimized for read/write I/O. However, the computer hardware hosting the DWDatamart database must be optimized for read I/O. With that difference in mind, you can separate the DWDatamart to a different server or drive from the DWStagingandConfig and DWRepository databases. However, the DWStagingandConfig and DWRepository databases must remain on the same server.

At a high level, ETL occurs in the processes described in the following sections. If you plan on authoring management packs that are used for custom reporting, you will probably need to know more about these processes in depth. For more information about ETL processes, see the Authoring Guide for System Center 2012 - Service Manager.

Extract

The extract process starts on a scheduled interval. Extract is the process that retrieves raw data from your online transaction processing system (OLTP) store, which in this case is the Service Manager database.

1. The extract process queries Service Manager for the delta data that has accumulated since the last time the extract process ran.
2. The new data is written into the DWStagingandConfig database in the same basic form as it is in the Service Manager database.

Transform

The transform process starts on a scheduled interval. Transform is the process that moves the raw data from the DWStagingandConfig database. It also does any cleansing, reformatting, and aggregation that is required to alter the raw data into the final format for reporting. This transformed data is written into the DWRepository database.

Load

The load process starts on a scheduled interval. The load process queries for the data from the DWRepository database. The transformed data from DWRepository is inserted into the DWDatamart database. The DWDatamart is the database that is used for all end-user reporting needs.

About Reimporting Previously Removed Management Packs

During development and testing of management packs that contain reports that access data warehouse information, you might need to remove the management packs and then reimport them later. However, after a management pack is uninstalled from the data warehouse, if the new management pack contains the same dimension, fact, or cube name with a schema that is different from the original, you must delete the dimension or fact table from the DWRepository and DWDataMart databases manually and also delete any referencing cube from the SQL Server Analysis Services (SSAS) database.

In addition, if a dimension or fact is already referenced by an existing data cube, you must also delete the management pack that contains the data cube and the data cube itself before uninstalling the new management pack. Because System Center 2012 – Service Manager does not remove the dimension or fact table from the DataSourceView and because dimensions are not removed from SSAS database, you must manually delete information that a data cube references. In this situation, you should use SQL Server Management Studio to remove any custom data cube that you created with the management pack from the DWASDatabase before you reregister or reinstall an updated management pack.

In general, you should avoid having the same dimension, fact, and cube name in differing schemas. Service Manager does not support this condition.

See Also

Managing the Data Warehouse in System Center 2012 - Service Manager

Registering Source Systems to the System Center Data Warehouse

The data warehouse in System Center 2012 – Service Manager retrieves data from one or more data sources. These data sources are the transactional processing systems that produce and govern data that you will eventually want to measure and analyze. For example, incidents and change requests are created and managed in Service Manager, software updates and power policies are managed in Configuration Manager, and other systems produce and govern other data sets.

Registering the data warehouse creates a relationship between the data warehouse server and the source system so that information can flow between them. In Service Manager, you can register to Service Manager, Operations Manager, and Configuration Manager directly. You can also use the updated software development kit (SDK) layer on top of the data warehouse, which enables you to push data into the data warehouse directly from other sources. For example, you might want to push data from your Human Resources computer system in the data warehouse.

Registering Source Systems Topics

- How to Register the System Center Data Warehouse to Operations Manager

  Describes how to register with Operations Manager and then validate the registration.

- How to Register Configuration Manager With the System Center Data Warehouse to

  Describes how to register with Configuration Manager and then validate the registration.
- How to Register the System Center Data Warehouse to a Service Manager Source

  Describes how to register with another Service Manager data source and then validate the registration.
- How to Manage Data Import Jobs for Operations Manager and Configuration Manager

  Describes how to manage data import jobs and change a job schedule.
- Troubleshooting System Center Data Warehouse Errors

  Describes steps you can take to troubleshoot System Center data warehouse errors.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

How to Register the System Center Data Warehouse to Operations Manager

You can use the following procedures in System Center 2012 – Service Manager to register the System Center Data Warehouse to Operations Manager and then validate the registration.

To register the data warehouse to Operations Manager

1. By using an account that is a member of the Service Manager and data warehouse management administrators group, log on to the computer that hosts the Service Manager console.
2. In the Service Manager console, select **Data Warehouse**.
3. In the **Administration** pane, expand **Data Warehouse**, and then select **Data Sources**.
4. In the **Tasks** list, click **Register data source**.
5. In the Register Data Source Wizard, on the **Before You Begin** page, click **Next**.
6. On the **Data Source Type** page, select **Operations Manager**.
7. Under **Specify a Root Management Server** area, type the following information:
   a. For **Root Management server name**, type the server name.
   b. For **Operational database server**, type the database server name.
   c. For **Database name**, type the name of the database.
8. Click **Next**.
9. On the **Credentials** page, you can accept the default entry in the **Run as account** list, and then click **Next**, or you can enter credentials from a user or group of your choice.

   Important
   The account that you specify will be assigned administrative credentials on the

Service Manager management server and granted Read permission on the Service Manager database. You can specify different credentials from other Service Manager management groups when you are registering with the data warehouse.

10. On the **Summary** page, you can review the settings that you have chosen. Click **Finish**.
11. On the **Result** page, when **Data source registration complete.** appears, click **Finish**.

To validate the Operations Manager registration process

- In the **Data Sources** view, the new data source appears in the list of data sources, with the data source type of **Operations Manager**. You might have to refresh your view to see the new data source.

See Also

Registering Source Systems to the System Center Data Warehouse

How to Register Configuration Manager With the System Center Data Warehouse to

You can use the following steps in System Center 2012 – Service Manager to register Configuration Manager with the System Center Data Warehouse and then validate the registration.

To register Configuration Manager with the data warehouse

1. By using an account that is a member of the Service Manager and data warehouse management administrators group, log on to the computer that hosts the Service Manager console.
2. In the Service Manager console, select **Data Warehouse**.
3. In the **Administration** pane, expand **Data Warehouse**, and then select **Data Sources**.
4. In the **Tasks** list, click **Register data source**.
5. In the Register Data Source Wizard, on the **Before You Begin** page, click **Next**.
6. On the **Data Source Type** page, select **Configuration Manager**.
7. Under **Specify a Central Site Server**, type the following information:
   a. For **Central Site server name**, type the site server name.
   b. For **Database name**, type the name of the database.
8. Click **Next**.
9. On the **Credentials** page, you can accept the default entry in the **Run as account** list, and then click **Next**, or you can enter credentials from a user or group of your choice.

   Important
   The account that you specify will be assigned administrative credentials on the Service Manager management server and granted Read permission on the Service Manager database. You can specify different credentials from other

Service Manager management groups when you are registering with the data warehouse.

10. On the **Data Selection** page, choose the domains to extract, and then click **Next**. For example, select **System Center Configuration Manager Connector Configuration** and **System Center Configuration Manager Power Management Connector**.
11. On the **Summary** page, you can review the settings that you have chosen. Click **Finish**.
12. On the **Result** page, when **Data source registration complete** appears, click **Finish**.

To validate the Configuration Manager registration process

- In the **Data Sources** view, the new data source appears in the list of data sources, with the data source type of **Configuration Manager**. You might have to refresh your view to see the new data source.

See Also

Registering Source Systems to the System Center Data Warehouse

How to Register the System Center Data Warehouse to a Service Manager Source

You can use the following procedures in System Center 2012 – Service Manager to register the System Center Data Warehouse with a Service Manager management group and then validate the registration. This makes it possible to host multiple Service Manager management groups in a single data warehouse.

To register the data warehouse with another Service Manager management group

1. By using an account that is a member of the Service Manager and data warehouse management administrators group, log on to the computer that hosts the Service Manager console.
2. In the Service Manager console, select **Data Warehouse**.
3. In the **Administration** pane, expand **Data Warehouse**, and then select **Data Sources**.
4. In the **Tasks** list, click **Register data source**.
5. In the Register Data Source Wizard, on the **Before You Begin** page, click **Next**.
6. On the **Data Source Type** page, select **Service Manager**.
7. Under **Specify a Service Manager Server**, type the following information:
   a. For **Service Manager server name**, type the server name.
8. Click **Next**.
9. On the **Credentials** page, you can accept the default entry in the **Run as account** list, and then click **Next**, or you can enter credentials from a user or group of your choice.

   Important
   The account that you specify will be assigned administrative credentials on the Service Manager management server and granted Read permission on the

Service Manager database. You can specify different credentials from other Service Manager management groups when registering with the data warehouse.

10. On the **Summary** page, you can review the settings that you have chosen. Click **Finish**.
11. On the **Result** page, when **Data source registration complete.** appears, click **Finish**.

To validate the Service Manager registration process

- In the **Data Sources** view, the new data source appears in the list of data sources, with the data source type of **Service Manager**. You might have to refresh your view to see the new data source.

See Also

Registering Source Systems to the System Center Data Warehouse

How to Manage Data Import Jobs for Operations Manager and Configuration Manager

You can use the following procedure to manage data warehouse data import jobs in System Center 2012 – Service Manager. Data import jobs are like other data warehouse jobs, and you can manage them with the Service Manager console and also with Windows PowerShell cmdlets. Methods of management include:

- Revising the processing schedule to hourly, daily, or weekly
- Suspending a job
- Resuming a suspended, or Not Started, job

To manage data import jobs and change a job schedule

1. In the Service Manager console, click **Data Warehouse**, expand **Data Warehouse**, and then click **Data Warehouse Jobs**.
2. In the **Data Warehouse Jobs** pane, select a job name, and then under **Tasks**, click **Properties**.
3. In the job properties dialog box that appears, you can view the current schedule. You can change the schedule to one of your choice. For example, change the schedule to **Daily** and run the job at **1:00 AM**, and then click **OK**.
4. You can optionally **Suspend** jobs, and you can **Resume** any that are suspended or Not Started.

See Also

Registering Source Systems to the System Center Data Warehouse

Troubleshooting System Center Data Warehouse Errors

This section describes steps you can take to troubleshoot System Center data warehouse errors in System Center 2012 – Service Manager.

Using the Operations Manager event log on the Data Warehouse server to troubleshoot errors

Service Manager event logs are found in the Operations Manager event log. Evaluating events in the log is useful because most errors from the data warehouse are found in this event log. Events in the log are from two different sources: Deployment and Data Warehouse.

Events with a source of **Deployment** are usually generated during management pack deployment, which includes report deployment or assembling the data warehouse, for example, by creating outriggers, dimensions, and fact tables. Errors in the event log usually include instructions about how to recover from the errors. For example, you might read instructions suggesting that you stop and then restart the Service Manager services. The three services on a data warehouse management server are:

- System Center Data Access Service
- System Center Management

  Note
  For System Center 2012 R2 Service Manager, the System Center Management service was renamed to Microsoft Monitoring Agent.
- System Center Management Configuration

When you start and stop Service Manager services, you must stop and start all three services.

After the data warehouse is deployed, events are more likely to have a source of **Data Warehouse**. These events are created by jobs within the normal course of operations like extract, transform, and load (ETL) jobs; the MPSync job; and the DWMaintenance job.

Using the Service Manager console to troubleshoot errors

In the Service Manager console, click **Data Warehouse Jobs** and you will see ETL job and MPSync job status. If your deployment was successful and your data warehouse is correctly registered to at least one Service Manager management group, you see at least five jobs. Every job should have the status **Running** or **Not Started**.

If you see a job status listed as **Failed**, you can select the job, and then in the **Tasks** pane, click **Modules** to find out which job module has failed. Then, you can examine the Operations Manager event log on the data warehouse server to determine why the module failed.

In the **Data Warehouse** workspace, you can click **Management Packs** in the left pane. That is where you can view all the management packs in the data warehouse and the status of their deployment. When you import a management pack to Service Manager, the MPSync job synchronizes it to the data warehouse, where the MPSync job derives its name from management pack synchronization. When you get the list of management packs in the data warehouse, you can find out if your management pack has been deployed successfully or not.

If your management pack has defined data warehouse-specific elements, such as outriggers, dimensions, fact tables, or reports, that management pack must be successfully deployed before the new tables and reports will be ready to use.

Using Windows PowerShell to troubleshoot errors

The Windows PowerShell cmdlets in the following table provide detailed information about the data warehouse jobs.

Command	Description
Get-SCDWMgmtGroup	This command tells you which sources are currently registered with the data warehouse. You should expect to see at least two different DataSourceName values.
Get-SCDWJob	This command lists the data warehouse job status of the current batch. Using the command, you can check whether the jobs are enabled or not, which jobs are running, and when they started. When the MPSync or DWMaintenance jobs start, they disable all of the ETL jobs. You will see the **Is Enabled** column set to **False** for each of the ETL jobs. This means that even if the ETL job status shows it is running, it actually is not running. When the MPSync or DWMaintenance job completes, the ETL jobs are automatically enabled and resume processing. Jobs normally have the **Not Started** status, unless the previous batch has completed. If you prefer, you can use the **Get-SCDWJob** command to view the last few batches of a specific job.
Get-SCDWJob –JobName <Specific job name> -NumberOfBatches <number>	Use this command to see the latest job, specified by <Specific job name>, completed, when it started, and when it ended. You can calculate how long it ran and what the next batch ID and status is. The job batch ID is always incremental.
Get-SCDWJobModule	This command provides detailed information about the specific modules within the job. This is very useful when you see job failures and you want to find out what caused the failure.

Troubleshooting Common Data Warehouse Issues

This list is not exhaustive, but it covers most of the common problems that you are likely to encounter.

Reports are not deployed after registering the data warehouse

Symptoms

When you open the Service Manager console, a dialog box appears indicating that the Reporting Service is unavailable. Another symptom is that the **Reporting** workspace button appears in the Service Manager console; however, there are no reports displayed in the workspace. Another symptom is that no reports have been deployed to the Reporting Services server.

Other aspects of the data warehouse deployment might appear to have gone smoothly. For example, in the Service Manager console, when you click **Data Warehouse**, and then click **Data Warehouse Jobs**, you see two extract jobs, a transform and load job, and an MPSync job.

Troubleshooting Steps

To troubleshoot this problem, complete the following steps.

Step 1: Check the deployment status of your management packs:

1. In the Service Manager console, click **Data Warehouse**.
2. Click **Management Packs**, and in the search **Filter** box, type **report**. This filters results to report-related management packs.
3. Check the deployment status (last column) of the following management packs. None of the management packs should have a status of **Failed**.
    - ServiceManager.ActivityManagement.Report.Library
    - ServiceManager.ProblemManagement.Report.Library
    - ServiceManager.IncidentManagement.Report.Libraryxxx
    - ServiceManager.ConfigurationManagement.Report.Library
    - ServiceManager.ChangeManagement.Report.Library

Step 2: Check the event log for error messages that mention the assembly Microsoft.EnterpriseManagement.Reporting.Code.dll file.

If any of the above five management packs failed deployment:

1. On the data warehouse management server, open the Operations Manager event log.
2. Filter the events with **Event Sources** as **Deployment** and **Event Level** as **Error**.
3. If there are error messages in the event log that indicate **cannot load Assembly Microsoft.EnterpriseManagement.Reporting.Code.dll**, review the following items:
    a. Your installation of SQL Server Reporting Services (SSRS) may be on a different server than the data warehouse management server. If so, refer to the instructions in the Deployment Guide for System Center 2012 – Service Manager and copy the assembly to the SSRS server, and then add access permission to it.
    b. If your SSRS installation is on the same server as the data warehouse management server, restart the SSRS service.
4. Restart SSRS:
    a. Log on to the server where SSRS is installed.

b. Click **Start**, **All Programs**, **Microsoft SQL Server 2008** (or **Microsoft SQL Server 2008 R2**), **Configuration Tools**, and then click **Reporting Services Configuration Manager**.
c. In the **Reporting Services Configuration Connection** window, click **Connect**.
d. In the **Reporting Server Status** window, click **Stop**, and then click **Start**.
e. Click **Exit**.

Step 3: Redeploy any failed report management packs:

1. In the Service Manager console, click **Data Warehouse**.
2. Click **Management Packs**, and then in the search filter, type **report**.
3. For each of the management packs listed in step 1, in the **Tasks Pane**, click **Restart Deployment**.

Note
If the deployment status of a management pack is listed as **Completed**, the **Restart Deployment** option is unavailable.

After the deployment status of the report management packs has updated from **Failed** to **Completed**, open the Service Manager console. Reports should display in the **Reporting** workspace. You may have to restart the Service Manager console to view the reports because the console caches the list of reports.

Jobs fail after importing a custom management pack

Symptom

One or more data warehouse jobs start failing after importing a custom management pack and synchronizing it to the data warehouse.

Troubleshooting Steps

To troubleshoot this problem, complete the following steps:

1. Check the event log to ensure that the root cause is the custom management pack:
   a. On data warehouse management server, open the Operations Manager event log.
   b. Find the event that is related to the job failure.
   c. Determine if the failure is related to the custom management pack you imported.
2. If the failure is related to the custom management pack, you should remove it and let the rest of the data warehouse operate as usual. You can fix the management pack and reimport it later:
   a. Uninstall the custom management pack using the Service Manager console.
   b. Run the MP Sync job.
   c. Verify that the custom management pack is listed in **Data Warehouse** under **Management Packs**.
   d. After the MP Sync job is completed, resume the failed job either from the Service Manager console or with a Windows PowerShell cmdlet.
3. Fix and reimport the custom management pack:
   a. Remove the custom management pack and recover from the failure using step 2, shown previously.

b. Fix the custom management pack.

c. Import the fixed custom management pack into Service Manager, and then run the MP Sync job to sync it to the data warehouse.

Data warehouse is not receiving new data, or jobs seem to take too long to complete

Symptom

You do not see data or new data in any of your reports. Another symptom is that ETL jobs are taking too long to run and the jobs do not show a status of **Not Started**.

Troubleshooting Steps

To troubleshoot this problem, complete the following steps:

1. Use the Windows PowerShell cmdlet **Get-SCDWJob** to determine if all ETL jobs are enabled. Start Windows PowerShell, and then type **Get-SCDWJob**.
2. If the ETL jobs are disabled and either the MPSyncJob or DWMaintenance jobs are running, you will have to wait awhile to get the job status again because these two background jobs disable the ETL jobs. However, if the two jobs are listed as **Not Started** and the ETL jobs are disabled, you can use the **Enable-SCDWJob** cmdlet to enable each of them, for example:

   ```
   Enable-SCDWJob -JobName Transform.Common
   ```

3. If the MPSync and DWMaintenance ETL jobs are all enabled and running but their individual batch ID has not changed for a long time, or if you use the **Get-SCDWJobModule** cmdlet for specific jobs and you do not see that any module is actually running, check the event log and see if there are any error messages. Sometimes the error message might be many days old and you might need to review many days-worth of events.
4. Check if the three services—System Center Data Access Service, System Center Management, and System Center Management Configuration—on the data warehouse management server are actually running. On the data warehouse management server, click **Start**, click **Run**, and then type **Services.msc**. In **Services** verify that the following services are running: System Center Data Access Service, System Center Management, and System Center Management Configuration.

   Note
   For System Center 2012 R2 Service Manager, the System Center Management service was renamed to Microsoft Monitoring Agent.

   If any of the services are not running, restart all three services. In addition, if all services are actually running, events from the Event Source Data Warehouse and OpsMgr SDK Service are sent to the Operations Manager event log. You can use this information as another source to verify whether all the services are running. If you do not see events from the Event Source Data Warehouse and OpsMgr SDK Service for a long time, you should restart all three services.

Custom data warehouse extensions do not appear in the data warehouse

Symptom

After importing your management pack, which defines some dimensions or fact tables to Service Manager, the MPSync job has run several times, but you still do not see your dimension or fact tables in the DataMart.

Troubleshooting Steps

Ensure that your management pack is sealed. The MPSync Job can import only sealed management packs from Service Manager into the data warehouse. If you have not sealed your management pack, seal it, and then import it using the Service Manager.

Ensure that your management pack is synced to the data warehouse by completing the following steps:

1. Open the Service Manager console.
2. Click **Data Warehouse**.
3. Click **Management Packs**, and then locate your management pack in the list of management packs. To do this, use the search feature by typing your management pack name in the search box. If you do not see your management pack:
    a. It might have failed to import into the data warehouse management server. Go to the data warehouse management server, open the Operations Manager event log and then filter the events with **Event Sources** as **OpsMgr SDK Service**.
    b. The MPSync job may not have run yet. It runs on a recurring schedule, which is, by default, once every hour. You can modify the schedule with Windows PowerShell. To speed up management pack synchronization, after you import your management pack you can manually resume the MPSync job, either from the Service Manager console or by using Windows PowerShell.

Check the deployment status of your management pack:

1. Open the Service Manager console.
2. Click **Data Warehouse**.
3. Click **Management Packs**, and then find your management pack in the list of management packs. To do this you can search for your management pack name.
4. Check the deployment status of your management pack. If the deployment status is **Failed**:
    a. On the data warehouse management server, open the Operations Manager event log, and then filter the events with **Event Sources** as **Deployment**.
    b. If there is an error message, the message usually indicates what went wrong. If after you make any needed fixes to the management pack and the error still occurs, you can uninstall this management pack using the Service Manager console. After the MPSync job runs, the management pack is uninstalled from data warehouse management server.

Management packs are stuck in Pending Association status after registering to the data warehouse

Symptom

Some management packs remain in **Pending Association** status several hours after registering Service Manager with the data warehouse and several (up to four or more) hours have passed. You can determine the time elapsed by opening the Service Manager console and navigating to **Data Warehouse**, **Data Warehouse Jobs**, **MPSync Job**, and then clicking **Details** from the **Tasks** pane.

Troubleshooting Steps

To troubleshoot this problem, complete the following steps:

1. View the **Details** of the MPSync job. Review each batch ID for the problem management pack in the **MPSyncJob** dialog box. In the **MP Sync Job** dialog box, click the **Management Pack** column name to sort the list according to management pack name. Find any management packs with **Pending Association** status. In the list of management packs, check to see if, in the later batch, the management pack status is listed as **Associated**, for example:
   - For Batch ID 136, Management Pack Microsoft.SystemCenter.ConfigurationManager is Pending Association.
   - For Batch ID 207, Management Pack Microsoft.SystemCenter.ConfigurationManager is Associated.

   This indicates the management pack is associated properly in batch 207, even though it ran into an error in batch 136. Because it recovered in batch 207, the management pack is correctly associated and the synchronization completed successfully.
2. If in the **MP Sync Job** dialog box, the Pending Association status for a management pack repeats for every batch, you will have to troubleshoot further to determine the reason why the management pack fails to associate. You should start by looking for deployment failures in other management packs that your management pack depends on.

   In the Service Manager console, click **Data Warehouse**, click **Management Packs**, and then click the **Deployment Status** column heading. If you see any management pack with a deployment status of **Failed** or **Not Started**, this is usually due to a management pack dependency. Because management packs can depend on others, any failure can cause other management packs to fail deployment. Any impacted management pack has the **Not Started** status.
3. Find the deployment failures in the event log. Open the Operations Manager Event log on the data warehouse, filter the event log to the events where the Event Source is **Deployment** and Event Level is **Warning** or **Error**.
4. If there is an error message similar to the following message, you will have to unregister the data warehouse from Service Manager, reinstall the data warehouse, and then reregister the Service Manager management server to the data warehouse management server:

   ```
   Deployment Execution Infrastructure has retried the maximum
   number of times and is giving up on this execution step.
   MP Element ID:
   DerivedManagementPack.SystemDerivedMp.ServiceManager.ActivityMan
   agement.Library.Datawarehouse
   MP name: ServiceManager.ActivityManagement.Library.Datawarehouse
   MP version: 7.0.5826.0
   Operation: Install
   Error message:  Cannot find resource with ID
   TransformActivityStatusResource
   ```

ETL jobs fail due to login credentials problems

Symptom

Some or all ETL jobs have failed. The Operations Manager event log on the data warehouse management server indicates that the ETL job failure is related to a login user failure.

Troubleshooting Steps

To troubleshoot this problem, check if the password for each Run As account has changed or expired. You can update the account using the following steps:

1. Navigate to **Data Warehouse**, **Security**, **Run As Accounts**, and then click the related run as account. Click **Properties** in the **Tasks** pane, update the **Password** field in the window, and then click **OK**.
2. If this Run As account is an Operational System Account, you also have to update the services that are running under the account:
   a. On the data warehouse management server, click **Start**, click **Run**, and then type **Services.msc**.
   b. In **Services**, update the passwords for the services that run under the account, for example, System Center Data Access Service and System Center Management Configuration.
   c. Restart the services.

   Note
   The MP Sync job and Extract jobs can use a different Run As account other than Operational System Account. This Run As account is created when Service Manager is registered to a data warehouse.

It is easy to update the password if it is expired. However it is more difficult to update the system if you change the Run As account. We do not recommend that you modify Run As accounts.

If the job failure is not related to the password, make sure that the Run As account for the failed job can be used to connect to the target database. For example, ensure that the Extract job Run As account can be used to connect to the Service Manager database. If not, make sure that the Structured Query Language (SQL) service that is hosting the database is running.

See Also

Registering Source Systems to the System Center Data Warehouse

How to Disable a Data Warehouse Job Schedule

You can use the following procedure to disable the schedule for the extract, transform, and load (ETL) jobs; however, you can use this procedure to disable the schedule for any data warehouse job. In this release of Service Manager (System Center 2012 – Service Manager), you can disable the schedules only by using Windows PowerShell cmdlets.

Note
For information about how to run Service Manager Windows PowerShell cmdlets, see Getting Started with Service Manager Cmdlets for Windows PowerShell.

To disable a schedule for a data warehouse job by using Windows PowerShell cmdlets

1. On the computer that hosts the data warehouse management server, click **Start**, point to **All Programs**, click **Microsoft System Center**, click **Service Manager 2012**, and then click **Service Manager Shell**.
2. At the Windows PowerShell prompt, type the following commands, and press ENTER after each command:

```
Disable-SCDWJobSchedule –JobName Extract_<data warehouse management group name>
Disable-SCDWJobSchedule –JobName Extract_<Service Manager management group name>
Disable-SCDWJobSchedule –JobName Transform.Common
Disable-SCDWJobSchedule –JobName Load.Common
```

3. Type **exit**, and then press ENTER.

See Also

Managing the Data Warehouse in System Center 2012 - Service Manager

How to Enable Data Warehouse Job Schedules

Use the following procedure to enable the schedule for the ETL jobs as needed; you can use this procedure to enable the schedule for any of the data warehouse jobs. By default, the schedules for the extract, transform, and load (ETL) jobs are enabled. In this release of Service Manager (System Center 2012 – Service Manager), you can enable the schedules only by using Windows PowerShell.

To enable a schedule for a data warehouse job by using a Windows PowerShell cmdlet

1. On the computer that hosts the data warehouse management server, click **Start**, point to **All Programs**, click **Microsoft System Center**, click **Service Manager 2012**, and click **Service Manager Shell**.
2. At the Windows PowerShell prompt, type the following commands, and then press ENTER after each command:

```
Enable-SCDWJobSchedule –JobName Extract_<data warehouse management group name>
Enable-SCDWJobSchedule –JobName Extract_<Service Manager management group name>
Enable-SCDWJobSchedule –JobName Transform.Common
Enable-SCDWJobSchedule –JobName Load.Common
```

3. Type **exit**, and then press ENTER.

See Also

Managing the Data Warehouse in System Center 2012 - Service Manager

How to View the Status of a Data Warehouse Job

You can use the following procedures to view the status of a data warehouse job in System Center 2012 – Service Manager to determine whether a job is running, stopped, or failed.

Note

For information about running Service Manager Windows PowerShell cmdlets, see Getting Started with the Service Manager Cmdlets in the Administrator's Guide for System Center 2012 - Service Manager.

To view the status of a data warehouse job by using the Service Manager console

1. In the Service Manager console, click **Data Warehouse**.
2. In the **Data Warehouse** pane, expand **Data Warehouse**, and then click **Data Warehouse Jobs**.
3. In the **Data Warehouse Jobs** pane, review the list of jobs to view their status.

To view the status of a data warehouse job by using a Windows PowerShell cmdlet

1. On the computer that hosts the data warehouse management server, click **Start**, point to **All Programs**, click **Microsoft System Center**, click **Service Manager 2012**, and then click **Service Manager Shell**.
2. Type the following command, and then press ENTER.

```
Get-SCDWJob
```

3. Review the list of jobs to view their status.

See Also

Managing the Data Warehouse in System Center 2012 - Service Manager

How to Stop and Start a Data Warehouse Job

You can stop and start data warehouse jobs that are running in System Center 2012 – Service Manager. For example, you might have to stop all of the data warehouse jobs that are running to ensure that a security update to the data warehouse management server does not interfere with any jobs that might run. After the server has been updated and restarted, you resume all the data warehouse jobs. You can stop and then start jobs by using the Service Manager console or by using Windows PowerShell cmdlets. In this example, only the extract, transform, and load (ETL) jobs are running.

Note

For information about using the Service Manager Windows PowerShell cmdlets, see Getting Started with Service Manager Cmdlets for Windows PowerShell.

To stop and start data warehouse jobs using the Service Manager console

1. In the Service Manager console, click **Data Warehouse**.
2. Expand **Data Warehouse**, and then click **Data Warehouse Jobs**.
3. In the **Data Warehouse Jobs** pane, select a job that is running, and then click **Suspend** in the **Tasks** list.
4. Repeat the previous step for each data warehouse job.
5. To resume each job, select a job that is stopped in the **Data Warehouse Jobs** pane, and then click **Resume** in the **Tasks** list.

To stop all data warehouse jobs using Windows PowerShell cmdlets

1. On the computer that hosts the data warehouse management server, click **Start**, point to **All Programs**, click **Microsoft System Center**, click **Service Manager 2012**, and then click **Service Manager Shell**.
2. At the Windows PowerShell prompt, type the following commands, and then press ENTER after each command:

```
Stop-SCDWJob-JobName Extract_<data warehouse management group name>
Stop-SCDWJob –JobName Extract_<Service Manager management group name>
Stop-SCDWJob –JobName Transform.Common
Stop-SCDWJob –JobName Load.Common
```

3. Type **exit**, and then press ENTER.

To start all data warehouse jobs using Windows PowerShell cmdlets

1. On the computer that hosts the data warehouse management server, click **Start**, point to **All Programs**, click **Microsoft System Center**, click **Service Manager 2012**, and then click **Service Manager Shell**.
2. At the Windows PowerShell prompt, type the following commands, and then press ENTER after each command:

```
Start-SCDWJob –JobName Extract_<data warehouse management group name>
Start-SCDWJob –JobName Extract_<Service Manager management group name>
Start-SCDWJob –JobName Transform.Common
Start-SCDWJob –JobName Load.Common
```

3. Type **exit**, and then press ENTER.

See Also

Managing the Data Warehouse in System Center 2012 - Service Manager

How to Schedule a Data Warehouse Job

You can use the following procedure to schedule a data warehouse job in System Center 2012 – Service Manager.

You could use this procedure in a scenario where a schedule for the data warehouse jobs has been defined in Service Manager. You want to change the schedule for the data warehouse jobs to define standard maintenance windows for the Service Manager database and for the data warehouse. Use the **Set-SCDWJobSchedule** cmdlet to schedule the data warehouse jobs. The **Set-SCDWJobSchedule –ScheduleType Weekly** cmdlet and parameter combination allows jobs to run only on the days you specify. For example, the following commands define a daily or weekly schedule:

```
Set-SCDWJobSchedule -JobName Transform.Common –ScheduleType Daily -DailyFrequency
01:00:00 -DailyStart 06:00
```

```
Set-SCDWJobSchedule -JobName Transform.Common -ScheduleType Weekly -WeeklyFrequency
Tuesday, Thursday -WeeklyStart 06:00
```

Note

To run Windows PowerShell cmdlets, the execution policy must be set to RemoteSigned. For more information, see Getting Started with the Service Manager Cmdlets in the Deployment Guide for System Center 2012 – Service Manager.

In the following procedure, you configure a schedule for the Transform job to run every 45 minutes, starting at 2:00 in the morning. However, you can modify the commands to set your own schedule.

To configure a schedule for data warehouse jobs

1. On the computer that hosts the data warehouse management server, click **Start**, point to **All Programs**, click **Microsoft System Center**, click **Service Manager 2012**, and then click **Service Manager Shell**.
2. At the Windows PowerShell prompt, type the following command, and then press ENTER.

```
Set-SCDWJobSchedule -JobName Transform.Common -ScheduleType
Daily –DailyFrequency 00:45:00 –DailyStart 02:00
```

To validate a data warehouse job schedule

1. On the computer that hosts the data warehouse management server, click **Start**, point to **All Programs**, click **Microsoft System Center**, click **Service Manager 2012**, and then click **Service Manager Shell**.

2. Type the following command, and then press ENTER:

```
Get-SCDWJobSchedule
```

See Also

Managing the Data Warehouse in System Center 2012 - Service Manager

How to Process All Dimensions in the Data Warehouse Using Windows PowerShell Cmdlets

You can process all the dimensions in the data warehouse in one operation using Windows PowerShell cmdlets, instead of processing each dimension individually. On the server that hosts SQL Server Analysis Services (SSAS), use the following Windows PowerShell script. Be sure to specify the fully qualified server name. You can type each command separately, or you can save them all as a Windows PowerShell script (.ps1) file and then run the script.

Before you can use Service Manager cmdlets, you need to configure the Service Manager Shell. For information about configuring the Service Manager Shell, see Configuring and Using the System Center 2012 - Service Manager Cmdlets for Windows PowerShell.

To process all dimensions using cmdlets

1. Copy and paste the following code snippets at the prompt in a Service Manager Shell:
   a.
   b.
   c.

See Also

Managing the Data Warehouse in System Center 2012 - Service Manager

How to View Data Warehouse Job History

A history of data warehouse jobs is collected as they run in System Center 2012 – Service Manager. You can view this history to determine how long a job ran or to determine the last time the job ran successfully. When you display the data warehouse job history, you display the number of entries that you specify by using the *NumberOfBatches* parameter. Use the following procedure to view the last five entries in the history of a data warehouse job.

To view the last five entries in the data warehouse job history

1. On the computer that hosts the data warehouse management server, click **Start**, point to **All Programs**, click **Microsoft System Center**, click **Service Manager 2012**, and then click **Service Manager Shell**.
2. Type the following command, and then press ENTER.

```
Get-SCDWJob -NumberOfBatches 5
```

3. Type **exit**, and then press ENTER.

See Also

Managing the Data Warehouse in System Center 2012 - Service Manager

How to Troubleshoot a Data Warehouse Job

In System Center 2012 – Service Manager, after the Data Warehouse Registration Wizard is complete and after Reporting becomes available in the Service Manager console, you can start running reports. If you encounter a problem with reports (for example, the incident management report you run does not show the current data), you can use Windows PowerShell cmdlets to troubleshoot the problem. For example, you can use the following procedure to determine whether a transform job failed, and you can evaluate any error messages that the transform job created.

To troubleshoot data warehouse jobs by using Windows PowerShell cmdlets

1. On the computer that hosts the data warehouse management server, click **Start**, click **All Programs**, click **All Programs**, click **Accessories**, and then click **Windows PowerShell**.
2. Type the following command, and then press ENTER.

   ```
   Get-SCDWJob
   ```

3. Review the output, and locate any job with a status of "Failed."
4. Type the following command, and then press ENTER. In the command, specify the data warehouse job that failed as the value of the *JobName* parameter.

   ```
   Get-SCDWJobModule -JobName Transform.Common
   ```

5. In the output, locate a status of "Failed," and then review the **Error Message** column for more information about why the data warehouse job failed.
6. When you are ready to retry the failed job, in the Service Manager console, click **Data Warehouse**.
7. Expand **Data Warehouse**, and then click **Data Warehouse Jobs**.
8. In the **Data Warehouse Jobs** pane, select the failed job in the list, and then click **Resume** in the **Tasks** list.

See Also

Managing the Data Warehouse in System Center 2012 - Service Manager

How to Configure Microsoft SharePoint for Analytics

Microsoft SharePoint 2010 not only stores Excel workbooks that contain Service Manager Microsoft Online Analytical Processing (OLAP) data cubes in document libraries, but it is also

used to render Excel workbooks with the use of a web browser. Using SharePoint makes it possible for Service Manager users that do not have Excel to get access to the information they need. It also enables quick and easy access from mobile devices.

Note
You must already have Microsoft SharePoint 2010 for Internet Sites Enterprise installed to perform this procedure.

To enable Excel Services on SharePoint 2010

1. Click **Start**, and then click **SharePoint 2010 Central Administration**.
2. Under **System Settings**, click **Manage farm features**.
3. Ensure that both the **Excel Services Application View Farm Feature** and **Excel Services Application Web Part Farm Feature** are set to **Active**. If they are not set to **Active**, click **Activate**.

See Also

Managing the Data Warehouse in System Center 2012 - Service Manager

Managing the System Center 2012 - Service Manager Self-Service Portal

The Self-Service Portal in System Center 2012 – Service Manager is used by end users to contact help desk personnel for help requests. Users can also search the knowledge base, perform tasks, and manage their requests.

Use the procedures in the following topics to manage portal pages and links.

Managing Self-Service Portal Topics

- How to Configure Concurrent Sessions and Calls

  Describes how to configure concurrent sessions and calls.
- How to Modify the Self-Service Portal Attachment File Size

  Describes how to modify the Self Service Portal attachment file size.
- Customizing the Self Service Portal

  Provides an overview of customizing the Self-Service Portal.
- Enabling Tracing and Debugging for the Self Service Portal

  Explains when tracing and debugging is used to troubleshoot the Self-Service Portal.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager

- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

How to Configure Concurrent Sessions and Calls

By limiting the number of concurrent calls and sessions on the Web Content Server in System Center 2012 – Service Manager, you can limit the number of resources used by the Self-Service Portal. Use the following procedure to configure the number of concurrent calls and sessions. For more information, see the MSDN article <serviceThrottling> to specify the throttling mechanism of a Windows Communication Foundation (WCF) service.

To configure concurrent calls and sessions

1. Log in to the computer hosting the Web Content Server with administrative privileges.
2. Using a text editor of your choosing (for example, Notepad), open the Web.config file in the %inetroot%\inetpub\wwwroot\System Center Service Manager Portal\servicehost folder.
3. Locate the <serviceBehaviors> section, as shown in the following example:

```
<system.serviceModel>
<behaviors>
<serviceBehaviors>
<behavior name="DefaultHttpServiceBehavior">
<serviceMetadata httpGetEnabled="true"/>
<serviceDebug includeExceptionDetailInFaults="true"/>
<dataContractSerializer maxItemsInObjectGraph="2147483647"/>
</behavior>
<behavior name="DefaultHttpsServiceBehavior">
<serviceMetadata httpsGetEnabled="true"/>
<serviceDebug includeExceptionDetailInFaults="true"/>
<dataContractSerializer maxItemsInObjectGraph="2147483647"/>
</behavior>
</serviceBehaviors>
</behaviors>
```

4. Add the line <serviceThrottling maxConcurrentCalls="160" maxConcurrentSessions="10000"/> in both the DefaultHttpServiceBehavior and DefaultHttpsServiceBehavior sections, as shown in the following example:

```
<system.serviceModel>
<behaviors>
<serviceBehaviors>
```

```
<behavior name="DefaultHttpServiceBehavior">
<serviceMetadata httpGetEnabled="true"/>
<serviceThrottling maxConcurrentCalls="160"
maxConcurrentSessions="10000"/>
<serviceDebug includeExceptionDetailInFaults="true"/>
<dataContractSerializer maxItemsInObjectGraph="2147483647"/>
</behavior>
<behavior name="DefaultHttpsServiceBehavior">
<serviceMetadata httpsGetEnabled="true"/>
<serviceDebug includeExceptionDetailInFaults="true"/>
<serviceThrottling maxConcurrentCalls="160"
maxConcurrentSessions="10000"/>
<dataContractSerializer maxItemsInObjectGraph="2147483647"/>
</behavior>
</serviceBehaviors>
</behaviors>
```

5. Close your text editor, and save the changes.

See Also

Managing the System Center 2012 - Service Manager Self-Service Portal

How to Modify the Self-Service Portal Attachment File Size

By default, users can attach files in requests that they submit when they use the Self-Service Portal in System Center 2012 – Service Manager. However, the Self-Service Portal limits the attachment file size to 10 megabytes (MB). You can modify the Self-Service Portal default attachment file size by editing a property manually in the Web.config file.

Note
The maximum file size that the Self-Service Portal supports is independent of the work item maximum size settings that are specified in the Service Manager console in the Administration workspace.

To modify the Self-Service Portal attachment file size

1. Log in to the computer that hosts the Web Content Server with administrative credentials.
2. Using a text editor of your choice (for example, Notepad), open the Web.config file in the %inetroot%\inetpub\wwwroot\System Center Service Manager Portal\servicehost folder.
3. Locate the <binaryMessageEncoding> section, as shown in the following example:

```
<binaryMessageEncoding>
        <readerQuotas maxArrayLength="10485760"/>
      </binaryMessageEncoding>
```

4. Modify the line `<readerQuotas maxArrayLength="10485760"/>` by replacing the `maxArrayLength` value with a value of your choice.
5. Close the text editor, and save the changes.

See Also

Managing the System Center 2012 - Service Manager Self-Service Portal

Customizing the Self Service Portal

You can customize the Self-Service Portal in System Center 2012 – Service Manager to better suit your organization. Example customizations presented in this section are somewhat limited; they include changes to formatting and adding a SharePoint list. However, the Self-Service Portal is based on SharePoint web services, so you can make additional customizations on your own, outside the scope of this section.

Use the procedures in the following topics to customize the Self-Service Portal.

Self-Service Portal Customization Topics

- How to Update the Portal Title and Image

  Describes how to update the Self-Service Portal's tile and associated logo.
- How to Add Navigation Links

  Describes how to add navigational links to the Self-Service Portal.
- How to Update the Portal Theme

  Describes how to update the theme for the entire Self-Service Portal.
- How to Add a Portal Announcement Page

  Describes how to add an announcement page using a SharePoint list.
- How to Modify the Help Article Web Part

  Describes how to modify a specific web part in the Self-Service Portal.
- How to Modify a Master Page File

  Describes how to modify a master page file using SharePoint Designer.
- How to Select the Self Service Portal Language

  Describes how to select the localized languages that are displayed in the Self-Service Portal based on a user's choice.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager

- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

How to Update the Portal Title and Image

You can make limited customizations to the SharePoint Web parts that make up the Self-Service Portal. You can customize the left pane navigational elements, the home page title, image, and the web-parts that present data to the web user by using the **Site Actions** menu on **Site Pages**. By using this procedure, you can make changes to the following items to customize the Self-Service Portal for your environment:

- Title
- Image

To update the portal title and image

1. Start a browser and connect to the Self-Service Portal home page, for example, *http://<SiteName>:81/SMPortal*.
2. In the upper left corner, click **Site Actions**, and then click **Site Settings**.
3. On the **Site Settings** page, in the **Look and Feel** area, click **Title, description, and icon**.
4. Follow the on-screen directions to change the title, logo, and website address, and then click **OK**.

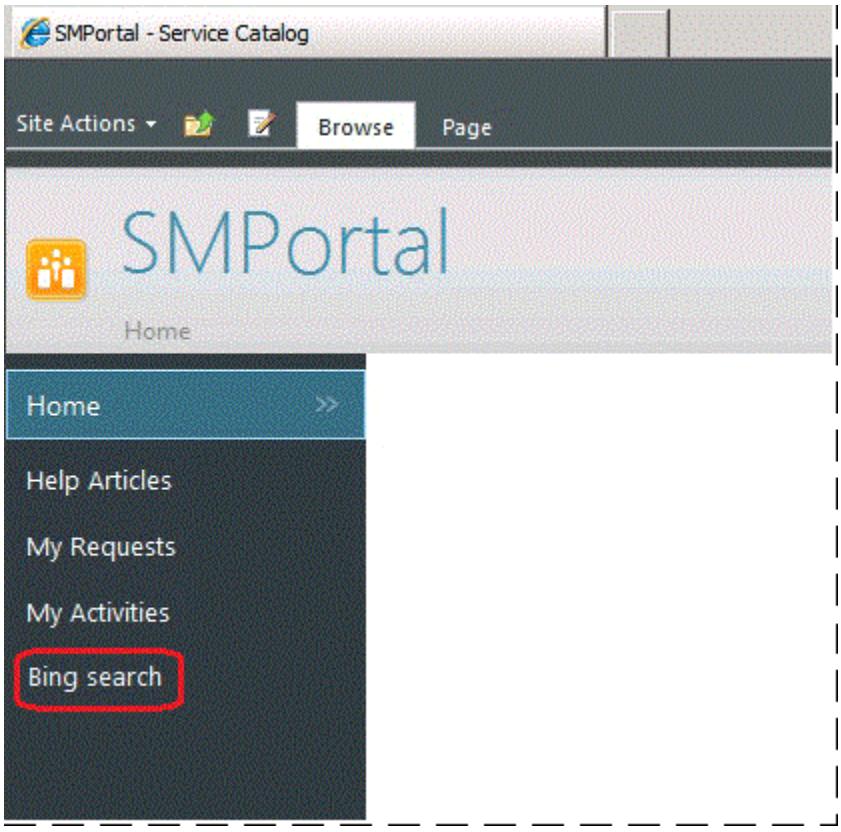
   Note
   In this guide, it is assumed that the website name is SMPortal, and all of the examples in this guide use SMPortal in all path statements. If you change the website name, you must adjust the examples that are presented in this guide.

See Also

Managing the System Center 2012 - Service Manager Self-Service Portal

How to Add Navigation Links

You can add additional navigation links to the Self-Service Portal home page in System Center 2012 – Service Manager. As an example, the following procedure adds a link titled "Bing search" to an external website (http://www.bing.com), as shown in the following illustration.



To add navigation links

1. Start a browser, and connect to the Self-Service Portal home page, for example, http://<WebServerName>:82/SMPortal.
2. In the upper left corner, click **Site Actions**, and then click **Site Settings**.
3. On the **Site Settings** page, in the **Look and Feel** area, click **Quick launch**.
4. On the **Quick Launch** page, click **New Navigation Link**.
5. In the **Type the Web address** field, type **http://www.bing.com**.
6. In the **Type the description** field, type **Bing search**, and then click **OK**.

See Also

Managing the System Center 2012 - Service Manager Self-Service Portal

How to Update the Portal Theme

You can update the color theme used by the Self-Service Portal in System Center 2012 – Service Manager. As an example, the following procedure changes the color theme from the default theme to one of your choice.

To update the portal theme

1. Start a browser, and connect to the Self-Service Portal home page, for example, http://<WebServerName>:82/SMPortal.
2. In the upper left corner, click **Site Actions**, and then click **Site Settings**.
3. On the **Site Settings** page, in the **Look and Feel** area, click **Site theme**.
4. On the **Site Theme** page, select the theme of your choice in the theme list, and then click **Apply**. For example, select **Azure**.

See Also

Managing the System Center 2012 - Service Manager Self-Service Portal

How to Add a Portal Announcement Page

You can add a new page on the Self-Service Portal in System Center 2012 – Service Manager for administrative announcements. As an example, the following procedures add an announcement page, and then you add an announcement, informing end users that the Help Desk will be closed on New Year's Day.

To add an announcement page

1. Start a browser, and connect to the Self-Service Portal home page, for example, http://<WebServerName>:82/SMPortal.
2. In the upper left corner, click **Site Actions**, and then click **Site Settings**.
3. On the **Site Settings** page, in the **Look and Feel** area, click **Quick launch**.
4. On the **Quick Launch** page, click **New Navigation Link**.
5. In the **Type the Web address** field, type **/SMPortal/Lists/Announcements/AllItems.aspx**, and then in the description box, type **Announcements**.
6. Click **OK**, and then navigate to the home page.

To create an announcement

1. Start a browser, and connect to the Self-Service Portal home page, for example, http://<WebServerName>:82/SMPortal.
2. Click **Announcements**.
3. On the **Announcements – All items** page, click **Add new announcement**.
4. In the **Title** box, type a name for the announcement. For example, type **Help Desk Closed New Year's Day**.
5. In **Body**, you can type additional information for the announcement.
6. Optionally, you can set an expiration date by selecting the date in the **Expires** box. For example, you can set the **Expires** date to January 2nd.
7. Click **Save** to close the announcement.

See Also

Managing the System Center 2012 - Service Manager Self-Service Portal

How to Modify the Help Article Web Part

You can edit SharePoint Web parts of the Self-Service Portal in order to modify the Service Manager help article web part, which end users use to search for knowledge articles. However, customization is limited in this example.

To modify the help article web part

1. Start a browser, and connect to the Self-Service Portal home page, for example, http://<WebServerName>:82/SMPortal.
2. Click **Help Articles**, and then in the upper left corner, click **Site Actions**.
3. Click **Edit Page**, and on the right side of page, click the down-pointing arrow, and then click **Edit Web Part**.
4. In the **KnowlegeArticleWebPart** box, do the following:
    a. In the **Page** area, type a value for **Background Color**. For example, type **FF0890E5**.
    b. In the **Page Title** area, type a value for **Foreground Color**. For example, type **FFAA0000**.
    c. Type a value for **Font Family**. For example, type **Courier New**.
    d. Type a value for **Font Size**. For example, type **24**.
    e. Select a value for **Font Style**. For example, select **Bold**.
    f. Optionally, modify any other properties as desired.
5. Click **OK** to close the **Edit Web Part** box, and then click **Save & Close** to close the Web part page editor.

See Also

Managing the System Center 2012 - Service Manager Self-Service Portal

How to Modify a Master Page File

You can edit some web elements of the Self-Service Portal using Microsoft SharePoint Designer 2010. You can use SharePoint Designer 2010 to modify SharePoint master pages and style sheets. However, customization is limited in this example to formatting. In any of the following example modifications, you can choose customizations that better fit your organization.

Note

You should have SharePoint Designer 2010 installed before you use the following procedure. However, you can download SharePoint Designer 2010 from the Microsoft Download Center if you do not already have it installed.

To modify a master page file

1. Start a browser, and connect to the Self-Service Portal home page, for example, http://<WebServerName>:82/SMPortal.
2. In the upper left corner, click **Site Actions**, and then select **Edit in SharePoint Designer**.
3. In the navigation pane, select **Master Pages**, and then in the **Master Pages** list, select **SMPortalPage.master**.
4. In the **Customization** area, click **Edit file** to open it in the **Advanced Editor**.
5. Select the title in the design window, and then in the **Tag Properties** pane, under **Appearance**, expand **Font**.
6. Click the box to the right of **Name**, and then select **Times New Roman**.
7. In the lower-left portion of SharePoint Designer 2010, click **Split** to show both the preview pane and the XHTML view of the master file.
8. Click the **Layout** menu tab, and then click **Manage Layers**.
9. In the **Layers** list, select **s4-workspace**. The XHTML view appears and selects the corresponding code.
10. At the top of the selected code, right click the code ** **, and then click **Follow Code Hyperlink** to open the CSS file that is associated with the master file.
11. In the CSS file, look for the section labeled `Body{` near the top of the XHTML code, and then under `height:100%`, insert a new line and type **background-color:#006600**.
12. Save the CSS and SMPortalPage.master files that you have updated, and then close SharePoint Designer 2010.
13. Refresh your view of the Self-Service Portal to view the changes that you have made.

See Also

Managing the System Center 2012 - Service Manager Self-Service Portal

How to Select the Self Service Portal Language

Service Manager does not include a localized Self Service Portal SharePoint template. As a result, after you install the Self-Service Portal on a non-English SharePoint site, it will contain content that is not localized. In order to display the Self-Service Portal in a fully localized language, you must modify the Self Service Portal to suit your organization's needs.

In System Center 2012, because the portal is based on SharePoint 2010, it is possible for your end-users to choose the languages they want displayed by themselves, subject to the SharePoint administrator's configuration.

You can also set up multiple SharePoint sites for the Self-Service Portal which can have different default languages and then you can direct users to a particular portal if you want. End-users can still change their language to whatever language they want, as long as the administrator has enabled it on the site.

To select the Self-Service Portal language

1. Install whatever language packs you want for your SharePoint product site and then

follow instructions to install and deploy them using of the following options.

- Download SharePoint 2010 Server Language packs and then read and follow the installation and deployment instructions.
- Download SharePoint 2010 Foundation language packs and then read and follow the installation and deployment instructions.

2. Once you have the language packs deployed you can configure the language settings. As a SharePoint site administrator, open the Self-Service Portal home page, click **Site Actions** and then select **Site Settings**.
3. Under **Site Administration**, click **Language settings** and select your default language and additional languages you want to enable and then click **OK**.
4. Click **Site Actions**, select **Site Settings** and then click **Quick Launch** and then modify items such as **Home**, **Help Articles**, **My Requests**, and **My Activities** for your language.
5. Click **Site Actions**, select **Site Settings** and then click **Site Libraries and lists** and open each item, such as **Customize Calendar** and then modify items such as title, description and navigation and associated columns headings.
6. Separately, each individual user can choose the language they want to display in the Self-Service Portal, under <Account Name> by selecting **Select Display Language** and then click the language they want to display.

Enabling Tracing and Debugging for the Self Service Portal

By default, Service Manager disables debugging and tracing for the Self-Service Portal (ASP.NET pages) and for the Service Manager Web service (an ASP.NET application). When contacting Microsoft Product Support Services, they might ask you to enable tracing and debugging for troubleshooting purposes. For more information about debugging and enabling tracing for ASP.NET pages and applications see the following topics:

- ASP.NET Debugging Overview
- ASP.NET Tracing Overview
- How to: Enable Tracing for an ASP.NET Page
- How to: Enable Tracing for an ASP.NET Application
- How to: Enable Debugging for ASP.NET Applications

See Also

Managing the System Center 2012 - Service Manager Self-Service Portal

Using Service Manager Tasks to Troubleshoot Computer Problems

If you want to view the logs on a remote computer that is exhibiting problems, you must first create a task that opens Event Viewer. Event Viewer reads logs from remote computers.

In System Center 2012 – Service Manager, administrators can create and use tasks to automate and simplify lengthy, complex, or repetitive processes. Operators typically use tasks to help troubleshoot user incidents. After creating a task, operators can run the task directly from the Service Manager console.

Important

In this release, to create a task, the logged-on user must have administrative credentials.

The Event Viewer task that you create will display logs from the computer that is identified as a configuration item in the incident. The help desk analyst can then select an incident in the Service Manager console and run this task for the computers that are related to the incident.

Using Tasks to Troubleshoot Problems Topics

- How to Create a Task

  Describes how to create a task.

- How to Run a Task from an Incident View

  Describes how to run a task from an incident view.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

How to Run a Task from an Incident View

Use the following procedure to run a task, such as the Ping task, from an Incident view in System Center 2012 – Service Manager.

To run a task from an Incident view

1. In the Service Manager console, click **Work Items**, and then select any Incident Management view. Select an incident in the view, and notice that in the **Tasks** pane, under **<Incident Name>**, the **Ping Related Computer** task appears.
2. In the **Tasks** pane, click the task to run it. For example, **Ping Related Computer**. If a computer is not associated with the incident, you must specify the name of the computer to run the task on. If more than one computer is associated with an incident, choose one computer to run the task on.
3. If the task logs actions into the action log, you can open the incident and view the action log to see the output that the task generated.
4. If the **Console Task Output - <Task Name>** box appears, verify the output generated by the task, and then click **Close**.

See Also

Using Service Manager Tasks to Troubleshoot Computer Problems

How to Create a Task

Use the following procedures in System Center 2012 – Service Manager to create a task—for example, a task that you can use to open Event Viewer and view logs on a computer—and then validate the new task. Event Viewer displays the logs from the remote computer that is listed as a Configuration Item in the incident.

To create a task

1. In the Service Manager console, click **Library**.
2. On the **Library** pane, expand **Library**, and then select **Tasks.**
3. On the **Tasks** pane, select **Create Task**.
4. On the **Before You Begin** page, click **Next**.
5. On the **General** page, do the following:
   a. In the **Task name** box, type a name for the task. For example, type **Event Viewer**.

      Note
      In this release, if you edit and change any of the properties of a task, you have to close and reopen the console before you can view the task.

   b. Next to the **Target class** area, click the ellipsis button (**…**).
   c. In the **Choose Class** dialog box, in the **Class** list, click **Incident**, and then click **OK**.
   d. In the **Management pack** list, make sure that **Service Manager Incident Management Configuration Library** is selected, and then click **Next**.

      Note
      In this release, if you select the option to create a new management pack, you have to close and reopen the console before you can view this task.
6. On the **Display Task by Category** page, select the category where the task will be displayed. For example, select **Incident Management Folder Tasks**, and then click **Next**.
7. On the **Command Line** page, do the following:
   a. In the **Full path to command** box, type the full path of the command you want to run with this task. For example, type **%windir%\system32\eventvwr.exe**.
   b. In the **Parameters** area, click **Insert Property**.
   c. In the **Select Property** dialog box, in the **Related classes** list, expand **Incident**, and then click **Is Related to Configuration Item**.
   d. In the **Available Properties** box, type **Computer Name**.
   e. Under **Windows Computer**, click **NetBIOS Computer Name**, and then click **Add**.
   f. Optionally, select **Log in action log when this task is run** to add information to the

incident action log when the task runs, and then click **Next**.

8. On the **Summary** page, click **Create**.
9. On the **Completion** page, observe that **The new task was created successfully** appears, and then click **Close**.

To validate a new task

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Work Items**, expand **Incident Management**, and then click **All Incidents**.
3. In the **All Incidents** pane, click an incident for which a computer name has been entered as a configuration item.
4. In the **Tasks** pane, under the name of the incident you selected in the previous step, click **Event Viewer**.
5. Notice that Event Viewer starts, and the events from the computer that are associated with the incident are displayed.

You can use the Get-SCSMTask Windows PowerShell command to view Service Manager tasks.

See Also

Using Service Manager Tasks to Troubleshoot Computer Problems

To Configure System Center 2012 - Service Manager CEIP Settings

During setup in System Center 2012 – Service Manager, on the **Help improve System Center** page, you have the option to participate in the Customer Experience Improvement Program (CEIP). For a Service Manager management server, you can use the first following procedure to let Service Manager participate in the program or remove Service Manager from this program. For either a data warehouse management server or Service Manager management server, you use the second following procedure to modify the registry to join or leave the Customer Experience Improvement Program.

To configure Service Manager CEIP settings using the Service Manager console

1. In the Service Manager console, in the toolbar, click **Help**.
2. In the **Help** menu, you can choose to either let Service Manager join the program or remove Service Manager from the program: Observe the entry **Join the Customer Experience Improvement Program**, and then do one of the following:
   - If a check mark is displayed, click **Join the Customer Experience Improvement Program** to remove Service Manager from the CEIP program.
   - If the check mark is not displayed, click **Join the Customer Experience**

Improvement Program to join the CEIP program, and then in the System Center Service Manager dialog box, click **Yes** to confirm your decision.

To configure CEIP settings using the registry

1. On the Service Manager management server or data warehouse server, open Registry Editor.
2. Create the following registry key if it does not already exist.

   HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\SQMClient\SCSM
3. Create the following DWORD (32-bit) Value if it does not already exist.

   CEIPEnable
4. Set the value to 1 to participate in the CEIP or set the value to 0 to leave the CEIP.

See Also

Administering System Center 2012 - Service Manager

Appendix A - List of User Role Profiles in System Center 2012 - Service Manager

This appendix provides detailed information about the scope and properties of user role profiles in System Center 2012 – Service Manager.

EndUser

Operation	Instance Type Scope	Properties	Relationships	Presentational Elements Scope
Read	All	All	All	Object Templates
Create	• Work Item • Work Item Log • File Attachment • Reviewer • User	All for the specified types.	All for the specified types.	None

Operation	Instance Type Scope	Properties	Relationships	Presentational Elements Scope
	Preference			
Update	• File Attachment • Work Item Log • Star Rating	All for the specified types.	• DocumentHasAverageRating->KnowledgeArticle • UserHasPreference->User • WorkItemAffectedUser->User • WorkItemAssignedToUser->User • WorkItemCreatedByUser->User • FileAttachmentAddedByUser->User • BillableTimeHasWorkingUser->User • IncidentPrimaryOwner->User • TroubleTicketResolvedByUser->User • TroubleTicketClosedByUser->User • ReviewerIsUser->User • ReviewerVotedByUser->User • WorkItemRelatesToWorkItem->WorkItem • WorkItemRelatesToRequestOffering->RequestOffering • WorkItemRelatesToConfigItem->ConfigurationItem • WorkItemAboutConfigItem->ConfigurationItem	None
Delete	None	None	None	None

ReadOnlyOperator

Operation	Instance Type Scope	Properties	Relationships	Presentational Elements Scope
Read	All	All	All	All
Create	• User Preferen	All for the specified	All for the specified types.	None

Operation	Instance Type Scope	Properties	Relationships	Presentational Elements Scope
	ce • Personal Notification	types.		
Update			• WorkItemAboutConfigItem->ConfigurationItem • WorkItemRelatesToConfigItem->ConfigurationItem • EntityLinksToKnowledgeDocument->ConfigurationItem • UserHasPreference->User • WorkItemAffectedUser->User • WorkItemAssignedToUser->User • WorkItemCreatedByUser->User • FileAttachmentAddedByUser->User • BillableTimeHasWorkingUser->User • IncidentPrimaryOwner->User • TroubleTicketResolvedByUser->User • TroubleTicketClosedByUser->User • ReviewerIsUser->User • ReviewerVotedByUser->User • WorkItemRelatesToRequestOffering->RequestOffering • WorkItemRelatesToWorkItem->WorkItem	None
Delete	None	None	None	None

IncidentResolver

Operation	Instance Type Scope	Properties	Relationships	Presentational Elements Scope
Read	All	All	All	All
Create	• Incident • Manual Activity • File Attachment • Work Item Log • User Preference • Personal Notification	All for the specified types.	All for the specified types.	None
Update	• File Attachment • Work Item Log • Manual Activity • Star Rating	All for the specified types.	• WorkItemAboutConfigItem->ConfigurationItem • WorkItemRelatesToConfigItem->ConfigurationItem • EntityLinksToKnowledgeDocument->ConfigurationItem • WorkItemRelatesToWorkItem->WorkItem • DocumentHasAverageRating->KnowledgeArticle • UserHasPreference->User • WorkItemAffectedUser->User • WorkItemAssignedToUser->User • WorkItemCreatedByUser->User • FileAttachmentAddedByUser->User • WorkItem.BillableTimeHasWorkingUser->User	None

Operation	Instance Type Scope	Properties	Relationships	Presentational Elements Scope
			• WorkItem.IncidentPrimaryOwner->User • WorkItem.TroubleTicketResolvedByUser->User • WorkItem.TroubleTicketClosedByUser->User • ReviewerIsUser->User • ReviewerVotedByUser->User	
Delete	• File Attachment • Manual Activity	All for the specified types.	All for the specified types.	None

ChangeInitiator

Operation	Instance Type Scope	Properties	Relationships	Presentational Elements Scope
Read	All	All	All	All
Create	• Change Request • Activity • File Attachment • Work Item Log • Reviewer • User Preference • Personal Notification	All for the specified types.	All for the specified types.	None

Operation	Instance Type Scope	Properties	Relationships	Presentational Elements Scope
Update	Star Rating	All for the specified types.	• WorkItemAboutConfigItem->ConfigurationItem • WorkItemRelatesToConfigItem->ConfigurationItem • EntityLinksToKnowledgeDocument->ConfigurationItem • WorkItemRelatesToWorkItem->WorkItem • DocumentHasAverageRating->KnowledgeArticle • UserHasPreference->User • WorkItemAffectedUser->User • WorkItemAssignedToUser->User • WorkItemCreatedByUser->User • FileAttachmentAddedByUser->User • BillableTimeHasWorkingUser->User • IncidentPrimaryOwner->User • TroubleTicketResolvedByUser->User • TroubleTicketClosedByUser->User • ReviewerIsUser->User • ReviewerVotedByUser->User • WorkItemAboutCatalogItem->CatalogItem	None
Delete	None	None	None	None

ActivityImplementer

Operation	Instance Type Scope	Properties	Relationships	Presentational Elements Scope
Read	All	All	All	All

Operation	Instance Type Scope	Properties	Relationships	Presentational Elements Scope
Create	• User Preference • Personal Notification	All for the specified types.	All for the specified types.	None
Update	Star Rating	• ManualActivity.Status • ManualActivity.Notes	• WorkItemAboutConfigItem->ConfigurationItem • WorkItemRelatesToConfigItem->ConfigurationItem • EntityLinksToKnowledgeDocument->ConfigurationItem • WorkItemRelatesToWorkItem->WorkItem • DocumentHasAverageRating->KnowledgeArticle • UserHasPreference->User • WorkItemAffectedUser->User • WorkItemAssignedToUser->User • WorkItemCreatedByUser->User • FileAttachmentAddedByUser->User • BillableTimeHasWorkingUser->User • IncidentPrimaryOwner->User • TroubleTicketResolvedByUser->User • TroubleTicketClosedByUser->User • ReviewerIsUser->User • ReviewerVotedByUser->User	None

Operation	Instance Type Scope	Properties	Relationships	Presentational Elements Scope
Delete	None	None	None	None

ProblemAnalyst

Operation	Instance Type Scope	Properties	Relationships	Presentational Elements Scope
Read	All	All	All	All
Create	• Problem • File Attachment • Work Item Log • User Preference • Personal Notification	All for the specified types.	All for the specified types.	None
Update	• Problem • File Attachment • Work Item Log • Star Rating	All for the specified types.	• WorkItemAboutConfigItem->ConfigurationItem • WorkItemRelatesToConfigItem->ConfigurationItem • EntityLinksToKnowledgeDocument->ConfigurationItem • WorkItemRelatesToWorkItem->WorkItem • DocumentHasAverageRating->KnowledgeArticle • UserHasPreference->User • WorkItemAffectedUser->User • WorkItemAssignedToUser->User • WorkItemCreatedByUser->User • FileAttachmentAddedByUser-	None

Operation	Instance Type Scope	Properties	Relationships	Presentational Elements Scope
			>User • BillableTimeHasWorkingUser->User • IncidentPrimaryOwner->User • TroubleTicketResolvedByUser->User • TroubleTicketClosedByUser->User • ReviewerIsUser->User • ReviewerVotedByUser->User	
Delete	File Attachment	All for the specified types.	All for the specified types.	None

ServiceRequestAnalyst

Operation	Instance Type Scope	Properties	Relationships	Presentational Elements Scope
Read	All	All	All	All
Create	All for the specified types.	All for the specified types.	All for the specified types.	None
Update	• Service Request • Activity • File Attachment • Work Item Log • Reviewer		• WorkItemAboutConfigItem->ConfigurationItem • WorkItemRelatesToConfigItem->ConfigurationItem • EntityLinksToKnowledgeDocument->ConfigurationItem • WorkItemRelatesToWorkItem->WorkItem • Knowledge.DocumentHasAverageRating->KnowledgeArticle • WorkItemAffectedUser->User • UserHasPreference->User	None

Operation	Instance Type Scope	Properties	Relationships	Presentational Elements Scope
	• Star Rating		• WorkItemAssignedToUser->User • WorkItemCreatedByUser->User • FileAttachmentAddedByUser->User • ReviewerIsUser->User • ReviewerVotedByUser->User • WorkItemRelatesToRequestOffering->RequestOffering	
Delete	• Activity • File Attachment • Reviewer	All for the specified types.	All for the specified types.	None

ReleaseManager

Operation	Instance Type Scope	Properties	Relationships	Presentational Elements Scope
Read	All	All	All	All
Create	• Release Record • Activity • File Attachment • Work Item Log • Reviewer • User Preference • Personal Notification	All for the specified types.	All for the specified types.	None

Operation	Instance Type Scope	Properties	Relationships	Presentational Elements Scope
Update	• Release Record • Activity • File Attachment • Work Item Log • Reviewer • Star Rating	All for the specified types.	• WorkItemAboutConfigItem->ConfigurationItem • WorkItemRelatesToConfigItem->ConfigurationItem • EntityLinksToKnowledgeDocument->ConfigurationItem • WorkItemRelatesToWorkItem->WorkItem • DocumentHasAverageRating->KnowledgeArticle • WorkItemAffectedUser->User • UserHasPreference->User • WorkItemAssignedToUser->User • WorkItemCreatedByUser->User • FileAttachmentAddedByUser->User • ReviewerIsUser->User • ReviewerVotedByUser->User	None
Delete	• Activity • File Attachment • Reviewer	All for the specified types.	All for the specified types.	None

ChangeManager

Operation	Instance Type Scope	Properties	Relationships	Presentational Elements Scope
Read	All	All	All	All
Create	• Change Request • Activity	All for the specified types.	All for the specified types.	None

Operation	Instance Type Scope	Properties	Relationships	Presentational Elements Scope
	• File Attachment • Work Item Log • Reviewer • User Preference • Personal Notification			
Update	• Change Request • Change Request • Activity • File Attachment • Work Item Log • Reviewer • Star Rating	All for the specified types.	• WorkItemAboutConfigItem->ConfigurationItem • WorkItemRelatesToConfigItem->ConfigurationItem • EntityLinksToKnowledgeDocument->ConfigurationItem • WorkItemRelatesToWorkItem->WorkItem • Knowledge.DocumentHasAverageRating->KnowledgeArticle • WorkItemAffectedUser->User • UserHasPreference->User • WorkItemAssignedToUser->User • WorkItemCreatedByUser->User • FileAttachmentAddedByUser->User • WorkItem.BillableTimeHasWorkingUser->User • WorkItem.IncidentPrimaryOwner->User •	None

Operation	Instance Type Scope	Properties	Relationships	Presentational Elements Scope
			WorkItem.TroubleTicketResolvedByUser->User • WorkItem.TroubleTicketClosedByUser->User • ReviewerIsUser->User • ReviewerVotedByUser->User • WorkItemAboutCatalogItem ->CatalogItem	
Delete	• Activity • File Attachment • Reviewer	All for the specified types.	All for the specified types.	None

AdvancedOperator

Operation	Instance Type Scope	Properties	Relationships	Presentational Elements Scope
Read	All	All	All	All
Create	• Work Item • Configuration Item • Announcement • File Attachment • Work Item Log • Reviewer • User Preference	All for the specified types.	All for the specified types.	None

Operation	Instance Type Scope	Properties	Relationships	Presentational Elements Scope
	• Personal Notification			
Update	• Work Item • Configuration Item • Announcement • File Attachment • Work Item Log • Reviewer • User Preference	All for the specified types.	• Knowledge.DocumentHasAverageRating->KnowledgeArticle • UserHasPreference->User • WorkItemAffectedUser->User • WorkItemAssignedToUser->User • WorkItemCreatedByUser->User • FileAttachmentAddedByUser->User • BillableTimeHasWorkingUser->User • IncidentPrimaryOwner->User • TroubleTicketResolvedByUser->User • TroubleTicketClosedByUser->User • ReviewerIsUser->User • ReviewerVotedByUser->User • WorkItemRelatesToRequestOffering->RequestOffering	None
Delete	• Announcement • Activity • Reviewer • File Attachment	All for the specified types.	All for the specified types.	None

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Operation	Instance Type Scope	Properties	Relationships	Presentational Elements Scope
Read	All	All	All	All
Create	• Work Item • Configu	All for the specified	All for the specified types.	• Template • View

Operation	Instance Type Scope	Properties	Relationships	Presentational Elements Scope
	ration Item • Catalog Item • Announcement • File Attachment • Work Item Log • Reviewer • User Preference • Personal Notification	types.		• Folder • Enumeration
Update	• Work Item • Configuration Item • Catalog Item • Announcement • File Attachment • Work Item Log • Reviewer • Star Rating		• DocumentHasAverageRating->KnowledgeArticle • UserHasPreference->User • WorkItemAffectedUser->User • WorkItemAssignedToUser->User • WorkItemCreatedByUser->User • FileAttachmentAddedByUser->User • BillableTimeHasWorkingUser->User • IncidentPrimaryOwner->User • TroubleTicketResolvedByUser->User • TroubleTicketClosedByUser->User • ReviewerIsUser->User • ReviewerVotedByUser->User • ServiceOfferingRelatesToRequestOffering->RequestOffering	• Template • View • Folder • Enumeration
Delete	• Activity • Reviewer • File Attachment • Announ	All for the specified types.	All for the specified types.	• Template • View • Folder • Enum

Operation	Instance Type Scope	Properties	Relationships	Presentational Elements Scope
	cement			eration

Workflow

Operation	Instance Type Scope	Properties	Relationships	Presentational Elements Scope
Read	All	All	All	All
Create	• Work Item • Configuration Item • Announcement • File Attachment • Work Item Log • Reviewer • SLA Information • Admin Item SLA • User Preference	All for the specified types.	All for the specified types.	None
Update	• Work Item • Configuration Item • Announcement • File Attachment • Work Item Log • Reviewer • SLA Information • Admin Item SLA • Star Rating	• System.Knowledge.DocumentHasAverageRating • System.UserHasPreference • System.WorkItemAffectedUser • System.WorkItemAssignedToUser • System.WorkItemCreatedByUser • System.FileAttachmentAddedByUser • System.WorkItem.BillableTimeHasWorkingUser	None	

Operation	Instance Type Scope	Properties	Relationships	Presentational Elements Scope
		• System.WorkItem.IncidentPrimaryOwner • System.WorkItem.TroubleTicketResolvedByUser • System.WorkItem.TroubleTicketClosedByUser • System.ReviewerIsUser • System.ReviewerVotedByUser		
Delete	DCM_NonCompliance_CI	All for the specified types.	All for the specified types.	None

ReportUser

Operation	Instance Type Scope	Properties	Relationships	Presentational Elements Scope
Read	SRS Resource Store	All for the specified type	All for the specified type	None
Create	Personal Notification	All for the specified type	All for the specified type	None
Update	None	None	None	None
Delete	None	None	None	None

ImpliedIncidentAffectedUser

The permissions for the implied Affected User profile are granted through the WorkItemAffectedUser relationship.

Operation	Type	Property	Relationship
Read	Incident or service	All properties of an	All relationships that include the

Operation	Type	Property	Relationship
	request instances, and anything that is contained within.	incident instance.	incident or service request instance.
Create	Work items that the user is affected by: • Work item log • File attachment	All properties of a work item log and a file attachment for the incident or service request instance.	File attachment for an incident or service request instance.
Update	Work items that the user is affected by: • Incident • Service request • Work item log • File attachment	All properties of an incident or service request instance.	Incident instance BillableTimeHasWorkingUser->User.
Delete	Work item that the user is affected by - File attachment	File attachment for an incident or service request instance.	File attachment for an incident or service request instance.

ImpliedReviewer

The permissions for the implied Review Activity Reviewer profile are granted through the ReviewerIsUser relationship.

Operation	Type	Property	Relationship
Read	Reviewer instances and anything that is contained within.	All properties of a Reviewer instances and anything that is contained within.	All relationships that include the Reviewer instance, and anything that is contained within.
Create	None	None	None
Update	None	Reviewer instances: • Reviewer.Comments • Reviewer.DecisionDate • Reviewer.Decision	Reviewer Instances: • ReviewerVotedByUser->User • ReviewerVotedByUser-

Operation	Type	Property	Relationship
			>Reviewer
Delete	None	None	None

ImpliedActivityEditor

The permissions for the implied Assigned To User profile are granted through the WorkItemAssignedToUser relationship.

Operation	Type	Property	Relationship
Read	Activity instances and anything that is contained in it.	None	None
Create	Work item instances that the user is assigned to: • Activity • Reviewer	All properties of Activity and Reviewer instances that are related to a work item instance.	All the Activity and Reviewer instances that are related to a work item Instance.
Update	Work item instances that the user is assigned to: Activity	All properties of an activity and the work item instances.	All Activity instances that are related to the work item Instance.
Delete	None	None	None

ImpliedConfigItemCustodian

The permissions for the implied **CI Owner** profile are granted through the **ConfigItemOwnedByUser** relationship.

Operation	Type	Property	Relationship
Read	Configuration item instances and anything that is contained within.	All properties of a configuration item instance and anything that is contained in it.	All relationships that include a configuration item instance, and anything that is contained in it.
Create	None	None	None
Update	None	None	Configuration item Instance - WorkItemAboutConfigItem

Operation	Type	Property	Relationship
Delete	None	None	None

ImpliedPrimaryComputerUser

The permissions for the implied CI Primary User profile are granted through the ComputerPrimaryUser relationship.

Operation	Type	Property	Relationship
Read	Configuration item instances and anything that is contained within.	All properties of a configuration item instance and anything that is contained within.	All relationships that include the configuration item instance and anything that is contained within.
Create	None	None	None
Update	None	None	None
Delete	None	None	None

Appendix B - Mapping Active Directory Domain Services Attributes to Properties in System Center 2012 - Service Manager

Using an Active Directory connector, System Center 2012 – Service Manager synchronizes data with the User, Group, Computer, and Printer Active Directory Domain Services (AD DS) objects. The following tables describe the mapping between the attributes of the Active Directory objects and the corresponding Service Manager class properties.

User/Microsoft.AD.User

The following table describes the mapping between the attributes of the Active Directory User object and the Service Manager **Microsoft.AD.User** class properties.

Active Directory user attribute	Microsoft.AD.User property
physicaldeliveryofficename	Office
displayname	displayname

Active Directory user attribute	Microsoft.AD.User property
company	Company
employeeid	Employeeid
department	Department
telephonenumber	BusinessPhone
homePhone	HomePhone
facsimileTelephoneNumber	Fax
mobile	Mobile
pager	Pager
mail	Email
givenname	FirstName
initials	Initials
sn	LastName
distinguishedname	Distinguishedname
title	Title
manager	manager
samaccountname	UserName
l	City
StreetAddress	StreetAddress
st	State
postalCode	Zip
co	Country
localeID	Locale
msRTCSIP-PrimaryUserAddress	SipAddress
objectSid	SID
Domain	Domain

Group/Microsoft.AD.UserBase

The following table describes the mapping between the attributes of the Active Directory Group object and the Service Manager **Microsoft.AD.UserBase** class properties.

Active Directory group attribute	Microsoft.AD.UserBase property
displayname	displayname
mail	Email
distinguishedname	Distinguishedname
samaccountname	samaccountname
objectSid	SID
Domain	Domain

Printer/Microsoft.AD.Printer

The following table describes the mapping between the attributes of the Active Directory PrintQueue object and the Service Manager **Microsoft.AD.Printer** class properties.

Active Directory printer attribute	Microsoft.AD.Printer property
uNCName	uNCName
serverName	serverName
shortServerName	shortServerName
printerName	printerName
printNetworkAddress	printNetworkAddress
printShareName	printShareName
isDeleted	isDeleted
driverName	driverName
driverVersion	driverVersion
printMemory	printMemory
printCollate	printCollate
printOwner	printOwner
assetNumber	assetNumber
managedBy	managedBy

Active Directory printer attribute	Microsoft.AD.Printer property
printDuplexSupported	printDuplexSupported
printColor	printColor
printStaplingSupported	printStaplingSupported
versionNumber	versionNumber
url	url
printMediaSupported	printMediaSupported
printRateUnit	printRateUnit
printMaxXExtent	printMaxXExtent
printKeepPrintedJobs	printKeepPrintedJobs
printRate	printRate
printMediaReady	printMediaReady
printPagesPerMinute	printPagesPerMinute
printMaxResolutionSupported	printMaxResolutionSupported
printMACAddress	printBinNames
printMACAddress	printMACAddress
portName	portName
physicalLocationObject	physicalLocationObject
keywords	keywords
printNotify	printNotify
wWWHomePage	wWWHomePage
whenChanged	whenChanged
modifyTimeStamp	modifyTimeStamp
location	location
canonicalName	canonicalName
displayname	displayname
cn	Fullname
distinguishedname	Distinguishedname
description	description

Computer/Microsoft.Windows.Computer

The following table describes the mapping between the attributes of the Active Directory Computer object and the Service Manager **Microsoft.Windows.Computer** class properties.

Active Directory computer attribute	Microsoft.Windows.Computer property
msDS-SiteName	ActiveDirectorySite
dNSHostName	DNSName
ipHostNumber	IPAddress
networkAddress	NetworkName
msDS-PrincipalName	PrincipalName
displayname	displayname
samaccountname	NetbiosComputerName
objectSid	ActiveDirectoryObjectSid
ou	OrganizationalUnit
Domain	NetbiosDomainName

Appendix C - Mapping System Center 2012 - Service Manager Properties to Configuration Manager Database Views

The hardware inventory feature in Configuration Manager gathers information about computers in the organization. In Service Manager, by using a Configuration Manager Connector, you can import that hardware inventory data from Configuration Manager. The tables in this appendix describe the mapping between Service Manager properties and column names of Configuration Manager 2007 database views.

Microsoft.SystemCenter.ConfigurationManager.DeployedComputer

The following table describes the mapping for the **Microsoft.SystemCenter.ConfigurationManager.DeployedComputer** type.

Service Manager type	Service Manager property	Column name of Configuration Manager database views
System.Entity	DisplayName	SCCM.Ext.vex_GS_COMPUTER_SYSTEM.Name0
Microsoft.SystemCenter.ConfigurationManager.DeployedComputer	HardwareID [Key]	SCCM.Ext.vex_R_System.Hardware_ID0
	SMBIOS_UUID	SCCM.Ext.vex_R_System.SMBIOS_GUID0
	SMBIOSAssetTag	SCCM.Ext.vex_GS_SYSTEM_ENCLOSURE.SMBIOSAssetTag0
	Manufacturer	SCCM.Ext.vex_GS_SYSTEM_ENCLOSURE.Manufacturer0
	Model	SCCM.Ext.vex_GS_COMPUTER_SYSTEM.Model0
	NumberOfProcessors	SCCM.Ext.vex_GS_COMPUTER_SYSTEM.NumberOfProcessors0
	SystemType	SCCM.Ext.vex_GS_COMPUTER_SYSTEM.SystemType0
	ChassisType	SCCM.Ext.vex_GS_SYSTEM_ENCLOSURE.ChassisTypes0
	SerialNumber	If SCCM.Ext.vex_GS_SYSTEM_ENCLOSURE.SerialNumber0 is NULL, '00000000' or 'Not Available', then SCCM.Ext.vex_GS_PC_BIOS.SerialNumber0, else SCCM.Ext.vex_GS_SYSTEM_ENCLOSURE.SerialNumber0

Microsoft.Windows.Computer

The following table describes the mappings for the **Microsoft.Windows.Computer** type.

Service Manager type	Service Manager property	Column name of Configuration Manager database views
System.Entity	DisplayName	SCCM.Ext.vex_GS_COMPUTER_SYSTEM.

Service Manager type	Service Manager property	Column name of Configuration Manager database views
		Name0
Microsoft.Windows.Computer	PrincipalName (FQDN) [Key]	Constructed using SCCM.Ext.vex_GS_COMPUTER_SYSTEM.Name0 or SCCM.Ext.vex_R_System.Netbios_Name0 and SCCM.Ext.vex_GS_COMPUTER_SYSTEM.Domain0 or SCCM.Ext.vex_R_System.Resource_Domain_OR_Workgr0. If SCCM.Ext.vex_GS_COMPUTER_SYSTEM.Name0 is null, SCCM.Ext.vex_R_System.Netbios_Name0 is used as name. If SCCM.Ext.vex_GS_COMPUTER_SYSTEM.Domain0 is null, SCCM.Ext.vex_R_System.Resource_Domain_OR_Workgr0 is used as domain.
	NetbiosComputerName	SCCM.Ext.vex_R_System.Netbios_Name0
	NetbiosDomainName	SCCM.Ext.vex_R_System.Resource_Domain_OR_Workgr0
	OffsetInMinuteFromGreenwichTime	SCCM.Ext.vex_GS_Computer_System.CurrentTimeZone0
	IsVirtualMachine	SCCM.Ext.vex_GS_Computer_System.Model0, vex_GS_Manufacturer, that is, Model0 = "Virtual Machine" or "VMware Virtual Platform" OR Manufacturer="Microsoft Corporation" or "VMware, Inc"
	ActiveDirectorySite	SCCM.Ext.vex_R_System.AD_Site_Name0
	LastInventoryDate	SCCM.Ext.Vex_GS_Workstation_Status.LastHWScan

Microsoft.Windows.OperatingSystem

The following table describes the mappings for the **Microsoft.Windows.OperatingSystem** type.

Service Manager type	Service Manager property	Column name of Configuration Manager database views
System.Entity	DisplayName	SCCM.Ext.vex_GS_OPERATING_SYSTEM.Caption0
Microsoft.Windows.OperatingSystem	OSVersion	SCCM.Ext.vex_GS_OPERATING_SYSTEM.Version0
	BuildNumber	SCCM.Ext.vex_GS_OPERATING_SYSTEM.BuildNumber0
	CSDVersion	SCCM.Ext.vex_GS_OPERATING_SYSTEM.CSDVersion0
	InstallDate	SCCM.Ext.vex_GS_OPERATING_SYSTEM.InstallDate0
	SystemDrive	SCCM.Ext.vex_GS_OPERATING_SYSTEM.SystemDirectory0
	WindowsDirectory	SCCM.Ext.vex_GS_OPERATING_SYSTEM.WindowsDirectory0
	PhysicalMemory	SCCM.Ext.vex_GS_OPERATING_SYSTEM.TotalVisibleMemorySize0
	LogicalProcessors	SCCM.Ext.vex_GS_COMPUTER_SYSTEM.NmberOfProcessors0
	CountryCode	SCCM.Ext.vex_GS_OPERATING_SYSTEM.CountryCode0
	Locale	SCCM.Ext.vex_GS_OPERATING_SYSTEM.Locale0
	Manufacturer	SCCM.Ext.vex_GS_OPERATING_SYSTEM.Manufacturer0
	OSLanguage	SCCM.Ext.vex_GS_OPERATING_SYSTEM.OSLanguage0
	MinorVersion	SCCM.Ext.vex_GS_OPERATING_SYSTEM.Version0
	MajorVersion	SCCM.Ext.vex_GS_OPERATING_SYSTEM.Version0

Microsoft.Windows.Peripherals.LogicalDisk

The following table describes the mappings for the **Microsoft.Windows.Peripherals.LogicalDisk** type.

Service Manager type	Service Manager property	Column name of Configuration Manager database views
System.Entity	DisplayName	SCCM.Ext.vex_GS_LOGICAL_DISK.Name0
Microsoft.Windows.LogicalDevice	DeviceID [Key]	SCCM.Ext.vex_GS_LOGICAL_DISK.DeviceID0
	Name	SCCM.Ext.vex_GS_LOGICAL_DISK.Name0
	Description	SCCM.Ext.vex.GS_LOGICAL_DISK.Description0
Microsoft.Windows.LogicalDisk	VolumeName	SCCM.Ext.vex_GS_LOGICAL_DISK.VolumeName0
Microsoft.Windows.Peripherals.LogicalDisk	FileSystem	SCCM.Ext.vex_GS_LOGICAL_DISK.FileSystem0
	Compressed	SCCM.Ext.vex_GS_LOGICAL_DISK.Compressed0
	Size	SCCM.Ext.vex_GS_LOGICAL_DISK.Size0
	DriveType	SCCM.Ext.vex_GS_LOGICAL_DISK.DriveType0
	FreeSpace	SCCM.Ext.vex_GS_LOGICAL_DISK.FreeSpace0

Microsoft.Windows.Peripherals.PhysicalDisk

The following table describes the mappings for the **Microsoft.Windows.Peripherals.PhysicalDisk** type.

Service Manager type	Service Manager property	Column name of Configuration Manager database views
System.Entity	DisplayName	SCCM.Ext.vex_GS_DISK.Name0
Microsoft.Windows.LogicalDevice	DeviceID [Key]	SCCM.Ext.vex_GS_DISK.DeviceID0

Service Manager type	Service Manager property	Column name of Configuration Manager database views
	Name	SCCM.Ext.vex_GS_DISK.Name0
	Description	SCCM.Ext.vex.GS_DISK.Description0
Microsoft.Windows.PhysicalDisk	MediaType	SCCM.Ext.vex.GS_DISK.MediaType0
	PNPDeviceID	SCCM.Ext.vex.GS_DISK.PNPDeviceID0
Microsoft.Windows.Peripherals.PhysicalDisk	Caption	SCCM.Ext.vex.GS_DISK.Description0
	Index	SCCM.Ext.vex.GS_DISK.Index0
	InterfaceType	SCCM.Ext.vex.GS_DISK.InterfaceType0
	Manufacturer	SCCM.Ext.vex.GS_DISK.Manufacturer0
	Model	SCCM.Ext.vex.GS_DISK.Model0
	SCSIBus	SCCM.Ext.vex.GS_DISK.SCSIBus0
	SCSILogicalUnit	SCCM.Ext.vex.GS_DISK.SCSILogicalUnit0
	SCSIPort	SCCM.Ext.vex.GS_DISK.SCSIPort0
	SCSITargetID	SCCM.Ext.vex.GS_DISK.TargetId0
	Size	SCCM.Ext.vex.GS_DISK.Size0
	TotalCylinders	SCCM.Ext.vex.GS_DISK.TotalCylinders0
	TotalHeads	SCCM.Ext.Vex.GS_DISK.TotalHeads0
	TotalSectors	SCCM.Ext.vex.GS_DISK.TotalSectors0
	TotalTracks	SCCM.Ext.vex.GS_DISK.TotalTracks0
	TracksPerCylinder	SCCM.Ext.vex.GS_DISK.TracksPerCylinder0

Microsoft.Windows.Peripherals.Processor

The following table describes the mappings for the **Microsoft.Windows.Peripherals.Processor** type.

Service Manager type	Service Manager property	Column name of Configuration Manager database views
System.Entity	DisplayName	SCCM.Ext.vex_GS_PROCESSOR.Name0
Microsoft.Windows.LogicalDevice	DeviceID [Key]	SCCM.Ext.vex_GS_PROCESSOR.DeviceID0
	Name	SCCM.Ext.vex_GS_PROCESSOR.Name0
	Description	SCCM.Ext.vex.GS_PROCESSOR.Name0
Microsoft.Windows.Processor	Family	SCCM.Ext.vex.GS_PROCESSOR.Family0
	MaxClockSpeed	SCCM.Ext.vex.GS_PROCESSOR.MaxClockSpeed0
	Type	SCCM.Ext.vex.GS_PROCESSOR.ProcessorType0
	BrandID	SCCM.Ext.vex.GS_PROCESSOR.BrandID0
	PCache	SCCM.Ext.vex.GS_PROCESSOR.PCache0
	CPUKey	SCCM.Ext.vex.GS_PROCESSOR.CPUKey0
	IsMobile (bool)	SCCM.Ext.vex.GS_PROCESSOR.IsMobile0
	IsMultiCore (bool)	SCCM.Ext.vex.GS_PROCESSOR.IsMulticore0
Microsoft.Windows.Peripherals.Processor	Manufacturer	SCCM.Ext.vex.GS_PROCESSOR.Manufacturer0
	Speed	SCCM.Ext.vex.GS_PROCESSOR.NormSpeed0
	DataWidth	SCCM.Ext.vex.GS_PROCESSOR.DataWidth0
	Revision	SCCM.Ext.vex.GS_PROCESSOR.Revision0
	Version	SCCM.Ext.vex.GS_PROCESSOR.Version0

Microsoft.Windows.Peripherals.NetworkAdapter

The following table describes the mappings for the **Microsoft.Windows.Peripherals.NetworkAdapter** type.

Service Manager type	Service Manager property	Column name of Configuration Manager Database Views
System.Entity	DisplayName	SCCM.Ext.vex_GS_NETWORK_ADAPTER.Name0
Microsoft.Windows.LogicalDevice	DeviceID [Key]	SCCM.Ext.vex_GS_NETWORK_ADAPTER.DeviceID0
	Name	SCCM.Ext.vex_GS_NETWORK_ADAPTER.Name0
	Description	SCCM.Ext.vex.GS_NETWORK_ADAPTER.Description0
Microsoft.Windows.NetworkAdapter	Bandwidth	SCCM.Ext.vex.GS_NETWORK_ADAPTER.Speed0
	MaxSpeed (int)	SCCM.Ext.vex.GS_NETWORK_ADAPTER.MaxSpeed0
	ProductName	SCCM.Ext.vex.GS_NETWORK_ADAPTER.ProductName0
	DefaultIPGateway	SCCM.Ext.vex.GS_NETWORK_ADAPTER_CONFIGUR.DefaultIPGateway0
	DHCPHostName	SCCM.Ext.vex.GS_NETWORK_ADAPTER_CONFIGUR.DHCPServer
	IPEnabled	SCCM.Ext.vex.GS_NETWORK_ADAPTER_CONFIGUR.IPEnabled0
Microsoft.Windows.Peripherals.NetworkAdapter	AdapterType	SCCM.Ext.vex.GS_NETWORK_ADAPTER.AdapterType0
	Index	SCCM.Ext.vex.GS_NETWORK_ADAPTER_CONFIGUR.Index0
	Manufacturer	SCCM.Ext.vex.GS_NETWORK_ADAPTER.Manufacturer0
	MACAddress	SCCM.Ext.vex.GS_NETWORK_ADAPTER.MACAddress0

Service Manager type	Service Manager property	Column name of Configuration Manager Database Views
	ServiceName	SCCM.Ext.vex.GS_NETWORK_ADAPTER.ServiceName0
	DHCPEnabled	SCCM.Ext.vex.GS_NETWORK_ADAPTER_CONFIGUR.DHCPEnabled0
	DHCPServer	SCCM.Ext.vex.GS_NETWORK_ADAPTER_CONFIGUR.DHCPServer0
	DNSDomain	SCCM.Ext.vex.GS_NETWORK_ADAPTER_CONFIGUR.DNSDomain0
	IPAddress	SCCM.Ext.vex.GS_NETWORK_ADAPTER_CONFIGUR.IPAddress0
	IPSubnet	SCCM.Ext.vex.GS_NETWORK_ADAPTER_CONFIGUR.IPSubnet0

System.DeviceHasSoftwareItemInstalled

The following table describes the mappings for the **System.DeviceHasSoftwareItemInstalled** type.

Service Manager type	Service Manager property	Column name of Configuration Manager database views
System.Entity	DisplayName	SCCM.Ext.vex_GS_INSTALLED_SOFTWARE.ProductName0
System.SoftwareItem	ProductName [Key]	SCCM.Ext.vex_GS_INSTALLED_SOFTWARE.ProductName0
	Publisher [Key]	SCCM.Ext.vex_GS_INSTALLED_SOFTWARE.Publisher0
	VersionString [Key]	SCCM.Ext.vex_GS_INSTALLED_SOFTWARE.ProductVersion0
	MajorVersion	SCCM.Ext.vex_GS_INSTALLED_SOFTWARE.VersionMajor0
	MinorVersion	SCCM.Ext.vex_GS_INSTALLED_SOFTWARE.VersionMinor0

Service Manager type	Service Manager property	Column name of Configuration Manager database views
	LocaleID	SCCM.Ext.vex_GS_INSTALLED_SOFTWARE.Language0
System.DeviceHasSoftwareItemInstalled	InstalledDate	SCCM.Ext.vex_GS_INSTALLED_SOFTWARE.InstalledDate0
	InstalledPath	SCCM.Ext.vex_GS_INSTALLED_SOFTWARE.InstalledLocation0
	SerialNumber	SCCM.Ext.vex_GS_INSTALLED_SOFTWARE.ProductID0
	IsVirtualApplication	SCCM.Ext.Vex_GS_INSTALLED_SOFTWARE.InstallType

System.DeviceHasSoftwareUpdateInstalled

The following table describes the mappings for the **System.DeviceHasSoftwareUpdateInstalled** type.

Service Manager type	Service Manager property	Column name of Configuration Manager database views
System.SoftwareUpdate	Vendor [Key]	SCCM.Ext.vex_LocalizedCategoryInstances.CategoryInstanceName
	Title [Key]	SCCM.Ext.vex_LocalizedCIProperties.DisplayName
Microsoft.Windows.SoftwareUpdate	ArticleID	SCCM.Ext.vex_UpdateCIs.ArticleID
	BulletinID	SCCM.Ext.vex_UpdateCIs.BulletinID
	SupportString	SCCM.Ext.vex_LocalizedCIProperties.CIInformativeURL
	Classification	SCCM.Ext.vex_LocalizedCategoryInstances.CategoryInstanceName
System.DeviceHasSoftwareUpdateInstalled	InstallStatus	SCCM.Ext.vex_UpdateComplianceStatus.Status

Microsoft.SystemCenter.ConfigurationManager.DCM_CI

The following table describes the mappings for the **Microsoft.SystemCenter.ConfigurationManager.DCM_CI** type.

Service Manager type	Service Manager property	Column name of Configuration Manager database views
Microsoft.SystemCenter.ConfigurationManager.DCM_CI	DisplayName	SCCM.Ext.vex_LocalizedCIProperties.DisplayName
	UniqueID [Key]	SCCM.Ext.vex_ConfigurationItems.CI_UniqueID
	Description	SCCM.Ext.vex_LocalizedCIProperties.Description
	IsBaseline	SCCM.Ext.vex_ConfigurationItems.CIType_ID

Microsoft.SystemCenter.ConfigurationManager.DCM_NoncompliantCI

The following table describes the mappings for the **Microsoft.SystemCenter.ConfigurationManager.DCM_NoncompliantCI** type.

Service Manager type	Service Manager property	Column name of Configuration Manager database views
Microsoft.SystemCenter.ConfigurationManager.DCM_NoncompliantCI	UniqueID [Key]	SCCM.Ext.vex_ConfigurationItems.CI_UniqueID
	Baseline_UniqueID [Key]	SCCM.Ext.vex_ConfigurationItems.CI_UniqueID
	MaxNonComplianceCriticality [Key]	SCCM.Ext.vex_CICurrentComplianceStatus.MaxNoncomplianceCriticality

System.Domain.User

The following table describes the mappings for the **System.Domain.User** type.

Configuration Manager class	Configuration Manager database value	Service Manager property
System.Domain.User	Domain [Key]	Parse SCCM_Ext.vex_GS_SYSTEM_CONSOLE_USER
	UserName [Key]	Parse SCCM_Ext.vex_GS_SYSTEM_CONSOLE_USER

Microsoft.SystemCenter.ConfigurationManagergr.CollectionInf

The following table describes the mapping for the **Microsoft.SystemCenter.ConfigurationManagergr.CollectionInf** type.

Service Manager type	Service Manager property	Column name of Configuration Manager database views
System.ConfigItem	DisplayName	SCCM_Ext.vex_Collection.CollectionName
Microsoft.SystemCenter.ConfigurationManagergr.CollectionInf	Count	Count of computers in collection
	CollID [Key]	SCCM_Ext.vex_Collection.CollID
	CollectionName	SCCM_Ext.vex_Collection.CollectionName
	CollectionID	SCCM_Ext.vex_Collection.CollectionID

Microsoft.ConfigMgr.SoftwarePackage

The following table describes the mapping for the **Microsoft.ConfigMgr.SoftwarePackage** type.

Service Manager type	Service Manager property	Column name of Configuration Manager database views
System.ConfigItem	DisplayName	SCCM_Ext.vex_Package.Name
Microsoft.ConfigMgr.SoftwarePackage	ID [Key]	SCCM_Ext.vex_Package.PackageID
	Version	SCCM_Ext.vex_Package.Version

Service Manager type	Service Manager property	Column name of Configuration Manager database views
	Language	SCCM_Ext.vex_Package.Language
	Manufacturer	SCCM_Ext.vex_Package.Manufacturer
	Description	SCCM_Ext.vex_Package.Description

Appendix D - System Center 2012 - Service Manager Registry Keys

Caution
Incorrectly editing the registry can severely damage your system. Before making changes to the registry, you should back up any valued data on the computer.

System Center 2012 – Service Manager stores many settings in the registry. You seldom have to edit the registry yourself, because most of those settings are derived from entries that you make in day-to-day use. However, some changes to settings might occasionally be required. Service Manager stores most registry values in the following locations:

- HKEY_CURRENT_USER\Software\Microsoft\System Center\2010\Service Manager\Console
- HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\System Center\2010

Service Manager Console Registry Keys

The keys in this section are used to manage the Service Manager console for the Service Manager console user. These keys are found in the HKEY_CURRENT_USER\Software\Microsoft\System Center\2010\Service Manager\Console directory.

Key	Description and value
HKEY_CURRENT_USER\Software\Microsoft\System Center\2010\Service Manager\Console\ConsoleDisplaySettings\NavigationPaneExpanded	The navigation pane is expanded when the value is set to 1 and not expanded when the value is set to 0.
HKEY_CURRENT_USER\Software\Microsoft\System Center\2010\Service Manager\Console\ConsoleDisplaySettings\NavigationPaneWidth	Specifies the navigation pane width, limited to display resolution.
HKEY_CURRENT_USER\Software\Microsoft\System Center\2010\Service	The **Tasks** pane is expanded when the value is set to 1, and not expanded when the value

Key	Description and value
Manager\Console\ConsoleDisplaySettings\TasksPaneExpanded	is set to 0.
HKEY_CURRENT_USER\Software\Microsoft\System Center\2010\Service Manager\Console\ConsoleDisplaySettings\NaN	Specifies the **Tasks** pane width, limited to display resolution.
HKEY_CURRENT_USER\Software\Microsoft\System Center\2010\Service Manager\Console\ConsoleDisplaySettings\ForceHighContrast	High Contrast is enabled when the value is set to 1, and not enabled when the value is set to 0.
HKEY_CURRENT_USER\Software\Microsoft\System Center\2010\Service Manager\Console\ConsoleWindowSettings\IsConsoleMaximized	The Service Manager console is maximized when the value is set to 1, and not maximized when the value is set to 0.
HKEY_CURRENT_USER\Software\Microsoft\System Center\2010\Service Manager\Console\ConsoleWindowSettings\ConsoleLocation\X	Specifies the top left corner of the Service Manager console horizontal coordinate.
HKEY_CURRENT_USER\Software\Microsoft\System Center\2010\Service Manager\Console\ConsoleWindowSettings\ConsoleLocation\Y	Specifies the bottom left corner of the Service Manager console vertical coordinate.
HKEY_CURRENT_USER\Software\Microsoft\System Center\2010\Service Manager\Console\ConsoleWindowSettings\ConsoleSize\Height	Specifies the height of the Service Manager console, limited to display resolution.
HKEY_CURRENT_USER\Software\Microsoft\System Center\2010\Service Manager\Console\ConsoleWindowSettings\ConsoleSize\Width	Specifies the width of the Service Manager console, limited to display resolution.
HKEY_CURRENT_USER\Software\Microsoft\System Center\2010\Service Manager\Console\SmConsoleDisplaySettings\NavigationPaneVisible	The Service Manager console navigation pane is visible when the value is set to 1 and hidden when the value is set to 0.
HKEY_CURRENT_USER\Software\Microsoft\System Center\2010\Service Manager\Console\SmConsoleDisplaySettings\TasksPaneVisible	The Service Manager console **Tasks** pane is visible when set to 1 and hidden when the value is set to 0.

Key	Description and value
HKEY_CURRENT_USER\Software\Microsoft\System Center\2010\Service Manager\Console\SmConsoleDisplaySettings\SelectedWunderBarIndex	Depending on the value, the corresponding workspace is selected in the Service Manager console. **Administration** = 0, **Library** = 1, **Work Items** = 2, **Configuration Items** = 3, **Data Warehouse** = 4, **Reporting** = 5. Values higher than 5 correspond to any custom workspaces that are added to the Service Manager console.
HKEY_CURRENT_USER\Software\Microsoft\System Center\2010\Service Manager\Console\SmConsoleDisplaySettings\NavigationModelNodeLocation	The value for the key is the last view that the user selected before closing the Service Manager console, so that when the Service Manager console reopens, it reopens in this view. **msscnav://root/Windows/Window/ConsoleDisplay/Folder.f837da16-dc5d-7a25-1b48-c62eb5965806/Folder.8afcc5db-910c-35a0-700f-fd9a94b4169b/View.fbf52403-7ce7-05c4-0ca9-7c61030e5f57** is an example value.
HKEY_CURRENT_USER\Software\Microsoft\System Center\2010\Service Manager\Console\ViewDisplaySettings\DetailPaneHeight	Specifies the height of the details pane.
HKEY_CURRENT_USER\Software\Microsoft\System Center\2010\Service Manager\Console\ViewDisplaySettings\DetailPaneExpanded	The Service Manager console details pane is visible when the value is set to 1 and hidden when the value is set to 0.
HKEY_CURRENT_USER\Software\Microsoft\System Center\2010\Service Manager\Console\User Settings\SDKServiceMachine	Specifies the name of the server that the Service Manager console is connected to.

Service Manager Registry Keys

Keys in this section are used to manage functions that are internal to Service Manager.

Key	Description and values
HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\System	Specifies the group change check

Key	Description and values
Center\2010\Common\GroupCalcPollingIntervalMilliseconds	interval in milliseconds. For more information, see the Planning Guide for System Center 2012 – Service Manager

Operations Guide for System Center 2012 - Service Manager

The Operations Guide for Microsoft System Center 2012 – Service Manager provides information about using the Service Manager console for day-to-day tasks that you perform to manage service desk functions for your organization's computer infrastructure. This guide provides detailed procedures for the following tasks:

Operations Guide Topics

- Searching for Information in System Center 2012 - Service Manager

  Describes how to search for configuration items and other incidents, problems, and knowledge articles.
- Managing Incidents and Problems in System Center 2012 - Service Manager

  Describes how incidents and problems are created, edited, and resolved.
- Managing Changes and Activities in System Center 2012 - Service Manager

  Describes changes and activities are created, edited, and closed.
- Managing Service Requests in System Center 2012 - Service Manager

  Describes how service requests are created, approved, fulfilled, and closed.
- Managing Release Records in System Center 2012 - Service Manager

  Describes how release records are created, edited, combined, and used to track releases.
- Managing Chargeback Reports in System Center 2012 SP1 - Service Manager

  Describes how to manage chargeback reports.
- Using Data Warehouse Reporting and Analytics in System Center 2012 - Service Manager

  Describes how standard reports and OLAP data cubes are used to view data and trends across your Service Manager environment.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager

- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

Downloadable Documentation

You can download a copy of this technical documentation from the Microsoft Download Center. Always use the TechNet library for the most up-to-date information.

Searching for Information in System Center 2012 - Service Manager

In System Center 2012 – Service Manager, you can use the search feature in the Service Manager console to look for information. The search box is in the upper-right corner of the Service Manager console. By default, the search feature looks for all objects. The results can include incidents, change requests, problems, and configuration items of Windows-based computers. You can filter search results by using the filter bar. You can also perform an advanced search for these items plus the following items:

- Knowledge articles
- Domain users
- Manual activities

However, only knowledge articles are returned when you perform a knowledge search.

When you search for most items in Service Manager, only exact keyword matches return results. However, partial matches are returned for configuration items of Windows-based computers. Searches that use wildcard characters are not supported.

When you search for items, you open a view that displays a large number of items, and there are more than 5,000 items in the results, the complete results can take a few minutes to appear.

Managing Incidents and Problems in System Center 2012 - Service Manager

System Center 2012 – Service Manager helps your organization manage incidents and problems by implementing and automating help desk ticketing processes so that these processes comply with the best practices that are described in the Microsoft Operations Framework (MOF) and in the Information Technology Infrastructure Library (ITIL). For more information about MOF 4.0, see Microsoft Operations Framework.

If you need to add or extend the functionality of Service Manager to implement custom processes for handling incidents and problems, you can use standard Microsoft development tools and the Service Manager SDK.

The procedures in this section are organized according to common problem and incident management scenarios. Even though the sample scenarios refer to a fictitious organization,

Woodgrove Bank, the scenarios and steps are based on real use and they describe how to use the problem and incident management features in Service Manager.

At first, the difference between affected items and related items in problem and incident forms might not be obvious. However the difference describes different relationships. An affected item is something that is directly affected by the problem or incident, for example, your computer. Whereas, a related item is something more loosely related but not directly affected. For example, a related item could be any other configuration item that is not directly affected but connected to another configuration item as a reference.

Incident and Problem Topics

- Sample Scenarios: Managing Incidents and Problems

  Describes the scenarios that involve incidents and problems in Service Manager.
- Managing Incidents

  Describes how to create, edit, and resolve incidents and incident views.
- Troubleshooting Incidents

  Describes how to troubleshoot incidents by using service maps and by running tasks.
- Managing Problems

  Describes how to create and edit problem records, how to resolve problems and related incidents automatically, and how to link incidents or change requests to a problem record.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager

Sample Scenarios: Managing Incidents and Problems

These sample scenarios for System Center 2012 – Service Manager help you achieve your goal of managing incidents and problems by using multiple scenarios end to end. You can think of these sample scenarios as a case study that helps put the individual scenarios and procedures in context.

Scenarios for Managing Incidents and Problems

Scenario	Description
Managing Incidents	Describes how incidents and incident views are created, edited, and resolved.
Troubleshooting Incidents	Describes how to troubleshoot incidents using

Scenario	Description
	service maps and by running tasks.
Managing Problems	Describes how to create and edit problem records, resolve problems and related incidents automatically, and link incidents or change request to a problem record.

Managing Incidents

In the scenario that encompasses incident management, Phil uses incident management to restore regular operations as quickly and as cost-effectively as possible. For example, by using the E-mail Incident template to populate a new email-related incident, he can quickly create an incident and ensure that the correct **Impact**, **Urgency**, **Assigned Analyst**, and **Support Tier** fields are configured. Carrying the example further, he creates a new incident for a user who is unable to view an email that was sent with restricted permissions. Phil creates an incident view so that he can easily work with all incidents that are created for email problems. When changes are made to an incident, he edits the incident to reflect the changes.

In another example, an end user experiences a printer problem, and she sends an email message to the help desk. Upon receipt of the message, Service Manager automatically creates an incident from the message. Phil investigates the problem, in part, by viewing the service. After the underlying problem has been solved, he resolves and closes the incident.

At Woodgrove Bank, connectors are configured in such a way that Service Manager imports configuration items and alerts from, so that some new incidents are created automatically. Phil reviews the automatically created incidents for accuracy.

Troubleshooting Incidents

In the scenario that encompasses troubleshooting incidents, Phil is conducting an initial investigation of the problem that Joe is experiencing. Phil suspects that the root cause of the problem is that Microsoft Exchange Server 2010 Service Pack 1 (SP1) needs to be applied to Joe's Exchange server. However, there are other Exchange servers at Woodgrove Bank that probably also need to be updated. Phil starts his investigation by viewing the service that Garret created for the Exchange service. When any incidents affect a service component, that component is marked with an orange icon resembling a square containing an exclamation point. When a change request affects a service component, the component is marked with a special blue icon resembling a square containing a right-pointing arrow. Phil uses the map view on the **Service Components** tab to view configuration items and view incidents associated with them. Then, he opens other configuration items and adds them to the open incident.

To further troubleshoot, Phil wants to ping a remote computer that is exhibiting problems. He can use tasks that are part of the Service Manager console instead of having to use various other tools.

Managing Problems

In the scenario that encompasses problem management, Phil has created a change request asking the Exchange Administrators group to apply a service pack that is expected to resolve the problem. When a root cause is found and mitigated or resolved, the change request is completed and Phil is notified. He then uses the prescribed procedures to resolve a problem and automatically resolve incidents associated with the problem.

See Also

Managing Incidents and Problems in System Center 2012 - Service Manager

Managing Incidents

The procedures in this section describe how to manage incidents by using System Center 2012 – Service Manager.

For a detailed description of the complete scenarios for managing incidents and problems, see Sample Scenarios: Managing Incidents and Problems.

Help desk analysts use incident management to restore regular operations as quickly and as cost-effectively as possible by creating new incidents. They also work in partnership with Service Manager administrators to ensure that incidents that are created automatically or by end users are correctly categorized and reassigned to appropriate personnel. Methods that analysts use to accomplish these duties include:

- Using the E-mail Incident template to create new incidents.
- Reviewing automatically created incidents, such as those incidents that are automatically created from System Center Operations Manager 2007 using the Operations Manager Alert connector.
- Reviewing and updating incidents that are created by end users who have sent requests by email.
- Combining incidents into parent-child relationships when incidents are related.

To manage an incident, complete the steps in the following table.

Step	Description
Step 1: How to Manually Create a New Incident	Describes how to create new incidents in response to a call from a user or from an email request.
Step 2: How to Change an Existing Incident	Describes how to make changes to an incident in response to new information.
Optional step: How to Contact a User from an Incident Form	Describes how to contact a user by email or instant message while you have an incident form open.
Step 3: How to Create an Incident View and	Describes how to create a view of incidents that

Step	Description
Personalize It	match the criteria you define.
Step 4: Combining Incidents into Parent-Child Groups	Describes the actions you can take to combine incidents into parent-child relationships.
Step 5: How to Resolve and Close an Incident	Describes how to resolve and close an incident after the underlying problem is solved.

Combining Incidents into Parent-Child Groups

Incidents in System Center 2012 – Service Manager are usually short-lived while help desk analysts investigate and then restore operations. Often, incidents are related and it is useful to group incidents together. You can create a parent incident to group other existing incidents together, which can help provide visibility into them and their relationship to one another.

A Service Manager administrator can define automatic incident resolution settings so that when a parent incident is resolved, all its child incidents resolve automatically, do not resolve automatically, or to let the analyst decide whether to resolve or not. Similarly, an administrator can also define automatic incident reactivation settings so that when a parent incident is reactivated, all its child incidents reactivate automatically, do not reactivate automatically, or to let the analyst decide whether to reactivate the child incidents. Both processes can help you verify that all child incidents are resolved or activated together as a group.

In This Section

How to Create a Parent Incident from an Incident Form

Describes how to create a new parent incident from an already opened incident.

How to Link an Open Incident to a Parent Incident

Describes how to link an opened incident to an existing parent incident.

How to Resolve a Parent Incident

Describes how to resolve a parent incident and its child incidents.

How to Link an Active Incident to a Resolved Parent Incident

Describes how to link an incident to a parent incident that is already resolved.

How to Reactivate a Resolved Parent Incident

Describes how to reactivate a resolved parent incident and automatically reactivate its child incidents.

How to Create a Parent Incident Template

Describes how to create a parent incident template that new incidents are created from.

How to View a Parent Incident from a Child Incident

Describes how to easily open a parent incident from a child incident.

How to Link a New Incident to a Parent Incident

Describes how to create a new child incident and link it to a related parent incident.

See Also

Managing Incidents

How to Create a Parent Incident from an Incident Form

In System Center 2012 – Service Manager, one way a help desk analyst can create a parent incident is when an existing incident is already opened. You can create a parent incident using the following steps. A parent incident serves as a container for several incidents.

The following procedure is performed on an incident that is neither a parent incident nor a child incident. Afterward, a new parent incident is created and the existing incident is converted to a child incident.

To create a parent incident from an incident form

1. In the Service Manager console, open the Work Items workspace, and in the **Work Items** pane, expand **Incidents**.
2. Select any Incident Management view that contains active incidents, and then select an incident.
3. In the **Tasks** pane, click **Edit** to open the incident.
4. In the **Tasks** pane, click **Link to New Parent Incident** to open the **Link to New Parent Incident** dialog box.
5. In the **Link to New Parent Incident** dialog box, select a template to create the new parent incident with, and then click **OK**. For example, select **Networking Issue Incident Template**, and then click **OK**.
6. In the **Title** box, type a new description or modify the description that is inserted by the template. For example, type **Network Outage in Bldg 773.**
7. In the **Affected user** box, select the user who reported this incident. For example, select **Joe Andreshak**.
8. In the **Alternate Contact Method** box, enter additional contact information for the affected user (optional).

9. The **Child Incidents** tab appears in the form where you view the child incident that the new parent incident is grouped with and where you can add other child incidents.
10. In the parent incident form, click **OK** to close it.
11. In the original incident form, click **OK** to close it.

See Also

Combining Incidents into Parent-Child Groups

How to Link an Open Incident to a Parent Incident

The help desk analyst can link open incidents to a parent incident or remove links using the following procedures.

To link open incidents to a parent incident

1. In the Service Manager console, open the Work Items workspace, and in the **Work Items** pane, expand **Incident Management**.
2. Select any incident view that contains one or more incidents that you want to link to a parent incident.
3. Select one or more incidents, and in the **Tasks** pane, click **Link/Unlink to Existing Parent Incident**, and then in the submenu, click **Link**.
4. In the **Link to parent incident** dialog box, click **Link**.
5. In the **Select Parent Incident** dialog box, select the parent incident that you want to link the open incident to, and then click **OK** to create the link and close the **Select Parent Incident** dialog box.

To remove links between child incidents and the parent incident

1. In the Service Manager console, open the Work Items workspace, and in the **Work Items** pane, expand **Incident Management**.
2. Select any incident view that contains one or more incidents that you want to unlink from the parent incident.
3. Select one or more incidents, and in the **Tasks** pane, click **Link/Unlink to Existing Parent Incident**, and then in the submenu, click **Unlink**.
4. In the **Unlink** confirmation dialog box, click **Yes**.

See Also

Combining Incidents into Parent-Child Groups

How to Resolve a Parent Incident

In System Center 2012 – Service Manager, the help desk analyst can resolve a parent incident, and then Service Manager will automatically resolve all its child incidents, if the Service Manager administrator has configured Incident settings accordingly. This method of resolving incidents can help the analyst quickly close many child incidents. Use the following procedure to resolve a parent incident.

To resolve a parent incident

1. In the Service Manager console, open the Work Items workspace, and in the **Work Items** pane, expand **Incident Management**.
2. Select the **All Open Parent Incidents** view, and then in the list of parent incidents, select the incident that you want to resolve.
3. In the **Tasks** pane, click **Change Incident Status**, and then in the submenu, click **Resolve**.
4. In the **Resolve** dialog box, select a **Resolution Category**, and then in the **Comments** box, type a description of the steps that you have taken to resolve the incident.
5. If you want child incidents to resolve automatically and the option is available, ensure that the **Resolve child incidents when resolving this parent incident** option is selected, and then click **OK** to resolve the incident—and child incidents, if selected, and then close the **Resolve** dialog box.

See Also

Combining Incidents into Parent-Child Groups

How to Link an Active Incident to a Resolved Parent Incident

While reviewing active incidents in System Center 2012 – Service Manager, help desk analysts might determine that an incident should have already been resolved because another analyst has already corrected the underlying cause. If there is a closed parent incident, the analyst can use the following procedure to link the incident to the resolved parent and then automatically resolve the active incident.

To link an active incident to a resolved parent and automatically close the active incident

1. In the Service Manager console, open the Work Items workspace, and in the **Work Items** pane, expand **Incident Management**.
2. Select any incident view that contains the incident that you want to a resolved parent to.
3. Select one or more incidents, and in the **Tasks** pane, click **Link/Unlink to Existing Parent Incident**, and then in the submenu, click **Link**.
4. In the **Select Parent Incident** dialog box, select the resolved parent incident that you want to link the open incident to, and then click **OK**.
5. In the **Link to parent incident** dialog box, select **Link to parent and resolve incident**.
6. If you are linking multiple active incidents to a resolved parent, ensure that you select **Repeat this option for all conflicts** to automatically resolve all the incidents.

See Also

Combining Incidents into Parent-Child Groups

How to Reactivate a Resolved Parent Incident

In System Center 2012 – Service Manager, the help desk analyst can reactivate a parent incident, and then Service Manager will automatically activate all its child incidents, if the Service Manager administrator has configured Incident settings accordingly. This method of reactivating incidents can help the analyst quickly activate many child incidents. Use the following procedure to reactivate a parent incident.

Depending on parent incident settings in the Administration workspace, behavior of automatic child incident resolution and reactivation varies. For more information about automatic incident resolution, see How to Set Parent Incident Options in the Administrator's Guide for System Center 2012 – Service Manager.

To reactivate a parent incident

1. In the Service Manager console, open the Work Items workspace, and in the **Work Items** pane, expand **Incident Management**.
2. Select the **All Incidents** view, and then in the list of parent incidents, select the incident that you want to reactivate.
3. In the **Tasks** pane, click **Change Incident Status**, and then in the submenu, click **Activate**.
4. In the **Activate** dialog box, in the **Comments** box, type a description of the reason that you are activating the incident.
5. Click **OK** to activate the incident and child incidents, if they are available and selected, and to close the **Activate** dialog box.

See Also

Combining Incidents into Parent-Child Groups

How to Create a Parent Incident Template

In System Center 2012 – Service Manager, a parent incident template is used to create new incidents. Incidents created from a template will include information for fields that you do not have to enter manually. By using a template for new incidents, new incidents are created faster than from scratch.

The template author creates a template for release records by using the following procedure.

To create a parent incident template

1. In the Service Manager console, open the Library workspace, and in the **Library** pane, select **Templates**.
2. In the **Tasks** list under **Template**, click **Create Template**.
3. In the **Create Template** dialog box, type a name for the incident template and a description of what the template applies.
4. Under **Class**, click **Browse**; in the **Select a Class** box, select **Incident**; and then click **OK** to close the **Select a Class** box.
5. Optionally, you can select the management pack where the template is saved.

6. Click **OK** to close the **Create Template** dialog box, and the new incident template form appears.
7. Enter information on the **General** tab, and then click the **Activities** tab.
8. Optionally, you can add, delete, or modify manual activities for the template.
9. If you add an activity, the activity form opens. Enter necessary information, and then click **OK** to save the activity.
10. When you have added all the activities you want, click **OK** to save the incident template and close it. The incident template then appears in **Templates** list.

See Also

Combining Incidents into Parent-Child Groups

How to View a Parent Incident from a Child Incident

In System Center 2012 – Service Manager, the help desk analyst can use the following procedure to easily view parent incidents when a child incident is open. Reviewing parent incident information is often necessary to determine the status of its child incidents. Use the following procedure to view a parent incident from a child incident.

To view a parent incident from a child incident

1. In the Service Manager console, open the Work Items workspace, and in the **Work Items** pane, expand **Incident Management**.
2. Select an incident view that contains a child incident that you want to open, and then select the incident.
3. In the **Tasks** pane, click **Edit**.
4. In the incident form banner, the parent incident ID and description appears next to **Parent incident**. Click the linked parent incident to open it.
5. After reviewing the parent incident information, you can optionally update any information, such as comments, in the Action Log.
6. If you make changes to the parent incident, click **OK**. Otherwise, click **Cancel**.
7. If you make changes to the child incident, click **OK**. Otherwise, click **Cancel**.

See Also

Combining Incidents into Parent-Child Groups

How to Link a New Incident to a Parent Incident

When analysts create new incidents, System Center 2012 – Service Manager automatically notifies you if any parent incidents exist with the same classification category. The purpose of the notification is to help you combine incidents into parent child groups where a common underlying issue exists. Later, you can use the parent incident to manage the group of incidents as a whole and to serve as a single point of resolution.

Use the following procedure to manually create a new incident and then link it to a related parent.

To link a new incident to a parent incident

1. In the Service Manager console, select **Work Items**.
2. In the **Work Items** pane, expand **Incident Management**, and then click an incident view, such as **All Incidents**.
3. In the **Tasks** pane, under **Incident Management**, click **Create Incident**.
4. In the **Tasks** pane, click **Apply Template**.
5. Under **Templates** in the **Apply Template** dialog box, select an incident template, such as **Software Issue Incident Template**, and then click **OK**.
6. When the template applies a classification category or if you manually select a classification category that is in use by an active parent incident, a message appears in the incident form banner. You can optionally click the link to create a link from the new incident to the existing parent. If you are linking the new incident to a parent incident, perform one of the appropriate following substeps:
   - If the parent incident is resolved, in the **Link to parent incident** dialog box, click **Link to parent and resolve incident**.
   - Click the link to create the link between the new incident and the parent incident.
7. In the **Title** box, type a new description or modify the description that is inserted by the template.
8. In the **Affected user** box, select the user who reported this incident.
9. In the **Alternate Contact Method** box, enter additional contact information for the affected user (optional).
10. If necessary, click the **Related Items** tab.
11. Optionally, in the **Attached Files** area, click **Add**.
12. Optionally, in the **Open** dialog box, select the file that you want to attach to this incident, and then click **Open**. For example, select the screen shot of an error message that the affected user has received.
13. Click **OK**.

To validate creation of a new incident

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Incident Management**, and then click **All Incidents**. New incidents appear in the **All Incidents** view.

See Also

Combining Incidents into Parent-Child Groups

Managing Incidents Overview

In System Center 2012 – Service Manager, help desk analysts use incident management to restore regular operations as quickly and as cost-effectively as possible.

Using the E-mail Incident template to populate a new email-related incident, you can quickly create an incident and ensure that the correct **Impact**, **Urgency**, **Assigned Analyst**, and **Support Tier** fields are configured.

If you configure connectors so that Service Manager imports configuration items and alerts from Operations Manager, some new incidents are automatically created. An analyst reviews the automatically created incidents for accuracy.

In Service Manager, incidents are automatically created from email requests by users. If the user is recognized as a Service Manager end user, the request that is sent to the help desk email address automatically creates a new incident.

Note

Service Manager can automatically generate new incidents from email requests only after a Service Manager administrator enables inbound email processing. By default, the impact and urgency of every incident created by email submission is set to medium, and no category is assigned.

Normally, you create incidents only for user accounts in your organization that have Active Directory Domain Services (AD DS) accounts that are synchronized with Service Manager. However, you might occasionally need to manually create incidents for users. For example, you might need to create an incident for a new user whose account is not yet in AD DS or if an Active Directory account is not yet synchronized with Service Manager. You can also manually create incidents to support external vendors who do not have Active Directory accounts. In another example, you might need to open an incident for an on-site technician who does not have an Active Directory account but who needs to report an incident. Or, you might need to open an incident for an externally-supported customer who does not have an Active Directory account. In all these examples, you must manually create a user in Service Manager. For more information, see “How to Add a Member to a User Role” in the Administrator's Guide for System Center 2012 - Service Manager in the topic.

Depending on the needs of your organization, you might want to have a clear distinction between an incident’s Assigned To user and the primary owner. Within Service Manager, neither use has any implied value. For example, although you can choose both of these two users in an incident form, you might want customers to deal with a single person who is your customer focal point. In this case, that person might be the primary owner who also owns other incidents. An Assigned To user might be one of many analysts who might work on an incident temporarily before the incident is assigned to another analyst before it is ultimately resolved and closed.

IDs that are assigned to change requests and incidents are not created in sequence. However, newer change requests and incidents are assigned IDs with a higher number than the IDs created previously.

See Also

Managing Incidents

How to Manually Create a New Incident

In System Center 2012 – Service Manager, incidents are automatically created from email requests by users. However, you can use the following procedures to manually create a new incident in the Service Manager console and then validate it. For example, you might want to manually create a new incident for a person who is experiencing an email-related problem. You can link other affected items, such as various computers, to indicate that the issue affects more than one computer.

To create a new incident from a configuration item view

1. In the Service Manager console, select **Configuration Items**.
2. In the **Configuration Items** pane, expand **Configuration Items**, expand **Computers**, and then click **All Windows Computers**.
3. In the **All Windows Computers** view, filter for the computer for which you want to create an incident, and then select the computer. For example, select **Exchange01.woodgrove.com**.
4. In the **Tasks** pane, click **Create Related Incident**.
5. In the **Tasks** pane, click **Apply Template**.
6. Under **Templates** in the **Apply Template** dialog box, select **Software Issue Incident Template**, and then click **OK**.
7. In the **Title** box, type a new description or modify the description inserted by the template. For example, type **User unable to open e-mail that has restricted permissions.**
8. In the **Affected user** box, select the user who reported this incident. For example, select **Joe Andreshak**.
9. In the **Alternate Contact Method** box, enter additional contact information for the affected user (optional).
10. Click the **Related Items** tab.
11. In the **Attached Files** area, click **Add**.
12. In the **Open** dialog box, select the file that you want to attach to this incident, and then click **Open**. For example, select the screen shot of an error message that the affected user has received.
13. Click **OK**.

To create a new incident by email

1. In an email program, create a new email message, and enter the help desk alias or email address in the **To** box. For example, enter **Helpdesk@Helpdesk.Woodgrove.com** in the **To** box.
2. In the **Subject** box, type a subject. For example, enter **Unable to print checks**.
3. In the message body, type additional information that the help desk analyst can use to correct the problem. For example, enter **The check printer has a paper jam. I will use a backup printer until the jam is fixed**.

4. Optionally, attach files that the help desk analyst can use to correct the problem.

To validate creation of a new incident

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Incident Management**, and then click **All Incidents**. New incidents appear in the **All Incidents** view.

See Also

Managing Incidents

How to Change an Existing Incident

In System Center 2012 – Service Manager, you can use the following procedures to change the urgency of an incident, edit an unassigned incident from Operations Manager, link a knowledge article to an incident, and validate the changes. Users create simplified incidents using the Self-Service Portal, based on the Incident portal template. Because user-created incidents are simplified, analysts often need to revise new incidents with additional information. Additionally, there is no functional difference between incidents created with the Self-Service Portal, using either the **Need help with a problem** or **Need repair or fix** options.

Note

Incidents are automatically created by System Center 2012 – Service Manager when the Operations Manager Alert connector is enabled. You can edit the new incidents that are generated when an Operations Manager alert is raised and then assign the incidents to analysts. For more information, see “Importing Data and Alerts from Operations Manager 2007” in System Center Service Manager 2012 Administrator's Guide.

To change the urgency of an incident

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Incident Management**, and then click **All Open E-Mail Incidents**.
3. In the **All Open E-Mail Incidents** view, select the original incident. For example, select the **Unable to print checks** incident.
4. In the **Tasks** pane, click **Edit**.
5. In the **Incident** form, in the **Urgency** list, select **High**.
6. Optionally, type a comment in the **Action Log** box. If you do not want end users to be able to read the comment, select the **Private** check box that is above the **Action Log** box. For example, in the **Action Log** box, type **The user called to say that the backup printer is unavailable and that this issue is now urgent**. Then, click **Add**. The new comment appears as a log entry.
7. Click **OK** to close the form and to save your changes.

To edit an unassigned incident from Operations Manager

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Incident Management**, and then click **All Open Operations Manager Incidents**.
3. In the **All Open Operations Manager Incidents** view, select an incident that was created automatically from an Operations Manager alert.
4. In the **Tasks** pane, click **Edit**.
5. In the **Incident** form, under **Support Group**, select **Tier 1**.
6. Under **Assigned to**, enter the name of the help desk analyst who will investigate the problem.
7. Click **OK** to close the form and to save your changes.

To link a knowledge article to an incident

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Incident Management**, and then click **All Open Operations Manager Incidents**.
3. In the **All Open Operations Manager Incidents** view, select the incident that was created automatically from an Operations Manager alert.
4. In the **Tasks** list, click **Search for Knowledge Articles**.
5. In the **Knowledge Search** dialog box, type a search term in the **Search for** box, and then click **Go**. For example, type **MICR Check Printer Article**.
6. Select the article, click **Link to <IncidentName>**, click **OK** to close the informational dialog box, and then click **Close**.

To validate incident edits

- Open the incident, and then verify that your changes appear. For example, verify that the comment you entered appears as a log entry.

See Also

Managing Incidents

How to Contact a User from an Incident Form

In System Center 2012 – Service Manager, you can contact a user by email or by instant message when an incident form is open. The presence indicator is shown in the form next to the affected user's name, and it displays their current status, if known. For the presence indicator to accurately reflect a user's status, the user must have an Active Directory account, and the user must be a member of the same domain in which the Service Manager management server has its computer account. Additionally, the computer running the Service Manager console must have Microsoft Office Lync 2010 installed.

Note

If a user's account belongs to a domain other than the domain in which the Service Manager management server has its computer account, the presence indicator might not accurately display the user's status.

To contact a user by email

1. In an open incident form, click the presence indicator next to the **Affected user** box, and then click the triangle icon next to the box.
2. Click **Send Mail**.
3. Your email client program opens and adds the user's name to the **To** box. Compose the e-mail message, and then send it.

To contact a user by instant message

1. In an open incident form, click the presence indicator next to the **Affected user** box, and then click the triangle next to the box.
2. Click **Send Instant Message**.
3. Your instant message program opens. Compose the instant message, and then send it.

See Also

Managing Incidents

How to Create an Incident View and Personalize It

In System Center 2012 – Service Manager, you can use the following procedures to create and personalize an incident view and then validate it.

Views let you group incidents that share certain criteria. For example, the following procedure helps you create a view that lists all the incidents in which the classification has been set to **E-mail Problems** or to some other classification. When you create a new view, it is saved and becomes available for later use.

You can also personalize a view. However, when you personalize changes to a view, those changes are not saved. For example, you can personalize the **All Incidents** view, but if you change column widths, column sorting, or grouping or if you remove columns, the next time you return to the view it displays information in the same manner as it did before you personalized it.

To create an incident view

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Incident Management**.
3. In the **Tasks** pane, click **Create View**.
4. In the **General** section of the **Create View** dialog box, type a name for the view in the **Name** box. For example, type **E-mail Incidents**.
5. In the **Description** box, type a description. For example, type **All incidents in which the**

classification is E-Mail Problem.

6. Click **Criteria**.
7. Next to the **Search for objects of a specific class** list, click **Browse**.
8. In the **Select a Class** list, under **View**, select **Combination classes**, select **Incident (Typical)**, and then click **OK**.
9. In the **Related classes** box, ensure that **Incident** is selected. In the **Available properties** list, select **Classification Category**, and then click **Add**. You might need to scroll to see the **Add** button.
10. At the end of the **Criteria** section, in the **Criteria** definition area, select **E-mail problems**. When the criterion is complete, it resembles **[Incident] Classification Category equals E-Mail Problems**.
11. Click **Display**, and in the **Columns to display** list, select **Status**, **Classification Category**, and **Description**. Next, under **Assigned To User**, select **Display Name**. Then, click **OK**.

To personalize an incident view

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Incident Management**, and then select an incident view. For example, select **All Incidents**.
3. Right-click any view column heading to resize the columns, to remove items from the results, or to change column sorting and grouping. Repeat this step until you are satisfied with the results.

To validate the incident view creation

- In the **Work Items** pane, ensure that an **E-Mail Incidents** view exists under **Incident Management**. Ensure that the view displays all the incidents in the **E-Mail Problems** category.

  Note
  It might take a few seconds for the new incident view to appear.

See Also

Managing Incidents

How to Resolve and Close an Incident

In System Center 2012 – Service Manager, you can use the following procedures to resolve and close an incident and then validate that the incident was resolved and closed.

After you research a problem and resolve its source, you can resolve and close the incident. An incident is considered resolved when the required change has been made. When the affected user has confirmed that the problem that caused the incident has been eliminated, the incident can be closed.

To resolve and close an incident

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Incident Management**, and then click **E-Mail Incidents**.
3. In the **E-Mail Incidents** view, select the incident you want to resolve and close.
4. In the **Tasks** pane, click **Change Incident Status** and then click **Resolve**.
5. In the **Resolve** dialog box, select the appropriate category for resolving this incident in the **Resolution Category** list. For example, select **Fixed by higher tier support**.
6. In the **Comments** box, type a comment that explains the resolution. For example, type **Resolved by installing Service Pack 1 on the Exchange server**, and then click **OK**.
7. In the **Tasks** pane, click **Change Incident Status** and then **Close**.
8. In the **Close** dialog box, type a comment about the closure of the incident, and then click **OK**.

To validate that an incident was resolved and closed

- In the **All Incidents** pane, the status for the incident or incidents changes from **Active** to **Resolved** when you resolve an incident and from **Resolved** to **Closed** when you close the incident.

  Note
  It might take a few seconds for the new status to appear. To immediately view the change, click **Refresh**.

See Also

Managing Incidents

Troubleshooting Incidents

The procedure in this section describes how to troubleshoot incidents in System Center 2012 – Service Manager.

For a detailed description of the complete scenario for troubleshooting incidents, see Sample Scenarios: Managing Incidents and Problems.

Complete the following step to troubleshoot incidents.

Task	Description
Step 1: How to Troubleshoot an Incident Using a Service Map	Describes how to troubleshoot an incident using a service map to view the configuration items that are part of a service.

Note

You might not be able to successfully troubleshoot all incidents with this step.

See Also

Operations Guide for System Center 2012 - Service Manager

How to Troubleshoot an Incident Using a Service Map

You can use the following procedures to troubleshoot an incident in System Center 2012 – Service Manager using a service map. A service map is a visual representation of a service from the perspective of the business and user that shows critical dependencies, settings, and areas of responsibility. Because a service map can show the relationship between incidents and configuration items, it is especially useful when you troubleshoot issues that might affect multiple incidents and configuration items. For example, if an incident affects one configuration item, other configuration items that are part of the service might also be affected. If necessary, you can add additional configuration items as items that are affected by the same open incident.

Additionally, when you use the **Service Components** tab to view the service map, you can easily determine whether there are active incidents or change requests open for a service component. When any incidents affect a service component, that component is marked with an orange icon resembling a square containing an exclamation point. When a change request affects a service component, the component is marked with a special blue icon resembling a square containing a right-pointing arrow.

To view incidents that affect service components

1. In the Service Manager console, click **Configuration Items**.
2. In the **Configuration Items** pane, expand **Business Services**, and then click **All Business Services**.
3. In the **All Business Services** list, double-click a business service. For example, double-click **Exchange Service**.
4. In the dialog box that opens, click the **Service Components** tab.

   Note that the list of service components includes configuration items. For example, the list might include computers running Microsoft Exchange Server. When a service component is marked with an icon, the icon indicates that an incident is associated with the service component.
5. Select a configuration item that has a related work item. For example, select the **Exchange01.woodgrove.com** server.
6. In the **Related work items for the selected item** list, select a work item to view, and then click **Open**.

To add related service components to an open incident

1. In the list of service components, select an item that has an active incident.
2. Under **Related work items for the selected item**, select a work item, and then click **Open** to open the incident.
3. Under **Affected Items**, click **Add**.
4. In the **Select objects** dialog box, select the configuration item to add to the incident, click **Add**, and then click **OK**.
5. Click **OK** to update the incident, and then return to the **Service Components** tab for the service.
6. Repeat the previous steps to add other service components to the open incident.
7. Click **OK** to close the service item.

To validate that the service components were added to an incident

- Open the business service to which you added the incident, and then click the **Related Items** tab. Verify that the new incident appears under **Work items affecting this configuration item**.

See Also

Troubleshooting Incidents

Managing Problems

The procedures in this section describe how to manage problems in System Center 2012 – Service Manager.

For a detailed description of the complete scenario for managing problems, see Sample Scenarios: Managing Incidents and Problems.

In Service Manager, problems are records that are created to help prevent future problems and incidents from happening, to eliminate recurring incidents, and to minimize the impact of incidents that cannot be prevented. Analysts can use the Service Manager console to create problem records and to associate incidents with problems.

Complete these steps to manage problems in Service Manager.

Task	Description
Step 1: How to Create and Edit Problem Records	Describes how to create and edit problem records to group related incidents.
Step 2: How to Resolve Problem Records and Related Incidents Automatically	Describes how to resolve a single problem to automatically close the related incidents.
Step 3: How to Link an Incident or Change Request to a Problem Record	Describes how to link an incident or change request to an associated problem record.

See Also

Managing Incidents and Problems in System Center 2012 - Service Manager

How to Create and Edit Problem Records

In System Center 2012 – Service Manager, you can use the following procedures to create new problem records and then edit them by using the Service Manager console. You can create a new problem record from the Service Manager console, from an incident view, or from an incident form.

To create a new problem record from the console

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Problem Management**, and then click **Active Problems**.
3. In the **Tasks** pane, click **Create Problem**.
4. In the **Title** box, type a title for the problem. For example, type **Outlook E-Mail Restricted Permissions**.
5. In the **Description** box, type a description of the problem. For example, type **Users cannot view e-mail messages sent with restricted permissions**.
6. If you want to assign the problem to an analyst, enter the name of the analyst in the **Assigned to** box.
7. In the **Source** list, select the source of the problem request.
8. Select the appropriate values in the **Category**, **Impact**, and **Urgency** boxes.
9. Click **OK**.

To create a new problem record from an incident view

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Incident Management**, and then click **All Incidents**.
3. In the **All Incidents** list, search for incidents whose titles match the problem record that you want to create, and then click **Search**. For example, search for **restricted permission**.
4. In the search results, select the incidents for which you want to create a problem record. In the **Tasks** pane under **Selected Items**, click **Create Problem**.
5. In the **Title** box, type a title for the problem. For example, type **Outlook E-Mail Restricted Permissions**. When you create a problem by using this method, the problem form inherits the title from the open incident if a single incident was selected. If multiple incidents were selected, the **Title** box is blank. You can change the title of the problem record.
6. In the **Description** box, type a description of the problem. For example, type **Users cannot view e-mail messages sent with restricted permissions**.

7. If you want to assign the problem to an analyst, enter the name of the analyst in the **Assigned to** box.
8. In the **Source** list, select the source of the problem request.
9. Select the appropriate values in the **Category**, **Impact**, and **Urgency** boxes.
10. Click **OK**.

To create a new problem record from an incident form

1. Make sure that an incident is already open. Then, under **Tasks**, click **Create Problem**.
2. In the **Title** box, type a title for the problem. For example, type **Outlook E-Mail Restricted Permissions**. When you create a problem using this method, the problem form inherits the title from the open incident. You can change the title of the problem record.
3. In the **Description** box, type a description of the problem. For example, type **Users cannot view e-mail messages sent with restricted permissions**.
4. If you want to assign the problem to an analyst, enter the name of the analyst in the **Assigned to** box.
5. In the **Source** list, select the source of the problem request.
6. Select the appropriate values in the **Category**, **Impact**, and **Urgency** boxes.
7. Click **OK**.

To edit a problem record

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Problem Management**, and then click **Active Problems**.
3. In the **Active Problems** view, double-click a problem. For example, double-click the **Outlook E-Mail Restricted Permissions** problem.
4. In the problem form, edit information that needs to be changed. For example, if a workaround is found for the problem, click the **Resolution** tab. Then, in the **Workarounds** field, type the workaround steps.
5. Click **OK**.

To validate the creation of a new problem record

- In the **Tasks** list, click **Refresh** to view the new problem record, or open the problem record to view the revised information.

See Also

Managing Problems

How to Resolve Problem Records and Related Incidents Automatically

In System Center 2012 – Service Manager, you can use the following procedures to resolve a problem record and the incidents that are associated with it and then validate the resolution.

To resolve a problem record and the incidents that are associated with it

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Problem Management**, and then click **Active Problems**.
3. In the **Active Problems** view, double-click the problem record that you want to resolve. Then, in the **Tasks** pane, click **Resolve**.
4. Click the **Resolution** tab, and then click to select the **Auto-resolve all incidents associated with this problem** check box.
5. In the **Resolution Category** box, select the appropriate category.
6. In the **Resolution Description** box, type a summary of the resolution for this problem record. For example, type **Application of Exchange Server 2010 SP1 fixed the restricted permission problem that affected users across forests**.
7. Click **OK**.

To validate problem and incident resolution

- Verify that the incidents associated with the problem record appear in the **All Incidents** view and that they have a status of **Resolved**.

  Note
  It might take a few minutes for the incident status to be updated to **Resolved**.

See Also

Managing Problems

How to Link an Incident or Change Request to a Problem Record

In System Center 2012 – Service Manager, you can use the following procedure to link an incident or change request to a problem record if you created a problem record without linking it to an existing incident or change request.

To link an incident or change request to a problem record

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Problem Management**, and then click **Active Problems**.
3. In the **Active Problems** view, double-click a problem record. For example, double-click the **Outlook E-mail Restricted Permissions** problem record.
4. In the problem form, click the **Related Items** tab.

5. Under **Work Items**, click **Add**.
6. In the **Select objects** dialog box, either select a work item or search for and select one or more work items to link to the problem record. Click **Add**, and then click **OK**.
7. Click **OK** to close the form.

To validate the link

- In the **Active Problems** view, open the problem record to which you linked a work item, click the **Related Items** tab, and then verify that the items you linked appear under **Work Items**.

See Also

Managing Problems

Managing Changes and Activities in System Center 2012 - Service Manager

Information Technology (IT) departments must manage changes to their IT environment and the risk associated with such changes. The change management features in System Center 2012 – Service Manager help you manage change by providing repeatable, predictable, and measured processes to implement change.

The topics in this section are organized according to common change management scenarios. Even though the sample scenarios refer to a fictitious organization, Woodgrove Bank, the scenarios and steps are based on real use, and they describe how to use the change and activity management features in Service Manager.

Change and Activity Topics

- Sample Scenario: Managing Changes and Activities

  Describes the scenarios that involve change requests and activities in Service Manager.
- Initiating and Classifying a Change Request

  Describes how change requests are started and classified and how to add items and activities to change requests.
- Approving and Modifying Change Requests

  Describes how to modify change requests by adding change details and change reviewers. Also describes how to approve a review activity.
- Suspending and Resuming a Change Request

  Describes how to pause, resume, and unblock a failed change request.
- Implementing and Closing a Change Request

  Describes how to complete manual activities to track tasks, how to close a change request after you finalize the changes, and how to notify users.

Other Resources for This Component

- TechNet Library main page for **System Center Service Manager 2012**
- Planning Guide for System Center 2012 - Service Manager
- Administrator's Guide for System Center 2012 - Service Manager

Sample Scenario: Managing Changes and Activities

This sample scenario for System Center 2012 – Service Manager helps you achieve your goal of managing changes and activities by using multiple scenarios end to end. You can think of this sample scenario as a case study that helps put the individual scenarios and procedures in context.

Scenarios for Managing Changes and Activities

Scenario	Description
Initiating and Classifying a Change Request	Describes how change requests are started and classified. Also describes how to add items and activities to change requests.
Approving and Modifying Change Requests	Describes how to modify change requests by adding change details and change reviewers. Also describes how to approve a review activity.
Suspending and Resuming a Change Request	Describes how to pause and resume a change request.
Implementing and Closing a Change Request	Describes how to complete manual activities to track tasks, how to close a change request after you finalize the changes, and how to notify users.

Initiating and Classifying Change Requests

In the scenario that encompasses initiating and classifying a change request, Julia, the messaging support analyst, wants to propose and track a change. To do this, she creates a change request to capture information that she and others will use to evaluate, plan, develop, test, deploy, and assess changes. Julia starts by initiating the change request and then identifying its priority and category.

In incident management scenarios, Phil created an incident in which a user had a messaging problem, and he completed an initial investigation of the problem. In this scenario, Julia continues to investigate the same incident. She verifies that the cause is a known issue and that Microsoft Exchange Server 2010 SP1 fixes it. She also determines that all Exchange servers

need the service pack, not just a single server. Next, Julia views the service map for the Exchange service configuration item that requires the service pack, and she opens a change request from the service's configuration item form. Lastly, Julia attaches a saved screen shot to the change request, which might help later with the change request review.

After the change request is created, the change reviewers at Woodgrove Bank must approve the change request, and the change implementers must complete the actions that are required for the change. These review and implementation steps are defined in the change request as a set of review activities and manual activities.

Approving Change Requests

In the scenario that encompasses approving a change request, Garret wants to enforce the Woodgrove Bank business process of requiring approval of any IT infrastructure changes before the changes are deployed. He wants to enforce this business process by using Service Manager to associate review activities for a change request. By requiring approval, the change request is implemented only after decision makers at Woodgrove Bank agree that the change is necessary. Garret can set up various review methods, such as unanimous voting, percentage of positive votes, or automatic approval.

The procedures that are related to this scenario describe a change to Woodgrove Bank's IT infrastructure that is approved before deployment.

Suspending and Resuming Change Requests

During the course of reviewing the readiness of a change request, Garret occasionally wants to put a change request on hold and then later resume that change request. For example, Julia previously created a change request. That change request depends on the additional work of an external team. Garret wants to put that change request on hold until the external team completes its work. Garret will resume the change request after the external team's work is complete. Garret also wants to occasionally unblock failed change requests.

Implementing and Closing Change Requests

After changes to Garret's IT infrastructure are tested and approved for deployment, his final step is to finish any remaining manual activities that are associated with the change request. A manual activity must be designated as either completed or failed. When all manual activities are completed, the change request is automatically set as completed, and it appears in the **Change Requests: Completed** view. If a manual activity fails, the change request is automatically set as failed, and it appears in the **Change Requests: Failed** view. When the change request appears in either view, Garret can close the change request. After a change request has been closed, it cannot be reopened.

In the scenario that encompasses implementing and closing change requests, Aaron completes a warranty review manual activity. Next, Garret sets the change request's remaining manual activities to **Completed**, and closes the change request. Garret opens a second existing change

request, sets the post-implementation manual activity to **Failed**, and then closes that change request.

See Also

Managing Changes and Activities in System Center 2012 - Service Manager

Initiating and Classifying a Change Request

The procedures in this section describe how to initiate and classify a change request in System Center 2012 – Service Manager from start to finish.

For a detailed description of the complete scenario for initiating and classifying a change request, see Sample Scenario: Managing Changes and Activities.

A change request normally results in a change to a configuration item. Therefore, it is important to understand the difference between a related item and a linked or affected item. A related item indicates that an association exists between the change request and a configuration item or other change requests. In other words, the change request might affect the related item or it might not. An affected or linked item indicates that the change request is tied directly to the item and that the change will affect the item itself.

Complete the following steps to initiate and classify a change request.

Task	Description
Step 1: How to Create a New Change Request	Describes how to create a new change request for a service to modify server infrastructure.
Step 2: How to Add Related Items to a Change Request	Describes how to add items, such as files, to a change request.
Step 3: How to Add Manual Activities to a Change Request	Describes how to add a manual activity to a change request to manage tasks.
Step 4: How to Add Dependent Activities to a Change Request for Release Records	Describes how to add a dependent activity to a change request for a release record.

See Also

Managing Changes and Activities in System Center 2012 - Service Manager

How to Create a New Change Request

You can use the following procedures in System Center 2012 – Service Manager to create a change request for servers that are part of a service and then validate the creation of the change

request. First, you view items from the service dependency view. Then, you navigate to the configuration items and open a change request template. Lastly, you assess the priority, impact, and risk level of the request. Although you create the change request from a service dependency view, you can also create a new change request from other places in Service Manager.

Note

IDs that are assigned to change requests and incidents are not created in sequence. However, newer change requests and incidents are assigned IDs with a higher number than ones created previously.

To create a change request

1. In the Service Manager console, click **Configuration Items**.
2. In the **Configuration Items** pane, expand **Business Services**, and then click **All Business Services**.
3. In the **All Business Services** pane, double-click the service. For example, double-click **IT Messaging Service**.
4. In the dialog box that opens, click the **Service Dependents** tab.
5. In the **Expand to** list, click **Level 1**, and then view the items in the list. Notice the server names. For example, **Exchange01.woodgrove.com** and **Exchange02.woodgrove.com** appear in the list.
6. In the **Service Dependents** list, select a computer, and then click **Open**. For example, select and open **Exchange01.woodgrove.com**.
7. In the computer form, click **Create Related Change Request** under **Tasks**.
8. In the **Select Template** dialog box, click a template, and then click **OK**. For example, click **Changes to messaging infrastructure template**.
9. In the **Title** box, type a name for the change request. For example, type **Apply Exchange Server 2010 Service Pack 1**. Notice that various values in the form are populated with information from the change request template.
10. In the **Description** and **Reason** fields, type a description and the reason for the change request. For example, type **Apply Exchange Server 2010 Service Pack 1 to these servers** in the **Description** field, and type **The service pack fixes the problem that these servers have** in the **Reason** field.
11. In the **Assigned To** field, enter the name of the person to whom you want to assign the change request. For example, type **Aaron Lee**.
12. Specify the priority, impact, and risk. For example, In the **Priority** list, select **Medium**. In the **Impact** list, select **Standard**. In the **Risk** list, click **Medium**.
13. In the **Config Items To Change** list, make sure that one server is listed, and then click **Add**.
14. In the **Select Objects** dialog box, select another item to add to the change request, and then click **Add**. For example, select **Exchange02.woodgrove.com**, and then click **OK**.
15. Click **OK** to close the change request form.

To validate the creation of a change request

1. Open the service that contains the items for which you created the change request, and then click the **Service Dependents** tab.
2. In the **Service Components** list, notice that the two servers you opened the change request for are marked with **YES** under the **Affected By Change** column.
3. Click **Cancel** to close the service.

See Also

Initiating and Classifying a Change Request

How to Add Related Items to a Change Request

In System Center 2012 – Service Manager, you can use the following procedures to add related items to a change request and then validate the addition of the items. You can add related items, such as configuration items, incidents, other change requests, files, and knowledge articles. When you add files, such as saved screen shots, saved written procedures, and knowledge articles, reviewers and implementers can more easily review, approve, and implement the change.

To add files to any work item, including change requests, you must first enable the appropriate option. For more information, see How to Configure General Change Settings in the Service Manager Administrator's Guide.

To add related items to a change request

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Change Management**, and then click **All Change Requests**.
3. In the **All Change Requests** pane, double-click the change request to which you want to add an item.
4. Click the **Related Items** tab.
5. On the **Related Items** tab under **Attached Files**, click **Add** to attach a file to the change request.

   Note
   You might need to maximize the form to view buttons on the tab.
6. Under **Knowledge Articles**, click **Add** to attach a knowledge article to the change request.
7. Click **OK**.

To validate that you added related items to a change request

- To verify that the file and knowledge articles were attached to the change request, reopen the change request, and then click the **Related Items** tab.

See Also

Initiating and Classifying a Change Request

How to Add Manual Activities to a Change Request

In System Center 2012 – Service Manager, you can use the following procedures to add a manual activity and then assign it to yourself and then validate that the manual activity was added. For example, when you investigate a new change request, you might want to add a manual activity to the change request. This manual activity could be any task that is not defined in the change request template that was used to create the change request.

Note

You cannot delete an activity in a change request if the change request is in progress, however you can skip the activity or put the change request on hold and then delete the activity.

To add a manual activity

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Change Management**, and then click **All Change Requests**.
3. Double-click the change request to which you want to add a manual activity. For example, double-click **Apply Exchange Server 2010 Service Pack 1**.
4. Click the **Activities** tab, and then click **Add**. In the **Select Template** dialog box, click **Default Manual Activity**, and then click **OK**.
5. In the **Title** box, type a name that describes the manual activity. For example, type **Warranty Review**.
6. In the **Description** box, type a description of the manual activity. For example, type **Verify that the server is still under warranty before approval**.
7. Under **Activity Implementer**, click the ellipsis button (…).
8. In the **Select User** dialog box, select the name of the person who will perform the manual activity, and then click **OK**. For example, select **Aaron Lee**.
9. Click **OK** to update the changes to the manual activity.
10. Click **OK** to update the change request and to close the form.

To validate that the manual activity was added

- Reopen the change request, and then click the **Activities** tab to view the manual activity that you added.

See Also

Initiating and Classifying a Change Request

How to Add Dependent Activities to a Change Request for Release Records

In System Center 2012 – Service Manager, you can use the following procedures to add a dependent activity to an existing change request, which is used as part of the release management process. Although you can add dependent activities to work items, such as release records and service requests, the primary purpose of a dependent activity is for use as a mechanism to associate a change request with a release record. Specifically, a manual activity in a release record is linked to the dependent activity in a change request. When it is completed, the dependent activity indicates that the release management process is complete for the change request.

If you intend to use release management as part of the standard processes in your organization, consider adding dependent activities to change request templates. For more information about creating change request templates, see How to Create Change Request Templates.

To add a dependent activity to a change request

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Change Management**, and then click **All Change Requests**.
3. Double-click the change request to which you want to add a dependent activity. For example, double-click **Apply Exchange Server 2010 Service Pack 1**.
4. Click the **Activities** tab, and then click **Add**. In the **Select Template** dialog box, click **Default Dependent Activity**, and then click **OK**.
5. In the **Title** box, type a name that describes the dependent activity. For example, type **Exchange Server 2010 SP1 - Deploy, Test, and Verify** .
6. In the **Description** box, type a description of the dependent activity. For example, type **Verify that the service pack is deployed, tested, and verified successful**.
7. Under **Owner**, click the ellipsis button (…).
8. In the **Select User** dialog box, select the name of the person who has overall responsibility for the dependent activity, and then click **OK**.
9. Under **Assigned To**, click the ellipsis button (…).
10. In the **Select User** dialog box, select the name of the person who will perform the dependent activity, and then click **OK**. For example, select **Aaron Lee**.
11. As an option, specify scheduling information on the **Scheduling** tab.
12. Click **OK** to update the changes to the dependent activity.
13. Click **OK** to update the change request and to close the form.

To validate that the dependent activity was added

- Reopen the change request, and then click the **Activities** tab to view the dependent activity that you added.

See Also

How to Create Change Request Templates

How to Choose Changes to Deploy

Approving and Modifying Change Requests

The procedures in this section describe how to approve a change request in System Center 2012 – Service Manager.

For a detailed description of the complete scenario for approving a change request, see Sample Scenario: Managing Changes and Activities.

Complete the following steps to approve or modify a change request.

Task	Description
Step 1: How to Edit a Change Request	Describes how to edit a change request to add or revise details.
Step 2: How to Add a Change Reviewer	Describes how to add a change reviewer to a change request.
Step 3: How to Approve a Review Activity Using the Console	Describes how to approve a review activity for a change request.
Step 4: How to Send Automated Activity and Change Request Notifications	Describes how to notify users when they have an activity that requires approval or when a change request is closed.

How to Edit a Change Request

In System Center 2012 – Service Manager, you can use the following procedures to edit a change request and then validate the edit. For example, you might want to change the priority of an existing change request from medium to high.

Note
You cannot delete an activity in a change request if the change request is in progress, however you can skip the activity or put the change request on hold and then delete the activity.

To edit a change request

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Change Management**, and then click **All Change Requests**.
3. Double-click a change request. For example, double-click **Apply Exchange Server 2010 Service Pack 1**.

4. Make the change that you want. For example, if you want to change the priority to high, select **High** in the **Priority** list. Or, type new text in the **Description** box.
5. Click **OK** to update the change request and to close it.

To validate an edited change request

1. Double-click the change request that you updated.
2. Verify that your changes are displayed in the change request form.

See Also

Approving and Modifying Change Requests

How to Add a Change Reviewer

In System Center 2012 – Service Manager, you can use the following procedures to add a change reviewer for an existing change request and then validate that the reviewer was added. You can select who reviews change requests in a way that supports your business processes. For example, if a change affects a process for which certain people are responsible, you can give those people the ability to approve change requests that affect the process.

To add a change reviewer

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Work Items**, click **Change Management**, and then click **All Change Requests**.
3. Double-click a change request to open it. For example, double-click **Apply Exchange Server 2010 Service Pack 1**.
4. Click the **Activities** tab to view the list of manual and review activities.
5. Double-click the activity to which you want to add a reviewer. The activity must have a status of **In Progress** or **Pending**, and in the ID column, the activity must also have the **RA** prefix or the prefix you defined for review activities.
6. In the dialog box that appears, click **Add**, type the name of a reviewer, select **Must Vote**, and then click **OK**. For example, type **Aaron Lee**.
7. Click **OK** to close the dialog box, and then click **OK** to update the change request and to close the form.

To validate that a reviewer was added

1. Double-click the change request to which you added a reviewer. For example, double-click **Apply Exchange Server 2010 Service Pack 1**.
2. Click the **Activities** tab, and then double-click the activity to which you added a reviewer.
3. Verify that the reviewer was added.

See Also

Approving and Modifying Change Requests

How to Approve a Review Activity Using the Console

In System Center 2012 – Service Manager, you can use the following procedures to approve a review activity in the Service Manager console and then validate the approval. In many cases, multiple people or groups must vote to approve a single review activity before its approval is final.

Note
Users can only approve or reject the activities that are assigned to them.

To approve a review activity for a change request

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Work Items**, expand **Activity Management**, expand **Review Activities**, and then click **In-Progress Activities**.
3. Select a review activity. For example, select the **Messaging Infrastructure Request Approval**.
4. In the **Tasks** pane, click **Approve**.
5. In the **Comments** dialog box, type any comments that you have for the approval or rejection, and then click **OK**.

To validate review activity approval

- If all the reviewers approved the activity, the activity does not appear in the **In-Progress Activities** view.
- If an activity is still in progress, it requires approval from other reviewers. Click **In-Progress Activities**, and then open the activity to view your voting status.

See Also

Approving and Modifying Change Requests

Suspending and Resuming a Change Request

The procedures in this section describe how to suspend and resume a change request in System Center 2012 – Service Manager.

For a detailed description of the complete scenario for suspending and resuming a change request, see Sample Scenario: Managing Changes and Activities.

Complete the following steps to suspend or resume a change request.

Task	Description
Step 1: How to Put a Change Request on Hold	Describes how to put a change request on hold indefinitely.
Step 2: How to Resume a Change Request	Describes how to resume a change request that was put on hold.
Optional step: How to Unblock a Failed Change Request	Describes how to unblock a failed change request.

See Also

Managing Changes and Activities in System Center 2012 - Service Manager

How to Put a Change Request on Hold

You can use the following procedures to put a change request on hold in System Center 2012 – Service Manager and then validate that the change request is on hold. For example, you might need to put a change request on hold if an external team needs to complete a manual activity.

To put a change request on hold

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Work Items**, expand **Change Management**, and then click **Change Requests: Manual Activity In Progress**.
3. Select a change request to put on hold. For example, select **Apply Exchange Server 2010 Service Pack 1**.
4. In the **Tasks** pane, click **Put On Hold**.
5. In the **Comments** dialog box, type a note that indicates why the change request was put on hold, and then click **OK**.

To validate that the change request is on hold

- Click the **Change Requests: On Hold** view to ensure that the change request has been put on hold.

See Also

Suspending and Resuming a Change Request

How to Resume a Change Request

You can use the following procedures to resume a change request that was put on hold in System Center 2012 – Service Manager and then validate that the change request was resumed. For example, you might need to resume a change request after an external team has completed a manual activity.

To resume a change request

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Work Items**, expand **Change Management**, and then click **Change Requests: On Hold**.
3. Select a change request. For example, select **Apply Exchange Server 2010 Service Pack 1**.
4. In the **Tasks** pane, click **Resume**.
5. In the **Comments** dialog box, type a comment, and then click **OK**.

To validate the change request was resumed

- If the current activity for a change request is a review activity, click the **Change Requests: In Review** view to ensure that the change request was resumed.
- If the current activity for a change request is a manual activity, click the **Change Requests: Manual Activity In Progress** view to ensure that the change request was resumed.

See Also

Suspending and Resuming a Change Request

How to Unblock a Failed Change Request

In System Center 2012 – Service Manager, you can use the following procedures to unblock a failed change request and then validate that the change request is unblocked. For example, you might need to unblock an activity of a change request that a review board or other review body has failed. Unblocking the change request resets the change request so that the change owner can provide more information.

To unblock a failed change request

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Work Items**, expand **Change Management**, and then click **Change Requests: Failed**.
3. Select a change request. For example, select **Apply Exchange Server 2010 Service Pack 1**.
4. In the **Tasks** pane, click **Return To Activity**.
5. In the **Return to Activity** dialog box, select the failed activity, type a comment in the **Comments** box, and then click **OK**.

To validate the change request is unblocked

- If the failed activity for a change request is a review activity, click the **Change Requests: In Review** view to ensure that the change request is unblocked.

- If the failed activity for a change request is a manual activity, click the **Change Requests: Manual Activity In Progress** view to ensure that the change request is unblocked.

See Also

Suspending and Resuming a Change Request

Implementing and Closing a Change Request

The procedures in this section describe how to implement and close a change request in System Center 2012 – Service Manager.

For a detailed description of the complete scenario for implementing and closing a change request, see Sample Scenario: Managing Changes and Activities.

Complete the following steps to implement and close a change request.

Task	Description
Step 1: How to Complete or Fail a Manual Activity	Describes how to complete or fail a manual activity to track tasks.
Step 2: How to Close a Change Request	Describes how to close a change request after changes are finalized or after the change request fails.
Optional Step: How to Send Automated Activity and Change Request Notifications	Describes how to send automatic notifications for activities and change requests.

See Also

Managing Changes and Activities in System Center 2012 - Service Manager

How to Complete or Fail a Manual Activity

You can use the following procedures to complete or fail a manual activity in System Center 2012 – Service Manager and then validate that the manual activity is complete or failed.

To successfully complete a manual activity

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Work Items**, expand **Activity Management**, expand **Manual Activities**, and then click **In-Progress Activities**.
3. Select the manual activity.

4. In the **Tasks** pane, click **Mark as Completed**.
5. In the **Comments** box, type a comment, and then click **OK**.

To fail a manual activity

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Work Items**, expand **Activity Management**, expand **Manual Activities**, and then click **In-Progress Activities**.
3. Select the manual activity.
4. In the **Tasks** pane, click **Mark as Failed**.
5. In the **Comments** box, type a comment, and then click **OK**. For example, type **The post-implementation analysis indicates that the new hardware does not adequately meet our needs and has failed the review**.

To validate that a manual activity is complete or failed

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Work Items**, expand **Activity Management**, expand **Manual Activities**, and then click **All Activities**.
3. Verify that the manual activity is set to either **Completed** or **Failed**.

See Also

Implementing and Closing a Change Request

How to Close a Change Request

In System Center 2012 – Service Manager, you can use the following procedures to permanently close a successful change request or a failed change request and then validate the closure of the change request. You cannot reopen a closed change request.

Note

If an end user cancels a software request before the software is deployed to the end user's computer, the associated change request might reflect the **In Progress** status indefinitely. If this occurs, cancel the request and then close it.

To close a successful change request

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Work Items**, expand **Change Management**, and then click **Change Requests: Completed**.
3. Select the change request.
4. In the **Tasks** pane, click **Close**.
5. In the **Comment** box, type a comment, and then click **OK**.

To close a failed change request

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, click **Change Management**, and then click **Change Requests: Failed**.
3. Select the change request.
4. In the **Tasks** pane, click **Close**.
5. In the **Comments** box, type a comment, and then click **OK**.

To validate the closure of a change request

- Click the **Change Requests: Closed** view to ensure that the closed change request appears in the list.

See Also

Implementing and Closing a Change Request

How to Send Automated Activity and Change Request Notifications

In System Center 2012 – Service Manager, you can use the following procedure to notify reviewers that an activity is available for review. You can use the second procedure to notify users that a change request has been closed.

Note
Only administrators can configure workflow notifications.

To notify reviewers that an activity is available for review

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Workflows**, and then click **Configuration**.
3. Select **Activity Event Workflow Configuration**, and then click **Configure Workflow Rules** in the **Tasks** pane.
4. In the **Select a Class** dialog box, select **Review Activity**, and then click **OK**.
5. In the **Configure Workflows** dialog box, click **Add**.
6. In the Configure Workflows for Objects of Class Review Activity Wizard, click **Next** on the **Before You Begin** page.
7. On the **Workflow Information** page, type a name and a description for the workflow. In the **Check for events** list, ensure that the **When an object is updated** item is selected, and then click **Next**.
8. On the **Specify Criteria** page, select the **Changed From** tab. Under **Available Properties**, select **Status**, and then click **Add**.
9. Under **Criteria**, select **Pending**, and then select the **Changed To** tab. Under **Available Properties**, select **Status**, and then click **Add**.

10. Under **Criteria**, select **In Progress**, and then click **Next**.
11. On the **Apply Template** page, clear the **Apply the selected template** check box, and then click **Next**.
12. On the **Select People to Notify** page, select the **Enable notification**.
13. Under **User**, select **Assigned To User**.
14. Under **E-mail Template**, if you cannot select a template, click **Create E-Mail Template**. Otherwise, select an email notification template to apply.
15. If you are creating an email notification template, complete the Create E-Mail Notification Template Wizard.
16. After you have selected an email template, click **Add**, ensure that **Reviewers** appears under the **User** column, and then click **Next**.
17. On the **Summary** page, review the summary information, and then click **Create**.
18. On the **Completion** page, click **Close**.

To notify users that a change request has been closed

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Workflows**, and then click **Configuration**.
3. Select **Change Request Event Workflow Configuration**, and then click **Configure Workflow Rules** in the **Tasks** pane.
4. In the **Configure Workflows** dialog box, click **Add**.
5. In the Configure Workflows for Objects of Class Change Request Wizard, click **Next** on the **Before You Begin** page.
6. On the **Workflow Information** page, type a name and a description for the workflow. In the **Check for events** list, ensure that the **When an object is updated** item is selected, and then click **Next**.
7. On the **Specify Criteria** page, select the **Changed From** tab. Under **Available Properties**, select **Status**, and then click **Add**.
8. Under **Criteria**, select **Completed**.
9. Click the **Changed To** tab.
10. Under **Available Properties**, select **Status**, and then click **Add**.
11. Under **Criteria**, select **Closed**, and then click **Next**.
12. On the **Apply Template** page, clear the **Apply the selected template** check box, and then click **Next**.
13. On the **Select People to Notify** page, select the **Enable notification** check box.
14. Under **User**, select **Assigned To User**. Under **Template**, select **Assigned To User Notification Template**, click **Add**, and then click **Next**.
15. On the **Summary** page, review the summary information, and then click **Create**.
16. On the **Completion** page, click **Close**.

To validate receipt of the notification

- The reviewer of the review activity or the user that the change request is assigned to receives an email message that indicates that a new review activity requires approval or that the change request was closed.

See Also

Implementing and Closing a Change Request

Managing Service Requests in System Center 2012 - Service Manager

Service requests are requests for existing, preauthorized services and features that System Center 2012 – Service Manager can manage as a type of work item. Service requests help you deliver a service request fulfillment solution to align your business and information technology (IT) strategy and ensure that IT services provide business value. Service requests are tightly coupled with the service catalog, and together they help add value to your IT organization by clearly managing service requests. This can help lead to a better understanding of the supply and demand for services and a more efficient and transparent customer service provided by your IT organization.

Service request functionality in Service Manager is based on Microsoft Operations Framework (MOF) 4.0 and Information Technology Infrastructure Library (ITIL) V3 processes in order to align with industry standards. While not all functionality was completed with strict adherence to those standards, the following items are included in service request fulfillment in Service Manager:

- Processes to record, track, and process service requests
- Service fulfillment workflow automation
- A consistent interface that helps Service Manager administrators identify and map their existing IT services
- Support for situations where cost tracking and service level agreements (SLAs) are required
- Time-to-resolution tracking through SLA integration

Service request topics

- How to Create a Service Request Using the Service Manager Console

  Describes how to create a service request from the Service Manager console.
- How to Approve and Complete a Service Request Using Activities

  Describes how to approve and complete a service request using activities.
- How to Cancel a Service Request

  Describes how to cancel a service request.
- How to Close a Service Request

  Describes how to close a service request after it has been completed.
- How to View Service Request Details

  Describes how to view the details of a service request.

- How to Duplicate or Hide Views for Service Requests

  Describes how to duplicate or hide service request views.

How to Create a Service Request Using the Service Manager Console

End users often create service requests in System Center 2012 – Service Manager by accessing the service catalog from the Self-Service Portal or by submitting email requests. However, you can use the following procedure to manually create a new service request in the Service Manager console. For example, you might want to manually create a new service request if a user contacts the help desk by telephone. In the following example, you can update any information that you want to as you complete the form.

To create a new service request using the Service Manager console

1. In the Service Manager console, expand **Work Items**, expand **Service Request Fulfillment**, and then select a subnode, such as **Assigned To Me**.
2. In the **Tasks** pane under **Service Request Fulfillment**, click **Create Service Request from Template**.
3. Under **Templates** in the **Select Template** dialog box, select a template, and then click **OK** to open a new service request and apply the template. For example, select **Request Membership to Group**.
4. In the **<SR<ID>: ServiceRequestName>** form in the **Affected user** box, select the user who submitted the service request. For example, select **Joe Andreshak**.
5. Optionally, in the **Alternate Contact Method** box, enter additional contact information for the affected user.
6. In the **Title** box, type a title for the service request or update one if it has been populated by a template. For example, type **Request Membership to Active Directory Group – Joe Andreshak**.
7. In the **Description** box, enter a description for this service request.
8. In the **Urgency** and **Priority** lists, select one for each if they have not been populated by a template.
9. In the **Source** list, select **Portal** if it has not been populated by a template.
10. In the **Assigned to** box, choose an analyst to assign the service request to. For example, assign the service request to yourself.
11. Click **OK** to save and close the service request form.

See Also

Managing Service Requests in System Center 2012 - Service Manager

How to Approve and Complete a Service Request Using Activities

In System Center 2012 – Service Manager, you can use the following procedures to approve a review activity and complete a manual activity for a service request in the Service Manager console. In many cases, multiple people or groups must vote to approve a single review activity before its approval is final. After approval, a service request might need a manual activity completed to verify that the service was provided to the requesting user and to close the service request.

Note

Users can only approve or reject and close the activities that are assigned to them.

To approve a review activity for a service request

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Work Items**, expand **Activity Management**, expand **Review Activities**, and then click **Activities Assigned to Me**.
3. Select a review activity. For example, select the **Approval for the user requesting membership to an Active Directory group**.
4. In the **Tasks** pane, click **Approve**.
5. In the **Comments** dialog box, type any comments that you have for the approval or rejection, and then click **OK**.

To complete a manual activity for a service request

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Work Items**, expand **Activity Management**, expand **Manual Activities**, and then click **Activities Assigned to Me**.
3. Select a manual activity. For example, select the **Approval for the user requesting membership to an Active Directory group**.
4. In the **Tasks** pane, click **Mark as Completed**.
5. In the **Comments** dialog box, type any comments that you have for the manual activity, and then click **OK**. For example, type **The Active Directory administrator has added this user to the groups requested**.

See Also

Managing Service Requests in System Center 2012 - Service Manager

How to Cancel a Service Request

Occasionally, you might need to cancel a service request in System Center 2012 – Service Manager. You can accomplish this by using the Service Manager console. You can use the following procedure to cancel a service request.

To cancel a service request

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Work Items**, expand **Service Request Fulfillment**, and then click **All Open Service Requests** or some other service request view.
3. Select the service request that you want to cancel. For example, select **Request Membership to Active Directory Group – Joe Andreshak**.
4. In the **Tasks** pane, click **Cancel**.
5. In the **Comments** dialog box, type any comments that you have for cancelling the service request, and then click **OK**. For example, type **This request was a duplicate and is not needed**.

See Also

Managing Service Requests in System Center 2012 - Service Manager

How to Close a Service Request

In System Center 2012 – Service Manager, after all the review activities are approved or rejected and any manual activities are completed, you can close a service request in the Service Manager console. You can use the following procedure to close a service request.

To close a service request

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Work Items**, expand **Service Request Fulfillment**, and then click **Completed Service Requests**.
3. Select a completed service request. For example, select **Request Membership to Active Directory Group – Joe Andreshak**.
4. In the **Tasks** pane, click **Close**.
5. In the **Comments** dialog box, type any comments that you have for the closure, and then click **OK**.

See Also

Managing Service Requests in System Center 2012 - Service Manager

How to Edit a Service Request

In System Center 2012 – Service Manager, service requests are often created by end users by accessing the service catalog from the Self-Service Portal or by submitting email requests, and you might need to update a service request with additional information. You can use the following procedure to update a service request in the Service Manager console.

To edit a service request using the Service Manager console

1. In the Service Manager console, expand **Work Items**, expand **Service Request Fulfillment**, and then select a subnode, such as **Assigned To Me**.
2. In the list, select a service request to edit, and then in the **Tasks** pane under **<Service Request ID – Service Request Name>**, click **Edit**. For example, select **Request Membership to Active Directory Group**.
3. In the **<SR<ID>: ServiceRequestName>** form in the **Affected user** box, select the user who submitted the service request. For example, select **Joe Andreshak**.
4. Update any information in form as necessary, and then click **OK** to close the form.

See Also

Managing Service Requests in System Center 2012 - Service Manager

How to View Service Request Details

You can use the following procedure to view the details of a service request in the Service Manager console in System Center 2012 – Service Manager.

To view service request details

1. In the Service Manager console, expand **Work Items**, expand **Service Request Fulfillment**, and then select a subnode, such as **Assigned To Me**.
2. In the list, select a service request to view, and then in the **Tasks** pane under **<Service Request ID – Service Request Name>**, click **Edit**. For example, select **Request Membership to Active Directory Group**.
3. Review information in service request form, and then click **OK** to close the form.

See Also

Managing Service Requests in System Center 2012 - Service Manager

How to Duplicate or Hide Views for Service Requests

You can use the following procedures to duplicate or hide a service request view in the Service Manager console in System Center 2012 – Service Manager. You can use the **Unhide** task if you want to show the hidden view. You can modify the title or other view criteria using the **Edit View** task.

To duplicate a service request view

1. In the Service Manager console, expand **Work Items**, expand **Service Request Fulfillment**, and then select a subnode. For example, click **Assigned To Me**.
2. In the **Tasks** pane, click **Duplicate View**.

3. In the **Select management pack** dialog box, select a management pack to add the new view information to or create a new one, and then click **OK**.
4. Optionally, you can use the **Edit View** task to edit the new view, titled **<View Name – Copy>**, to change the view name or other criteria of the view.
5. In the **Work Items** pane, locate the new duplicate view that was created. For example, click **Assigned To Me – Copy**.
6. In the **Tasks** pane, click **Edit View**.
7. In the **Edit Assigned To Me –Copy** dialog box, click **Criteria**.
8. In the **Criteria** area, next to **Assigned To User ID**, in the text box after **equals**, type **[me]**, and then click **OK**.

To hide a service request view

1. In the Service Manager console, expand **Work Items**, expand **Service Request Fulfillment**, and then select a subnode, such as **Closed Service Requests**.
2. In the **Tasks** pane, click **Hide View**.

See Also

Managing Service Requests in System Center 2012 - Service Manager

Managing Release Records in System Center 2012 - Service Manager

The key to understanding release management in System Center 2012 – Service Manager is realizing how objects, such as change requests and activities, interact—facilitated by release records. Release management uses parent and child release records to help automate the process of updating the status of change requests and the status propagation between parallel activities, sequential activities, and the activities within them.

Often, there are multiple parts of a project, and there is more than one change request that can be deployed at different times that can affect a project. The overall goal of change management and release management is to protect the production environment from unnecessary changes, so that every change to it must first be approved. Release management deals only with approved changes.

When changes are approved, it is up to release management processes to group the changes together, schedule them, and develop them. Depending on the nature of the change, sometimes development can occur in the project phase and other times it can occur in the release management phase. Regardless of when development occurs, release management ensures that changes are tested and that they are safe to deploy. Additionally, release management is used to evaluate and package various releases together to help minimize infrastructure downtime. The package of releases is tested together to verify that no technical or resource conflicts exist that could affect infrastructure availability. Multiple changes are bundled together and planned for deployment together during the next scheduled release or maintenance window. The function of

release management using release records is to consolidate multiple changes and deploy them in the safest and most efficient method possible.

After changes have been bundled together, a release manager defines the sequence of actions needed for a release with release activities. For example, different changes might have infrastructure update tasks, database modification tasks, tasks to update applications, or other individual tasks. In some cases, it might make sense to group some tasks together with infrastructure updates or perform database updates or application updates. Some tasks can be deployed simultaneously, while other tasks must be deployed sequentially or separately.

Managing Release Records in Service Manager

The release manager or other person responsible for the release defines the sequence of actions with a release record. The release record might depict the deployment sequence of different changes using parallel activities, sequential activities, and other activities. The release manager can delegate the responsibility for activities to others. When an activity is delegated, the person responsible for the activity can modify the activity and update its status.

When you modify an activity, its status is not immediately updated. There is a delay after until the workflow activates and the activity status is updated. Often, 30 to 60 seconds might elapse before you see the updated status of the activity in the console after you refresh your view of an item. Other dependent activities in the release record might take longer to update. For example, assume that you have a release record containing a dozen activities. If you update an item near the top of the list, it might take 30 seconds to update in the console. Then, the next activity in the release record might automatically get updated 30 seconds later, and so on. Therefore, the update that you originally made might take some time to propagate to all affected activities in the release record.

Parts of Release Records

Because releases are often bundled together, you can group multiple release records together by using a parent-child relationship. Essentially, a parent release record serves as a container for multiple child release records. However, a newly created release record is not a parent release record by default. You must convert a release record to a parent release record in order to add child release records.

Like change requests, release records contain activities for approval and manual actions. In addition, release records can contain parallel and sequential activities. Parallel and sequential activities are containers for other activities, and they define how constituent activities must be implemented—parallel activities can be implemented simultaneously, while other parallel activities are also in progress. Sequential activities must be completed in the order they are organized, one after another.

Release Record Topics

- Sample Scenario: Managing Release Records

This topic is a sample scenario, similar to a case study, that helps put the individual scenarios and procedures in context.

- How to Create a Release Record

  Describes how to create a release record.
- How to Create a Release Record Template

  Describes how to create a release record template.
- Combining Release Records into Parent-Child Groups

  This topic and its subtopics describe how to combine release records into parent-child groups.
- Defining Release Package Configuration Items

  This topic and its subtopics describe how you define release package configuration items.
- How to Create a Template for Parallel and Sequential Activities

  Describes how to create a template for parallel and sequential activities that are used in release records.
- How to Choose Changes to Deploy

  Describes how to review and choose changes to deploy.
- How to Plan Release Activities

  Describes how to plan release activities.
- How to Skip a Failed Activity

  Describes how to skip a failed activity.
- How to Determine Status and Progress for a Change Request in the Release Record

  Describes how to determine the status and progress for a change request that is contained in a release record.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager

Sample Scenario: Managing Release Records

This sample scenario for System Center 2012 – Service Manager helps you achieve your goal of managing release records by using multiple scenarios end to end. You can think of this sample scenario as a case study that helps put the individual scenarios and procedures in context.

Scenarios for Managing Release Records

Scenario	Description
How to Create a Release Record	Describes how to create a release record.
How to Create a Release Record Template	Describes how to create a release record template.
Combining Release Records into Parent-Child Groups	Describes how to combine release records into parent-child groups.
Defining Release Package Configuration Items	Describes how to define release package configuration items.
How to Create a Template for Parallel and Sequential Activities	Describes how to create templates for parallel sequential activities used in release records.
How to Choose Changes to Deploy	Describes how to review and choose changes to deploy.
How to Plan Release Activities	Describes how to plan release activities.
How to Skip a Failed Activity	Describes how to skip a failed activity.
How to Determine Status and Progress for a Change Request in the Release Record	Describes how to determine the status and progress for a change request that is contained in a release record.

Managing Release Records Scenario

Information Technology (IT) managers at Woodgrove Bank administer multiple projects simultaneously. Usually, IT project teams in the organization do not have access to the controlled production environment. Additionally, the preproduction environment is limited with restricted access. The IT organization runs projects, develops financial applications, and develops infrastructure improvements. When it is necessary to modify some part the controlled environment production environment, the IT project team submits change requests asking to update infrastructure, update an application, deploy a product, or implement a set of new processes.

Release management starts when there are approved changes. According to company policies, the changes must be deployed through release management processes. The release manager, Garret, creates a parent release record, and then he drafts a high-level diagram of the release and links high-level activities to a change request. The release activity in a release record is linked to an existing deployment activity in a change request. Garret or a delegated activity designer then adds child release records and new activities as necessary to the release record that detail the steps needed to be completed to deploy the change. This process is repeated for each change request to allow any level of detail needed. Therefore, any number of change requests can be included in the release record, depending on the need of the organization. When a change request is ready for implementation, the change implementer marks corresponding activities as Completed.

Woodgrove Bank normally deploys updates to its production environment, also called a release, once a month. Garret wants to package several releases that he defined in the June release, in the July release, and so on. He defines those releases as parent releases, and he links all network-related and database-related releases into the June parent release, and he links an application-related release into the July parent release. He also adds a new “Test Network with Database Integration” activity into the June release to ensure that both subreleases function together.

The next major release for Woodgrove Bank is a deployment of a new version of its HRWeb web application. HRWeb developers have given the Release Management team a new build of the HRWeb application. The Woodgrove Release Management team evaluates the build in its testing environment, finds a critical problem in the build, and then asks developers to fix the problem and provide a new build. The development team provides a new build, and the Release Management team successfully retests it in the test environment. The build then moves to the preproduction environment, where it is tested and used in the preproduction environment for two weeks. When testing is completed successfully, the build is deployed to the production environment. During this process, Garret creates a new build configuration item, links it to the HRWeb software configuration item, and links the build configuration item to the release record release package. When the last build is deployed into the production environment, Garret updates the version information in the HRWeb software configuration item, and he closes the release record.

At Woodgrove Bank, Garret configures administrative settings for releases, and he creates a parent release record. He also creates templates for parallel and sequential activities. Then, Phil creates release records, based on the templates that Garret created. Phil chooses which changes to deploy, and then he updates release activities by adding, deleting, or modifying them for each release, as necessary. Garret configures notifications for release records to notify users. Garret and Phil can review the status and the progress of change requests for a release whenever they need to.

How to Create a Release Record

The Release Manager creates a release record in System Center 2012 – Service Manager using the following procedure.

To create a release record

1. In the Service Manager console, open the **Work Items** workspace, and in the **Work Items** pane, expand **Release Management**.
2. In the **Tasks** pane, click **Create Release Record**.
3. In the **Select Template** dialog box, select a release record template, and then click **OK** to open it.
4. In the release record form on the **General** tab, enter any necessary information, and then click the **Activities** tab.
5. Modify the default set of release activities that are added from the release record template, if any are present. You can add, delete, or modify sets of activities to the

release record, including the following actions:

- Add activities from the list of existing activity templates.
- Move activities up and down in the order in which they are completed.
- Move activities in the process list, and place them inside container activities.
- Move activities from container activities, and place them anywhere in the process list.
- Delete activities.

6. As you add an activity, the activity form opens. Enter necessary information, and then click **OK** to save the activity.
7. When you have added all the activities you want, click **OK** to save the release record and close it. The release record then appears in the **Release Records: All** view.

See Also

Managing Release Records in System Center 2012 - Service Manager

How to Create a Release Record Template

In System Center 2012 – Service Manager, a release record template is used to create new release records. A release record template can include predefined release activities. When you use a template for new release records, new release records are created faster than when you create them from scratch.

The template author creates a template for release records by completing the following procedure.

To create a release record template

1. In the Service Manager console, open the **Library** workspace, and in the **Library** pane, select **Templates**.
2. In the **Templates** list, select **Default Release Record**, and then in the **Tasks** pane under **Templates**, click **Create Template**.
3. In the **Create Template** dialog box, type a name for the template and a description of what the template applies.
4. Under **Class**, click **Browse**, and in the **Select a Class** box, select **Release Record**, and then click **OK** to close the **Select a Class** box.
5. Click **OK** to close the **Create Template** dialog box, and the New Release Record Template form appears.
6. Enter information in the boxes on the **General** tab, and then click the **Activities** tab.
7. You can add, delete, or modify sets of activities to the release record template, including the following actions:
   - Add activities from the list of existing activity templates.
   - Move activities up and down in the order in which they are completed.
   - Move activities in the process list, and place them inside container activities.

- Move activities from container activities, and place them anywhere in the process list.
- Delete activities.

8. As you add an activity, the activity form opens. Enter necessary information, and then click **OK** to save the activity.
9. When you have added all the activities you want, click **OK** to save the release record template and close it. The release record template then appears in **Templates** list.

See Also

Managing Release Records in System Center 2012 - Service Manager

Combining Release Records into Parent-Child Groups

In System Center 2012 – Service Manager, releases are normally deployed to production environments at intervals you define. For example, you can package several releases into monthly batches. You can define each batch as a parent release, which consolidates and links other smaller project-specific releases into a monthly package. This process can help you verify that all child releases are evaluated together.

Combining Release Records into Parent-Child Group Topics

- How to Promote a Release Record to a Parent Release Record

  Describes how to promote a release record to a parent release record to allow child release record addition.
- How to Demote a Parent Release Record to a Child Release Record

  Describes how to demote a parent release record to a child release record.
- How to Link a Child Release Record to the Current Release Record

  Describes how to link a child release record to the release record that is already open.
- How to Unlink the Current Release Record from a Parent Release Record

  Describes how to unlink a child release record that you have open from its parent release record.
- How to Unlink a Child Release Record from the Current Release Record

  Describes how to unlink a child release record from its parent release record while you have the parent record open.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

How to Promote a Release Record to a Parent Release Record

In System Center 2012 – Service Manager, the Release Manager can promote a release record to parent release record using the following procedure. A parent release record serves as a container for several releases.

The following procedure is performed on a release record that is neither a parent release record nor a child release record.

To promote a release record to a parent release record

1. In the Service Manager console, open the **Work Items** workspace, and in the **Work Items** pane, expand **Release Management**.
2. Select any Release Management view, and then select a release record.
3. In the **Tasks** pane, click **Edit** to open the release record.
4. In the **Tasks** pane, click **Convert or Revert to Parent**.
5. In the **Comments** box, type a comment indicating that you have converted the release record to a parent release record, and then click **OK** to close the **Comments** box.
6. The **Child Items** tab appears in the form where you can add child release records.
7. In the release record form, click **OK** to close it.

See Also

Combining Release Records into Parent-Child Groups

How to Demote a Parent Release Record to a Child Release Record

In System Center 2012 – Service Manager, the Release Manager can demote a parent release record using the following procedure. If a parent release record contains child release records, all the child release records that it contains are unlinked from the parent and are no longer child release records.

The following procedure is performed on a parent release record that may or may not have child release records linked to it.

To demote a parent release record

1. In the Service Manager console, open the **Work Items** workspace, and in the **Work Items** pane, expand **Release Management**.
2. Select any Release Management view that contains a parent release that you want to demote, and then select the release record.
3. In the **Tasks** pane, click **Edit** to open the release record.
4. In the **Tasks** pane, click **Convert or Revert to Parent**.
5. If the release record that you are demoting contains child release records, a message appears stating that all links to child records will be removed. If so, click **OK** to unlink any child release records.
6. In the **Comments** box, type a comment indicating that you have reverted the release

record from a parent release record, and then click **OK** to close the **Comments** box.

7. The **Child Items** tab no longer appears in the form.
8. In the release record form, click **OK** to close it.

See Also

Combining Release Records into Parent-Child Groups

How to Link a Child Release Record to the Current Release Record

In System Center 2012 – Service Manager, the Release Manager can link a child release record while editing a parent release record using the following procedure.

To link a child release record to the current parent release record

1. In the Service Manager console, open the **Work Items** workspace, and in the **Work Items** pane, expand **Release Management**.
2. Select any Release Management view that contains a parent release record where you want link to a child release record.
3. In the **Tasks** pane, click **Edit**, and then in the parent release record form, click the **Child Items** tab.
4. On the **Child Items** tab, click **Add**.
5. In the **Select objects** dialog box, select the release record that you want to link to a parent, and then click **Add**. Click **OK** to close the **Select objects** dialog box.
6. In the parent release record form, click **OK** to close it.

See Also

Combining Release Records into Parent-Child Groups

How to Unlink the Current Release Record from a Parent Release Record

In System Center 2012 – Service Manager, the Release Manager can unlink a child release record using the following procedure.

To unlink the current release record from a parent release record

1. In the Service Manager console, open the **Work Items** workspace, and in the **Work Items** pane, expand **Release Management**.
2. Select any Release Management view that contains a child release record that you want to unlink from its parent release record.
3. In the **Tasks** pane, click **Link or Unlink to Existing Parent Release Record**, and then in the fly-out list, click **Unlink**.
4. In the **Comments** box, type a comment indicating that you have unlinked the child release record from its parent release record, and then click **OK** to close the **Comments** box.

See Also

Combining Release Records into Parent-Child Groups

How to Unlink a Child Release Record from the Current Release Record

In System Center 2012 – Service Manager, the Release Manager can unlink a child release record while editing a parent release record using the following procedure.

To unlink a child release record from the current parent release record

1. In the Service Manager console, open the **Work Items** workspace, and in the **Work Items** pane, expand **Release Management**.
2. Select any Release Management view that contains a parent release record where you want unlink to a child release record.
3. In the **Tasks** pane, click **Edit**, and then in the parent release record form, click the **Child Items** tab.
4. On the **Child Items** tab, select the child release records to unlink, and then click **Remove**.

   Note
   You can select multiple child items by pressing Shift+Click.
5. In the parent release record form, click **OK** to close it.

See Also

Combining Release Records into Parent-Child Groups

Defining Release Package Configuration Items

In System Center 2012 – Service Manager, release packages normally contain a build and an environment that the release is tested with. The topics in this section describe how to build the configuration item parts that are contained in a release package and how they are added to the release package.

Release Package Configuration Item Topics

- How to Create a Build Configuration Item

  Describes how to create a build configuration item that defines the software and version that the build consists of.
- How to Create an Environment Configuration Item

  Describes how to create an environment configuration item that defines the computers, services, and people that the environment consists of.
- How to Add Release Package Information to a Release Record

  Describes how to add release package information, such as a build and environment that defines what the release package consists of.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

How to Create a Build Configuration Item

In System Center 2012 – Service Manager, the release manager can create a build configuration item that defines the software and version that a build consists of by performing the following procedure. After a build is created, it is normally added to the release package of a release record.

To create a build configuration item

1. In the Service Manager console, click **Configuration Items**.
2. In the **Configuration Items** pane, expand **Configuration Items**, and then click **Builds**.
3. In the **Tasks** pane, under **Builds**, click **Create Build**.
4. On the **General** tab in the form, do the following:
   a. In the **Title** box, type a name for the build. For example, for the build that will be used to deploy the new HRWeb software, type **HRWeb July 2011**.
   b. In the **Version** box, type a version number or other designation. For example, type **0.2**.
   c. Click **OK**.
5. On the **Related Items** tab, under **Configuration Items: Computers, Services and People**, click **Add** to associate a software configuration item, and then do the following for each software item that you want to add:
   a. In the **Select objects** dialog box under **Filter by class** list, click the drop-down arrow, and then select **Software Items**.
   b. In the **Available objects** list, select the software configuration item that you want to associate with the build, click **Add**, and then click **OK** to close the **Select objects** dialog box.
6. Click **OK** to close the build form.

See Also

Defining Release Package Configuration Items

How to Create an Environment Configuration Item

In System Center 2012 – Service Manager, the release manager can create an environment configuration item that defines the computers, services, and people that the environment consists of by performing the following procedure. After an environment is created, it is normally added to the release package of a release record.

To create an environment configuration item

1. In the Service Manager console, click **Configuration Items**.
2. In the **Configuration Items** pane, expand **Configuration Items**, and then click **Environments**.
3. In the **Tasks** pane, under **Environments**, click **Create Environment**.
4. On the **General** tab in the form, do the following:
   a. In the **Title** box, type a name for the environment. For example, for the pre-environment that will be used to test the new HRWeb software, type **Environment for HRWeb July 2011**.
   b. Optionally, in other boxes on the tab, type or select information that might help you easily identify the environment that you are creating. For example, set the **Category** to **Pre Production**.
   c. Click **OK**.
5. On the **Related Items** tab, under **Configuration Items: Computers, Services and People**, you can add configuration items that are important to the environment. Examples might include the following:
   - Software
   - Users
   - Computers
6. Click **OK** to close the environment form.

See Also

Defining Release Package Configuration Items

How to Add Release Package Information to a Release Record

In System Center 2012 – Service Manager, the Release Manager can add release package information for a release record using the following procedure. The release package normally contains the build and environment that the release is tested with.

To add release package information to a release record

1. In the Service Manager console, open the **Work Items** workspace, and in the **Work Items** pane, expand **Release Management**.
2. Select any Release Management view that contains a release record where you want to add release package information.
3. In the **Tasks** pane, click **Edit**, and then in the release record form, click the **Release Package** tab.
4. On the **Release Package** tab, under **Configuration Items to Modify**, click **Add**.
5. In the **Select objects** dialog box, select the computer-related configuration items that you want to add to the release package, click **Add**, and then click **OK** to close the **Select objects** dialog box.

6. Under **Affected Services**, click **Add**.
7. In the **Select objects** dialog box, select the business service items that you want to add to the release package and click **Add**, and then click **OK** to close the **Select objects** dialog box.
8. In the release record form, click **OK** to close it.

See Also

Defining Release Package Configuration Items

How to Create a Template for Parallel and Sequential Activities

In System Center 2012 – Service Manager, release record templates for parallel and sequential activities are used to create new activities that contain a collection of predefined activities that should be grouped together to form some kind of process. You can think of parallel and sequential activities as container activities because their primary function is to contain individual activities.

The template author creates a template for a parallel activity by performing the following procedure. Afterward, the same steps are followed to create a template for a sequential activity.

To create a template for a parallel activity

1. In the Service Manager console, open the **Library** workspace, and in the **Library** pane, select **Templates**.
2. In the **Templates** list, select **Default Parallel Activity**, and then in the **Tasks** pane under **Templates**, click **Create Template**.
3. In the **Create Template** dialog box, type a name for the template and a description of what the template applies.
4. Under **Class**, click **Browse**, in the **Select a Class** box, select **Parallel Activity**, and then click **OK** to close the **Select a Class** box.
5. Click **OK** to close the **Create Template** dialog box, and the New Container Activity Template form appears.
6. Enter information in the boxes on the **General** tab, and then click the **Activities** tab.
7. You can add, delete, or modify sets of activities to the parallel activity template, including the following actions:
    a. Add activities from the list of existing activity templates.
    b. Add parallel or sequential activities from the list of existing activity templates.
    c. Move activities up and down in the order in which they are completed.
    d. Move activities in the process list.
    e. Delete activities.
8. As you add an activity, the activity form opens. Enter necessary information, and then click **OK** to save the activity.
9. When you have added all the activities you want, click **OK** to save the parallel activity

template and close it. The parallel activity template then appears in **Templates** list.

10. Repeat this procedure for a sequential activity, replacing instances of “parallel activity” with “sequential activity.”

See Also

Managing Release Records in System Center 2012 - Service Manager

How to Choose Changes to Deploy

In System Center 2012 – Service Manager, the release manager selects approved changes for release by performing the following procedure. Using this process, the release manager links a manual activity in the release record to a dependent activity in a change request and then completes the manual activity in the release record. As a result, this process marks the dependent activity in the change request as completed.

The procedure to create a dependent activity to add it to a change request should already be completed before you proceed. For more information about adding dependent activities to change request, see How to Add Dependent Activities to a Change Request for Release Records.

To choose changes to deploy

1. In the Service Manager console, open the **Work Items** workspace, in the **Work Items** pane, expand **Release Management**, and then select **Release Management**.
2. In the **Work Items** pane, select a view under **Release Management** that displays a release record that comprises changes that are ready for deployment, and then double-click the release record.
3. Click the **Activities** tab.
4. In the list that appears, right-click a manual activity to link a change request dependent activity to, and then select **Link to Change Request Activity**.
5. In the **Select Change Request Activity** dialog box, select the change request to link to, expand it, and then select one or more dependent activities, and then click **OK** twice.

   Tip
   When you have linked the activity, the selected activity shows a linking indicator that resembles a chain icon. The tooltip for the selected activity shows IDs for the linked change request dependent activities.
6. Navigate to **Activity Management**, expand **Manual Activities**, and then select **In-Progress Activities**.
7. Select the manual activity and then in the **Tasks** list click **Mark as Completed**.
8. Navigate to **Change Management**, expand **All Change Requests**, and then open the change request that is linked to the release record.
9. Click the **Activities** tab and notice that the dependent activity is now marked **Completed**.

See Also

Managing Release Records in System Center 2012 - Service Manager

How to Add Dependent Activities to a Change Request for Release Records

How to Plan Release Activities

In System Center 2012 – Service Manager, the Release Manager creates and modifies the structure of release activities by performing the following procedure.

To plan release activities

1. In the Service Manager console, open the **Work Items** workspace, and in the **Work Items** pane, expand **Release Management**, and then select **Release Management**.
2. In the **Work Items** pane, select a view under **Release Management** that displays a release record that includes release activities that you want to add or modify activities for, and then double-click the record to open it.
3. Click the **Activities** tab to view the list of proposed changes and dependent activities they contain.
4. Optionally, you can change the activities view by clicking either **Diagram View** or **List View**.
5. Select a dependent change management activity, and then move it to the top of release management activity list or diagram. A dependent indicator appears on release management activities, which resembles the link in a chain.

See Also

Managing Release Records in System Center 2012 - Service Manager

How to Skip a Failed Activity

In System Center 2012 – Service Manager, the release manager skips a failed activity by performing the following procedure.

To skip a failed activity

1. In the Service Manager console, open the **Work Items** workspace, in the **Work Items** pane, expand **Release Management**, and then select **Release Management**.
2. In the **Work Items** pane, select a view under **Release Management** that displays a release record that includes a failed release activity or an activity in progress that you want to skip, and then double-click the record to open it.
3. Click the **Activities** tab to view the list of proposed changes and dependent activities they contain. Optionally, you can change the activities view by clicking either **Diagram View** or **List View**.
4. Right-click the failed activity or the activity in progress that you want to skip, and then click **Skip Activity**.

5. In the **Comments** box, enter the reason why you are skipping the activity, and then click **OK** to close the box. The activity that you skipped displays an icon resembling a blue down-pointing arrow to indicate that the activity is marked as skipped.

See Also

Managing Release Records in System Center 2012 - Service Manager

How to Determine Status and Progress for a Change Request in the Release Record

In System Center 2012 – Service Manager, the change manager reviews the status and progress of a change request in the currently opened release record. He knows the ID of the change request and its title, or at least a few of the keywords of the title. He can review the status of the change request by performing the following procedure.

To determine status and progress for a change request in a release record

1. In the Service Manager console, open the **Work Items** workspace, in the **Work Items** pane, expand **Release Management**, and then select **Release Management**.
2. In the **Work Items** pane, under **Release Management**, select the **Release Records: In Progress**.
3. In the **Release Records: In Progress** view, double-click the record of interest to open it.
4. Click the **Activities** tab to view the list of proposed changes and dependent activities they contain. Optionally, you change the activities view by clicking either **Diagram View** or **List View**.
5. You can view records by using any of the following methods:
    - Mouse scrolling:
        - You can find the release management activity showing that it is linked to the specific change request by looking for an indicator icon and viewing its properties while in either diagram view or list view.
        - The following information is shown for all activities:
            - Activity IDs
            - Activity titles
            - Activity status indicator icons, which vary based on the state of the activity
    - Using the diagram view:
        - When you are using the diagram view, you can use **Zoom** to choose different for activities.
    - Using search anywhere in the Service Manager console:
        - You can search for and view an activity by searching with any of the following information:
            - Change request ID

        - Keywords from the linked change request's title
        - Change activity's ID
        - Keywords from the dependent activity's title
    - Filtering:
        - You can filter any returned search results by keywords and also by criteria such as class, last modified dates, and name.
6. You can double-click an activity to view its status and the details of its progress.

See Also

Managing Release Records in System Center 2012 - Service Manager

Managing Chargeback Reports in System Center 2012 SP1 - Service Manager

This section provides an overview of how to view chargeback reports and how to configure the sample reports in System Center 2012 – Service Manager SP1. Before you can use the reports they must be installed and configured for your installation of Service Manager. For more information about installing and configuring chargeback reports, see the Administering System Center 2012 – Service Manager document.

Managing Chargeback Reports Topics

- How to View and Use Chargeback Reports

  Describes how to view and use chargeback reports.
- How to Configure Sample Chargeback Reports

  Describes how to configure sample chargeback reports.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager

How to View and Use Chargeback Reports

You can use the following procedure to view and analyze a Microsoft Online Analytical Processing (OLAP) data cube from System Center 2012 – Service Manager with Microsoft Excel. You can also save your workbooks into an analysis library. Using the PivotTable field list, you can drag and drop fields from the cube into the workbook. For more information about using Excel slicers, see Creating and Using Excel Slicers.

You must have Excel, or a viewer capable of opening Excel data files, installed on the computer running the Service Manager console in order to use the following procedure.

Note
The first time you analyze a cube with Excel, it can take a few minutes to load.

To view and use chargeback report information in an OLAP data cube with Excel

1. In the Service Manager console, click **Data Warehouse**, expand the **Data Warehouse** node, and then click **Cubes**.
2. In the **Cubes** pane, select a cube name, and then under **Tasks**, click **Analyze Cube in Excel**. For example, select **SystemCenterServiceManagerChargebackCube** and analyze it.
3. When the worksheet opens in Excel, you can drag and drop fields from the PivotTable Field List and create slicers and charts.
    a. For example, if you want to see costs assigned to various cloud resources, expand **ServiceManagerInfraDailyChargeback**, and then select **Cloud Cost**.
    b. You can add additional fields to generate a more complex analysis. For example, you can add additional values from the **ServiceManagerInfraDailyChargeback** MeasureGroup by selecting the **VM Cost** and **VM Total Cost** to see the value of virtual machines in the clouds.
4. Optionally, you can save the workbook to a shared folder or other shared location, such as the analysis library. For more information about the analysis library, see How to Use the Analysis Library.

See Also

Creating and Using Excel Slicers

How to Use the Analysis Library

Using OLAP Cubes for Advanced Analytics

How to Configure Sample Chargeback Reports

You can use the following procedure to configure the sample Microsoft Excel chargeback report (ChargebackReport.xlsx) that is included with System Center 2012 – Service Manager Service Pack 1. This sample report is designed for you to modify for use in your organization. You can update the report any way you like. The sample report contains the following tabs:

- Dashboard – This tab shows a chart of the top 3 cost centers, clouds, VMM user roles, price sheets, spending trend, and overall spending for the period that you select.
- Chargeback Daily Details – This tab shows a comprehensive list of daily costs detailing virtual machine cloud level and other costs assigned to price sheets for the year and month you select. It also includes a graph showing the top 3 clouds within cost centers.
- Chargeback Monthly Details – This tab shows a comprehensive list of costs assigned to price sheets for the year and month you select.

Note

The first time you open the file in with Excel, you must configure the workbook data connection so that it can retrieve information from OLAP data cubes in the Service Manager data warehouse management server.

To configure the sample workbook connection

1. Using Windows Explorer, navigate to the Service Manager installation folder and then open the Chargeback child folder.
2. Open the ChargebackReport.xlsx file, click the **Data** tab, and then click **Connections**.
3. In the **Workbook Connections** dialog box, for each connection, view its **Properties** and replace <LocalHost> with the server name of your Service Manager data warehouse management server. If your data warehouse analysis database name is not DWASDataBase, then replace the database name with the one that you use.
4. Optionally, you can save the workbook to a shared folder or other shared location, such as the analysis library. For more information about the analysis library, see How to Use the Analysis Library.

See Also

How to Use the Analysis Library

Using Data Warehouse Reporting and Analytics in System Center 2012 - Service Manager

Service Manager reports enable you to collect and view data and trends from across the business environment. For example, you can generate a report that shows the number of incidents that occur in a specific time frame. You can then use that information to calculate the cost of each incident (in hours) and also to identify any trends and take preventative measures to reduce the cost and occurrence of incidences.

Standard reports are viewable for all Service Manager console users in the Reporting workspace. If users can view work items and have permission to the SystemCenter and ServiceManager folders on the SQL Server Reporting Services (SSRS) server, they can also view reports in work item task lists. Any user can export report data from a report they view. Exported reports are saved in a variety of file formats.

The following tasks are addressed in this guide.

Data Warehouse Reporting and Analytics Topics

- Data Warehouse and Analytics Overview

  Provides an overview of data warehouse and analytics in Service Manager.
- Using and Managing Standard Reports

  Introduces standard reporting in Service Manager.

- Using OLAP Cubes for Advanced Analytics

  Explains OLAP cube structure, how to use and troubleshoot OLAP cube, and how to create dashboards that show OLAP cube data.
- Customizing the Data Warehouse

  Explains data warehouse structure so that you can customize reports using its data.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager

Data Warehouse and Analytics Overview

The data warehouse in System Center 2012 – Service Manager provides three primary functions:

1. Offload data from the main Service Manager database to improve performance of the Service Manager database
2. Long-term data storage
3. Provide data for reports

The data warehouse that ships with Service Manager is actually its own management group. It has essentially all the System Center common platform pieces that are present in other System Center components, such as System Center 2012 – Operations Manager. These components are built on the common platform, which in turn consists of the following:

- A model-based database for storing configuration information about the data warehouse and for staging the data after it has been extracted from the Service Manager database. In the data warehouse management group, this instance of the mode-based database is named DWStagingAndConfig.
- The management server, which consists of the following:
  - System Center Data Access service
  - System Center Management service

    Note

    ForSystem Center 2012 R2 Service Manager, the System Center Management service was renamed to Microsoft Monitoring Agent.
  - System Center Management Configuration service

In addition to its base that is built on the System Center common platform, the Service Manager data warehouse has two other databases:

- DWRepository—where the transformed data is stored and optimized for reporting purposes.
- DWDataMart—where the transformed data is loaded and where, ultimately, reports query from.

The data warehouse was designed to:

- Be fully extensible by means of management packs.
- Utilize data warehousing best practices, such as dimensional modeling with facts and dimensions.
- Operate at very large scale.

The data warehouse in System Center 2012 – Service Manager was designed and built with the intention of being a platform component that enables System Center users to collocate data from all System Center products to gain comprehensive insight across their information technology (IT) investments.

The Difference between OLTP and OLAP (Performing vs. Analyzing Transactions)

Online transaction processing (OLTP) systems are designed for fast writes against small units of work—for example, for the fast creation of a single incident. In contrast, online analytical processing (OLAP) data warehouses are designed to facilitate fast analysis across large sets of data—for example, quickly determining service level agreement (SLA) adherence across all incidents created in the last year.

Data Warehouse and Analytics Elements

The data warehouse and analytics elements of System Center 2012 – Service Manager consist of the System Center common model, data warehouse databases, OLAP cubes, management pack orchestration processes, and the Service Manager software development kit (SDK). The following sections describe each of these elements in further detail.

System Center Common Model and Data Warehouse Database Schema

Diagrams that represent the System Center common model and the data warehouse database schema are available for System Center 2012 – Service Manager. The database schema is based on the common management pack model, which means the relational database objects and relationships benefit from class inheritance.

If you are not familiar with developing management packs, writing custom queries against the data warehouse can be intimidating. However, the schema diagrams are very useful to help get you started. You can download the Visio diagrams, SystemCenterCommonModel-SCSM2010.vsd and DWDataMart.vsd, as part of the Service Manager Job aids (SM_job_aids.zip). The different types of tables in the data warehouse are color coded in the schema diagram.

Service Manager Data Warehouse Databases

The data warehouse in Service Manager comprises the following databases:

- DWStagingAndConfig—where data is extracted from source systems, such as Service Manager and Operations Manager, is initially stored.
- DWRepository—where extracted source data is transformed into the reporting optimized structure.

- DWDataMart—where published data is stored and gets consumed by the reports. This is also where data is stored for an extended period of time to facilitate historical reporting and analysis.

OLAP Cubes

As mentioned previously, an OLAP cube is used for online analytical processing, and it is a data structure that provides fast analysis of data. You can think of it as helping manipulate and analyze data from multiple perspectives. The cube data structure can help overcome some limitations of relational databases.

System Center 2012 – Service Manager includes a number of predefined OLAP cubes that users can view in Microsoft Excel and also as SharePoint dashboards. Authors can create their own OLAP cubes for customized data sources and include the cubes in custom management packs.

Service Manager Software Development Kit

The System Center 2012 – Service Manager SDK contains information that you might need when you are authoring with Service Manager to extend the data warehouse so that it can manage your own customized data. Before you can utilize the capabilities of the data warehouse, such as OLAP cube processing for customized data, you must first create a custom management pack and import it. Your custom management pack bundle will contain a definition for your data model and, possibly, OLAP cube definitions.

You can learn more about using the SDK to create your own custom management pack for Service Manager in the Authoring Guide for System Center 2012 - Service Manager. Additionally, you can download the System Center 2012 - Service Manager 2012 SDK at the Microsoft Download Center.

Using and Managing Standard Reports

This section describes how to use standard reports in System Center 2012 – Service Manager.

The simple reporting infrastructure that is included in both System Center Service Manager 2010 and System Center 2012 – Service Manager is built on SQL Server Reporting Services (SSRS), where data is accessed from the Service Manager data warehouse. The SSRS infrastructure provides for basic reporting functionality, such as report-level security, report subscriptions, browser-based access to reports, linked reports, and customization. This reporting functionally is similar to the experience that is included with System Center Operations Manager 2007 R2.

The Reporting workspace contains the catalog of reports that users can run on demand. Reports are viewable for all Service Manager console users. If users can view work items and have permission to the SystemCenter and ServiceManager folders on the SSRS server, they can also view reports in work item task lists. Like in Operations Manager, you can run a report in context. For example, you can select a computer in a view in the console and then run the Computer Details report about that computer. Any user can export report data from a report they view. Exported reports are saved in a variety of file formats.

For more information about SSRS, see SQL Server Reporting Services. If you want to see the relationship between high-level processes and services that are involved between Service Manager and SSRS, refer to the Service Manager architecture diagram (ArchitectureDiagram.vsd) that is included in the Service Manager job aids (SM_job_aids.zip). Because the architecture diagram is too large to see properly in this guide, you can download it and the other jobs aids from the Microsoft Download Center.

Standard Reporting Topics

- How to View the Standard Report Catalog

  Describes how to view the Standard Report Catalog.
- How to Add Permissions for Standard Reports

  Describes how to add permissions for standard reports.
- How to Run a Standard Report

  Describes how to run standard reports.
- How to Export Standard Report Data

  Describes how to export a standard report.
- How to Create a Standard Linked Report in Service Manager

  Describes how to create a standard linked report.
- How to Add a Standard Report to the Service Manager Favorite Reports Folder

  Describes how to add a standard report.
- How to Configure Standard Report Subscriptions

  Describes how to configure standard report subscriptions.
- How to Schedule a Standard Service Manager Report

  Describes how to schedule a standard Service Manager report.
- How to Add Non-Service Manager Reports to the Report Catalog

  Describes how to add reports to the report catalog that were not created in Service Manager.
- Standard Reports Available in Service Manager

  Lists the standard reports that are available in Service Manager.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager

How to View the Standard Report Catalog

You can use the following procedure to view the catalog of reports that is available in System Center 2012 – Service Manager.

To view the report catalog

1. In the Service Manager console, click **Reporting**.
2. Expand **Reports**, and then click a folder. For example, click **Incident Management**.

The reports that are available appear in the results pane of the **Report** console.

See Also

Using and Managing Standard Reports

How to Add Permissions for Standard Reports

By default, all System Center 2012 – Service Manager users have access to reports through the Reporting workspace. However, before users who do not have administrator permissions can view the Reporting workspace, you must add permissions through SQL Server Reporting Services (SSRS).

You can grant access at the root level, which enables a user to view the Reporting workspace and all the reports in Service Manager. You can also grant restricted access to specific report folders, such as the Incident report folder, or to individual reports.

The following procedure describes how to grant SSRS access for all the Service Manager reports to an Active Directory group (woodgrove\SCSMReportAccess).

To add SSRS permissions

1. On the computer on which SRSS is installed, start Report Manager. For example, open http://<ReportServerName>:80/Reports.
2. Locate the folder or report for which you want to grant access permission. For example, locate the SystemCenter and ServiceManager root folders.
3. Click **Security**.
4. Click **Edit Item Security**.
5. The following message appears: "Item security is inherited from a parent item. Do you want to apply security settings for this item that are different from those of the Home parent item?"

   Click **OK**.
6. Click **New Role Assignment**.
7. Type the name of the Active Directory group or user in the **Group or user name** box. For example, type **woodgrove\SCSMReportAccess**.
8. Set the roles for the group or user. Select the **Browser** check box to grant access to run reports.
9. Click **OK**.

See Also

Using and Managing Standard Reports

How to Run a Standard Report

You can use the following procedure to run a report in System Center 2012 – Service Manager. In this procedure, you run an incident management report to determine how many incidents were resolved in the previous week.

Note

Before you can run a report, the extract, transform, and load (ETL) process must be complete. For more information about the ETL process and about how to schedule it to run, see How to Enable Data Warehouse Jobs Schedules in the Administrator's Guide for System Center 2012 - Service Manager.

The Service Manager data warehouse does not create dimensions for classes or relationships in unsealed management packs. If you are using an unsealed management pack, you will not see any data from that management pack in your reports. Because of this, the best practice is to model all classes and relationships in sealed management packs.

For this example, you must have previously created an incident. Otherwise, the report will return no data.

To run a report

1. In the Service Manager console, click **Reporting**.
2. Expand **Reports**, and then expand a report folder. For example, expand **Incident Management**.
3. Click the name of the report you want to run. For example, click the **List of Incidents** report.
4. In the **Tasks** list, click **Run Report**.
5. Click **Parameter Control Header** to display the parameter controls for the report. Use these parameters to customize the report.

   Each report has a set of parameters you can use to search and filter for the specific items you want to include in the report. For example, in the **List of Incidents** report, you can set the following parameters:

   - **Date Filter**. You can search by the date the incident was created, by the date it was resolved, or by the date it was closed.
   - **Assigned To**
   - **Priority**
   - **ID**
   - **Description**
   - **Resolution Description**
   - **Contact Method**
   - **Source**
   - **Status**

- **Classification Category**
- **Support Group**
- **Urgency**
- **Impact**
- **Resolution Category**

6. In the **Start Date** list, select the date one week before the current date (today), and then click anywhere in the form.
7. Optionally, specify other criteria that you want to filter.
8. In the **Tasks** list, click **Run Report**.
9. In the report, review the data to ensure the incident information that you want to view is displayed. If you do not see the information you expect, revise the criteria, and then run the report again by clicking **Run Report**.

   In reports that show lists or additional detail, such as the associated subreports in the List of Incidents report, you might see multiple rows that contain the same information. This is because an instance can have multiple types; for example, a computer is a Computer, a Windows Computer, and a Managed Windows Computer. The level of detail for these reports is per type per instance. Therefore, these multiple types result in multiple rows.

   Note
   If there is no data in the report, ensure that the ETL process is complete. A delay might occur between the start of the process and when data is available for reports.

See Also

Using and Managing Standard Reports

How to Export Standard Report Data

You can use the following procedure in System Center 2012 – Service Manager to export a report into several different types of files so that you can use the data from the reports in different tools. For example, you can export the report data into a comma-separated value (CSV) file and then import it into Microsoft Office Excel.

To open the report and then export the report data

1. In the Service Manager console, click **Reporting**.
2. Expand **Reports**, and then click any view. For example, click **Incident Management**.
3. In the **Incident Management** view, select the **List of Incidents** report, and then in the **Tasks** list, click **Run Report**.
4. Click **Parameter Control Header** to display the parameter controls for the report. Use these parameters to customize the report.
5. In the **Start Date** list, select the date one week before the current date (today), and then click anywhere in the form.

6. Optionally, specify other criteria that you want to filter.
7. In the **Tasks** list, click **Run Report**.
8. In the **List of Incidents** report, review the data to ensure the incident information that you want to view is displayed. If you do not see the information you expect, revise the criteria, and then run the report again by clicking **Run Report**.
9. Click the **Export** icon, and then select the format in which you want to save the report. In the list, select one of the following:
   - **XML file with report data**
   - **CSV (comma delimited)**
   - **Acrobat (PDF) file**
   - **MHTML (web archive)**
   - **Excel**
   - **TIFF file**
   - **Word**
10. Save the file to the desktop with a file name of your choice, and then close the report form.

See Also

Using and Managing Standard Reports

How to Create a Standard Linked Report in Service Manager

You can use the following procedure in System Center 2012 – Service Manager to create a linked report.

A linked report is a shortcut to a report—it is similar to a program shortcut on your desktop. A linked report is derived from publicly defined reports from any management pack. A linked report retains some of the original report's properties, such as the report layout. Other properties of the linked report, such as parameters and subscriptions, can be different from the original report.

To create a linked report

1. In the **Reporting** view, select the report you want to use as the basis for the linked report, and then, in the **Tasks** pane, click **Run Report**.
2. In the **Report** window, click **Save as Linked Report** in the **Task** pane.
3. Type a name and an optional description for the new linked report.
4. Select a management pack for the linked report.
5. Click **Select Folder**, and then select the folder in which you want to save the report.
6. Click **OK**.
7. Close the report.

After the next data warehouse synchronization, the new linked report is displayed in the folder where you saved it. For information about scheduling a data warehouse synchronization job, see How to Schedule a Data Warehouse Job.

Note

You might have to close and reopen the console after the synchronization job is complete to see the report.

See Also

Using and Managing Standard Reports

How to Add a Standard Report to the Service Manager Favorite Reports Folder

You can use the following procedure to add a report to the Favorite Reports folder in System Center 2012 – Service Manager.

After you have run several reports and determined the best parameters to use to customize the report contents, you can save a report to the Favorite Reports folder. This enables you to run the report directly from the **Reporting** view without having to specify parameters.

To save a report to the Favorite Reports folder

1. In the **Reporting** view, select the report that you want to use as the basis for the saved report, and then, in the **Tasks** pane, click **Run Report**.
2. In the report window, click **Save as Favorite Report** under **Tasks**.
3. Type a name for the report, and then click **OK**.
4. Close the report window.
5. In the **Reporting** navigation tree, click **Favorite Reports**.

The new report is displayed.

See Also

Using and Managing Standard Reports

How to Configure Standard Report Subscriptions

You can set up subscriptions to your reports in System Center 2012 – Service Manager through SQL Server Reporting Services (SSRS) Report Manager. Configuring a subscription to a report enables you to automate the delivery of a report. Report subscriptions can be sent through email, stored on the report server, or even posted to a Microsoft SharePoint site.

To create report subscriptions

- complete the procedures in the Subscriptions and Delivery (Reporting Services) topic in the SQL Server 2008 R2 Books Online.

See Also

Using and Managing Standard Reports

How to Schedule a Standard Service Manager Report

In System Center 2012 – Service Manager, you can schedule a linked report to run on a regular basis to ensure that the information is up to date. To do this, use SQL Server Reporting Services (SSRS) Report Manager. In SSRS Report Manager, you can schedule reports to run one time or on a continuous basis at intervals of hours, days, weeks, or months. You can do the following:

- Schedule report delivery in a standard or data-driven subscription.
- Schedule report history so that new snapshots are added to the report history at regular intervals.
- Schedule time to refresh the data of a report snapshot.
- Schedule the expiration of a cached report to occur at a predefined time so that it can be refreshed later.

To configure a schedule for a report, complete the procedure in the Scheduling Reports, Shared Datasets, and Subscriptions topic in SQL Server 2008 R2 Books Online.

See Also

Using and Managing Standard Reports

How to Add Non-Service Manager Reports to the Report Catalog

You can display SQL Server Reporting Services (SSRS) reports from any source using the Reporting workspace in the Service Manager console. The Reports workspace in System Center 2012 – Service Manager displays the folders and reports that are contained in the System Center\Service Manager folder on the SSRS server. Therefore, you can add any reports that you want to the folder. For example, you might have a financial report that you want to view from the Reporting workspace.

To add a custom report to the report catalog

1. On the server that hosts SSRS, open Report Manager. For example, open http://<ReportServerName:80>/Reports.
2. Navigate to the System Center\ServiceManager reports folder, create a new folder, and give it a name. For example, name the folder **Financial Management**.
3. In the new folder, click **New Data Source**, and then add the data source of the new report.
4. Add the new report that uses the new data source.
5. Open the Service Manager console, select the **Reporting** workspace, and then navigate to the folder that contains the report.
6. In the **Tasks** pane, click **Run Report**.

See Also

Using and Managing Standard Reports

Standard Reports Available in Service Manager

The following reports are available in System Center 2012 – Service Manager.

Report area	Report name	Description
Activity management	List of Activities	Provides a list of activities within a certain time frame that meet the specified criteria. The data in the report includes the type of activity, the current status, and the priority.
Activity management	List of Manual Activities	Provides a list of all the manual activities within a certain time frame that also meet the specified criteria. The data in the report includes the current status, stage, priority, and user to whom the activity is assigned.
Activity management	List of Review Activities	Provides a list of all the review activities within a certain time frame that meet the specified criteria. The data in this report includes the current status, stage, approval condition, and approval threshold.
Activity management	Manual Activity Detail	Provides detailed information about a specific manual activity, including the title, description, status, and affected customers.
Activity management	Review Activity Detail	Provides detailed information about a specific review activity, including the title, description, status, reviewers, and approval condition.
Activity management	Activity Distribution	Provides the number of activities during a specified time frame. The data in this report includes the activity status, type, and stage. You can filter the data by status, stage, or type.

Report area	Report name	Description
Change management	Change Management KPI Trend	Provides the number and current state (in progress, completed, failed, or canceled) of change requests during a specified time frame. You can filter the data returned in this report by day, week, month, quarter, or year.
Change management	List of Change Requests	Provides a list of change requests within a certain time frame. The data in this report includes the current status, category, and user to whom the request is assigned.
Change management	Change Request Detail	Provides detailed information about a specific change request, including the title, description, status, change creator, and template.
Configuration management	Computer Detail	Provides detailed configuration information for a specific computer.
Configuration management	Computer Inventory	Provides a list of computers available in the management group. **Note** The Computer Inventory report might contain more total computers than actually exist in a single Service Manager management group. This situation is uncommon but possible when you have more than one management group share a data warehouse. More specifically, if you manually create a computer in one management group and

Report area	Report name	Description
		manually create a computer with the same name in another management group, the data warehouse cannot reconcile the two manually-created computers. Because this situation does not occur when computers are discovered by a connector, you can avoid multiple computers appearing in the report by deleting the manually-created computer configuration item and then discover it by using a connector.
Configuration Management	Software Update Compliance Trend	Provides detailed information for software update compliance. You can filter this data by classification or category, and by day, week, month, quarter, or year.
Incident management	Incident Analyst	Provides key performance metrics for a specified analyst. The data in this report includes the number of incidents assigned to the analyst, the number of incidents resolved by the analyst, the number of incidents worked on by the analyst, and any labor logged against an incident.
Incident management	Incident Details	Provides detailed information for a specific incident, including the title, description, classification, affected services, affected configuration items, and related activities.

Report area	Report name	Description
Incident management	Incident KPI Trend	Provides the number of incidents, including the number of incidents past their targeted resolution time, the number of escalated incidents, the average time to resolution, the labor minutes per incident, and the size of the incident backlog. You can filter this data by classification or category, and by day, week, month, quarter, or year.
Incident management	Incident Resolution	Provides the number of incidents, including the number of incidents past their targeted resolution time and the average time to resolution. You can filter the data by day, week, month, quarter or year.
Incident management	List of Incidents	Provides a list of all incidents within a certain time frame. The data in this report includes the users to whom incidents are assigned, when the incidents were created, and the current status of the incidents.
Problem management	Configuration Items (CIs) with Most Incidents	Provides a list of the configuration items that have at least the number of incidents associated with them, as specified by the value you enter for **Incidents per Configuration Item** during the specified time frame. This report also includes the number of change requests and problems associated with the specific configuration item.
Problem management	List of Problems	Provides a list of all problems within a certain time frame.
Problem management	Problem detail	Provides detailed information for

Report area	Report name	Description
		a specific problem.
Release management	List of Release Records	Provides a list of all release records within a certain time frame.
Release management	Release Record Detail	Provides detailed information for a specific release record.
Service Management	Service KPI Trend	Provides key metrics across services, groups and collections for Service Manager, Operations Manager, and Configuration Manager. This report enables trending and flexible grouping.
Service Management	Service Summary	Provides a scorecard-like report that includes a comprehensive view of the health of a service, including period-over-period analytic capabilities.

See Also

Using and Managing Standard Reports

Using OLAP Cubes for Advanced Analytics

In System Center 2012 – Service Manager, data that is present in the data warehouse can be consolidated from various sources. It is presented through Service Manager by using predefined and customized Microsoft Online Analytical Processing (OLAP) data cubes. In short, advanced analytics in Service Manager consist of publishing, viewing, and manipulating cube data, usually in either Microsoft Excel or Microsoft SharePoint. Excel is primarily used by itself to view and manipulate data. SharePoint is used primarily as a means of publishing and sharing cube data.

Service Manager includes a System Center–wide data warehouse. Therefore, data from Operations Manager, Configuration Manager, and Service Manager can be consolidated into the data warehouse, where you can easily use multiple data views to get any information that you might want. This is also an interface where you can put data into the same data warehouse from your own custom sources, such as SAP applications or a third-party human resources application. This consolidation creates a common data model and enables enriched analyses to help you build a data warehouse across your Information Technology (IT) organization that can serve all your business intelligence and reporting needs.

When your data is in a common model, you can manipulate information and have common definitions and a common taxonomy for your whole enterprise. You can do this by deploying

OLAP data cubes and accessing the information from the cubes, using standard tools such as Excel and SharePoint. This makes it possible for your users to employ skills that they already know. You control the definition of your business logic in a centralized manner. For example, you can define key performance indicators, such as the incident time-to-resolution thresholds, and which values for the thresholds are green, yellow, or red. You can control these choices in a centralized manner and empower your users to easily use the data, yet have the common definition appear in their Excel reports or their SharePoint dashboards.

Advanced Analytic Topics

- Understanding OLAP Cubes

  Describes OLAP cube usage, structure, deployment, troubleshooting, and creation.
- Analyzing Data with Excel 2010

  Describes how to analyze date with Excel 2010.
- How to View and Analyze an OLAP Data Cube with Excel

  Describes how to view and analyze an OLAP data cube using Excel.
- Creating and Using Excel Slicers

  Describes how to create and use Excel slicers.
- How to Refresh OLAP Data Cube Information

  Describes how to refresh OLAP data cubes.
- How to Manage the Analysis Libraries

  Describes how to manage analysis libraries.
- How to Use the Analysis Library

  Describes how to use the analysis library.
- Advanced Analytical Reports Available in System Center 2012 - Service Manager

  Lists the OLAP data cubes present in Service Manager.
- Creating and Deploying Dashboards

  Explains how to create and deploy dashboards to display OLAP cube information in SharePoint 2010.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager

Understanding OLAP Cubes

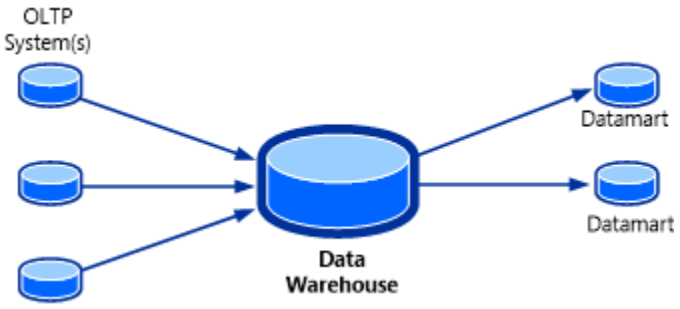
Online analytical processing (OLAP) cubes are a feature in System Center 2012 – Service Manager that use the existing data warehouse infrastructure to provide self-service business intelligence capabilities to end users.

An OLAP cube is a data structure that overcomes the limitations of relational databases by providing rapid analysis of data. Cubes can display and sum large amounts of data while also providing users with searchable access to any data points. This way, the data can be rolled up, sliced, and diced as needed to handle the widest variety of questions that are relevant to a user's area of interest.

Software vendors or information technology (IT) developers with a working knowledge of OLAP cubes can create management packs to define their own extensible and customizable OLAP cubes that are built on the data warehouse infrastructure that was provided in Service Manager 2010. These cubes are stored in SQL Server Analysis Services (SSAS). Self-service business intelligence tools such as Excel and SQL Server Reporting Services (SSRS) can target these cubes in SSAS, and you can use them to analyze the data from multiple perspectives.

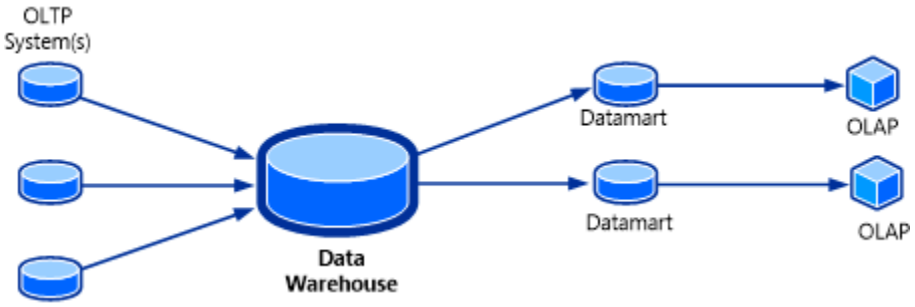
The databases that a business uses to store all its transactions and records are called online transaction processing (OLTP) databases. These databases usually have records that are entered one at a time and that contain a wealth of information that can be used by strategists to make informed decisions about their business. The databases that are used to store the data, however, were not designed for analysis. Therefore, retrieving answers from these databases is costly in terms of time and effort. OLAP databases are specialized databases that are designed to help extract this business intelligence information from the data.

In Service Manager 2010, the data warehouse provided OLAP databases that contained data in simplified, read-optimized schemas that were ready for consumption. The topology of the system is shown in the following illustration.



One drawback to this system, however, is that OLAP databases essentially contained the exact same type of information that was found in OLTP databases. There were no precalculated aggregations of data to answer increasingly complex and varied queries.

OLAP cubes can be considered as the final piece of the puzzle for a data warehousing solution. An OLAP cube, also known as multidimensional cube or hypercube, is a data structure in SQL Server Analysis Services (SSAS) that is built, using OLAP databases, to allow near-instantaneous analysis of data. The topology of this system is shown in the following illustration.



The useful feature of an OLAP cube is that the data in the cube can be contained in an aggregated form. To the user, the cube seems to have the answers in advance because assortments of values are already precomputed. Without having to query the source OLAP database, the cube can return answers for a wide range of questions almost instantaneously.

The main goal of System Center 2012 – Service Manager OLAP cubes is to give software vendors or information technology (IT) developers the ability to perform near-instantaneous analysis of data for both historical analysis and trending purposes. System Center 2012 – Service Manager does this by:

- Allowing you to define OLAP cubes in management packs that will be created automatically in SSAS when the management pack is deployed.
- Automatically maintaining the cube without user intervention, performing such tasks as processing, partitioning, translations and localization, and schema changes.
- Allowing users to use self-service business intelligence tools, such as Excel, to analyze the data from multiple perspectives.
- Saving generated Excel reports for future reference.

To see how data warehouse cubes are represented in the Service Manager console, navigate to the **Data Warehouse** workspace, and then click **Cubes**.

Understanding OLAP Cubes Topics

- About OLAP Cubes

  Explains OLAP cube parts and actions that users can take using OLAP cube parts.
- About Modeling OLAP Cubes in Management Packs

  Describes management pack elements that you can use to define and customize an OLAP cube.
- About Cube Partitioning

  Explains the impact that cube partitions have on scalability and performance.
- About Cube Processing

  Explains what occurs during cube processing.
- About Cube Deployment

  Explains what occurs during cube deployment.
- Maintaining OLAP Cubes

  Describes best practices for maintaining OLAP cubes.

- Troubleshooting OLAP Cubes

  Describes common problems that you might have to troubleshoot for OLAP cubes.
- How to Create an OLAP Cube Using a Management Pack

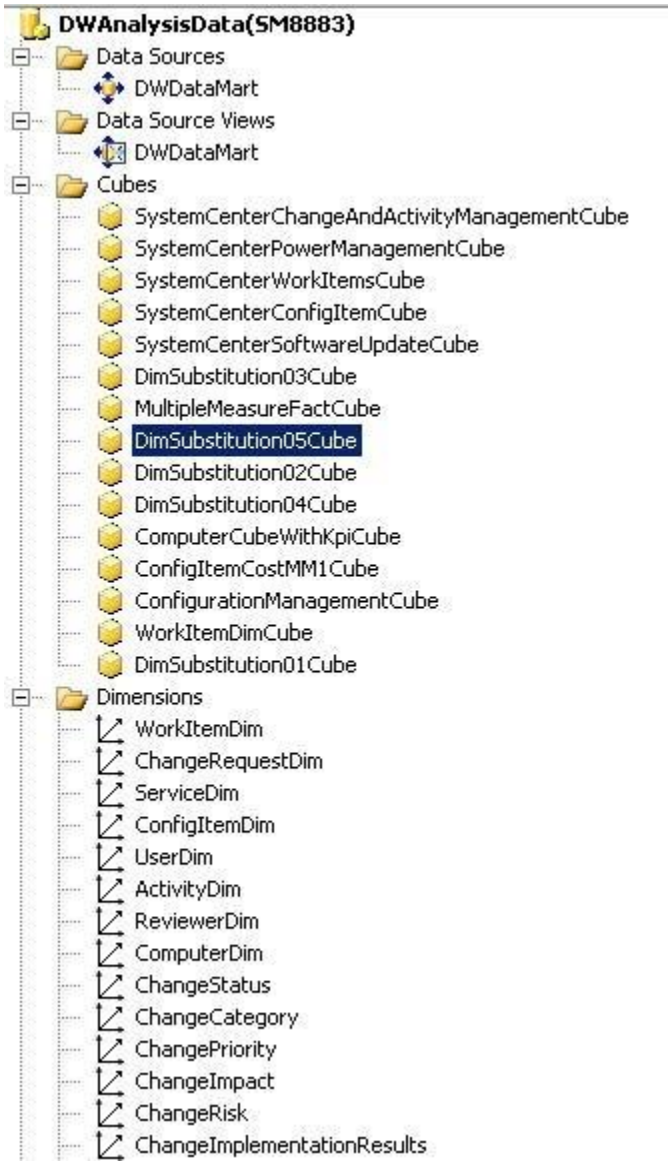
  Describes how to create an OLAP cube by using a management pack.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager

About OLAP Cubes

The following illustration shows an image from SQL Server Business Intelligence Development Studio (BIDS) that depicts the main parts that are required for online analytical processing (OLAP) cubes. These parts are the data source, data source view, cubes, and dimensions. The following sections describe the OLAP cube parts and the actions that users can take using them.



Data Source

A data source is the origin of all the data that is contained within an OLAP cube. An OLAP cube connects to a data source to read and process raw data to perform aggregations and calculations for its associated measures. The data source for all Service Manager OLAP cubes is the data marts, which includes the data marts for both Operations Manager and Configuration Manager. Authentication information about the data source must be stored in SQL Server Analysis Services (SSAS) to establish the correct level of permissions.

Data Source View

The data source view (DSV) is a collection of views that represent the dimension, fact, and outrigger tables from the data source, such as the Service Manager data marts. The DSV contains all the relationships between tables, such as primary and foreign keys. In other words,

the DSV specifies how the SSAS database will map to the relational schema, and it provides a layer of abstraction on top of the relational database. Using this layer of abstraction, relationships can be defined between fact and dimension tables, even if no relationships exist within the source relational database. Named calculations, custom measures, and new attributes may also be defined in the DSV that may not natively exist in the data warehouse dimensional schema. For example, a named calculation that defines a Boolean value for *Incidents Resolved* calculates the value as true if an incident's status is resolved or closed. Using the named calculation, Service Manager can then define a measure to display useful information such as the percentage of incidents resolved, the total number of incidents resolved, and the total number of incidents that are not resolved.

Another quick example of a named calculation is *ReleasesImplementedOnSchedule*. This named calculation provides a quick health status check on the number of release records in which the actual end date is less than or equal to the scheduled end date.

OLAP Cubes

An OLAP cube is a data structure that overcomes limitations of relational databases by providing rapid analysis of data. OLAP cubes can display and sum large amounts of data while also providing users with searchable access to any data points so that the data can be rolled up, sliced, and diced as needed to handle the widest variety of questions that are relevant to a user's area of interest.

Dimensions

A dimension in SSAS references a dimension from the Service Manager data warehouse. In System Center 2012 – Service Manager, a dimension is roughly equivalent to a management pack class. Each management pack class has a list of properties, while each dimension contains a list of attributes, with each attribute mapping to one property in a class. Dimensions allow the filtering, grouping, and labeling of data. For example, you can filter computers by the installed operating system and group people into categories by gender or age. The data can then be presented in a format where the data is categorized naturally into these hierarches and categories to allow a more in-depth analysis. Dimensions may also have natural hierarches to allow users to "drill down" to more detailed levels of detail. For instance, the Date dimension has a hierarchy that can be drilled down by Year, then Quarter, then Month, then Week, and then Day.

The following illustration shows an OLAP cube that contains the Date, Region, and Product dimensions.

For example, Microsoft team members might want a quick and simple summary of the sales of the Xbox 360 gaming console in 2010. They can further drill down to get sales figures for a more focused time frame. Business analysts may want to examine how the sales of Xbox 360 consoles were affected by the launch of the new console design and the Kinect for Xbox 360 controller-free gaming experience. This helps them determine what sales trends are occurring and what potential revisions of business strategy are needed. By filtering on the date dimension, this information can be quickly delivered and consumed. This slicing and dicing of data is enabled only because the dimensions have been designed with attributes and data that can easily be filtered and grouped by the customer.

In System Center 2012 – Service Manager, all OLAP cubes share a common set of dimensions. All dimensions use the primary data warehouse data mart as their source, even in multiple data mart scenarios. In multiple data mart scenarios, this can possibly lead to dimension key errors during processing of the cube.

Measure Group

A measure group is the same concept as a fact in data warehouse terminology. Just as facts contain numeric measures in a data warehouse, a measure group contains measures for an OLAP cube. All the measures in an OLAP cube that derive from a single fact table in a data source view also can be considered to be a measure group. There can be instances, however, in which there will be multiple fact tables from which the measures in an OLAP cube derive. Measures of the same detail level are united in one measure group. Measure groups define what data will be loaded into the system, how the data is loaded, and how the data is bound to the multidimensional cube.

Each measure group also contains a list of partitions, which hold the actual data in separate, nonoverlapping sections. Measure groups also contain aggregation design, which defines the presummarized data sets that are calculated for each measure group to improve the performance of user queries.

Measures

Measures are the numeric values that users want to slice, dice, aggregate, and analyze; they are one of the fundamental reasons why you would want to build OLAP cubes using data warehousing infrastructure. By using SSAS, you can build OLAP cubes that will apply business rules and calculations to format and display measures in a customizable format. Much of your OLAP cube development time will be spent determining and defining which measures will be displayed and how they will be calculated.

Measures are values that usually map to numeric columns in a data warehouse fact table, but they can also be created on dimension and degenerate dimension attributes. These measures are the most important values of an OLAP cube that are analyzed and the primary interest to end users who browse the OLAP cube. An example of a measure that exists in the data warehouse is ActivityTotalTimeMeasure. ActivityTotalTimeMeasure is a measure from ActivityStatusDurationFact that represents the time that each activity is in a certain status. The detail level of a measure is made up of all the dimensions that are referenced. For example, the detail level of the *ComputerHostsOperatingSystem* relationship fact consists of the Computer and Operating System dimensions.

Aggregation functions are calculated on measures to enable further data analysis. The most common aggregation function is Sum. A common OLAP cube query, for example, sums up the total time for all activities that are *In Progress*. Other common aggregation functions include Min, Max, and Count.

After the raw data has been processed in an OLAP cube, users can perform more complex calculations and queries using multidimensional expressions (MDX) to define their own measure expressions or calculated members. MDX is the industry standard for querying and accessing data that is stored in OLAP systems. SQL Server was not designed to work with the data model that multidimensional databases support.

Drill-Down

When a user drills down into the data in an OLAP cube, the user is analyzing the data at a different level of summarization. The level of detail of the data changes as the user drills down, examining the data at different levels in the hierarchy. As the user drills down, he or she moves from summary information to data with a more narrow focus. The following are examples of drilling down:

- Drilling down into data to look at demographic information about the population of the United States, then into the state of Washington, then into the metropolitan area of Seattle, then into the city of Redmond, and finally into the population at Microsoft.
- Drilling down into sales figures for Xbox 360 consoles for the 2011 calendar year, then the fourth quarter of the year, then the month of December, then the week before Christmas, and finally Christmas Eve.

Drill Through

When users “drill through” data, they want to see all the individual transactions that contributed to the OLAP cube’s aggregated data. In other words, the user can retrieve the data at a lowest level of detail for a given measure value. For example, when you are given the sales data for a particular month and product category, you can drill through that data to see a list of each table row that is contained within that cell of data.

It is common to confuse the terms “drill down” and “drill through” with each other. The main difference between them is that a drill-down operates on a predefined hierarchy of data—for example, USA, then into Washington, then into Seattle—within the OLAP cube. A drill-through go directly to the lowest level of detail of data and retrieves a set of rows from the data source that has been aggregated into a single cell.

Key Performance Indicator

Organizations can use key performance indicators (KPIs) to gauge the health of their enterprise and their performance by measuring their progress toward their goals. KPIs are business metrics that can be defined to monitor progress toward certain predefined objectives and goals. A KPI usually has a target value and an actual value, which represents a quantitative goal that is critical to the success of the organization. KPIs are usually displayed in groups on a scorecard to show the overall health of the business in one quick snapshot.

An example of a KPI is to complete all change requests within 48 hours. A KPI can be used to measure the percentage of change requests that are resolved within that time frame. You can

create dashboards to represent KPIs visually. For example, you might want to define a KPI target value for completion of all change requests within 48 hours to 75 percent.

Partitions

A partition is a data structure that holds some or all of the data in a measure group. Every measure group is divided into partitions. A partition defines a subset of the fact data that is loaded into the measure group. SSAS Standard Edition allows only one partition per measure group, while SSAS Enterprise Edition allows a measure group to contain multiple partitions. Partitions are a feature that is transparent to the end user, but they have a major impact on both the performance and the scalability of OLAP cubes. All partitions for a measure group always exist in the same physical database.

Partitions make it possible for an administrator to better manage an OLAP cube and improve an OLAP cube's performance. For example, you can remove or reprocess the data in one partition of a measure group without affecting the rest of the measure group. When you load new data into a fact table, only the partitions that should contain the new data are affected.

Partitioning also improves processing and query performance for OLAP cubes. SSAS can process multiple partitions in parallel, leading to a much more efficient use of CPU and memory resources on the server. While it runs a query, SSAS fetches, processes, and aggregates data from multiple partitions as well. Only partitions that contain the data that is relevant to a query are scanned, which reduces the overall amount of input and output.

One example of a partitioning strategy is to place the fact data for each month into a monthly partition. At the end of each month, all the new data goes into a new partition, which leads to a natural distribution of data with nonoverlapping values.

Aggregations

Aggregations in an OLAP cube are presummarized data sets. They are analogous to a SQL SELECT statement with a GROUP BY clause. SSAS can use these aggregations when it answers queries to reduce the amount of necessary calculations, returning the answers quickly to the user. Built-in aggregations in the OLAP cube reduce the amount of aggregation SSAS has to perform at query time. Building the correct aggregations can drastically improve query performance. This is often an evolving process throughout the lifetime of the OLAP cube as its queries and usage change.

A base set of aggregations is usually created that will be useful for most of the queries against the OLAP cube. Aggregations are built for each partition of an OLAP cube within a measure group. When an aggregation is built, certain attributes of dimensions are included in the presummarized data set. Users can quickly query the data based on these aggregations when they browse the OLAP cube. Aggregations must be designed carefully because the number of potential aggregations is so large that building all of them would take an unreasonable amount of time and storage space.

Service Manager uses the following two options when it builds and designs aggregations in Service Manager OLAP cubes:

- Performance Gain Reaches
- Usage-based optimization

The Performance Gain Reaches option defines what percentage of aggregations is built. For example, setting this option to the default and recommended value of 30 percent means that aggregations will be built to give the OLAP cube a 30-percent estimated performance gain. However, this does not mean that 30 percent of the possible aggregations will be built.

Usage-based optimization makes it possible for SSAS to log the requests for data so that when a query is run, the information is fed into the aggregation design process. SSAS then reviews the data and recommends which aggregations should be built to give the best estimated performance gain.

See Also

Customizing the Data Warehouse

About Modeling OLAP Cubes in Management Packs

The ability to define customized management pack elements was used to model the online analytical processing (OLAP) cube management pack elements that are included in System Center 2012 – Service Manager. These management pack elements make it possible for the user to declaratively define and customize an OLAP cube at a higher level of abstraction. Based on the definition, the deployment of these management pack elements create the correct relationships, components, and fundamental building blocks of the OLAP cube at a greater level of detail, without any further user guidance. The following are the two main management pack elements that are included in OLAP cubes:

- SystemCenterCube
- CubeExtension

SystemCenterCube

The SystemCenterCube element defines the OLAP cube to a varying degree of detail, depending on your specific needs. This element contains the following subelements:

- MeasureGroup
- Substitution
- CustomMDX
- NamedCalculation
- Measure
- KPI
- Action (however, only drill-through actions are supported currently)
- ManyToManyRelationship

MeasureGroup

Each OLAP cube contains a collection of facts that exist in the data mart, where each member in the collection corresponds to a measure group. Each measure group must have its own unique name within the OLAP cube. However, a single fact may correspond to multiple measure groups in an OLAP cube. For example, the abstract relationship *WorkItemAssignedToUser* may be defined three times in an OLAP cube, with the unique measure group names of *ChangeRequestAssignedToUser*, *IncidentAssignedToUser*, and *ProblemAssignedToUser*. As

described in the in the Substitution section, you can customize the fact so that only change requests, incidents, and problems are included in the respective measure group for the OLAP cube.

The following example shows the management pack element for the IncidentAssignedToUser measure group:

```
<MeasureGroup DateDimAlias="IncidentAssignedToUserDateDim" MeasureGroupName-
"IncidentAssignedTouser" Fact="DWBase!WorkItemAssignedToUserFact"/>
```

When the OLAP cube is deployed, the dimension, outriggers, and foreign key relationships are automatically calculated and the data source view will be updated with these new elements. The following table describes measure group attributes.

Attribute	Required	Values	Definition
DateDimAlias	No	String	The name of the date dimension that will filter on this measure group. If no alias is defined, the date dim role playing name will automatically be "(MeasureGroupName)_DateDim"
MeasureGroupName	Yes	String	The name of the measure group in the cube. This name must be unique within the cube.
Fact	Yes	Relationship or CustomFact	The target of the measure group, which must be a fact in the data warehouse.

Substitution

Because relationship facts in the data warehouse may target abstract relationships and dimensions, you need to substitute in concrete dimensions so that the measure group will contain only instances that you want to browse.

This is illustrated in the following example.

```
<Substitution MeasureGroupName="IncidentAssignedTouser" RelationshipEndpoint="Source"
Relationship="Workitem!System.WorkItemAssignedToUser"
TargetDimension="DWBase!WorkItemDim" ReplacementDimension="IncidentDW!IncidentDim"/>
```

In this example, the *IncidentAssignedToUser* measure group points at the *WorkitemAssignedToUser* relationship. This relationship, however, will not only contain incidents, but it will also contain change requests and problems that have also been assigned to any users. To ensure that this measure group only contains incidents, Service Manager substitutes *WorkItemDim* with *IncidentDim*. This means that the table that is created in the data source view for the measure group automatically performs an inner join on WorkItemDim with IncidentDim and

returns only those instances where a join is valid based on the EntityDimKey or BaseManagedEntityId.

Remember that you must define the relationship endpoint where you want to perform the substitution. This element is required because it is possible that the source and endpoint dimensions are identical and a methodology is needed to uniquely identify which dimension to substitute. An example of such a relationship is *WorkItemRelates to WorkItem*.

The substitution element is also used to define alias dimensions for the cube. In other words, you can define an alias name for a dimension, but it is not required to actually substitute a dimension. In effect, the substitution in this case is not on the dimension but on the cube dimension or alias dimension name, as shown in the following example:

```
<Substitution MeasureGroupName="IncidentAssignedToUser" RelationshipEndpoint="Target"
Relationship="Workitem!System.WorkItemAssignedToUser"
AliasTargetDimensionAs="AssignedToUserDim" TargetDimension="DWBase!UserDim"/>
```

In this example, the alias cube dimension name is *AssignedToUserDim*. This is the name of the dimension that will be used to actually filter on this cube. By allowing users to define alias names, names can be specifically tailored to enable the desired, many-to-many relationships in the cube. This makes more advanced filtering and analytical capabilities possible.

Finally, substitutions are valid not only for relationship facts but for custom facts as well. In this scenario, the relationship endpoint would be set to *None*. The following table describes substitution attributes.

Attribute	Required	Values	Definition
MeasureGroupName	Yes	String	The measure group name on which to perform the substitution
RelationshipEndPoint	Yes	(Target, Source, None)	The endpoint of the relationship to perform the substitution. By default, the value is None for custom facts.
Relationship	No	ManagementPackRelationship	The relationship to use for the substitution.

Attribute	Required	Values	Definition
AliasTargetDimensionAs	No	String	The alias name of the original targeted dimension
AliasReplacementDimensionsAs	No	String	The alias name for the substituted dimension
DimensionAlias	No	ManagementPackDimension	The dimension alias from a custom fact if one exists

Custom MDX

You can use custom Multi-Dimensional Expression (MDX) scripts to modify and tailor the OLAP cube to the exact specifications that meet your needs. Because Service Manager are model based, it is impossible to determine all your possible semantic needs when taking into account the wide spectrum of requirements and exact specifications for the domain-specific business needs of a particular user. Custom MDX makes it possible for you to define MDX scripts that will be applied to the OLAP cube to enable specific scenarios that users need to measure and instrument.

Named Calculation

You can use named calculations to define new attributes on a dimension that a custom measure can later target. This makes it possible for you to extend the dimensional schema and customize the schema to fit your exact needs. The following example is from the SystemCenterWorkItemsCube:

```
<NamedCalculation ID="IncidentsPastTargetResolutionTime" Target="IncidentDW!IncidentDim"
ColumnType="Int">
<Calculation>(case when ( (([Status] = 'IncidentStatusEnum.Resolved' OR [Status] =
'IncidentStatusEnum.Closed') AND ResolvedDate &gt; TargetResolutionTime) OR (([Status] !=
'IncidentStatusEnum.Resolved' AND [Status] != 'IncidentStatusEnum.Closed') AND
GETUTCDATE() &gt; TargetResolutionTime)) then 1 else 0 end )</Calculation>
</NamedCalculation>
```

In this example, the Incident dimension contains data, such as the status of the incident and the target resolution time. However, there is no native measure that calculates the number of incidents that exceeded the target resolution time, although this type of data is very useful for a

systems administrator. You can create this scenario using a named calculation and aggregate the data so that a custom measure can target the new attribute and then present the information to an end user.

Remember that Service Manager supports only NamedCalculation targeting dimensions. NamedCalculation cannot target facts. The following table describes named calculation attributes.

Attribute	Required	Values	Definition
ID	Yes	String	Name of the named calculation.
Target	Yes	ManagementPackDimension	The target dimension for the measure
ColumnType	Yes	(Int, Double)	The Structured Query Language (SQL) type of the column
Type	No	(Count, Sum)	The type of the measure

The subelement <Calculation> contains, as its value, the definition of the named calculation. The value is stored as an MDX expression.

Measure

You can use custom measures to aggregate and display data based on numeric attributes from dimensions. Service Manager does not support custom measures based on facts. Continuing with the example of he Named Calculation above, Service Manager defines a custom measure on IncidentsPastTargetResolutionTime as the following:

```
<Measure ID="IncidentsPastTargetResolutionTimeCount" Target="IncidentDW!IncidentDim"
Type="Sum" Property="IncidentsPastTargetResolutionTime"/>
```

Reviewing this XML code, the target of the measure is the IncidentDimension and the specific property is *IncidentsPastTargetResolutionTime*. This is the custom property that was defined previously. Custom measures can target either native or calculated properties in the dimension.

Finally, the measure type is defined to be a sum. Possible values for a measure type include Sum and Count. Because of performance considerations, Service Manager Distinct Count measure types are not allowed. The following table describes measure attributes.

Attribute	Required	Values	Definition
ID	Yes	String	Name of the measure

Attribute	Required	Values	Definition
Target	Yes	ManagementPackDimension	The target dimension for the measure
Property	Yes	String	The targeted dimension property
Type	No	(Count, Sum)	The type of the measure

ManyToManyRelationship

The ManyToManyRelationship makes it possible for you, the cube designer, to add custom, many-to-many dimensions to an OLAP cube, for enabling advanced analytic scenarios. Defining many-to-many relationships is beyond the scope of this document. However, you can investigate this concept and its benefits. For more information about the ManyToManyRelationship, see The Many-to-Many Revolution 2.0.

During cube deployment, Service Manager automatically adds many-to-many dimensions to the cube for all "one-hop" relationships, without any interaction from you. However, Service Manager does not add many-to-many dimensions for cascading (multi-hop) relationships because of the exponential increase of possible relationships that could be added. Adding all these relationships can significantly degrade performance when the OLAP cube is browsed. This is because the aggregations of many-to-many relationships are generally not calculated during processing and because the joins will be evaluated while the OLAP cube is browsed. If you want a specific, cascading, many-to-many relationship, you can define the relationship using a management pack element and it will be added to the OLAP cube. Conversely, you can overwrite an automatically generated, many-to-many relationship to use a different intermediate measure group in instances in which multiple intermediate groups exist. In this case, Service Manager automatically uses the first group that is encountered. The following is an example of a many-to-many management pack relationship element:

```
<ManyToManyRelationship CubeDimension="ServiceDim"
TargetMeasureGroup="AlertAboutConfigItem"
IntermediateMeasureGroup="ServiceContainsConfigItem" />
```

The following table describes many to many relationship attributes.

Attribute	Required	Values	Definition
CubeDimension	Yes	String	Name of the many-to-many cube dimension
TargetMeasureGroup	Yes	String	The target measure group to create the

Attribute	Required	Values	Definition
			many-to-many relationship
IntermediateMeasureGroup	Yes	String	The intermediate measure group to create the many-to-many relationship

KPI

Organizations and businesses can use key performance indicators (KPIs) to quickly estimate the health of an enterprise by measuring its progress toward a predefined goal. Each KPI has a target value and an actual value. The target value is a quantitative goal that is critical to the success of the organization. Large amounts of data are filtered to one discrete value that can be used to monitor performance and progress towards goals and benchmarks. Some examples of KPIs are a college having a goal that 90% of their students graduate within four years or a basketball team with a goal of causing the opposing team to shoot less than 50 percent for a game. You can use a scorecard to show a group of KPIs, providing in one instantaneous snapshot the overall health of a business. The following is an example KPI:

```
<KPI ID="IncidentResolutiuonKpi" >

<Caption> The ratio of incidents resolved </Caption>

<Value>IIF(([Measures].[IncidentDimCount])&gt;
0,([Measures].[IncidentsResolvedCount]/[Measures].[IncidentDimCount]),null)</Value>

<Goal>1.0</Goal>

<GreenThreshold> 0.75</GreenThreshold>

<YellowThreshold>0.5 </YellowThreshold>

<Direction>Up</Direction>

<StatusGraphic>Thermometer</StatusGraphic>

</KPI>
```

The following table describes KPI attributes.

Attribute	Required	Values	Definition
ID	Yes	String	Name of the KPI
Caption	Yes	String	Description of the KPI
Value	Yes	String	MDX script defining the numeric value of the KPI

Attribute	Required	Values	Definition
Goal	Yes	String	The target value of the KPI
Green Threshold	Yes	String (between 0.1 and 1)	Any number that is above or below this threshold, depending on the direction, is marked as green in the status symbol.
Yellow Threshold	Yes	String (between 0.1 and 1)	Any number that is above or below the threshold, depending on the direction, but does not meet the green threshold is marked as yellow in the status symbol. A number that does not meet the yellow threshold is marked as red in the status symbol.
Direction	Yes	(Up, Down)	If the direction is up, any numbers above the green or yellow threshold are marked with the corresponding symbol. Similarly for down, numbers below the green or yellow thresholds are marked with the corresponding symbol.
Status Graphic	Yes	(Shapes, TrafficLight, RoadSigns, Gauge, ReversedGauge, Thermometer, Cylinder, Faces, VarianceArrow)	The symbol that will represent the KPI.

Action

Actions are events that you can trigger on an OLAP cube when you are accessing data in the cube. Only drill-through actions are supported by Service Manager. The following is an example of an action:

```
<Action ID="DrillThroughOnWICreatedByUser" MeasureGroupName="CreatedByUser"
ActionType="DrillThrough">
<DrillThroughColumns CubeDimension="WorkItemCreatedByUser_UserDim">
<Property PropertyName="FirstName" />
<Property PropertyName="LastName" />
<Property PropertyName="Company" />
<Property PropertyName="Department" />
<Property PropertyName="Office" />
</DrillThroughColumns>
</Action>
```

The following table describes actions attributes.

Attribute	Required	Values	Definition
ID	Yes	String	Name of the drill-through action
MeasureGroupName	Yes	String	Targeted measure group of the action
ActionType	Yes	(DrillThrough)	Type of action. Only drill-through actions are supported by Service Manager.
CubeDimension	Yes	String	The cube dimension that is the target of the action, which must be a slicer on the Measure Group
PropertyName	Yes	String	Attribute of the dimension that is displayed when the drill-through action is executed

CubeExtension

The primary purpose of the CubeExtension element is to make it possible for you to modify the OLAP cube after the cube has deployed onto SSAS, without having to uninstall and reinstall the cube. In situations in which the OLAP cube has been fully processed with years of data, recreating the cube is time consuming because all partitions have to be fully reprocessed.

The CubeExtension element can define the following elements:

- NamedCalculation
- ManyToManyRelationship
- KPI
- Measure
- Action
- CustomMdx

Each customization that is defined in a CubeExtension element can also be defined in a SystemCenterCube object. The only customization that is not allowed is the addition of facts or measure groups and substitutions to the cube.

See Also

Understanding OLAP Cubes

About Cube Partitioning

Each measure group in a cube is divided into partitions, where a partition defines a portion of the fact data that is loaded into a measure group. SQL Server Analysis Services (SSAS) on SQL Server 2008 R2 Standard Edition allows only one partition per measure group, while multiple partitions are allowed in the Enterprise Edition. Partitions are completely transparent to the end user, but they have an important impact on performance and scalability. For example, partitions can be processed separately and in parallel. They can have different aggregation designs, although this was not implemented in System Center 2012 – Service Manager. You can reprocess a partition without affecting all the other partitions in a measure group. Also, SSAS automatically scans only the partitions that contain the necessary data for a query, which can vastly improve query performance.

Cube partitioning is performed on every data warehouse maintenance job run, which is hourly by default. The specific process module that runs is named ManageCubePartitions. It always runs after the CreateMartPartitions step. This dependency data is stored in the infra.moduletriggercondition table.

The main dynamic link library (DLL), which handles partitioning, is in the warehouse utility DLL, Microsoft.EnterpriseManagement.Warehouse.Utility, in the PartitionUtil class. Specifically, there is a ManagePartitions() method in the class that handles all partition maintenance. The data warehouse maintenance DLL, Microsoft.EnterpriseManagement.Warehouse.Maintenance, and the data warehouse online analytical processing (OLAP) DLL, Microsoft.EnterpriseManagement.Warehouse.Olap, both call into Microsoft.EnterpriseManagement.Warehouse.Utility to handle partitions during maintenance and cube deployment. This is why actual partition handling is in the common warehouse utility DLL to avoid duplicating logic or code.

Cube Partitioning Maintenance performs the following tasks:

- Create partitions
- Delete partitions
- Update partition boundaries

To do this, the Structured Query Language (SQL) table etl.TablePartition is read to determine all the fact partitions that have been created for a measure group. The following actions occur:

1. Start cube processing for each measure group in the cube
2. Get all partitions from the etl.TablePartition table for the measure group
3. Delete any partitions that exist in the measure group but that are missing from the etl.TablePartition table
4. Add any new partitions that have been created and that exist only in the etl.TablePartition table
5. Update any partition that might have changed by matching each partition to the RangeStartDate and RangeEndDate in the etl.TablePartition table

Remember the following about cube processing:

- Only measure groups that are targeted at facts contain multiple partitions in SQL Server 2008 R2 Standard Edition. By default, all measure groups and dimensions contain only one partition. Therefore, the partition does not have any boundary conditions.
- The partition boundaries are defined by a query binding that is based on datekeys that match up to the datekeys for the corresponding fact partition in the etl.TablePartition table.

See Also

Understanding OLAP Cubes

About Cube Processing

When an online analytical processing (OLAP) cube has been deployed and all its partitions have been created, it is ready to be processed so that it is viewable. Processing a cube is the final step after extract, transform, and load (ETL) runs. These steps occur as follows:

1. Extract: Extract data from the source system
2. Transform: Apply functions to conform data to a standard dimensional schema
3. Load: Load the data into the data mart for consumption
4. Process: Load the data from the data mart into the OLAP cube for browsing

Processing of an OLAP cube occurs when all the aggregations for the cube are calculated and the cube is loaded with these aggregations and data. Dimension and fact tables are read, and the data is calculated and loaded into the cube. When you design an OLAP cube, processing must be carefully considered because of the potentially significant effect that processing might have in a production environment where millions of records may exist. A full process of all partitions in such an environment might take anywhere from days to even weeks, which might render the Service Manager infrastructure and cubes unusable to end users. One recommendation is to disable the processing schedule of any cubes that are not being used to reduce the overhead on the system.

OLAP cube processing consists of two separate tasks:

1. Dimension processing
2. Partition processing

Each OLAP cube has a corresponding processing job in the Service Manager console, and it runs on a user-configurable schedule. Each type of processing task is described in the following sections.

Dimension Processing

Whenever a new dimension is added to the SQL Server Analysis Server (SSAS) database, a full process must be run on the dimension to bring it to a fully processed state. After a dimension has been processed, however, there is no guarantee that it will be processed again when another cube that targets the same dimension is processed. By not automatically reprocessing the dimension prevents Service Manager from reprocessing every dimension for every cube. This is especially true if the dimension has been recently processed, because it is unlikely that new data exists that has not yet been processed. To optimize processing efficiency, there is a singleton class, which is defined in the Microsoft.SystemCenter.Datawarehouse.OLAP.Base management pack, that is named Microsoft.SystemCenter.Warehouse.Dimension.ProcessingInterval. The following is an example of this class:

```
<!-- This singleton class defines the minimum interval of time in minutes that must
elapse before a shared dimension is reprocessed. -->
<ClassType ID="Microsoft.SystemCenter.Warehouse.Dimension.ProcessingInterval"
Accessibility="Public" Abstract="false" Base="AdminItem!System.AdminItem"
Singleton="true">
<Property ID="IntervalInMinutes" Type="int" Required="true" DefaultValue="60"/>
</ClassType>
```

This singleton class contains a property, *IntervalInMinutes*, which describes how often to process a dimension. By default this property is set to 60 minutes. For example, if a dimension was processed at 3:05 P.M. and another cube that targets the same dimension is processed at 3:45 P.M., the dimension will not be reprocessed. One drawback to this approach is the increased likelihood of dimension key errors. A retry mechanism handles dimension key errors to reprocess the dimension and then the cube partition. For more information about processing failures, see the “Common Problems with Debugging and Troubleshooting” section in the Troubleshooting OLAP Cubes topic.

After a dimension has been fully processed, incremental processing with *ProcessUpdate* is executed. The only other time that *ProcessFull* is executed is when a dimension schema changes, because it results in the dimension returning to an unprocessed state. Remember that if *ProcessFull* is performed on a dimension, all affected cubes and their partitions will subsequently exist in an unprocessed state and they will have to be fully processed on their next scheduled run.

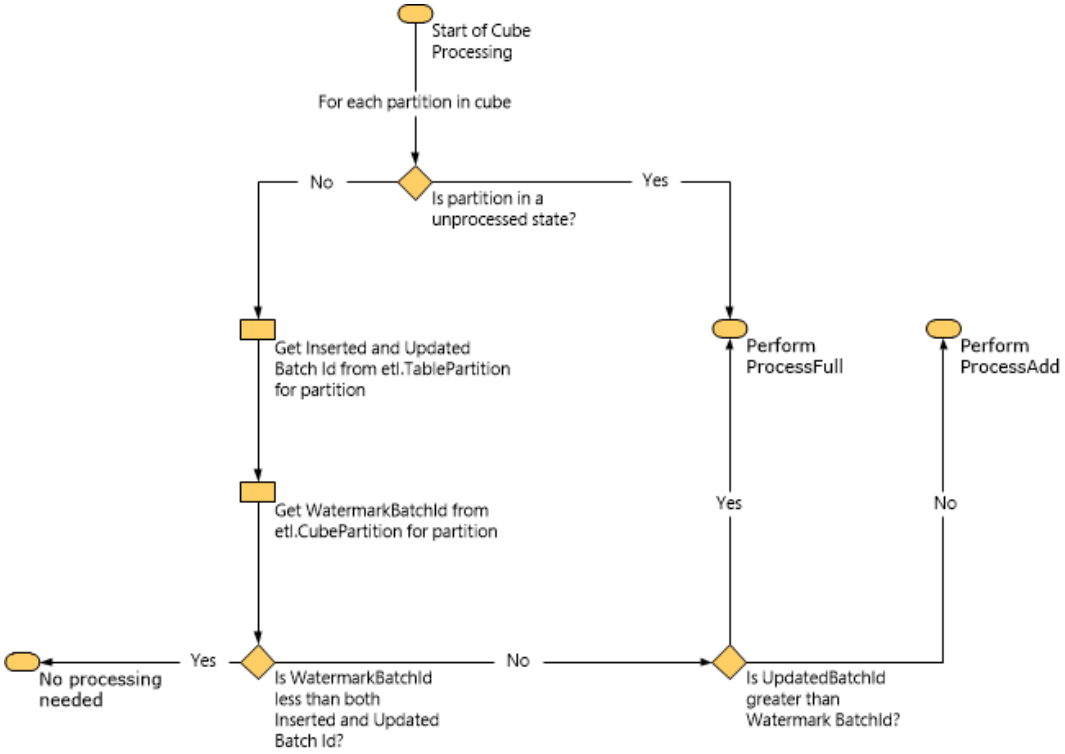
Partition Processing

Partition processing must be carefully considered because reprocessing a large partition is very slow and it consumes many CPU resources on the server that hosts SSAS. Partition processing

generally takes longer than dimension processing. Unlike dimension processing, processing a partition has no side effects on other objects. The only two types of processing that are performed on System Center 2012 – Service Manager OLAP cubes are ProcessFull and ProcessAdd.

Similar to dimensions, creating new partitions in an OLAP cube requires a ProcessFull task for the partition to be in a state where it can be queried. Because a ProcessFull task is an expensive operation, you should perform a ProcessFull task only when necessary; for example, when you create a partition or when a row has been updated. In scenarios in which rows have been added and no rows have been updated, Service Manager can perform a ProcessAdd task. To do this, Service Manager uses watermarks and other metadata. Specifically, the etl.cubepartition table and the etl.tablepartition table are queried to determine what type of processing to perform.

The following diagram illustrates how Service Manager determines what type of processing to perform based on the watermark data.



When a ProcessAdd task is performed, Service Manager limits the scope of the query using watermarks. For example, if the InsertedBatchId value is 100 and the WatermarkBatchId value is 50, the query loads data only from the data mart where the InsertedBatchId is greater than 50 and less than 100.

Finally, it is important to note that Service Manager does not support manual processing of OLAP cubes using SSAS or Business Intelligence Development Studio. Processing cubes outside of the methods that are provided in System Center 2012 – Service Manager, including the Service Manager console and Service Manager cmdlets, will not update the watermark tables. Therefore, it is possible that data integrity problems might occur. If you have accidentally reprocessed the cube manually, one possible workaround is to unprocess the OLAP cube manually in the same

manner. Then, the next time Service Manager processes the cube, it will automatically perform a ProcessFull task because partitions will be in an unprocessed state. This will update all watermarks and metadata correctly so that any possible data integrity problems will be fixed.

See Also

Understanding OLAP Cubes

About Cube Deployment

Online analytical processing (OLAP) cube deployment uses the Service Manager deployment infrastructure to create OLAP cubes in the SQL Server Analysis Services (SSAS) database.

To summarize, a deployable element returns a deployer with a collection of resources that are serialized and that are used to create the OLAP cube in the SSAS database. For OLAP cubes, the name of the deployable object is CubeDeployable for the SystemCenterCube element and CubeExtensionDeployable for the CubeExtension element. The deployer for both elements is CubeDeployer.

The dbo.Selector table in the DWStagingAndConfig database contains an entry for both the SystemCenterCube and CubeExtension management pack elements. The deployment engine uses this metadata if additional deployment processing is necessary for a management pack element when the management pack is imported into the data warehouse using the MPSync job.

Deployments use the Analysis Management Objects (AMO) application programming interface (API) to create and modify all the cube components in the SSAS database. Specifically, AMO in disconnected mode is used because the CubeDeployable element will not have a connection to the SSAS database. Working with AMO in disconnected mode makes it possible for you to create the entire tree of AMO objects without establishing a connection to the server. Service Manager then serializes the hierarchy of objects as stream resources and attaches them to the deployer object that is passed back to the deployment infrastructure. The deployer object is then deserialized, establishes a connection to the SSAD database, and creates the objects by sending the appropriate requests to the server.

Only major objects can be serialized. In AMO, major objects are considered classes that represent a complete object as a complete entity and not as part of another object. For example, major objects include Server, Cube, and Dimension, which are all stand-alone entities. The DimensionAttribute, however, is not a major object because it can only be created as part of a parent major object of Dimension. DimensionAttribute, therefore, is a minor object. The OLAP cube design focuses on creating all the major objects that are needed for cubes, along with any dependent minor objects. These major objects are the objects that will be serialized—and, eventually, deserialized—before the objects are created in the SSAS database.

Resources that wrap major objects must be created in a specific order for deployment to complete successfully and satisfy the dependency requirements of the OLAP cube elements. The following two lists illustrate the deployment sequence for the SystemCenterCube and CubeExtension elements, respectively:

1. DataSourceView elements
2. dimension elements

3. date dimension element
4. cube element
1. DataSourceView elements
2. cube element

See Also

Understanding OLAP Cubes

Maintaining OLAP Cubes

The information in the following sections describes maintenance best practices for online analytical processing (OLAP) cubes.

Periodically Reprocess Analysis Services Dimensions

SQL Server Analysis Services (SSAS) best practices recommend that SSAS dimensions should be fully processed periodically. Fully processing the dimensions rebuilds indices and optimizes the data storage of multidimensional data, which improves query and cube performance that can degrade over time. This is similar to periodically defragmenting a hard disk on a computer.

However, a drawback to fully processing an SSAS dimension is that all affected OLAP cubes become unprocessed, and they must also be fully processed to return them to the state in which you can query them. System Center 2012 – Service Manager does not explicitly fully process on SSAS dimensions. Therefore, you must decide when to perform this maintenance task.

Memory Considerations

If you run all data warehouse extraction, transformation, and load (ETL) operations and OLAP cube functions on one server, carefully consider the memory needs of the operating system, data warehouse, and SSAS to ensure that the server can handle all the data-intensive operations that can run concurrently. This is especially important because processing OLAP cubes is a memory-intensive operation.

For more information, review hardware requirements and guidelines in the Planning Guide for System Center 2012 - Service Manager. Also review the SQL Server 2008 R2 Analysis Services Operations Guide.

See Also

Understanding OLAP Cubes

Troubleshooting OLAP Cubes

The following sections describe common problems that you might need to troubleshoot online analytical processing (OLAP) data cubes in the System Center 2012 – Service Manager data warehouse.

Processing Failures

Although safeguards exist in the DWRepository database to ensure data integrity, they cannot completely prevent the possibility of a processing error. The most common processing error is a DimensionKeyNotFound exception. Because SQL Server Analysis Server (SSAS) dimensions are processed every 60 minutes by default, it is possible that, while processing the fact's measure

group, the dimension keys do not yet exist. In this case, by default the processing logic reprocesses the SSAS dimensions using a ProcessUpdate task and then reprocesses the fact up to two times to resolve the key errors.

There are some uncommon situations in which the reprocessing might fail. The following are possible causes of this failure:

- Only the data warehouse Repository enforces foreign keys to ensure the integrity of the data. The data mart does not have any foreign keys for performance considerations. Because the load process bulk moves the data from the repository to the data mart using ActiveX Data Objects methods, it is possible that the fact data may have been loaded before the dimension keys as a result of a timing problem. To resolve this problem, the load process must be run again to move the existing dimension keys.
- In multiple data mart situations, all the dimensions of each data mart target the primary data warehouse data mart. This is to reduce the size and processing time of the OLAP cubes. It is possible, however, for facts in the Operations Manager or Configuration Manager data marts to target dimension keys that do not yet exist in the primary data warehouse data mart. In this case, you must run the load job on the primary data mart to resolve the processing failure for cubes that target the Operations Manager or Configuration Manager data marts.

Troubleshooting MDX Customizations

Because many cube customizations require a working knowledge of Multidimensional Expressions (MDX), it is common for syntax errors to occur in the initial MDX expression that is used for OLAP cube customization. Multiple attempts may be necessary before the expression is suitable for your needs. You should test the MDX expression on the OLAP cube using Business Intelligence Development Studio (BIDS) or SSAS, without saving the changes, before you add the MDX expression to the OLAP cube using a CubeExtension or defining it in the SystemCenterCube element.

However, if you do have an error in the MDX expression when you add it in a management pack by using a CubeExtension, you can uninstall the cube extension to revert any changes that were made on the OLAP cube. If the expressions are defined using a SystemCenterCube element, you must uninstall the management pack and then manually delete the OLAP cube from SSAS before you make any corrections and redeploy the OLAP cube management pack. Because of this, you should define cube customizations by using the CubeExtension element.

OLAP Cube Management Pack Deployment Failures

You may have a situation in which you want to browse the *WorkItems Assigned To User* measure group and then you want to slice on all users in a particular department. When you attempt to perform filter on *UserDim*, nothing happens or no data is returned. This might be very confusing because *UserDim* has a relationship to the measure group.

In this situation, remember that the same database dimension can have multiple roles in the multidimensional model. We call these dimensions role-playing dimensions. For example, the time dimension can be used multiple times in an OLAP cube that describes flight information. The different role-playing dimensions in this case could be *Departure Time* and *Arrival Time*, where both target the *Time* dimension.

In a *WorkItems Assigned To User* example, the given role-playing name of the user dimension is actually *AssignedToUser*. If the user filtered by this particular dimension instead of “UserDim”, they would return the correct information.

BIDS has a useful feature called a Dimension Usage tab that shows the relationships between dimensions and OLAP cubes so that you can determine which dimensions you can use to slice and dice the OLAP cube. Furthermore, in the *WorkItems Assigned To User* example, *UserDim* has no relationship to the *WorkItemAssignedToUser* measure group, while *UserDim(AssignedToUser)* does have a relationship to the measure group where the join attribute is UserDimKey. In this case, you can see the role-playing name is highlighted within the parentheses of the Dimension Usage tab.

Service Manager does not have a Dimension Usage tab capability. Therefore, you will have to look at BIDS to determine exactly which dimensions can filter on a particular cube.

Failure to Process OLAP Cubes on a Remote SSAS Server

In certain situations, processing an OLAP cube on a remote SSAS server might fail because the firewall has not been configured properly. The default instance of SSAS uses TCP/IP port 2383, and this port must be unblocked in the firewall to allow access. To unblock the port, run the following command-line instructions:

```
C:\Windows\system32>set port=2383

C:\Windows\system32>netsh advfirewall firewall add rule name="Analysis Services"
protocol=TCP dir=in localport=2383 action=allow
```

OLAP Cube Processing Stops

There can be many causes for OLAP cube processing to stop. You must first ensure that the server has enough RAM, especially in situations in which the data warehouse and the SSAS server are hosted on the same server, so that there is enough memory to run data warehouse extraction, transformation, and load (ETL) and cube processing jobs concurrently. A few potential solutions are listed here:

1. There are known deadlock problems in Microsoft SQL Server 2008 Analysis Services. The workaround is to increase the number of threads in the processing thread pool before the processing stops. If the system is already stopped, the workaround is to restart both the System Center Management service and the Analysis Services service and then reset the cube processing workitem to a status of 3, which means not started, so that the Service Manager workflow engine can restart it.

   Note

   For System Center 2012 R2 Service Manager, the System Center Management service was renamed to Microsoft Monitoring Agent.

   To determine the relevant cube processing workitem, you can run the following queries on the DWStagingAndConfig database. Note that these queries are shown individually; however, you can easily join them together in one query:

   ```
   select processId from infra.process where processname like
   'Process.{CubeName}'
   ```

```
select batchid from infra.batch where processId = {ProcessId
from previous query}
select * from infra.workitem(nolock) where BatchId = {BatchId
from previous query}
update infra.workitem set statusid = 3 where workitemId =
{workitemId from previous query)
```

2. Check the CoordinatorExecutionMode property on the SSAS service, and ensue that it is set properly. You can read more about this problem on the SQL Server forums.

The DWMaintenance Task Stops on the ManageCubePartitions/ManageCubeTranslations Step

In this situation, the most common cause is a nonresponsive SSAS server. The workaround is the same for the first step in the previous section, “OLAP Cube Processing Stops.” To determine the relevant cube processing workitem, you can run the following queries on the DWStagingAndConfig database. Note that these queries are shown individually; however, you can easily join them together in one query:

```
select processid from infra.process where processname = 'DWMaintenance'
select * from infra.ProcessModule where ProcessId = {ProcessId from previous query} (Note
the ProcessModuleId where the VertexName is ManageCubePartitions/ManageCubeTranslaions)
Select * from infra.batch where ProcessId = {ProcessId from previous query} (Note the
BatchId from the largest batch)
select * from infra.WorkItem where BatchId = {BatchId from previous query}
update infra.workitem set statusid = 3 where workitemId = {workitemId for the step that
is hung with the corresponding processmoduleid for
ManageCubePartitions/ManageCubeTranslations)
```

See Also

Understanding OLAP Cubes

How to Create an OLAP Cube Using a Management Pack

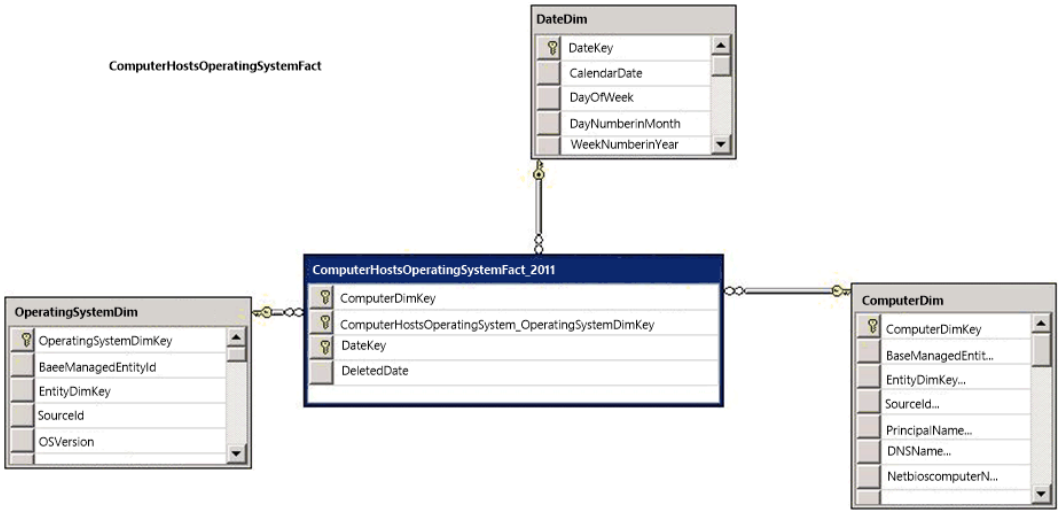
A System Center online analytical processing (OLAP) cube is defined as a collection of the following management pack elements:

- Measure groups, which points to the facts that are included
- Substitutions to be performed on the fact
- MDX resources
- Drill-Through Actions
- KPIs
- Named Calculations

- Custom Measures
- Many to Many Relationships

All elements other than MeasureGroups are optional.

When you define an OLAP cube using the schema above and you import the management pack, the System Center 2012 – Service Manager data warehouse deploys the cube using SQL Server Analysis Management Objects (AMO), and it creates the required infrastructure to maintain it. For example, you can create a simple OLAP cube based on *ComputerHostsOperatingSystemFact*. The following illustration is the dimensional view of the fact in the warehouse.



To create an OLAP cube using a management pack

1. Copy the following management pack source code and save it:

```
<Warehouse>
<Extensions>
<SystemCenterCube ID="ComputerCube">
<MeasureGroups>
<MeasureGroup ID="ComputerHostsOperatingSystem"
Fact="DWBase!ComputerHostsOperatingSystemFact" />
</MeasureGroups>
</SystemCenterCube>
</Extensions>
</Warehouse>
```

2. Import the management pack, and then run the MPsync job. The OLAP cube will appear in the Service Manager console in an unprocessed state.
3. To view OLAP cube, open the Service Manager console, navigate to **Data Warehouse**

and **Cubes**, and then click **ComputerCube**.

4. A data warehouse process job is created for the OLAP cube with a default 24-hour job schedule. Therefore, process the cube using the Service Manager console or using the cmdlet **Start-SCDWJob -JobName Process.ComputerCube**.
5. Open the cube in Excel using the link from the **Task** pane, and look at the cube structure that was created.
6. Notice that the following measure groups are created for the OLAP cube:
   - A measure group corresponding to the fact ComputerHostsOperatingSystemFact with a Count measure
   - A measure group corresponding to the dimensions that it points to
   - Computerdim and OperatingsystemDim with the count measure
7. Notice that the following cube dimensions are created:
   - The outrigger dimensions corresponding to the fact are added as cube dimensions so that you can slice the facts on those dimensions. These dimensions include Priority and Status.
   - DateDim is added to the OLAP cube because it is relevant to any fact.
   - EntityStatus and RelationshipStatus cube dimensions are defined for all cubes to indicate whether the entity or relationship is deleted.

See Also

Understanding OLAP Cubes

Analyzing Data with Excel 2010

System Center 2012 – Service Manager includes predefined Microsoft Online Analytical Processing (OLAP) data cubes that connect to the data warehouse to retrieve data so that you can manipulate it by using Microsoft Excel in a tabular fashion. When it is opened, a data cube is presented as a worksheet containing a blank PivotTable report. Information defining the OLAP data source is embedded in a worksheet. When you open a report or when you refresh the data connection, Excel uses Microsoft SQL Server Analysis Services (SSAS) to connect to the data warehouse to retrieve key performance indicators (KPIs) and other data. After it is opened, the current worksheet contains a snapshot or subset of data from the data warehouse. If you save a worksheet, the data source connection information, KPIs, and any other customizations you have made are saved with it. If you save the worksheet to an analysis library, you can later reopen it without having to use the Service Manager console.

KPIs included in Service Manager data cubes are predefined, special, calculated measures that are defined on the server that make it possible for you to track KPIs, such as status (does the current value meet a specific number?) and trend (what is the value over time?). When these KPIs are displayed in a PivotTable, the server can send related icons that are similar to the new Excel icon set to indicate status levels that are above or below a certain threshold (for example, with a stop light icon) or whether a value is trending up or down (for example, with a directional arrow icon).

PivotTables can help you quickly and easily create useful reports. PivotTables that appear in Service Manager data cubes include many predefined KPI categories, called measure groups or dimensions. These groups are the highest level of categorization, and they help you examine the data and focus your analysis. In turn, most measure groups have many additional levels of subcategories and individual fields. All the categories, subcategories, and fields are contained in the PivotTable Field List. For example, you can create a straightforward report using the following steps:

1. Using the PivotTable Field List, select a category and add it as a row.
2. Select a second category and add it as a column.
3. Select a category or subcategory to add values.

After you have created your report, you can add any level of additional complexity by sorting, filtering, formatting, and adding calculations and charts. You can also go in and out of categories as you continue your analysis.

To view a demonstration of creating a report and manipulating data in Excel using data from an OLAP data cube in a PivotTable, see Demo: Explore Adventure Works in Excel by using an OLAP PivotTable report.

See Also

Using OLAP Cubes for Advanced Analytics

How to View and Analyze an OLAP Data Cube with Excel

You can use the following procedure to view and analyze a Microsoft Online Analytical Processing (OLAP) data cube from System Center 2012 – Service Manager with Microsoft Excel. You can also save your workbooks into an analysis library. Using the PivotTable field list, you can drag and drop fields from the cube into the workbook. For more information about using Excel slicers, see Creating and Using Excel Slicers.

You must have Microsoft Excel 2007 or later installed on the computer running the Service Manager console in order to use the following procedure.

Note

The first time you analyze a cube with Excel, it can take a few minutes to load.

To view and analyze an OLAP data cube with Excel

1. In the Service Manager console, click **Data Warehouse**, expand the **Data Warehouse** node, and then click **Cubes**.
2. In the **Cubes** pane, select a cube name, and then under **Tasks**, click **Analyze Cube in Excel**. For example, select **SystemCenterWorkItemsCube** and analyze it.
3. When the worksheet opens in Excel, you can drag and drop fields from the PivotTable Field List and create slicers and charts.
    a. For example, if you want to see the total number of incidents currently open, expand **IncidentDimGroup**, and then select **Incidents Opened**.

b. You can add additional fields to generate a more complex analysis. For example, you can add computers from the **ComputerDim** dimension by selecting the **DisplayName** field to see the number of incidents that affect different computers.

4. Optionally, you can save the workbook to a shared folder or other shared location, such as the analysis library. For more information about the analysis library, see How to Use the Analysis Library.

See Also

Creating and Using Excel Slicers

How to Use the Analysis Library

Using OLAP Cubes for Advanced Analytics

Creating and Using Excel Slicers

The most useful reporting data available from System Center 2012 – Service Manager is in the form of data cubes. One method of viewing and manipulating cube data is using PivotTables in Microsoft Excel. You can use slicers in Excel to filter PivotTable data.

Slicers are easy-to-use filtering components that contain a set of buttons that enable you to quickly filter the data in a PivotTable report, without the need to open drop-down lists to find the items that you want to filter.

When you use a regular PivotTable report filter to filter on multiple items, the filter indicates only that multiple items are filtered, and you have to open a drop-down list to find the filtering details. However, a slicer clearly labels the filter that is applied and provides details so that you can easily understand the data that is displayed in the filtered PivotTable report.

For more information about Excel slicers, see Use slicers to filter PivotTable data on the Microsoft Office website.

See Also

Using OLAP Cubes for Advanced Analytics

How to Refresh OLAP Data Cube Information

You can use the following procedures in System Center 2012 – Service Manager to refresh data in a Microsoft Online Analytical Processing (OLAP) data cube and then validate that it was refreshed. By default, most OLAP data cubes are refreshed every 24 hours. However, you can manually refresh the data to ensure that you are accessing the latest information from the data warehouse.

If necessary, you can also manually process an OLAP data cube outside of the processing job.

To refresh OLAP data cube information using the Service Manager console

1. In the Service Manager console, click **Data Warehouse**, expand it, and then click **Cubes**.
2. In the **Cubes** pane, select a cube name, and then under **Tasks**, click **Process Cube**.

3. Click **OK** to close the **Process Cube** dialog box.

To validate that the OLAP data cube was refreshed in the Service Manager console

- Select an OLAP data cube and verify that the date and time information under **Last Processed Date** has been updated since you processed the cube and that the cube **Status** is listed as **Processed**.

To manually refresh OLAP data cube information

- Run the following script for the OLAP data cube of your choice.

```
Update etl.CubePartition set

watermarkbatchid = 0

where cubename = 'ComputerCube'
```

See Also

Using OLAP Cubes for Advanced Analytics

How to Manage the Analysis Libraries

You can use the following procedure to manage the analysis libraries in the Service Manager console in System Center 2012 – Service Manager. The analysis libraries are file storage areas, such as network shares, Universal Naming Convention (UNC) paths, and Microsoft SharePoint. The libraries are used to house Microsoft Excel data files, which are generated from Microsoft Online Analytical Processing (OLAP) data cubes. When they are saved to an analysis library, you can easily access Excel files and the cube data they connect to without having to open the Service Manager console. Instead, you can open the storage location directly or from the Reporting workspace.

You might want to create many analysis library folders for different departments in your organization.

In order to add a new analysis library folder, the underlying shared folder or other sharing location must already exist and you must have permission to write to it.

To manage an analysis library folder

1. In the Service Manager console, click **Data Warehouse**, expand the **Data Warehouse** node, and then click **Analysis Libraries**.
2. In the **Tasks** pane, click **Add Library Folder**.
3. In the **Add Library Folder** dialog box under **Name**, type a name for the new analysis library folder. For example, type **Incident Management Analysis Library**.
4. Under **Description**, type a description that identifies the type of information that the folder will contain. For example, type **This folder contains saved incident**

management-related workbooks.

5. Under **UNC Path**, type the path that represents the library folder. An example might resemble **\\computer1\IncidentManagmentReports**. You can also click **Browse** to search for a location.

See Also

Using OLAP Cubes for Advanced Analytics

How to Use the Analysis Library

You can use the following procedure in System Center 2012 – Service Manager to view Microsoft Excel workbooks that connect to Microsoft Online Analytical Processing (OLAP) data cubes by using the **Analysis Library** node in the Reporting workspace. Workbooks are saved to the Analysis Library by Service Manager so that report users can easily access the workbooks.

To use the analysis library

1. In the Service Manager console, click **Reporting**, expand the **Analysis Library** node, and then navigate to the folder that contains an Excel workbook that you want to open.
2. Select the Excel workbook that you want to open, and then in the **Tasks** list, click **Open Excel File**.
3. In the Excel workbook, you can refresh the data from the data warehouse. For example, if you are using Microsoft Excel 2010, you can click the **Data** tab and then click **Refresh All** to update the workbook.

See Also

Using OLAP Cubes for Advanced Analytics

Advanced Analytical Reports Available in System Center 2012 - Service Manager

The following analytical reports, which are presented as Microsoft Online Analytical Processing (OLAP) data cubes, are available in System Center 2012 – Service Manager. The data cubes that are included in this release of Service Manager contain measures and dimensions.

Dimensions

The following dimensions are contained in various data cubes. However, not all data cubes contain each dimension.

WorkItemDim, ConfigItemDim, UserDim, ComputerDim ,ChangeRequestDim, ReviewerDim, SerivceDim, ConfigItemObjectStatus, ConfigItemAssetStatus, ActivityStatus, ActivityPriority, ActivityArea, ActivityStage, ChangeStatus,Change Category, ChangePriority, ChangeImpact, ChangeRisk, ChangeImplementationResults, ChangeArea, ReviewerDecision, ServiceStatus, ServiceClassification, ServicePriority, DateDim, DeletionStatusDim, OperatingSystemDim, ProcessorDim, NetworkAdapterDim, LogicalDiskDim, PhysicalDiskDim, DeployedComputerDim, SLAConfigurationDim, SLAMetricDim, SLADatePropertyTimeMetricDim, CalendarDim,

WorkItemGroupDim, BillableTimeDim, IncidentDim, ProblemDim, ReleaseRecordDim, SLAInstanceStatus, IncidentStatus, IncidentSource, IncidentTierQueues, IncidentClassification, IncidentResolutionCategory, IncidentImpact, IncidentUrgency, ProblemStatus, ProblemSource, ProblemClassification,ProblemResolution, ReleaseStatus, ReleaseType, ReleaseCategory, ReleasePriority, ReleaseImpact, ReleaseRisk, ReleaseImplementionResults, ReleaseTemplate, ReviewActivityDim, ServiceRequestDim, RequestOfferingDim, ServiceOfferingDim, OfferingDim, ReviewActivityApproval, ServiceRequestStatus, ServiceRequestTemplate, ServiceRequestPriority, ServiceRequestUrgency, ServiceRequestSource, ServiceRequestImplementationResults, ServiceRequestArea, ServiceRequestSupportGroup, OfferingStatus, ServiceOfferingCategory, ConfigurationManagerCollectionDim, PowerActivityRecordEventType, SoftwareUpdateDim

Work Item Data Cube

The work item data cube contains the following measures:

SLAInstanceInformationCount, SLAInstanceStatusCount, SLAConfigurationHasMetricCount, SLAConfigurationHasCalendarCount, WorkItemGroupContainsWorkItemCount, WorkItemIsAboutConfigItemCount, WorkItemCreatedByUserCount, WorkItemAssignedToUserCount, WorkItemAffectedByUserCount, WorkItemRelatesToConfigItemCount, WorkItemRelatesToWorkItemCount, WorkItemHasBillableTimeCount, BillableTimeBilledByUserCount, TotalTimeMeasure, IncidentStatusDurationCount, IncidentStatusCount, IncidentResolutionByUserCount, IncidentPrimaryUserCount, IncidentIsAboutConfigItemCount, IncidentCreatedByUserCount, IncidentAssignedToUserCount, IncidentAffectedByUserCount, IncidentRelatesToConfigItemCount, IncidentRelatesToWorkItemCount, IncidentHasBillableTimeCount, IncidentRelatesToProblemCount, IncidentSLAInstanceInformationCount, WorkItemGroupContainsIncidentCount, ProblemResolutionByUserCount, ProblemIsAboutConfigItemCount, ProblemCreatedByUserCount, ProblemAssignedToUserCount, ProblemAffectedByUserCount, ProblemRelatesToConfigItemCount, ProblemRelatesToWorkItemCount, ProblemHasBillableTimeCount, ProblemSLAInstanceInformationCount, ReleaseIsAboutConfigItemCount, ReleaseCreatedByUserCount, ReleaseAssignedToUserCount, ReleaseSLAInstanceInformationCount, WorkItemIsAboutComputerCount, WorkItemIsAboutServiceCount, ServiceContainsConfigItemCount, ServiceContainsComputerCount, WorkItemDimCount, SLAConfigurationDimCount, SLAMetricDimCount, SLADatePropertyTimeMetricDimCount, CalendarDimCount, WorkItemGroupDimCount, ConfigItemDimCount, UserDimCount, BillableTimeDimCount, TimeWorkedSum, IncidentDimCount, IncidentsResolvedCount, IncidentsResolvedWithinTargetResolutionTimeCount,IncidentsResolutionTimeInHoursSum, IncidentsPastTargetResolutionTimeCount, ProblemDimCount, ReleaseRecordDimCount, ReleasesImplementedOnScheduleCount, ComputerDimCount, ServiceDimCount

Power Management Data Cube

The power management data cube contains the following measures:

ComputerHostsOperatingSystemCount, DeployedComputerRunsWindowsComputerCount, ConfigManagerCollectionHasComputerCount, Hour0, Hour1, Hour2, Hour3, Hour4, Hour5, Hour6, Hour7, Hour8, Hour9, Hour10, Hour11, Hour12, Hour13, Hour14, Hour15, Hour16, Hour17, Hour18, Hour19, Hour20, Hour21, Hour22, Hour23, PowerActivityDayCount, PowerActivityRecordEventTypeCount, ServiceContainsConfigItemCount, ServiceContainsComputerCount, ComputerDimCount, OperatingSystemDimCount, DeployedComputerDimCount, ConfigurationManagerCollectionDimCount, ServiceDimCount, ConfigItemDimCount

Software Updates Data Cube

The software updates data cube contains the following measures:

ComputerHostsOperatingSystemCount, DeployedComputerRunsWindowsComputerCount, ConfigurationManagerCollectionHasComputerCount, IsInstalled, IsMissing, IsUnknown, ComputerHasSoftwareUpdateCount, ServiceContainsConfigItemCount, ServiceContainsComputerCount, ComputerDimCount, OperatingSystemDimCount, DeployedComputerDimCount, ConfigurationManagerCollectionDimCount, SoftwareUpdateDimCount, ServiceDimCount, ConfigItemDimCount

Service Catalog Data Cube

The service catalog data cube contains the following measures:

SLAConfigurationHasMetricCount, SLAConfigurationHasCalendarCount, ActivityIsAboutConfigItemCount, ActivityCreatedByUserCount, ActivityAssignedToUserCount, ActivityRelatesToConfigItemCount, ActivityRelatesToWorkItemCount, ActivityTotalTimeMeasure, ActivityStatusDurationCount, ActivityStatusCount, ReviewActivityHasReviewerCount, ReviewerIsReviewerUserCount, ReviewerVotedByUserCount, ReviewActivityRelatesToConfigItemCount, ReviewActivityAssignedToUserCount, ReviewActivityCreatedByUserCount, WorkItemGroupContainsServiceRequestCount, ServiceRequestIsAboutConfigItemCount, ServiceRequestCreatedByUserCount, ServiceRequestAssignedToUserCount, ServiceRequestRelatesToConfigItemCount, ServiceRequestRelatesToWorkItemCount, ServiceRequestAffectedUserCount, ServiceRequestContainsActivityCount, ServiceRequestTotalTimeMeasure, ServiceRequestStatusDurationCount, ServiceRequestStatusCount, ServiceRequestSLAInstanceInformationCount, SLAInstanceStatusCount, ServiceRequestRelatesToRequestOfferingCount, ServiceOfferingRelatesToRequestOfferingCount, ServiceOfferingPublishedByUserCount, RequestOfferingPublishedByUserCount, ServiceOfferingOwnerCount, RequestOfferingOwnerCount, ServiceRelatesToServiceOfferingCount, SLAConfigurationDimCount, SLAMetricDimCount, SLADatePropertyTimeMetricDimCount, CalendarDimCount, WorkItemDimCount, ConfigItemDimCount, ActivityDimCount, UserDimCount, ReviewerDimCount, ReviewActivityDimCount, WorkItemGroupDimCount, ServiceRequestDimCount, RequestOfferingDimCount, ServiceOfferingDimCount,OfferingDimCount, ServiceDimCount

Configuration Item Data Cube

The configuration item data cube contains the following measures:

ConfigItemRelatesToConfigItemCount, ComputerPrimaryUserCount, ComputerHostsOperatingSystemCount, ComputerHostsProcessorCount, ComputerHostsNetworkAdapterCount, ComputerHostsLogicalDiskCount, ComputerHostsPhysicalDiskCount, ServiceImpactsUserCount, ConfigItemOwnedByUserCount, ConfigItemServicedByUserCount, ConfigItemImpactsCustomersCount, DeployedComputerRunsWindowsComputerCount, ServiceContainsConfigItemCount, ServiceContainsComputerCount, ConfigItemDimCount, ComputerDimCount, UserDimCount, OperatingSystemDimCount, TotalRAMInMB, ProcessorDimCount, TotalProcessorSpeed, NetworkAdapterDimCount, LogicalDiskDimCount, TotalDiskSpace, PhysicalDiskDimCount, ServiceDimCount, DeployedComputerDimCount

Change and Activity Management Data Cube

The change and activity management data cube contains the following measures:

WorkItemIsAboutConfigItemCount, WorkItemCreatedByUserCount, WorkItemAssignedToUserCount, WorkItemRelatesToWorkItemCount, ActivityIsAboutConfigItemCount, ActivityCreatedByUserCount, ActivityAssignedToUserCount, ActivityRelatesToWorkItemCount, ActivityIsAboutComputerCount, ChangeRequestIsAboutConfigItemCount, ChangeRequestCreatedByUserCount, ChangeRequestAssignedToUserCount, ChangeRequestRelatesToWorkItemCount, ChangeRequestContainsActivityCount, ChangeRequestIsAboutComputerCount, ReviewActivityHasReviewerCount, ReviewerIsReviewerUserCount, ReviewerVotedByUserCount, ReviewActivityRelatesToConfigItemCount, ReviewActivityAssignedToUserCount, ReviewActivityCreatedByUserCount, WorkItemIsAboutComputerCount, ActivityRelatesToChangeRequestCount, ServiceContainsConfigItemCount, ServiceContainsComputerCount, WorkItemDimCount, ConfigItemDimCount, UserDimCount, ActivityDimCount, ActivitiesImplementedCount, ActivitiesImplementedOnScheduleCount, ComputerDimCount, ChangeRequestDimCount, ChangeRequestsImplementedCount, ChangeRequestsImplementedOnScheduleCount, EmergencyChangeRequestsCount, ProcessTimePerChangeInDaysSum, ReviewerDimCount, ServiceDimCount

See Also

Using OLAP Cubes for Advanced Analytics

Creating and Deploying Dashboards

You can use PerformancePoint Dashboard Designer in System Center 2012 – Service Manager to create and manage SharePoint dashboards and their elements to measure, monitor, and manage business performance with live data from the Service Manager data warehouse. Dashboards are mechanisms that display hierarchical arrangements of key performance indicators (KPIs).

You can use Dashboard Designer to define multiple filters for a dashboard, such as filters that are defined over time, by geography, or against different KPI destinations. When you publish dashboards to a SharePoint site, end users can navigate them by using page filters and drill-up and drill-down functionality. You can also use Dashboard Designer to create views and elements, such as scorecard elements, KPIs, data sources, indicators, and reports for use in dashboards.

This section is an example showing how you can create a PerformancePoint Services dashboard using the Analysis Services ServiceManager WorkItems Cube. This involves creating a data source for the cube and then creating a scorecard that and creating a resolved incidents KPI. Then, you can create an example single-page dashboard using a filter, a scorecard, and a report. Finally, you complete the example by exploring the deployed dashboard and its interactive features. You must have Microsoft SharePoint Designer 2010 installed to complete the examples in the following topics.

Important

You must have the Enterprise edition of SharePoint Designer 2010 to create SharePoint PerformancePoint dashboards. For more information about upgrading to the Enterprise edition, see Upgrade from a SharePoint Server 2010 Standard CAL to an Enterprise CAL.

For more information about PerformancePoint Dashboard Designer, see PerformancePoint Dashboard Designer.

Creating and Deploying Dashboard Topics

- How to Configure SharePoint Infrastructure for Dashboards

  Describes how to configure SharePoint infrastructure to support dashboards.
- How to Create a Data Source for Dashboard Designer

  Describes how to create a data source for Dashboard Designer.
- How to Build the Resolved Incidents Scorecard

  Describes how to build the Resolved Incidents scorecard for later use in a dashboard.
- How to Configure the KPI

  Describes how to configure key performance indicators.
- How to Create the Incidents by Analyst Report

  Describes how to create the Incidents by Analyst Report.
- How to Create the Resolved Incidents Dashboard

  Describes how to create the Resolved Incidents dashboard.
- How to Deploy the Resolved Incidents Dashboard

  Describes how to deploy the Resolved Incidents dashboard to a SharePoint site.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager

- Planning Guide for System Center 2012 – Service Manager

How to Configure SharePoint Infrastructure for Dashboards

Before you can create and deploy dashboards for use on the Self-Service Portal in System Center 2012 – Service Manager, you must configure Microsoft SharePoint 2010 and then install Dashboard Designer.

To configure SharePoint infrastructure for dashboards

1. Open your web browser, navigate to your top-level site in SharePoint 2010, click **Site Actions**, and then click **Site Settings**.
2. Under **Site Collection Administration**, click **Site collection features**. On the **Features** page, click **Activate** next to **SharePoint Server Publishing Infrastructure** and **PerformancePoint Services Site Features**.
3. Enable the new features at the parent **Site** level by opening the site that you want to be the parent of your Business Intelligence site. Then, under **Site Actions**, click **Site Settings**. Under **Site Actions**, click **Manage site features**. Click **Activate** next to **SharePoint Server Publishing Infrastructure** and **PerformancePoint Services Site Features**.
4. Next, add a Business Intelligence Center site by opening the site that you want to be the parent of the new site. Click **Site Actions**, and then click **New Site**. On the **New SharePoint Site** page, select the **Business Intelligence Center** site template, type a title and a URL name, and then click **Create**.
5. As an option, you can create the Business Intelligence Center Site under the Service Manager Self-Service Portal Site. To do this, apply the SMPortalTheme: click **Site Actions**, click **Site Settings**, and then under **Look and Feel**, click **Site theme**. Click **Specify a theme**, click **SMPortalTheme**, and then click **Apply**.
6. Next, configure the PerformancePoint Unattended Service Account by opening the SharePoint Central Administration page. Then, under **Application Management**, click **Manage service applications**. Click **PerformancePoint Service Application**, and then click **PerformancePoint Service Application Settings**. Type your credentials in the **Secure Store and Unattended Service Account** area, and then click **OK**.
7. If an error message appears that says “The Unattended Service Account cannot be set for the service application,” you can resolve this problem by doing the following:
   a. Navigate to the **SharePoint 2012 Central Administration** page, and then under **Application Management**, click **Manage service applications**.
   b. Click **Secure Store Service**, and then click **Generate New Key**.
   c. Type a pass phrase, and then click **OK**.
8. On the new Business Intelligence Center site page that you created, move your mouse over the **Monitor Key Performance** area of the page, and then click **Start using PerformancePoint Services**.
9. If an error message appears that says “An error occurred during the processing of <FolderPath>/<PageName>.aspx. Code blocks are not allowed in this file,” you can resolve this problem by inserting the following information into the Web.config file

between the PageParserPaths tags of your SharePoint site:

```
<PageParserPaths>
<PageParserPath VirtualPath="<FolderPath>/<PageName>.aspx"
CompilationMode="Always" AllowServerSideScript="true"/>
</PageParserPaths>
```

10. On the new page, **click Run Dashboard Designer**, and then in the **Application Run – Security Warning** dialog box, click **Run** to install PerformancePoint Dashboard Designer. Later, you can start Dashboard Designer from the **Start** menu.

See Also

Creating and Deploying Dashboards

How to Create a Data Source for Dashboard Designer

You can use the following information to create a new data source in System Center 2012 – Service Manager and save it by using Dashboard Designer.

The workspace is an XML document that defines the PerformancePoint item definitions for a particular project. The saved workspace items are stored in SharePoint lists and libraries. You can add existing stored items to a workspace, based on the project requirements.

To create a data source for Dashboard Designer

1. Open PerformancePoint Dashboard Designer, and in the **Workspace Browser**, select **Data Connections**.
2. Click the **Create** tab, and then click **Data Source**.
3. In the **Select a Data Source Template** dialog box, select **Analysis Services**, and then click **OK**.
4. In the **New Data Source** pane, ensure that the **Editor** tab is selected, and then type information for the connection settings for the data source using the examples in the following table.

Property	Value
Server	<YourServerName>
Database	DWASDataBase
Cube	ServiceManager WorkItems Cube

5. To save the data source, in the **Workspace Browser** pane, right-click the new data source, and then click **Save**. As an option, you can rename the data source.
6. To save the workspace, click **Save As**, and save the Dashboard Designer Workspace in the folder that you want.

See Also

Creating and Deploying Dashboards

How to Build the Resolved Incidents Scorecard

Before you can use a scorecard in a dashboard in System Center 2012 – Service Manager, you must create the scorecard. Use the following procedure to use a wizard to create an example scorecard called Resolved Incidents Scorecard. The wizard also creates key performance indicators (KPIs) from the SystemCenterWorkItemsCube data source.

To build the Resolved Incidents Scorecard

1. Open Dashboard Designer, connect to the server that hosts the DWASDataBase, and then select **Service Manager WorkItems Cube**. Or, if you have previously saved a designer workspace file that contains the connection information, open the file.
2. On the **Home** tab, click **Add Lists**. In the **Add Lists** box, click **PerformancePoint Content**, and then click **OK**.
3. To add a scorecard to the workspace, in the **Workspace Browser**, right-click the **PerformancePoint Content** list, point to **New**, and then click **Scorecard**.
4. In the **Select a Scorecard Template** window, in the **Category** tree, ensure that **Microsoft** is selected. In the **Template** list, select **Analysis Services**, and then click **OK**.
5. In the Create an Analysis Services Scorecard Wizard, on the **Select a data source page**, select the **SystemCenterWorkItemsCube** data source, and then click **Next**.

   Note
   When you use the wizard to create a scorecard based on an Analysis Services data source, there are two options that enable the creation of KPIs. You can use the first option to create KPIs based on the measures of the cube. You can use the second option to import KPIs from the cube, if the cube contains KPIs.
6. On the **Select a KPI Source** page, select **Create KPIs from Analysis Services measures**, and then click **Next**.
7. On the **Select KPIs to Import** page, click **Add KPI** and then in the new row, type **Resolved Incidents KPI** for the name.
8. Select **Incidents Resolved Count** under **Actual**.
9. Select **Increasing is Better** under **Band Method**.
10. Select **Incidents Opened** under **Targets** and then click **Next**.
11. On the **Add Measure Filters** page, click **Next**.
12. On the **Add Member Columns** page, click **Next**.
13. On the **Locations** page, click **Finish**.
14. Notice that the KPI and scorecard are added to the workspace and that the scorecard opens in the design pane. In the **Workspace Browser**, modify the name of the new scorecard to **Resolved Incidents Scorecard**, and then press **Enter**.
15. Save the information in **Designer Workspace**.

See Also

Creating and Deploying Dashboards

How to Configure the KPI

Use the following procedures to configure the key performance indicators (KPIs) that you created in the How to Build the Resolved Incidents Scorecard topic. You will later use this information in a PerformancePoint dashboard.

In the first procedure, you configure the Resolved Incidents KPI number formats and threshold values. In the second procedure, you configure the Resolved Incidents Scorecard and add the Incident Classification hierarchy to allow browsing of the KPI by the hierarchy members. In addition, you will format the scorecard. In the dashboard, the selection of members of the Incident Classification hierarchy will filter a report.

To configure the KPI

1. Using Dashboard Designer, open the file you saved previously that contains the Incident Resolved Scorecard.
2. In the **Workspace Browser**, click **Resolved Incidents KPI**.
3. To configure the thresholds for the Target metric, select the **Target** metric.
4. In the **Thresholds** section, modify the value for **Threshold 2** to **50%**, and the value for **Threshold 1** to **25%**.
5. In the Thresholds section, modify the value for **Best** to **100%**.
6. To save the KPI, in the **Workspace Browser**, right-click **Resolved Incidents KPI**, and then click **Save**.

To configure the Resolved Incidents KPI

1. In the **Workspace Browser**, select the scorecard named **Resolved Incidents Scorecard**.
2. To refresh the scorecard with the updated KPI definition, on the **Edit** ribbon tab, inside the **View** group, click **Update**.
3. To add the Incident Classification hierarchy to the scorecard rows, in the **Details** pane, expand **Dimensions**, expand the **IncidentDim_IncidentClassification** dimension, and then drag **IncidentClassificationValue** onto the **Incident** scorecard cell.
4. In the **Select Members** dialog box, expand the **All** member list, select all the values other than the empty value, and then click **OK**.
5. To refresh the scorecard, on the **Edit** ribbon tab, inside the **View** group, click **Update**.

See Also

Creating and Deploying Dashboards

How to Create the Incidents by Analyst Report

Use the following procedure to create an Analytic Grid report named Incidents by Analyst.

To create the Incidents by Analyst report

1. Open Dashboard Designer, connect to the server that hosts the DWASDataBase, and then click **Service Manager WorkItems Cube**. Or, if you have previously saved a designer workspace file that contains the connection information, open that file.
2. In the **Workspace Browser**, right-click the **PerformancePoint Content** list, select **New**, and then click **Report**.
3. In the **Select a Report Template** dialog box, select the **Analytic Grid** template, and then click **OK**.
4. In the Create an Analytic Grid Report wizard, on the **Select a Data Source** page, select the **SystemCenterWorkItems** data source, and then click **Finish**.
5. In the **Workspace Browser**, modify the name of the report to **Incidents by Analyst**, and then press **Enter**.
6. To configure the report, in the **Details** pane, expand **Dimensions**, expand the **AssignedToUserDim** dimension, and then drag the **User Name** attribute into the **Rows** drop zone.
7. To configure the hierarchy member selection, in the **Rows** drop zone, click the down arrow to the right of the **AssignedToUserDim** hierarchy to open the **Select Members** dialog box.
8. In the **Select Members** dialog box, right-click **All members** member, point to **Autoselect Members**, click **Select "User Name"**, and then click **OK**.
9. In the **Details** pane, expand **Measures**, and then drag the **IncidentDimCount** and **Incidents Resolved Count** measures into the **Columns** drop zone.
10. Right-click the **Incidents Resolved Count** column heading, point to **Sort**, and then click **Smallest to Largest**.
11. Right-click anywhere in table, point to **Filter**, and then click **Filter Empty Rows**.
12. In the **Details** pane, expand **Dimensions**, expand the **IncidentDim_IncidentClassification** dimension, and then drag **IncidentClassificationValue** into the **Background** drop zone.
13. On the **Edit** ribbon tab, in the **View** group, click **Settings**.
14. In the **View Settings** window, click **Show Information Bar**, and then click **OK**.
15. In the design pane, click the **Query** tab, and then review the MDX expression that was created automatically to support the report design.
16. To save the report, in the **Workspace Browser**, right-click the **Incidents by Analyst** report, and then click **Save**.

See Also

Creating and Deploying Dashboards

How to Create the Resolved Incidents Dashboard

Use the following procedure to create and assemble the Resolved Incidents Dashboard. This involves the Resolved Incidents Scorecard and the Incidents by Analyst report. You will then create connections to pass values between the dashboard items.

To create the Resolved Incidents Dashboard

1. Open Dashboard Designer, connect to the server that hosts the DWASDataBase, and then click **Service Manager WorkItems Cube**. Or, if you have previously saved a designer workspace file that contains the connection information, open that file.
2. In the **Select a Dashboard Page Template** window, select the **2 Columns** template, and then click **OK**.
3. In the **Workspace Browser**, modify the name of the dashboard to **Resolved Incidents Dashboard**, and then press **Enter**.
4. To add the **Resolved Incidents Scorecard** to the dashboard, in the **Details** pane, expand **Scorecards**, expand the **PerformancePoint Content** list, and then drag the **Resolved Incidents Scorecard** into the **Left Column** zone.
5. To add the Incidents by Analyst report to the dashboard, in the **Details** pane, expand **Reports**, expand the **PerformancePoint Content** list, and then drag the **Incidents by Analyst** report into the **Right Column** zone.
6. To create the connection between the scorecard and the report, in the **Right Column** zone, click **Incidents by Analyst**.
7. On the **Edit** ribbon tab, click **Create Connection**.
8. In the **Connection** dialog box, in the **Get Values From** list, select **Left Column – (1) Resolved Incidents Scorecard**.
9. Click the **Values** tab, and in **Connect To**, select the **Incident Classification IncidentClassificationValue** hierarchy.
10. In the **Source Value** list, select **Member Row: Member Unique Name**, and then click **OK**.
11. Save the dashboard and the workspace.

See Also

Creating and Deploying Dashboards

How to Deploy the Resolved Incidents Dashboard

Use the following procedure to deploy the Resolved Incidents Dashboard to the SharePoint Dashboards library.

In this procedure you deploy the Resolved Incidents Dashboard to the SharePoint Dashboards library using the selected master page. Each dashboard is published as a folder that consists of a web page for each page in the dashboard.

After you deploy the dashboard, you can select values in the Resolved Incidents Scorecard to show information that applies only to that classification. For example, if you select an E-Mail Problems value, only incidents with the E-Mail Problems classification appear in the scorecard portion of the report.

To deploy the Resolved Incidents Dashboard

1. Open Dashboard Designer, connect to the server that hosts the DWASDataBase, and

then select **Service Manager WorkItems Cube**. Or, if you have previously saved a designer workspace file that contains the connection information, open that file.

2. In the Workspace Browser, right-click the **Resolved Incidents Dashboard**, and then select **Deploy to SharePoint**.
3. In the **Deploy To** dialog box, notice the selection of the Dashboards library.
4. In the **Master Page** list, select **Minimal**, and then click **OK**.
5. Internet Explorer starts and opens the first dashboard page.

See Also

Creating and Deploying Dashboards

Customizing the Data Warehouse

After the System Center 2012 – Service Manager data warehouse is deployed and you have viewed its reports, you can customize the information in the reports to better suit your organization. For example, you might want to recreate reports that you have used in the past with other information systems using Service Manager. Or, you might want to customize the reports for your internal business processes for incidents or change management.

The information in this section can help you determine how to extend and customize the data warehouse to enable in-depth analyses.

Customizing the Data Warehouse Topics

- About Data Warehouse Dimensional Modeling Using a Star Schema

  Explains concepts of the dimensional modeling schema that is used in the data warehouse.
- About Fact Tables in the Data Warehouse

  Explains concepts of fact tables that are used in the data warehouse.
- About Outriggers in the Data Warehouse

  Explains concepts of outriggers that are used in the data warehouse.
- About Dimensions in the Data Warehouse

  Explains concepts of dimensions that are used in the data warehouse.

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager
- Operations Guide for System Center 2012 – Service Manager
- Administrator's Guide for System Center 2012 – Service Manager
- Planning Guide for System Center 2012 – Service Manager

About Data Warehouse Dimensional Modeling Using a Star Schema

The data warehouse in System Center 2012 – Service Manager is a set of databases and processes. The processes add information to the databases automatically. In short, the purpose

of the data warehouse is to add information to the data mart where you and other users run reports and perform analyses to help manage your business. System Center 2012 – Service Manager stores data warehouse data longer in the warehouse than in the Service Manager database because of the usefulness of the data for trending and analysis. Also, data warehouse data often outlives its usefulness for normal transactional processing needs.

The data warehouse is optimized for aggregating and analyzing a lot of data at once in many seemly unpredictable ways. This behavior differs from transactional processing systems, which are optimized for write access on few records in any given transaction, making the behavior of those transactions more predictable.

To optimize the data warehouse for performance and ease of use, Service Manager uses the Kimball approach to dimensional modeling. (For more information about the Kimball approach, see Dimensional modeling.) This means that tables in the DWDataMart database are grouped logically into subject matter areas that resemble a star when they are laid out in a diagram. Therefore, these groupings are often called star schemas, and they include the following:

- In the center of the star is a fact table. Fact tables represent relationships, measures, and key performance indicators (KPIs). Fact tables are normally long and have relatively few columns, but they contain a large number of transactions.
- The fact table joins to dimension tables, which represent classes, properties, and enumerations. Dimension tables usually contain far fewer rows than fact tables, but they are wider because they have attributes by which report users slice and dice reports. These attributes can include status, classifications, and date attributes (such as Created Date or Resolved Date) of a class.
- An outrigger is a special kind of dimension table that hangs off another dimension table for performance and usability reasons.

When you think about a star schema, consider what a star schema for a coffee shop might resemble. If the transactions represent coffee purchases, the dimensions might include the following:

- A date dimension to consolidate the transaction by both Gregorian and fiscal calendars
- A customer dimension that indicates who bought the coffee
- An employee dimension that indicates who made the coffee
- A product dimension that indicates the coffee type, such as espresso, drip coffee, latte, or breve
- A store dimension

When you consider the measures that the fact table might include, the list might include the following:

- Quantity sold
- Price per unit
- Total sales
- Total discounts

Information technology (IT) processes are not very different from the coffee shop example when you are designing a dimensional model. There are transactions that occur, such as incident

creation, resolution, and closure, that can produce interesting and useful metrics, such as time to resolution, resolution target adherence, billable time incurred by analysts, and duration in status.

When you think about extending and customizing your data warehouse, consider the business questions that you want to answer, and investigate dimensional modeling for useful information and best practices. For additional information about customizing the data warehouse, see the other topics in this section.

See Also

Customizing the Data Warehouse

About Fact Tables in the Data Warehouse

This topic describes how to define relationship facts in the data warehouse in System Center 2012 – Service Manager. A relationship fact in the Service Manager data warehouse is similar to a relationship in Service Manager. You can use a relationship fact to help answer queries, such as the following:

- Which work items are currently assigned to the user John Smith so that you can determine their status?
- What is the list of all the computers in the domain that currently have Windows 7 installed so that you can update them to Windows 7 Service Pack 1 (SP1)?
- What are all the review activities that list Samantha Smith as a reviewer so that they can be reassigned because she is on vacation?

In each of these scenarios, there is a source instance and a target instance that are joined together by a relationship. Without a relationship fact, it is difficult to determine the associations between the instances. Consider the relationship in the Microsoft.Windows.ComputerHostsOperatingSystem in the Microsoft.Windows.Library management pack in the following example:

```
<RelationshipType ID="Microsoft.Windows.ComputerHostsOperatingSystem"
Accessibility="Public" Base="System!System.Hosting">
<Source ID="Computer" Type="Microsoft.Windows.Computer" />
<Target ID="OperatingSystem" Type="Microsoft.Windows.OperatingSystem" MaxCardinality="1"
/>
</RelationshipType>
```

In a Service Manager relationship, the source and target are always modeled by a management pack class. In this relationship, the class Microsoft.Windows.Computer is the source and the class Microsoft.Windows.OperatingSystem is the target. The following information defines the corresponding RelationshipFact based on the Microsoft.Windows.ComputerHostsOperatingSystem relationship:

```
<RelationshipFact ID="ComputerHostsOperatingSystemFact" Accessibility="Public"
Domain="Domain.ConfigurationManagement" TimeGrain="Daily"
SourceType="Windows!Microsoft.Windows.Computer" SourceDimension="ComputerDim">
```

```
<Relationships RelationshipType="Windows!Microsoft.Windows.ComputerHostsOperatingSystem"
TargetDimension="OperatingSystemDim" />
</RelationshipFact>
```

Notice how the relationship fact defines a source dimension and a target dimension. You might notice that the source and target dimensions target the source and target classes from the original relationship that the relationship fact is modeled on. For more information about dimensions, see About Dimensions in the Data Warehouse.

You can use relationship facts by associating two dimensions together, which makes it possible for reports to use the association to display important information from each dimension in relation to the other. For example, you can use the WorkItemAssignedToUser relationship to display information about incidents or change requests for a specific user in the report. This makes it possible for you to navigate in the data to find information that is specific to your needs. This is just one example of how relationship facts are useful in creating specialized views of data in reports.

The attributes and subelement tags that are required for modeling a relationship fact in a user-defined management pack are described in the following table for the <RelationshipFact> tag.

Attribute	Description
ID	A unique identifier for the relationship fact element. This is also the table name of the relationship fact in the data warehouse and data mart.
Accessibility	This element should always be set to Public because the deployment process creates system-derived management packs that refer to this outrigger during the generation of the automated transforms.
Domain	The scope of the relationship fact. Possible values include the following: Instance Management Activity Management, Incident Management Change Management, and Problem Management. The value for this attribute must be an enumeration that is a child of the parent Domain enumeration, which is defined in the Microsoft.SystemCenter.Datawarehouse.Base management pack.
TimeGrain	The detail level of the relationship fact. The value must be one of the following: Hourly, Daily, Weekly, or Monthly.

Attribute	Description
SourceType	The management pack class for the source of the relationship.
SourceDimension	The dimension that targets the source class. This is an optional field. If no SourceDimension is specified, Service Manager automatically finds the dimension that directly targets the source class itself or the closest parent class of the source class in the class hierarchy.

In a multiple-relationship fact, the source dimension always remains the same. However, the target dimension can change, depending on the specific relationship. Every relationship type attribute in a multiple relationship fact must be unique. The following is an example of the relationship fact in the WorkItemAssignedToAndCreatedByUser management pack:

```
<RelationshipFact ID="WorkItemAssignedToAndCreatedUserFact" Accessibility="Public"
Domain="Domain.InstanceManagement" TimeGrain="Daily"
SourceType="WorkItem!System.WorkItem" SourceDimension="WorkItemDim">
<Relationships RelationshipType="WorkItem!System.WorkItemAssignedToUser"
TargetDimension="UserDim" />
<Relationships RelationshipType="WorkItem!System.WorkItemCreatedByUser"
TargetDimension="UserDim" />
</RelationshipFact>
```

In this example, you can see that although the target dimension is identical for both relationships, the relationships themselves are unique. Therefore, the relationship fact is valid. For more examples of outriggers, dimensions, and relationship facts, you can examine any of the data warehouse management packs that are included in Service Manager. A good example is the base data warehouse management pack named Microsoft.SystemCenter.Datawarehouse.Base.

See Also

Customizing the Data Warehouse

About Outriggers in the Data Warehouse

An outrigger in the data warehouse in System Center 2012 – Service Manager is essentially a list that can logically group together a set of values. The following tables show two examples that display a logical grouping of values that denote Priority and Windows Operating Systems.

Priority
Low

Priority
Medium
High

Windows Operating Systems
Windows XP
Windows Vista
Windows 7

An outrigger is useful in two ways:

- You can use discrete values from an outrigger as a drop-down menu for a report parameter when you create and view reports in the Service Manager console.
- You can use outrigger values to group data in reports for advanced analysis.

Outriggers in the data warehouse can target one or more class properties and consolidate them into a single set of discrete values. These properties can only be a data type String or ManagementPackEnumeration. When they are based on an enumeration, outriggers also preserve the hierarchy. Service Manager does not support an outrigger that is defined on a data type other than String or ManagementPackEnumeration.

Although the benefit of defining an outrigger on an enumeration is evident, an advantage of defining an outrigger on a string column is that the data warehouse infrastructure combines the distinct values of a property from the instance space into a small list. You can then use the list in an easy-to-use drop-down list in a report. A good example of a string-based outrigger is the `Manufacturer` property on the **Computer** class, which is modeled as a string in the Service Manager database. By defining an outrigger on that property, Service Manager provides the ability to select a value from the drop-down list, instead of searching among manufacturers that you procured your computers from.

To view an example of how an outrigger is used in a report in the parameter header, open the Service Manager console; navigate to **Reporting, Activity Management**; and then run the **Activity Distribution** report. Next, review the **Status** list to see the values of the outrigger. You can see how the outrigger was modeled in the management pack in the following example. Note the class **System.WorkItem.Activity**, which is defined in the System.Workitem.Activity.Library management pack:

```
<ClassType ID="System.WorkItem.Activity" Accessibility="Public"
Base="WorkItem!System.WorkItem" Hosted="false" Abstract="true">
< Property ID="SequenceId" Type="int" />
<Property ID="Notes" Type="richtext" MaxLength="4000" />
<Property ID="Status" Type="enum" EnumType="ActivityStatusEnum" />
```

```
<Property ID="Priority" Type="enum" EnumType="ActivityPriorityEnum" />
<Property ID="Area" Type="enum" EnumType="ActivityAreaEnum" />
<Property ID="Stage" Type="enum" EnumType="ActivityStageEnum" />
</ClassType>
```

Next, you might want to define an outrigger based on the enumeration property `Status`. The following example shows how you can define an outrigger in a management pack of your choice:

```
<Outrigger ID="ActivityStatus" Accessibility="Public">
<Attribute ID="Status"
PropertyPath="$Context/Property[Type='CoreActivity!System.WorkItem.Activity']/Status$" />
</Outrigger>
```

As described previously, you—the management pack author—can define an outrigger on one or more class properties. Each class property is modeled by a corresponding attribute in the outrigger. The following is an example of enumeration-based outrigger visualization. In this example, Activity Status is based on ActivityStatusEnum:

```
<EnumerationTypes>
<EnumerationValue ID="ActivityStatusEnum" Accessibility="Public" />
<EnumerationValue ID="ActivityStatusEnum.Ready" Parent="ActivityStatusEnum"
Accessibility="Public" Ordinal="5.0" />
<EnumerationValue ID="ActivityStatusEnum.Active" Parent="ActivityStatusEnum"
Accessibility="Public" Ordinal="10.0" />
<EnumerationValue ID="ActivityStatusEnum.OnHold" Parent="ActivityStatusEnum"
Accessibility="Public" Ordinal="15.0" />
<EnumerationValue ID="ActivityStatusEnum.Completed" Parent="ActivityStatusEnum"
Accessibility="Public" Ordinal="20.0" />
<EnumerationValue ID="ActivityStatusEnum.Failed" Parent="ActivityStatusEnum"
Accessibility="Public" Ordinal="25.0" />
<EnumerationValue ID="ActivityStatusEnum.Cancelled" Parent="ActivityStatusEnum"
Accessibility="Public" Ordinal="30.0" />
<EnumerationValue ID="ActivityStatusEnum.Rerun" Parent="ActivityStatusEnum"
Accessibility="Public" Ordinal="35.0" />
...
</EnumerationTypes>
```

Each of the values is included in the outrigger's set of discrete values. The following table lists the column ID and ActivityStatusValue from the ActivityStatus outrigger, which contains all the enumeration values from ActivityStatusEnum.

ID	ActivityStatusValue
ActivityStatusEnum.Completed	Completed
ActivityStatusEnum	Activity Status
ActivityStatusEnum.Active	In Progress
ActivityStatusEnum.OnHold	On Hold
ActivityStatusEnum.Rerun	Rerun
ActivityStatusEnum.Failed	Failed
ActivityStatusEnum.Ready	Pending
ActivityStatusEnum.Cancelled	Cancelled

In the previous table, the ID column from the outrigger contains all the EnumerationValue IDs from the ActivityStatus enumeration type. The ActivityStatusValue is the actual user-friendly display name that appears in the report drop-down menus.

The following example provides further detail about how to construct and model an outrigger. Again, the outrigger ActivityStatus is used as an example:

```
<Outrigger ID="ActivityStatus" Accessibility="Public">
<Attribute ID="Status"
PropertyPath="$Context/Property[Type='CoreActivity!System.WorkItem.Activity']/Status$" />
</Outrigger>
```

The following table describes the attributes for the <Outrigger> tag.

Attribute	Description
ID	A unique identifier for the outrigger element. This is also the table name of the outrigger in the data warehouse and datamart.
Accessibility	This element should always be set to Public.

Each <Outrigger> parent tag contains one or more <Attribute> subelement tags. The following table describes the attributes for this tag.

Attribute	Description
ID	A unique identifier for each outrigger attribute
PropertyPath	PropertyPath syntax, which must uniquely identify the class and attribute that the outrigger attribute is targeting.

See Also

Customizing the Data Warehouse

About Dimensions in the Data Warehouse

A dimension in the Service Manager data warehouse in System Center 2012 – Service Manager is roughly analogous to a management pack class. Each management class has a list of properties, while each dimension contains a list of attributes. Each dimension attribute corresponds to one property in a class.

Suppose that a user wants a report in Service Manager to display some information about the attributes for the computers in a particular domain. For example, the user may want to know the IP address, number of logical processors, and Domain Name System (DNS) name for each computer. Using dimensions, the user can bring the data over from Service Manager to the data warehouse where reports can query and display this data for each computer.

In the Service Manager data warehouse, a dimension always targets a single class. The dimension attributes then map to the target class's properties. In this example, to get the information about the attributes from a computer, there is a computer dimension that is targeted at the Microsoft.Windows.Computers class.

In certain cases that are described in further detail in this topic, a dimension may also map to the properties of a target class's base and derived classes. Therefore, while a dimension may be roughly analogous to a management pack class, it can also contain properties that are within that management pack class's hierarchy.

You can see an example of how a dimension is used in the Activity Distribution report. In the report, under **Select affected configuration item (optional)**, when you click **Add**, the **Select dimension objects** box opens and you can search for dimension instances in the ConfigItemDim dimension. You can filter on the **Display Name** property. When you select **All Windows Computers** as the dimension object, the report header is updated with the selected filter value. When you run the report, only activities that affect the selected configuration item, **All Windows Computers**, are displayed.

To see how the dimension was modeled, you can look at the System.Entity and System.ConfigItem classes that are defined in the System.Library management pack:

```
<ClassType ID="System.Entity" Accessibility="Public" Hosted="false" Abstract="true"
Singleton="false">
<Property ID="DisplayName" Type="string" MinLength="0" Key="false" CaseSensitive="false"
MaxLength="4000" />
</ClassType>
<ClassType ID="System.ConfigItem" Base="System.Entity" Accessibility="Public"
Hosted="false" Abstract="true">
<Property ID="ObjectStatus" Type="enum" EnumType="System.ConfigItem.ObjectStatusEnum"
DefaultValue="System.ConfigItem.ObjectStatusEnum.Active" />
```

```
<Property ID="AssetStatus" Type="enum" EnumType="System.ConfigItem.AssetStatusEnum" />
<Property ID="Notes" Type="richtext" MaxLength="4000" />
</ClassType>
```

To revise the configuration item dimension to target the ObjectStatus and AssetStatus properties of System.ConfigItem and the DisplayName property of the base class System.Library, you can define the dimension with the following three properties as attributes:

```
<Dimension ID="ConfigItemDim" Accessibility="Public" Target="System!System.ConfigItem"
InferredDimension="true" HierarchySupport="Exact" Reconcile="true">
<InclusionAttribute ID="DisplayName"
PropertyPath="$Context/Property[Type='System!System.Entity']/DisplayName$"
SlowlyChangingAttribute="false" />
<InclusionAttribute ID="ObjectStatus"
PropertyPath="$Context/Property[Type='System!System.ConfigItem']/ObjectStatus$"
SlowlyChangingAttribute="false" />
<InclusionAttribute ID="AssetStatus"
PropertyPath="$Context/Property[Type='System!System.ConfigItem']/AssetStatus$"
SlowlyChangingAttribute="false" />
</Dimension>
```

The following table provides details about how to construct and model a dimension by examining the XML schema elements and attributes for a <Dimension>.

Attribute	Description
ID	A unique identifier for the dimension element. This is also the table name of the dimension in the data warehouse and datamart.
Accessibility	This element should always be set to “Public”.
Target	The management pack class name that the dimension is targeting.
InferredDimension	This value is always to true.
HierarchySupport	The hierarchy of classes that help define the properties that will be included in the dimension. There are three possible values: 1. Exact 2. IncludeExtendedClassProperties 3. IncludeDerivedClassProperties For details of these values, see the next sections of this topic.

Attribute	Description
Extends	Optional boolean flag to indicate whether the dimension is a base dimension or is extending another dimension. After a dimension has been defined, you can use the Service Manager data warehouse to “extend” the dimension and add more attributes at a later point in time. If the Extends flag is set to true, HierarchySupport must be set to Exact and all the extension attributes must be listed. By default, this flag is set to false.
Reconcile	Optional boolean flag that indicates whether two instances, which are otherwise identical and only differ with regard to which source the data originated from, should be consolidated into one single row of data. By default, this flag is set to false. Dimensions that are related to configuration items should have this flag set to true, and dimensions that are related to work items have this flag set to false.

The HierarchySupport attribute determines which classes are processed and the specific attributes that are included in the dimension. Details for each possible value are described in the following sections.

Exact

When the HierarchySupport attribute is Exact, you must manually define each attribute that should be included in the dimension using the <InclusionAttribute> tag. These attributes can be either from the target class or any of the target class’s base and derived classes. Each inclusion attribute corresponds to one class property. The following table describes each of the attributes in the <InclusionAttribute> tag.

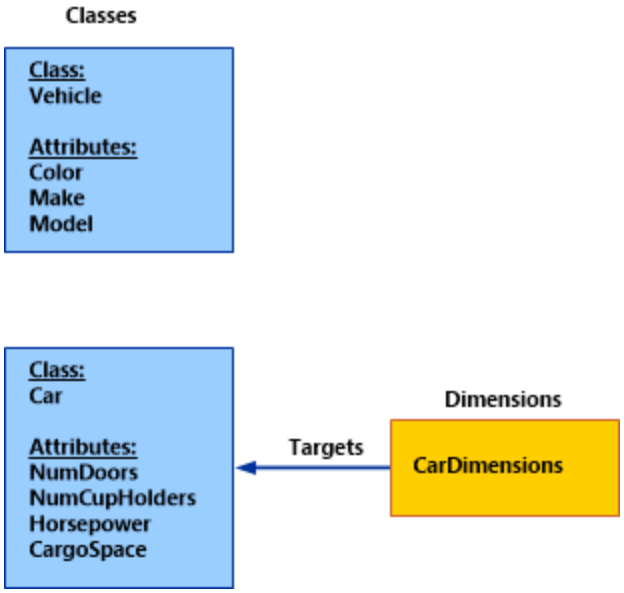
Attribute	Description
ID	A unique identifier for the attribute element.
PropertyPath	PropertyPath syntax that must uniquely identify the class and attribute that the dimension attribute is targeting.
SlowlyChangingAttribute	This attribute should always be false.

The previous ConfigItemDim dimension example had a HierarchySupport value of Exact. Therefore, only the listed inclusion attributes (DisplayName, ObjectStatus, AssetStatus) are processed in the transform and included in the dimension table in the data warehouse repository and datamart.

The Exact HierarchySupport value requires you to manually list each attribute that you want in the dimension. However, you might want all the attributes for a class, as well as attributes from its base and derived classes, to be included in the dimension. In these cases, it can take a lot of effort to list each attribute explicitly. To help, Service Manager includes two other HierarchySupport values that automatically handle these cases for you. These values are described in the following sections.

IncludeExtendedClassProperties

For a dimension with a HierarchySupport of IncludeExtendedClassProperties, all the attributes of the target class and all of its base classes are included in the dimension table and transform. The following illustration shows an example: CarDimension, which targets the class Car and has a HierarchySupport of IncludeExtendedClassProperties.



Because CarDimension targets the Car class and has a HierarchySupport value of IncludeExtendedClassProperties, it processes both the Car class and its base class, Vehicle. The resulting table and transform contain the attributes in the following table.

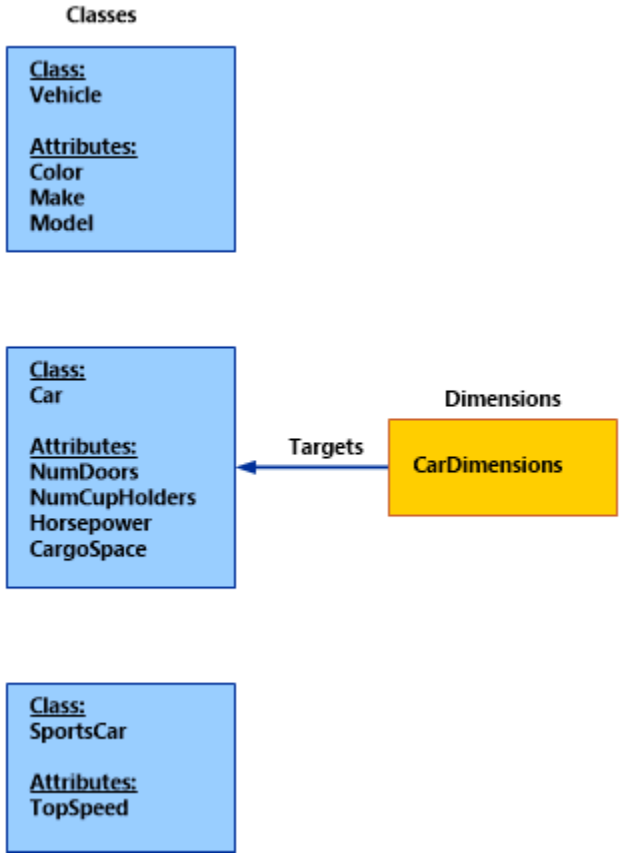
CarDimension Attributes
Color
Make

CarDimension Attributes
Model
NumDoors
NumCupHolders
Horsepower
CargoSpace

IncludeDerivedClassProperties

For a dimension with a HierarchySupport of IncludeDerivedClassProperties, all the attributes of the target class, its base classes, and its derived classes are included in the dimension table and its associated transform.

Slightly modifying the previous example, CarDimension now has a HierarchySupport of IncludeDerivedClassProperties below. Because it processes both the base and derived classes of the target class, the dimension now processes the attributes of three classes: Vehicle, Car, and Sportscar, as shown in the following illustration.



The CarDimension dimension table and transform contain the attributes in the following table.

CarDimension Attributes
Color
Make
Model
NumDoors
NumCupHolders
Horsepower
CargoSpace
TopSpeed

See Also

Customizing the Data Warehouse

Authoring for System Center 2012 - Service Manager

The Authoring Guide for System Center 2012 – Service Manager describes the use, authoring, and customization of management packs, which enable customizations in Service Manager.

Administrator's Guide Topics

- Introduction to the Service Manager Authoring Guide

  Provides an introduction to the Authoring Guide for System Center 2012 – Service Manager, including an overview of the System Center 2012 – Service Manager Authoring Tool.
- Management Packs: Working with Management Packs

  Describes how to work with management packs when you are customizing and authoring in Service Manager.
- Classes: Customizing and Authoring

  Describes how to customize and author classes in Service Manager.
- Forms: Customizing and Authoring

  Describes how to customize and author forms in Service Manager.
- Workflows: Customizing and Authoring

  Describes how to customize and author workflows in Service Manager.
- Sample Scenario: The Woodgrove Bank Customization

Provides an end-to-end sample customization scenario that illustrates how to use the Authoring Tool.

- Views Sample Scenario: How to Customize a Column Title in a View

  Provides an example of customizing predefined views, specifically, customizing the **Category** column title in the predefined **My Incidents** view.

- Reports Sample Scenario: How to Include Dashboards and Reports in Custom Views

  Provides an example of including a pre-defined dashboard in a custom view that is displayed in the Service Manager console.

For more information and examples for authoring and customizations in Service Manager, for the Service Manager data warehouse, and for custom reporting, see the following blogs:

- Modeling in System Center Service Manager
- The System Center Platform in Service Manager Part 2: The Model-Based Database - Try It!
- How to create a custom report and display it in the console
- The System Center Platform in Service Manager Part 6: The Data Warehouse – Try It!
- A Deep Dive on Creating Outriggers and Dimensions in the Data Warehouse
- A Deep Dive on Creating Relationship Facts in the Data Warehouse
- Introduction to the Data Warehouse: Custom Fact Tables, Dimensions and Outriggers

Other Resources for This Component

- TechNet Library main page for System Center 2012 – Service Manager

Downloadable Documentation

You can download a copy of this technical documentation from the Microsoft Download Center. Always use the TechNet library for the most up-to-date information.

Introduction to the Service Manager Authoring Guide

System Center 2012 – Service Manager automates help desk functions, such as ticketing and change request processes, to help organizations manage their help desks. Service Manager integrates with Active Directory Domain Services (AD DS), Operations Manager, and Configuration Manager to build a single, reconciled inventory of an organization's assets.

Service Manager uses management pack files that contain object definitions for the various features of the product. You can customize the behavior of Service Manager and extend it by creating and modifying management packs. This authoring guide describes the use, authoring, and customization of management packs.

The System Center Service Manager 2010 Software Development Kit (SDK) contains information that you might need when you are authoring with Service Manager. The SDK includes reference information for the class libraries and documents that the schema uses to create XML-based

management packs. To download the documentation for the System Center Service Manager 2010 SDK, see System Center Service Manager Software Development Kit (SDK) Documentation.

This section includes overviews of management packs, authoring methods for Service Manager, and the Service Manager Authoring Tool.

Authoring Topics

- Overview of Management Packs

  Provides an overview of management packs in Service Manager.
- Overview of Authoring Methods for Service Manager

  Provides an overview of authoring methods in Service Manager.
- Overview of the Authoring Tool for System Center 2012 – Service Manager

  Provides information about the installation and usage of the System Center 2012 – Service Manager Authoring Tool.

Overview of Management Packs

Management packs in System Center 2012 – Service Manager are XML-based files that contain definitions for classes, workflows, views, forms, and reports. You can use management packs to do the following:

- Extend Service Manager with new objects
- Extend Service Manager with new behavior
- Store new custom objects that you created, such as forms or templates.
- Transport customizations to another Service Manager deployment or implement the customizations in a newer deployment

You can use management packs to extend Service Manager with the definitions and the information necessary to implement all or part of a service management process.

By default, the Service Manager installation folder contains several preimported management packs that enable core Service Manager features, such as incident management and change management.

Important

Unsealed management packs are not automatically upgraded during an upgrade to System Center 2012 – Service Manager.

See Also

Introduction to the Service Manager Authoring Guide

Overview of Authoring Methods for Service Manager

There are three methods that you can use to customize System Center 2012 – Service Manager. While all three methods result in changes to a management pack file, they differ in scope and in the complexity of the customization that they provide.

The three methods for customizing and extending Service Manager are as follows:

- Using the Service Manager console
- Using the System Center 2012 – Service Manager Authoring Tool
- Directly modifying and authoring management pack files

In general, we recommend that you use the Service Manager console or the Authoring Tool for simple customizations and that you work directly with the management pack files only for customizations that the Service Manager console and the Authoring Tool do not support.

Using the Service Manager Console

In System Center 2012 – Service Manager, the **Administration** pane and the **Authoring** pane in the Service Manager console provide for limited ad hoc customization of Service Manager features. When you customize Service Manager features in the Service Manager console, the customizations are stored in new or existing unsealed management packs and in the Service Manager database. (Unsealed management packs are management packs that you can modify. For more information about sealed and unsealed management packs, see Management Packs: Key Concepts).

The Service Manager console provides for the following customizations:

- In the **Administration** pane, you can customize settings for activities, change management, incident management, and notifications. For example, you can configure the list notification recipients when an incident changes status.
- In the **Authoring** pane, you can make simple customizations to objects, such as queues, lists, and views.

For more information about customizations you can make from the Service Manager console, see the Administrator's Guide for System Center 2012 - Service Manager.

Using the Authoring Tool

The Authoring Tool provides an environment in which you can open, view, customize, extend, and author Service Manager management packs. You can use the Authoring Tool to modify some class properties, customize forms in a graphical form designer, and modify and create Service Manager workflows.

You can also use the Authoring Tool to create advanced customizations that require testing and verification before implementation. The Authoring Tool does not require advanced user skills or advanced knowledge of the internal architecture of Service Manager.

Directly Modifying and Authoring Management Pack Files

For extensive or complex customizations and for customizations that require coding (such as extending the data in the Service Manager database, customizing forms, or modifying the default behavior of a feature's workflow), you have to edit the .xml file of the corresponding management pack directly. Working directly with management pack files requires in-depth knowledge in several areas, such as the System Center Common Schema and the structure of management packs. Also, manual editing is prone to errors.

See Also

Introduction to the Service Manager Authoring Guide

Overview of the Authoring Tool for System Center 2012 – Service Manager

The Authoring Tool is a tool in System Center 2012 – Service Manager that you can use to open an existing management pack so that you can view, customize, and extend it. Using the Authoring Tool, you can do the following:

- Extend and customize the Service Manager class model
- Customize forms
- Create and customize workflows

You can also use the Authoring Tool to create new Service Manager management packs. By authoring management packs, you can customize the features of Service Manager.

After you modify or create a management pack, you must save it and then import it into Service Manager.

Authoring Tool Topics

- Requirements for the Authoring Tool

  Provides information about the hardware and software requirements of the Authoring Tool.
- How to Set Up the Authoring Tool

  Describes how to set up the Authoring Tool.
- Authoring Tool Panes

  Describes how to use the different panes of the Authoring Tool.
- Upgrading Management Packs to Work with the Authoring Tool in System Center 2012 - Service Manager

  Describes Authoring Tool upgrade issues and workarounds.

Requirements for the Authoring Tool

Before you set up the Authoring Tool in System Center 2012 – Service Manager, ensure that the server on which you plan to install the Authoring Tool meets all the following server and operating system requirements.

Server Requirements

You can install the Authoring Tool on a server that hosts the Service Manager management server, or you can install it on a separate server.

Operating System Requirements

- Windows Vista (any edition) with the latest service pack
- Windows 7
- Windows Server 2008 with the latest service pack
- Windows Server 2008 R2

Additional Requirements

- Microsoft .NET Framework 3.5, which you can download from the Microsoft Download Center.
- Microsoft Visual Studio 2008 Shell, which must be in the same language as the display language of the operating system. You can install Visual Studio 2008 Shell from the **Prerequisites** page in the Service Manager Authoring Tool Setup Wizard.

See Also

Overview of the Authoring Tool for System Center 2012 – Service Manager

How to Set Up the Authoring Tool

The SCSM2012_AuthoringTool_RTM.exe program file contains the System Center 2012 – Service Manager Authoring Tool .msi installation package and support files. This includes the files that are required for customizing default System Center 2012 – Service Manager forms. Ensure that the user who will be running the Authoring Tool has access to the local folder that you used to extract the files from the SCSM2012_AuthoringTool_RTM.exe program file.

If Windows Error Reporting is enabled on the computer that is running the Authoring Tool, errors are reported automatically.

To install the Authoring Tool

1. Verify that the computer on which you plan to install the Authoring Tool meets the requirements that are described in Requirements for the Authoring Tool.
2. Download the SCSM2012_AuthoringTool_RTM.exe program file from the Microsoft Download Center to the local computer on which you want to install the Authoring Tool. Double-click **SCSM2012_AuthoringTool_RTM.exe**.
3. In the **WinZip Self-Extractor – SCSM2012_AuthoringTool_RTM.exe** dialog box, type a path to which to extract the files, and then click **Unzip**.
4. Browse to the folder where you extracted the files, expand the **CDImage** folder, and locate **Setup.exe**. Double-click **Setup.exe** to start Setup.
5. In the Service Manager Authoring Tool Setup Wizard, click **Install the Service Manager Authoring Tool**.
6. Continue through the **Product registration** and the **Installation location** pages.

7. On the **Prerequisites** page, if any prerequisite test fails, you must update the server to ensure that each prerequisite is met. If Microsoft Visual Studio 2008 Shell is not installed, click **Install Microsoft Visual Studio Shell 2008** to install the application.

   Click **Check prerequisites again**, and fix any other problems until all prerequisite tests pass.
8. Continue through the **Use Microsoft Update to help keep your computer secure and up-to-date** pages.
9. On the **Installation summary** page, click **Install** and wait for the installation to finish.

To start the Authoring Tool

1. On your desktop, click **Start**.
2. Click **Programs**, click **Microsoft System Center**, and then click **Service Manager 2012 Authoring**.
3. Click **Service Manager Authoring Tool**, and wait for the Authoring Tool to open.
4. In the **Class Browser** pane, click **Refresh**. This populates the browser with all the classes that are defined in management packs from the <Installation folder>/Library folder. When you opened the Authoring Tool for the first time, this pane was empty.

See Also

Overview of the Authoring Tool for System Center 2012 – Service Manager

Authoring Tool Panes

In the System Center 2012 – Service Manager Authoring Tool, you can open a management pack, view and customize its objects, and author new objects.

The Authoring Tool has several panes. You can resize, dock, undock, move, or close each pane according to your preferences. You can open any of the panes in the Authoring Tool from the **View** menu.

The following sections describe the panes in the Authoring Tool.

Class Browser

The **Class Browser** pane displays the classes and their properties from all the management packs that are in the Library folder and all the management packs that have been opened in the Authoring Tool. You can also drag a property from this pane to add a control to a form that you are authoring in the authoring pane.

Form Browser

The **Form Browser** pane displays a list of forms from all the management packs that are in the Library folder or from a specific management pack. From this pane, you can locate and select a form to view or to customize in the authoring pane, without knowing the exact management pack of the form. From this pane, you can also view the details of a form in the **Details** pane.

Management Pack Explorer

In this navigation pane, you can view management packs and their objects. The objects are grouped by types. The **Management Pack Explorer** displays classes, forms, workflows, and references. You can also select a specific object, such as a form, to customize.

Authoring

The authoring pane displays the tabs in which you change or create management pack objects, such as forms and classes. For example, when you customize or author forms, this pane displays the user interface (UI) controls of a form so that you can add, move, or change these controls to customize the appearance and behavior of the form.

The authoring pane also contains the **Start Page** tab, which displays the **Authoring Tool Overview** page.

Details

The **Details** pane displays details, such as properties, for a selected object. The information in this pane is updated every time you select an object in the **Management Pack Explorer**, authoring pane, **Class Browser** pane, or **Form Browser** pane. You can make changes directly in this pane to update property values.

Form Customization Toolbox

The **Form Customization Toolbox** pane displays basic UI controls that you can drag to the authoring pane when you customize forms.

Activities Toolbox

The **Activities Toolbox** pane displays activities that you can use as building blocks when you author workflows.

See Also

Overview of the Authoring Tool for System Center 2012 – Service Manager

Upgrading Management Packs to Work with the Authoring Tool in System Center 2012 - Service Manager

During an upgrade of System Center Service Manager 2010 to System Center 2012 – Service Manager, all Service Manager customized, unsealed. (Unsealed management packs are management packs that you can modify. For more information about sealed and unsealed management packs, see Management Packs: Key Concepts).management packs are copied to the new Service Manager folders without any further upgrade-related processing. Using these custom management packs that were authored in System Center Service Manager 2010 in System Center 2012 – Service Manager is supported. However, there are some issues to be aware of, and you may have to make some updates to these management packs to ensure that they work properly and as intended after the upgrade to System Center 2012 – Service Manager.

Forms

The placement of a control in a form is determined by its top, bottom, left, and right margins in relation to either its parent control or to the form itself. In a customized form, this method can cause controls to be adjusted improperly when the margins of the parent control or of the form are modified.

As a result of new styles that were implemented in System Center 2012 – Service Manager, some custom forms that were authored in System Center Service Manager 2010 might have layout issues when they are imported into System Center 2012 – Service Manager. Depending on the customization, some controls might be placed incorrectly, causing issues such as overlapping and clipping. Some of these issues affect only how the form looks, and other issues can prevent some intended functionality of the form.

The following sections describe the issues that you might encounter when you import into System Center 2012 – Service Manager forms that were authored in System Center Service Manager 2010. These sections also describe how you can use the System Center 2012 – Service Manager Authoring Tool to rectify these issues to ensure that these forms look and function as intended.

Clipping and Overlapping Controls

Some controls on a form might appear clipped, with incomplete border lines and cut-off text. Sometimes this issue appears in conjunction with another issue in which controls overlap each other. Also, some controls on a form might not be visible, causing some functionality of the form to be unavailable.

To rectify these issues, you may have to use the Authoring Tool to adjust the control's properties as follows. You may have to try several remedies, and you may have to make several attempts before the control is placed correctly.

- Select the affected control, and check the value of its **Margin** properties: **Bottom**, **Left**, **Right**, and **Top**. For example, set the values of these properties to 0, or to a positive value, to ensure that there are no negative values that cause the control to be placed incorrectly.
- Check the values of the affected control's **Layout** group properties: **Horizontal Alignment** and **Vertical Alignment**. You may have to set the values of these properties to **Stretch** for better control alignment.
- Place the affected control in a grid inside a **Panel** control for better control alignment.
- Set the parent control's dimensions to **Auto** to allow its size to shrink or grow dynamically.
- Set the **Height** property of the container of the affected control to **Auto**. This allows the width and the height of controls to be automatically adjusted correctly to fit the container of the object.

Shuffling of Controls

Some controls on a form might be shuffled with each other, resulting in controls not being placed in their designated location on the form.

To rectify this issue, use the Authoring Tool to do one of the following:

- Drag controls to their desired location on the form.

- Select the control that is shuffled. In the **Details** pane, in the **Margin** properties group, adjust properties such as **Bottom** or **Left** to place the control in the desired location.
- Select the control that contains the shuffled control. In the **Details** pane, modify its properties such as **Bottom** or **Left**, in the **Margin** properties group.

Workflows

Workflows that were developed in System Center Service Manager 2010 are supported in System Center 2012 – Service Manager.

Virtual Machine Management Activities

The Virtual Machine Management workflow activities in System Center 2012 – Service Manager support System Center Virtual Machine Manager (VMM) 2008 R2. However, these activities do not support System Center 2012 – Virtual Machine Manager (VMM).

If you are trying to automate IT processes that require the use of an activity that supports System Center 2012 – Virtual Machine Manager (VMM), using System Center 2012 - Orchestrator runbooks and VMM instead might be helpful.

See Also

Overview of the Authoring Tool for System Center 2012 – Service Manager

Management Packs: Working with Management Packs

All customizations to objects and to functionality in Service Manager are implemented by using management packs. This section describes management packs and how to use and manage them to implement various types of customizations using different customization methods.

Management Pack Topics

- Management Packs: Key Concepts

  Describes the key concepts of a management pack.
- Management Packs: Guidelines and Best Practices

  Describes guidelines and best practices for working with management packs.
- Working with Management Packs in the Service Manager Console

  Describes how to work with management packs in the Service Manager console.
- Working with Management Packs in the Service Manager Console

  Describes how to work with management packs in the Authoring Tool.
- Working with Management Pack XML Files

  Describes how to work directly with management pack XML files.
- How to Seal a Service Manager Management Pack

  Describes how to seal a Service Manager management pack.
- How to Bundle Management Packs and Resource Files

Describes how to bundle management pack and resource files.

- How to Unbundle a Bundled Management Pack

  Describes how to unbundle a management pack to customize its individual files.

Management Packs: Key Concepts

Before you work with management packs in System Center 2012 – Service Manager, you should be familiar with the following management pack concepts.

Sealed and Unsealed Management Packs

There are two types of management packs:

- Sealed management packs: A sealed management pack (.mp file) cannot be modified.
- Unsealed management packs: An unsealed management pack (.xml file) can be modified.

Other than lists and forms, objects such as views that are defined in a sealed management pack cannot be customized. Customizing a list that is defined in a sealed management pack includes adding list items. Customizing a form that is defined in a sealed management pack includes adding fields.

You cannot unseal a management pack that is sealed. To modify objects that are stored in a management pack that you have already sealed, you can modify the original unsealed management pack file from which the sealed management pack was created. Alternatively, you can import the sealed management pack, and export it to a new unsealed management pack, that can be modified. After you import a sealed management pack, you cannot import the unsealed version of the same management pack until you delete the sealed version.

Model Management Pack

A model management pack is a management pack that contains definitions for basic objects, such as classes, combination classes, and relationship types.

Building model management packs makes it possible for other customizations—typically, customizations that are related to presentation, such as templates, views, and tasks—to be stored in separate management packs that depend on the model extensions. In addition, model management packs are easily transferred into the data warehouse for archiving and reporting purposes.

Dependencies, Resources, and Bundling of Management Packs

A management pack can depend on another management pack that is sealed. For example, a custom template in one management pack can depend on a list that is defined in another management pack. The management pack that contains the base definitions (such as the list), on which other definitions depend, must be sealed. A management pack can also require resources, such as a form or an image, that are stored separately.

When you deploy a management pack that has resource requirements, you must bundle the required resources and the management pack into a single management pack file that can be imported into Service Manager.

In addition, if a management pack has dependencies on other management packs, those dependent management packs must be imported first. As an alternative, you can bundle the dependent management packs along with the required resources and the depending management pack.

For more information about how to bundle a management pack with its resources and dependent management packs, see the How to Bundle Management Packs and Resource Files.

Management Pack Customization

You might have to customize and extend the default, preimported management packs so that information technology (IT) professionals and other users in your organization can extend existing solutions and customize them to meet your business and customer needs. To customize features in Service Manager, you can add new objects or modify the objects that are related to that feature.

A customization to an object is a modification that applies to the base definition of the object. For customizations to be able to be applied to a base definition, the base definition must be stored in a sealed management pack. And because it is not possible to save customizations in the sealed management pack that contains the object's base definition, you always have to use or create another unsealed management pack to store customizations.

Typically, when you customize objects from a default, preimported management packs, you work with two management packs. The first management pack is the sealed management pack that contains the base definitions of objects, and the second management pack, which is initially unsealed, contains the customizations to the base object. In this case, the management pack with the customization depends on the management pack that contains the base definition of the object.

When you customize objects that are defined in an unsealed management pack, you can use the same management pack to store the customizations.

After you complete the customizations, you can deploy them by importing the management pack into Service Manager. During an import of a sealed management pack, Service Manager synchronizes the Service Manager database and the data warehouse database with the definitions from the management pack. During an import of an unsealed management pack, other than list definitions, Service Manager synchronizes only the Service Manager database with the definitions from the management pack. List definitions in an unsealed management pack are synchronized to both databases.

See Also

Management Packs: Working with Management Packs

Management Packs: Guidelines and Best Practices

The following guidelines and best practices for working with management packs in System Center 2012 – Service Manager are described in this topic:

- Group customizations into separate management packs.
- Seal model management packs.
- Create your own custom management packs when possible.
- Export custom management packs.
- Work across multiple management groups.

Group Customizations into Separate Management Packs

Group customizations into separate management packs as follows:

- Store model extensions and presentation extensions in separate management packs.

  We recommend that you store the following objects in a model management pack:

  - New classes and class extensions, including properties and corresponding icons
  - New lists
  - Combination classes
  - Relationships
  - Child EnumerationValues that should not be modified
  - Forms for viewing and editing objects of the defined classes, and the respective assembly resources
- Group customizations by the solution that you are developing. For example, store incident-management-related customizations and settings separately from change-management-related customizations and settings.
- Group customizations based on usage considerations. For example, store customizations that you need to test and deploy as a unit in the same management pack.

Seal Model Management Packs

You should seal management packs that contain base classes and other model objects, on which other definitions in other management packs depend on. Sealing a management pack prevents it from being modified. Also, it is important to seal a management pack so that its definitions are synchronized with the data warehouse database during import. This makes it possible for you to later add customizations (in another management pack), such as presentations that depend on the base objects from the sealed management pack.

Create Your Own Custom Management Packs When Possible

Some of the solution-specific, preimported, unsealed management packs (“Configuration” management packs) contain customizable elements for the specific solution. In some cases you must store your customizations in those preimported management packs to ensure that the management pack adheres to the dependency rules. For example, templates that use list values that are defined in a “Configuration” management pack must be stored in that same management

pack. This is because the list values that are used are defined in another unsealed management pack, and dependency on unsealed management packs is not supported.

However, whenever possible we recommend that you create new management packs to store your customizations. Creating your own management pack simplifies transportation of the management pack, and it can simplify an upgrade.

For example, when you extend a solution by adding objects, such as views, tasks, groups, queues, and form customizations—objects that have dependencies on other objects that are defined in sealed management packs—you should create a new management pack to store the custom objects.

Export Custom Management Packs

Periodically, export your customized management packs from the Service Manager database, and store the backup file on a hard drive. This will ensure that custom management packs are synchronized with the management packs in the Service Manager database. It will also make it possible for you to restore the customizations to the Service Manager database, if necessary.

Work Across Multiple Management Groups

Ensure that you do not make different customizations to the same management pack in different management groups. To implement customizations across multiple management groups, you can import the same customized management pack in the other management groups.

For example, if you want to have the same enumerations in multiple management groups, make the change in one management group, and then copy the custom management pack to the rest of the management groups. That way, the version and identity of the management pack is identical in all the management groups.

See Also

Management Packs: Working with Management Packs

Working with Management Packs in the Service Manager Console

When you make customizations in the Service Manager console in System Center 2012 – Service Manager, you save them in a management pack file. Sometimes, you have to first create a new management pack file. Later, to implement the customizations of the management pack, you import it into the Service Manager console.

When you create a management pack in the Service Manager console, you provide the display name for the management pack. Service Manager generates a random ID that is used as the internal name for the management pack and that becomes the management pack's file name. If you need to further customize objects in that management pack by directly modifying its XML code, it might be difficult to locate the management pack file that you want to edit. In that case,

we recommend that you modify the management pack internal file name to be a meaningful name, and use it as follows:

- Edit the management pack XML file itself; change the internal management pack name to the new name.
- Rename the management pack file on the hard drive to the new name.

For more information about using management packs in the Service Manager console, see the Administrator's Guide for System Center 2012 - Service Manager.

See Also

Management Packs: Working with Management Packs

Working with Management Packs in the Authoring Tool

System Center 2012 – Service Manager objects are stored in management packs. To modify an object using the System Center 2012 – Service Manager Authoring Tool, you open the management pack file that contains that object. To capture changes that you made in the Authoring Tool, you then save the changes in the original management pack file or in a new management pack file. If the original object that you changed is defined in a sealed management pack, you must save your changes in a new or an existing unsealed management pack. Unlike Service Manager, to save modified objects the Authoring Tool manipulates the actual management pack files on the hard drive—in an offline mode, without direct interaction with the Service Manager database.

Later, to implement these changes, you import the management pack file into the Service Manager console, which updates the Service Manager database with the information from the management pack file. You can also import the management pack file into a different environment, such as a production environment. When you import a management pack, the Service Manager server examines the XML code in the management pack file. If the management pack file contains XML code that is not valid, the management pack is not imported.

The procedures in this section describe how to work with management pack files in the Authoring Tool.

Working with Management Packs in the Authoring Tool Topics

- How to Open a Management Pack File in the Authoring Tool

  Describes how to open a management pack file.
- How to Create a New Management Pack File in the Authoring Tool

  Describes how to create a new management pack file.

How to Open a Management Pack File in the Authoring Tool

If you want to customize objects that are defined in a management pack in System Center 2012 – Service Manager, you have to open the management pack file that contains these objects in the

System Center 2012 – Service Manager Authoring Tool. You can use the following procedure to open a management pack file in the Authoring Tool.

The **Management Pack Explorer** pane in the Authoring Tool displays all the management packs that are open. A management pack that you open and change is designated with an asterisk (*)—for example, CustomMP*—until it is saved.

When you select a management pack file to open, the system opens the specified management pack. In addition, it opens the following management packs:

- All the other management packs that are located in the same folder as the management pack that you are opening
- All the management packs in the Library folder in the Service Manager installation folder, for example, in the \Program Files (x86)\Microsoft System Center\Service Manager 2012 Authoring\Library folder

This is important because the definitions from all open management packs co-exist in the Authoring Tool; therefore, they cannot contradict each other.

Note
You cannot create new management pack files in the <Authoring Tool Installation>\Library folder.

To open a management pack file

1. On your desktop, click **Start**.
2. Click **Service Manager Authoring Tool**, and wait for the Authoring Tool to open.
3. In the Authoring Tool, on the menu bar, click **File**, and then click **Open**.
4. In the **Open File** dialog box, select the management pack file that you want to open, and then click **Open**. The file that you select must have an .xml or .mp file name extension. For example, select **Management Packs** as the file type, and then select the following management pack file:

   <Authoring Tool installation drive>\Program Files (x86)\Microsoft System Center\Service Manager 2012 Authoring\Library\ServiceManager.IncidentManagement.Library.mp
5. Wait for the management pack to open, and then verify that it is displayed in the **Management Pack Explorer** pane.

You can now select the management pack file that you opened, and you can expand **Classes**, **Forms**, **Workflows**, or **References** to view the objects of the management pack.

See Also

Working with Management Packs in the Authoring Tool

How to Create a New Management Pack File in the Authoring Tool

To be able to implement customizations that you make in the System Center 2012 – Service Manager Authoring Tool, you have to save them to a management pack file.

If you customize an object from a sealed management pack, you will not be able to save that customization in the original sealed management pack. In this case, you can either use an existing unsealed management pack or you can create a new management pack, which by default will be unsealed.

You can use the following procedure to create a new management pack file.

To create a new management pack file

1. On your desktop, click **Start**.
2. Click **Service Manager Authoring Tool**, and wait for the Authoring Tool to open.
3. In the Authoring Tool, on the menu bar, click **File**, and then click **New**.
4. In the **New Management Pack** dialog box, enter a file name and a location for the new management pack file.

   Ensure that the file name that you enter does not contain spaces or special characters, and do not specify the Authoring Tool installation folder as the location for new and customized management pack files.
5. Click **Open**.
6. In the **Management Pack Explorer**, verify that the new management pack is listed.

See Also

Working with Management Packs in the Authoring Tool

Working with Management Pack XML Files

For elaborate customizations of management packs, the Service Manager console and the System Center 2012 – Service Manager Authoring Tool might not be sufficient, and you might need to author or modify management pack files directly. Working directly with management pack files requires in-depth knowledge in several areas, such as the System Center Common Schema and the structure of management packs.

This section provides background information and guidelines that can help you author and modify management packs to customize Service Manager.

Working with Management Pack XML Files Topics

- Changes to the System Center Common Schema

  Describes the changes that were made to the System Center Common Schema.
- Directly Authoring a Management Pack File to Manage Projectors

  Describes how to directly author management pack files.

Changes to the System Center Common Schema

System Center 2012 – Service Manager includes an updated version of the System Center Management Pack Schema. This schema is now called the System Center Common Schema,

and it includes a number of improvements and additions that are intended to enhance existing functionality and enable Service Manager features. This topic describes the changes to the System Center Common Schema.

For more information about Service Manager management packs and for more XML samples, see Directly Authoring a Management Pack File to Manage Projectors.

Properties and Property Restrictions

The common schema extends classes through several new property types. These property types include the binary, enumerator, and autoincrement types.

In addition, you can define restrictions on certain property values. For example, you can define a regular expression restriction on a string property value. In the following example, the **BuildingName** property has a regular expression restriction that is defined so that only a value that contains the word "Building" followed by a space and a number is considered valid.

```
<ClassType ID="Lobby" Accessibility="Public" Base="System!System.Entity">
   <Property ID="Id" Type="int" Key="true" />
   <Property ID="BuildingName" Type="string" RegEx="Building [0-9]+" />
</ClassType>
```

Images

Images are not stored inside a management pack. Therefore, the **<PresentationTypes>** section of the management pack no longer contains the **<Images>**, **<Image>**, or **<ImageData>** tags. Instead, use an image resource.

```
<Resources>
   <Image ID="TestLibrary.Resources.Image1" Accessibility="Public" FileName="image.png"/>
</Resources>
```

Enumerations

The common schema supports enumerations. Enumerations are a tree of values that you can use to restrict the value of a property or attribute.

Each enumeration has a required unique **ID** attribute and an optional **Parent** attribute.

In the following example, the **XBoxState** enumeration is defined with three possible values: Running, Stopped, and Error.

```
<EnumerationTypes>
   <EnumerationValue ID="XBoxState" Accessibility="Public"/>
   <EnumerationValue ID="XBoxState.Running" Parent="XBoxState" Accessibility="Public"/>
```

```
  <EnumerationValue ID="XBoxState.Stopped" Parent="XBoxState" Accessibility="Public"/>
   <EnumerationValue ID="XBoxState.Error" Parent="XBoxState" Accessibility="Public" />
   <EnumerationValue ID="XBoxState.Error.RROD" Parent="XBoxState.Error"
Accessibility="Public" />
</EnumerationTypes>
```

In the following example, the **Xbox** class defines an **enum** property of type **XBoxState**.

```
<ClassType ID="XBox" Accessibility="Public" Base="System!System.ConfigItem"
Hosted="true">
   <Property ID="Id" Type="int" Key="true" />
   <Property ID="Name" Type="string" />
   <Property ID="State" Type="enum" EnumType="XBoxState" />
</ClassType>
```

Relationships

The functionality of relationship definitions has been enhanced in the common schema. The **RelationshipType** type now has **Source** and **Target** subelements with **ID** properties that can be used as display names. In addition, you can define minimum and maximum cardinality for both the source and target (for example, 1-to-1 or 0-to-many relationships).

Cardinality is not enforced by the management pack validation process, but it is intended to help define user interfaces for the management pack. For example, cardinality can be checked to determine whether a field can be represented in a form by a text box or by a list.

Important

Any **MaxCardinality** value that is defined as greater than 1 is processed as unlimited.

If you add a new relationship type from your own management pack, users must have sufficient privileges to update all properties of the source and target class instances of the relationship type in order to create an instance of the new relationship type.

In the following example, a hosting relationship (called **HasXboxes**) between the **Lobby** type and the **Xbox** type is defined. In this relationship definition, each **Lobby** type can have multiple **Xbox** types.

```
<RelationshipType ID="HasXBboxes" Accessibility="Public" Base="System!System.Hosting">
   <Source ID="Source" Type="Lobby" />
   <Target ID="Target" Type="Xbox" MinCardinality="0" MaxCardinality="9999" />
</RelationshipType>
```

Combination Classes

Combination classes represent an aggregation of multiple related types in the management pack, similar to views that are defined in a Microsoft SQL Server database that can return data from multiple tables. Combination classes store and retrieve all the aggregated data in one operation to the database, and they can make it easier to define user interfaces for a management pack.

In the following example, a projection is defined for an incident management view. This projection combines several different components that are related to an incident into one unit that can be used more easily for forms and for database operations.

```
<TypeProjections>
   <TypeProjection ID="System.WorkItem.Incident.View.ProjectionType"
      Accessibility="Public" Type="Incident!System.WorkItem.Incident">
      <Component Alias="AffectedUser"
Path="$Target/Path[Relationship='SMCore!System.WorkItemCreatedForUser']$"/>
      <Component Alias="AssignedUser"
Path="$Target/Path[Relationship='SMCore!System.WorkItemAssignedToUser']$"/>
   </TypeProjection>
   <TypeProjection ID="System.WorkItem.Incident.View.DCMProjectionType"
Accessibility="Public" Type="Incident!System.WorkItem.Incident.DCMIncident">
      <Component Alias="AffectedUser"
Path="$Target/Path[Relationship='SMCore!System.WorkItemCreatedForUser']$"/>
      <Component Alias="AssignedUser"
Path="$Target/Path[Relationship='SMCore!System.WorkItemAssignedToUser']$"/>
      <!--Baseline and Configuration Item Information-->
      <Component Alias="AffectedComputer"
Path="$Target/Path[Relationship='Incident!System.WorkItem.Incident.DCMIncident.Refers.Non
ComplianceComputer']$"/>
   </TypeProjection>
   <TypeProjection ID="System.WorkItem.ChangeRequestViewProjection"
Accessibility="Public" Type="System.WorkItem.ChangeRequest">
      <Component Alias="AssignedTo"
Path="$Target/Path[Relationship='SMCore!System.WorkItemAssignedToUser']$"/>
   </TypeProjection>
   <TypeProjection ID="System.WorkItem.ChangeRequestProjection" Accessibility="Public"
Type="System.WorkItem.ChangeRequest">
```

```
      <Component Alias="Activity"
Path="$Target/Path[Relationship='SMActivity!System.WorkItemContainsActivity']$">
         <Component Alias="ActivityAssignedTo"
Path="$Target/Path[Relationship='SMCore!System.WorkItemAssignedToUser']$"/>
         <Component Alias="ActivityRelatedWorkItem"
Path="$Target/Path[Relationship='SMCore!System.WorkItemRelatesToWorkItem']$">
            <Component Alias="ActivityRelatedWorkItemAssignedTo"
Path="$Target/Path[Relationship='SMCore!System.WorkItemAssignedToUser']$"/>
         </Component>
         <Component Alias="ActivityRelatedConfigItem"
Path="$Target/Path[Relationship='SMCore!System.WorkItemRelatesToConfigItem']$"/>
         <Component Alias="ActivityAboutConfigItem"
Path="$Target/Path[Relationship='System!System.WorkItemAboutConfigItem']$"/>
         <Component Alias="ActivityFileAttachment"
Path="$Target/Path[Relationship='System!System.WorkItemHasFileAttachment']$">
            <Component Alias="ActivityFileAttachmentAddedBy"
Path="$Target/Path[Relationship='System!System.FileAttachmentAddedByUser']$"/>
         </Component>
         <Component Alias="Reviewer"
Path="$Target/Path[Relationship='SMActivity!System.ReviewActivityHasReviewer']$">
            <Component Alias="User"
Path="$Target/Path[Relationship='SMActivity!System.ReviewerIsUser']$"/>
            <Component Alias="VotedBy"
Path="$Target/Path[Relationship='SMActivity!System.ReviewerVotedByUser']$"/>
         </Component>
      </Component>
      <Component Alias="CreatedBy"
Path="$Target/Path[Relationship='SMCore!System.WorkItemCreatedByUser']$"/>
      <Component Alias="AssignedTo"
Path="$Target/Path[Relationship='SMCore!System.WorkItemAssignedToUser']$"/>
      <Component Alias="CreatedFor"
Path="$Target/Path[Relationship='SMCore!System.WorkItemCreatedForUser']$"/>
      <Component Alias="RelatedWorkItem"
Path="$Target/Path[Relationship='SMCore!System.WorkItemRelatesToWorkItem']$">
         <Component Alias="RelatedWorkItemAssignedTo"
Path="$Target/Path[Relationship='SMCore!System.WorkItemAssignedToUser']$"/>
```

```
      </Component>
      <Component Alias="RelatedConfigItem"
Path="$Target/Path[Relationship='SMCore!System.WorkItemRelatesToConfigItem']$"/>
      <Component Alias="AboutConfigItem"
Path="$Target/Path[Relationship='System!System.WorkItemAboutConfigItem']$"/>
      <Component Alias="FileAttachment"
Path="$Target/Path[Relationship='System!System.WorkItemHasFileAttachment']$">
         <Component Alias="FileAttachmentAddedBy"
Path="$Target/Path[Relationship='System!System.FileAttachmentAddedByUser']$"/>
      </Component>
   </TypeProjection>
   <TypeProjection ID="System.FileAttachmentProjection" Accessibility="Public"
Type="System!System.FileAttachment">
      <Component Alias="FileAttachmentAddedBy"
Path="$Target/Path[Relationship='System!System.FileAttachmentAddedByUser']$"/>
   </TypeProjection>
</TypeProjections>
```

Console Tasks

Console tasks are extended in the common schema. Previously, console tasks were simple pointers to an application directory and executable file name. Console tasks are now implemented as handler code in a Microsoft .NET Framework assembly. The handler code references the assembly that houses the code, the handler name, and a list of named values that can be passed as arguments to the handler.

In the following example, the **Some.Handler.Name** handler is defined in the **MyLibrary.Resources.Assembly** assembly. A list of handler parameters and their values is also defined.

```
<ConsoleTask ID="MyLibrary.ConsoleTasks.T1"
    Accessibility="Public"
     Target="System!System.Entity"
     Enabled="true"
     RequireOutput="true">
   <Assembly>MyLibrary.Resources.Assembly1</Assembly>
   <Handler>Some.Handler.Name</Handler>
   <Parameters>
      <Argument Name="Application">cmd.exe</Argument>
      <Argument Name="WorkingDirectory">%TEMP%</Argument>
```

```
      <Argument>test1</Argument>
      <Argument>test2</Argument>
   </Parameters>
</ConsoleTask>
```

Resources

Binary data is not stored directly in a management pack. Instead, metadata about the binary resource is stored in the management pack, and the actual binary data is stored externally in a resource file. The metadata includes a unique identifier, the file name, the creation data, the modified date, and accessibility information.

Binary data can include generic resources, images, assemblies, report definitions, and forms. The following example shows a generic XML resource, an assembly resource, and a report resource.

```
<Resources>
   <Resource ID="TestLibrary.Resources.Test1" Accessibility="Public"
FileName="res1.xml"/>
   <Resource ID="TestLibrary.Resources.Test2" Accessibility="Public"
FileName="res2.xml"/>
   <Assembly ID="TestLibrary.Resources.Assembly1" Accessibility="Public"
QualifiedName="Baz, Version=1.0.0.0" FileName="baz.dll"/>
   <Assembly ID="TestLibrary.Resources.Assembly2" Accessibility="Public"
QualifiedName="Yoyo, Version=1.0.0.0" FileName="yoyo.dll">
      <Dependency ID="TestLibrary.Resources.Assembly1"/>
   </Assembly>
   <ReportResource ID="TestLibrary.Resources.Report1" Accessibility="Public"
MIMEType="text/xml" FileName="res1.xml"/>
   <Image ID="TestLibrary.Resources.Image1" Accessibility="Public" FileName="image.png"/>
</Resources>
```

Forms

Forms are defined in a management pack. You can use forms to view and modify a single instance of a type or combination class.

Forms are based on the Windows Presentation Framework (WPF), and they are defined in assemblies. The assembly and class that contain the form implementations for a management pack are included in the resources section of the management pack. As with any binary resource in a management pack that uses the new common schema, the management pack itself does not

contain the binary data for the form. Only the resource manifest is specified in the management pack.

You can specify your own configuration information for the form in the management pack. In the following example, the Configuration section contains a **ShowXboxes** property. This configuration information is not evaluated by the management pack verification process; it is only interpreted by the form implementation.

```
    <Forms>
   <Form ID="LobbyForm" Target="Projection" Assembly="FormAssembly"
TypeName="MyFormClass">
   <Configuration>
      <ShowXboxes>yes</ShowXboxes>
   </Configuration>
   </Form>
</Forms>
```

See Also

Directly Authoring a Management Pack File to Manage Projectors

Forms: General Guidelines and Best Practices

Directly Authoring a Management Pack File to Manage Projectors

Management packs are used to direct and extend the functionality of System Center 2012 – Service Manager. This topic uses projectors as an example for describing the various sections of a management pack and for defining the various objects that are needed for managing projectors in an organization.

This topic includes a complete management pack sample with the necessary extensions to manage projectors in an organization. Also, it describes how to import a management pack using a Windows PowerShell cmdlet.

This topic describes the following sections of a management pack:

- The Manifest
- TypeDefinitions to create class enumerations and relationships
- Forms

This topic also describes the following sections of a management pack that contain declarations and definitions for user interface (UI) and localization elements:

- Categories
- Presentation
- Class Extensions

The Manifest Section

The first section of a management pack contains the manifest. The manifest identifies the management pack and declares any references to other management packs.

The following example shows the **Manifest** section of a management pack that was designed to track projectors in an organization.

```
<Manifest>
  <Identity>
    <ID>ServiceManager.Projector_Authoring</ID>
    <Version>7.0.3707.0</Version>
  </Identity>
  <Name>Projector Library</Name>
  <References>
    <Reference Alias="System">
      <ID>System.Library</ID>
      <Version>7.0.3707.0</Version>
      <PublicKeyToken>31bf3856ad364e35</PublicKeyToken>
    </Reference>
    <Reference Alias="SMConsole">
      <ID>Microsoft.EnterpriseManagement.ServiceManager.UI.Console</ID>
      <Version>7.0.3707.0</Version>
      <PublicKeyToken>31bf3856ad364e35</PublicKeyToken>
    </Reference>
    <Reference Alias="Authoring">
      <ID>Microsoft.EnterpriseManagement.ServiceManager.UI.Authoring</ID>
      <Version>7.0.3707.0</Version>
      <PublicKeyToken>31bf3856ad364e35</PublicKeyToken>
    </Reference>
    <Reference Alias="SMConfig">
      <ID>ServiceManager.ConfigurationManagement.Library</ID>
      <Version>7.0.3707.0</Version>
      <PublicKeyToken>31bf3856ad364e35</PublicKeyToken>
    </Reference>
  </References>
```

```
</Manifest>
```

Important

In the **References** section, do not use nonalphanumeric values, such as a '.', in the Alias for a reference.

TypeDefinitions Section—Creating a Class

The next section of a management pack contains type definitions. The **TypeDefinitions** section of a management pack contains definitions for classes, enumerations, and relationships that are used by the management pack.

The following example shows a class that contains information about projectors:

```
<TypeDefinitions>
    <EntityTypes>
      <ClassTypes>
        <ClassType ID="System.ConfigItem.Projector" Base="System!System.ConfigItem"
Hosted="false" Accessibility="Public" Abstract="false">
          <Property ID="SerialNumber" Type="int" Key="true" />
          <Property ID="Make" Type="string" />
          <Property ID="Model" Type="string"  />
          <Property ID="Location" Type="string" />
          <Property ID="Condition" Type="enum" EnumType="ProjectorCondition"  />
        </ClassType>
      </ClassTypes>
      <RelationshipTypes>
      </RelationshipTypes>
      <EnumerationTypes>
        <EnumerationValue ID="ProjectorCondition" Accessibility="Public"/>
        <EnumerationValue ID="ProjectorCondition.Working" Parent="ProjectorCondition"
Accessibility="Public"/>
        <EnumerationValue ID="ProjectorCondition.BeingRepaired"
Parent="ProjectorCondition" Accessibility="Public"/>
        <EnumerationValue ID="ProjectorCondition.New" Parent="ProjectorCondition"
Accessibility="Public"/>
        <EnumerationValue ID="ProjectorCondition.Broken" Parent="ProjectorCondition"
Accessibility="Public"/>
        <EnumerationValue ID="ProjectorViewTasksEnumeration" Accessibility="Public"/>
```

```
    </EnumerationTypes>
  </EntityTypes>
</TypeDefinitions>
```

The following is a section-by-section explanation of what the type definition contains.

The ClassTypes Section

The **ClassType** element defines the projector class:

```
<ClassType ID="System.ConfigItem.Projector" Base="System!System.ConfigItem"
Hosted="false" Accessibility="Public" Abstract="false">
```

The **ID** attribute is the unique identifier of this class. It is set to:

```
ID="System.ConfigItem.Projector"
```

The **Base** attribute is the ID of the class from which this class derives. Because a projector is a kind of configuration item, this is set to:

```
Base="System!System.ConfigItem"
```

The notation of **System!** indicates that this class, **System.ConfigItem**, is in the management pack that is referenced by the alias **System**.

The **Hosted** attribute defines whether this class is hosted by another class. In this case, an instance of this class can only exist when a host instance exists that contains it. For this example, projectors are not hosted by anything; therefore, the **Hosted** attribute is set to **false**:

```
Hosted="false"
```

Setting the **Hosted** attribute to **true** indicates that the class is hosted by another class. A hosting relationship must be declared in the **RelationshipTypes** section.

The **Accessibility** attribute defines whether other classes can derive from this class. In cases where you might want to allow others to create a more specific version of your class, set this attribute to **public**, for example:

```
Accessibility="Public"
```

Setting the **Accessibility** attribute to **Internal** prevents other classes from deriving from this class.

The **Abstract** attribute defines whether instances of this class can be created, or whether the class should just be used as a parent class to other classes to derive from. In this example, this attribute is set to **false**. Setting this attribute to **true** means that no instances of this class can be created directly and that this class can be used only as a parent class.

The next section of the class definition contains the class properties. The XML that defines the class properties for this example are defined in the following code example:

```
<Property ID="SerialNumber" Type="int" Key="true" />
<Property ID="Make" Type="string" />
<Property ID="Model" Type="string"  />
```

```
   <Property ID="Location" Type="string" />
   <Property ID="Condition" Type="enum" EnumType="ProjectorCondition"  />
```

Each **Property** element has the following attributes:

- The **ID** attribute, which designates the unique identifier of the property.
- The **Type** attribute, which indicates the data type of the property.
- The **Key** attribute. Setting this attribute to **true** indicates that this property is to be used to uniquely identify this class.

Creating Enumeration Types

Enumerations of the **enum** data type are special data types. Enumerations are used to constrain the data that is allowed for a property to a specific set of values. Enumerations can be hierarchical; one enumeration can be based on another enumeration.

Enumerations are defined in the **EnumertionTypes** section of a solution pack. An enumeration definition contains the root enumeration, followed by the actual enumeration values.

Each **EnumerationValue** accepts a few attributes:

In this example, an enumeration is defined for keeping track of the condition of the projectors. The following defines this enumeration:

- **ID** is the identifier for the enumeration or enumeration value.
- **Accessibility** specifies whether this enumerator can contain other enumerators.
- **ParentName** is an attribute that specifies the **ID** of the parent of the enumerator value.

```
<EnumerationTypes>
   <EnumerationValue ID="ProjectorCondition" Accessibility="Public"/>
   <EnumerationValue ID="ProjectorCondition.Working" Parent="ProjectorCondition"
Accessibility="Public"/>
   <EnumerationValue ID="ProjectorCondition.BeingRepaired" Parent="ProjectorCondition"
Accessibility="Public"/>
   <EnumerationValue ID="ProjectorCondition.New" Parent="ProjectorCondition"
Accessibility="Public"/>
   <EnumerationValue ID="ProjectorCondition.Broken" Parent="ProjectorCondition"
Accessibility="Public"/>
   <EnumerationValue ID="ProjectorViewTasksEnumeration" Accessibility="Public"/>
</EnumerationTypes>
```

Creating a Form

Service Manager forms are based on Windows Presentation Framework (WPF) forms. Service Manager extends WPF with simple attributes that are added to the XML definition and allow Service Manager to bind data from the management pack to the form.

Service Manager forms can be created by using several different tools, including Microsoft Visual Studio or Microsoft Expression Blend. Because the forms are XML-based, they can also be defined by using any XML editor.

The following example shows a form definition that was created by using Microsoft Expression Blend. This form contains four controls, three text boxes and one combo box, that are bound to the **Projector** class properties that were defined previously:

```
<UserControl xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml" xmlns:local="clr-
namespace:SMFormsDemo" x:Class="SMFormsDemo.TestControl" x:Name="Control" Width="574"
Height="390" Opacity="1" xmlns:d="http://schemas.microsoft.com/expression/blend/2008"
xmlns:mc="http://schemas.openxmlformats.org/markup-compatibility/2006" mc:Ignorable="d"
Background="{DynamicResource {x:Static SystemColors.WindowBrushKey}}">
   <UserControl.Resources>
      <ObjectDataProvider ObjectType="{x:Type local:helper}" MethodName="GetStatusValues"
x:Key="getStatusValues"/>
   </UserControl.Resources>
   <Grid x:Name="LayoutRoot">
      <Label Margin="70,20,0,0" HorizontalAlignment="Left" VerticalAlignment="Top"
Width="160" Height="25" Content="Serial Number:"/>
      <TextBox Margin="180,20,0,0" HorizontalAlignment="Left" VerticalAlignment="Top"
Width="160" Height="25" d:IsStaticText="True" Text="{Binding Path=SerialNumber,
Mode=TwoWay}"/>
      <Label Margin="70,60,0,0" HorizontalAlignment="Left" VerticalAlignment="Top"
Width="160" Height="25" Content="Make:"/>
      <TextBox Margin="180,60,0,0" HorizontalAlignment="Left" VerticalAlignment="Top"
Width="160" Height="25" d:IsStaticText="True" Text="{Binding Path=Make, Mode=TwoWay}"/>
      <Label Margin="70,100,0,0" HorizontalAlignment="Left" VerticalAlignment="Top"
Width="160" Height="25" Content="Model:"/>
      <TextBox Margin="180,100,0,0" HorizontalAlignment="Left" VerticalAlignment="Top"
Width="160" Height="25" d:IsStaticText="True" Text="{Binding Path=Model, Mode=TwoWay}"/>
      <Label Margin="70,140,80,0" HorizontalAlignment="Left" VerticalAlignment="Top"
Width="160" Height="25" Content="Location:"/>
```

```
      <TextBox Margin="180,140,80,0" HorizontalAlignment="Left" VerticalAlignment="Top"
Width="160" Height="25" d:IsStaticText="True" Text="{Binding Path=Location,
Mode=TwoWay}"/>
      <Label Margin="70,180,80,0" HorizontalAlignment="Left" VerticalAlignment="Top"
Width="160" Height="25" Content="Condition:"/>
      <ComboBox Margin="180,180,80,0" HorizontalAlignment="Left" VerticalAlignment="Top"
Width="160" Height="25" ItemsSource="{Binding Source={StaticResource getStatusValues},
Mode=OneWay }" IsSynchronizedWithCurrentItem="True">
         <ComboBox.SelectedItem>
            <Binding Path="Condition" Mode="TwoWay"
UpdateSourceTrigger="PropertyChanged"/>
         </ComboBox.SelectedItem>
         <ComboBox.ItemTemplate>
            <DataTemplate>
               <StackPanel>
                  <TextBlock Text="{Binding Path=DisplayName}"/>
               </StackPanel>
            </DataTemplate>
         </ComboBox.ItemTemplate>
      </ComboBox>
   </Grid>
</UserControl>
```

To enable binding of controls on the form to class properties that are defined in a management pack, a number of items must be specified.

Binding Text Controls

To bind text boxes to class properties in a management pack, add a **Binding Path** tag to the text box control's **Text** property, for example:

```
{Binding Path=SerialNumber, Mode=TwoWay}
```

This tag binds the text box control to the **SerialNumber** property of the **Projector** class that was defined in the management pack, and it specifies that this should be a two-way binding. The value of the property is retrieved from the database and displayed in the text box when the form is loaded, and the property value is stored back to the database if it is changed by the user.

Binding Combo Boxes

To allow the form to retrieve enumeration data from the underlying management pack and bind it to a control on the form, a helper class must be defined in the **code-behind** in the form. This helper class should contain a method that returns an enumeration that is defined in the management pack. To return an enumeration use the **GetEnumerations** method of the current management pack. This instance is accessed with the **ConsoleContextHelper** class from the Service Manager software development kit (SDK). In the following example, a helper class defines a **GetStatusValues** method that retrieves the values for the **ProjectorCondition** enumeration that was defined in the management pack:

```
public class helper
{
   public static ICollection<IDataItem> GetStatusValues()
   {
      return ConsoleContextHelper.Instance.GetEnumerations("ProjectorCondition",true);
   }
}
```

To access this method, a few things must be defined in the form definition in the management pack.

First, a namespace that points to the namespace for the **code behind** for the form is added to the form definition. In this example, the namespace is **SMFormsDemo**:

```
xmlns:local="clr-namespace:SMFormsDemo"
```

Next, an **ObjectDataProvider** must be defined to provide the values for the combo box that displays the projector status. This **ObjectDataProvider** is defined as a resource:

```
<UserControl.Resources>
   <ObjectDataProvider
      ObjectType="{x:Type local:helper}"
      MethodName="GetStatusValues"
      x:Key="getStatusValues" />
</UserControl.Resources>
```

This data provider specifies the object and method name that retrieves the enumeration values from the management pack.

Finally, to bind the combo box to the enumeration values that are defined in the management pack, an **ItemsSource** attribute is added to the combo box definition. This attribute specifies where to retrieve the enumeration values, for example:

```
ItemsSource="{Binding Source={StaticResource getStatusValues}, Mode=OneWay }"
```

Next, **SelectedItem** and **ItemTemplate** elements are added to the Extensible Application Markup Language (XAML) definition of the combo box control. The following example shows the combo box definition with the binding XAML included:

```
<ComboBox Margin="180,180,80,0" HorizontalAlignment="Left" VerticalAlignment="Top"
Width="160" Height="25" ItemsSource="{Binding Source={StaticResource getStatusValues},
Mode=OneWay }" IsSynchronizedWithCurrentItem="True">
   <ComboBox.SelectedItem>
      <Binding Path="Condition" Mode="TwoWay" UpdateSourceTrigger="PropertyChanged"/>
   </ComboBox.SelectedItem>
   <ComboBox.ItemTemplate>
      <DataTemplate>
         <StackPanel>
            <TextBlock Text="{Binding Path=DisplayName}"/>
         </StackPanel>
      </DataTemplate>
   </ComboBox.ItemTemplate>
</ComboBox>
```

The Category Section

The **Category** section of a management pack groups management pack elements together for easier navigation.

The first two **<Category>** elements in the example are used to control the display of the **New** and **Edit** tasks in the **Projectors** view.

```
<Category ID="ProjectorViewHasTasks.View" Target="AllProjectorsView"
Value="ProjectorViewTasksEnumeration" />
<Category ID="ProjectorViewHasTasks.CreateTask" Target="CreateProjector"
Value="ProjectorViewTasksEnumeration" />
```

The second two **Category** elements in the example management pack are used to make the projector condition enumeration appear in the **Lists** view in the **Authoring** pane in the Service Manager console. This enables the user to customize the values:

```
<Category ID="Project.ProjectorConditionEnumVisibleCategory" Target="ProjectorCondition"
Value="System!VisibleToUser"/>
```

Adding this category in the following example makes the **Edit** task appear in the **Lists** view for the **EnumerationValue** that is pointed at in the **Target** attribute:

```
<Category ID="Projector.ProjectorConditionCategory" Target="ProjectorCondition"
Value="Authoring!Microsoft.EnterpriseManagement.ServiceManager.UI.Authoring.EnumerationVi
ewTasks"/>
```

The Presentation Section

The **Presentation** section of a management pack declares and defines user-interface-related elements. These include forms declarations, categories, and console tasks.

The Forms Section

The **Forms** section declares forms that are used by your management pack. The following example specifies where to find the form that is defined to display and edit instances of the **Projector** class. This binds the form to the **Projector** class that is defined in the management pack:

```
<Forms>
   <Form TypeName="SMFormsDemo.TestControl"
      ID="TestForm"
      Target="System.ConfigItem.Projector"
      Assembly="ProjectorFormsAssembly"
      Accessibility="Public">
   <Category>Form</Category>
   </Form>
</Forms>
```

The following attributes are used in the preceding example:

- The **TypeName** attribute contains the namespace and class name of the form.
- The **ID** attribute contains the unique identifier of this form instance.
- The **Target** attribute contains the name of the class that this form is bound to.
- The **Assembly** attribute points to the external resource that contains the form.
- The **Accessibility** attribute defines whether this form can be customized.

Defining a View

The **Views** section of a management pack contains definitions of user interface (UI) views. These views can be used to filter and display objects in a management pack.

```
<View Target="System.ConfigItem.Projector"
Enabled="true"
TypeID="SMConsole!GridViewType"
ID="AllProjectorsView"
Accessibility="Public">
```

```
<Category>NotUsed</Category>
<Data>
<Adapters>
      <Adapter AdapterName="dataportal:EnterpriseManagementObjectAdaptor">

<AdapterAssembly>Microsoft.EnterpriseManagement.UI.SdkDataAccess</AdapterAssembly>
   <AdapterType>
Microsoft.EnterpriseManagement.UI.SdkDataAccess.DataAdapters.EnterpriseManagementObjectAd
apter
   </AdapterType>
      </Adapter>
            <Adapter AdapterName="viewframework://adapters/ListDefault">

<AdapterAssembly>Microsoft.EnterpriseManagement.UI.ViewFramework</AdapterAssembly>

<AdapterType>Microsoft.EnterpriseManagement.UI.ViewFramework.ListSupportAdapter</AdapterT
ype>
            </Adapter>
</Adapters>
<ItemsSource>
  <AdvancedListSupportClass DataTypeName=""
AdapterName="viewframework://adapters/AdvancedList"
FullUpdateAdapter="dataportal:EnterpriseManagementObjectAdapter" FullUpdateFrequency='1'
DataSource="mom:ManagementGroup" IsRecurring="true" RecurrenceFrequency="5000"
treaming='true' xmlns="clr-
namespace:Microsoft.EnterpriseManagement.UI.ViewFramework;assembly=Microsoft.EnterpriseMa
nagement.UI.ViewFramework"
xmlns:av="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml" xmlns:s="clr-
namespace:System;assembly=mscorlib" >
    <AdvancedListSupportClass.Parameters>
                <QueryParameter Parameter="TargetClass"
Value="System.ConfigItem.Projector"/>
    </AdvancedListSupportClass.Parameters>
    </AdvancedListSupportClass>
    </ItemsSource>
```

```
    <Criteria />
</Data>
<Presentation>
<Columns>
            <mux:ColumnCollection
xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
xmlns:mux="http://schemas.microsoft.com/SystemCenter/Common/UI/Views/GridView"
xmlns:s="clr-namespace:System;assembly=mscorlib">
              <mux:Column Name="SerialNumber" DisplayMemberBinding="{Binding
Path=SerialNumber}" Width="100" DisplayName="SerialNumber" Property="SerialNumber"
DataType="s:Int32" />
              <mux:Column Name="Location" DisplayMemberBinding="{Binding Path=Location}"
Width="100" DisplayName="Location" Property="Location" DataType="s:String" />
              <mux:Column Name="Condition" DisplayMemberBinding="{Binding
Path=Condition.DisplayName}" Width="100" DisplayName="Condition"
Property="Condition.DisplayName" DataType="s:String" />
              <mux:Column Name="DisplayName" DisplayMemberBinding="{Binding
Path=DisplayName}" Width="100" DisplayName="Display Name" Property="DisplayName"
DataType="s:String" />
              <mux:Column Name="OwnerUser" DisplayMemberBinding="{Binding
Path=OwnerUser.DisplayName}" Width="100" DisplayName="SupportOwner"
Property="OwnerUser.DisplayName" DataType="s:String" />
            </mux:ColumnCollection>
</Columns>
</Presentation>
</View>
```

The View Target attribute points to the class that the view will be used to display.

In the preceding example, the Service Manager Console management pack is referenced. This management pack contains a definition of a view type being used. In this instance, the **SMConsole!GridViewType** view type is defined.

The **AdvancedListSupportClass** defines a number of parameters, the most important of which is the **TargetClass** parameter. Set this parameter to the **ID** of the **ClassType** that will appear in this view. To display the columns that are properties of the **ClassType**, use the **Column** element and bind it to the **PropertyID** attribute.

The **IsRecurring** attribute of the **ListSupportClass** element determines whether the view auto-refreshes. The **RecurrenceFrequency** attribute defines the refresh interval in milliseconds. In this example, the refresh interval is set to 1 second, but that is not recommended for production installations.

Defining Folders

Defining a folder determines the location in the navigation tree in which the view is displayed. In this example, a configuration item is defined so that it is only suitable to place the view under the existing folder for configuration items in the **Configuration Items** workspace:

```
<Folders>
  <Folder ID="Folder.Projectors" Accessibility="Public"
ParentFolder="SMConfig!ServiceManager.Console.ConfigurationManagement.ConfigItem.Root" />
</Folders>
<FolderItems>
   <FolderItem
      ElementID="AllProjectorsView"
      Folder="Folder.Projectors" />
   </FolderItems>
```

In the preceding example, the **ElementID** attribute contains a reference to the view that was created. The **Folder** attribute points to a **Folders.Projectors** folder, which in turn has its root as defined in the **Configuration Management** workspace of the Service Manager console. This root folder is defined in the Configuration Management management pack.

The **ImageReference** element maps the view that was previously created to an icon that is defined in the **Configuration Management** namespace:

```
<ImageReferences>
  <ImageReference ElementID="Folder.Projectors" ImageID="SMConfig!ConfigItemImage16x16"
/>
  <ImageReference ElementID="AllProjectorsView" ImageID="SMConfig!ConfigItemImage16x16"
/>
</ImageReferences>
```

Localization Using the LanguagePacks Section

The **LanaguagePacks** section of a management pack defines string resources and mappings for management pack elements.

In the example, the **EnumerationValue ProjectorCondition.Working** must appear as **Working**. To do this, display names for each of the following must be defined:

- View: All projectors
- Enumerations: working, broken, in repair, new

```
  <LanguagePacks>
```

```
    <LanguagePack ID="ENU" IsDefault="true">
      <DisplayStrings>
        <DisplayString ElementID="AllProjectorsView">
          <Name>All Projectors</Name>
          <Description>This displays all projectors</Description>
        </DisplayString>
        <DisplayString ElementID="ProjectorCondition.Working">
          <Name>Working</Name>
        </DisplayString>
        <DisplayString ElementID="ProjectorCondition.Broken">
          <Name>Broken</Name>
        </DisplayString>
        <DisplayString ElementID="ProjectorCondition.BeingRepaired">
          <Name>In Repair</Name>
        </DisplayString>
        <DisplayString ElementID="ProjectorCondition.New">
          <Name>New</Name>
        </DisplayString>
      </DisplayStrings>
    </LanguagePack>
</LanguagePacks>
```

You can create additional **LanguagePack** elements, as necessary, for each additional language you require. The correct display string appears to the user based on the user's locale.

Resources

The **Resources** section of a management pack contains references to binary resources, which are contained in assemblies that are separate from the management pack. In the following example, a resource is defined that points to the assembly that contains the form that is used by the **Projector** class:

```
<Assembly ID="ProjectorFormsAssembly"
         Accessibility="Public"
         QualifiedName="SMFormsDemo, Version=1.0.0.0" FileName="SMFormsDemo.dll"
CreationDate="1900-10-12T13:13:13" ModifiedDate="2008-12-12T12:12:12" />
```

Class Extensions

A class extension is a class that adds properties to an existing class. In most cases, this existing class is in a sealed management pack. In cases where the existing class is not in a sealed management pack, the class extension must be contained in the same management pack as the class that is being extended.

A class extension inherits the properties of any parent classes, for example:

- Class A has a property called Property1
- Class B derives from, or extends, Class A and therefore has a property called Property1. This property is inherited from Class A, the parent, or base class)
- The definition of Class B adds a property called Property2.
- Any class extension that derives from Class B will inherit Property1 and Property2.

The following example shows a class extension definition:

```
<TypeDefinitions>
     <EntityTypes>
       <ClassTypes>
         <ClassType ID="IncidentManagmentPack.Extension" Accessibility="Public"
Base="Incident!System.WorkItem.Incident" Hosted="false" IsExtensionType="true">
          <Property ID="TimeOnIncident" Type="int" Key="false" />
        </ClassType>
      </ClassTypes>
    </EntityTypes>
  </TypeDefinitions>
```

This class extension extends the **System.WorkItem.Incident** class and adds a new property called **TimeOnIncident**.

The definition for a class extension is similar to that of a class definition. Two attributes of the **ClassType** element are used to define a class definition: the **Base** attribute and the **IsExtensionType** attribute.

The **Base** attribute specifies the **ID** of the parent class from which the class extension derives. In this instance, the attribute value is set to **Incident!System.WorkItem.Incident**. This value contains the **Alias** of the full management pack name, which contains the class being extended, an exclamation point, and then the name of the base class. For more information, see the following example.

The **IsExtensionType** attribute defines whether this class is an extension of the base class. Because **TimeOnIncident** is an extension to the **Incident** class, this property is set to **true**:

```
IsExtensionType="true"
```

The other option is **false**, which indicates that it is not an extension of another class but a new class that inherits from the base. The default value is **false**; therefore, this attribute does not have to be used if the class is not an extension.

Full Example

The following code example shows the full management pack containing the class extension.

```
<ManagementPack xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsl="http://www.w3.org/1999/XSL/Transform" ContentReadable="true"
SchemaVersion="1.1">
   <Manifest>
     <Identity>
      <ID>ServiceManager.Extension</ID>
      <Version>1.0.0.0</Version>
     </Identity>
    <Name>ServiceManagerExtension</Name>
     <References>
       <Reference Alias="System">
        <ID>System.Library</ID>
        <Version>1.0.2780.0</Version>
        <PublicKeyToken>31bf3856ad364e35</PublicKeyToken>
      </Reference>
      <Reference Alias="Incident">
        <ID>System.WorkItem.Incident.Library</ID>
        <Version>1.0.2780.0</Version>
        <PublicKeyToken>31bf3856ad364e35</PublicKeyToken>
      </Reference>
    </References>
  </Manifest>
   <TypeDefinitions>
     <EntityTypes>
       <ClassTypes>
         <ClassType ID="IncidentManagmentPack.Extension" Accessibility="Public"
Base="Incident!System.WorkItem.Incident" Hosted="false" Extension="true">
          <Property ID="TimeOnIncident" Type="int" Key="false" />
        </ClassType>
      </ClassTypes>
```

```
    </EntityTypes>
  </TypeDefinitions>
</ManagementPack>
```

Importing a Management Pack by Using a Windows PowerShell Cmdlet

You can use the Windows PowerShell Import-SCSMManagementPack cmdlet to import a Service Manager management pack, for example:

```
Import-SCSMManagementPack MyServiceManager.ManagementPack.xml
```

This document does not describe how to import and use management packs in the Service Manager console. For information about using management packs in the Service Manager console, see Using Management Packs in System Center 2012 - Service Manager.

Example: Full Management Pack

The following code examples represent the full sample management pack that is used for examples in this topic, in addition to the form definition and the C# code-behind for the form.

Management Pack

```
<ManagementPack ContentReadable="true" SchemaVersion="1.1"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsl="http://www.w3.org/1999/XSL/Transform">
  <Manifest>
    <Identity>
      <ID>ServiceManager.Projector</ID>
      <Version>7.0.3707.0</Version>
    </Identity>
    <Name>Projector Library</Name>
    <References>
      <Reference Alias="SMConsole">
        <ID>Microsoft.EnterpriseManagement.ServiceManager.UI.Console</ID>
        <Version>7.0.3707.0</Version>
        <PublicKeyToken>31bf3856ad364e35</PublicKeyToken>
      </Reference>
      <Reference Alias="Authoring">
        <ID>Microsoft.EnterpriseManagement.ServiceManager.UI.Authoring</ID>
        <Version>7.0.3707.0</Version>
```

```
        <PublicKeyToken>31bf3856ad364e35</PublicKeyToken>
      </Reference>
      <Reference Alias="System">
        <ID>System.Library</ID>
        <Version>7.0.3707.0</Version>
        <PublicKeyToken>31bf3856ad364e35</PublicKeyToken>
      </Reference>
      <Reference Alias="SMConfig">
        <ID>ServiceManager.ConfigurationManagement.Library</ID>
        <Version>7.0.3707.0</Version>
        <PublicKeyToken>31bf3856ad364e35</PublicKeyToken>
      </Reference>
    </References>
  </Manifest>
  <TypeDefinitions>
    <EntityTypes>
      <ClassTypes>
        <ClassType ID="System.ConfigItem.Projector" Accessibility="Public"
Abstract="false" Base="System!System.ConfigItem" Hosted="false" Singleton="false"
Extension="false">
          <Property ID="SerialNumber" Type="int" Key="true" />
          <Property ID="Make" Type="string" />
          <Property ID="Model" Type="string" />
          <Property ID="Location" Type="string" />
          <Property ID="Condition" Type="enum" EnumType="ProjectorCondition" />
        </ClassType>
      </ClassTypes>
      <EnumerationTypes>
        <EnumerationValue ID="ProjectorCondition" Accessibility="Public" />
        <EnumerationValue ID="ProjectorCondition.Working" Accessibility="Public"
Parent="ProjectorCondition" />
        <EnumerationValue ID="ProjectorCondition.BeingRepaired" Accessibility="Public"
Parent="ProjectorCondition" />
        <EnumerationValue ID="ProjectorCondition.New" Accessibility="Public"
Parent="ProjectorCondition" />
```

```
        <EnumerationValue ID="ProjectorCondition.Broken" Accessibility="Public"
Parent="ProjectorCondition" />
        <EnumerationValue ID="ProjectorViewTasksEnumeration" Accessibility="Public" />
      </EnumerationTypes>
    </EntityTypes>
  </TypeDefinitions>
  <Categories>
    <Category ID="AllProjectorsView.Category" Target="AllProjectorsView"
Value="SMConsole!Microsoft.EnterpriseManagement.ServiceManager.UI.Console.ViewTasks" />
    <Category ID="ProjectorViewHasTasks.CreateTask" Target="AllProjectorsView"
Value="Authoring!Microsoft.EnterpriseManagement.ServiceManager.UI.Authoring.CreateTypeCat
egory" />
    <Category ID="Projector.ProjectorConditionCategory" Target="ProjectorCondition"
Value="Authoring!Microsoft.EnterpriseManagement.ServiceManager.UI.Authoring.EnumerationVi
ewTasks" />
    <Category ID="Project.ProjectorConditionEnumVisibleCategory"
Target="ProjectorCondition" Value="System!VisibleToUser" />
  </Categories>
  <Presentation>
    <Forms>
      <Form ID="TestForm" Accessibility="Public" Target="System.ConfigItem.Projector"
Assembly="ProjectorFormsAssembly" TypeName="New_CI_lab.TestControl">
        <Category>Form</Category>
      </Form>
    </Forms>
    <Views>
      <View ID="AllProjectorsView" Accessibility="Public" Enabled="true"
Target="System.ConfigItem.Projector" TypeID="SMConsole!GridViewType" Visible="true">
    <Category>NotUsed</Category>
    <Data>
    <Adapters>
    <Adapter AdapterName="dataportal:EnterpriseManagementObjectAdapter">
    <AdapterAssembly>Microsoft.EnterpriseManagement.UI.SdkDataAccess</AdapterAssembly>

<AdapterType>Microsoft.EnterpriseManagement.UI.SdkDataAccess.DataAdapters.EnterpriseManag
ementObjectAdapter</AdapterType>
```

```
    </Adapter>
    <Adapter AdapterName="viewframework://adapters/AdvancedList">
    <AdapterAssembly>Microsoft.EnterpriseManagement.UI.ViewFramework</AdapterAssembly>

<AdapterType>Microsoft.EnterpriseManagement.UI.ViewFramework.AdvancedListSupportAdapter</
AdapterType>
    </Adapter>
    <Adapter AdapterName="omsdk://Adapters/Criteria">
    <AdapterAssembly>Microsoft.EnterpriseManagement.UI.SdkDataAccess</AdapterAssembly>

<AdapterType>Microsoft.EnterpriseManagement.UI.SdkDataAccess.DataAdapters.SdkCriteriaAdap
ter</AdapterType>
    </Adapter>
    </Adapters>
    <ItemsSource>
    <AdvancedListSupportClass DataTypeName=""
AdapterName="viewframework://adapters/AdvancedList"
FullUpdateAdapter="dataportal:EnterpriseManagementObjectAdapter" FullUpdateFrequency='1'
DataSource="mom:ManagementGroup"
  IsRecurring="true" RecurrenceFrequency="5000"  Streaming='true' xmlns="clr-
namespace:Microsoft.EnterpriseManagement.UI.ViewFramework;assembly=Microsoft.EnterpriseMa
nagement.UI.ViewFramework"
xmlns:av="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml" xmlns:s="clr-
namespace:System;assembly=mscorlib" >
    <AdvancedListSupportClass.Parameters>
                <QueryParameter Parameter="TargetClass"
Value="System.ConfigItem.Projector"/>
    </AdvancedListSupportClass.Parameters>
    </AdvancedListSupportClass>
    </ItemsSource>
    <Criteria />
    </Data>
    <Presentation>
    <Columns>
```

```
<mux:ColumnCollection xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
xmlns:mux="http://schemas.microsoft.com/SystemCenter/Common/UI/Views/GridView"
xmlns:s="clr-namespace:System;assembly=mscorlib">

              <mux:Column Name="SerialNumber" DisplayMemberBinding="{Binding
Path=SerialNumber}" Width="100" DisplayName="SerialNumber" Property="SerialNumber"
DataType="s:Int32" />

              <mux:Column Name="Location" DisplayMemberBinding="{Binding Path=Location}"
Width="100" DisplayName="Location" Property="Location" DataType="s:String" />

              <mux:Column Name="Condition" DisplayMemberBinding="{Binding
Path=Condition.DisplayName}" Width="100" DisplayName="Condition"
Property="Condition.DisplayName" DataType="s:String" />

              <mux:Column Name="DisplayName" DisplayMemberBinding="{Binding
Path=DisplayName}" Width="100" DisplayName="Display Name" Property="DisplayName"
DataType="s:String" />

              <mux:Column Name="OwnerUser" DisplayMemberBinding="{Binding
Path=OwnerUser.DisplayName}" Width="100" DisplayName="SupportOwner"
Property="OwnerUser.DisplayName" DataType="s:String" />

            </mux:ColumnCollection>

    </Columns>

    </Presentation>

    </View>

    </Views>

    <Folders>

      <Folder ID="Folder.Projectors" Accessibility="Public"
ParentFolder="SMConfig!ServiceManager.Console.ConfigurationManagement.ConfigItem.Root" />

    </Folders>

    <FolderItems>

      <FolderItem ElementID="AllProjectorsView" ID="FolderItem.AllProjectors"
Folder="Folder.Projectors" />

    </FolderItems>

    <ImageReferences>

      <ImageReference ElementID="Folder.Projectors"
ImageID="SMConfig!ConfigItemImage16x16" />

      <ImageReference ElementID="AllProjectorsView"
ImageID="SMConfig!ConfigItemImage16x16" />

    </ImageReferences>
```

```
  </Presentation>
  <LanguagePacks>
    <LanguagePack ID="ENU" IsDefault="true">
      <DisplayStrings>
    <DisplayString ElementID="System.ConfigItem.Projector">
    <Name>Projector</Name>
    </DisplayString>
        <DisplayString ElementID="Folder.Projectors">
          <Name>Projectors</Name>
          <Description>This is the Projector Folder</Description>
        </DisplayString>
        <DisplayString ElementID="AllProjectorsView">
          <Name>All Projectors</Name>
          <Description>This displays all projectors</Description>
        </DisplayString>
        <DisplayString ElementID="ProjectorCondition.Working">
          <Name>Working</Name>
        </DisplayString>
        <DisplayString ElementID="ProjectorCondition.Broken">
          <Name>Broken</Name>
        </DisplayString>
        <DisplayString ElementID="ProjectorCondition.BeingRepaired">
          <Name>In Repair</Name>
        </DisplayString>
        <DisplayString ElementID="ProjectorCondition.New">
          <Name>New</Name>
        </DisplayString>
      </DisplayStrings>
    </LanguagePack>
  </LanguagePacks>
  <Resources>
    <Assembly ID="ProjectorFormsAssembly" Accessibility="Public"
FileName="New_CI_lab.dll" QualifiedName="New_CI_lab, Version=0.0.0.0" />
  </Resources>
```

```
</ManagementPack>
```

Form Definition

```
<UserControl
    xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
    xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
    xmlns:local="clr-namespace:SMFormsDemo"
    x:Class="SMFormsDemo.TestControl"
    x:Name="Control"
    Width="574" Height="390" Opacity="1"
xmlns:d="http://schemas.microsoft.com/expression/blend/2008"
xmlns:mc="http://schemas.openxmlformats.org/markup-compatibility/2006" mc:Ignorable="d"
Background="{DynamicResource {x:Static SystemColors.WindowBrushKey}}">
  <UserControl.Resources>
    <ObjectDataProvider ObjectType="{x:Type local:helper}"  MethodName="GetStatusValues"
x:Key="getStatusValues" />
  </UserControl.Resources>
  <Grid x:Name="LayoutRoot">
    <Label Margin="70,20,0,0" HorizontalAlignment="Left" VerticalAlignment="Top"
Width="160" Height="25" Content="Serial Number:"/>
    <TextBox Margin="180,20,0,0" HorizontalAlignment="Left" VerticalAlignment="Top"
Width="160" Height="25" d:IsStaticText="True" Text="{Binding Path=SerialNumber,
Mode=TwoWay}"/>
    <Label Margin="70,60,0,0" HorizontalAlignment="Left"  VerticalAlignment="Top"
Width="160" Height="25" Content="Make:"/>
    <TextBox Margin="180,60,0,0" HorizontalAlignment="Left" VerticalAlignment="Top"
Width="160" Height="25" d:IsStaticText="True" Text="{Binding Path=Make, Mode=TwoWay}" />
    <Label Margin="70,100,0,0" HorizontalAlignment="Left" VerticalAlignment="Top"
Width="160" Height="25" Content="Model:"/>
    <TextBox Margin="180,100,0,0" HorizontalAlignment="Left" VerticalAlignment="Top"
Width="160" Height="25" d:IsStaticText="True" Text="{Binding Path=Model, Mode=TwoWay}"/>
    <Label Margin="70,140,80,0" HorizontalAlignment="Left" VerticalAlignment="Top"
Width="160" Height="25" Content="Location:"/>
    <TextBox Margin="180,140,80,0" HorizontalAlignment="Left" VerticalAlignment="Top"
Width="160" Height="25" d:IsStaticText="True" Text="{Binding Path=Location, Mode=TwoWay}"
/>
```

```
    <Label Margin="70,180,80,0" HorizontalAlignment="Left" VerticalAlignment="Top"
Width="160" Height="25" Content="Condition:"/>
    <ComboBox Margin="180,180,80,0" HorizontalAlignment="Left" VerticalAlignment="Top"
Width="160" Height="25" ItemsSource="{Binding Source={StaticResource getStatusValues},
Mode=OneWay }" IsSynchronizedWithCurrentItem="True">
      <ComboBox.SelectedItem>
        <Binding Path="Condition" Mode="TwoWay" UpdateSourceTrigger="PropertyChanged"/>
      </ComboBox.SelectedItem>
      <ComboBox.ItemTemplate>
        <DataTemplate>
          <StackPanel>
            <TextBlock Text="{Binding Path=DisplayName}"/>
          </StackPanel>
        </DataTemplate>
      </ComboBox.ItemTemplate>
    </ComboBox>
  </Grid>
</UserControl>
```

Form Code-Behind

```
using System;
using System.Collections.Generic;
using System.Collections.ObjectModel;
using System.Threading;
using System.Windows.Controls;
using Microsoft.EnterpriseManagement.ServiceManager.Application.Common;
using Microsoft.EnterpriseManagement.UI.DataModel;
namespace SMFormsDemo
{
   /// <summary>
   /// Interaction logic for ProjectorForm.xaml
   /// </summary>
   public partial class TestControl : UserControl
```

```
    {
          public TestControl()
        {
           InitializeComponent();
        }
    }
    public class helper
    {

        public static ICollection<IDataItem> GetStatusValues()
        {
              return
ConsoleContextHelper.Instance.GetEnumerations("ProjectorCondition",true);
        }
    }
}
```

See Also

Changes to the System Center Common Schema

Forms: General Guidelines and Best Practices

How to Seal a Service Manager Management Pack

When a management pack in System Center 2012 – Service Manager contains base definitions that other management packs have to reference, such as a list, it must be sealed. After you seal a management pack, you cannot directly modify objects in the sealed management pack, and you cannot unseal the sealed management pack, but you can define references to objects in the sealed management packs.

For more information about how to modify objects that are stored in a management pack that you have already sealed, see Management Packs: Key Concepts.

Sealing a management pack requires using a key file that provides additional identity to a management pack, and it contains a public/private key pair. Before you can seal a management pack, you must create this file in advance. For more information about how to create the required key file, see How to: Create a Public/Private Key Pair. After you create the key file, store it in a safe location.

We recommend that you sign a management pack after it is sealed. Signing a management pack is important in ensuring that the file is not modified when you transfer the file between locations.

The key that you use for signing a management pack is the same key that is used in the process of cryptographically signing any file. You can use the same key for both sealing and signing a management pack, because the public portion of the key is used for sealing.

To seal a Service Manager management pack

1. Create an .snk key file that contains a public/private key pair.
2. In the System Center 2012 – Service Manager Authoring Tool, in **Management Pack Explorer**, right-click the management pack that you want to seal, and then click **Seal Management Pack**.
3. In the **Seal Management Pack** dialog box, in the **Key File** box, enter the location of the key file that you previously created. The file must have an .snk extension. You must also fill in the **Company** box. Filling in the other boxes is optional.
4. Click **Seal** to create a sealed management pack, which will be stored in the folder that you specify in the **Output Directory** box.

See Also

Management Packs: Working with Management Packs

How to Bundle Management Packs and Resource Files

A custom management pack might include references to resources, such as an image or a form assembly. To import such a management pack into System Center 2012 – Service Manager, you must first bundle the management pack file and its associated resources into a single .mpb management pack file.

In Service Manager, to bundle a management pack file with its resources, use the Windows PowerShell cmdlet **New-SCSMManagementPackBundle**. For more information about this cmdlet, see New-SCSMManagementPackBundle.

When you bundle a management pack, any form .dll in the bundle is stored in the Service Manager database, along with any other resources, such as images. The form is then automatically deployed to any Service Manager console computer that needs to render that form. When the form is loaded for the first time in the Service Manager console, it is retrieved from the Service Manager database and cached on the local computer. In subsequent uses, the form is retrieved from the local cache.

To customize management packs that are bundled in an .mpb file, you must first unbundle the .mpb file and then individually customize each management pack and resource file. For more information about how to unbundle an .mpb management pack file, see How to Unbundle a Bundled Management Pack.

See Also

Management Packs: Working with Management Packs

How to Unbundle a Bundled Management Pack

A bundled management pack (.mpb) file in System Center 2012 – Service Manager includes several management pack (.mp) files. In addition, it might include references to resources, such as an image or a form assembly. To customize a .mpb file, you must access and customize the individual files in the bundle.

In this version of the System Center 2012 – Service Manager Authoring Tool, you cannot directly open an .mpb file to access its individual files. Instead, you must manually unbundle the .mpb file and store all the .mp, .xml, and other resource files in a single folder that is accessible to the Authoring Tool. Then, you can open and customize the individual files in the Authoring Tool in the same manner that you customize other management packs. After you complete the customizations, you have to rebundle the files and generate a new .mpb management pack file.

You can extract most of the resource files from an .mpb file by using a Windows PowerShell script. The following procedures provide Windows PowerShell sample scripts that extract files from an .mpb file. For more information about how to use the Service Manager SDK to create other scripts, see Service Manager SDK.

You cannot extract sealed management packs from an .mpb file. Package owners must provide each file separately for a sealed management pack.

To extract individual unsealed management packs from an .mpb file

1. Start a Service Manager Windows PowerShell session. For more information, see Configuring and Using the System Center 2012 - Service Manager Cmdlets for Windows PowerShell.
2. In the Windows PowerShell console, type the following commands:

   ```
   mkdir <mpdir>

   Get-SCSMManagementPack -bundlefile .\<filename>.mpb | Export-
   SCSMManagementPack -path <mpdir>
   ```

   - In the command, replace the <*mpdir*> placeholder with the folder in which the extracted management pack files will be stored.
   - Replace the <*filename*> placeholder with the name of the .mpb file.

   You can now navigate to the <*mpdir*> folder in the current working folder to view and access the management pack files that you extracted.

To extract resource files from an .mpb file

1. In a Windows PowerShell window, type the following commands:

   ```
   $SM2012DirKey = Get-ItemProperty
   "hklm:\SOFTWARE\Microsoft\System Center\2012\Common\Setup"

   $SM2012Dir = $SM2012DirKey.InstallDirectory

   [reflection.assembly]::loadfrom($SM2012Dir + "\SDK
   Binaries\Microsoft.EnterpriseManagement.Packaging.dll")
   ```

```
[reflection.assembly]::LoadWithPartialName("Microsoft.Enterpr
iseManagement.Core") | out-null
$emg = new-object
Microsoft.EnterpriseManagement.EnterpriseManagementGroup
localhost
$mpbReader =
[Microsoft.EnterpriseManagement.Packaging.ManagementPackBundl
eFactory]::CreateBundleReader()
$mpb = $mpbReader.Read("$PWD\Administration.mpb", $emg)
```

From the $mpb object, you can now access the $mpb.ManagementPacks; these are the management packs in the .mpb bundle. And, you can access the $mpb.GetStreams(ManagementPack),which associates the resources with a management pack in that bundle. These resources will be in the form of binary streams that you can write to files.

See Also

Management Packs: Working with Management Packs

Classes: Customizing and Authoring

A class is the main element that is used to represent objects that are used in System Center 2012 – Service Manager. A class can represent a computer, a user, an incident, or a form.

Class definitions that represent a larger element, such as a Service Manager feature, are often grouped together. Class definitions are stored in management packs that must be imported into Service Manager to enable Service Manager functionality.

Classes Topics

- Classes: Key Concepts

  Describes the key concepts of classes.
- Classes: General Guidelines and Best Practices

  Describes guidelines and best practices for classes.
- How to Browse a Class in the Authoring Tool

  Describes how to locate and view a class in the Authoring Tool.
- How to Edit Details of a Class in the Authoring Tool

  Describes how to edit the details, such as the description and name of a class, in the Authoring Tool.
- How to Create a Class Using Inheritance in the Authoring Tool

  Describes how to define class inheritance in the Authoring Tool.

- How to Extend a Class in the Authoring Tool

  Describes how to extend a class in the Authoring Tool.

Classes: Key Concepts

Objects in System Center 2012 – Service Manager are *instances* of a particular base class. All instances of a base class have a common set of properties and common behavior.

Like all management pack elements, classes have *ID* and *Display Name* properties. In this documentation, “ID” refers to the unique name of the class that is seen only in the Authoring Tool, while “Name” and “Display Name” refer to the language-specific name that appears in the Service Manager console.

Note

When you are creating a class, always ensure that class names are unique among management packs. If possible, use class names that are meaningful in your environment. You can determine whether a class name already exists by using the search feature in the **Class Browser** window of the System Center 2012 – Service Manager Authoring Tool.

Properties

All instances of a particular class share a common set of *properties*. The values for these properties are provided in various methods by users and can vary among different instances. Properties are used to represent details of the actual object, such as a unique name, location, and other details that may be interesting to the user or that are required for management scenarios.

Key Properties

A *key property* uniquely identifies each instance of a particular class. If a property is marked as a key property, each instance of the class must have a unique value for that property, and the value cannot be null. For *hosted classes*, the value must only be unique for all instances of the class that have the same hosting parent. For *unhosted classes*, it must be unique for all instances of the class in the management group. Hosting relationships are further described later in this section.

Classes do not always require a key property. A key property is only required if more than one instance of a class is expected for a single parent. If only a single instance is expected, a key property is not required but may still be defined.

For example, **SQL Database Engine** has a key property of **Instance Name** because a single computer can have more than one instance of Microsoft SQL Server installed. When there are multiple instances of **SQL Database Engine**, each instance must have a different value for **Instance Name** in order to clearly distinguish between the different objects. The **IIS Web Server** class, by contrast, does not define a key property because there can be only one instance installed on any computer.

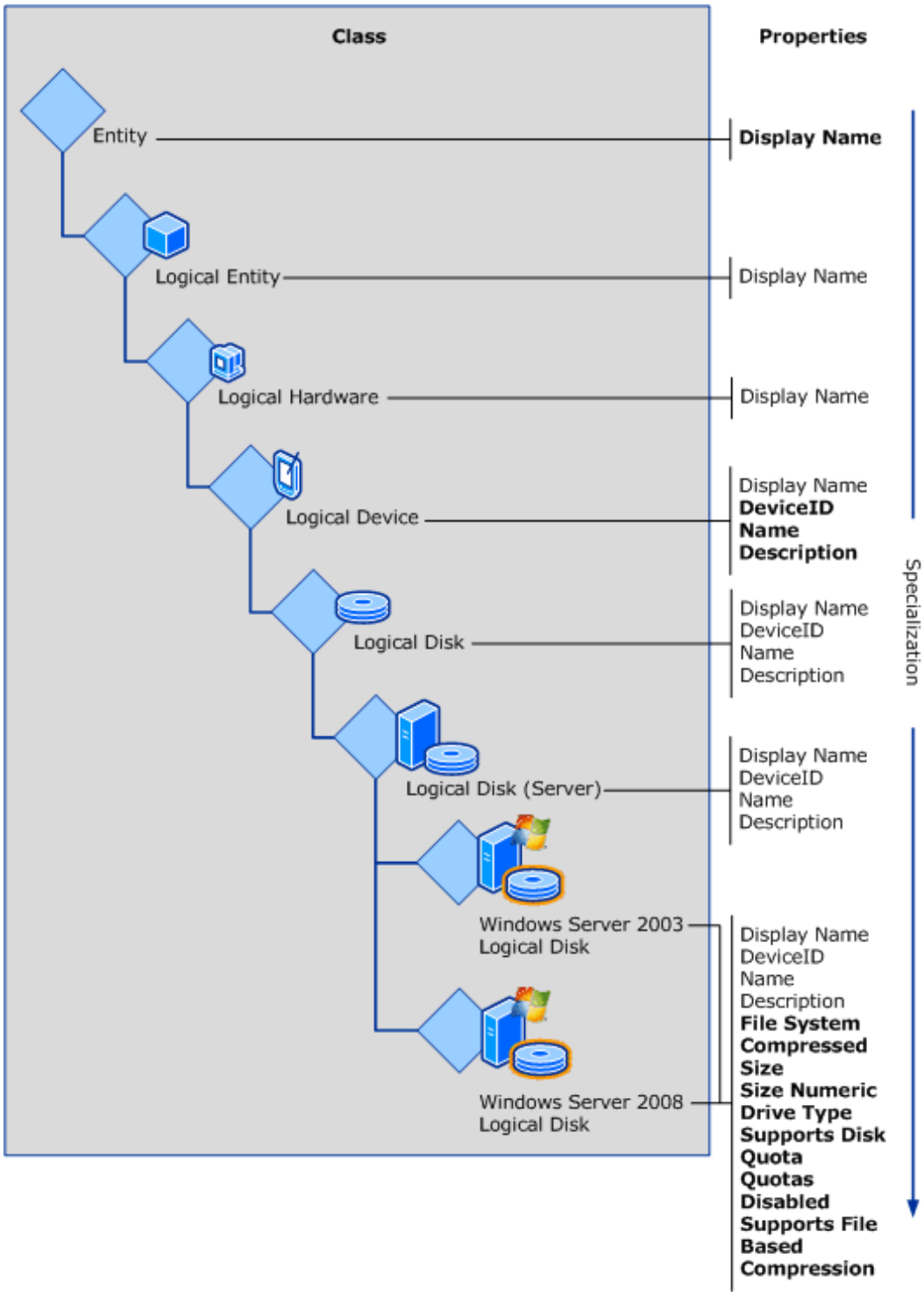
All objects have a **Path Name** property that is calculated from the object's key property or properties and those of its hosting parent or parents. For unhosted objects, **Path Name** will be the key property of the class itself. **Path Name** can be used to uniquely identify any instance of a class in the management group.

Base Classes and Inheritance

Every class must specify a *base class* that identifies an existing class that the new class will *specialize*. The management pack libraries that are included with Service Manager contain several classes that can be used as the base for custom classes in management packs. A management pack will typically have at least one class inheriting from a library class and potentially other classes inheriting from classes in the same management pack.

The concept of a base class can be illustrated with the Windows Server Operating System management pack. This management pack includes classes representing logical disks installed on the computer. The following illustration shows the classes **Windows Server 2003 Logical Disk** and **Windows Server 2008 Logical Disk**. These classes are both based on **Logical Disk (Server)** that is defined in the Microsoft.Windows.Server.Library management pack file. **Logical Disk (Server)** is in turn based on **Logical Disk**, which itself is based on **Logical Device**, and so on through **Logical Hardware**, **Logical Entity**, and finally **Entity**. All classes can trace a similar inheritance path and will always end up at **Entity**, which is the root of the class structure. This is the only class that does not have a base class, and all other classes eventually inherit from it.

Inheritance of properties between classes



Entity has a single property, named **Display Name**. This property is inherited by all classes inheriting from **Entity**. All classes eventually inherit from **Entity**. That is why all classes have a **Display Name** property. No other classes in this example have properties until **Logical Device**,

which defines **Name**, **Description**, and **DeviceID**. **DeviceID** is specified as the key property. These properties are all inherited by **Logical Disk** and **Logical Disk (Server)**. **Logical Disk (Server)** then adds the additional properties **Size**, **Drive Type**, and **File System**. The bottom-level classes that are specific to the version of the operating system inherit the entire set of properties provided by those classes above them in the inheritance tree.

Class Types

Most classes have one or more actual instances and are known as *concrete classes*. *Abstract classes* and *singleton classes* are special kinds of classes that behave differently and are used for particular scenarios.

Abstract Classes

Abstract classes have no instances and exist only to act as a base class for other classes. All properties and relationships that are defined at the abstract class level are inherited by child classes and do not have to be defined again. Most of the classes that are defined in management pack libraries are abstract, since they are only provided to act as base classes for classes that are defined in custom management packs.

Abstract classes are used where there is a common set of properties, relationships, or grouping that can be defined across all further specializations of a class. In the previous example, all of the classes shown above **Windows Server 2003 Logical Disk** and **Windows Server 2008 Logical Disk** are abstract. They exist only for the lower-level classes to inherit from.

Singleton Classes

Singleton classes are used when there is one and only one instance of a class. The class is the instance, and it always exists. The single instance is being created when the management pack is installed. Similarly, a key property is not required for a singleton class, because it will only ever have a single instance. A common use of singleton classes is for the **Groups** class, because there is only a single instance of this class required throughout the management group.

Class Extensions

To customize a class, you can extend it by adding new properties to the existing class definition. The new properties will now be included in all instances of that class that already exist, and in any new instances that will be created. An abstract class cannot be extended.

Relationships

Relationships are defined between classes to indicate an association between a particular instance of one class and the particular instance of another. There are three types of relationships, and they are detailed in the following sections:

- Hosting relationship
- Containment relationship
- Reference relationship

Class relationships affect objects in the following ways.

Relationship type	Key property and existence	Available properties
Hosting	The value of the key property must be unique for all instances of the class in the management group. For hosted classes however, the key property value must be unique only for all objects that have the same hosting parent. To uniquely identify a hosted object, the key property of both the object and the object's parent are required and the key of the hosted class will be the combination of both the hosting class key property, and the hosted class key property. The existence of a hosted class depends on the existence of the hosting class.	Any workflow that is targeted at a class have access to that class's properties in addition to the properties of any of its hosting parent(s). For example, a script in a workflow using the **SQL 2008 DB Engine** class as its target might require the name of the computer on which the instance of SQL Server 2008 is installed. Because an object can have only one hosting parent, we know the computer that hosts any particular instance of the **SQL 2008 DB Engine** class. The workflow script can access the properties of the targeted object and the properties of that target's hosting parent.
Containment	Key property and existence are not dependent on container object.	Any workflow that is targeted at a class have access to that class's properties in addition to the properties of any of its container parent(s). For example, a script in a workflow targeting an incident class, can access the properties of the container queue's class.
Reference	Key property and existence are not dependent on referenced object.	Any workflow that is targeted at a class have access only to that class's properties.

Reference Relationship

The *reference relationship* is the most general relationship type. A reference relationship is used when the parent and child classes are not dependent on one another; for example, a database could reference another database that it is replicating. One database is not dependent on the other, and the objects exist separately.

Containment Relationship

The *containment relationship* type is less restrictive than the hosting relationship. It declares that one class is related to another class, although one is not required for the other. Unlike a hosting relationship, a containment relationship is many-to-many. This means that one object can contain multiple objects, and a single object can be contained by multiple other objects. For example, one group can contain multiple objects, and a single object can be a member of multiple groups.

Containment relationships are typically used for group membership where objects are included in a group through a containment relationship between the group and the member object.

Hosting Relationship

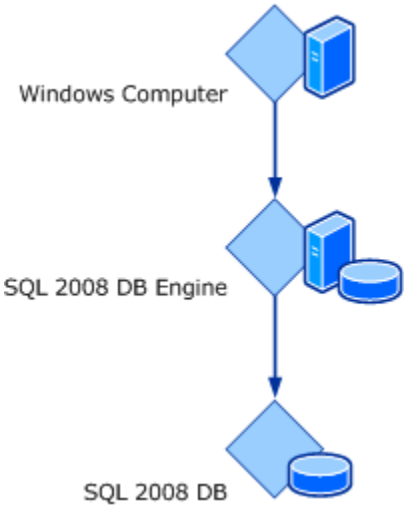
The most restrictive relationship between classes is the *hosting* relationship. A class hosted by another class is called a *hosted class*, and an instance of the class is called a *hosted object*. If a class is not hosted by another, it is called an *unhosted class*, and an instance of the class is called an *unhosted object*.

When one object is hosted by another, that object relies on its hosting parent for its very existence. If the hosting parent is removed, the hosted child will also be removed. For example, a logical disk cannot exist without the computer that it is installed on.

A hosted object can have only one hosting parent, but one parent can host multiple children. For example, a particular disk can be installed on only a single computer, but one computer can have several disks installed.

The SQL Server management pack provides another example of hosting relationships. The hosting relationship between the **Windows Computer** class, the **SQL 2008 DB Engine** class, and the **SQL 2008 DB** class is shown here.

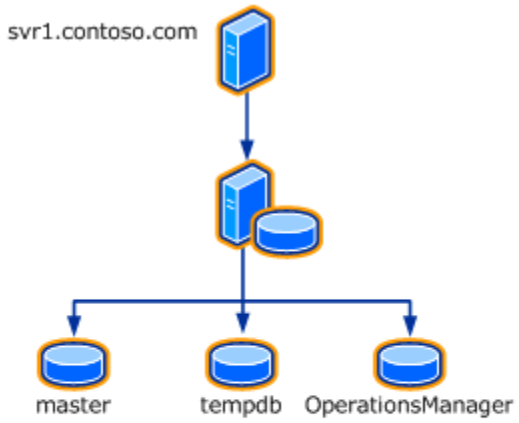
Hosting relationships for SQL Server 2008 classes



The **SQL 2008 DB Engine** class represents an instance of SQL Server 2008 installed on a particular computer. Because a database can be installed on only a single database engine, the **SQL 2008 DB Engine** class hosts the **SQL 2008 DB** class. There can be several databases with the same name in a management group, but any databases installed on a particular instance of the **SQL Server** class must have a unique name. The database engine, in turn, is hosted by the **Windows Computer** class. There can be several **SQL Server** instances with the same name in a management group. Each one on a particular computer must have a unique name.

Because there are two hosting relationships, the path name for each database will be the computer name followed by the instance name followed by the database name. An example is shown in the following diagram.

Sample database hosting relationships



Database Name	Path Name
master	svr1.contoso.com\MSSQLSERVER\master
tempdb	svr1.contoso.com\MSSQLSERVER\tempdb
OperationsManager	svr1.contoso.com\MSSQLSERVER\OperationsManager

See Also

Classes: Customizing and Authoring

Classes: General Guidelines and Best Practices

Use the following guidelines and best practices when you are customizing classes in the System Center 2012 – Service Manager Authoring Tool.

Naming Conventions for Type Definitions

The Service Manager schema model naming convention is based on the .NET namespaces naming convention.

Basic Naming Conventions

The basic naming convention is **CompanyName.TechnologyArea.ProductName.FunctionalityArea.Name**, where:

- **ProductName** is optional; use it if the definition is independent of any specific product.
- **FunctionalityArea** is optional; use it if the definition can apply to different areas.
- **Name** reflects the meaning of the class, not the inheritance hierarchy.

Examples: **Microsoft.AD.Printer**, **Microsoft.Windows.Computer**, **System.Knowledge.Article**, **System.WorkItem.Incident**, and **System.StarRating.Average**.

The System Namespace

The **System** namespace refers to definitions that are independent of Microsoft and Windows. This usually applies to the base definitions that either Windows applications or Unix applications depend on. These base definitions should be company independent.

Use the following guidelines for the System prefix:

- **System.Computer** represents any type of computer, and it is not vendor specific.
- Use the **System** prefix if you expect others to define schemas on top of that namespace.
- Note that **Microsoft.Windows.Computer** does not start with **System**, although most Windows applications (regardless of the vendor that defines it) rely on this definition.

Best Practices for Naming Classes

Use the following best practices when you are naming classes:

- Do not create two separate classes (even if they are in two different management packs) that would result in identical key values being stored for different objects of the two classes.
- When you are extending a class, always ensure that the class extension names are unique across management packs. If possible, use meaningful class extension names.
- When you are extending a class, do not define a property with an ID that is already in use in that class.
- Do not use periods in names of properties of a custom class.
- If you add a custom named calculation when you author a cube, preface the name of the named calculation with NC_. This will reduce the possibility of using a name of a property that already exists.

Do Not Create Too Many Classes

Creating too many classes can result in needless complexity with minimal value. A good rule is to use the least number of classes to achieve the desired results. Other than abstract classes, if a class is not going to be the target of any workflow or be used to store data, it probably should not be created. Also, if two classes are similar, consider using a single class for both of them, possibly by using a property that can hold the values for any differences.

Do Not Use Properties That Update Too Frequently

Property values should change rarely after they are first populated. A possible cause for frequent property value changes is a custom connector or any other customization that programmatically updates the Service Manager database. These scenarios can potentially cause property values to update too frequently, such as every 10 to 15 minutes or less for a large number of objects.

Such frequent changes to property values might slightly impact the performance of the workflows, and they might have other performance impacts. This is because the system keeps track of those changes in history. Also, depending on the property being changed, these changes can add a significant amount of data to be processed and stored by the data warehouse.

Do Not Extend an Abstract Class

In System Center 2012 – Service Manager, you cannot extend an abstract class. If you need to extend an abstract class, you can do either of the following:

- Create a new class with the properties you want to add, and then create a relationship between the new class and the abstract class.
- Extend each of the relevant concrete classes that derive from the abstract class.

Improve Simple Search for Work Item Classes

When you define a custom class that is derived from the "**System.WorkItem**" class, we recommend that you store the **DisplayName** property of that class in the following format: **WorkItem.ID<SPACE>WorkItem.Title**.

This improves simple search. Simple search searches only the **DisplayName** property, and by explicitly including the **Title** property value and the **ID** property value in the **DisplayName** property value, the results of simple search are improved. This is because the user can search either by a word in the title or by ID.

See Also

Classes: Customizing and Authoring

How to Browse a Class in the Authoring Tool

You can use the **Class Browser** pane in the System Center 2012 – Service Manager Authoring Tool to browse classes and their properties. While you are browsing classes, you can add a control to a form by dragging properties from the **Class Browser** pane to a form that is being authored in the authoring pane.

The **Class Browser** pane can display classes from any management pack that is in the Library folder and from any management pack that has been opened in the Authoring Tool. When you select a class, the **Class Browser** pane displays the properties that are specifically defined for that class and the internal properties that are generated by the system. By default, the Library folder is in the following location: C:\Program Files (x86)\Microsoft System Center\Service Manager 2012 Authoring\Library.

When you select a management pack in the **Class Browser** pane, all the classes from the selected management pack are displayed, and you can expand the class for which you want to view properties. When you select **All Management Packs**, all the classes from all the management packs in the Library folder are displayed. Whenever you change the selection of the management pack, you must refresh the **Class Browser** pane.

To browse a class

1. If the **Class Browser** pane is not visible in the Authoring Tool, click **View**, and then click **Class Browser**.
2. In the **Class Browser** pane, in the management pack list, select the management pack

that contains the class that you want to browse. For example, select the **System Library** management pack.

3. Locate the class that you want to view, such as the **Computer** class, and then do the following:
   - To view the details of the class, such as **Description** and **Internal Name**, right-click the class, and then click **Details**.
   - To view the list of class properties, such as **Display Name** and **Asset Status**, expand the class in the **Class Browser** pane. To further view details of a property, right-click the property, and then click **Details**.
   - To open the management pack that contains the definition of the class, right-click the class, and then click **View**.

See Also

Classes: Customizing and Authoring

How to Edit Details of a Class in the Authoring Tool

You can use the System Center 2012 – Service Manager Authoring Tool to view the properties of a class and to edit the details, such as the name or description, of a class.

In the **Management Pack Explorer**, you can select a class and view its details in the **Details** pane. If you select a class that is defined in an unsealed management pack, you can change the name and description of that class.

To change the name or description of a class

1. On your desktop, click **Start**.
2. Click **Service Manager Authoring Tool**, and wait for the Authoring Tool to open.
3. Ensure that both the **Management Pack Explorer** and the **Details** panes are open.
4. Click **File**, and then click **Open**.
5. In the **Open File** dialog box, select an unsealed management pack that contains the class that you want to change, and then click **Open**. For example, open the *<Authoring Tool installation folder>* \Samples\Woodgrove.AutomatedActivity.AddComputerToGroupMP.xml sample management pack.
6. In the **Management Pack Explorer**, expand the management pack that contains the class that you want to change.
7. Expand **Classes**, and then locate and select the class that you want to change.
8. Select the value of the **Name** or **Description** property, and then enter the new value. Values that cannot be changed are unavailable.
9. In the **Management Pack Explorer**, right-click the management pack that contains the changed class, and then click **Save**.

See Also

Classes: Customizing and Authoring

How to Create a Class Using Inheritance in the Authoring Tool

In the System Center 2012 – Service Manager Authoring Tool, you can create a class that inherits properties and relationships from an existing base class. You can then modify or add properties and relationships to the new class.

As the first step of defining class inheritance, choose the base class from which to inherit properties and relationships. In the Authoring Tool, you can choose the base class by using one of the following methods:

- Use a shortcut to inherit properties and relationships from the base configuration item class.
- Use a shortcut to inherit properties and relationships from the base work item class.
- First select the base class, and then start defining the inheritance.
- Start defining inheritance without a specific base class selection.

The following procedures describe all the methods for defining class inheritance in the Authoring Tool.

To start with the configuration item class or the work item class as a base class

1. If the **Management Pack Explorer** is not visible in the Authoring Tool, click **View**, and then click **Management Pack Explorer**.
2. In the **Management Pack Explorer**, select and then expand any management pack.
3. Right-click **Classes**, and then click **Create Configuration Item Class** or **Create Work Item Class**.
4. If you are creating a class from a sealed management pack, in the **Target Management Pack** dialog box, select an unsealed management pack to store the class customization, and then click **OK**.

   Note
   If you are creating a class from an unsealed management pack, this class customization is saved in that selected management pack.
5. In the **Create Class** dialog box, specify the internal name for the new class, and then click **Create**.

   In the authoring pane, you can now view the list of properties of the new class. If you are creating a configuration item class, all properties of the configuration item class are listed. If you are creating a work item class, all properties of the work item class are displayed.
6. Click **Create property** or **Create relationship** to define new properties and new relationships for the class.

To start with a selected base class

1. If the **Management Pack Explorer** is not visible in the Authoring Tool, click **View**, and

then click **Management Pack Explorer**.

2. In the **Management Pack Explorer**, locate and then right-click the base class from which the new class will inherit properties and relationships. Select **Inherit from this class**.
3. In the **Inherit New Class** dialog box, enter an internal name for the class.

   In the authoring pane, the **Class properties and relationship** list displays the properties of the base class.
4. You can now click **Create property** or **Create relationship** to add properties or a relationship to the new class.

To start without a selected base class

1. If the **Management Pack Explorer** is not visible in the Authoring Tool, click **View**, and then click **Management Pack Explorer**.
2. In the **Management Pack Explorer**, select and then expand any management pack.
3. Right-click **Classes**, and then click **Create other class**.
4. In the **Base class** dialog box, select the base class to inherit properties and relationships from.

   Optionally, if you know in which management pack the base class that you want to use is defined, you can filter on the respective management pack, and then select the base class for this customization.

   Click **OK**.
5. If the base class that you selected to inherit properties and relationships from is in a sealed management pack, in the **Target Management Pack** dialog box, select an unsealed management pack to store the class customization, and then click **OK**.

   If the base class that you selected to inherit properties and relationships from is in an unsealed management pack, this class customization will be saved in that selected management pack.
6. In the **Create class** dialog box, specify the internal name for this class, and then click **Create**.

   In the authoring pane, you can now view the list of properties of the new class. This list includes all the properties of the base class that you selected.

See Also

Classes: Customizing and Authoring

How to Extend a Class in the Authoring Tool

You can extend a class in the System Center 2012 – Service Manager Authoring Tool by adding properties and relationships to the definition of the class. Extending a class affects all existing instances of that class: all instances of that class will be updated to include the new properties and relationships.

To extend a class

1. If the **Management Pack Explorer** pane is not visible in the Authoring Tool, click **View**, and then click **Management Pack Explorer**.
2. In the **Management Pack Explorer** pane, locate and right-click the class that you want to extend, and then click **Extend class**.
3. In the **Target Management Pack** dialog box, select an unsealed management pack to store the class extension, and then click **OK**.
4. The **Class properties and relationship** list on the **Extension of <class>** tab in the authoring pane displays the properties and the relationships of the class. Create new properties and relationships as follows:
   a. Click **Create property**; in the **Create property** dialog box, type a name in **Internal name** for the new property; and then click **Create**.
   b. Click **Create relationship**; in the **Create relationship** dialog box, type a name in **Internal name** for the new relationship; and then click **Create**.

   Note
   When you are extending a class, do not define a property with an ID that is already in use in that class.
5. Locate and select the new property or relationship in the **Class properties and relationship** list, and modify its properties in the **Details** pane as needed.

See Also

Classes: Customizing and Authoring

Forms: Customizing and Authoring

A form is a window that makes it possible for users to interact with objects from the database. Users can use a form to view and edit the properties of objects. Each form is tied to a specific class, and it displays information only for instances of the targeted class. A form contains fields. Typically, each field is bound to a specific property of the form's targeted class. The incident form, for example, is tied to the incident object. Therefore, the incident form displays information about incident objects in the database.

A System Center 2012 – Service Manager form consists of the Windows Presentation Foundation (WPF) form implementation in a Microsoft .NET Framework assembly and a form definition in a Service Manager management pack. The form definition specifies the class that the form represents, along with the other properties of the form.

Forms Topics

- Forms: Key Concepts

  Describes the key concepts of forms.

- Forms: General Guidelines and Best Practices

  Describes guidelines and best practices for working with forms.
- Guidelines and Best Practices for Authoring Forms in the Authoring Tool

  Describes the guidelines and the best practices for authoring forms in the System Center 2012 – Service Manager Authoring Tool.
- How to Browse a Form in the Authoring Tool

  Describes how to view a form in the Authoring Tool.
- How to Customize a Form in the Authoring Tool

  Describes how to customize a form in the Authoring Tool.
- How to Create a New Form in the Authoring Tool

  Describes how to create a new form starting with a blank form, or starting with a custom WPF form, in the Authoring Tool.
- How to Add a Check Box Control to a Form in the Authoring Tool

  Describes how to add a **Check Box** control to a form in the Authoring Tool.
- How to Add a Date Picker Control to a Form in the Authoring Tool

  Describes how to add a **Date Picker** control to a form in the Authoring Tool.
- How to Add an Image Control to a Form in the Authoring Tool

  Describes how to add an **Image Control** to a form in the Authoring Tool.
- How to Add a Label Control to a Form in the Authoring Tool

  Describes how to add a **Label** control to a form in the Authoring Tool.
- How to Add a List Picker Control to a Form in the Authoring Tool

  Describes how to add a **List Picker** control to a form in the Authoring Tool.
- How to Add a Panel Control to a Form in the Authoring Tool

  Describes how to add a **Panel** control to a form in the Authoring Tool.
- How to Add a Single Instance Picker Control to a Form in the Authoring Tool

  Describes how to add a **Single Instance Picker** control to a form in the Authoring Tool.
- How to Add a Tab Control and Tab Item Controls to a Form in the Authoring Tool

  Describes how to add a **Tab Control** and a **Tab Item** control to a form in the Authoring Tool.
- How to Add a Text Box Control to a Form in the Authoring Tool

  Describes how to add a **Text Box** control to a form in the Authoring Tool.
- How to Add a User Picker Control to a Form in the Authoring Tool

  Describes how to add a **User Picker** control to a form in the Authoring Tool.
- How to Customize the Default Incident Form (Sample Scenario)

  Describes how to customize the default incident form.
- Properties of Form Controls

  Provides information about the WPF-based and the Service Manager–based properties of form controls.

Forms: Key Concepts

Before customizing forms, you should be familiar with the following form concepts.

How Forms Are Used

When the management pack that contains the form definitions is imported into System Center 2012 – Service Manager, the form definitions are stored in the database. Later, when the user initiates a Service Manager console task that requires the display of an object, Service Manager must find a form to display the requested object. Service Manager accesses the database and searches for a form that has been defined for that object. If no form is defined for the object, Service Manager searches for a form that is defined for the object's parent object. Service Manager continues to search the entire object's inheritance hierarchy until it finds a defined form.

Generic Forms

If Service Manager cannot find any form for the object or for any of its parent objects, Service Manager dynamically builds a default *generic form* for that object. The generic form is a system-generated form that is sufficient for simple form use. The generic form represents a quick and easy way to create a form for objects without any form definitions.

By default, the generic form displays all the properties of the form in a simple layout that you cannot change. The generic form displays the properties of all the parent objects in the inheritance hierarchy of the form, and you cannot change that behavior. Customizations to the generic form are limited. For example, you can specify the properties that you want the generic form to display; however, the generic form cannot be used as a basis for customization. If you later define a custom form for that object, your custom form overwrites the object's generic form.

For information about hiding properties in a generic form and other ways that you can customize a generic form, see the blog post Overview of the Forms Infrastructure and the Generic Form.

Combination Classes in Forms

Sometimes, you need a form to display information that is derived from more than one class. To do this, you create a *combination class* and then bind a field on the form to the combination class. For more information about combination classes, see Changes to the System Center Common Schema.

Functional Aspects of a Form

A form has the following functional aspects:

1. Initialization
2. Size and location
3. Refresh
4. Submit changes

These aspects are described in the following sections.

Initialization

During initialization, a form's Extensible Application Markup Language (XAML) is parsed and all controls on the form are instantiated and loaded. The form's **Loaded** event indicates when the form and all contained elements have been loaded. Data-loading operations are asynchronous. Therefore, the target instance may not be available when the **Loaded** event is raised. Instead, the **DataContextChanged** event must be used for notification when the target instance is set for the form. The **PropertyChanged** event for the **DataContext** property can be used in place of the **DataContextChanged** event.

We recommend that you use the **Loaded** event for control-related custom initialization and then use the **DataContextChanged** or **PropertyChanged** events on the **DataContext** property for target instance-related custom initialization.

Size and Location

When a form is displayed in a pop-up window, its initial size is determined based on the form's **Width**, **Height**, **MinWidth**, and **MinHeight** properties. If these properties are not set for the form, the form's initial size is calculated based on its content.

We recommend that you set these properties as follows:

- Set the **Width** and **Height** properties of the form to explicitly specify the ideal size. Consider setting these properties to the **Auto** value. This sets the width and height of the form based on the size of the content.
- Set the **MinWidth** and **MinHeight** properties of the form to specify the smallest window acceptable for the form. If a user resizes the window to a smaller size than specified, scrollbars appear for scrolling to the hidden form content.

When the form is hosted inside the Service Manager forms host, the last-used size and location is preserved for subsequent display of that form by the same user within the same run session.

Refresh

The target instance of a form can change as a result of executing a **Refresh** command on the form. The handler for this command fetches new data from the database. When the data arrives, the form's **DataContext** property value is set to the new target instance and the **DataContextChanged** event is raised.

To differentiate between the **DataContextChanged** event that was raised when the form was first loaded and the event that was raised to handle a **Refresh** command, check the **OldValue** property of the event arguments that are passed in with the event. This property is null if the form has just been initialized.

Submit Changes

The form host pop-up window in Service Manager provides buttons for submitting changes that are made in the form and for closing the pop-up window.

When a user clicks the **Apply** button for a form, the form's target instance is submitted for storage. This operation is synchronous; therefore, the user cannot edit the form until the submission operation is complete. If failure occurs during the form submission, an error message appears. The form remains open for further changes. We recommend that users apply their

changes frequently to avoid collisions if another instance of the form is being edited at the same time.

If the user clicks the **OK** button, the behavior is similar to **Apply**, except that, if the form submission operation is successful, the form and its host window are closed.

If the user clicks the **Cancel** button, a dialog box appears that asks the user to confirm the operation. The user can click **Yes** and lose changes, or click **No** and return to the form.

See Also

Forms: Customizing and Authoring

Forms: General Guidelines and Best Practices

You can extend features of System Center 2012 – Service Manager by adding or modifying forms. This topic describes some best practice recommendations for creating and using Service Manager forms, using various tools and scripting form definitions directly.

This topic is primarily targeted at partners and customers who are experienced in building their own custom forms by using Windows Presentation Foundation (WPF) and Microsoft Visual Studio Team System or Microsoft Expression Blend.

The general guidelines for authoring a new form are as follows.

- Use standard controls.
- Follow general form design guidelines.
- Avoid code-behind.
- Include exception handling.
- Consider forms customization and upgrades.
- Name all customizable controls.
- Bind the form to data sources.
- Use Service Manager forms infrastructure validation rules, value convertors, and error templates.
- Use forms infrastructure commands and events.

For information about these guidelines, see the following sections.

Use Standard Controls

Controls that are used on a form can be:

- **Standard controls**. This includes .NET library controls, such as combo box and list box.
- **Custom controls**. This includes additional controls that are created by the form author or by a third party.

Tip

When you use standard controls wherever possible and avoid creating custom controls, you promote consistency with regard to the user experience of forms. If you must create a custom control, separate the visual appearance and behavior and the logical behavior

by using control templates to define the appearance of the control. Preferably, there should be a separate control template for each Windows Theme.

Follow General Form Design Guidelines

When you design a form, use public design guidelines to ensure that the form is user friendly and that it adheres to common user-interaction paradigms.

For more information about general Windows design, see Windows User Experience Interaction Guidelines.

In addition:

- Divide information across multiple tabs to make the form simpler and easier to read. Include the most commonly used information on the first tab and information of lesser importance on subsequent tabs.
- Use layout panels to lay out controls on the form. This ensures that the form behaves correctly when it is resized and localized.
- Avoid setting individual control visual properties, and use styles instead. This makes it possible for you to change the appearance of all controls across a series of forms by modifying the style, and it promotes a consistent appearance across related forms.

Avoid Code-Behind

Code-behind is a term that describes the code that is joined with markup-defined objects when an XAML page is markup compiled. Limit the use of code-behind in a form as much as possible. It is preferable that you embed the code for a form in the control itself, because later it is easier to change that code. Instead, use the declarative capabilities that are supported by the Service Manager forms infrastructure to define value conversions and validation rules in the form.

As a general guideline, you should limit the use of code-behind to situations in which it is not possible to provide the required functionality by using the declarative capabilities of XAML, with classes defined in the WPF and the forms infrastructure library. Even then, consider moving the functionality that is implemented in code-behind into a helper library, and then reference it from the XAML.

Include Exception Handling

Ensure that the code in the form contains exception handling so that the form can be loaded both during the design phase in the Authoring Tool and in the Service Manager console at run time.

Consider Forms Customization and Upgrades

When you are designing a new form, you should consider future customizations and upgrades to that form. To ensure that it is possible to customize and to upgrade a form while preserving customizations, follow the guidelines and tips that are provided previously in this section, along with the following guidelines:

- Consider future customizations and upgrades early while you are designing the form. Forms are likely to evolve in future versions, and it is important to consider how users will be able to upgrade to new versions of your form while preserving their customizations to the original form. For example, you might provide an updated form after users have already invested

heavily in customizing your original form. Users expect their customizations to survive the version upgrade.

- Provide a unique name for each control on the form to make it possible for customizations to be applied to controls. Form customizations are stored as a set of actions that are targeted at a specific control or a set of controls. The target control is referenced by name, which is why it is important to preserve control names across versions of the form. If a control does not have a name, the Form Customization Editor generates a name, but the generated name is not preserved across different versions of the form.
- Ensure that control names remain immutable across different versions of the form. This ensures that customizations for a given control in a previous version can be applied to the same control in a new version of the form.
- If possible, avoid moving controls to a different location on the same tab when you upgrade a form. A common user customization is moving controls on the form to a different location. If you change the location of a control in a new version of the form, there is a risk that the new control location could overlap with a control that the user has relocated.
- If possible, avoid moving controls between tabs when you are designing an update to an existing form. Controls are identified both by name and by the tab on which they are located. Moving a control from one tab to another in a new version of the form can break customizations that the user makes to that control, because the customizations will fail to identify the target control.
- When the update to a form includes new controls, consider adding the new controls to a new tab. That is the safest way to avoid interfering with any user customizations to the existing tabs and controls.
- Be aware of how controls are bound. Read-only controls should use only one-way bindings.

Name all Customizable Controls

Ensure that the control names describe what data the control is bound to, or describe what the control does.

Bind the Form to Data Sources

The main purpose of a form is to visualize a single object from the Service Manager database. This object is called a **target instance**, which is always specified by the **DataContext** property of a form (which is inherited from the **FrameworkElement** class).

Important

Do not modify the form's **DataContext** property. The forms hosting environment uses this property to identify the form target instance.

In the Service Manager data model, a target instance is represented as a **BindableDataItem** object. This class aggregates the underlying software development kit (SDK) object, and it exposes its properties through an indexer, which takes a property name as a parameter.

The **BindableDataItem** class also implements **ICustomTypeDescriptor**, which makes it possible to use the **BindableDataItem** class as a data source for WPF binding. The following is an example of binding a target instance property to the **Text** property of a **TextBox** control:

```
<TextBox Name="textBoxDescription" Text="{Binding Path=Summary}"/>
```

It is not necessary to specify the **Source** of the binding because the target instances are set as the **DataContext** of the form, which serves as the default **Source** for all controls on the form.

Controls on the form can be bound to data sources other than the target instance, and the forms infrastructure library contains a number of controls that perform the binding implicitly. For example, the instance picker control is bound to the data source, which provides the collection of instances to choose. It is also possible to define additional data sources declaratively using the **ObjectDataProvider** and **XmlDataProvider** classes.

The forms infrastructure considers the target instance as the only read/write data source on the form. Therefore, the implementation of the **Submit** command will only store the changes that are made to the target instance. Other data sources for the form are treated as read only.

Use Service Manager Forms Infrastructure Validation Rules, Value Convertors, and Error Templates

We recommend that you use forms infrastructure validation rules in forms to designate data input that is not valid. The WPF binding infrastructure supports validation for control properties that are bound to a data source with either one-way or two-way bindings. The binding object has a **ValidationRules** collection that can contain any number of **ValidationRule** objects. Whenever data is pushed from the control to the data source, the **ValidationRule** objects are called to validate the value.

The forms infrastructure library contains a number of validation rules that handle the most common cases. The forms infrastructure takes advantage of the validation rules to determine whether the form contents can be submitted for storing. For example, a form's **Submit** button can be disabled if there is a control that has a validation error on the form.

We recommend that you use the custom error template that is provided with the forms infrastructure library. If a control has a validation error, it appears by default with a red border around it. The WPF makes it possible to define a custom error indicator through the **Validation.ErrorTemplate** property, which can be set on any control. The Service Manager forms infrastructure library contains a custom error template, which displays an error icon instead of the WPF red border. In addition, when a mouse points to the error icon, a tooltip pops up with an error message. The error message should indicate the reason why the data in the control failed validation.

The following example shows how to reference the error template in XAML:

```
<TextBox Text="{Binding SomeProperty}"
         scwpf:Validation.ValueRequired="True"
         Validation.ErrorTemplate="{DynamicResource {ComponentResourceKey {x:Type
scwpf:Validation}, InvalidDataErrorTemplate}}"/>
```

If built-in validation rules do not provide the required validation logic, we recommend that you build custom validation rules to represent that logic. This will make it possible for standard and custom validation logic to coexist within the common validation handling mechanism.

If the validation rules mechanism is not adequate for a particular scenario, you should instead handle **FormEvents.PreviewSubmitEvent** and run the validation from there.

The following code example provides an example of the pattern that you can use to run custom validation:

```
void MyForm_Loaded(object sender, RoutedEventArgs e)
{
    // hook to handle form events
    this.AddHandler(
        FormEvents.PreviewSubmitEvent,
        new EventHandler<PreviewFormCommandEventArgs>(this.OnPreviewSubmit));
}
private void OnPreviewSubmit(object sender, PreviewFormCommandEventArgs e)
{
    string errorMessage;
    bool result = this.DoVerify(out errorMessage);
    if (!result)
    {
        // cancel Submit operation
        e.Cancel = true;
        // display error message
        MessageBox.Show(errorMessage);
    }
}
internal bool DoVerify(out string errorMessage)
{
    // Do custom verification and return true to indicate that
    // validation check has passed; otherwise return false and
    // populate errorMessage argument
}
```

Use Form Infrastructure Commands and Events

The form infrastructure exposes a number of commands that can be run on a form. These commands include:

- **FormsCommand.Submit**, which saves the target instance of the form.
- **FormsCommand.SubmitAndClose**, which saves the target instance of the form and closes the form.
- **FormsCommand.Refresh**, which repeats the query for the target instance of the form.
- **FormCommands.Cancel**, which discards all changes and closes the form.

Each of these commands is bracketed by events, which are raised before and after the command runs.

Before the command, the following events are raised:

- The **FormEvents.PreviewSubmit** event is raised before the **FormCommand.Submit** command, and the **FormEvents.Submitted** event is raised after the **FormCommand.Submit** command.
- The **FormEvents.PreviewRefresh** event is raised before the **FormCommands.Refresh** command, and the **FormCommand.Refreshed** command is raised after the **FormCommand.Submit** command.
- The **FormEvents.PreviewCancel** event is raised before the **FormCommands.Cancel** command, and the **FormCommand.Canceled** event is raised after the **FormCommand.Cancel** command.

The preview events pass along a **PreviewFormCommandEventArgs** object. This object contains a mutable **Cancel** property that will prevent the corresponding command from running when the property is set to **true**.

The post-command events pass a **FormCommandExecutedEventArgs** object. This object contains a **Result** property that indicates whether the running of the command succeeded, was canceled, or caused an error. In case of an error, the **Error** property of the **FormCommandExecutedEventArgs** object references the exception that provides information about the error.

It is possible to enable, disable, and run form commands both programmatically and declaratively.

To enable form commands programmatically, establish a **CommandBinding** between the form and the related command.

In the following example, a command binding is established between the form and a **Refresh** command, and two handlers are defined for this command. The first handler returns whether or not the **Refresh** command can run, and the second handler actually contains the implementation of the **Refresh** command:

```
public class MyForm : UserControl
{
    public MyForm()
    {
```

```
            // do standard initialization
            // establish CommandBinding for Refresh command
            this.CommandBindings.Add(
                new CommandBinding(FormCommands.Refresh, this.ExecuteRefresh,
this.CanExecuteRefresh));
        }
        private void CanExecuteRefresh(
              object sender,
              CanExecuteRoutedEventArgs e)
        {
            // put your logic that determines whether Refresh
// can be executed here
            bool canExecute = true;
            BindableDataItem dataItem = this.DataContext as BindableDataItem;
            if (dataItem)
            {
                canExecute = dataItem["Status"] != "New";
            }
            e.CanExecute = canExecute;
        }
        private void ExecuteRefresh(
            object sender,
            ExecutedRoutedEventArgs e)
        {
            // here is placeholder for the code that has do be
// executed upon running Refresh command
        }
    }
```

You can also define handlers for form commands declaratively. You can do this by employing a **Rule** object that uses a **RoutedCommandTrigger**. The following code example shows how to define handlers declaratively:

```
    <scwpf:BusinessLogic.Rules>
```

```
        <scwpf:RuleCollection>
            <scwpf:Rule>
                <scwpf:Rule.Triggers>
                    <scwpf:RoutedCommandTrigger
RoutedCommand="{x:Static scwpf:FormCommands.Refresh}"/>
                </scwpf:Rule.Triggers>
                <scwpf:Rule.Conditions>
                    <scwpf:PropertyMatchCondition
                        Binding="{Binding Status}"
                        Value="New"
                        Operation="NotEquals" />
                </scwpf:Rule.Conditions>
                <!-- Use RuleAction objects to define the logic that executed
                upon running Refresh command; this can be left empty -->
            </scwpf:Rule>
        </scwpf:RuleCollection>
    </scwpf:BusinessLogic.Rules>
```

See Also

Windows Presentation Foundation (WPF) Web Site (WindowsClient.NET)

Forms: Customizing and Authoring

Guidelines and Best Practices for Authoring Forms in the Authoring Tool

Use the following guidelines when you are authoring forms in the System Center 2012 – Service Manager Authoring Tool. For more information about how Windows Presentation Foundation (WPF) forms work and WPF customization guidelines, see Windows Presentation Foundation on MSDN.

- When you are customizing existing default forms by adding new controls, first create a new **Tab** control, and then add the new controls to the new **Tab** control.
- Store all customizations of a particular form in a single management pack.
- Group related controls in a **Panel** control so that you can better handle them as a group.
- You can drop controls only in containers, such as the **Panel** container control.

- Set one or more of the following control properties to **Auto** to allow for dynamic adjustment of placement: **Height**, **Width**, **Minimum Height**, **Minimum Width**, **Left**, **Top**, **Right**, and **Bottom**. Depending on the resulting behavior, adjust these settings.

See Also

Forms: Customizing and Authoring

How to Browse a Form in the Authoring Tool

Use one of the following two procedures to browse a form in the System Center 2012 – Service Manager Authoring Tool. In both procedures, note that the properties in the **Details** pane are updated according to the class property that is bound to the selected control. And, note that the **Binding Path** entry in the **Details** pane indicates the respective property that the field in the form represents.

To browse a form from the Form Browser

1. If the **Form Browser** pane is not visible, click **View**, and then click the **Form Browser** tab.
2. In the **Form Browser** pane, select the management pack that contains the form that you want to view.
3. In the list of forms, right-click the form that you want to view, and then click **View**. The form opens in the authoring pane.
4. Ensure that the **Details** pane is visible. If not, click **View** on the menu bar, and then click **Details Window**. The properties of the form appear in the **Details** pane.
5. Select a control on the form.

To browse a form from Management Pack Explorer

1. In the Authoring Tool, click **File**, and then click **Open**.
2. In the **Open a Management Pack** dialog box, select the management pack that contains the form that you want to view. For example, select **Management Packs** as the file type, and then select the **ServiceManager.ChangeManagement.Library.mp** management pack in the D:\Program Files (x86)\Microsoft System Center\Service Manager 2012 Authoring\Library folder.
3. In the **Management Pack Explorer**, select the opened management pack, and then expand **Forms**. Right-click the form that you want to view, and then click **View form**. The form opens in the authoring pane.
4. Ensure that the **Details** pane is visible. If not, click **View** on the menu bar, and then click **Details Window**. The properties of the form appear in the **Details** pane.
5. Select a control on the form.

See Also

Forms: Customizing and Authoring

How to Customize a Form in the Authoring Tool

You can use the System Center 2012 – Service Manager Authoring Tool to customize some properties of a form. For example, you can change the layout of the form's fields, and you can add an icon to the form.

To customize a form, you open the management pack file that contains the original form definition. After you complete the customizations, you save the changes to a management pack file. If the original form is defined in an unsealed management pack, you save your customizations to that management pack. If the original form is defined in a sealed management pack, you must save your customizations to an unsealed management pack that is already open in the Authoring Tool or to an unsealed management pack that you create.

To use the custom form in Service Manager, import the management pack that contains the custom form into the Service Manager console. Then, when you run a task that requires that form, the custom form is displayed instead of the default form.

Use the following procedure to customize an existing form.

Important
You cannot perform two customizations to the same form at the same time. Additionally, the Authoring Tool option **Undo all customizations** does not fully delete information from the management pack. If you want to remove all artifacts, delete the customized form, which removes it and any associated type projection from the management pack.

To customize an existing form

1. In the Authoring Tool, click **File**, and then click **Open**.
2. In the **Open File** dialog box, select the management pack that contains the form that you want to customize, and then click **Open**. For example, select the Change Management Library management pack. The path might be *Authoring Tool installation drive*\Program Files (x86)\Microsoft System Center\Service Manager 2012 Authoring\Library\ServiceManager.ChangeManagement.Library.mp.
3. Locate the form that you want to customize using the **Form Browser** or the **Management Pack Explorer**, as follows:

   Using the **Form Browser**:

   a. In the **Form Browser**, select **All Management Packs** or select the management pack that contains the form that you want to customize, such as the **Service Manager Change Management Library** management pack.
   b. Right-click the form that you want to customize, such as the form that ends with **ChangeRequestForm**, and then click **View**.
   c. In the authoring pane, click **Customize**.

Using the **Management Pack Explorer**:

a. In the **Management Pack Explorer** pane, select the management pack that contains the form that you want to customize, such as the **Service Manager Change Management Library** management pack.

b. Expand **Forms**, and then right-click the form that you want to customize, such as the form that ends with **ChangeRequestForm**.

c. Select **Customize**.

4. In the **Target Management Pack** dialog box, select an unsealed management pack in which to save this customization, and then click **OK**.

   In the **Management Pack Explorer** pane, a new form item appears in the **Forms** list of the management pack that you specified as the targeted management pack. The name of the new form ends with the string **(Customized)**.

5. In the authoring pane, you can rearrange the location of controls on the form to change the appearance and behavior of the form. Also, you can add controls to the form by doing the following:

   - Drag controls from the **Form Customization Toolbox** pane.
   - Drag specific properties from the **Class Browser** pane. This will automatically create and bind the control according to the property that you dragged.

See Also

Forms: Customizing and Authoring

How to Create a New Form in the Authoring Tool

If you defined a new custom class to extend System Center 2012 – Service Manager, you might have to create a custom form to interact with that class. You can use the System Center 2012 – Service Manager Authoring Tool to create a form using either of the following methods:

- Start from a base class.
- Load a custom Windows Presentation Foundation (WPF) form that was initially developed by the Microsoft Visual Studio development system, and continue to customize that form in the Authoring Tool.

The Authoring Tool includes form controls, such as the **Check Box**, **Date Picker**, **Tab Control**, and **Tab Item**, that you can add to the form. You can access these controls from the **Form Customizations Toolbox**. Typically, you bind the form controls to specific properties of the form's base class. Therefore, using either method you must first select a base class for the form to be associated with. For more information about the controls that you can add to a form, see previous topics in this section, such as How to Add a Check Box Control to a Form in the Authoring Tool, and How to Add a Tab Control and Tab Item Controls to a Form in the Authoring Tool.

The following sections describe how to create a new form in the Authoring Tool.

Creating a New Form from a Base Class

Use the following procedure to create a simple form from a base class.

Note

When you create a form from a base class, the Authoring Tool does not support advanced capabilities. For example, there is no support for code-behind, complex rules, such as field interdependency or calculated values.

To create a new form from a base class

1. In the **Management Pack Explorer**, expand the management pack in which you want to store the new form. Right-click **Forms**, and then click **Create**.
2. In the **Base class** dialog box, select the base class for the form. You can narrow your search by selecting a specific management pack, or you can leave the default **All Management Packs**. Click **OK**.
3. If you selected a sealed management pack in step 1, the **Target Management Pack** dialog box appears. Select an unsealed management pack in which to store the form, and then click **OK**.
4. In the **Create form** dialog box, in the **Internal name** box, type a name for the form, and then click **Create**.

   An initial blank form is displayed in the authoring pane. The initial form consists of a header section at the top and a body section underneath; both sections are blank.
5. Customize the form by dragging controls from the **Form Customizations Toolbox** pane to the new form.
6. Save the management pack that contains the form that you created.

Creating a New Form That Is Based on a Custom WPF Form

Sometimes a simple form is not sufficient, and you must use advanced features, such as custom logic, in the form. In this case, you can develop a custom WPF form by using a tool other than the Authoring Tool, using instead Visual Studio. Then, instead of authoring a form from base class, you load that WPF form's assembly file into the Authoring Tool and use that as a starting point for further customizations to the form. The form customizations that you make in the Authoring Tool are stored in a management pack file.

Later, to use the customized form in Service Manager, after you complete all customizations, you must bundle the original form assembly file with the management pack that contains the customizations that you made in the Authoring Tool. For more information about bundling a management pack and creating a .mpb file, see How to Bundle Management Packs and Resource Files.

Use the following procedure to load a custom WPF form assembly file into the Service Manager and customize that form.

To create a new form that is based on a custom WPF form

1. In the **Management Pack Explorer**, expand the management pack in which you want to store customizations to the form. Right-click **Forms**, and then click **Add Custom**.
2. In the **Base class** dialog box, select the base class for the form. You can narrow your search by selecting a specific management pack, or keep the default **All Management Packs**. Click **OK**.
3. If you selected a sealed management pack in step 1, the **Target Management Pack** dialog box appears. Select an unsealed management pack in which to store the form, and click **OK**.
4. In the **Add custom form** dialog box, type a name in the **Internal name** box. In the **Assembly** box, select the assembly file that contains the custom form that you want to load, and in the **Type** box, select the name of the form from the assembly file that you want to load. Click **Create**. The form that you selected is now displayed in the authoring pane.
5. Customize the form by dragging controls from the **Form Customizations Toolbox** pane to the form on the authoring pane.
6. Save the management pack that contains the customizations of the form.
7. Bundle the form's original assembly file, the management pack that contains the form customizations that you made in the Authoring Tool, and any other resource files that you need, to create an .mpb file.

See Also

Forms: Customizing and Authoring

How to Add a Check Box Control to a Form in the Authoring Tool

A **Check Box** control in System Center 2012 – Service Manager Authoring Tool presents an option on the form, and lets the user choose that option. You can modify the properties of the **Check Box** control to customize characteristics such as the label that is displayed on the check box.

Use the following procedure to add a **Check Box** control to a form.

To add a Check Box control to a form

1. Ensure that the **Form Customization Toolbox** pane is open and that the form that you want to customize is open in the authoring pane.
2. Drag the **Check Box** icon from the **Form Customization Toolbox** pane to the form. Click the **Check Box** control on the form.
3. In the **Details** pane, select the **Content** property and set its value to text that will be displayed on the check box.
4. In the **Details** pane, select the **Binding Path** property, and then click the ellipsis (**…**) icon. In the **Binding Path** dialog box, expand the classes, and then select a **Boolean** property for the control to bind to. Note that the **Content** property is automatically set to the display name of the property that the control is bound to.

5. Click any other property, such as **Font Family**, in the **Details** pane to customize the properties of the **Check Box** control.
6. Click **File**, and then click **Save All** to save the custom form to a management pack.

See Also

Forms: Customizing and Authoring

How to Add a Date Picker Control to a Form in the Authoring Tool

A **Date Picker** control in the System Center 2012 – Service Manager Authoring Tool is used for displaying dates on a form. You can modify the properties of the **Date Picker** control to customize characteristics such as the format of the date that is displayed.

Use the following procedure to add a **Date Picker** control to a form.

To add a Date Picker control to a form

1. Ensure that the **Form Customization Toolbox** pane is open and that the form that you want to customize is open in the authoring pane.
2. Drag the **Date Picker** icon from the **Form Customization Toolbox** pane to the form. Click the **Date Picker** control on the form.
3. In the **Details** pane, select the **Binding Path** property. Click the ellipsis (**…**) icon, and then in the **Binding Path** dialog box, select the class property that you want the **Date Picker** control to bind to.
4. Click any property, such as **Date Format**, in the **Details** pane to customize the properties of the **Date Picker** control.
5. Click **File**, and then click **Save All** to save the custom form to a management pack.

See Also

Forms: Customizing and Authoring

How to Add an Image Control to a Form in the Authoring Tool

An **Image** control in the System Center 2012 – Service Manager Authoring Tool is used for displaying an image. You can modify the properties of the **Image** control to customize characteristics such as the location, size, and image that is displayed.

Use the following procedure to add an **Image** control to a form.

To add an Image control to a form

1. Ensure that the **Form Customization Toolbox** pane is open and that the form that you want to customize is open in the authoring pane.
2. Drag the **Image** icon from the **Form Customization Toolbox** pane to the form.

3. In the **Insert Image** dialog box, specify the path of the image file for the image. Note that the image you chose appears on the form.
4. Click any property in the **Details** pane to customize other properties of the **Image** control.
5. Click **File**, and then click **Save All** to save the custom form to a management pack.

See Also

Forms: Customizing and Authoring

How to Add a Label Control to a Form in the Authoring Tool

A **Label** control is used in the System Center 2012 – Service Manager Authoring Tool for displaying a label on a form. You can modify the properties of the **Label** control to customize characteristics such as the text string that the label displays.

Use the following procedure to add a **Label** control to a form.

To add a Label control to a form

1. Ensure that the **Form Customization Toolbox** pane is open and that the form that you want to customize is open in the authoring pane.
2. Drag the **Label** icon from the **Form Customization Toolbox** pane to the form. Click the **Label** control on the form.
3. In the **Details** pane, select the **Binding Path** property. Click the ellipsis (**…**) icon, and then in the **Binding Path** dialog box, select the class property that you want the **Label** control to bind to.

   Alternatively, if you want the **Label** control to display a static string, select the **Content** property and type a string to replace the default Label_1 string. It will be displayed on the form.
4. Click any other property in the **Details** pane to customize properties of the **Label** control.
5. Click **File**, and then click **Save All** to save the custom form to a management pack.

See Also

Forms: Customizing and Authoring

How to Add a List Picker Control to a Form in the Authoring Tool

The **List Picker** control in the System Center 2012 – Service Manager Authoring Tool is a System Center 2012 – Service Manager custom control that is used for selecting an item from a prepopulated list of items. You can modify properties of the **List Picker** control to customize the characteristics of the control.

One of the characteristics of the control that you have to set is the list of items that will populate the **List Picker** control that you are creating. You can either choose an existing list, such as the **Activity Priority** list, or you can create a new list while you are creating the control.

To add list items to a newly created list, you must use the Service Manager console. You cannot use the Authoring Tool to add list items to a newly created list. For more information about using the Service Manager console to add list items, see How to Add a List Item.

Use the following procedure to add a **List Picker** control to a form.

To add a List Picker control to a form

1. Ensure that the **Form Customization Toolbox** pane is open and that the form that you want to customize is open in the authoring pane.
2. Drag the **List Picker** icon from the **Form Customization Toolbox** pane to the form. Click the **List Picker** control on the form.
3. In the **Details** pane, select the **List type** property, and then click the ellipsis (**…**) icon. In the **Select a list** dialog box, select the list of items that will populate the **List Picker** control that you are creating. Select a list from the **Available lists** list.

   Click **OK**.
4. Click any other property, such as **Width** or **Height**, in the **Details** pane to customize other properties of the **List Picker** control.
5. Click **File**, and then click **Save All** to save the custom form to a management pack.

See Also

Forms: Customizing and Authoring

How to Add a Panel Control to a Form in the Authoring Tool

The **Panel** control in the System Center 2012 – Service Manager Authoring Tool is a **Layout** control that helps you manage a group of related controls. Typically, you drag and position several controls that have a related purpose on the form on a panel control. Then, if you need to move the controls that are on the panel, instead of moving each control individually, you can simply move the **Panel** control.

Use the following procedure to add a **Panel** control to a form.

To add a Panel control to a form

1. Ensure that the **Form Customization Toolbox** pane is open and that the form that you want to customize is open in the authoring pane.
2. Drag the **Panel** icon from the **Form Customization Toolbox** pane to the form. You can now add other controls on the **Panel** control.

See Also

Forms: Customizing and Authoring

How to Add a Single Instance Picker Control to a Form in the Authoring Tool

A **Single Instance Picker** control in the System Center 2012 – Service Manager Authoring Tool is a System Center 2012 – Service Manager custom control. It is used for presenting a list of instances of a certain class, and it lets the user select an instance from that list. This control resembles the **User Picker** control, but instead of being based on the **User** class, it is based on any class that you specify, including custom classes. You can modify properties of the **Single Instance Picker** control to customize characteristics such as the class whose instances will populate the list.

Use the following procedure to add a **Single Instance Picker** control to a form.

To add a Single Instance Picker control to a form

1. Ensure that the **Form Customization Toolbox** pane is open and that the form that you want to customize is open in the authoring pane.
2. Drag the **Single Instance Picker** icon from the **Form Customization Toolbox** pane to the form. Click the **Single Instance Picker** control on the form.
3. In the **Details** pane, select the **Binding Path** property, and then click the ellipsis (**…**) icon. In the **Binding Path** dialog box, select the related class whose instances will populate the control's instances list on the form.
4. Click any other property, such as **Width** or **Height**, in the **Details** pane to customize other properties of the **Single Instance Picker** control.
5. Click **File**, and then click **Save All** to save the custom form to a management pack.

See Also

Forms: Customizing and Authoring

How to Add a Tab Control and Tab Item Controls to a Form in the Authoring Tool

A **Tab Control** control, combined with **Tab Item** controls, is used for arranging visual content in tabular form in the System Center 2012 – Service Manager Authoring Tool. You can modify the properties of these controls to customize characteristics such as the appearance and layout. Typically, the **Tab Control** control is accompanied by several **Tab Item** controls that enable selection of individual items inside the **Tab Control**.

Use the following procedures to add a **Tab Control** control and **Tab Item** controls to a form.

To add a Tab Control control to a form

1. Ensure that the **Form Customization Toolbox** pane is open and that the form that you want to customize is open in the authoring pane.
2. Drag the **Tab Control** icon from the **Form Customization Toolbox** pane to the form. Click the **Tab Control** control on the form.

3. Click any property in the **Details** pane to customize the properties of the **Tab Control** control.
4. Click **File**, and then click **Save All** to save the custom form to a management pack.

To add a Tab Item control to a form

1. Add a **Tab Control** control as described in the previous procedure, and then select it on the form.
2. Drag the **Tab Item** icon from the **Form Customization Toolbox** pane, and drop it on the **Tab Control** control that it should be associated with.
3. Right-click the **Tab Item** control, and then click **Edit Content**. Enter the text that you want to appear as the label on the **Tab Item**. Click any property in the **Details** pane to customize other properties of the **Tab Item** control.
4. Click **File**, and then click **Save All** to save the custom form to a management pack.

See Also

Forms: Customizing and Authoring

How to Add a Text Box Control to a Form in the Authoring Tool

A **Text Box** control is used in the System Center 2012 – Service Manager Authoring Tool for text display and editing. You can modify the properties of the control to customize characteristics such as the location, the size, the wrapping behavior, and the text of the **Text Box** control.

Use the following procedure to add a **Text Box** control to a form.

To add a Text Box control to a form

1. Ensure that the **Form Customization Toolbox** pane is open and that the form that you want to customize is open in the authoring pane.
2. Drag the **Text Box** icon from the **Form Customization Toolbox** window to the form. Click the **Text Box** control on the form.
3. Set a text string by doing either of the following:
   - In the **Details** pane, select the **Binding Path** property. Click the ellipsis (**…**) icon, and then in the **Binding Path** dialog box, select the class property that you want the **Text Box** control to bind to.
   - Select the **Text** property. Select the default **Text Box** string value and replace it. Note that the new string value that you entered now appears on the form.
4. Select the **Accepts the ENTER key** property, and set its value to **True**. In the deployed form, this value lets users enter multiple lines of text.
5. Click any other property, such as **Horizontal Scroll Bar Visibility** and **Maximum Lines**, in the **Details** pane to customize other properties of the **Text Box** control.
6. Click **File**, and then click **Save All** to save the custom form to a management pack.

See Also

Forms: Customizing and Authoring

How to Add a User Picker Control to a Form in the Authoring Tool

The **User Picker** control is a System Center 2012 – Service Manager custom control that is used for choosing a user from a drop-down list of users. You can modify the properties of the **User Picker** control in the System Center 2012 – Service Manager Authoring Tool to customize characteristics such as the layout and the list of users to bind to.

Use the following procedure to add a **User Picker** control to a form.

To add a User Picker control to a form

1. Ensure that the **Form Customization Toolbox** pane is open and that the form that you want to customize is open in the authoring pane.
2. Drag the **User Picker** icon from the **Form Customization Toolbox** pane to the form. Click the **User Picker** control on the form.
3. In the **Details** pane, select the **Binding Path** property, and then click the ellipsis (**…**) icon. In the **Binding Path** dialog box, select the related user class that represents the user instances that you want this control to bind to. On the deployed form, the user can use this control to view and pick one of the user instances of the specified related user class.
4. Click any property in the **Details** pane to customize the properties of the **User Picker** control.
5. Click **File**, and then click **Save All** to save the custom form to a management pack.

See Also

Forms: Customizing and Authoring

How to Customize the Default Incident Form (Sample Scenario)

This sample scenario describes how to apply simple customizations to a default form in the System Center 2012 – Service Manager Authoring Tool. In this scenario, you customize the Incident form, which is the default form for interacting with incidents. You customize the form in the Authoring Tool and then save the customized form in a new management pack. Then, in the Service Manager console, you import this new management pack. Afterwards, whenever you create or view an incident, Service Manager displays the customized form. The Incident form, System.WorkItem.Incident.ConsoleForm, is defined in the Service Manager Incident Management Library management pack.

The sample scenario for customizing the default Incident form consists of three steps.

Step 1: View the Default Incident Form

Before you customize the form, view the default form in the Service Manager console and identify elements on the form that you want to customize. For example, you can plan to rearrange various text boxes on the form.

To view the default incident form

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, click **Incident Management**.
3. In the **Tasks** pane, click **Create Incident**.
4. Review the **Incident** form. This form is the form that you use to create and view incidents. You can identify elements in the form that you might want to customize.

Step 2: Customize the Default Incident Form

Use the following procedure to customize the default Incident form in the Authoring Tool.

To customize the Incident form

1. Click **Start**, point to **Programs**, point to **Microsoft System Center**, point to **Service Manager 2012 Authoring**, and then click **Service Manager Authoring Tool**.
2. In the Authoring Tool, click **File**, and then click **New**.
3. In the **New Management Pack** dialog box, in the **File name** box, type **MyIncidentFormCustomizations**, and then click **Save**.

   Note that the **MyIncidentFormCustomizations** management pack is now listed in the **Management Pack Explorer**.
4. In the **Form Browser** pane, locate and then right-click the **System.WorkfItem.Incident.ConsoleForm** form, which is the default Incident form, and then click **View**.

   Note that the **Service Manager Incident Management Library** management pack, which contains the default Incident form, is now listed in the **Management Pack Explorer**.
5. In the authoring pane, click **Customize**.
6. In the **Target Management Pack** dialog box, select **MyIncidentFormCustomizations**, and then click **OK**.
7. Wait for the authoring pane to display the form that you are customizing. You can now add controls, such as a **Label**, a **Text Box**, or an **Image**, to the form. Ensure that the **Details** window is open and visible, so that you can browse and modify properties of the controls.
8. In the **Management Pack Explorer**, right-click **MyIncidentFormCustomizations**, and then click **Save**.
9. Exit the Authoring Tool.

Step 3: Use the Customized Default Incident Form

Use the following procedure to view and use the customized Incident form in the Service Manager console.

To use the customized System.WorkItem.Incident.ConsoleForm form

1. Start the Service Manager console, and then click **Administration**.
2. In the **Administration** pane, click **Management Packs**.
3. In the **Tasks** pane, click **Import**.
4. In the **Select Management Packs to Import** dialog box, click the **MyIncidentFormCustomizations.xml** management pack file. Click **Open**.
5. In the **Import Management Packs** dialog box, click **Import**, wait for the management pack to be imported, and then click **OK**.
6. Click **Incidents**, and then in the **Tasks** pane, click **Create Incident**.

   Note that the **Incident** form that is displayed is your customized form.
7. Fill in the form, and then save the incident.

See Also

Forms: Customizing and Authoring

Properties of Form Controls

The table in this topic lists the properties of System Center 2012 – Service Manager form controls. This information can help you customize and create forms in the System Center 2012 – Service Manager Authoring Tool.

Table of Control Properties

Most properties of Service Manager forms are based on Windows Presentation Foundation (WPF) properties, and other properties are defined by Service Manager. The following table provides details about the WPF-based property groups and their respective properties, when they are applicable. For more information about WPF properties, see System.Windows.Controls Namespace on MSDN.

Service Manager property group	Service Manager property name	Source of property	WPF-based property group/property	Additional information
Appearance	Opacity	WPF	UIElement/Opacity	
	Visibility	WPF	UIElement/Visibility	
Binding	Binding	WPF	Binding/Mode	

Service Manager property group	Service Manager property name	Source of property	WPF-based property group/property	Additional information
	Mode			
	Binding Path	Service Manager and WPF	Binding/Path	Binds the control to the property that the control displays. The control dynamically displays the property that it is bound to, updating the value as it changes. The type of the control and the type of the displayed property must match; for example, the type of the **Binding Path** property of a **Date Picker** control must be **Date**.
	Binds directly to source	WPF	Binding/BindsDirectlyToSource	
Date	Date Format	Service	N/A	The format

Service Manager property group	Service Manager property name	Source of property	WPF-based property group/property	Additional information
		Manager		in which the control displays the date, such as “Full date and time”, and “Short”.
Drawing	Source Path	Service Manager	N/A	A path to the image file in an **Image** control.
	Stretch	WPF	Image/Stretch	
	Stretch Direction	WPF	Viewbox/StretchDirection	
Brush	Background Brush	N/A	N/A	The background color in the control.
	Foreground Brush	N/A	N/A	The foreground color in the control, basically, the color of text.
Instance	Instance Type	Service Manager	N/A	The type of the instance in a **Single Instance Picker** control. The value is a class, such as **Activity**,

Service Manager property group	Service Manager property name	Source of property	WPF-based property group/property	Additional information
				Computer, or a custom class.
	Instance type internal name	Service Manager	N/A	The internal name of the **Instance Type** property.
Label	Content	WPF	ContentControl/Content	A fixed string to be displayed in the label.
	Font Family	WPF	TextBlock/FontFamily	
	Font Size	WPF	TextBlock/FontSize	
	Font Style	WPF	TextBlock/FontStyle	
	Font Weight	WPF	TextBlock/FontWeight	
	Label Binding Mode	WPF	Binding/Mode	
	Label Binding Path	Service Manager and WPF	N/A	Included in almost all controls. Binds the label of the control to the property that this control displays.
	Label binds directly to source	WPF	Binding/BindsDirectlyToSource	
Layout	Height	WPF	FrameworkElement/Height	Can be set to **Auto** or

Service Manager property group	Service Manager property name	Source of property	WPF-based property group/property	Additional information
				to **NaN**, allowing for dynamic adjustment of size.
	Horizontal Alignment	WPF	FrameworkElement/HorizontalAlignment	
	Minimum Height	WPF	FrameworkElement/MinHeight	Can be set to **Auto** or to **NaN**, allowing for dynamic adjustment of size.
	Minimum Width	WPF	FrameworkElement/MinWidth	Can be set to **Auto** or to **NaN**, allowing for dynamic adjustment of size.
	Vertical Alignment	WPF	FrameworkElement/VerticalAlignment	
	Width	WPF	FrameworkElement/Width	Can be set to **Auto** or to **NaN**, allowing for dynamic adjustment of size.
List	List type	Service Manager	N/A	The type of list that this control displays. This can be an existing

Service Manager property group	Service Manager property name	Source of property	WPF-based property group/property	Additional information
				list or a custom list.
	List type internal name	Service Manager	N/A	The internal name of the **List type** property.
Margin	Bottom	WPF	Control/Bottom	Can be set to **Auto** or to **NaN**, allowing for dynamic adjustment of size.
	Left	WPF	Control/Left	Can be set to **Auto** or to **NaN**, allowing for dynamic adjustment of size.
	Right	WPF	Control/Right	Can be set to **Auto** or to **NaN**, allowing for dynamic adjustment of size.
	Top	WPF	Control/Top	Can be set to **Auto** or to **NaN**, allowing for dynamic adjustment of size.
Miscellaneous	Flow	WPF	FrameworkElement/FlowDirection	

Service Manager property group	Service Manager property name	Source of property	WPF-based property group/property	Additional information
	Direction			
	Focusable	WPF	UIElement/Focusable	
	Is Enabled	WPF	UIElement/IsEnabled	
	Name	WPF	FrameworkElement/Name	
Text	Accepts the Enter key	WPF	TextBox/AcceptsReturn	
	Content	WPF	ContentControl/Content	
	Font Family	WPF	TextBlock/FontFamily	
	Font Size	WPF	TextBlock/FontSize	
	Font Style	WPF	TextBlock/FontStyle	
	Font Weight	WPF	TextBlock/FontWeight	
	Horizontal Scroll Bar Visibility	WPF	TextBox/HorizontalScrollBarVisibility	
	Max Lines	WPF	TextBox/MaxLines	
	Text	WPF	TextBox/Text	
	Text Wrapping	WPF	TextBlock/TextWrapping	
	Vertical Scroll Bar Visibility	WPF	TextBox/VerticalScrollBarVisibility	

See Also

Working with Forms in the Authoring Tool

Workflows: Customizing and Authoring

Using System Center 2012 – Service Manager, you can automate many administrative processes that previously required manual tasks. The feature that makes this automation possible is the Windows Workflow Foundation (WF) workflow. A WF workflow comprises workflow activities, which are also referred to as *WF activities* to differentiate them from other Service Manager

activity types. Each workflow activity performs a function, such as joining a user or a computer to a group in Active Directory Domain Services (AD DS), creating a Service Manager incident, or running a script. You can assemble WF activities into a workflow that performs a set of tasks, and you can specify the conditions under which the workflow runs.

Workflows Topics

- Automating IT Processes with Workflows

  Describes how to automate information technology (IT) processes using workflows and describes the WF activities that the Authoring Tool provides.
- Creating Workflows for IT Processes

  Describes how to create workflows for IT processes.
- How to Deploy a Workflow to Service Manager

  Describes how to deploy a workflow in Service Manager.
- Configuring the Activities Toolbox

  Describes how to configure the Activities Toolbox.
- Workflow Activity Reference

  Provides details about the default WF activities in the Activity Library.

Automating IT Processes with Workflows

This section describes functionality in System Center 2012 – Service Manager that you can use to automate processes. It describes the relationships between workflows and management packs, and it describes the Windows Workflow Foundation (WF) activities that the System Center 2012 – Service Manager Authoring Tool provides in the default Activity Library.

Automating IT Processes with Workflows Topics

- Workflows and Management Packs

  Describes the files, formats, and trigger conditions for WF workflows.
- The Activity Library

  Describes the workflow activities that are available in Authoring Tool as default activities.

Workflows and Management Packs

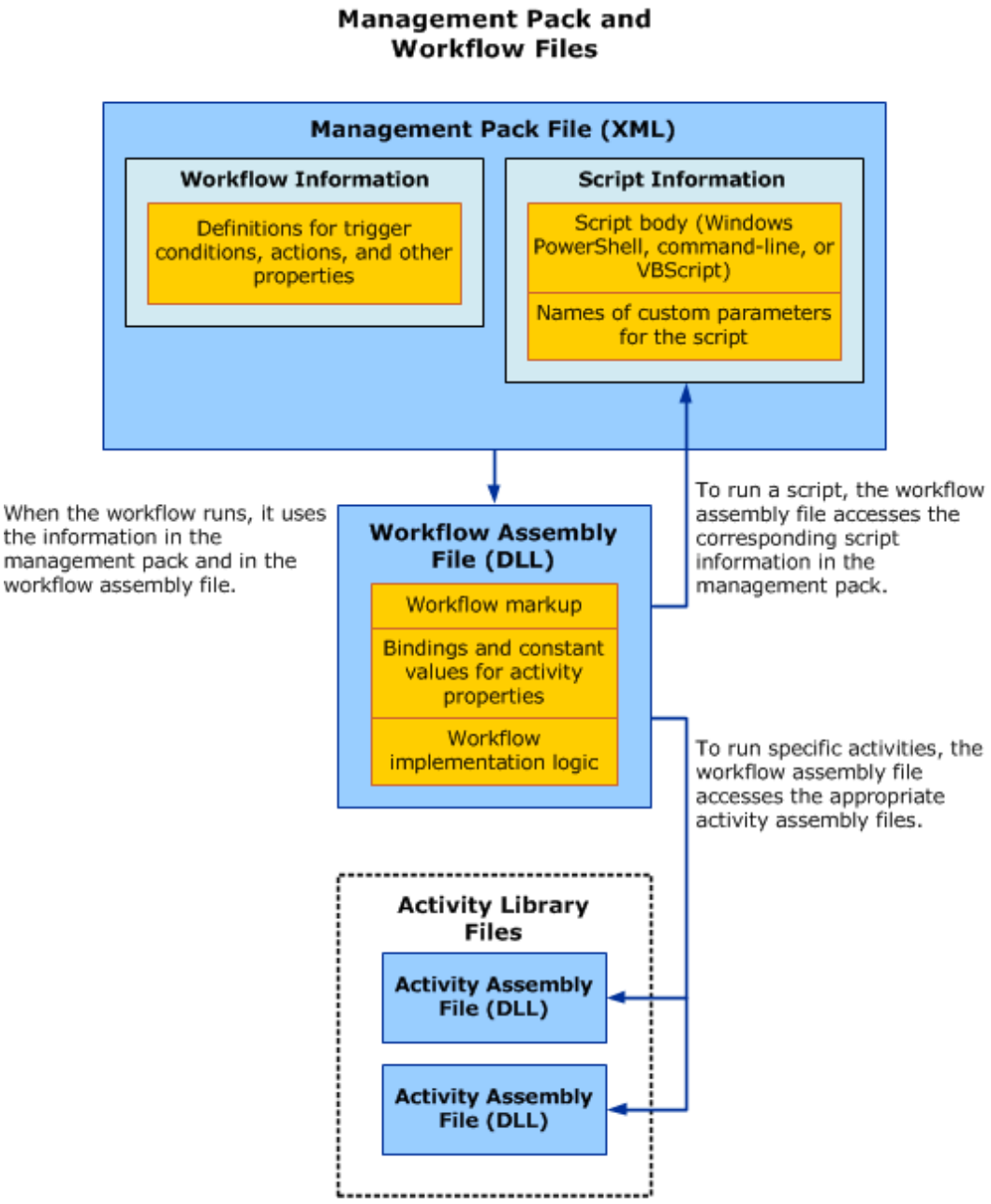
System Center 2012 – Service Manager runs a Windows Workflow Foundation (WF) workflow using trigger condition information stored in the management pack. For each workflow, the management pack contains one data source module and one write action module. The data source module defines the condition that triggers the workflow to run, and the write action module defines the workflow actions. The management pack also stores any script information that the workflow uses.

Files and Formats

In addition to the management pack file, WF workflows require several supporting files:

- **Authoring environment files**. When you create or edit a workflow, these files store the raw workflow information, such as property values and workflow logic.
- **Compiled workflow assembly file** (*workflowname*.dll). When you save a management pack in the System Center 2012 – Service Manager Authoring Tool, the tool also compiles any raw workflow files (the XOML and CS files) into a workflow assembly (DLL) file.
- **Activity assembly files** (*activityname*.dll). These files contain definitions of the available workflow activities. The Authoring Tool cannot modify the activity assembly files.

To implement a management pack with workflows in your Service Manager console environment, make sure that Service Manager has access to the workflow assembly file and the activity assembly files, as well as the management pack itself. The following illustration shows how the various files interact when a workflow runs.



Trigger Conditions for Workflows

A workflow's data source module defines the workflow trigger condition. A workflow can have one of two types of trigger condition:

- **Timer.** This option (also referred to as a *schedule*) triggers the workflow on designated days of the week or at another specified interval.
- **Database query**. This option (also referred to as a *subscription*) triggers the workflow when a specific type of change occurs to a specific class of object. You can select the class from any of the installed management packs, and you can choose from three types of changes:

- When a new instance of the class is created
- When an instance of the class is updated
- When an instance of the class is deleted

See Also

Managing Workflows

How to Deploy a Workflow to Service Manager

Automating IT Processes with Workflows

The Activity Library

The Activity Library in System Center 2012 – Service Manager Authoring Tool provides a number of workflow activities for building basic Windows Workflow Foundation (WF) workflows. Each activity performs a discrete function, such as establishing a loop structure within the workflow, running a script, or creating a Service Manager incident. The Activity Library includes the following types of activities:

- **Active Directory Activities.** Activities that perform Active Directory functions, such as adding users or computers to groups.
- **Control Flow Activities.** Activities that provide structure for the workflow, such as loops and if-else branches.
- **Virtual Machine Management Activities.** Activities that you can use to build workflows that perform simple operations with virtual machines.
- **Script Activities.** Activities that run Windows PowerShell, command-line, or Microsoft Visual Basic Scripting Edition (VBScript) scripts.
- **Service Manager Activities.** Activities that perform Service Manager functions, such as creating or updating incidents.

The following tables list the default activities that are available with the Authoring Tool:

Active Directory activity	Description
Add AD DS Computer To Group	Use this activity to add a computer to a security group in Active Directory Domain Services (AD DS). When you use this activity, make sure that the Service Manager Workflow account has sufficient permissions to modify security groups in AD DS.
Add AD DS User To Group	Use this activity to add a user to a security group in AD DS. When you use this activity, make sure that the Service Manager Workflow account has sufficient permissions to modify security groups

Active Directory activity	Description
	in AD DS.

Control Flow activity	Description
Delay	Use this activity to introduce a delay between activities in a workflow.
For Each Loop	Use this activity to repeat a certain set of activities for a defined number of iterations.
IfElse	Use this activity to control the sequence of activities within a workflow based on a Boolean (True/False) condition. You can use the outcome of a previous activity (such as a script activity) for the condition.
Parallel	Use this activity to fork the sequence of activities into two simultaneous sequences of activities.

Virtual Machine Management activity	Description
Get VM	Use this activity to retrieve a list of one or more virtual machine IDs from a System Center Virtual Machine Manager (VMM) Library.
Move VM	Use this activity to move a virtual machine from the VMM library to a maintenance host.
Shutdown VM	Use this activity to shut down the guest operating system on a virtual machine.
Start VM	Use this activity to start a stopped or paused virtual machine.
Save State VM	Use this activity to save the state of a virtual machine, and then stop the virtual machine.

Script activity	Description
Command Script	Use this activity to run a command-line script as part of a WF workflow.
VBScript Script	Use this activity to run a VBScript script as part

Script activity	Description
	of a WF workflow.
Windows PowerShell Script	Use this activity to run a Windows PowerShell script as part of a WF workflow.

Service Manager activity	Description
Create Incident	Use this activity to create and populate a Service Manager incident.
Get Incident	Use this activity to retrieve one or more Service Manager incidents.
Update Incident	Use this activity to save property changes to one Service Manager incident.
Set Activity Status To Completed	Use this activity to update the status of a Service Manager automated activity.

See Also

Configuring the Way Activities Manage and Pass Information

How to Add an Activity to a Workflow

How to Remove an Activity from a Workflow

Configuring the Activities Toolbox

Automating IT Processes with Workflows

Creating Workflows for IT Processes

To use a workflow to automate a process in the System Center 2012 – Service Manager Authoring Tool, you must define what the workflow should do, when it should run, and what information it needs. You can start with general definitions and then refine them until you have details that you can work with in Service Manager.

Creating Workflows for IT Processes Topics

- Managing Workflows

  Describes how to create, save, edit, or delete workflows.
- Adding or Removing Workflow Activities

  Describes how to add activities; remove, copy, and paste activities; and configure specialized activities to import Windows PowerShell scripts into a workflow.
- Configuring the Way Activities Manage and Pass Information

Describes how to use properties to pass information to a workflow and activities within the workflow.

Managing Workflows

Use the procedures in this section to create or delete workflows in the System Center 2012 – Service Manager Authoring Tool. The Authoring Tool provides a wizard to help you create workflows.

All workflows run under the security context of the Service Manager Workflow account.

If you are following the Woodgrove Bank customization scenario, proceed to How to Create a New Workflow.

Managing Workflows Topics

- How to Create a New Workflow

  Describes how to create a new workflow.
- How to Save and Build a Workflow

  Describes how to save and build a workflow.
- How to Copy a Workflow

  Describes how to copy a workflow.
- How to Edit a Workflow's Details

  Describes how to edit a workflow's details.
- How to Delete a Workflow

  Describes how to delete a workflow.

How to Create a New Workflow

Use the Create Workflow Wizard to create a new workflow in the System Center 2012 – Service Manager Authoring Tool. After you create the workflow, you can populate the workflow with activities, as described in Adding or Removing Workflow Activities.

Important

All workflows run under the security context of the Service Manager Workflow account.

The following procedures guide you through the process of creating a new workflow:

- If you want to create a workflow that runs according to a schedule or a fixed time interval, use the procedure "To create a new workflow triggered by a timer or schedule."
- If you want to create a workflow that runs in response to a change in the Service Manager database, use the procedure "To create a new workflow triggered by a database change." In the Woodgrove Bank customization scenario, Ken uses this procedure to create a workflow named **AddComputertoADGroupWF**.

Important

After you have completed the wizard, you cannot change the type of trigger that the workflow uses. For example, after you create a workflow that uses a timer trigger, you cannot change it to use a database trigger instead.

To create a new workflow triggered by a timer or schedule

1. In the Authoring Tool, open the management pack where you want to store this workflow.
2. In the **Management Pack Explorer**, right-click **Workflows**, and then click **Create**.
3. On the **General** page of the Create Workflow Wizard, enter a name for the workflow. The name must include only alphanumeric or underscore characters, have 50 or fewer characters, and start with an alphabetical or underscore character, and it cannot have spaces. For example, enter **AddComputerToADGroupWF**.
4. If you want to add a description of the workflow, type it in the **Description** box. Note that, although there is no limit on the length of this text, some views (such as the list of the workflow's properties on the **Summary** page of the wizard) might only display the first 200 characters.
5. If you want to change the default values for the workflow retry interval and the maximum time to run, on the **General** page, click **Advanced**. In the **Advanced** dialog box, set new values for **Interval** and for **Maximum time to run the workflow**, and then click **OK**. Note that the value for the maximum time to run must be more than 60 seconds, but less than 24 hours.
6. On the **Trigger Condition** page, if you want the trigger to run at a specific time or at a specific interval, use the default setting **Timer**, and then click **Next**.
7. On the **Trigger Criteria** page, configure the interval at which to run the workflow (either **Weekly** or **Other Interval**):
   a. To set the workflow to run on specific days of the week, click **Weekly**. Use the **Start time** dial control to set a start time for the rule. To set the hour, minutes, or 00:00-24:00 values, click the value, and then click the up arrow or down arrow. Then, select the check boxes for each day that you want the rule to run.

      Note
      The time that you set is the time on the Service Manager server that runs the workflow, not the local time on the server that runs the Authoring Tool.

      -or-

      To set the workflow to repeat after a specific time, click **Other Interval**. In the **Frequency** box, enter an integer value, and then select the type of interval (**Days**, **Hours**, **Minutes**, or **Seconds**).

   b. After you have set the interval for the workflow, click **Next**.
8. On the **Summary** page, review the settings for the new workflow, and then click **Create**. After the wizard is completed, click **Close**.

To create a new workflow triggered by a database change

1. In the Authoring Tool, open the management pack where you want to store this workflow.

2. In the **Management Pack Explorer**, right-click **Workflows**, and then click **Create**.
3. On the **General** page of the **Create Workflow** wizard, enter a name for the workflow. The name must include only alphanumeric or underscore characters, have 50 or fewer characters, and start with an alphabetical or underscore character, and it cannot have spaces. For example, enter **AddComputerToADGroupWF**.
4. If you want to add a description of the workflow, type it in the **Description** box. Note that, although there is no limit on the length of this text, some views (such as the list of the workflow's properties on the **Summary** page of the wizard) might only display the first 200 characters.
5. If you want to change the default values for the workflow retry interval and the maximum time to run, on the **General** page, click **Advanced**. In the **Advanced Workflow Limits** dialog box, set new values for these options, and then click **OK**. Note that the value for the maximum time to run must be more than 60 seconds, but less than 24 hours.
6. On the **Trigger Condition** page, click **Run only when a database object meets specified conditions**, and then click **Next**.
7. On the **Trigger Criteria** page, to select a **Class name**, click **Browse**. In the **Class Property** dialog box, select the class of object with which the workflow will interact, and then click **OK**. For example, select **Automated Activity: Add Computer To AD Group**.
8. To select a **Change event**, click the drop-down list, select one of the options, and then click **Next**. For example, click the drop-down list, and then click **When an instance of the class is updated**.
9. Optionally, under **Add Criteria to this trigger**, click **Additional Criteria** to set advanced criteria, such as when the activity status changes from **Pending** to **In Progress**.
10. On the **Summary** page, review the settings for the new workflow, and then click **Create**. After the wizard is completed, click **Close**.

See Also

Step 3: Create the WF Workflow

Managing Workflows

How to Save and Build a Workflow

Workflows are saved whenever you save the management pack. In addition, when you save a management pack, the System Center 2012 – Service Manager Authoring Tool automatically identifies the Windows Workflow Foundation (WF) workflow files that are associated with the workflow information in the management pack and builds them into workflow assemblies. (Each WF workflow may have multiple raw files.) The tool builds one assembly per workflow.

For more information about the relationships between workflows, management pack files, and workflow assembly files, see Workflows and Management Packs.

To save and build workflows

- In the **Management Pack Explorer**, right-click the management pack, and then click **Save**.

See Also

Workflows and Management Packs

Managing Workflows

How to Copy a Workflow

Use this procedure to create a copy of a workflow in the System Center 2012 – Service Manager Authoring Tool. After you copy the workflow, you can edit the properties of either the copy or the original, as described in How to Edit a Workflow's Details.

To copy a workflow

- In the **Management Pack Explorer**, expand **Workflow**, right-click the workflow you want to copy, and then click **Copy**.

  The Authoring Tool creates a copy of the workflow and gives it a name that consists of the original workflow name and "_Copy."

See Also

Managing Workflows

How to Edit a Workflow's Details

Use this procedure to edit workflow details in the System Center 2012 – Service Manager Authoring Tool.

To edit workflow details

1. In the **Management Pack Explorer**, expand **Workflow**, right-click the workflow, and then click **Details**. If you are already editing the workflow, right-click the authoring pane background, and then click **Details**.
2. If you want to edit the workflow description, in the **Details** pane, click the **Description** box and type a new description, or click the ellipsis (**...**) button to open the **Workflow Properties** dialog box. Click the **Description** box, and then edit the description.
3. If you want to edit any of the other workflow details, in the **Details** pane, click any of the details, and then click the ellipsis (**...**) button to open the **Workflow Properties** dialog box. You can edit the following details:
   - **Name**: On the **General** tab, click **Name**, and then edit the workflow name.
   - **Retry and timeout limits**: On the **General** tab, click **Advanced**, and then edit the appropriate values.
   - **Trigger condition for a timer-based workflow**: On the **Scheduler** tab, edit the appropriate values.
   - **Trigger condition for a query-based workflow**: On the **Trigger** tab, edit the appropriate values.

     Important
     If you change the trigger class of the workflow while the workflow is open in the authoring pane, any activity details that were set to use values from properties of the trigger class are cleared. The workflow does not run until

you reset those activity details to use values from the new trigger class.

Important
You cannot change the type of trigger that the workflow uses. For example, after you create a workflow that uses a timer trigger, you cannot change it to use a query trigger instead.

See Also

Managing Workflows

How to Delete a Workflow

Use this procedure to delete a workflow in the System Center 2012 – Service Manager Authoring Tool.

To delete a workflow

1. In the **Management Pack Explorer**, expand **Workflow**, right-click the workflow you want to delete, and then click **Delete**.
2. To make sure that the workflow is permanently deleted, save the management pack.

See Also

Managing Workflows

Adding or Removing Workflow Activities

Workflow activities are the building blocks of a workflow. You can use the procedures in this section to add activities to a workflow; remove, copy, and paste activities; and configure specialized activities to import Windows PowerShell scripts into your workflow.

If you are following the Woodgrove Bank customization scenario, see How to Add an Activity to a Workflow.

Adding or Removing Workflow Activities Topics

- How to Add an Activity to a Workflow

  Describes how to add an activity to a workflow.
- How to Copy and Paste an Activity Within a Workflow

  Describes how to copy and paste an activity within a workflow.
- How to Add a Script to a Workflow

  Describes how to add a script to a workflow.
- How to Add a Control Flow Activity to a Workflow

  Describes how to add a control flow activity to a workflow.
- How to Remove an Activity from a Workflow

  Describes how to remove an activity from a workflow.

How to Add an Activity to a Workflow

Use this procedure to add an activity to a workflow from the **Activities Toolbox** pane in the System Center 2012 – Service Manager Authoring Tool.

In the Woodgrove Bank customization scenario, Ken uses this procedure to add the Windows Workflow Foundation (WF) activities **Add AD DS Computer to Group** and **Set Activity Status to Completed** to his workflow.

To add an activity to a workflow

1. In the **Management Pack Explorer**, expand **Workflows**, right-click the workflow you want, and then click **Edit**. This opens the workflow in the authoring pane. For example, right-click **AddComputerToADGroupWF**, and then click **Edit**.
2. In the **Activities Toolbox** pane, locate the appropriate activity group.
3. Drag the activity you want to the authoring pane, and then drop it between the workflow Start and End icons or between two existing activities. The sequence of activities that is displayed in the authoring pane—from the top down—represents the order in which the activities will run. To run activities in a loop or if-else structure, drag the structure activity (such as For Each Loop) onto the authoring pane first, and then drop the activities into the structure activity.

   For example, drag **Add AD DS Computer to Group** from the **Active Directory Activities** group to the authoring pane, and then drop it between the workflow Start and End icons. Then, drag **Set Activity Status to Completed** and drop it between the previous activity and the End icon.
4. You can set the properties of an activity immediately after you add it to the authoring pane, or you can set the properties later.

   Note
   If you do not set the properties at this time, the activity might be marked with a Red Exclamation Point icon. This icon indicates that one or more properties of the activity must be set before the activity can run. To see a list of these required properties, click the icon.

See Also

The Activity Library

Step 3: Create the WF Workflow

Adding or Removing Workflow Activities

How to Copy and Paste an Activity Within a Workflow

If your workflow uses multiple activities of the same type (such as multiple Add AD DS Computer To Group activities), you can use copy and paste functionality in the System Center 2012 – Service Manager Authoring Tool to quickly duplicate activities. To duplicate the values of the activity's properties with the activity, set values for the properties, and then copy and paste the activity.

To copy and paste an activity

1. In the **Management Pack Explorer**, expand **Workflows**, right-click the workflow you want, and then click **Edit**. This opens the workflow in the authoring pane.
2. In the authoring pane, right-click the activity, and then click **Copy**.
3. Do one of the following:
   - To paste the activity at the end of the workflow, right-click the authoring pane, and then click **Paste**.
   - To paste the activity immediately after an existing activity, right-click the existing activity, and then click **Paste**.

See Also

The Activity Library

Adding or Removing Workflow Activities

How to Add a Script to a Workflow

The Activity Library includes specialized activities that incorporate Windows PowerShell scripts, VBScript scripts, or command-line scripts into workflows. Use a script activity to import the content of the script and to define the parameters that the script requires to run. The System Center 2012 – Service Manager Authoring Tool creates a task in the management pack to manage the script and store the script content and parameters.

Service Manager does not verify the script parameters; therefore, you have to ensure that the script logic handles validation. Also, when you create an incident with an extended property and do not provide a value for the extended property, the value of the parameter is not parsed, and it is passed as $Data/Property.

Script activities run as a separate process from the workflows; however, they also run under the security context of the Service Manager Workflow account.

Use the following procedure to add a script to a workflow.

To add a script to a workflow

1. In the **Management Pack Explorer**, expand **Workflows**, right-click the workflow that you want, and then click **Edit**. This opens the workflow in the authoring pane.
2. In the **Activities Toolbox** pane, locate the activity group **Script Activities** and its subgroup **Generic Script Activities**. Drag the script activity that you want to use to a position between the workflow start and workflow end icons or between two existing activities.
3. Set the script activity properties:
   a. In the **Details** pane, click any of the properties in the **Activity Inputs** category, and then click the ellipses (**…**) button that appears next to the property.
   b. In the **Configure a Script Activity** dialog box, click **Import Script**. In the **Import** dialog box, select the script file that you want to use, and then click **Open**.

Caution

After you import a script for a script activity, if you click **Import Script** again, any new script that you import completely replaces the previous script.

c. Click **Script Properties**. To create a parameter for the script, click **New**, and in the **Name** column, type a name.

Note

For VBScript script and command script activity, there is no **Name** column.

d. To set a value for the parameter, in the **Value** column, type a constant value. If appropriate for the parameter, type switch characters such as '/t', which is typical for command scripts.

e. To bind the parameter to another property so that the parameter obtains its value from that property, click the corresponding ellipses (**…**) button. In the **Bind 'Parameter' to Activity Property** dialog box, select the property that you want to use.

f. If you are working with a script that requires Windows PowerShell snap-ins in order to run, in the **Windows PowerShell snap-ins** box, type the names of the snap-ins, separated by semicolons.

g. Click **OK** to close the **Configure a Script Activity** dialog box.

See Also

The Activity Library

Adding or Removing Workflow Activities

How to Add a Control Flow Activity to a Workflow

Use control flow activities to provide structure—branches, loops, or timer delays—for your workflow. The System Center 2012 – Service Manager Authoring Tool provides four built-in control flow activities:

- **Delay Activity**: Introduces a delay between activities in a workflow.
- **For Each Loop Activity**: Takes as an input an array (*collection*) of objects, and repeats the set of activities in the **For Each Loop** object in the collection.
- **IfElse Activity**: Controls the sequence of activities in a workflow based on a Boolean (True/False) condition.
- **Parallel Activity**: Forks the sequence of activities into two simultaneous sequences of activities.

To use a **Delay** activity, just drag the **Delay** activity into the workflow, and then set the activity's **TimeoutDuration** property to the delay interval you want to use. To use an **IfElse** or **Parallel** activity, drag the activity into the workflow, and then drop regular activities into the **IfElse** or **Parallel** activity.

Using a **For Each Loop** activity resembles using an **IfElse** or **Parallel** activity; however, you might want to set additional properties for the activities in the **For Each Loop**. Use the following procedure to add a **For Each Loop** to a workflow.

To add a For Each Loop to a workflow

1. In the **Management Pack Explorer**, expand **Workflows**, right-click the workflow you want, and then click **Edit**. This opens the workflow in the authoring pane.
2. In the **Activities Toolbox** pane, locate the activity group **Control Flow**.
3. Drag the **For Each Loop** activity to a position between the Workflow Start and Workflow End icons or between two existing activities.
4. Add the activities for which you want to loop the execution to the **Loop Container(ForEachChildActivity)**. To add each activity:
    a. In the **Activities Toolbox** pane, expand the activity group that contains the activity that you want to use.
    b. Drag the activity to a position to the top of the **Loop Container** activity. If the **Loop Container** activity already contains other activities, drag the new activity to a position before, after, or between the existing activities.
    c. Most workflow activities that you place in this container have two additional properties: **Current Item** and **Property to Bind**. For each activity within the loop container, set these properties as follows:

        Note
        Setting the properties is not mandatory, and it is useful only if you want to take the object from the **Input Collection** of the **Loop Container**.

        i. Set **Current Item** to the **Current Item** property of the **Loop Container** activity of the **ForEach** activity. Note that, if this activity is the first activity in the **For Each Loop**, **Current Item** is set automatically.
        ii. Set the value of the **Property to Bind** property to the value of the property of the current activity that will use the **Current Item** value.

See Also

Adding or Removing Workflow Activities

How to Remove an Activity from a Workflow

Use this procedure to remove an activity from a workflow in the System Center 2012 – Service Manager Authoring Tool. This operation does not remove the activity from the Activity Library or from the **Activities Toolbox** pane.

To remove an activity from a workflow

- In the authoring pane, right-click the activity, and then click **Delete**.

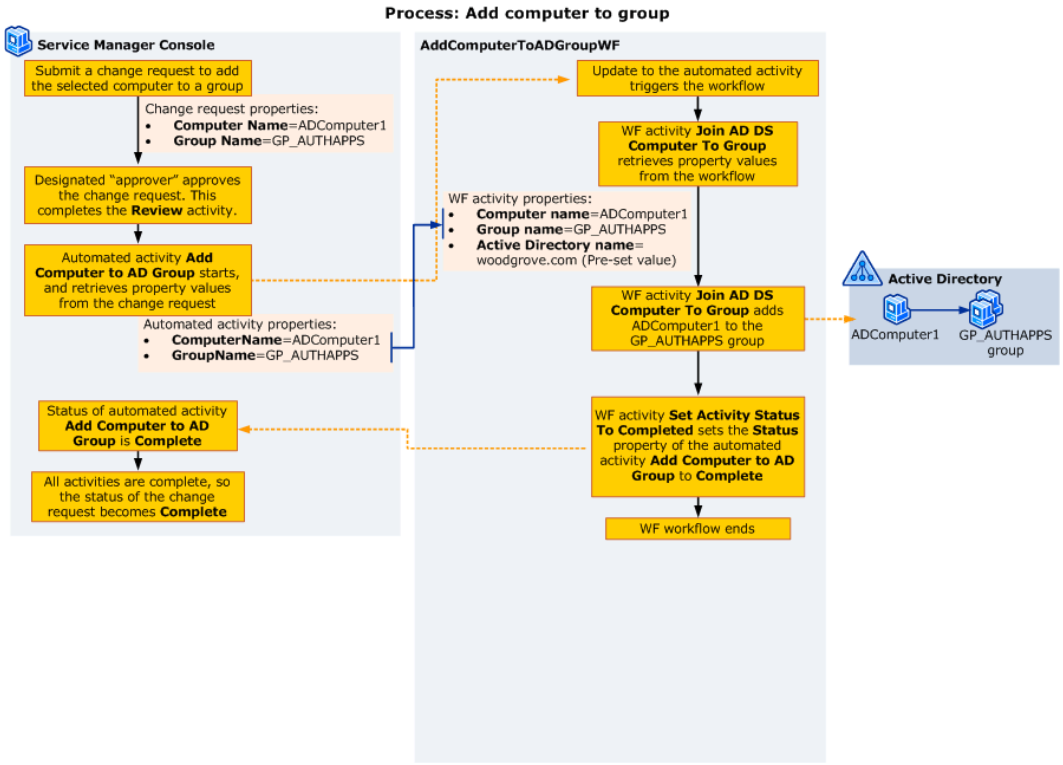
See Also

The Activity Library

Adding or Removing Workflow Activities

Configuring the Way Activities Manage and Pass Information

The activity properties provide ways to transfer data. For the Woodgrove Bank customization scenario, the name of the computer and the name of the group must be transferred from the automated provisioning activity to the workflow activity that does the actual work. The following illustration shows how the computer and group names pass from the Service Manager automated activity to the Windows Workflow Foundation (WF) activities in the workflow.



You can use the following steps to configure properties to pass the values:

- How to Set an Activity Property to a Constant Value—Sets the **Active Directory Server** property of the **Add AD DS Computer To Group** activity to a constant value.
- How to Set an Activity Property to Use a Value from the Trigger Class—Associates the **ComputerName** and **GroupName** properties defined previously with the **Computer name** and **Group name** properties of the **Add AD DS Computer To Group** activity.

For larger, more complex workflows, you have an additional option. To pass values from one activity to another, complete the steps in How to Set an Activity Property to Use a Value from Another Activity.

Configuring Activities Topics

- How to Set an Activity Property to a Constant Value

  Describes how to set an activity property to a constant value.
- How to Set an Activity Property to Use a Value from Another Activity

  Describes how to set an activity property to use a value from another activity.

- How to Set an Activity Property to Use a Value from the Trigger Class

  Describes how to set an activity property to use a value from the trigger class.

How to Set an Activity Property to a Constant Value

In the Woodgrove Bank customization scenario, Ken uses this procedure to set the **Active Directory name** property of the **Add AD DS Computer to Group** activity.

Use this procedure in the System Center 2012 – Service Manager Authoring Tool to set a property to a constant value (also referred to as a literal value). This value applies anytime this workflow starts.

To set an activity property to a constant value

1. In the authoring pane, click the activity you want. The **Details** pane becomes active, and it displays the properties for this activity.

   For example, in the **AddComputertoADGroupWF** workflow, click the **Add AD DS Computer to Group** activity.
2. In the **Details** pane, click the property you want to set, and in the text box, type a value.

   For example, for the **Add AD DS Computer to Group** activity, click **Computer Domain name**, and in the text box, type **woodgrove.com**.

See Also

Step 3: Create the WF Workflow

Configuring the Way Activities Manage and Pass Information

How to Set an Activity Property to Use a Value from Another Activity

Use this procedure in the System Center 2012 – Service Manager Authoring Tool to configure an activity to obtain its property values from another activity in the workflow. This process is referred to as "binding" one property to another.

To set an activity property to use a value from another activity

1. In the authoring pane, click the activity you want. The **Details** pane becomes active, and it displays the properties for this activity.
2. Click the property you want to set, and then click the ellipsis (**…**) button that appears for that property.
3. In the list of activities in the dialog box, expand the activity you want, and then select the property you want to use.
4. Click **OK** to close the dialog box.

See Also

Configuring the Way Activities Manage and Pass Information

How to Set an Activity Property to Use a Value from the Trigger Class

Use this procedure in the System Center 2012 – Service Manager Authoring Tool to set a property to retrieve its value from the Service Manager class used to trigger the workflow. You cannot use this method with a workflow that has a Timer trigger.

In the Woodgrove Bank customization scenario, Ken uses this procedure to set the **Computer Name** and **Group Name** properties of the **Add AD DS Computer to Group** activity to retrieve the values of the **Automated Activity: Add Computer To AD Group** properties **Computer Name**, **Group Name**, and **Activity ID** from the change request.

To configure activity properties to retrieve data from a trigger class

1. In the authoring pane, click the activity you want. The **Details** pane becomes active and displays the properties for this activity. For example, click the **Add AD DS Computer to Group** activity or the **Set Activity Status to Completed** activity.
2. In the **Details** pane, click the property you want to set, and then click the ellipsis (**…**) button that appears next to the property.

   For example, for the **Add AD DS Computer to Group** activity, click **Group Name**, and then click the ellipsis (**…**) button.
3. On the left side of the **Define input for the activity addADDSComputerToGroup1** dialog box, click **Use a class property**. Selecting this option produces a list of the properties that are available in the trigger class.
4. Select the class property that you want to use for this activity property.

   For example, for the **Add AD DS Computer to Group** activity, do the following:

   a. In the **Details** pane for the **Add AD DS Computer to Group** activity, click **Group Name**, click the ellipsis (**…**) button, click **Use a class property**, click **GroupName**, and then click **OK**.

   b. In the **Details** pane, click **Computer Name**, click the ellipsis (**…**) button, click **Use a class property**, click **ComputerName**, and then click **OK**.

   For the **Set Activity Status to Completed** activity, click **Activity ID**, and then click the ellipsis (**…**) button that appears next to the property. In the **Define input for the activity setActivityStatusToCompleted1** dialog box, click **Use a class property**, and then in the property list, click **ID (Internal)**. Click **OK**.

See Also

Step 3: Create the WF Workflow

Configuring the Way Activities Manage and Pass Information

How to Deploy a Workflow to Service Manager

Use these procedures to move workflows from the System Center 2012 – Service Manager Authoring Tool to the Service Manager console. First, you must physically move the workflow assembly file and the management pack file that contains the workflow information. Then, you must import the management pack into Service Manager.

To move the management pack and workflow files

1. On the computer that is running the Authoring Tool, browse to the folder where you saved the management pack, and then copy the management pack and workflow files. The workflow file is automatically created in the same folder as the management pack. For example, copy **AddComputerToADGroupMP.xml** and **AddComputerToADGroupWF.dll**.
2. On the computer that is running the Service Manager console, browse to the Service Manager installation folder, for example, C:\Program Files\Microsoft System Center\Service Manager 2012.
3. Paste the copied management pack and workflow files into this folder. For example, paste **AddComputerToADGroupMP.xml** and **AddComputerToADGroupWF.dll**.

   Note
   You can move the management pack file to a different folder before you import it into the Service Manager console. However, you must place the workflow assembly file in the Service Manager installation folder.

To import the management pack into Service Manager

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Management Packs**.
3. In the **Tasks** pane, under **Management Packs**, click **Import Management Pack**.
4. In the **Select Management Packs to Import** dialog box, select the management pack file that is associated with the workflow, and then click **Open**. For example, select **AddComputerToADGroupMP.xml**.
5. In the **Import Management Packs** dialog box, click **Add** to add the management pack that you want to import.
6. Click **Import**, and then click **OK**.

See Also

Workflows and Management Packs

Workflows: Customizing and Authoring

Configuring the Activities Toolbox

There are two ways to configure the Activities Toolbox in the System Center 2012 – Service Manager Authoring Tool:

- Modify the default toolbox by adding or removing custom activities. These changes require administrative-level permissions, and they are visible to all users of the Authoring Tool.
- Personalize the toolbox. These changes do not require special permissions. Changes made by one user affect only that user.

Configuring the Activities Toolbox Topics

- Modifying the Default Toolbox

  Describes how to add custom activities to the default Activities Toolbox.
- Personalizing the Activities Toolbox

  Describes how to personalize the Activities Toolbox.

Modifying the Default Toolbox

If the default set of Windows Workflow Foundation (WF) activities does not meet the needs of your organization, you can use custom activities with the System Center 2012 – Service Manager Authoring Tool. Custom activities include activities you or your organization develops or activities that non-Microsoft parties develop. These activities must be compiled into assembly files (*activitysetname*.dll). For information about developing WF activities, see the Workflow Activity Reference.

Installing or removing custom activity assemblies changes the set of available activities for all Authoring Tool users. When you install or remove an activity assembly, remember to notify Authoring Tool users of the changes. Custom activities do not appear automatically in the Activities Toolbox; in order to use custom activities, users must add them to personalized activity groups. For more information, see How to Add Activities to a Personalized Activity Group.

Modifying the Default Toolbox Topics

- How to Install a Custom Activity Assembly

  Describes how to install a custom activity assembly.
- How to Remove a Custom Activity Assembly

  Describes how to remove a custom activity assembly.

How to Install a Custom Activity Assembly

So that you can use custom or third-party Windows Workflow Foundation (WF) activities in workflows, the activity assembly files must first be installed. You must have administrative permissions on the computer running the System Center 2012 – Service Manager Authoring Tool and the computer running Service Manager. Like the default activities, custom activities must be available on the computer running Service Manager as well as on the computer running the Authoring Tool.

To install a custom activity assembly

1. On the computer running the Authoring Tool, browse to the Authoring Tool Workflow Activity Library folder, for example, D:\Program Files (x86)\Microsoft System Center\Service Manager 2012 Authoring\Workflow Activity Library. Paste the custom activity assembly into this folder.
2. On the computer running Service Manager, browse to the Service Manager installation folder, and then paste the custom activity assembly into this folder.
3. After you have installed the custom activity assembly, notify the Authoring Tool users that

they can now add the custom activities to personalized activity groups, by using the following procedures:

Note

Users can only add custom activities to personalized activity groups; they cannot add custom activities to the default activity groups.

a. How to Create a Personalized Activity Group provides instructions for creating a personalized activity group.

b. How to Add Activities to a Personalized Activity Group provides instructions for adding custom activities to a personalized activity group.

See Also

How to Create a Personalized Activity Group

How to Add Activities to a Personalized Activity Group

Modifying the Default Toolbox

How to Remove a Custom Activity Assembly

To remove a custom activity assembly, you must have administrative permissions on the computer running the System Center 2012 – Service Manager Authoring Tool and on the computer running the Service Manager console. After the custom activity assembly has been removed, the activities compiled into that assembly are no longer available in personalized activity groups.

To remove a custom activity assembly

1. On the computer running the Authoring Tool, browse to the Authoring Tool Workflow Activity Library folder, for example, D:\Program Files (x86)\Microsoft System Center\Service Manager 2012 Authoring\Workflow Activity Library. Remove the custom activity assembly from this folder.
2. On the computer running the Service Manager console, browse to the Service Manager installation folder. Remove the custom activity assembly from this folder.
3. After you have removed the custom activity assembly, notify the Authoring Tool users that the custom activities are no longer available.

See Also

Modifying the Default Toolbox

Personalizing the Activities Toolbox

Use the procedures in this section to personalize the **Activities Toolbox** pane in the System Center 2012 – Service Manager Authoring Tool. Each user can personalize the **Activities Toolbox** differently; the Authoring Tool stores this information as part of each user's profile.

Important

You can only modify personalized activity groups. You cannot modify the default activity groups.

Personalizing the Activities Toolbox Topics

- How to Create a Personalized Activity Group

  Describes how to create activity groups in the **Activities Toolbox** pane.
- How to Rename a Personalized Activity Group

  Describes how to change the name of a personalized activity group.
- How to Add Activities to a Personalized Activity Group

  Describes how to add activities to a personalized activity group or more than one personalized activity group.
- How to Remove Activities from a Personalized Activity Group

  Describes how to remove activities from a personalized activity group.
- How to Delete a Personalized Activity Group

  Describes how to delete a personalized activity group.

How to Create a Personalized Activity Group

Use these procedures to create activity groups in the **Activities Toolbox** pane in the System Center 2012 – Service Manager Authoring Tool.

To create a top-level activity group

1. In the **Activities Toolbox** pane, right-click **Activity Groups**, and then click **New Group**.
2. Enter a name for the new group.

To create an activity subgroup

1. In the **Activities Toolbox** pane, right-click the parent group, and then click **New Group**.
2. Enter a name for the new group.

See Also

Personalizing the Activities Toolbox

How to Rename a Personalized Activity Group

Use this procedure to change the name of a personalized activity group in the System Center 2012 – Service Manager Authoring Tool.

Important

You can only rename personalized activity groups. You cannot change the names of the default activity groups.

To rename an activity group

1. In the **Activities Toolbox** pane, right-click the group, and then click **Rename Group**.

2. Enter a new name for the group.

See Also

Personalizing the Activities Toolbox

How to Add Activities to a Personalized Activity Group

Use this procedure to add activities to a personalized activity group in the System Center 2012 – Service Manager Authoring Tool. Activities can belong to more than one group; for example, you can create a **Favorites** group and populate it with both default activities and custom activities that already belong to other groups.

Important
You can only add activities to personalized activity groups. You cannot add activities to the default activity groups.

If you want to use custom activities in workflows, you must add them to a group in order to make them available in the **Activities Toolbox** pane. Note that before you can add custom activities to groups, an administrator must install the appropriate activity assembly files on the computer running the Authoring Tool. For more information, see Modifying the Default Toolbox.

To add activities to a personalized activity group

1. In the **Activities Toolbox** pane, right-click the group, and then click **Choose Activities**.
2. In the **Choose Activities for a Group** dialog box, scroll the list to find the activities you want to add. Select the check boxes for the activities you want to add.
3. If you want to use custom activities that do not appear in the list, click **Add Custom Activities**. In the **Select Custom Activity Assembly** dialog box, select the custom activity assembly file, and then click **Open**. This adds the custom activities from this assembly file to the activity list.
4. After you have selected all of the activities for the group, click **OK**.

See Also

Modifying the Default Toolbox

Personalizing the Activities Toolbox

How to Remove Activities from a Personalized Activity Group

Use this procedure to remove activities from a personalized activity group in the System Center 2012 – Service Manager Authoring Tool. Note that removing an activity from a group does not remove the activity from the Activity Library or from any other group.

Important
You can only remove activities from personalized activity groups. You cannot remove activities from the default activity groups.

To remove activities from a personalized activity group

1. In the **Activities Toolbox** pane, right-click the group, and then click **Choose Activities**.
2. In the **Choose Activities for a Group** dialog box, scroll the list to find the activities you want to remove. Clear the check boxes for the activities you want to remove, and then click **OK**.

See Also

Modifying the Default Toolbox

Personalizing the Activities Toolbox

How to Delete a Personalized Activity Group

Use this procedure to delete an activity group in the System Center 2012 – Service Manager Authoring Tool. If the activity group contains one or more subgroups, the subgroups will also be deleted. Note that deleting an activity group does not remove its member activities from the Activity Library or from any other groups.

Important
You can only delete personalized activity groups. You cannot delete the default activity groups.

To delete a personalized activity group

- In the **Activities Toolbox** pane, right-click the group, and then click **Delete Group**.

See Also

Modifying the Default Toolbox

Personalizing the Activities Toolbox

Workflow Activity Reference

This section provides guidance for information technology (IT) developers so that they can create custom Windows Workflow Foundation (WF) activities that IT pros can use to build WF workflows that are specific to their IT processes. Custom WF activities extend the Activity Library—the activities that are distributed with the System Center 2012 – Service Manager Authoring Tool. The Workflow Activity Reference section of this document provides details of the default WF activities in the Activity Library. This information is intended to help developers (or IT pros acting as developers) create custom WF activities, as needed.

For information about how to use WF activities and WF workflows with Service Manager, see **Automating IT Processes with Workflow Rules**.

Workflow Activity Reference Topics

- Active Directory Activities

  Describes Active Directory Domain Services (AD DS) activities to make Active Directory functions part of your workflow.
- Control Flow Activities

Describes control flow activities to provide structure—branches, loops, or timer delays—for your workflow.

- Virtual Machine Manager Activities

  Describes virtual machine management activities to build workflows that make creating and updating virtual machines possible.

- Script Activities

  Describes script activities to run a script as part of a workflow.

- Service Manager Activities

  Describes Service Manager activities to make Service Manager functions part of your workflow.

- Guidelines for Creating Custom Activities

  Provides guidelines and details for creating custom activities in workflows.

- Sample Activity - Setting an Activity's Status to Completed

  Provides a sample activity that sets an activity's status to Completed.

Active Directory Activities

Use Active Directory Domain Services (AD DS) activities to make Active Directory functions part of your workflow in System Center 2012 – Service Manager.

The System Center 2012 – Service Manager Authoring Tool provides two default Service Manager activities in the **Active Directory Activities** group in the **Activities Toolbox** pane. The topics in this section describe these activities.

Active Directory Activities Topics

- Add AD DS Computer to a Group Activity

  Describes the prerequisites and properties for the activity that adds a computer to a security group in AD DS.

- Add AD DS User to Group Activity

  Describes the prerequisites and properties for the activity that adds a user to a security group in AD DS.

Add AD DS Computer to a Group Activity

This activity adds a computer to a security group in Active Directory Domain Services (AD DS) in System Center 2012 – Service Manager. The computer and the group must belong to the same domain, and all containers in the domain are searched.

Design Time Prerequisites

None.

Run Time Prerequisites

When you use this activity, make sure that the Service Manager Workflow account has sufficient permissions to modify security groups in AD DS.

Properties

The **Add AD DS Computer to Group** activity uses the input properties that are described in the following table.

Display name	Internal name	Type	Required	Description
Computer Domain	ComputerDomain	String	Yes	The fully qualified DNS domain name where the computer is located (for example, contoso.com)
Computer Name	FullyQualifiedComputerName	String	Yes	The name of the computer.
Group Name	FullyQualifiedGroupName	String	Yes	The name of the Active Directory Domain Services group.

The **Add AD DS Computer to Group** activity generates the output that is described in the following table.

Display name	Internal name	Type	Description
Output	Output	Boolean	The result of the operation: **True** if the addition succeeded, **False** if it failed.

Errors and Exceptions

None.

Remarks

None.

Example

Description

None.

Comments

See Also

Active Directory Activities

Add AD DS User to Group Activity

This activity adds a user to a security group in Active Directory Domain Services (AD DS) in System Center 2012 – Service Manager. The user and the group must belong to the same domain, and all the containers in the domain are searched.

Design Time Prerequisites

None.

Run Time Prerequisites

When you use this activity, make sure that the Service Manager Workflow account has sufficient permissions to modify security groups in AD DS.

Properties

The **Add AD DS User to Group** activity uses the input properties that are listed in the following table.

Display name	Internal name	Type	Required	Description
User Domain	UserDomain	String	Yes	The fully qualified domain name (FQDN) of the user.
User Name	UserName	String	Yes	The logon name of the user.
Group Name	FullyQualifiedGroupName	String	Yes	The FQDN of the group.

The **Add AD DS User to Group** activity generates the output that is described in the following table.

Display Name	Internal Name	Type	Description
Output	Output	Boolean	The result of the operation: **True** if the addition succeeded, **False** if it failed.

Errors and Exceptions

None.

Remarks

None.

Example

Description

None.

See Also

Active Directory Activities

Control Flow Activities

Use control flow activities to provide structure—branches, loops, or timer delays—for your workflow in System Center 2012 – Service Manager.

The Authoring Tool provides four default control flow activities in the **Control Flow** group in the **Activities Toolbox** pane.

Control Flow Activities Topics

- Delay Activity

  Describes the prerequisites and properties of the **Delay** activity.
- For Each Loop Activity

  Describes the prerequisites and properties of the **For Each Loop** activity.
- IfElse Activity

  Describes the prerequisites and properties of the **IfElse** activity.
- Parallel Activity

  Describes the prerequisites and properties of the **Parallel** activity.

Delay Activity

This activity introduces a delay between activities in a workflow in System Center 2012 – Service Manager. The **Delay** activity is derived from the Microsoft .NET Framework **DelayActivity** class.

Design Time Prerequisites

None.

Run Time Prerequisites

None.

Properties

The **Delay** activity uses the input properties that are listed in the following table.

Display name	Internal name	Type	Required	Description
Initialize TimeoutDuration	InitializeTimeoutDuration		Internal	Specifies a handler to initialize the **TimeoutDuration**

Display name	Internal name	Type	Required	Description
				property.
TimeoutDuration	TimeoutDuration	Timespan	Yes	Duration of the delay.

The **Delay** activity does not produce an output property.

Errors and Exceptions

None.

Remarks

For more information about this activity, see DelayActivity Class in the .NET Framework Class Library.

Example

Description

None.

Comments

See Also

Control Flow Activities

For Each Loop Activity

The **For Each Loop** activity takes as an input an array (*collection*) of objects and repeats the set of activities within the loop for each object in the collection. For example, if the input collection has five objects, the loop iterates five times. If the collection is empty, the loop does not iterate. There is no upper limit to the number of objects in the collection. The **For Each Loop** activity always runs on the computer on which the workflow runs.

The **For Each Loop** activity is a composite activity with two containers for activities:

- **Input Container**: This activity sets up the loop and defines the input collection. You can use the **Get Incident** or the **Get Virtual Machine** activity in this role.
- **Loop Container**: Named **ForEachChildActivity**, this activity contains the loop activities. Most Windows Workflow Foundation (WF) activities that you place in this container have two additional properties: **Current Item** and **Property to Bind**. For each activity within the loop container, set these properties as follows:
    a. Set **Current Item** to the **Current Item** property of the **Loop Container** activity of the **ForEach** activity. Note that if this activity is the first activity in the **For Each Loop** activity, **Current Item** is set automatically.
    b. Set the value of the **Property to Bind** property to the value of the property of the current activity that uses the **Current Item** value.

Two types of activities do not get the **Current Item** and **Property to Bind** properties and therefore cannot use the objects in the input collection:

- Script activities, such as the **Windows PowerShell Script** activity.
- Custom activities or other activities that do not inherit from the **WorkflowActivityBase** class. Such activities include those activities that are based on the **Activity** base class, such as native Visual Studio activities.

Design Time Prerequisites

None.

Run Time Prerequisites

None.

Properties

The **For Each Loop** activity uses the input properties that are described in the following table.

Display name	Internal name	Type	Required	Description
Input Collection	InputCollection	Array/Object	N/A	A collection of objects to be passed, one at a time, to the activities within the **For Each Loop** activity. If the activity that resides in the input container produces an array of objects as its output property, **Input Collection** is automatically set to that property. To view the current value of this property, right-click the loop container, and then click **Properties**.
Current Item	CurrentItem	Object	N/A	An index into **Input Collection** that activities within the loop can use as an

Display name	Internal name	Type	Required	Description
				input property. For the first activity in the loop container, this property is set automatically.

Errors and Exceptions

The **For Each Loop** activity uses the custom tracking service that is supplied by Service Manager to log errors and exceptions when the activity runs. The activity generates errors or exceptions under the following conditions:

- If any error occurs in the **ForEachLoop** activity and that is not with the child activities, the workflow terminates.
- If any error occurs within the child activities, the workflow terminates unless **ContinueOnError**=true.
- If any of the input properties are null. The activity does not iterate.

Each activity within the **For Each Loop** activity must write its own errors or exceptions to the custom tracking service. The **For Each Loop** activity does not do so itself.

Remarks

None.

Example

Description

None.

See Also

Control Flow Activities

IfElse Activity

This activity controls the sequence of activities within a workflow based on a Boolean (True/False) condition. You can use the outcome of a previous activity, such as a script activity, for the condition.

The **IfElse** activity is a Visual Studio activity that uses rules and conditions. For more information about using rules and conditions in Windows Workflow Foundation (WF), see Tutorial: Use Rules and Conditions in WF in the MSDN Library.

Design Time Prerequisites

None.

Run Time Prerequisites

None.

Properties

None.

Errors and Exceptions

None.

Remarks

For more information about the **IfElse** activity, see IfElseActivity Class in the .NET Framework 4 Class Library.

Example

Description

None.

Comments

See Also

Control Flow Activities

Parallel Activity

This activity forks the sequence of activities into two simultaneous sequences of activities. The **Parallel** activity is a Visual Studio activity. For more information about the **ParallelActivity** class, see ParallelActivity Class in the .NET Framework Class Library.

Design Time Prerequisites

None.

Run Time Prerequisites

None.

Properties

None.

Errors and Exceptions

None.

Remarks

None.

Example

Description

None.

Comments

See Also

Control Flow Activities

Virtual Machine Manager Activities

Use virtual machine management activities in System Center 2012 – Service Manager to build workflows that allow for creating and updating virtual machines. The virtual machine management activities support System Center Virtual Machine Manager (VMM) 2008 2.0.

The System Center 2012 – Service Manager Authoring Tool provides the following five default virtual machine management activities in the **VMM Activities** group in the **Activities Toolbox** pane.

Virtual Machine Manager Activities Topics

- Get VM Activity

  Describes the prerequisites and properties of the **Get VM** activity.
- Move VM Activity

  Describes the prerequisites and properties of the **Move VM** activity.
- Shutdown VM Activity

  Describes the prerequisites and properties of the **Shutdown VM** activity.
- Start VM Activity

  Describes the prerequisites and properties of the **Start VM** activity.
- Save State VM Activity

  Describes the prerequisites and properties of the **Save State VM** activity.

Get VM Activity

This activity in System Center 2012 – Service Manager retrieves a list of one or more virtual machine IDs from a System Center Virtual Machine Manager (VMM) Library.

Design Time Prerequisites

None.

Run Time Prerequisites

- The Virtual Machine Manager console and Service Manager must both be installed on the same server.
- Ensure that the Service Manager Workflow account has sufficient permissions to modify security groups in Active Directory Domain Services (AD DS).

Properties

The **Get VM** activity uses the input properties in the following table.

Display name	Internal name	Type	Required	Description
Parameter Set	ParameterSet	String	No; the	Specifies a subset of

Display name	Internal name	Type	Required	Description
			default is **Connection**.	parameters, organized for a particular purpose. For the **Get VM** activity, you can select one of the following parameter sets: • **All:** Search for all of the available virtual machines. • **ID:** Search for a virtual machine with a known ID. • **Connection:** Search for virtual machines that are connected to the Virtual Machine Manager (VMM) server that is designated by the **VMMServer** property. • **VMHostGroup:** Search for virtual machines that are connected to the virtual machine host that is designated by the **VM Host** property.
Continue On Error	ContinueOnError	Boolean	No. (The default setting is True.)	Determines whether the workflow should continue running if the activity fails.
Has Error	HasError		N/A	Specifies if the activity has an error

Display name	Internal name	Type	Required	Description
				set. (Read-only)
All	All	Boolean	No. (The default setting is True.)	Available if the **Parameter Set** is **All**. If it is set to **True**, the **Get VM** activity returns a list of the virtual machine IDs of all of the available virtual machines.
ID	ID	String	Required if **Parameter Set** is **ID**.	Available if the **Parameter Set** is **ID**. If it is set to **True**, the **Get VM** activity returns a list of the virtual machine IDs of all of the virtual machines whose virtual machine IDs match all or part of the specified ID value.
Management Group	ManagementGroup	String	No	Specifies the management group in which this activity will run. Set to **localhost**. (Read-only)
Script Server	Target	String	Yes	Specifies the Domain Name System (DNS) name of the server that runs the Service Manager console. Do not use **localhost**.
Script Time Limit	TimeoutSeconds	Integer	No. (The default setting is 300 seconds.)	Specifies the maximum number of seconds to allow for the activity to run.

Display name	Internal name	Type	Required	Description
VM Host	VMHost	String	Required if the **Parameter Set** is **VMHostGroup**	Available if the **Parameter Set** is **VMHostGroup**. If this parameter set is selected, the **Get VM** activity returns a list of the virtual machine IDs of all of the virtual machines running on the specified host.
VM Name	VMName	String	No	Specifies the name or part of a name of the virtual machine to search for. If the string is part of a name, the activity retrieves the IDs of all virtual machines that contain the string.
VMMServer	VMMServer	String	Yes	Specifies the name of the System Center Virtual Machine Manager (VMM) server that manages the virtual machines.

The **Get VM** activity generates the output that is described in the following table.

Display name	Internal name	Type	Comments
VM IDs	VMIDList	Array of strings	Specifies the list of the IDs of virtual machines with names that match all or part of the **VM Name** string.

Errors and Exceptions

The **Get VM** activity uses the custom tracking service that is supplied by Service Manager to log errors and exceptions when the activity runs. The activity generates errors or exceptions as appropriate if any of the script properties cannot be resolved.

See Also

Virtual Machine Manager Activities

Move VM Activity

This activity in System Center 2012 – Service Manager moves a virtual machine from the Virtual Machine Manager (VMM) Library to a maintenance host.

Design Time Prerequisites

None.

Run Time Prerequisites

- The Virtual Machine Manager console and Service Manager must both be installed on the same server.
- Ensure that the Service Manager Workflow account has sufficient permissions to modify security groups in Active Directory Domain Services (AD DS).

Properties

The **Move VM** activity uses the input properties in the following table.

Display name	Internal name	Type	Required	Description
Continue On Error	ContinueOnError	Boolean	No. (The default setting is True.)	Determines whether the workflow should continue running if the activity fails.
Has Error	HasError		N/A	Specifies whether the activity has an error set. (Read-only)
Block LM If Host Busy	BlockLMIfHostBusy	Boolean	No. (The default setting is False.)	Blocks retrying a Hyper-V live migration if the migration failed because the source host or the destination host is already participating in another live

Display name	Internal name	Type	Required	Description
				migration.
Job Group	JobGroup	Guid (string)	No	Specifies an identifier for a series of commands that will run as a set.
Job Variable	JobVariable	String	No	Specifies that job progress is tracked and stored in the variable named by this parameter.
Management Group	ManagementGroup	String	No	Specifies the management group in which this activity will run. Set to **localhost**. (Read-only)
Path	Path	String	No	Specifies the destination of the virtual machine on the maintenance host.
PROTipID	PROTipID	Guid	No	Specifies the ID of the Performance and Resource Optimization (PRO) tip that triggered this action. Allows for future auditing of PRO tips.
Run Asynchronously	RunAsynchronously	Boolean	No. (The default setting is False.)	Specifies that the job runs asynchronously so that control returns to the command shell immediately.
Script Server	Target	String	Yes	Specifies

Display name	Internal name	Type	Required	Description
				the Domain Name System (DNS) name of the server that runs the Service Manager console. Do not use **localhost**.
Script Time Limit	TimeoutSeconds	Integer	No. (The default setting is 300 seconds.)	Specifies the maximum number of seconds to allow for the activity to run.
Start VM On Target	StartVMOnTarget	Boolean	No. (The default setting is False.)	Specifies that a virtual machine starts as soon as it reaches its destination host.
Use Cluster	UseCluster	Boolean	No. (The default setting is False.)	Forces the use of Windows Server 2008 Cluster Migration for the transfer of a virtual machine that is in a saved state to a host, even if the cluster supports Hyper-V live migration.
Use LAN	UseLan	Boolean	No. (The default setting is False.)	Forces a transfer over the local area network (LAN) even if a faster transfer mechanism, such as a storage area network (SAN) transfer, is available.
VM Host	VMHostName	String	Yes	Specifies the name

Display name	Internal name	Type	Required	Description
				of the maintenance host to which the virtual machine will be moved.
VM ID	VMID	String	Yes	Specifies the unique ID of the virtual machine to be moved.
VMM Server	VMMServer	String	Yes	Specifies the name of the System Center Virtual Machine Manager (VMM) server that manages the virtual machines.

The **Move VM** activity generates the output that is described in the following table.

Display name	Internal name	Type	Comments
VM ID	VMID	String	Specifies the unique ID of the virtual machine that was moved. The input **VM ID** and the output **VM ID** are equal unless the activity failed to find a virtual machine with a **VM ID** that matches the input **VM ID**. In that case, the output **VM ID** is set to Null.

Errors and Exceptions

The **Move VM** activity uses the custom tracking service that is supplied by Service Manager to log errors and exceptions when the activity runs. The activity generates errors or exceptions as appropriate if any of the script properties cannot be resolved.

Remarks

None.

Example

Description

None.

See Also

Virtual Machine Manager Activities

Shutdown VM Activity

This activity in System Center 2012 – Service Manager shuts down the guest operating system on a virtual machine.

You can use the **Shutdown VM** activity on a virtual machine on a Windows-based host (a Hyper-V host or a Virtual Server host) only if virtualization guest services are installed on the virtual machine. For a virtual machine that is deployed on a Hyper-V host, the virtualization guest service is called Integration Components. For a virtual machine that is deployed on a Virtual Server host, the virtualization guest service is called Virtual Machine Additions.

Design Time Prerequisites

None.

Run Time Prerequisites

- The Virtual Machine Manager console and Service Manager must both be installed on the same server.
- Ensure that the Service Manager Workflow account has sufficient permissions to modify security groups in Active Directory Domain Services (AD DS).

Properties

The **Shutdown VM** activity uses the input properties that are described in the following table.

Display name	Internal name	Type	Required	Description
Continue On Error	ContinueOnError	Boolean	No. (The default setting is True.)	Determines whether the workflow should continue running if the activity fails.
Has Error	HasError		N/A	Specifies whether the activity has an error set. (Read-only)
Job Variable	JobVariable	String	No	Specifies that job progress is tracked and stored in the variable that is

Display name	Internal name	Type	Required	Description
				named by this parameter.
Management Group	ManagementGroup	String	No	Specifies the management group in which this activity will run. Set to **localhost**. (Read-only)
PROTipID	PROTipID	Guid	No	Specifies the ID of the Performance and Resource Optimization (PRO) tip that triggered this action. Allows for future auditing of PRO tips.
Run Asynchronously	RunAsynchronously	Boolean	No. (The default setting is False.)	Specifies that the job runs asynchronously so that control returns to the command shell immediately.
Script Server	Target	String	Yes	Specifies the Domain Name System (DNS) name of the server that runs the Service Manager console. Do not use **Localhost**.
Script Time Limit	TimeoutSeconds	Integer	No. (The default setting is 300 seconds.)	Specifies the maximum number of seconds to allow for the activity to run.
VM ID	VMID	String	Yes	Specifies the unique ID of the virtual machine to

Display name	Internal name	Type	Required	Description
				be shut down.
VMMServer	VMMServer	String	Yes	Specifies the name of the System Center Virtual Machine Manager (VMM) server that manages the virtual machines.

The **Shutdown VM** activity generates the output that is described in the following table.

Display name	Internal name	Type	Comments
VM ID	VMID	String	Specifies the unique ID of the virtual machine that was shut down. The input **VM ID** and the output **VM ID** are equal unless the activity failed to find a virtual machine with a **VM ID** that matches the input **VM ID**. In that case, the output **VM ID** is set to Null.

Errors and Exceptions

The **Shutdown VM** activity uses the custom tracking service that is supplied by Service Manager to log errors and exceptions when the activity runs. The activity generates errors or exceptions as appropriate if any of the script properties cannot be resolved.

Remarks

None.

Example

Description

None.

See Also

Virtual Machine Manager Activities

Start VM Activity

This activity in System Center 2012 – Service Manager starts a stopped or paused virtual machine.

Design Time Prerequisites

None.

Run Time Prerequisites

None.

Properties

The **Start VM** activity uses the input properties in the following table.

Display name	Internal name	Type	Required	Description
Continue On Error	ContinueOnError	Boolean	No. (The default setting is True.)	Determines whether the workflow should continue running if the activity fails.
Has Error	HasError		N/A	Specifies whether the activity has an error set. (Read-only)
Job Variable	JobVariable	String	No	Specifies that job progress is tracked and stored in the variable that is named by this parameter.
Management Group	ManagementGroup	String	No	The management group in which this activity will run. Set to **localhost**. (Read-only)
PROTipID	PROTipID	Guid	No	Specifies the ID of the Performance and Resource Optimization (PRO) tip that triggered this action. Allows for future auditing of

Display name	Internal name	Type	Required	Description
				PRO tips.
Run Asynchronously	RunAsynchronously	Boolean	No. (The default setting is False.)	Specifies that the job runs asynchronously so that control returns to the command shell immediately.
Script Server	Target	String	Yes	Specifies the Domain Name System (DNS) name of the server that runs the Service Manager console. Do not use **localhost**.
Script Time Limit	TimeoutSeconds	Integer	No. (The default setting is 300 seconds.)	Specifies the maximum number of seconds to allow for the activity to run.
VM ID	VMID	String	Yes	Specifies the unique ID of the virtual machine to be started.
VMMServer	VMMServer	String	Yes	Specifies the name of the System Center Virtual Machine Manager (VMM) server that manages the virtual machines.

The **Start VM** activity generates the output that is described in the following table.

Display Name	Internal Name	Type	Comments
VM ID	VMID	String	Specifies the unique ID of the virtual machine that was started. The

Display Name	Internal Name	Type	Comments
			input **VM ID** and the output **VM ID** are equal unless the activity failed to find a virtual machine with a **VM ID** that matches the input **VM ID**. In that case, the output **VM ID** is set to Null.

Errors and Exceptions

The **Start VM** activity uses the custom tracking service that is supplied by Service Manager to log errors and exceptions when the activity runs. The activity generates errors or exceptions as appropriate if any of the script properties cannot be resolved.

Remarks

None.

Example

Description

None.

See Also

Virtual Machine Manager Activities

Save State VM Activity

This activity in System Center 2012 – Service Manager saves the state of a virtual machine and then stops the virtual machine.

Design Time Prerequisites

None.

Run Time Prerequisites

- The Virtual Machine Manager console and Service Manager must be both installed on the same server.
- Ensure that the Service Manager Workflow account has sufficient permissions to modify security groups in Active Directory Domain Services (AD DS).

Properties

The **Save State VM** activity uses the input properties that are described in the following table.

Display name	Internal name	Type	Required	Description
Continue On Error	ContinueOnError	Boolean	No. (The default setting is True.)	Determines whether the workflow should continue running if the activity fails.
Has Error	HasError		N/A	Specifies whether the activity has an error set. (Read-only)
Job Variable	JobVariable	String	No	Specifies that job progress is tracked and stored in the variable that is named by this parameter.
Management Group	ManagementGroup	String	No	Specifies the management group in which this activity will run. Set to **localhost**. (Read-only)
PROTipID	PROTipID	Guid	No	Specifies the ID of the Performance and Resource Optimization (PRO) tip that triggered this action. Allows for future auditing of PRO tips.
Run Asynchronously	RunAsynchronously	Boolean	No. (The default setting is False.)	Specifies that the job runs asynchronously so that control returns to the command shell immediately.
Script Server	Target	String	Yes	Specifies the Domain Name

Display name	Internal name	Type	Required	Description
				System (DNS) name of the server that runs the Service Manager console. Do not use **localhost**.
Script Time Limit	TimeoutSeconds	Integer	No. (The default setting is 300 seconds.)	Specifies the maximum number of seconds to allow for the activity to run.
VM ID	VMID	String	Yes	Specifies the unique ID of the virtual machine to be saved.
VMM Server	VMMServer	String	Yes	Specifies the name of the System Center Virtual Machine Manager (VMM) server that manages the virtual machines.

The **Save State VM** activity generates the output that is described in the following table.

Display name	Internal name	Type	Comments
VM ID	VMID	String	Specifies the unique ID of the virtual machine that was saved. The input **VM ID** and the output **VM ID** are equal unless the activity failed to find a virtual machine with a **VM ID** that matches the input **VM ID**. In that case, the output **VM ID** is set to Null.

Errors and Exceptions

The **Save State VM** activity uses the custom tracking service that is supplied by Service Manager to log errors and exceptions when the activity runs. The activity generates errors or exceptions as appropriate if any of the script properties cannot be resolved.

Remarks

None.

Example

Description

None.

See Also

Virtual Machine Manager Activities

Script Activities

Use a script activity in System Center 2012 – Service Manager to run a script as part of a workflow.

Script activities run as a separate process from the workflows; however, they also run under the security context of the Service Manager Workflow account.

The System Center 2012 – Service Manager Authoring Tool provides the following three default script activities in the **Generic Script Activities** subgroup of the **Script Activities** group in the **Activities Toolbox** pane.

Script Activities Topics

- Command Script Activity

  Describes the prerequisites and properties of the **Command Script** activity.
- Windows PowerShell Script Activity

  Describes the prerequisites and properties of the **Windows PowerShell Script** activity.
- VBScript Script Activity

  Describes the prerequisites and properties of the **VBScript Script** activity.

Command Script Activity

This activity runs a command-line script as part of a Windows Workflow Foundation (WF) workflow.

Design-Time Prerequisites

None.

Run-Time Prerequisites

None.

Properties

The **Command Script** activity uses the input properties that are described in the following table.

Display name	Internal name	Type	Required	Description
Continue On Error	ContinueOnError	Boolean	No. (The default setting is True.)	Determines whether the workflow should continue running if the activity fails.
Has Error	HasError		N/A	Specifies whether the activity has an error set. (Read-only)
Management Group	ManagementGroupName	String	No	Specifies the management group to which the script server belongs. By default, this is set to **localhost**. (Read-only)
Script Parameters	Parameters	Dictionary <string,string>	Yes	Specifies command-line switches or switch/value pairs to be passed into the script when it runs.
Script Body	ScriptBody	String	Yes	Specifies the text of the script itself.
Script Server	Target	String	No	Specifies the Domain Name System (DNS) name of the server that runs the Service

Display name	Internal name	Type	Required	Description
				Manager console. Do not use **localhost**.
Script Time Limit	TimeoutSeconds	Integer	No. (The default setting is 300 seconds.)	Specifies the maximum number of seconds to allow for the script to run.

Errors and Exceptions

The **Command Script** activity uses the custom tracking service that is supplied by Service Manager to log errors and exceptions when the activity runs. The activity generates errors or exceptions as appropriate if any of the script properties cannot be resolved.

Remarks

None.

Example

Description

None.

See Also

Script Activities

Windows PowerShell Script Activity

This activity in System Center 2012 – Service Manager runs a Windows PowerShell script as part of a Windows Workflow Foundation (WF) workflow.

Design-Time Prerequisites

The **Windows PowerShell Script** activity depends upon the following prerequisites at design time:

- Windows PowerShell 2.0

Run-Time Prerequisites

Windows PowerShell 2.0

Properties

The **Windows PowerShell Script** activity uses the input properties that are described in the following table.

Display name	Internal name	Type	Required	Description
Continue On Error	ContinueOnError	Boolean	No. (The default setting is True.)	Determines whether the workflow should continue running if the activity fails.
Has Error	HasError		N/A	Specifies whether the activity has an error set. (Read-only)
Management Group	ManagementGroupName	String	No	Specifies the management group to which the script server belongs. By default, this is set to **localhost**. (Read-only)
Script Parameters	Parameters	Dictionary <string,string>	Yes	Specifies the name/value list of parameters to be passed into the script when it runs. You can set parameter values to any of the following management pack references: • $Target/…$ • $MPElement[…] • $Data/…$. $Data references are resolved only at run time in the parameters (not in the script itself). Using one of these references as the only value for a parameter sets that parameter to the

Display name	Internal name	Type	Required	Description
				XML string that represents the input data item (from **GetItemXML**).
Script Body	ScriptBody	String	Yes	Specifies the text of the script itself.
Snap-ins	SnapIns	String	No	Lists Windows PowerShell snap-ins to preload into the runspace.
Script Server	Target	String	No	Specifies the Domain Name System (DNS) name of the server that runs the Service Manager console. Do not use **localhost**.
Script Time Limit	TimeoutSeconds	Integer	No. (The default setting is 300 seconds.)	Specifies the maximum number of seconds to allow for the script to run.

Errors and Exceptions

The **Windows PowerShell Script** activity uses the custom tracking service that is supplied by Service Manager to log errors and exceptions when the activity runs. The activity generates errors or exceptions as appropriate if any of the script properties cannot be resolved.

Remarks

For more information about Windows PowerShell, see Windows PowerShell.

Example

Description

None.

See Also

Script Activities

VBScript Script Activity

This activity in System Center 2012 – Service Manager runs a VBScript script as part of a Windows Workflow Foundation (WF) workflow.

Design-Time Prerequisites

The **VBScript Script** activity depends on the following prerequisites at design time:

None.

Run-Time Prerequisites

None.

Properties

The **VBScript Script** activity uses the input properties that are described in the following table.

Display Name	Internal Name	Type	Required	Description
Continue On Error	ContinueOnError	Boolean	No. (The default setting is True.)	Determines whether the workflow continues to run if the activity fails.
Has Error	HasError		N/A	Specifies whether the activity has an error set. (Read-only)
Management Group	ManagementGroupName	String	No	Specifies the management group to which the script server belongs. (By default, this is set to **localhost**) (Read-only)
Script Parameters	Parameters	Dictionary <string,string>	Yes	Provides the list of the standard switches and any associated values that this script uses when it runs.

Display Name	Internal Name	Type	Required	Description
Script Body	ScriptBody	String	Yes	Specifies the text of the script itself.
Script Server	Target	String	No	Specifies the Domain Name System (DNS) name of the server that runs the Service Manager console. Do not use **localhost**.
Script Time Limit	TimeoutSeconds	Integer	No. (The default setting is 300 seconds.)	Specifies the maximum number of seconds to allow for the script to run.

Errors and Exceptions

The **VBScript Script** activity uses the custom tracking service that is supplied by Service Manager to log errors and exceptions when the activity runs. The activity generates errors or exceptions as appropriate if any of the script properties cannot be resolved.

Remarks

None.

Example

Description

None.

See Also

Script Activities

Service Manager Activities

Use Service Manager activities in System Center 2012 – Service Manager to make Service Manager functions part of your workflow.

The System Center 2012 – Service Manager Authoring Tool provides the following four default Service Manager activities in the **SM Activities** group in the **Activities Toolbox** pane.

Service Manager Activities Topics

- Create Incident Activity

  Describes the prerequisites and properties of the **Create Incident** activity.
- Get Incident Activity

  Describes the prerequisites and properties of the **Get Incident** activity.
- Update Incident Activity

  Describes the prerequisites and properties of the **Update Incident** activity.
- Set Activity Status to Completed Activity

  Describes the prerequisites and properties of the **Set Activity Status to Completed** activity.

Create Incident Activity

This activity creates and populates an incident in System Center 2012 – Service Manager.

Design-Time Prerequisites

None.

Run-Time Prerequisites

None.

Properties

The **Create Incident** activity uses the input properties that are listed in the following table.

Display name	Internal name	Type	Required	Comments
Incident ID	IncidentID	String	Yes	Specifies the unique identifier who is generated for the **Incident** object.
Action Log Comment	ActionLogComment	String	Yes	Specifies the comment to include in the **Incident** object's action log.
Affected User Domain	AffectedUserDomain	String	Yes	Specifies the name of the Domain Name System (DNS) domain of the primary user who is affected by the incident.

Display name	Internal name	Type	Required	Comments
Affected User Name	AffectedUserName	String	Yes	Specifies the user name of the primary user who is affected by the incident.
Category	Category	Integer	Yes	Specifies the type of incident, such as "Networking" or "Printing." The value is the ID of **enum**. (Category –**enum** data field)
Continue On Error	ContinueOnError	Boolean	No. (The default setting is true.)	Determines whether the workflow should continue running if the activity fails.
Impact	Impact	Integer	Yes	Specifies the impact of the incident on the affected user or users. The value is the ID of **enum**. (Impact -**enum** data type)
Source	Source	Integer	No	Specifies the source of information about the incident, such as "Phone" or "E-mail". The value is the ID of **enum**. (Source –**enum** data type field)
Summary	Summary	String	Yes	Specifies the summary text that describes the incident.

Display name	Internal name	Type	Required	Comments
Urgency	Urgency	Integer	Yes	Specifies the urgency of resolving the incident. The value is the ID of **enum**. (Urgency – **enum** data type field)

The **Create Incident** activity generates the output that is described in the following table.

Name	Type	Comments
SM Incident	System.WorkItem.Incident	Returns the constructed incident class instance.

Errors and Exceptions

None.

Remarks

None.

Example

Description

None.

Comments

See Also

Service Manager Activities

Get Incident Activity

This activity retrieves one or more incidents in System Center 2012 – Service Manager.

Design-Time Prerequisites

None.

Run-Time Prerequisites

None.

Properties

The **Get Incident** activity uses the input properties that are listed in the following table.

Display name	Internal name	Type	Required	Comments
Affected User Domain	AffectedUserDomain	String	No	Specifies the name of the Domain Name System (DNS) domain of the primary user who is affected by the incident.
Affected User Name	AffectedUserName	String	No	Specifies the user name of the primary user who is affected by the incident.
Category	Category	Integer	No	Specifies the type of incident, such as "Networking" or "Printing." The value is the ID of **enum**. (Category –**enum** data field)
Continue On Error	ContinueOnError	Boolean	No. (The default is true.)	Determines whether the workflow should continue running if the activity fails.
Incident ID	IncidentID	String	No	Specifies the unique identifier that is generated for the incident object.
Search Type	SearchType	Integer?	No	Specifies the title of the search type that is used with the activity.
Status	Status	Integer	No	Specifies the status of incident. The value is the ID of **enum**.

Display name	Internal name	Type	Required	Comments
				(Status –**enum** data field)
Summary Text	SummaryText	String	No	Specifies the summary text that describes the incident.

The **Get Incident** activity generates the output that is described in the following table.

Display name	Internal name	Type	Comments
SM Incidents	SMIncidents	Array of System.Workitem.Incident	Specifies an array of incident objects.

Errors and Exceptions

None.

Remarks

The **Get Incident** activity has its own validator to perform error validation on input properties.

Example

Description

None.

Comments

See Also

Service Manager Activities

Update Incident Activity

This activity in System Center 2012 – Service Manager saves property changes to one Service Manager incident.

Design-Time Prerequisites

None.

Run-Time Prerequisites

None.

Properties

The **Update Incident** activity uses the input properties that are described in the following table.

Display name	Internal name	Type	Required	Description
Action Log Comment	ActionLogComment	String	No	Specifies a comment to include in the Incident object's action log.
Affected User Domain	AffectedUserDomain	String	No	Specifies the name of the Domain Name System (DNS) domain of the primary user who is affected by the incident.
Affected User Name	AffectedUserName	String	No	Specifies the user name of the primary user who is affected by the incident.
Category	Category	Integer	No	Specifies the type of incident, such as "Networking" or "Printing." The value is the ID of **enum**. (Category – **enum** data type)
Continue On Error	ContinueOnError	Boolean	No. (The default setting is true.)	Determines whether the workflow should continue running if the

Display name	Internal name	Type	Required	Description
				activity fails.
Impact	Impact	Integer	No	Specifies the impact of the incident on the affected user or users. The value is the ID of **enum**. (Impact -**enum** data type)
Source	Source	Integer	No	Specifies the source of information about the incident, such as "Phone" or "E-mail." The value is the ID of **enum**. (Source – **enum** data type)
Service Manager Incident	SMIncident	System.Workitem.Incident	No	The constructed incident class instance to be updated.
Status	Status	Integer	No	Specifies the status of the incident that generated the activity. The value is the ID of **enum**. (Status –**enum** data type)
Summary	Summary	String	No	Specifies the summary text

Display name	Internal name	Type	Required	Description
				that describes the incident.
Urgency	Urgency	Integer	No	Specifies the urgency of resolving the incident. The value is the ID of **enum**. (Urgency – **enum** data type field)

The **Update Incident** activity generates the output that is described in the following table.

Display name	Internal name	Type	Description
SM Incident	SMIncident	System.WorkItem.Incident	Returns an update of the incident class instance. The input **SM Incident** and the output **SM Incident**are equal unless the activity failed to find the **SM Incident**. In that case, the output **SM Incident** is set to Null.

Errors and Exceptions

None.

Remarks

None.

Example

Description

None.

Comments

See Also

Service Manager Activities

Set Activity Status to Completed Activity

This activity updates the status of an automated activity in System Center 2012 – Service Manager.

Design-Time Prerequisites

None.

Run-Time Prerequisites

None.

Properties

The **Set Activity Status to Completed** activity uses the input properties that are described in the following table.

Display name	Internal name	Type	Required	Description
Activity ID	ActivityID	String	Yes	Specifies the identifier of a Service Manager automated activity object.

Errors and Exceptions

None.

Remarks

When you are using this activity in a workflow that is triggered by a Service Manager automated activity, enter **$Data/BaseManagedEntityId$** as the value of this property. This value applies to the **Set Activity Status to Completed** activity at the automated activity that triggered the workflow to run.

Example

Description

None.

Comments

See Also

Service Manager Activities

Guidelines for Creating Custom Activities

System Center 2012 – Service Manager automates a variety of information technology (IT) processes. For the Incident Management process, for example, System Center 2012 – Service Manager includes various automated steps, such as automated notifications to users when incidents are created or resolved and automatic routing of incidents to various queues, based on categorization. This automation is implemented by using workflows that are defined for the various solutions, and it uses Windows Workflow Foundation (WF) capabilities to describe, execute, and track the automated operations.

Customers and partners can extend the included automation by defining new workflows and adding them into a process. Workflows can be set to occur on a fixed schedule or on a specified condition occurring in the database, for example, when an incident is created or when it changes to a specified state, such as **Active** or **Resolved**.

The System Center 2012 – Service Manager Authoring Tool provides an easy-to-use method of creating new workflows. It provides a library of different workflow activities, such as creating an incident or updating an incident, and a drag-and-drop graphical designer that you can use to arrange these workflow activities into a workflow sequence. The Authoring Tool then compiles the new workflow into a set of definitions, code, and management pack content. When this information is imported into Service Manager, it integrates the new workflow into the specified solution.

Understanding what is going on behind the scenes of the Authoring Tool can benefit more advanced users. First, customers and partners can use this information to extend the workflow activity library in Service Manager with workflow activities that apply to their specific processes. Secondly, developers can use this information to build custom or advanced workflows that are compatible with Service Manager by using their development tool of choice, such as the Microsoft Visual Studio development system.

Workflow Activities and the WorkflowActivityBase Class

Service Manager workflows use WF activities. To work smoothly with the Authoring Tool, these activities derive from the base class **WorkflowActivityBase**, which belongs to the **Microsoft.EnterpriseManagement.Workflow.Common** namespace. The **WorkflowActivityBase** base class introduces properties and methods that are not available in the generic **Activity** base class for WF activities. For more information about how to define WF activities by using the generic **Activity** base class, see Activity Class.

Benefits of Using the WorkflowActivityBase Class

Users can import WF activities from the Visual Studio activity library, and they can work with those activities in the Authoring Tool **Authoring** pane. However, those activities behave in the same way as they do in the Visual Studio Design environment. They do not have the customizations that are built into the Service Manager activity library.

Note

Not all Visual Studio WF activities have been tested for compatibility with the Authoring Tool, and some Visual Studio WF activities might not run correctly in the Authoring Tool.

The following table lists the differences in behavior between WF activities that are based on the **WorkflowActivityBase** base class and WF activities that are based on the generic **Activity** base class.

Scenario	**Authoring Tool WF activity (**WorkflowActivityBase **base class)**	**Visual Studio WF activity (**Activity **base class)**
User binds activity properties (to Service Manager object properties or to properties from other activities).	Calls the **Bind property to** dialog box that is customized for Service Manager users.	Calls the **Bind property to** dialog box that is intended for developers.
User adds the activity to a **For-Each Loop** activity.	Adds the properties **Propertytobind** (the loop index) and **CurrentItem**, which are required to take part in loop-specific operations (**CurrentItem** is an internal property).	Behaves in the same way for each iteration of the loop, and does not interact with the property that indexes the loop.

Important
Because of the customizations that are required for the Authoring Tool workflow designer, activities that are based on the **WorkFlowActivityBase** class do not function as expected in the Visual Studio workflow design environment.

Users can build custom WF activities in Visual Studio for use in the Authoring Tool. However, to take advantage of the custom design-time behavior of the Authoring Tool, custom activities must be based on the **WorkflowActivityBase** class instead of the **Activity** class.

Workflow Activities and Service Manager Automated Activities

WF activities can interact with a different type of activity, the Service Manager activities that are used by Service Manager work items. *Work items* are one of the main types of objects that Service Manager uses. Work items track units of work, such as **Incidents**, **Service Requests**, **Change Requests**, and other units of work. Most work items comprise one or more Service Manager activities. For example, a **Change Request** typically includes at least two activities: a **Review** activity and a **Change Execution** activity. The work item typically executes these activities in order.

When a work item is created, the first Service Manager activity becomes active and remains active while Service Manager (or the user) carries out whatever work the activity represents. When that work finishes, Service Manager marks the first activity as **Completed** and activates the next activity in the sequence. When the final activity in the sequence is marked as **Completed**, Service Manager marks the entire work item as **Completed**.

Some Service Manager activities can be executed manually, such as the **Review** activity of a **Change Request**. Other Service Manager activities can be automated, such as an activity that

sends an email to a user. The **Change Execution** activity of a **Change Request** can be automated. Service Manager uses WF workflows to automate Service Manager activities.

Example: The Set Activity Status to Completed Activity

This example of a WF workflow activity in Service Manager uses the **Set Activity Status to Completed** WF activity. This WF activity typically represents the last step in a workflow that implements an automated Service Manager activity, and it sets the status of that activity to **Completed**. Setting this status triggers the system to move to the next activity in the work item, and this process repeats until the last activity in the work item is completed.

The **Set Activity Status to Completed** activity takes one input, **Activity ID**, which identifies the Service Manager activity on which to act. The WF activity then connects to the Service Manager management server, retrieves the specified Service Manager activity from the database, sets its status to **Completed**, and then saves it back to the database. Most of the code samples that are included in this example come from the SetActivityStatusToCompleted.cs file, an underlying file that describes the **Set Activity Status to Completed** activity.

Initializing the Example WF Activity

The first section of the SetActivityStatusToCompleted.cs file contains the declaration and initialization statements. This activity is based on the **WorkflowActivityBase** class, and it uses the validator class **SetActivityStatusToCompletedValidator** and the designer class **WorkflowActivityBaseDesigner**.

The **WorkflowActivityBaseDesigner** class contains the customizations that are described in the previous section, "Benefits of Using the WorkflowActivityBase Class." You can further extend and customize this class.

The first section of the activity definition for this example activity includes the following code:

```
namespace Microsoft.ServiceManager.WorkflowAuthoring.ActivityLibrary

{

    // ------------------------------------------------------------------------

    /// <summary>

    /// Activity to set an activity's status to complete

    /// </summary>

    // ------------------------------------------------------------------------

    [ToolboxItem(typeof(ActivityToolboxItem))]

    [ActivityValidator(typeof(Validators.SetActivityStatusToCompletedValidator))]

    [Designer(typeof(WorkflowActivityBaseDesigner))]

    public sealed partial class SetActivityStatusToCompleted : WorkflowActivityBase

    {
```

Input Properties for the Example WF Activity

The code declares one property, **ActivityId**, as a dependency property. This means that this property can be bound to parameters that are defined at the workflow level. In this case, the ID of the Service Manager activity is passed in to the workflow as a workflow parameter, and it flows into this activity as an input.

```
        // ------------------------------------------------------------------------------
--
        /// <summary>
        /// Dependency Property for ActivityId property
        /// </summary>
        // ------------------------------------------------------------------------------
--
        public static DependencyProperty ActivityIdProperty =
            DependencyProperty.Register("ActivityId", typeof(String),
typeof(SetActivityStatusToCompleted));


        // ------------------------------------------------------------------------------
--
        /// <summary>
        /// Activity ID
        /// </summary>
        // ------------------------------------------------------------------------------
--
        [Browsable(true)]
        [DesignerSerializationVisibility(DesignerSerializationVisibility.Visible)]
        public string ActivityId
        {
            get
            {
                return (string)this.GetValue(ActivityIdProperty);
            }
            set
            {
                this.SetValue(ActivityIdProperty, value);
            }
      }
```

Execution Behavior in the Example WF Activity

The **Execute** method does the actual work of this WF activity. Within the scope of the **Execute** method, the WF activity does the following:

- Detects whether it is operating within a **For-Each Loop** activity, and, if so, sets the appropriate WF activity properties.
- Connects to the specified Service Manager management server and creates an **EnterpriseManagementGroup** object.
- Uses the **ActivityId** property to get the identified Service Manager activity from the database.
- Finds the class definition of the Service Manager activity, gets the **Status** property of the retrieved Service Manager activity, and sets the property to the **Completed** enumeration list value.
- Commits the changes to the Service Manager activity.
- Uses the **TrackData** method (part of the WF infrastructure) to log tracking information about the execution and status of the WF activity.

```
        // ------------------------------------------------------------------------------
--
        /// <summary>
        /// The execute method will have the implementation to set the activity status to
complete.
        /// </summary>
        // ------------------------------------------------------------------------------
--
        protected override ActivityExecutionStatus Execute(ActivityExecutionContext
executionContext)
        {
            try
            {
                // Initialize the current item if the activity contained within the For-
Each loop
                base.Execute(executionContext);


                // Validate Parameters
                if (String.IsNullOrEmpty(ActivityId))
                {
                    throw new ArgumentNullException("ActivityId");
                }
```

```
                string SMServer = "localhost";

                Guid TaskGuid = new Guid(ActivityId);
                EnterpriseManagementGroup _mg = new EnterpriseManagementGroup(SMServer);

                EnterpriseManagementObject Activity = _mg.EntityObjects.GetObject
                    <EnterpriseManagementObject>(TaskGuid, ObjectQueryOptions.Default);

                ManagementPack SystemMP = _mg.ManagementPacks.GetManagementPack(
                    SystemManagementPack.System);
                ManagementPack ActivityMP = _mg.ManagementPacks.GetManagementPack(
                    Resources.ActivityManagementMP, SystemMP.KeyToken, SystemMP.Version);

                ManagementPackClass activityClass = _mg.EntityTypes.GetClass(
                    Resources.WorkItemActivityClass, ActivityMP);

                ManagementPackProperty status =
activityClass.PropertyCollection["Status"];
                ManagementPackEnumeration Completed =
                    _mg.EntityTypes.GetEnumeration("ActivityStatusEnum.Completed",
ActivityMP);

                Activity[status].Value = Completed;
                Activity.Commit();
            }
            catch (ArgumentNullException argNullException)
            {
                // Log to Tracking Service
                TrackData(argNullException.ToString());

                throw;
            }
            catch (EnterpriseManagementException mgmtException)
```

```
            {
                TrackData(mgmtException.ToString());
                throw;
            }

            return ActivityExecutionStatus.Closed;
        }
    }
}
```

Validation Behavior in the Example WF Activity

The SetActivityStatusToCompletedValidator.cs file defines the validation behavior of the WF activity. This behavior defines how the designer indicates whether this WF activity is fully defined or if it still requires one or more inputs to be defined. The Authoring Tool indicates a validation error similarly to Visual Studio by using a red exclamation point (**!**) icon on the workflow activity in the **Authoring** pane.

```
namespace Microsoft.ServiceManager.WorkflowAuthoring.ActivityLibrary.Validators
{
    // ------------------------------------------------------------------------------
    /// <summary>
    /// Validator for the SetActivityStatusToCompleted activity
    /// </summary>
    // ------------------------------------------------------------------------------
    internal class SetActivityStatusToCompletedValidator : ActivityValidator
    {
        // ------------------------------------------------------------------------------
--
        /// <summary>
        /// Validator for the SetActivityStatusToCompleted activity
        /// </summary>
        // ------------------------------------------------------------------------------
--
        public override ValidationErrorCollection Validate(ValidationManager manager,
object obj)
        {
```

```
            // Performing default validation
            ValidationErrorCollection errorColl = base.Validate(manager, obj);

            SetActivityStatusToCompleted setActivityStatusToCompletedObj =
                (SetActivityStatusToCompleted)obj;

            // Check if validation is happening during compilation of activity and
            // not during the hosting of an activity
            if (setActivityStatusToCompletedObj.Parent == null)
            {
                return errorColl;
            }

            string propertyName =
Common.GetPropertyName(setActivityStatusToCompletedObj);

            // Add validation error if ActivityId is null or empty
            if (setActivityStatusToCompletedObj.ActivityId == null
                &&

setActivityStatusToCompletedObj.GetBinding(SetActivityStatusToCompleted.ActivityIdPropert
y) == null
                &&
                String.Compare(propertyName, "ActivityId", false,
CultureInfo.InvariantCulture) != 0)
            {
                errorColl.Add(new ValidationError(

Resources.SetActivityStatusToCompleted_ActivityId_DesignTimeValidation, 10, false));
            }

            return errorColl;
        }
    }
}
```

Using the Example WF Activity in a Workflow

The **Set Activity Status to Completed** activity is included in the Authoring Tool default **Activities Toolbox** pane. For more information about adding custom activities to the **Activities Toolbox** pane, see How to Install a Custom Activity Assembly in the Authoring Tool online Help.

You can use the authoring pane of the Authoring Tool to author workflows in a manner that is similar to using the Visual Studio workflow design interface. However, the Authoring Tool offers the following benefits:

- Users without development skills can build workflows; they do not have to work with code directly.
- When a user saves a workflow in the Authoring Tool, the tool generates the corresponding Visual C# and XOML code and compiles it into a .dll file. The tool also integrates the workflow with a management pack that can interact directly with Service Manager.

Visual C# Code for the Workflow

The following sample shows the Visual C# code that the Authoring Tool generates for an example workflow that uses the **Set Activity Status to Completed** activity. This code declares a simple sequential workflow, **SetActivityStatusToCompleteWF**, that has one workflow parameter, the dependency property **ActivityId**. The value of **ActivityID** is determined by the management pack definitions that are shown later in this example. When the workflow runs, Service Manager identifies the value and passes it into the workflow.

```
namespace WorkflowAuthoring

{

    using System;

    using System.ComponentModel;

    using System.ComponentModel.Design;

    using System.Workflow.ComponentModel.Design;

    using System.Workflow.ComponentModel;

    using System.Workflow.ComponentModel.Serialization;

    using System.Workflow.ComponentModel.Compiler;

    using System.Drawing;

    using System.Collections;

    using System.Workflow.Activities;

    using System.Workflow.Runtime;



    public partial class SetActivityStatusToCompleteWF :
System.Workflow.Activities.SequentialWorkflowActivity
```

```
    {

        public static DependencyProperty ActivityIdProperty =
DependencyProperty.Register("ActivityId", typeof(string),
typeof(SetActivityStatusToCompleteWF));



[System.ComponentModel.DesignerSerializationVisibilityAttribute(DesignerSerializationVisi
bility.Visible)]
        [System.ComponentModel.BrowsableAttribute(true)]
        [System.ComponentModel.CategoryAttribute("Misc")]
        public string ActivityId
        {
            get
            {
                return ((string)(this.GetValue(ActivityIdProperty)));
            }
            set
            {
                this.SetValue(ActivityIdProperty, value);
            }
        }
    }
}
```

XOML Code for the Workflow

WF uses the XOML format for some of the workflow definitions. In the case of the example workflow, the Authoring Tool creates the file SetActivityStatusToCompleteWF.xoml with the following content:

```
<SequentialWorkflowActivity x:Class="WorkflowAuthoring.SetActivityStatusToCompleteWF"
x:Name="SetActivityStatusToCompleteWF" xmlns:ns0="clr-
namespace:Microsoft.ServiceManager.WorkflowAuthoring.ActivityLibrary;Assembly=Microsoft.S
erviceManager.WorkflowAuthoring.ActivityLibrary, Version=1.0.0.0, Culture=neutral,
PublicKeyToken=31bf3856ad364e35" xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
xmlns="http://schemas.microsoft.com/winfx/2006/xaml/workflow">
```

```
<ns0:SetActivityStatusToCompleted ActivityId="{ActivityBind
SetActivityStatusToCompleteWF,Path=ActivityId}" x:Name="setActivityStatusToCompleted1"
PropertyToBind="{x:Null}" />
</SequentialWorkflowActivity>
```

SetActivityStatusToCompleteWF.xoml declares that the workflow**, SetActivityStatusToCompleteWF**, runs one workflow activity, **Set Activity Status To Completed**. That activity has one input parameter, *ActivityId*, which gets its value from the **ActivityId** property of the workflow.

Declaring the Workflow and Its Trigger Condition in a Management Pack

Service Manager cannot use an isolated workflow .dll file; the workflow must be integrated with a management pack. The management pack defines when the workflow should run and what input values to use. At the same time that it generates the workflow code and compiles the workflow .dll file, the Authoring Tool adds the workflow-related information to a management pack.

The example workflow, **SetActivityStatusToCompleteWF**, is associated with an example management pack, named Woodgrove.AutomatedActivity.AddComputerToGroupMP.xml. This management pack extends the **Change Management** process with a new automated Service Manager activity. When the new activity becomes active during a change management operation, it triggers the **SetActivityStatusToCompleteWF** workflow.

The management pack defines the trigger of the workflow (when the new Service Manager activity changes state), and it defines the value to use for the **ActivityId** property (the unique identifier of the new Service Manager activity). When the workflow runs, it changes the status of the new Service Manager activity to **Completed**. Note that in a normal workflow, this would be the last step following some other task that is performed by other WF activities in the workflow.

The **Monitoring** section of the management pack contains the **Rule** definition for the workflow. In turn, the **Rule** definition has two parts, the **DataSource** element and the **WriteAction** element.

In the case of the example workflow, the **DataSource** element contains a **Subscription** element, which specifies that the workflow should run when an instance of the **AddComputerToGroup** class (a custom Service Manager class) changes state to **Active**.

```
<Monitoring>
    <Rules>
      <Rule ID="SetActivityToCompleteRule" Enabled="true"
     Target="SystemCenterLibrary!Microsoft.SystemCenter.SubscriptionWorkflowTarget"
     ConfirmDelivery="false" Remotable="true" Priority="Normal" DiscardLevel="100">
        <Category>Notification</Category>
        <DataSources>
          <DataSource ID="DS"
TypeID="Subscriptions!Microsoft.SystemCenter.CmdbInstanceSubscription.DataSourceModule">
    <Subscription>
```

```
<InstanceSubscription Type="$MPElement[Name='AddComputerToGroup']$">
    <UpdateInstance>
<Criteria>
   <Expression>
       <SimpleExpression>
           <ValueExpression>
   <Property State="Post">
$Context/Property[Type='Activity!System.WorkItem.Activity']/Status$
</Property>
   </ValueExpression>
   <Operator>Equal</Operator>
   <ValueExpression>
       <Value>
$MPElement[Name='Activity!ActivityStatusEnum.Active']$
       </Value>
   </ValueExpression>
</SimpleExpression>
    </Expression>
</Criteria>
    </UpdateInstance>
</InstanceSubscription>
<StartWatermark>1</StartWatermark>
<PollingIntervalInSeconds>60</PollingIntervalInSeconds>
<BatchSize>100</BatchSize>
   </Subscription>
</DataSource>
     </DataSources>
```

The **WriteAction** element (specifically, **Microsoft.EnterpriseManagement.SystemCenter.Subscription.WindowsWorkflowTaskWriteAction**) defines what to do when the trigger condition is met. Within this element, a **Subscription** element identifies the workflow assembly file to run (SetActivityStatusToCompleteWF.dll) and the class in the assembly that represents the workflow, **WorkflowTypeName**.

The **Subscription** element also includes a **WorkflowParameter** element, which defines the **ActivityId** property and, using the syntax **$Data/BaseManagedEntityId$**, binds it to the unique identifier of the Service Manager activity that is recorded in the **DataSource** element.

The **WriteAction** element also stores optional configuration details for the workflow, such as how many retries to perform if the workflow fails, how frequently to retry, and the maximum time in seconds that a workflow should run before it is shut off.

```
    <WriteActions>
    <WriteAction ID="WA"
TypeID="Subscriptions!Microsoft.EnterpriseManagement.SystemCenter.Subscription.WindowsWor
kflowTaskWriteAction">
    <Subscription>
        <WindowsWorkflowConfiguration>
     <AssemblyName>SetActivityStatusToCompleteWF</AssemblyName>
     <WorkflowTypeName>
WorkflowAuthoring.SetActivityStatusToCompleteWF
     </WorkflowTypeName>
     <WorkflowParameters>
 <WorkflowParameter Name="ActivityId"
      Type="string">$Data/BaseManagedEntityId$
 </WorkflowParameter>
     </WorkflowParameters>
     <RetryExceptions></RetryExceptions>
     <RetryDelaySeconds>60</RetryDelaySeconds>
     <MaximumRunningTimeSeconds>300</MaximumRunningTimeSeconds>
</WindowsWorkflowConfiguration>
    </Subscription>
</WriteAction>
     </WriteActions>
   </Rule>
 </Rules>
</Monitoring>
```

Importing the Management Pack

For the workflow to run on a particular Service Manager management server, all of the files that are related to the workflow must reside on that server. These files include the following:

- The WF activity assembly files. If you are using only the System Center 2012 – Service Manager WF activities, by default, the appropriate files are installed. If you are using custom activities, see How to Install a Custom Activity Assembly in the Authoring Tool online Help.

- The workflow assembly file, in this case, SetActivityStatusToCompleteWF.dll. You must manually copy this file to the Service Manager management server.
- The management pack file, in this case, Woodgrove.AutomatedActivity.AddComputerToGroupMP.xml. You must manually copy this file to the Service Manager management server.

When all of the files are in place, import the management pack into Service Manager. You can do this by using the mpimport.exe command-line tool or the Service Manager console. After you have imported the management pack, the workflow is ready to run whenever the condition that is defined as its trigger is met.

See Also

Workflow Activity Reference

Sample Activity - Setting an Activity's Status to Completed

The following is a sample activity in System Center 2012 – Service Manager that sets an activity's status to complete.

```
using System;

using System.Linq;

using System.Drawing;

using System.Collections;

using System.ComponentModel;

using System.Workflow.Runtime;

using System.Collections.Generic;

using System.Workflow.Activities;

using System.ComponentModel.Design;

using Microsoft.EnterpriseManagement;

using System.Workflow.ComponentModel;

using System.Workflow.Activities.Rules;

using System.Workflow.ComponentModel.Design;

using Microsoft.EnterpriseManagement.Common;

using System.Workflow.ComponentModel.Compiler;

using System.Workflow.ComponentModel.Serialization;

using Microsoft.EnterpriseManagement.Configuration;

using Microsoft.EnterpriseManagement.Configuration.IO;

using Microsoft.EnterpriseManagement.Workflow.Common;


namespace Microsoft.ServiceManager.WorkflowAuthoring.ActivityLibrary
```

```
{
    // ------------------------------------------------------------------------
    /// <summary>
    /// Activity to set an activity's status to complete
    /// </summary>
    // ------------------------------------------------------------------------
    [ToolboxItem(typeof(ActivityToolboxItem))]
    [ActivityValidator(typeof(Validators.SetActivityStatusToCompletedValidator))]
    [Designer(typeof(WorkflowActivityBaseDesigner))]
    public sealed partial class SetActivityStatusToCompleted : WorkflowActivityBase
    {
        // ------------------------------------------------------------------------
--
        /// <summary>
        /// Dependency Property for ActivityId property
        /// </summary>
        // ------------------------------------------------------------------------
--
        public static DependencyProperty ActivityIdProperty =
            DependencyProperty.Register("ActivityId", typeof(String),
typeof(SetActivityStatusToCompleted));

        // ------------------------------------------------------------------------
--
        /// <summary>
        /// Activity ID
        /// </summary>
        // ------------------------------------------------------------------------
--
        [Browsable(true)]
        [DesignerSerializationVisibility(DesignerSerializationVisibility.Visible)]
        public string ActivityId
        {
            get
            {
```

```
            return (string)this.GetValue(ActivityIdProperty);
        }
        set
        {
            this.SetValue(ActivityIdProperty, value);
        }
    }

    // ------------------------------------------------------------------------
--
    /// <summary>
    /// The execute method will have the implementation to set the activity status to
complete.
    /// </summary>
    // ------------------------------------------------------------------------
--
    protected override ActivityExecutionStatus Execute(ActivityExecutionContext
executionContext)
    {
        try
        {
            // Initialize the current item if the activity contained within the For-
Each loop
            base.Execute(executionContext);

            // Validate Parameters
            if (String.IsNullOrEmpty(ActivityId))
            {
                throw new ArgumentNullException("ActivityId");
            }

            string SMServer = "localhost";

            Guid TaskGuid = new Guid(ActivityId);
            EnterpriseManagementGroup _mg = new EnterpriseManagementGroup(SMServer);
```

```
                EnterpriseManagementObject Activity = _mg.EntityObjects.GetObject
                    <EnterpriseManagementObject>(TaskGuid, ObjectQueryOptions.Default);

                ManagementPack SystemMP = _mg.ManagementPacks.GetManagementPack(
                    SystemManagementPack.System);
                ManagementPack ActivityMP = _mg.ManagementPacks.GetManagementPack(
                    Resources.ActivityManagementMP, SystemMP.KeyToken, SystemMP.Version);

                ManagementPackClass activityClass = _mg.EntityTypes.GetClass(
                    Resources.WorkItemActivityClass, ActivityMP);

                ManagementPackProperty status =
activityClass.PropertyCollection["Status"];
                ManagementPackEnumeration Completed =
                    _mg.EntityTypes.GetEnumeration("ActivityStatusEnum.Completed",
ActivityMP);

                Activity[status].Value = Completed;
                Activity.Commit();
            }
            catch (ArgumentNullException argNullException)
            {
                // Log to Tracking Service
                TrackData(argNullException.ToString());

                throw;
            }
            catch (EnterpriseManagementException mgmtException)
            {
                TrackData(mgmtException.ToString());
                throw;
            }
```

```
            return ActivityExecutionStatus.Closed;
        }
    }
}
```

See Also

Workflow Activity Reference

Sample Scenario: The Woodgrove Bank Customization

To provide real-world context to the step-by-step procedures for the System Center 2012 – Service Manager Authoring Tool, we have created a fictitious scenario that takes place at a fictitious company, Woodgrove Bank.

The Woodgrove Bank customization scenario illustrates how Ken Myer, a server application developer for Woodgrove Bank, can easily extend the default change management process to support a new compliance change request process that the organization needs. The new compliance change request process will automatically add new computers to groups in Active Directory Domain Services (AD DS) so that the group software policies apply to the new computers.

Note

Some procedures in the Woodgrove Bank customization scenario rely on standard usage of the Service Manager console in System Center 2012 – Service Manager. This guide does not provide details for these common procedures. For more information about these procedures, see the Administrator's Guide for System Center 2012 - Service Manager.

Although there are many steps in extending the change management process, Ken has to think about four main things, which are described in the following sections.

Creating a New Custom Activity

A standard change request consists of two activities, a default review activity, and a default manual activity. In the new compliance change request process, Ken will perform the default review activity first, but the second activity is customized. Ken will create a new custom change request activity that uses a Windows Workflow Foundation (WF) workflow to automatically add a computer to an Active Directory group. Automating this change request process means that after the change is approved, the change will be completed without further user interaction. The custom activity is at the core of the new compliance change request process.

Creating Additional Custom Objects

Additionally, Ken will create new custom objects, such as a template, a queue, and a view to support working with the new type of activity. If email notifications are configured in the

environment, in the final steps of the scenario, Ken can configure email notifications to send confirmation email messages after the activity is complete.

Saving the Custom Objects in a Management Pack

Ken saves the custom objects to the Automated Activity: Add Computer to AD Group management pack so that he can transfer these objects between the Service Manager console and the System Center 2012 – Service Manager Authoring Tool.

Using the Customized Process

Eventually, after Ken imports the custom management pack into System Center 2012 – Service Manager and completes the creation of all the necessary custom objects, he can use the new process for compliance change requests. He creates a new compliance change request to add the ADComputer1 computer to the GP_AUTHAPPS AD DS group. He can then monitor the process to confirm that the new computer is successfully added to the group.

Woodgrove Bank Customization Scenario Topics

- Prerequisites for the Woodgrove Bank Customization Scenario

  Describes the prerequisites for the Woodgrove Bank customization sample scenario.
- High-Level Steps of the Woodgrove Bank Customization Scenario

  Describes the high-level steps of the Woodgrove Bank customization sample scenario.

Prerequisites for the Woodgrove Bank Customization Scenario

The Woodgrove Bank customization scenario has the following prerequisites:

- System Center 2012 – Service Manager must be installed in your environment.
- The System Center 2012 – Service Manager Authoring Tool must be installed in your environment.
- The Workflow Account in Service Manager must be a member of the Domain Administrators group because this scenario involves creating a workflow that adds a computer to a group in Active Directory Domain Services (AD DS). You specify the Workflow Account in the Service Manager Server Setup Wizard.

The Authoring Tool's installation folder includes a **Samples** subfolder that contains the following files, which are required for the Woodgrove Bank customization scenario.

File	Description
Woodgrove.AutomatedActivity.AddComputerToGroupMP.xml	A management pack that contains class definitions that are used in the Woodgrove Bank customization sample scenario.

File	Description
AddComputerToGroupFormAssembly.dll	The implementation of an automated activity form that is used in the Woodgrove Bank customization sample scenario.
Woodgrovebank.jpg	An image that is used for form customization in the Woodgrove Bank customization sample scenario.
New-mpbfile.ps1	A Windows PowerShell script that is used to bundle a management pack with its associated resource files into an .mpb file that can then be imported into Service Manager. Resource files can include items such as images and forms.

See Also

Sample Scenario: The Woodgrove Bank Customization

High-Level Steps of the Woodgrove Bank Customization Scenario

The steps of the Woodgrove Bank customization scenario are as follows. Details about each of those steps are provided in subsequent topics. For background information about this scenario, see Sample Scenario: The Woodgrove Bank Customization.

Step 1: Open the Woodgrove.AutomatedActivity.AddComputerToADGroupMP Management Pack

Ken has to create a class that represents the new custom activity, and a matching form to use to access that new class. He starts by opening the **Woodgrove.AutomatedActivity.AddComputerToADGroupMP** management pack that contains the definitions for the following class and form:

- The **Automated Activity: Add Computer To AD Group** custom class that represents the new automatic activity. This activity adds a new computer to a specified group in Active Directory Domain Services (AD DS).

- The form that represents the **Automated Activity: Add Computer To AD Group** class. Ken can use this form to enter information about the computer that is being added and the Active Directory group to which the computer should be added.

Instead of creating these necessary objects, you can import a pre-defined management pack as part of the Woodgrove Bank customization scenario.

For more information about how to open the management pack, see Step 1: Open the Woodgrove.AutomatedActivity.AddComputerToADGroupMP Management Pack.

Step 2: Customize the Default Change Request Form

Often, customers want to adapt default forms to their organizations' preferences. In this scenario, Ken adds an image that represents the company logo to the default change request form and then rearranges the layout of the fields on the form.

For more information about how to customize the default change request form, see Step 2: Customize the Default Change Request Form.

Step 3: Create the WF Workflow

Ken creates the **AddComputerToADGroupRule** workflow that automatically adds the specified computer to the specified Active Directory group after the compliance change request is approved.

For more information about how to create the workflow rule and the Windows Workflow Foundation (WF) Workflow, see Step 3: Create the WF Workflow.

Step 4: Move the Assembly Files to the Service Manager Console

Ken moves the workflow assembly file and the form assembly file to the Service Manager Program folder.

For more information about how to move the assembly files to the Service Manager console, see Step 4: Move the Assembly Files to the Service Manager Console.

Step 5: Bundle and Import the Custom Management Pack to Service Manager

Ken edits the custom management pack file to define the criteria that control when the workflow runs. Then, he has to bundle and import the custom management pack.

For more information about how to bundle and import the custom management pack into Service Manager, see Step 5: Bundle and Import the Custom Management Pack to Service Manager.

Step 6: Extend the Change Area Enumeration List

Ken adds the new **Compliance** list item that represents the new type of change request.

For more information about how to extend the change area enumeration list, see Step 6: Extend the Change Area Enumeration List.

Step 7: Create a New Task

Ken creates the **Start AD Users and Computers** task that starts the **AD Users and Computers** administration tool from the Service Manager console. Ken can conveniently monitor the Active Directory group to which the new computer is being added.

For more information about how to create a new task, see Step 7: Create a New Task.

Step 8: Create a New View

Ken creates the **Compliance Change Requests** view, which displays change requests of the new type. This includes all change requests in which **Area** = **Compliance**.

For more information about how to create a new view, see Step 8: Create a New View.

Step 9: Create a New Change Request Template

Create a new **Apply AppLocker Software Policy to Computer** change request template for the new compliance change request type.

For more information about how to create a new change request template, see Step 9: Create a New Change Request Template.

Step 10: Create a Notification Template and Subscription (Optional)

Ken creates the **Computer was added to AppLocker Policy Group** notification subscription that sends an email notification message to Ken when the status of an **Automated Activity: Add Computer To AD Group** activity is updated. This message notifies Ken that the workflow process is completed.

For more information about how to create a notification template and subscription (optional), see Step 10: Create a Notification Template and Subscription (Optional).

Step 11: Use the New Compliance Change Request Process

To test the new process, Ken creates a new compliance change request to add the **ADComputer1** computer to the **GP_AUTHAPPS** group. Next, he submits and approves the new change request. Finally, Ken verifies in AD DS that the new computer has been added to the appropriate Active Directory group.

For more information about how to use the new compliance change request process, see Step 11: Use the New Compliance Change Request Process.

Note

The example companies, organizations, products, domain names, email addresses, logos, people, places, and events depicted herein are fictitious. No association with any real company, organization, product, domain name, email address, logo, person, place, or event is intended or should be inferred.

See Also

Sample Scenario: The Woodgrove Bank Customization

Step 1: Open the Woodgrove.AutomatedActivity.AddComputerToADGroupMP Management Pack

The primary goal of the Woodgrove Bank customization scenario is to create a new custom activity that triggers a Windows Workflow Foundation (WF) workflow that automatically adds a computer to a group in Active Directory Domain Services (AD DS).

To create this new activity, in this step of the scenario Ken must extend the System Center 2012 – Service Manager class library by adding a new activity class that is derived from the base **Activity** class. This custom class includes all of the properties of the base activity class and two new properties, **ComputerName** and **GroupName**. These new properties identify the computer you are adding and the Active Directory group to which you are adding the computer. Ken also needs to define the **System.AddComputerForm** form that will represent the new **Automated Activity: Add Computer to AD Group** activity.

The necessary class activity and its associated form are already defined in the **Woodgrove.AutomatedActivity.AddComputerToADGroupMP** management pack. Therefore, to start the Woodgrove Bank customization scenario, Ken opens the **Woodgrove.AutomatedActivity.AddComputerToADGroupMP** management pack in the System Center 2012 – Service Manager Authoring Tool. Then, Ken explores the **Automated Activity: Add Computer to AD Group** class in the **Class Browser** pane.

Ken uses the Authoring Tool to complete the following procedure to open the **Woodgrove.AutomatedActivity.AddComputerToADGroupMP** management pack that defines the **Automated Activity: Add Computer to AD Group** activity and its associated form.

To open the Woodgrove.AutomatedActivity.AddComputerToADGroupMP management pack

1. Start the Authoring Tool.
2. Click **File**, point to **Open**, and then click **File**.
3. In the **Open File** dialog box, click the **Woodgrove.AutomatedActivity.AddComputerToGroupMP.xml** file to open the management pack.

To explore the "Automated Activity: Add Computer to AD Group" class

1. In the Authoring Tool, if the **Class Browser** is not visible, click **View**, and then click **Class Browser**.
2. Locate and expand the **Automated Activity: Add Computer to AD Group** class, and then view the class properties, such as **ComputerName** and **GroupName**.

See Also

Sample Scenario: The Woodgrove Bank Customization

Step 2: Customize the Default Change Request Form

The second step in the Woodgrove Bank customization scenario is to customize the default Change Request form, which is Microsoft.EnterpriseManagement.ServiceManager.ChangeManagement.Forms.ChangeRequestForm. Ken wants to rearrange some fields on the form and then add the Woodgrove Bank logo. Before Ken starts, he views the fields in the form to see how the values change according to the properties that are selected.

Next, Ken opens the **ServiceManager.ChangeManagement.Library.mp** management pack file in the System Center 2012 – Service Manager Authoring Tool, he customizes the form, and then saves the management pack file. Later, he must import the customized management pack into the Service Manager console.

To view the System.AddComputerForm form

1. In the Authoring Tool, expand **Forms** in the **Management Pack Explorer** pane. Right-click the **System.AddComputerForm** form, and then click **Customize** to open the form in the authoring pane.
2. In the authoring pane, ensure that the **Details** pane is visible. If it is not visible, click **View**, and then click **Details Window**.
3. Select a field on the form. Note that the properties in the **Details** pane are updated according to the class property that is bound to the field that you selected. Note the **Binding Path** entry in the **Details** pane. This entry indicates the property that the field in the form represents.

To customize the default Change Request form

1. In the Authoring Tool, click **File**, point to **Open**, and then click **File**. In the **Open File** dialog box, locate the **ServiceManager.ChangeManagement.Library.mp** management pack. For example, the path to the management pack might be as follows:

   D:\Program Files (x86)\Microsoft System Center\Service Manager 2012 Authoring\Library\ServiceManager.ChangeManagement.Library.mp.

   Select the management pack, and then click **Open**.
2. In the **Management Pack Explorer**, click the **Service Manager Change Management Library (sealed)** management pack, and then expand **Forms**. Right-click the form that ends with **ChangeRequestForm**, and then click **Customize**.
3. In the **Target Management Pack** dialog box, select the **WoodGrove Automated Activity - Add Computer To AD Group** management pack, and then click **OK**.

   A new form item now appears in the **Automated Activity - Add Computer To AD Group** management pack. The name of the new form is **Microsoft.EnterpriseManagement.ServiceManager.ChangeManagement.Forms.Cha**

ngeRequestForm (Customized).

4. Right-click the new form item, and then click **Customize** to open it in the authoring pane.
5. In the authoring pane, customize the look of the form by dragging fields and rearranging their location on the form.
6. Click **View**, and then click **Form Customization Toolbox**.
7. Drag the **Image** icon from the **Form Customization Toolbox** to the form.
8. In the **Insert Image** dialog box, specify the path of the **Woodgrovebank.jpg** file.
9. Click **File**, and then click **Save All** to save the custom management pack.

See Also

Sample Scenario: The Woodgrove Bank Customization

Step 3: Create the WF Workflow

In this step of the Woodgrove Bank customization scenario, Ken creates the workflow that supports the custom activity for change requests. To design the Windows Workflow Foundation (WF) workflow, Ken considers the following factors:

- **When should the workflow run?** The workflow should start when the applicable change request is approved.
- **What does the workflow need to do?** The workflow needs to add a computer to a group in Active Directory Domain Services (AD DS), and then change the status of the automated activity to "Complete."
- **What information does the workflow need?** The change request provides information about the specific computer and group to use. Properties of the workflow activities can retrieve the change request information from the Service Manager activity that is associated with the change request.

To create and implement his new workflow, Ken follows the steps in the rest of this section. He uses the **Woodgrove.AutomatedActivity.AddComputerToGroupMP** management pack, as described in Step 1: Open the Woodgrove.AutomatedActivity.AddComputerToADGroupMP Management Pack. These procedures assume that this management pack is still open in the System Center 2012 – Service Manager Authoring Tool.

Creating a New Workflow

Ken uses this procedure to create a workflow named **AddComputerToADGroupWF** in the **Woodgrove.AutomatedActivity.AddComputerToADGroupMP** management pack.

To create the new workflow

1. If the Authoring Tool is not open, start the Authoring Tool: On your desktop, click **Start**, click **Service Manager Authoring Tool**, and wait for the Authoring Tool to open.
2. If the **Woodgrove.AutomatedActivity.AddComputerToADGroupMP** management pack is not open, open it: On the **File** menu, point to **Open**, and then click **File**. In the

Open File dialog box, click **Woodgrove.AutomatedActivity.AddComputerToGroupMP.xml**, and then click **Open**.

3. In the **Management Pack Explorer**, right-click **Workflows**, and then click **Create**.
4. On the **General** page of the Create Workflow Wizard, in the **Name** box, type **AddComputerToADGroupWF**, and then click **Next**.
5. On the **Trigger Condition** page, click **Run only when a database object meets specified conditions**, and then click **Next**.
6. On the **Trigger Criteria** page, under **Class name**, click **Browse**.
7. In the **Class Property** dialog box, click **Automated Activity: Add Computer To AD Group**, and then click **OK** to return to the **Trigger Criteria** page.
8. Under **Change event**, in the list, select **When an instance of the class is updated**, and then click **Additional Criteria**.
9. In the **Pick additional criteria** dialog box, click the **Change To** tab, select the **Status** property of **Automated Activity: Add Computer To AD Group** class, and then click **Add**.
10. Under **Criteria**, select **[Activity] Status** equals **In Progress**, and then, in the **Pick additional criteria** dialog box, click **OK**.
11. On the **Trigger Criteria** page of the Create Workflow Wizard, click **Next**.
12. On the **Summary** page, review the settings for the new workflow, and then click **Create**. After the wizard has completed, click **Close**.
13. In the **Management Pack Explorer**, right-click the management pack, and then click **Save**.

For general information about these steps, see How to Create a New Workflow and How to Save and Build a Workflow.

Adding the Workflow Activities

Ken uses this procedure to add the WF activities **Add AD DS Computer to Group** and **Set Activity Status to Completed** to his workflow.

To add WF activities to the workflow

1. In the **Management Pack Explorer**, expand **Workflows**, right-click **AddComputerToADGroupWF**, and then click **Edit**.
2. In the **Activities Toolbox** pane, locate the **Active Directory Activities** group.
3. Drag **Add AD DS Computer to Group** to the authoring pane, and drop it between the Workflow Start and End icons.
4. Drag **Set Activity Status to Completed**, and drop it between the previous activity and the End icon.

For general information about these steps, see How to Add an Activity to a Workflow.

Configuring the Activity Properties

Ken uses this procedure to set the **Computer Name** and **Group Name** properties of the **Add AD DS Computer to Group** activity to retrieve the values of the **Automated Activity: Add Computer To AD Group** properties **Computer Name**, **Group Name**, and **Activity ID** from the change request. In addition, he sets the **Computer Domain name** property of the **Add AD DS Computer to Group** activity to a constant value.

To configure the activity properties

1. In the **Details** pane, click **Computer Name**, click the ellipsis button (**...**), click **Use a class property**, click **ComputerName**, and then click **OK**.
2. In the **Details** pane for the **Add AD DS Computer to Group** activity, click **Group Name**, click the ellipsis button (**...**), click **Use a class property**, click **GroupName**, and then click **OK**.
3. In the **Details** pane, click **Computer Domain name**, and in the text box, type **woodgrove.com**.
4. In the authoring pane, click the **Set Activity Status to Completed** activity.
5. Click **Activity ID**, and click the ellipsis button (**…**) that appears next to the property. On the left side of the dialog box, click **Use a class property**, and then, in the property list, click **ID (Internal)**. Click **OK**.
6. In the **Management Pack Explorer**, right-click the management pack, and then click **Save**.

For general information about these steps, see How to Set an Activity Property to Use a Value from the Trigger Class and How to Set an Activity Property to a Constant Value.

See Also

Sample Scenario: The Woodgrove Bank Customization

Step 4: Move the Assembly Files to the Service Manager Console

In this step of the Woodgrove Bank customization scenario, in System Center 2012 – Service Manager Ken must move the workflow assembly file and the form assembly file to the Service Manager program directory to use the workflow with the Service Manager console.

For general information about deploying a workflow to Service Manager, see How to Deploy a Workflow to Service Manager.

To move the assembly files

1. In Windows Explorer, open the folder in which you saved the management pack, and copy the **AddComputerToADGroupWF.dll** and **AddComputerToGroupFormAssembly.dll** files.
2. Open the Service Manager installation folder (for example, C:\Program Files\Microsoft

System Center\Service Manager 2012), and paste the copied files in that folder.

See Also

Sample Scenario: The Woodgrove Bank Customization

Step 5: Bundle and Import the Custom Management Pack to Service Manager

In this of the Woodgrove Bank customization scenario, Ken needs to bundle the management pack file with all the necessary resource files and then import the bundled file into System Center 2012 – Service Manager. When Service Manager imports a management pack, it validates the XML code in the management pack file and then imports the management pack only if it is valid.

To bundle the management pack file with its associated resource files

1. Ensure that the Woodgrove.AutomatedActivity.AddComputerToGroupMP.xml file and its associated resource files, such as the Woodgrovebank.jpg image file and the AddComputerToGroupFormAssembly.dll file, are in the same folder. For example, put all the files in the AuthoringSample folder.
2. Copy the folder that contains the files to the Service Manager management server.
3. Bundle the files using the Windows PowerShell cmdlet New-SCSMManagementPackBundle. For example:

```
New-SCSMManagementPackBundle –Name AddComputerToGroup.mpb -
ManagementPack
Woodgrove.AutomatedActivity.AddComputerToGroupMP.xml
```

To import the management pack into Service Manager

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Management Packs**.
3. In the **Tasks** pane, under **Management Packs**, click **Import Management Pack**.
4. In the **Select Management Packs to Import** dialog box, select **AddComputerToGroup.mpb**.
5. In the **Import Management Packs** dialog box, click **Add**, click **Import**, and then click **OK**.

See Also

Sample Scenario: The Woodgrove Bank Customization

Step 6: Extend the Change Area Enumeration List

In this step of the Woodgrove Bank customization scenario, Ken extends the **Change Area Enumeration** list by adding a new **Compliance** list item that represents the new change request type.

The following procedure provides only the high-level steps for creating a new list item in the Service Manager console. For the complete procedure for creating a new list item, see How to Add a List Item.

To create a new list item

1. In the Service Manager console, select **Change Area Enumeration** as the list to edit.
2. Specify **Compliance** as the new value to add to this list.

See Also

Sample Scenario: The Woodgrove Bank Customization

Step 7: Create a New Task

When Ken works with a compliance change request, he needs to easily access the Active Directory Users and Computers administrative tool.

In this step of the Woodgrove Bank customization scenario, to make it easy to access the tool, Ken creates a new task, **Start Active Directory Users and Computers**. He saves this task to the **Woodgrove Automated Activity – Add Computer To Group** management pack. He can later use the new task to start the tool.

The following procedure provides only the high-level steps for creating a new task in the Service Manager console. For the complete procedure for creating a new task, see How to Create a Task.

To create a new task

1. In the Service Manager console, specify the task name: **Start Active Directory Users and Computers**.
2. Specify the target class: **Change Request**.
3. Specify the management pack in which to save this customization: **Service Manager Change Management Configuration Library**.
4. Specify the display category for the task: **Change Management Folder Tasks**.
5. Specify the command: **%systemroot%\system32\mmc.exe**.
6. Clear the **Show output when this task is run** check box.

See Also

Sample Scenario: The Woodgrove Bank Customization

Step 8: Create a New View

To continue with the customizations in the Woodgrove Bank scenario, in this step Ken creates the **Compliance Change Requests** view that will display only change requests of the **Compliance** type. Ken saves the new view to the **Service Manager Change Management Configuration Library** management pack. Users can monitor these change requests in the Service Manager console.

Create a new view

1. In the Service Manager console, click **Work Items**.
2. In the **Work Items** pane, expand **Change Management**.
3. In the **Tasks** pane, click **Create View**.
4. In the **General** section of the **Create View** dialog box, type **Compliance Change Requests** in the **Name** box.
5. Select the **Criteria** section.
6. Next to the **Search for objects of a specific class** list, click **Browse**.
7. In the **Select a Class** dialog box, under **Name**, select **Change Request**. In the **Available Properties** list select **Area**, and then click **Add**.
8. At the end of the **Criteria** section, in the **Criteria** definition area, select the **Area** criterion, and in the empty box, set the value to **Compliance**. When the criterion is complete, it resembles **[Change Request] Area equals Compliance**.
9. Click **Display**, and in the **Columns to display** list, select **Status**, **Classification Category**, and **Description**. Then, click **OK**.

See Also

Sample Scenario: The Woodgrove Bank Customization

Step 9: Create a New Change Request Template

In this step of the Woodgrove Bank customization scenario, Ken creates a template for the new compliance change request type; the template is named **Apply AppLocker Software Policy to Computer**. The new template helps ensure consistency among all the change requests of this type, and it helps ensure the correct workflow behavior.

The following procedure provides only the high-level steps for creating a new template in the Service Manager console. For the complete procedure for creating a new template, see How to Create Change Request Templates.

To create a new template

1. In the Service Manager console, specify the following as the name of the template: **Apply AppLocker Software Policy to Computer**.
2. Set the class to **Change Request**.

3. Set the management pack to **WoodGrove Automated Activity: Add Computer to AD Group**.
4. When the change request form is displayed, note the customizations in the form, such as the image that was previously added and the new layout of the fields.
5. On the **General** tab on the form, set **Area** to **Compliance**.
6. On the **Activities** tab, add a review activity named **Review and Approve Adding Computer to Group**, and then set the reviewer to an appropriate user.
7. Add the new activity **Automated Activity: Add Computer AD Group**.
8. Set **Group** to **GP_AUTHAPPS**.
9. Save the template.

See Also

Sample Scenario: The Woodgrove Bank Customization

Step 10: Create a Notification Template and Subscription (Optional)

If System Center 2012 – Service Manager is configured with a Simple Mail Transfer Protocol (SMTP) server, as part of the Woodgrove Bank customization scenario, Ken can configure an email notification that will be sent to him when a new computer is added to the compliance group. This is an optional step.

The following procedure provides only the high-level steps for creating the **Computer Added to AppLocker Policy Notification Template** email notification template and subscription in the Service Manager console. For the complete procedure for creating a notification template, see How to Create Notification Templates.

To create an email notification template and subscription

1. In the Service Manager console, create a new notification email template. In the **Administration** pane, click **Notifications**, and then click **Templates**. In the **Tasks** pane, select **Create E-mail Template**, and then complete the Create E-Mail Notification Template Wizard.
2. On the **General** page, specify the **Name** to be **AppLocker Policy Notification Template**, and specify the **Class** as **Automated Activity: Add Computer to AD Group**. Specify **Management pack** to be **Woodgrove Automated Activity – Add Computer To Group**.
3. On the **Template Design** page, in the **Subject** box, type **Computer**, and then click **Insert**. In the **Property Picker** dialog box, select **ComputerName**. Add the following text to the **Subject** box: **was added to the AppLocker Policy Group**. Add any text in the **MessageBody** box, and save the template.
4. In the **Administration** pane, click **Notifications**, and then click **Subscriptions**. In the **Tasks** pane, click **Create Subscription**, and then complete the Create E-Mail Notification Subscription Wizard.

5. In the **Name** box, type **Computer Added to AppLocker Policy Notification**.
6. In the **Class** box, type **Automated Activity: Add Computer to AD Group**.
7. Specify **Notification condition** to be **When an object of the selected type is updated**.
8. Specify **Management pack** to be **Woodgrove Automated Activity – Add Computer To Group**.
9. On the **Additional Criteria** page, add criteria in which **Status** equals **Completed**.
10. On the **Template** page, specify **E-mail template** to be the previously created template, **Computer added to AppLocker Policy Notification**.
11. On the **Recipient** page, add recipients from your organization.

See Also

Sample Scenario: The Woodgrove Bank Customization

Step 11: Use the New Compliance Change Request Process

In this final step of the Woodgrove Bank customization scenario for System Center 2012 – Service Manager, Ken tests the new change request process and uses all its related customized objects. Ken creates a compliance change request to add the new ADComputer1 computer to the GP_AUTHAPPS group in Active Directory Domain Services (AD DS). Ken follows the process in the Service Manager console as it changes status while progressing from the first activity to the next.

To create a compliance change request

1. Start the Active Directory Users and Groups tool by using the **Start Active Directory Users and Computers** task. Note that it does not contain the **ADComputer1** computer that you are about to add.
2. In the Service Manager console, click **Work Items**, and then in the **Work Items** pane, expand **Change Management**.
3. In the **Tasks** pane, click **Create Change Request**, and then select **Apply AppLocker Software Policy to Computer**. In the Change Request form, note the icon that was previously added.
4. On the **General** tab, in the **Name** box, type **New Compliance Change Request**, and then set **Area** to **Compliance**.
5. Click the **Activities** tab, and in the **Process activities** area, open the **Add Computer to Group** activity.
6. On the **Activity Form** page, in the **Computer name** box, type **ADComputer1**. Click **OK** on the **Activity** form, and then click **OK** on the **Change** form.
7. In the **Change Management** pane, expand **Change Management**, and then click **Compliance Change Requests**. Wait approximately 10 to 20 seconds until the new change request appears in the **Compliance Change Requests View** pane. (You might have to refresh the view).
8. Use the **Start AD Users and Computers** task to start the Active Directory Users and

Computers tool. In the tool, create the **GP_AUTHAPPS** group. (In the previous steps in the scenario, you configured the change request process to add computers to this group.) When the state of the change request changes to **In Progress**, open it, select the **Review Activity: Approve Change Request** activity, and approve it. Then, click **Submit and Close**.

9. Wait approximately 5 to 10 seconds, and notice that the status of the activity changed to **Completed**. Also, notice that the status of the next activity has changed to **In Progress**, which means that the second activity has started to run. The activity rule has been triggered, and the custom workflow has started.

   To check the status of the **AddComputerToADGroupWF** workflow, select **Administration**. In the **Administration** pane, expand **Workflows**, and then select **Status**. In the **Status** pane, click **AddComputerToADGroupWF**.

10. Use the **Start AD Users and Computers** task to start the Active Directory Users and Computers tool, and notice that the **GP_AUTHAPPS** Active Directory group now contains the new **ADComputer1** computer. At this point, any policies that are configured to be applied to computers in this Active Directory group apply to the computer that was added.

    Notice that the status of the automated activity has now also changed to **Completed**, due to the last step in the **AddComputerToADGroupWF** workflow.

11. Start Microsoft Outlook and locate the email notification that was sent to the process manager about the new computer that was added to the Active Directory group.

See Also

Sample Scenario: The Woodgrove Bank Customization

Views Sample Scenario: How to Customize a Column Title in a View

System Center 2012 – Service Manager contains predefined views that you can use to display information and status of various work items and configuration items in the Service Manager console. Views are defined in unsealed management packs, allowing for some customizations of views.

For example, you can use the following procedure to customize a column title of a predefined view to reflect processes that are used in your organization.

Another customization to a view is adding a column to a predefined view. For more information about adding a column to an existing view, see the Editing a View in a Management Pack blog.

To customize a column title in a view

1. Locate and export the management pack that contains the view that you want to customize, as follows:
   a. In the Service Manager console, click **Administration**.
   b. In the **Administration** pane, select **Management Packs**.

c. In the **Management Packs** view, click **Sealed** to sort the column by sealed and unsealed management packs. Select the management pack that contains the view that you want to customize. It must be an unsealed management pack, such as **Service Manager Incident Management Configuration Library**.

d. In the **Tasks** pane, click **Export**.

e. In the **Browse For Folder** dialog box, select a folder to store the exported management pack, and then click **OK**.

2. Open the exported management pack in an XML editor, such as Notepad or Microsoft Visual Studio.

3. Update the management pack, as follows:

a. In the **<LanguagePacks>** section of the file, locate the **DisplayString** for the column that you want to customize.

This example shows the code for the **My Incidents** view:

```
System.WorkItem.Incident.AssignedToMe.View
```

and the code for the **Category** column in that view:

```
System.WorkItem.Incident.AssignedToMe.View.Header_Category
```

and the **DisplayString** for the **Category** column in the **My Incidents** view:

```
<DisplayString
ElementID="System.WorkItem.Incident.AssignedToMe.View.Header_C
ategory">
    <Name>Category</Name>
    <Description>Category</Description>
</DisplayString>
```

b. Replace the column title inside the **<Name></Name>** tags and inside the **<Description></Description>** tags with the custom column title. For example, replace **Category** with **My Organization's Category**.

4. Save the custom management pack.

5. Import the custom management pack in Service Manager:

a. In the **Administration** pane, select **Management Packs**.

b. In the **Tasks** pane, click **Import**.

c. In the **Select Management Pack to Import** dialog box, select a folder in which you stored the custom management pack, and then click **Open**.

d. In the **Import Management Pack** dialog box, click **Import**. Wait for the import to complete, and then click **OK**.

In the Service Manager console, select the view that you customized to see the new column title.

See Also

Authoring for System Center 2012 - Service Manager

Reports Sample Scenario: How to Include Dashboards and Reports in Custom Views

One of the benefits of the System Center 2012 – Service Manager dependency on Microsoft SharePoint, and of including the new Microsoft Online Analytical Processing (OLAP) cubes in the Service Manager box, is that it is very easy to create SharePoint dashboards using PerformancePoint Services in Microsoft SharePoint Server 2010 or Microsoft Excel. You can then create a custom view in Service Manager to display these dashboards.

Use the following procedures to create a custom view to display a SharePoint dashboard from your environment in the Service Manager console. Complete all of the following three procedures, in the order that they appear.

To create the dashboard management pack

1. In the Service Manager console, click **Administration**.
2. In the **Tasks** pane, click **Start PowerShell Session**.
3. In the Windows PowerShell window, type the following, and then press Enter:

   ```
   New-SCManagementPack –DisplayName Dashboards
   ```
4. In the Service Manager console, click **Work Items**. In the **Work Items** pane, right-click **Incident Management**, and then click **Create Folder**.
5. In the **Create new folder** dialog box, type **Dashboards** as the **Folder name**. Select **Dashboards** as the **Management pack**, and then click **OK**.
6. In the Windows PowerShell, type the following two commands:

   ```
   Get-SCManagementPack –DisplayName Dashboards | Export-
   SCManagementPack –Path C:\DashBoards
   ```

   ```
   Get-SCManagementPack –DisplayName Dashboards | Remove-
   SCManagementPack
   ```

To edit the dashboard management pack in Visual Studio

1. Start Microsoft Visual Studio.

   In Visual Studio, click **File**, click **Open**, click **File**, and in the **Open File** dialog box, point to the **C:\DashBoards** folder and open the management pack file that you just exported. The format of the file name is ManagementPack.<GUID>.xml.

   Edit the management pack file in Visual Studio, as described in the next several steps.
2. Locate the **<Assembly>** tag, and replace it with the following code:

   ```
   <Assembly>EnterpriseManagement!WpfViewsAssembly</Assembly>
   ```
3. Replace the current ID with **IncidentDashboards**, as follows:

   Locate the following code block:

   ```
   <Identity>
   ```

```
<ID>ManagementPack.aded6801e732473d80731943d22d33dc</ID>
      <Version>7.5.1088.276</Version>
    </Identity>
```

Within that block, update the **<ID>** block, as follows:

```
<ID>IncidentDashboards</ID>
```

Then, locate the following code block:

```
       <DisplayStrings>
         <DisplayString
ElementID="ManagementPack.aded6801e732473d80731943d22d33dc">
           <Name>Dashboards</Name>
         </DisplayString>
```

Within that block, update the **<DisplayString>** tags as follows:

```
<DisplayString ElementID="IncidentDashboards">
```

4. Select **File Save ManagementPack.<GUID>.xml As**, and in the **Save File As** dialog box, type **C:\DashBoards\IncidentDashboards.xml** as the **File name**.
5. In the **<References>** section, add a reference to the System.Library management pack. The resulting **<References>** section should look as follows:

```
     <References>
       <Reference Alias="EnterpriseManagement">

<ID>Microsoft.EnterpriseManagement.ServiceManager.UI.Console<
/ID>
         <Version>7.5.1088.276</Version>
         <PublicKeyToken>31bf3856ad364e35</PublicKeyToken>
       </Reference>
       <Reference Alias="IncidentManagement">
         <ID>ServiceManager.IncidentManagement.Library</ID>
         <Version>7.5.1088.276</Version>
         <PublicKeyToken>31bf3856ad364e35</PublicKeyToken>
       </Reference>
       <Reference Alias="System">
         <ID>System.Library</ID>
         <Version>7.5.1088.276</Version>
         <PublicKeyToken>31bf3856ad364e35</PublicKeyToken>
```

```
      </Reference>
    </References>
```

Save the updated file.

6. Add a new **PresentationsType** section between the **</Categories>** and the **<Presentation>** sections. The end result of this addition should be as follows:

```
  </Categories>
  <PresentationTypes>
    <ViewTypes>
      <ViewType ID="Dashboard" Accessibility="Public">
        <Configuration>
          <xsd:any minOccurs="0" maxOccurs="unbounded"
processContents="skip"
xmlns:xsd="http://www.w3.org/2001/XMLSchema" />
        </Configuration>
        <ViewImplementation>
          <Assembly>Console!WpfViewsAssembly</Assembly>

<Type>Microsoft.EnterpriseManagement.UI.WpfViews.Overview</Ty
pe>
        </ViewImplementation>
      </ViewType>
    </ViewTypes>
  </PresentationTypes>
  <Presentation>
```

Save the updated file.

7. Add a view declaration by adding the following between the **<Presentation>** and the **<Folders>** tags. The resulting code should look as follows:

```
  <Presentation>
    <Views>
      <View ID="View.IncidentDashboard"
Accessibility="Public" Enabled="true"
Target="System!System.Entity" TypeID="Dashboard"
Visible="true">
        <Category>NotUsed</Category>
```

```
        <Configuration>
          <Presentation>
            <Header />
            <Content>
              <WebBrowser
xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentat
ion" xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
Name="wb1"
Source="http://Dashboards/IncidentDashboard.aspx"/>
            </Content>
          </Presentation>
        </Configuration>
      </View>
    </Views>
    <Folders>
```

Note

Replace the URL in the **Source** attribute with a URL to a dashboard in your environment. This URL should display content that the user's browser can access on the Intranet or on the Internet.

Save the updated file.

8. Add a new **FolderItem** element to the **FolderItems** section. The resulting code should look as follows:

```
    <Folders>
      <Folder ID="Folder.dd2ff258eca54d93a4f10c312df00673"
Accessibility="Public"
ParentFolder="IncidentManagement!ServiceManager.Console.Incid
entManagement" />
    </Folders>
    <FolderItems>
      <FolderItem ElementID="View.IncidentDashboard"
ID="FolderItem.View.IncidentDashboard"
Folder="Folder.dd2ff258eca54d93a4f10c312df00673"/>
      <FolderItem
ElementID="EnterpriseManagement!Microsoft.EnterpriseManagemen
t.ServiceManager.UI.Console.Task.CreateGridView"
ID="FolderItem.695321a1458140e7af75fe3a95888f8e"
```

```
Folder="Folder.dd2ff258eca54d93a4f10c312df00673" />
    </FolderItems>
```

Important

The **Folder ID** is different each time because it is generated by the console when the folder is created. Copy the **ID** attribute from the **<Folder>** element, and paste it as the **Folder** attribute in the **FolderItem** element. Ensure that the values of the **Folder** element **ID** attribute and the **FolderItem** element **Folder** attribute are identical.

Save the updated file.

9. Update **DisplayString** with the **ID** from the previous step. Locate the following code:

```
<DisplayString ElementID="Folder.<ID>”
```

Update it with the **ID** from the previous step. This code should now resemble the following:

```
<DisplayString
ElementID="Folder.dd2ff258eca54d93a4f10c312df00673">
```

10. Add a new **ImageReference** element to the **ImageReferences** section. The resulting code should look as follows:

```
    <ImageReferences>
      <ImageReference ElementID="View.IncidentDashboard"
ImageID="IncidentManagement!IncidentMgmt_AllIncidents_16"/>
      <ImageReference
ElementID="Folder.dd2ff258eca54d93a4f10c312df00673"
ImageID="EnterpriseManagement!Microsoft.EnterpriseManagement.
ServiceManager.UI.Console.Image.Folder" />
    </ImageReferences>
```

Note

This **ImageReference** element points to the default **Incident** icon that is used for the **All Incidents** view in the Service Manager console. You can use a custom image resource instead.

Save the updated file.

11. Add a new **DisplayString** element to the **DisplayStrings** section. The resulting code should look as follows:

```
  <LanguagePacks>
```

```
    <LanguagePack ID="ENU" IsDefault="true">
      <DisplayStrings>
        <DisplayString ElementID="View.IncidentDashboard">
          <Name>Incident Dashboard</Name>
        </DisplayString>
        <DisplayString ElementID="IncidentDashboards">
          <Name>Dashboards</Name>
        </DisplayString>
        <DisplayString
ElementID="Folder.dd2ff258eca54d93a4f10c312df00673">
          <Name>Dashboards</Name>
        </DisplayString>
      </DisplayStrings>
    </LanguagePack>
  </LanguagePacks>
```

Save the updated file.

To display the dashboard in a custom view

1. In the Service Manager Windows PowerShell session, run the following command to validate the IncidentDashboards management pack:

   ```
   Test-SCManagementPack –FullName
   C:\DashBoards\IncidentDashboards.xml
   ```

2. If the validation is successful, import the management pack by running the following command:

   ```
   Import-SCManagementPack –FullName
   C:\DashBoards\IncidentDashboards.xml
   ```

3. Close and then reopen the Service Manager console.
4. Click **Work Items**. In the **Work Items** pane, expand **Incident Management**, and then expand **Dashboards**. Select the **Incident Dashboard** view to view the dashboard from the SharePoint site that is hosted in the Service Manager console.

   Note
   If you are running this procedure in an environment that does not have the Service Manager data warehouse, the dashboard may not display actual data.

Disaster Recovery Guide for System Center 2012 - Service Manager

A recovery plan for potential software and equipment failures in your System Center 2012 – Service Manager environment requires a deployment strategy that separates the Service Manager and data warehouse management servers from the computers that host their respective databases. During installation, you must back up the encryption keys on all the management servers, both the Service Manager management server and data warehouse management servers.

Note

The encryption keys on the Service Manager management server and data warehouse management server are different and each must be backed up.

You must also back up the Service Manager databases and your unsealed management packs.

Disaster recovery topics

- Disaster Recovery Scenarios Overview

  Provides an overview of the potential disaster recovery scenarios that are presented in this guide.
- Prepare for Service Manager Disaster Recovery

  Describes the steps you can take to prepare for potential disaster recovery.
- Implement Service Manager Disaster Recovery

  Describes the steps you can take to implement disaster recovery procedures if problems arise.

Downloadable Documentation

You can download a copy of this technical documentation from the Microsoft Download Center. Always use the TechNet library for the most up-to-date information.

Disaster Recovery Scenarios Overview

This topic provides an overview of the disaster recovery processes for each of the major parts of a System Center 2012 – Service Manager installation:

1. Service Manager Management Server
2. Data Warehouse Management Server
3. Service Manager Databases

Service Manager Management Server

You can take two approaches to restoring a failed Service Manager management server. You can replace the management server, or you can promote an additional management server to the primary role if an additional management server exists. The option of replacing the management server or promoting it depends largely on your time frame. If you can bring up another computer quickly, you might choose that option. Otherwise, you can promote an additional management server to the primary role and then add another management server later.

Promoting an additional management server involves the following procedures:

1. Promote an additional Service Manager management server. For more information, see How to Promote a Service Manager Management Server in this guide.
2. When a replacement server is available, install an additional Service Manager management server. For more information, see "How to Install an Additional Management Server" in the Deployment Guide for Service Manager for System Center 2012.

If promoting an additional Service Manager management server is not an option, you have to install a replacement management server. Installing a replacement Service Manager management server involves the following procedures:

1. Start with a new computer that has the same computer name as the computer that failed.
2. Restore the encryption key that you saved from the original Service Manager management server. For more information, see How to Restore the Service Manager Encryption Key in this guide.
3. Install a Service Manager management server. For more information, see "Service Manager for System Center 2012 Deployment Scenarios" in the Deployment Guide for Service Manager for System Center 2012.

Data Warehouse Management Server

Only one recovery scenario is possible for the data warehouse management server: you must install a new data warehouse management server on a computer with the same computer name as the computer that failed. Installing a replacement data warehouse management server involves the following procedures:

1. Start with a new computer that has the same computer name as the computer that failed.
2. Restore the encryption key that you saved from the original data warehouse management server. For more information, see How to Restore the Service Manager Encryption Key in this guide.
3. Install a data warehouse management server. For more information, see "Service Manager for System Center 2012 Deployment Scenarios" in the Deployment Guide for Service Manager for System Center 2012.

Service Manager Databases

Recovery procedures are the same for both the Service Manager database and the data warehouse database. You use a computer with the same name, and then you restore the

Microsoft SQL Server databases using the same instance as the original. Recovery of a Service Manager database and a data warehouse database involves the following procedures:

1. Start with a new computer with the same computer name and with the same SQL Server instance as the computer that failed.
2. Restore the SQL Server database or databases using the same instance name as the original. For more information, see Database Recovery in Service Manager in this guide.

Prepare for Service Manager Disaster Recovery

This section describes the steps that you must take for System Center 2012 – Service Manager disaster recovery before problems occur. The steps that you take to recover from a disaster are based on completion of the steps that are outlined here. In general, preparing your Service Manager environment for disaster recovery involves the following:

1. Deploying Service Manager with management servers and databases on separate computers.
2. Backing up the encryption keys on the Service Manager and data warehouse management servers.
3. Backing up the SQL databases.
4. Backing up your unsealed management packs.

In This Section

Deployment Strategy for Service Manager

Describes the deployment strategy that you must use to prepare for disaster recovery.

Backing Up Service Manager Management Servers

Describes the steps that you must take to back up Service Manager management servers.

Backing Up Service Manager Databases

Describes the steps that you must take to back up Service Manager databases.

Backing Up Unsealed Management Packs in Service Manager

Describes the steps that you must take to back up unsealed management packs.

Deployment Strategy for Service Manager

As a best practice, deploy your management servers and associated databases for System Center 2012 – Service Manager on separate computers. Isolating the management servers and databases provides for a successful disaster recovery operation in the event of potential software and equipment failures.

You must have a functioning database to restore a failed management server. Recovery of a management server is impossible if the management server and the associated database are on the same physical computer and that computer fails. For more information, see "Installing Service Manager on Four Computers" in the Deployment Guide for System Center 2012 - Service Manager.

Backing Up Service Manager Management Servers

When you deploy System Center 2012 – Service Manager, an encryption key is created and stored in the registry on the management servers. A matching encryption key is created in the associated databases. The encryption keys for the Service Manager and data warehouse management servers are stored in the Service Manager database. The matching encryption key for the data warehouse management server is stored in the DWStagingAndConfig database. By backing up the SQL Server databases, you back up the encryption key.

In addition, the computer name of the management server and Self-Service Portal is stored in the associated databases. Regardless of whether you encounter a software or hardware failure of a management server or Self-Service Portal, your recovery process is based on restoring a computer that has the same computer name as the computer that failed.

The steps for recovering from a management server failure are as follows:

1. Restore the encryption keys before you run Setup, and install the new management servers.
2. Install the new management server on a computer that has the same name as the original computer.
3. When you install the management server, select **Use an existing database**, and then specify the name of the computer that hosts the associated database.

For more information about these steps, see the topic Management Server Disaster Recovery in Service Manager in this guide.

In This Section

How to Back Up the Encryption Key in Service Manager

Describes how to back up the Service Manager encryption key.

How to Back Up the Encryption Key in Service Manager

Your disaster recovery strategy for System Center 2012 – Service Manager depends on backing up the encryption keys as soon as you complete the Service Manager installation. After you back up the encryption keys and store them in a safe location, you can recover from software or hardware failures on the Service Manager and data warehouse management servers.

You use the Encryption Key Backup or Restore Wizard to back up encryption keys on the management servers and Self-Service Portal. This wizard is located on the Service Manager installation media in the Tools\SecureStorageBackup folder.

To back up the encryption key

1. Log on to the computer that hosts the Service Manager management server of data warehouse management server by using an account that is a member of the Administrators group.
2. In Windows Explorer, open the Tools\SecureStorageBackup folder on the installation media.
3. Right-click **SecureStorageBackup.exe** then click **Run as administrator** to start the Encryption Key Backup or Restore Wizard.
4. On the **Introduction** page, click **Next**.
5. On the **Backup or Restore?** page, select **Backup the Encryption Key**, and then click **Next**.
6. On the **Provide a Location** page, type the path and file name for the encryption key. For example, if you want to specify the file name SMBackupkey.bin for the encryption key on the MyServer server in the Backup shared folder, type **\\MyServer\Backup\SMBackupkey.bin**, and then click **Next**.
7. On the **Provide a Password** page, in the **Password** box type a password that contains at least eight characters. In the **Confirm Password** box, retype the same password, and then click **Next**.

   Important
   Recovery of the password is not possible if the password is lost or forgotten.
8. After you see the message “Secure Storage Backup Complete,” click **Finish**.

Backing Up Service Manager Databases

There are up to eight databases in a System Center 2012 – Service Manager environment:

- ServiceManager
- DWDataMart
- DWRepository
- DWStagingAndConfig
- ReportServer

- Analyst
- OMDWDataMart
- CMDWDataMart

The first four databases in this list need to connect and exchange data with the Service Manager and data warehouse management servers. Data is encrypted during these exchanges. On the management servers, the encryption keys are backed up and restored as necessary, as explained in this guide. For more information about the encryption keys on the management servers, see Backing Up Service Manager Management Servers. For the servers that host databases, the encryption keys are stored in the databases themselves.

If a computer that hosts a database fails, all you need for recovery is the ability to restore the databases, which include the encryption keys, to a computer with the same name as the original computer. Your disaster recovery strategy for the Service Manager databases should be based on procedures for general SQL Server 2008 disaster recovery. For more information, see SQL Server 2008 R2 Books Online: Planning for Disaster Recovery.

As part of your disaster recovery preparation, you run a script to capture the Security log to preserve user role information for each database. After you deploy Service Manager and, if necessary, run the Data Warehouse Registration Wizard, you use the SQL Server Script Wizard to create a script that captures SQL Server logon permissions and object-level permissions. Then, if you need to restore a new server for the Service Manager databases, you can use this script to recreate the necessary logon permissions and object-level permissions. The wizard that is used to generate scripts in SQL Server 2008 differs from the wizard in SQL Server 2008 R2. Instructions for both the SQL Server 2008 wizard and the SQL Server 2008 R2 wizard are presented in this guide.

Enable Common Language Runtime on SQL Server

During installation of the Service Manager database, Service Manager Setup enables common language runtime (CLR) on the computer that is running SQL Server. If you restore a Service Manager database to another computer running SQL Server, you must enable CLR manually. For more information, see Enabling CLR Integration.

In This Section

How to Start the SQL Server 2008 Script Wizard

Describes how to generate a script to capture SQL Server 2008 logon permissions and object-level permissions.

How to Start the SQL Server 2008 R2 Script Wizard

Describes how to generate a script to capture SQL Server 2008 R2 logon permissions and object-level permissions.

How to Start the SQL Server 2008 Script Wizard

You can use the following procedure as part of your disaster recovery preparation steps for System Center 2012 – Service Manager to generate a script to capture SQL Server logon permissions and object-level permissions. You perform this procedure on the computer that hosts SQL Server Reporting Services (SSRS) and on the computers that host the following Service Manager and data warehouse databases:

- DWDataMart
- DWRepository
- DWStagingAndConfig
- ServiceManager
- ReportServer

To start the SQL Server Script Wizard

1. Using an account with Administrator privileges, log on to the computer that hosts the Service Manager or data warehouse database.
2. On the Windows desktop, click **Start**, point to **Programs**, point to **Microsoft SQL Server 2008**, and then click **SQL Server Management Studio**.
3. In the **Connect to Server** dialog box, do the following:
   a. In the **Server Type** list, select **Database Engine**.
   b. In the **Server Name** list, select the server and the instance for your Server Manager database. For example, select **computer\INSTANCE1**.
   c. In the **Authentication** list, select **Windows Authentication**, and then click **Connect**.
4. In the **Object Explorer** pane, expand **Databases**.
5. Right-click the database name, point to **Tasks**, and then click **Generate Scripts**. For this example, right-click **ServiceManager**, point to **Tasks**, and then click **Generate Scripts**.
6. In the **Script Wizard** dialog box, do the following:
   a. On the **Welcome to the Generate SQL Server Scripts Wizard** page, click **Next**.
   b. On the **Select Database** page, select the database for which you are generating the script. In this example, select **ServiceManager**, and then click **Next**.
   c. On the **Choose Script Options** page, set all True/False entries to **False**. In the **General** area, set **Script Logins** and **Script Object-Level Permissions** to **True**, and then click **Next**.
   d. On the **Choose Object Types** page, click **Select All**, and then click **Next**.
   e. On the **Choose Assemblies** page, click **Select All**, and then click **Next**.
   f. On the **Choose Database Roles** page, click **Select All**, and then click **Next**.
   g. On the **Choose Schemas** page, click **Select All**, and then click **Next**.
   h. On the **Choose Stored Procedures** page, click **Select All**, and then click **Next**.
   i. On the **Choose Tables** page, click **Select All**, and then click **Next**.
   j. On the **Choose User-Defined Table Types** page, click **Select All**, and then click **Next**.

k. On the **Choose User-Defined Functions** page, click **Select All**, and then click **Next**.

l. On the **Choose Users** page, click **Select All**, and then click **Next**.

m. On the **Choose Views** page, click **Select All**, and then click **Next**.

n. On the **Choose XML Schema Collections** page, click **Select All**, and then click **Next**.

o. On the **Choose full text catalogs** page, click **Select All**, and then click **Next**.

p. On the **Output Option** page, select **Script to file**, and in **File name**, type a location and file name for the script (for example, type **C:\Backup\ServiceManagerDatabaseScript.sql**), and then click **Next**.

q. On the **Script Wizard Summary** page, click **Finish**.

r. On the **Generate Script Progress** page, make sure that **Success** appears, and then click **Close**.

7. Save the script file that you just created on a separate physical computer, usually at the same location where you are saving your Service Manager encryption keys.
8. Run this same procedure on each of the three data warehouse databases and SSRS.
9. If you need to restore a database, use these scripts to restore permissions to the new server.

How to Start the SQL Server 2008 R2 Script Wizard

You can use the following procedure as part of your disaster recovery preparation steps for System Center 2012 – Service Manager to generate a script to capture SQL Server logon permissions and object-level permissions. You perform this procedure on the computer that hosts SQL Server Reporting Services (SSRS) and on the computers that host the following Service Manager and data warehouse databases:

- DWDataMart
- DWRepository
- DWStagingAndConfig
- ServiceManager
- ReportServer

To start the SQL Server Script Wizard

1. Using an account with Administrator privileges, log on to the computer that hosts the Service Manager or data warehouse database.
2. On the Windows desktop, click **Start**, point to **Programs**, point to **Microsoft SQL Server 2008 R2**, and then click **SQL Server Management Studio**.
3. In the **Connect to Server** dialog box, do the following:
   a. In the **Server Type** list, select **Database Engine**.
   b. In the **Server Name** list, select the server and the instance for your Service Manager database. For example, select **computer\INSTANCE1**.

c. In the **Authentication** list, select **Windows Authentication**, and then click **Connect**.

4. In the **Object Explorer** pane, expand **Databases**.
5. Right-click the database name, point to **Tasks**, and then click **Generate Scripts**. For this example, right-click **ServiceManager**, point to **Tasks**, and then click **Generate Scripts**.
6. In the Generate and Publish Scripts Wizard, do the following:
   a. On the **Introduction** page, click **Next**.
   b. On the **Choose Objects** page, select **Select specific database objects**, and then click **Select All**.
   c. In the database objects list, expand **Tables**.
   d. Clear the check box for the following tables:
      - **dbo.STG_Collation**
      - **dbo.STG_Locale**
      - **dbo.STG_MTD_ConverisonLog**
   e. Scroll up to the top of the list, and then collapse **Tables**.
   f. Expand **Stored Procedures**.
   g. Clear the check box for the following stored procedures:
      - **dbo.STG_DTS_ConvertToUnicode**
      - **dbo.STG_DTS_CreateClonedTable**
      - **dbo.STG_DTS_InsertSQL**
      - **dbo.STG_DTS_ValidateConversion**
   h. Click **Next**.
   i. On the **Set Scripting Options** page, select **Save scripts**, select **Save to file**, select **Single file**, specify a file location in **File name**, and then click **Next**.
   j. On the **Summary** page, click **Next**.
   k. When the script is complete, on the **Save or Publish Scripts** page, click **Finish**.
7. If you need to restore a database, use this script to set permissions.

Backing Up Unsealed Management Packs in Service Manager

Part of the disaster recovery plan for your System Center 2012 – Service Manager management server involves backing up your unsealed management packs. The following procedure describes how to back up your unsealed management packs.

In This Section

How to Back Up Unsealed Management Packs

Describes how to back up your unsealed management packs.

How to Back Up Unsealed Management Packs

You can use the Windows PowerShell command-line interface to identify and copy your unsealed management packs to a folder on your hard disk drive. After you copy them, save these management packs so that—as part of your disaster recovery plan for System Center 2012 – Service Manager—you can later import these management packs.

To back up unsealed management packs

1. On the computer that hosts the Service Manager management server, create a folder on the hard disk drive where you will store the backup copy of the management packs. For example, create the folder C:\mpbackup.
2. On the Windows desktop, click **Start**, point to **Programs**, point to **Windows PowerShell 1.0**, right-click **Windows PowerShell**, and then click **Run as administrator**.
3. In the Service Manager console, click **Administration**.
4. In the **Tasks** pane, click **Start PowerShell Session**
5. At the Windows PowerShell command prompt, type the following command:

```
Get-SCSMManagementPack | where {$_.Sealed -eq $false}|Export-
SCSMManagementPack -Path c:\mpbackup
```

6. Save the unsealed management packs on a separate physical computer.

Implement Service Manager Disaster Recovery

This section of the Disaster Recovery Guide for System Center 2012 – Service Manager describes the steps for recovering from potential software and equipment failures in your System Center 2012 – Service Manager environment. It includes information about how to recover Service Manager databases, management servers, and unsealed management packs.

In This Section

Database Recovery in Service Manager

Describes the steps that you can take to recover Service Manager databases.

Management Server Disaster Recovery in Service Manager

Describes the steps that you can take to recover Service Manager management servers.

Import Unsealed Management Packs in Service Manager

Describes the steps that you can take to import unsealed management packs.

Database Recovery in Service Manager

To restore a database (which includes the encryption keys) for System Center 2012 – Service Manager, you rebuild a new computer using the same computer names and instance names as the original. Your disaster recovery strategy for the Service Manager databases should be based on general procedures for SQL Server 2008 disaster recovery. For more information, see SQL Server 2008 R2 Books Online: Planning for Disaster Recovery. Remember that if you restore a database, you must give the new computer the same name as the original computer and use the same instance name as the original instance.

In addition, you must use the script that you created in the Backing Up Unsealed Management Packs in Service Manager section in this guide. You use this script to restore permissions for the recreated database.

Warning

Long-term historical data is stored in the Service Manager data warehouse and the current snapshot of the system is stored in the Service Manager database. Recreating the Service Manager data warehouse databases should only be used as a measure of last resort. When possible, you should try to restore the Service Manager data warehouse databases from backups and avoid recreating those databases. If reinstalled, the newly created Service Manager data warehouse databases will be able to synchronize the current snapshot of the system from the Service Manager database—however, historical data will be lost.

Management Server Disaster Recovery in Service Manager

This section describes how to recover a System Center 2012 – Service Manager management server or a data warehouse management server. If you installed additional Service Manager management servers, you have the option of promoting an additional Service Manager management server. Regardless of whether you encounter software or hardware failures of the Service Manager management server, your recovery process is based on restoring a computer that has the same computer name.

For either management server, your first step must be to restore the encryption key *before* you start the management server setup.

In This Section

How to Restore the Service Manager Encryption Key

Describes how to restore the Service Manager encryption key.

How to Recover a Service Manager Management Server

Describes how to recover a Service Manager management server.

How to Recover a Data Warehouse Management Server

Describes how to recover a data warehouse management server.

How to Promote a Service Manager Management Server

Describes how to promote a secondary Service Manager management server.

How to Restore the Service Manager Encryption Key

You can use the following procedure to restore the encryption keys before you run Setup.exe to restore a part of System Center 2012 – Service Manager.

To restore the encryption key

1. Log on to the computer that will host the Service Manager part that you are attempting to recover by using an account that is a member of the Administrators group. For example, log on to the computer that will host the Service Manager or data warehouse management servers.
2. In Windows Explorer, open the Tools\SecureStorageBackup folder on the installation media.
3. Right-click **SecureStorageBackup.exe** then click **Run as administrator** to start the Encryption Key Backup or Restore Wizard.

   Note
   In this release, the wizard contains references to “Operations Manager.” This issue will be resolved in a future release.
4. On the **Introduction** page, click **Next**.
5. On the **Backup or Restore?** page, select **Restore the Encryption Key**, and then click **Next**.
6. On the **Provide a Location** page, type the path and file name for the encryption key. For example, if you want to specify the file name SMBackupkey.bin for the encryption key on the server MyServer in the Backup shared folder, type **\\MyServer\Backup\SMBackupkey.bin**, and then click **Next**.
7. On the **Provide a Password** page, type the password that you used to back up the encryption key in the **Password** box. In the **Confirm Password** box, reenter the same password, and then click **Next**.

8. After you receive the message, “Secure Storage Key Restore Complete,” click **Finish**.

How to Recover a Service Manager Management Server

You can use the following procedure to reinstall a management server in System Center 2012 – Service Manager.

Note

You must restore the encryption key before starting this procedure. For more information, see How to Restore the Service Manager Encryption Key.

To recover a Service Manager management server

1. Log on to the computer that will host the new Service Manager management server using an account that has administrator rights.
2. On the Service Manager installation media, double-click the **Setup.exe** file.
3. On the **Service Manager Setup Wizard** page, click **Service Manager management server**.
4. On the **Product registration** page, type the information in the text boxes. If applicable, click **I have read, understood, and agree with the terms of the license agreement**, and then click **Next**.
5. On the **Installation location** page, verify that sufficient free disk space is available, and then click **Next**. If necessary, click **Browse** to change the location in which you want to install the Service Manager management server.
6. On the **System check results** page, make sure that the prerequisite check passed or at least passed with warnings, and then click **Next**.
7. On the **Configure the Service Manager database** page, do the following:
   a. In **Database server**, type the name of the computer that is hosting the Service Manager database, and then press the TAB key.
   b. Select **Use an existing database**.
   c. Click the **Database** list, select the database name for the Service Manager database (the default name is **ServiceManager**), and then click **Next**.
8. On the **Configure the Service Manager management group**, wait until the **Management group name** and **Management group administrators** fields have been populated. Then, click **Next**.
9. On the **Configure the account for Service Manager services** page, click **Domain account**; specify the user name, password, and domain for the account; and then click **Test Credentials**. Make sure that you receive the following message: "The credentials were accepted." and then click **Next**.
10. On the **Help improve System Center** page, indicate your preference for participation in both the Customer Experience Improvement Program and Error Reporting. For more information, click **Tell me more about the program**, and then click **Next**.

11. On the **Installation summary** page, click **Install**.
12. On the **Setup completed successfully** page, click **Close**.

How to Recover a Data Warehouse Management Server

You can use the following procedure to reinstall a data warehouse management server for System Center 2012 – Service Manager.

Note
You must restore the encryption key before starting this procedure. For more information, see How to Restore the Service Manager Encryption Key.

To recover a data warehouse management server

1. Log on to the computer that will host the new data warehouse management server using an account that has administrator rights.
2. On the Service Manager installation media, double-click the **Setup.exe** file.
3. On the **Service Manager Setup Wizard** page, click **Service Manager data warehouse management server**.
4. On the **Product registration** page, type the information in the boxes. If applicable, click **I have read, understood, and agree with the terms of the license agreement**, and then click **Next**.
5. On the **Installation location** page, verify that sufficient free disk space is available, and then click **Next**. If necessary, click **Browse** to change the location in which you want to install the Service Manager data warehouse management server.
6. On the **System check results** page, make sure that the prerequisite check passed or at least passed with warnings, and then click **Next**.
7. On the **Configure the data warehouse database** page, do the following:
   a. In the **Select a database to change its default properties** area, select **Staging and Configuration**.
   b. In **Database server**, type the name of the computer that is hosting data warehouse databases, and then press the TAB key.
   c. Select **Use an existing database**.
   d. Click the **Database** list, select the database name for the Staging and Configuration database (the default name is **DWStagingAndConfig**), and then click **Next**.
8. On the **Configure the data warehouse management group** page, wait until the **Management group name** and **Management group administrators** fields have been populated, and then click **Next**.
9. On the **Configure the reporting server for the data warehouse** page, in the **Report server** text box, type the computer name of the computer that hosts SQL Server Reporting Services (SSRS), and then click **Next**.

   Note

You must use the original URL for the Reporting Server.

10. On the **Configure the account for Service Manager services** page, click **Domain account**; specify the user name, password, and domain for the account; and then click **Test Credentials**. Make sure that you receive the following message: "The credentials were accepted.", and then click **Next**.
11. On the **Configure the reporting account** page, specify the user name, password, and domain for the account, and then click **Test Credentials**. After you receive a “The credentials were accepted” message, click **Next**.
12. On the **Help improve System Center** page, indicate your preference for participation in both the Customer Experience Improvement Program and Error Reporting. For more information, click **Tell me more about the program**, and then click **Next**.
13. On the **Use Microsoft Update to help keep your computer secure and up-to-date** page, indicate your preference for using Microsoft Update to check for Service Manager updates, and then click **Next**.
14. On the **Installation summary** page, click **Install**.
15. On the **Setup completed successfully** page, click **Close**.

How to Promote a Service Manager Management Server

When you first ran Setup for System Center 2012 – Service Manager, you installed the initial Service Manager management server and you defined the management group for your installation. The initial management server handles all the workflows in your Service Manager environment. You can use additional Service Manager management servers to load-balance Service Manager console connections. Also, you can promote one of the additional Service Manager management servers to take over the role of a failed initial Service Manager management server. For more information, see "Deploying Additional Service Manager Management Servers" in the Deployment Guide for System Center 2012 - Service Manager

You can use the following procedures to promote a secondary Service Manager management server.

To prepare the secondary management server

1. On the secondary management server, close the Service Manager console.
2. On the Windows desktop, click **Start**, and then click **Run**.
3. In the **Run** dialog box, in the **Open** text field, type **services.msc**, and then click **OK**.
4. In the **Services** window, in the **Services (Local)** pane, locate the following three services, and for each one click **Stop**:
   - System Center Data Access Service
   - System Center Management

     Note
     For System Center 2012 R2 Service Manager, the System Center

Management service was renamed to Microsoft Monitoring Agent.

- System Center Management Configuration

5. Leave the **Services** window open.
6. Open Windows Explorer. Locate the folder \Program Files\Microsoft System Center 2012\Service Manager.
7. In this folder, delete the Health Service State folder and all of its contents.

To define the computer name for the Service Manager database

1. On the Service Manager database, on the Windows desktop, click **Start**, point to **Programs**, point to **Microsoft SQL Server 2008**, and then click **SQL Server Management Studio**.
2. In the **Connect to Database Engine** dialog box, do the following:
   a. In **Server name**, type the name of the server that hosts the Service Manager database.
   b. In **Authentication**, select **Windows Authentication**.
   c. Click **Connect**.
3. In the **Object Explorer** pane, expand **Databases**, and then click **ServiceManager**.
4. On the toolbar, click **New Query**.
5. In the **SQLQuery1.sql** pane (the center pane), type the following, where <FQDN of your server> is the fully qualified domain name (FQDN) of the management server that you are promoting:

```
EXEC p_PromoteActiveWorkflowServer '<FQDN of your server>'
```

6. On the toolbar, click **Execute**.
7. At the bottom of the **SQLQuery1.sql** pane (the center pane), confirm that the “Query executed successfully” message appears.
8. Exit Microsoft SQL Server Management Studio.

To restart the services on the secondary management server

1. On the secondary management server, on the Windows desktop, click **Start**, and then click **Run**.
2. In the **Run** dialog box, in **Open**, type **services.msc**, and then click **OK**.
3. In the **Services** window, in the **Services (Local)** pane, locate the following three services, and for each one click **Start**.
   - System Center Data Access Service
   - System Center Management

     Note
     For System Center 2012 R2 Service Manager, the System Center Management service was renamed to Microsoft Monitoring Agent.

   - System Center Management Configuration

Your secondary management server is now the primary management server for the management group.

Import Unsealed Management Packs in Service Manager

After you have restored your System Center 2012 – Service Manager management server, the next step is to import unsealed management packs.

In This Section

How to Import Management Packs

Describes how to import your backup copy of unsealed management packs.

How to Import Management Packs

You can use this procedure to import the unsealed management packs that you saved earlier as part of your disaster recovery procedures for System Center 2012 – Service Manager.

To import management packs

1. In the Service Manager console, click **Administration**.
2. In the **Administration** pane, expand **Administration**, and then click **Management Packs**.
3. In the **Tasks** pane, under **Management Packs**, click **Import**.
4. In the **Select Management Packs to Import** window, under **Favorite Links**, specify the location where you backed up your unsealed management packs, select the files, and then click **Open**.
5. In the **Import Management Pack** window, click **Import**.

Glossary for System Center 2012 – Service Manager

Term	Definition
action log	A record of the actions that have been taken during the lifetime of an incident to resolve the incident. Examples include comments by the analyst, communications from the user, attachments, and task outputs.
activity	A unit of work that is performed as part of managing a problem, resolving an incident, or completing a change request or any other work item.
activity implementer	A user who has been assigned the Activity Implementer role and who implements an assigned manual activity.
automated activity	An activity that is automatically completed by Service Manager.
business hours	Working hours and holiday hours that are defined in a calendar.
business service	A collection of features and functions that enable a business process, including configuration items, metadata, and the people associated with the process.
change creator	The user who creates a new change request.
change manager	A user who coordinates change requests. Some of the tasks include adding or removing activities, voting on behalf of the change advisory board, overriding votes, or putting change requests on hold.
change request	A means of proposing a change to any component of an IT infrastructure or any aspect of an IT Service. It may be a document or record in which the nature and details of and the justification and authorization for the proposed change are entered.
child record	A work item that is subordinate to a parent.
class	A named descriptor for a set of objects that share the same attributes, operations, methods, relationships, and behaviors.

Term	Definition
classification	The placement of an incident into a hierarchy of descriptors that indicate what the incident is generally about. For example, an incident could be classified as being related to software, and then to Microsoft, and then to Word 2003.
combination class	A feature in Service Manager that is used mostly in reports and in views to display information from multiple classes that are defined in Service Manager.
configuration item	Any component that needs to be managed to deliver a service. In Service Manager, configuration items might include services, hardware, software, buildings, people, and formal documentation, such as process documentation and service level agreements (SLA).
configuration item class	A collection of configuration items. Groups can contain members of different configuration items classes (for example, a computer and a user).
connector	A software component that is the integration mechanism between Service Manager and an external system. It is used for data transfers from these external systems to Service Manager.
dependent change management activity	A change management activity that is used to link change requests to a release record.
DWDataMart database	The database that includes the reporting data, stored for the long-term.
DWRepository database	The database that includes the transformed data from the DWStagingAndConfig database.
DWStagingAndConfig database	The database that includes copies of management packs, configuration items, and work items.
extraction, transformation, and loading	The act of extracting data from various sources, transforming data to consistent types, and loading the transformed data for use by

Term	Definition
	applications.
filtered view	A view to which a set of conditions have been applied to reduce the total number of displayed objects.
groom	To permanently remove data from the data warehouse.
history	A record of all the changes to an object’s properties and relationships. History exists for all objects, such as configuration items and work items."
incident	A way of tracking any event that is not part of the standard operation of a service and that causes, or may cause, an interruption to, or a reduction in, the quality of that service.
knowledge	Information that can help an end-user or analyst solve a problem.
list	An administrator-defined customization that enables users to classify objects such as incidents, change requests, activities, or configuration items. For example, a list might be "Location" or "Organization."
list item	An option that constrains the values that users can enter for a specific list. For example, "Redmond" might be a list item for "Location."
management pack	A grouping of classes, workflows, views, forms, reports, and knowledge that extends Service Manager with the information necessary to implement all or part of a service management process. For example, the Incident management pack provides the necessary information to enable Service Manager to implement the incident management process.
notification subscriber	The user who receives notifications.
notification subscriber address	A package that contains information about how to reach a particular user. It includes items such as the protocol to use and the target address.

Term	Definition
notification subscription	A package that contains the notification subscriber, the notification subscriber address, and any additional information, such as when to send specific types of notifications
parent record	The highest-level container of one or more work items that includes new and changed configuration items.
problem management	The process by which the root cause of one or more incidents is identified and by which a workaround or a permanent fix is found.
problem record	A record that tracks the identification, investigation, and resolution of a root cause.
queue	A holding container for work items. Members of a queue must be of the same work item class (for example, only incidents).
recurring notification	A repeating type of notification that is based on a specified time interval.
release activity	A type of activity that is part of a release record, including dependent, manual, parallel, review, and sequential activities.
review activity	A step in a review process in which users approve or deny change requests.
reviewer	The user who completes an approval activity.
role-based security	A method of limiting access to the Service Manager console.
runbook	The sequence of activities that orchestrate actions on computers and networks.
Self-Service Portal	A Web interface that is configured by an administrator so that end users can search knowledge, create requests, and read IT announcements.
service catalog	The list of published service offerings.
service component	The set of configuration items that are used to deliver a business service, such as computers, Web sites, databases, and other application

Term	Definition
	components.
service dependent	The person or service in an enterprise that relies on a business service. These people and services are affected by the output and downtime of the business service.
Service Manager console	The console that is used by help desk analysts and administrators for help desk functions such as change, incident, problem, and configuration management.
Service Manager data warehouse management server	The Service Manager management server that performs the management functions for the data warehouse.
Service Manager database	A database that includes all the work items, configuration items, and administrative settings for the product.
Service Manager IT portal	A Web interface designed for information technology (IT) managers and IT professionals so that they can view and manage incidents, changes, and assets. It can also be used to examine metrics and reports.
Service Manager management server	The server that hosts the System Center Data Access Service service and Microsoft Office SharePoint sites.
Service Manager reporting server	The server that hosts Microsoft SQL Server Reporting Services (SSRS).
service map	A representation of a service from the perspective of the business and user that shows critical dependencies, settings, and areas of responsibility.
service offering	The item or work effort that is available to customers through the Self-Service Portal in the service catalog.
service request	A work item that is used to request an existing IT service that is being offered.
service request fulfillment	The process for managing service requests.
SLA	An industry-wide term that is detailed in the

Term	Definition
	Microsoft Operations Framework (MOF) and Information Technology Infrastructure Library (ITIL). Microsoft Solutions Framework (MSF) definition: An agreement between an IT organization and the user community that defines the responsibilities of all participating parties and that binds IT management to provide a particular service of a specific agreed-on quality and quantity. An SLA limits the demands that users may place on the service to the limits that are defined by the agreement.
SLA metric	A calculated time interval that Service Manager determines between the date and time fields in incidents and service requests. For example, the SLA metric “resolution time” is defined as the difference between the Incident Created Date and the Incident Resolved Date.
SLA target	The specified duration of time in which the IT organization must respond to or resolve an incident or service request.
SQL Server Analysis Services cube	(Analysis Services cube for short.) A conceptual view, consisting of descriptive categories (dimensions) and quantitative values (measures). The generic industry term is "OLAP data cube."
task	An action that a user accomplishes by using the Actions pane and the context-sensitive menu that affects non-Service Manager objects.
Tasks pane	A pane in the Service Manager console that contains tasks that a user can perform.
template	A method that is used to populate initial values in a class, such as a change request or incident.
user role	A method of granting permissions to specific users for groups of data. These permissions are based on a user role profile.

Term	Definition
user role profile	A set of permitted operations and classes of data that users need access to so they can perform specific job duties.
workflow	A sequence of activities, actions, or tasks through which documents or items are passed as part of an automated business process.

Privacy Statement for System Center 2012 - Service Manager

Microsoft is committed to protecting your privacy, while delivering software that brings you the performance, power, and convenience you desire in your personal computing. This privacy statement explains many of the data collection and use practices of Microsoft System Center 2012 Service Manager, including the Service Manager Authoring Tool ("Service Manager" collectively referred to as "Software"). This is a preliminary disclosure that focuses on features that communicate with the Internet and is not intended to be an exhaustive list. It does not apply to other online or offline Microsoft sites, products, or services.

Microsoft System Center 2012 Service Manager is a flexible platform for automating and adapting IT Service Management best practices to your organization's requirements. It provides built-in processes based on industry best practices for incident and problem resolution, change control, and compliance management.

Service Manager uses management pack files that contain the object definitions for the various features of the product. You can customize the behavior of Service Manager with additional properties and include them as input fields on forms by creating and modifying management packs using Microsoft System Center 2012 Authoring Tool ("Authoring Tool").

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Specific features

The remainder of this document will address the following specific features:

Data Integration and Automation

This feature is only applicable to Service Manager.

What This Feature Does:

Administrators and analysts can use Service Manager as a central hub to gather data from other System Center components such as Operations Manager and Configuration Manager, and leverage the gathered data to facilitate business processes. The Connector facility enables the collection and configuration of source data to integrate into Service Manager. For example, the connector can gather information regarding the computers managed by Configurations Manager

as well as the alerts gathered by Operations Manager. The service desk functions offered in Service Manager can then be configured to correlate the computers which generated the alerts with the affected user and automatically issue a service ticket for assigned personnel to remediate.

Information Collected, Processed, or Transmitted:

Service Manager's connector technology is user configurable. The IT administrator or analyst determines which data sources to integrate with, including from data sources such as users from Active Directory, computers from Configurations Manager, and alerts from Operations Manager. These sources can include domain registered information such as user name, computer name, or IP address. Administrators can access this data from the Service Manager Console application and authorize other users to access the entire set or subset of this data. None of this information is sent to Microsoft.

Use of Information:

Data integrated into Service Manager are used to carry out business processes such as service desk functions. This could include ticketing service where specific support personnel are assigned to resolve computer incidents. Service Manager includes the most often used service desk functions such as incident management, change management, and release management.

Choice and control:

By default setup Service Manager does not enable any connector. Users designated as administrators or analysts must explicitly configure data integration. At any time, the connectors can be disabled and re-enabled. These can be achieved through the Service Manager console.

1. Start Service Manager console, in navigation pane, select **Administration**
2. In the **Administration** workspace, select **Connectors**
3. A list of configured connectors can be seen in the central panel
4. To create a new connector from the **Task** panel, select **Create connector**
5. Select a configured connector and choose **Enable**, **Disable**, or **Delete** the connector

Microsoft Update

This feature is applicable to Software (Service Manager and the Authoring Tool).

What This Feature Does:

Microsoft update is a service that provides Windows updates as well as updates for other Microsoft software.

Information Collected, Processed, or Transmitted:

For details about what information is collected and how it is used, see the Update Services Privacy Statement at http://go.microsoft.com/fwlink/?linkid=50142.

Use of Information:

For details about what information is collected and how it is used, see the Update Services Privacy Statement at http://go.microsoft.com/fwlink/?linkid=50142.

Choice/Control:

Microsoft Update is not turned on as a default. It is controlled by a choice you make during the setup. You may later change it by accessing the Microsoft Update client under your Control Panel to turn updates on or off.

For details about controlling this feature, see the Update Services Privacy Statement at http://go.microsoft.com/fwlink/?linkid=50142.

Customer Experience Improvement Program

This feature is only applicable to Service Manager.

What This Feature Does:

The Customer Experience Improvement Program ("CEIP") collects basic information about your hardware configuration and how you use our software and services in order to identify trends and usage patterns. CEIP also collects the type and number of errors you encounter, software and hardware performance, and the speed of services. We will not collect your name, address, or other contact information.

Information Collected, Processed, or Transmitted:

For more information about the information collected, processed, or transmitted by CEIP, see the CEIP privacy statement at http://go.microsoft.com/fwlink/?LinkID=231317.

Use of Information:

We use this information to improve the quality, reliability, and performance of Microsoft Software and services.

Choice/Control:

You are offered the opportunity to participate in CEIP during setup of Service Manager. If you choose to participate and later change your mind, you can turn off CEIP at any time by:

1. Open the Service Manager Console.

2. Click the Help menu, and check or clear the **Join the Customer Experience Improvement Program** check box.

Release Notes for System Center 2012 - Service Manager

The following release notes apply to the appropriate version of Service Manager in System Center 2012, and they contain descriptions and workarounds for known issues.

There are three versions of these release notes:

1. Release Notes for System Center 2012 - Service Manager
2. Release Notes for Service Manager in System Center 2012 SP1
3. Release Notes for Service Manager in System Center 2012 R2

See Also

System Center Service Manager 2012

Release Notes for System Center 2012 - Service Manager

Important
Read these release notes before you install and use the System Center 2012 – Service Manager software.

Service Manager Requires a Hotfix

Description: Service Manager might stop unexpectedly unless you apply hotfix 2600907, which is available at Microsoft Support.

Workaround: None.

Upgrade from Service Manager 2010 SP1 Requires Cumulative Update 3

Description: Upgrading from Service Manager 2010 SP1 to System Center 2012 – Service Manager Release Candidate (RC) or later requires Cumulative Update 3. You can download System Center Service Manager 2010 Cumulative Update 3 from the Microsoft Download Center.

Workaround: None.

Data Warehouse Setup Might Fail if the Database or Log Path Includes a Single Quotation Mark Character

Description: During Setup, if you specify a database or log path that includes a single quotation mark character ('), Setup might fail.

Workaround: None. The path that you specify cannot include a single quotation mark character.

Setup Might Fail if the Service Manager 2010 Authoring Tool Has Been Installed

Description: Setup might fail if you have installed any version of the Service Manager 2010 Authoring Tool.

Workaround: Remove the Service Manager 2010 Authoring Tool, and then retry Setup.

Setup Does Not Install the Report Viewer Language Pack

Description: Setup includes a prerequisite checker that checks for and—if necessary, installs—the Microsoft Report Viewer. However, Setup does not install the Report Viewer Language Pack, which makes the Microsoft Report Viewer compatible with Windows operating systems that are configured to use languages other than English.

Workaround: If your system is configured to use a language other than English, you should manually install the Report Viewer Language Pack for that language. You can download the Microsoft Report Viewer Redistributable 2008 SP1 Language Pack from the Microsoft Download Center.

Service Manager Setup Fails if a SQL Server Instance Contains a $ Character

Description: If you attempt to install Service Manager using a named Structured Query Language (SQL) instance that contains a dollar sign ($) character, Setup fails.

Workaround: Use a SQL instance that does not contain the $ character in its name.

After the Display Language Is Changed, the Wizard Text Might Display an Incorrect Language

Description: After you change the display language using the **Language** menu in the Service Manager console, wizard text might be displayed in your previously selected language.

Workaround: If this problem affects you, do the following:

1. Close the Service Manager console.
2. On the **Start** menu, click **Run**, type **%temp%**, and then click **OK**.
3. Navigate up to the parent LOCAL folder.
4. Open \Microsoft\System Center Service Manager 2010\<ServerName>\<VersionNumber>\, and then delete the contents of the folder.

5. Open the Service Manager console, and the wizard text should appear in the correct language.

Localized Generic Incident Request Offerings Are Not Updated When You Upgrade

Description: Management packs in System Center 2012 – Service Manager Beta do not contain localized generic incident request offerings. When you upgrade from Beta to RC, the management packs that are present in the Beta version are carried forward during the upgrade process to the RC version. If you want to use localized generic incident request offerings included in the RC version of the management packs, you can import the upgraded management packs after upgrading.

This situation does not affect upgrades from the RC to final (RTM) versions.

Workaround: Import the management pack that contains localized request offerings after you upgrade to System Center 2012 – Service Manager by performing one of the following actions:

- Manually merge the pre-upgrade management pack with the RC management pack that has the localized information.
- Import the RC management pack with the localized information and then perform the edits again.

Upgrade to System Center 2012 – Orchestrator After All Service Manager Activities Are Completed

Description: Various settings are replaced when you upgrade System Center 2012 – Orchestrator from Beta to RC and those settings might not be preserved during the upgrade. For example, a connector's URL or runbook IDs might change.

Workaround: None. However, you should wait to upgrade System Center 2012 – Orchestrator to RC until all Service Manager activities are completed. Afterward, you should create a new Orchestrator connector.

Errors Might Occur When Modifying or Deleting Service Request Template Items

Description: When you create a service request using a request offering template and you modify or delete activities contained in the template, various errors might occur that prevent you from saving the service request.

Workaround: When creating service requests, avoid modifying or deleting activities contained in a request offering template. If necessary, you can create a new request offering template with only the activities necessary and properly configured for your intended use.

The Service Manager Console Stops When You Attempt to Open a Change Request if the SelectedDate Value Is Not Valid

Description: This problem can occur after upgrading from System Center Service Manager 2010 to System Center 2012 – Service Manager if a change request's scheduled end is set before the scheduled start date. The error message might resemble `System.ArgumentOutOfRangeException: SelectedDate value is not valid`.

Workaround: To display the change request containing a ScheduledStartDate value that is greater than the ScheduledEndDate value, you can use the following sets of commands in the Service Manager module for Windows PowerShell:

```
$class=get-scclass -Name System.WorkItem.ChangeRequest

$instances= get-scclassinstance $class | where {$_.ScheduledStartDate -gt

$_.ScheduledEndDate}

$instances | Select DisplayName, ScheduledStartDate, ScheduledEndDate
```

To correct the situation, run the following set of cmdlets. These cmdlets set the ScheduledEndDate value to the same value as ScheduledStartDate.

```
$class=get-scclass -Name System.WorkItem.ChangeRequest

$instances= get-scclassinstance $class | where {$_.ScheduledStartDate -gt

$_.ScheduledEndDate}

$instances | Select DisplayName, ScheduledStartDate, ScheduledEndDate

$instances | %{ $_.ScheduledEndDate = $_.ScheduledStartDate ; $_ } | update-

scclassinstance
```

Double-Byte Characters Might Not Display Correctly if a Knowledge Article Is Created from a TXT File

Description: If you create a knowledge article using a TXT file that contains double-byte characters, the characters might not display correctly.

Workaround: If this problem affects you, do not use TXT files to create knowledge articles. Instead, use RTF files.

Shortcut Keys Have Limited Functionality

Description: Most shortcut keys do not work properly.

Workaround: If a particular shortcut key does not work, on the **Tasks** menu, click **Tasks**, and then try the shortcut key.

The System Center 2012 Configuration Manager Connector Fails to Synchronize After an Upgrade from Service Manager CTP2 to System Center 2012 – Service Manager Beta

Description: An existing System Center 2012 Configuration Manager connector does not synchronize if you upgrade from Service Manager CTP2 to System Center 2012 – Service Manager Beta.

Workaround: You can work around this problem by completing the following steps:

1. Delete your System Center 2012 Configuration Manager connector.
2. Recreate the connector.
3. Synchronize the new connector.

Analyze Cube in Excel Does Not Work with Excel Viewer

Description: If you attempt to analyze an OLAP data cube in the Data Warehouse workspace using Microsoft Office Excel Viewer, a dialog appears stating erroneously that you can install Microsoft Excel viewer and try again.

Workaround: Close the Service Manager console, install Microsoft Excel, and then try again.

Configuring the Reporting Server Might Take a Long Time

Description: When you install the data warehouse, validation of the default web server URL might take as long as 25 seconds to complete.

Workaround: None.

Double-Byte Characters Are Sent Incorrectly to Search Provider

Description: When you perform a knowledge search and you type double-byte characters in the **Search Provider** box, they are not sent correctly to the search website. Instead, erroneous characters are sent.

Workaround: None.

Data Binding Does Not Work for Class Extension Properties

Description: The value for an extended property is not saved when a form control is bound to an extended property on a class.

Workaround: Restart the Service Manager console after binding to a property.

Sorting Knowledge Articles by Date Does Not Work

Description: When you try to sort knowledge articles by date, sorting does not work.

Workaround: None.

Software Required for the Service Manager console

Description: The Service Manager console requires Microsoft Analysis Management Objects (AMOs) so that it can work with SQL Server Analysis Services (SSAS). Choose one of the following three setup files to install Microsoft AMOs, based on the microprocessor architecture that you are using:

- X86 Package (SQLSERVER2008_ASAMO10.msi) - 2659 KB
- X64 Package (SQLSERVER2008_ASAMO10.msi) - 4317 KB
- IA64 Package(SQLSERVER2008_ASAMO10.msi) - 6055 KB

The System Center Alert Management Cube Management Pack Is Not Imported During Operations Manager Registration

Description: When you register Operations Manager as a data source, the System Center Alert Management Cube management pack will not be imported.

Workaround: First, create a data source for Operations Manager. For more information, see How to Register the System Center Data Warehouse to Operations Manager in the Service Manager Administrator's Guide.

Next, make sure that the System Center Data Warehouse Operations Manager management pack has been imported. In the Service Manager console, click **Data Warehouse**, click **Management Packs**, and confirm that **System Center Datawarehouse Operations Manager Library** is listed.

Finally, on the Data Warehouse Management Server, type the following Windows PowerShell commands to manually import the management pack. (This example assumes that Service Manager is on drive C and that you installed Service Manager using the default path).

```
cd 'C:\Program Files\Microsoft System Center\Service Manager 2012'
cd.\PowerShell
Import-Module .\System.Center.Service.Manager.psd1
Import-SCSMManagementPack ..\AlertCube.mpb
```

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Release Notes for Service Manager in System Center 2012 SP1

These release notes contain information that is required to successfully install Service Manager in System Center 2012 Service Pack 1 (SP1). They contain information that is not available in the product documentation.

Before you install and use Service Manager, read these release notes.

Known Issues

Service Manager Requires a Hotfix

Description: Service Manager might stop unexpectedly unless you apply hotfix 2600907, which is available at Microsoft Support.

Workaround: None.

Self-Service Portal Installation

Description: For Service Manager in System Center 2012 Service Pack 1 (SP1), you must install the Self-Service Portal on a server that does not host a Service Manager role.

Workaround: None.

Service Manager Requires SQL Server 2008 R2 SP1 or Later

Description: The Service Manager prerequisite checker included in Setup does not check for SQL Server 2008 R2 SP1, however it is required. If you are running the RTM version of SQL Server 2008 R2, then you must upgrade it to SQL Server 2008 R2 SP1 or later before you can install System Center 2012 Service Pack 1 (SP1).

Workaround: None.

Data Warehouse Setup Might Fail if the Database or Log Path Includes a Single Quotation Mark Character

Description: During Setup, if you specify a database or log path that includes a single quotation mark character ('), Setup might fail.

Workaround: None. The path that you specify cannot include a single quotation mark character.

Setup Might Fail if the Service Manager 2010 Authoring Tool Has Been Installed

Description: Setup might fail if you have previously installed any version of the Service Manager 2010 Authoring Tool.

Workaround: Remove the Service Manager 2010 Authoring Tool, and then retry Setup.

Setup Does Not Install the Report Viewer Language Pack

Description: Setup includes a prerequisite checker that checks for and—if necessary, installs—the Microsoft Report Viewer. However, Setup does not install the Report Viewer Language Pack, which makes the Microsoft Report Viewer compatible with Windows operating systems that are configured to use languages other than English.

Workaround: If your system is configured to use a language other than English, you should manually install the Report Viewer Language Pack for that language. You can download the Microsoft Report Viewer Redistributable 2008 SP1 Language Pack from the Microsoft Download Center.

Service Manager Setup Fails if a SQL Server Instance Contains a $ Character

Description: If you attempt to install Service Manager using a named Structured Query Language (SQL) instance that contains a dollar sign ($) character, Setup fails.

Workaround: Use a SQL instance that does not contain the $ character in its name.

MPSync Jobs Might Fail After Upgrading the Service Manager 2012 SP1 Data Warehouse

Before Upgrade

Description: After you upgrade the data warehouse to Service Manager 2012 SP1 and if your data warehouse has been running for more than 3 months, MPsynch jobs will fail. Additionally, transform and load jobs might also fail. This error can occur because of erroneous database grooming.

If you have not upgraded the data warehouse to Service Manager 2012 SP1 and this problem does not yet affect you, then you have to run the following query on the DWRepository database to get the actual SQL scripts that drop and add a constraint on the primary key in fact tables in the DWRepository database. Execute the following SQL script on your DWRepository database to prevent the problem from occurring in the future.

```
;WITH FactName

AS (

       select w.WarehouseEntityName from etl.WarehouseEntity w
```

```
       join etl.WarehouseEntityType t on w.WarehouseEntityTypeId =
t.WarehouseEntityTypeId
       where t.WarehouseEntityTypeName = 'Fact'
),FactList
AS (
    SELECT  PartitionName, p.WarehouseEntityName,
            RANK() OVER ( PARTITION BY p.WarehouseEntityName ORDER BY PartitionName ASC )
AS RK
    FROM    etl.TablePartition p
       join FactName f on p.WarehouseEntityName = f.WarehouseEntityName
)
, FactPKList
AS (
    SELECT  f.WarehouseEntityName, a.TABLE_NAME, a.COLUMN_NAME, b.CONSTRAINT_NAME, f.RK,
            CASE WHEN b.CONSTRAINT_NAME = 'PK_' + f.WarehouseEntityName THEN 1 ELSE 0 END
AS DefaultConstraints
    FROM    FactList f
    JOIN    INFORMATION_SCHEMA.KEY_COLUMN_USAGE a ON f.PartitionName = a.TABLE_NAME
    JOIN    INFORMATION_SCHEMA.TABLE_CONSTRAINTS b ON a.CONSTRAINT_NAME =
b.CONSTRAINT_NAME AND b.CONSTRAINT_TYPE = 'Primary key'
)
, FactWithoutDefaultConstraints
AS (
    SELECT  a.*
    FROM    FactPKList a
    LEFT JOIN FactPKList b ON b.WarehouseEntityName = a.WarehouseEntityName AND
b.DefaultConstraints = 1
    WHERE   b.WarehouseEntityName IS NULL AND a.RK = 1
)
, FactPKListStr
AS (
    SELECT  DISTINCT f1.WarehouseEntityName, f1.TABLE_NAME, f1.CONSTRAINT_NAME,
F.COLUMN_NAME AS PKList
    FROM    FactWithoutDefaultConstraints f1
    CROSS APPLY (
```

```
                    SELECT  '[' + COLUMN_NAME + '],'
                    FROM    FactWithoutDefaultConstraints f2
                    WHERE   f2.TABLE_NAME = f1.TABLE_NAME
                    ORDER BY COLUMN_NAME
                FOR
                   XML PATH('')
                ) AS F (COLUMN_NAME)
)
SELECT  'ALTER TABLE [dbo].[' + f.TABLE_NAME + '] DROP CONSTRAINT [' + f.CONSTRAINT_NAME
+ ']' + CHAR(13) + CHAR(10) +
        'ALTER TABLE [dbo].[' + f.TABLE_NAME + '] ADD CONSTRAINT [PK_' +
f.WarehouseEntityName + '] PRIMARY KEY NONCLUSTERED (' + SUBSTRING(f.PKList, 1,
LEN(f.PKList) -1) + ')' + CHAR(13) + CHAR(10)
FROM    FactPKListStr f
```

Workaround 1: If you have already upgraded and you do not have problems with transform or load job failures but do have a management pack deployment failure, then follow the steps in the Before Upgrade section. In addition, after the default primary keys have been restored, restart the failed management pack deployment in the Service Manager console by navigating to the Data Warehouse workspace and then select Management Pack.

Workaround 2: If you have upgraded and you have problems with transform or load job failures, then determine if the SystemDerivedMp.Microsoft.SystemCenter.Datawarehouse.Base management pack exists in the DWStagingAndConfig database by running the following query.

```
select * from ManagementPack where mpname like
'%SystemDerivedMp.Microsoft.SystemCenter.Datawarehouse.Base%'
```

If the management pack does not exist, you need to restore your database to a state prior to upgrade. To restore your database, perform the following steps.

1. Perform disaster recovery steps for the database backups.
2. Disable the MPSyncJob schedule.
3. Restore all the missing primary keys in the DWRepository manually. You can drop and recreate the primary key using the SQL script from the Before Upgrade section.
4. Restart the failed base management pack deployment using the Service Manager console.

Orchestrator Connector Account Password Cannot Contain $ Characters

Description: If the Orchestrator connector account password contains a $ character, the sync job completes, however runbooks are not updated in the Service Manager database.

Workaround: If your Orchestrator connector account password contains a $ character, change the password to one that does not include the $ character.

Registering an Operations Manager 2007 R2 Data Source Fails

Description: When you attempt to register an Operations Manager 2007 R2 data source in the Data Warehouse workspace, registration fails and an error appears stating that `The Data Access service is either not running or not yet initialized. Check the event log for more information`.

Workaround: None. This is a known problem when you try to register an Operations Manager 2007 R2 data source with Service Manager in System Center 2012 Service Pack 1 (SP1).

PowerShell Tasks Created with the Authoring Tool Do Not Work Properly

Description: When you use the Service Manager SP1 version of the Authoring tool to create a workflow, then custom scripts called by the workflow fail. This is due to a problem in the Service Manager MonitoringHost.exe.config file.

Workaround: To work around this problem, update the MonitoringHost.exe.config XML file using the following steps.

1. Navigate to %ProgramFiles%\Microsoft System Center 2012\Service Manager\ or the location where you installed Service Manager.
2. Edit the MonitoringHost.exe.config file and add the section in italic type from the example below in the corresponding section of your file. You must insert the section before <publisherPolicy apply="yes" />.
3. Save your changes to the file.
4. Restart the System Center Management service on the Service Manager management server.

```
<?xml version="1.0"?>

<configuration>

  <configSections>

    <section name="uri" type="System.Configuration.UriSection, System, Version=2.0.0.0,
Culture=neutral, PublicKeyToken=b77a5c561934e089" />

  </configSections>

  <uri>

    <iriParsing enabled="true" />

  </uri>

  <runtime>

    <assemblyBinding xmlns="urn:schemas-microsoft-com:asm.v1">

      <dependentAssembly>
```

```
        <assemblyIdentity name="Microsoft.Mom.Modules.DataTypes"
publicKeyToken="31bf3856ad364e35" />
        <publisherPolicy apply="no" />
        <bindingRedirect oldVersion="6.0.4900.0" newVersion="7.0.5000.0" />
      </dependentAssembly>
      <dependentAssembly>
        <assemblyIdentity
name="Microsoft.EnterpriseManagement.HealthService.Modules.WorkflowFoundation"
publicKeyToken="31bf3856ad364e35" />
        <publisherPolicy apply="no" />
        <bindingRedirect oldVersion="6.0.4900.0" newVersion="7.0.5000.0" />
      </dependentAssembly>
  <dependentAssembly>
         <assemblyIdentity name="Microsoft.EnterpriseManagement.Modules.PowerShell"
publicKeyToken="31bf3856ad364e35" />
        <bindingRedirect oldVersion="6.0.4900.0" newVersion="7.0.5000.0" />
     </dependentAssembly>
      <publisherPolicy apply="yes" />
      <probing privatePath="" />
    </assemblyBinding>
    <gcConcurrent enabled="true" />
  </runtime>
</configuration>
```

Information Linked from Setup Might Not Display Localized Content

Description: Information that is linked from Setup to the Setup log and to technical documentation might not display localized content. Setup logs in Service Manager are available in English only. Technical documentation is available in a variety of localized languages. Where available, localized technical documentation is displayed on TechNet; however, not all languages are available.

Workaround: None.

Full Text Search Does Not Work for Some Turkish Language Characters

Description: Full text search in the Self-Service Portal works only if you have a licensed non-Microsoft word breaker installed. However, full text search does not work for some characters of the Turkish language even if you have a licensed non-Microsoft Turkish word breaker installed.

Workaround: Load a licensed non-Microsoft word breaker that enables full-text search to function. For more information, see the following links for the version of SQL Server that you are using:

- SQL Server 2008 (http://go.microsoft.com/fwlink/?LinkId=205800)
- SQL Server 2008 R2 (http://go.microsoft.com/fwlink/?LinkId=205557).

Unassigned Virtual Machines Appear in Reporting Information

Description: All virtual machines appear in Microsoft Online Analytical Processing (OLAP) cube data and the sample Microsoft Excel report, regardless of whether a virtual machine is assigned to a cloud. Reporting information is designed to show unassigned virtual machines as rows without price sheet data.

Workaround: None.

Virtual Machine Component Aggregation Is Misleading

Description: The SystemCenterVmmCloudChargebackCube OLAP cube contains aggregated values for virtual machine components. However, values for the components should not be expressed in the cube using any manner other than a daily count.

Workaround: None. However, you should ignore any aggregated time values for virtual machine components other than daily values.

Reassigned Virtual Machine Values Might Be Erroneously Calculated

Description: When you remove and then reassign a virtual machine from one cloud object to another, erroneous calculated values might appear for both clouds where the virtual machine was assigned. This condition might occur only for the same date when values for the virtual machine are not removed from the cloud that the virtual machine was initially assigned to. Data for the next day is accurate.

Workaround: None.

Values in Price Sheets Are Effective Starting on the Next Day

Description: When you type a value in a price sheet, the value becomes effective on the following day. For example, if you modify a calculated price today, the updated price will not immediately appear in OLAP cube data or the sample chargeback Excel report. Instead, the old price continues to appear in OLAP cube data and the sample chargeback Excel report. This

behavior is expected; you can use it to update prices throughout your business day without the prices going into effect until the next business day.

Workaround: None.

After the Display Language Is Changed, the Wizard Text Might Display an Incorrect Language

Description: After you change the display language using the **Language** menu in the Service Manager console, wizard text might be displayed in your previously selected language.

Workaround: If this problem affects you, do the following:

1. Close the Service Manager console.
2. On the **Start** menu, click **Run**, type **%temp%**, and then click **OK**.
3. Navigate up to the parent LOCAL folder.
4. Open \Microsoft\System Center Service Manager 2010\<ServerName>\<VersionNumber>\, and then delete the contents of the folder.
5. Open the Service Manager console. The wizard text should appear in the language that you selected previously.

Errors Might Occur When You Modify or Delete Service Request Template Items

Description: When you create a service request using a request offering template and you modify or delete activities that are contained in the template, various errors might occur that prevent you from saving the service request.

Workaround: When you create service requests, avoid modifying or deleting activities that are contained in a request offering template. If necessary, you can create a new request offering template with only the activities that are necessary and configured properly for your intended use.

The Service Manager Console Stops When You Attempt to Open a Change Request if the SelectedDate Value Is Not Valid

Description: This problem can occur after upgrading from System Center Service Manager 2010 to System Center 2012 – Service Manager if a change request's scheduled end is set before the scheduled start date. The error message might resemble `System.ArgumentOutOfRangeException: SelectedDate value is not valid`.

Workaround: To display the change request containing a ScheduledStartDate value that is greater than the ScheduledEndDate value, you can use the following sets of commands in a Service Manager module for Windows PowerShell window:

```
$class=get-scclass -Name System.WorkItem.ChangeRequest

$instances= get-scclassinstance $class | where {$_.ScheduledStartDate -gt

$_.ScheduledEndDate}
```

```
$instances | Select DisplayName, ScheduledStartDate, ScheduledEndDate
```

To correct the situation, run the following set of cmdlets. These cmdlets set the **ScheduledEndDate** value to the same value as **ScheduledStartDate**.

```
$class=get-scclass -Name System.WorkItem.ChangeRequest

$instances= get-scclassinstance $class | where {$_.ScheduledStartDate -gt

$_.ScheduledEndDate}

$instances | Select DisplayName, ScheduledStartDate, ScheduledEndDate

$instances | %{ $_.ScheduledEndDate = $_.ScheduledStartDate ; $_ } | update-

scclassinstance
```

Double-Byte Characters Might Not Display Correctly if a Knowledge Article Is Created from a TXT File

Description: If you create a knowledge article using a TXT file that contains double-byte characters, the characters might not display correctly.

Workaround: If this problem affects you, do not use TXT files to create knowledge articles. Instead, use RTF files.

Shortcut Keys Have Limited Functionality

Description: Most shortcut keys do not work properly.

Workaround: If a particular shortcut key does not work, on the **Tasks** menu, click **Tasks**, and then try the shortcut key.

Analyze Cube in Excel Does Not Work with Excel Viewer

Description: If you attempt to analyze an OLAP data cube in the Data Warehouse workspace using Microsoft Office Excel Viewer, a dialog box appears, stating erroneously that you can install Microsoft Excel viewer and try again.

Workaround: Close the Service Manager console, install Microsoft Excel, and then try again.

Configuring the Reporting Server Might Take a Long Time

Description: When you install the data warehouse, validation of the default web server URL might take as long as 25 seconds to complete.

Workaround: None.

Double-Byte Characters Are Sent Incorrectly to Search Provider

Description: When you perform a knowledge search and you type double-byte characters in the **Search Provider** box, they are not sent correctly to the search website. Instead, erroneous characters are sent.

Workaround: None.

Data Binding Does Not Work for Class Extension Properties

Description: The value for an extended property is not saved when a form control is bound to an extended property on a class.

Workaround: Restart the Service Manager console after binding to a property.

Sorting Knowledge Articles by Date Does Not Work

Description: When you try to sort knowledge articles by date, sorting does not work.

Workaround: None.

The System Center Alert Management Cube Management Pack Is Not Imported During Operations Manager Registration

Description: When you register Operations Manager as a data source, the System Center Alert Management Cube management pack will not be imported.

Workaround: First, create a data source for Operations Manager. For more information, see How to Register the System Center Data Warehouse to Operations Manager in the Service Manager Administrator's Guide.

Next, make sure that the System Center Data Warehouse Operations Manager management pack has been imported. In the Service Manager console, click **Data Warehouse**, click **Management Packs**, and confirm that **System Center Datawarehouse Operations Manager Library** is listed.

Finally, on the Data Warehouse Management Server, type the following Windows PowerShell commands to manually import the management pack. (This example assumes that Service Manager is on drive C and that you installed Service Manager using the default path).

```
cd 'C:\Program Files\Microsoft System Center\Service Manager 2012'
cd.\PowerShell
Import-Module .\System.Center.Service.Manager.psd1
Import-SCSMManagementPack ..\AlertCube.mpb
```

See Also

Release Notes for System Center 2012 - Service Manager

System Center Service Manager 2012

Release Notes for Service Manager in System Center 2012 R2

Before you install and use Service Manager in System Center 2012 R2, read these release notes.

Known Issues

Service Manager console Installed on a VMM Server Causes VMM Connector Failure

Description: If the Service Manager console is installed on the same server as VMM, then you cannot use that Service Manager console to create a VMM connector to that VMM server.

Workaround: None, however you can use a different Service Manager console to create the VMM connector.

Data Warehouse stops working after upgrading Service Manager

Description: The Data Warehouse stops working after upgrading Service Manager in System Center 2012 SP1 to System Center 2012 R2 due to a Data Warehouse fact entity upgrade.

Workaround: To prevent this issue from occurring again, run the following SQL script for each of the following data warehouse databases: DW Repository, DW DataMart, CM DataMart, and OM DataMart. If this workaround is applied after data warehouse upgrade, resume the failed management pack upgrade process deploy captured in the list of Data Warehouse Management Packs from the Service Manager console.

```
IF OBJECT_ID('tempdb..#PKFixQueries') IS NOT NULL

    DROP TABLE #PKFixQueries


;WITH FactName

AS (

        SELECT  w.WarehouseEntityName

        FROM    etl.WarehouseEntity w

        JOIN    etl.WarehouseEntityType t ON w.WarehouseEntityTypeId =
t.WarehouseEntityTypeId

        WHERE   t.WarehouseEntityTypeName = 'Fact'

),FactList

AS (

    SELECT  PartitionName, p.WarehouseEntityName

    FROM    etl.TablePartition p

    JOIN    FactName f ON p.WarehouseEntityName = f.WarehouseEntityName

)

, FactWithPK

AS (
```

```
    SELECT  f.WarehouseEntityName, f.PartitionName, b.CONSTRAINT_NAME, a.COLUMN_NAME
    FROM    FactList f
    JOIN    INFORMATION_SCHEMA.KEY_COLUMN_USAGE a ON f.PartitionName = a.TABLE_NAME
    JOIN    INFORMATION_SCHEMA.TABLE_CONSTRAINTS b ON a.CONSTRAINT_NAME =
b.CONSTRAINT_NAME AND b.CONSTRAINT_TYPE = 'Primary key'
)
, FactWithDefaultOrNoPK
AS (
    SELECT  DISTINCT f.WarehouseEntityName, f.PartitionName
            , 'PK_' + f.WarehouseEntityName AS DefaultPKConstraint
            , 'PK_' + f.PartitionName AS NewPKConstraint
    FROM    FactList f
    LEFT JOIN    FactWithPK pkf ON pkf.WarehouseEntityName = f.WarehouseEntityName AND
pkf.PartitionName = f.PartitionName
    WHERE   pkf.WarehouseEntityName IS NULL OR pkf.CONSTRAINT_NAME = 'PK_' +
f.WarehouseEntityName
)
, FactPKList
AS (
    SELECT  DISTINCT f.WarehouseEntityName, f.COLUMN_NAME
    FROM    FactWithPK f
)
, FactPKListStr
AS (
    SELECT  DISTINCT f1.WarehouseEntityName, F.COLUMN_NAME AS PKList
    FROM    FactPKList f1
    CROSS APPLY (
                    SELECT  '[' + COLUMN_NAME + '],'
                    FROM    FactPKList f2
                    WHERE   f2.WarehouseEntityName = f1.WarehouseEntityName
                    ORDER BY COLUMN_NAME
                    FOR XML PATH('')
                ) AS F (COLUMN_NAME)
)
```

```
SELECT  f.PartitionName,
        '----------------------------- [' + f.PartitionName + '] ------------------------
-----' + CHAR(13) +
        'IF OBJECT_ID(''[' + f.DefaultPKConstraint + ']'') IS NOT NULL' + CHAR(13) +
        'BEGIN' + CHAR(13) +
        '  ALTER TABLE [dbo].[' + f.PartitionName + '] DROP CONSTRAINT [' +
f.DefaultPKConstraint + ']' + CHAR(13) +
        'END' + CHAR(13) + CHAR(13) +
        'IF OBJECT_ID(''[' + f.NewPKConstraint + ']'') IS NULL' + CHAR(13) +
        'BEGIN' + CHAR(13) +
        '  ALTER TABLE [dbo].[' + f.PartitionName + '] ADD CONSTRAINT [' +
f.NewPKConstraint + '] PRIMARY KEY NONCLUSTERED (' + SUBSTRING(pk.PKList, 1,
LEN(pk.PKList) -1) + ')' + CHAR(13) +
        'END' AS Query
INTO    #PKFixQueries
FROM    FactWithDefaultOrNoPK f
JOIN    FactPKListStr pk ON pk.WarehouseEntityName = f.WarehouseEntityName

DECLARE @PartitionName NVARCHAR(MAX), @Query NVARCHAR(MAX)
WHILE EXISTS (SELECT 1 FROM #PKFixQueries)
BEGIN
    SELECT  TOP 1
            @PartitionName = PartitionName,
            @Query = Query
    FROM    #PKFixQueries

    PRINT   @Query
    EXEC(@Query)

    DELETE  #PKFixQueries
    WHERE   PartitionName = @PartitionName
END
```

Installing chargeback report files on the Service Manager management server might fail after upgrade

Description: When installing chargeback report files on the Service Manager management server after upgrading Service Manager in System Center 2012 SP1 to System Center 2012 R2, you may receive an error message. This occurs because files are not able to be imported from Operations Manager.

Workaround: If this issue affects you, complete the following procedure and try to use chargeback again:

To prepare for chargeback

1. On the server running System Center 2012 R2 Virtual Machine Manager, copy the following management packs from their installed location, by default *InstallationDrive*:\Program Files\Microsoft System Center 2012 R2\Virtual Machine Manager\ManagementPacks to a folder on the server running the Service Manager management server.
   - Microsoft.SystemCenter.VirtualMachineManager.PRO.Library
   - Microsoft.SystemCenter.VirtualMachineManager.PRO.V2.Library
   - Microsoft.SystemCenter.VirtualMachineManager.Pro.2008.Library
   - Microsoft.SystemCenter.VirtualMachineManager.Library
   - Microsoft.SystemCenter.VirtualMachineManager.2012.Discovery
2. Start the Service Manager console and navigate to **Administration**, **Management Packs**.
3. **Import** the management packs that you copied to the Service Manager management server. Make sure to click **Yes** on the **Online Data Connection** dialog box.

Service Manager Requires a Hotfix

Description: Service Manager might stop unexpectedly unless you apply a Hotfix which is available at Microsoft Support.

Workaround: Apply Hotfix 2600907.

Self-Service Portal Installation

Description: For Service Manager in System Center 2012 R2, you must install the Self-Service Portal on a server that does not host a Service Manager role.

Workaround: None.

Service Manager Requires SQL Server 2008 R2 SP1 or Later

Description: The Service Manager prerequisite checker included in Setup does not check for SQL Server 2008 R2 SP1, however it is required. If you are running the RTM version of SQL

Server 2008 R2, then you must upgrade it to SQL Server 2008 R2 SP1 or later before you can install System Center 2012 R2.

Workaround: None.

Data Warehouse Setup Might Fail if the Database or Log Path Includes a Single Quotation Mark Character

Description: During Setup, if you specify a database or log path that includes a single quotation mark character ('), Setup might fail.

Workaround: None. The path that you specify cannot include a single quotation mark character.

Setup Might Fail if the Service Manager 2010 Authoring Tool Has Been Installed

Description: Setup might fail if you have previously installed any version of the Service Manager 2010 Authoring Tool.

Workaround: Remove the Service Manager 2010 Authoring Tool, and then retry Setup.

Setup Does Not Install the Report Viewer Language Pack

Description: Setup includes a prerequisite checker that checks for and—if necessary, installs—the Microsoft Report Viewer. However, Setup does not install the Report Viewer Language Pack, which makes the Microsoft Report Viewer compatible with Windows operating systems that are configured to use languages other than English.

Workaround: If your system is configured to use a language other than English, you should manually install the Report Viewer Language Pack for that language. You can download the Microsoft Report Viewer Redistributable 2008 SP1 Language Pack from the Microsoft Download Center.

Service Manager Setup Fails if a SQL Server Instance Contains a $ Character

Description: If you attempt to install Service Manager using a named Structured Query Language (SQL) instance that contains a dollar sign ($) character, Setup fails.

Workaround: Use a SQL instance that does not contain the $ character in its name.

Orchestrator Connector Account Password Cannot Contain $ Characters

Description: If the Orchestrator connector account password contains a $ character, the sync job completes, however runbooks are not updated in the Service Manager database.

Workaround: If your Orchestrator connector account password contains a $ character, change the password to one that does not include the $ character.

Registering an Operations Manager 2007 R2 Data Source Fails

Description: When you attempt to register an Operations Manager 2007 R2 data source in the Data Warehouse workspace, registration fails and an error appears stating that `The Data Access service is either not running or not yet initialized. Check the event log for more information`.

Workaround: None. This is a known problem when you try to register an Operations Manager 2007 R2 data source with Service Manager in System Center 2012 R2.

Information Linked from Setup Might Not Display Localized Content

Description: Information that is linked from Setup to the Setup log and to technical documentation might not display localized content. Setup logs in Service Manager are available in English only. Technical documentation is available in a variety of localized languages. Where available, localized technical documentation is displayed on TechNet; however, not all languages are available.

Workaround: None.

Full Text Search Does Not Work for Some Turkish Language Characters

Description: Full text search in the Self-Service Portal works only if you have a licensed non-Microsoft word breaker installed. However, full text search does not work for some characters of the Turkish language even if you have a licensed non-Microsoft Turkish word breaker installed.

Workaround: Load a licensed non-Microsoft word breaker that enables full-text search to function. For more information, see the following links for the version of SQL Server that you are using:

- SQL Server 2008 (http://go.microsoft.com/fwlink/?LinkId=205800)
- SQL Server 2008 R2 (http://go.microsoft.com/fwlink/?LinkId=205557).

Unassigned Virtual Machines Appear in Reporting Information

Description: All virtual machines appear in Microsoft Online Analytical Processing (OLAP) cube data and the sample Microsoft Excel report, regardless of whether a virtual machine is assigned to a cloud. Reporting information is designed to show unassigned virtual machines as rows without price sheet data.

Workaround: None.

Virtual Machine Component Aggregation Is Misleading

Description: The SystemCenterVmmCloudChargebackCube OLAP cube contains aggregated values for virtual machine components. However, values for the components should not be expressed in the cube using any manner other than a daily count.

Workaround: None. However, you should ignore any aggregated time values for virtual machine components other than daily values.

Reassigned Virtual Machine Values Might Be Erroneously Calculated

Description: When you remove and then reassign a virtual machine from one cloud object to another, erroneous calculated values might appear for both clouds where the virtual machine was assigned. This condition might occur only for the same date when values for the virtual machine are not removed from the cloud that the virtual machine was initially assigned to. Data for the next day is accurate.

Workaround: None.

Values in Price Sheets Are Effective Starting on the Next Day

Description: When you type a value in a price sheet, the value becomes effective on the following day. For example, if you modify a calculated price today, the updated price will not immediately appear in OLAP cube data or the sample chargeback Excel report. Instead, the old price continues to appear in OLAP cube data and the sample chargeback Excel report. This behavior is expected; you can use it to update prices throughout your business day without the prices going into effect until the next business day.

Workaround: None.

After the Display Language Is Changed, the Wizard Text Might Display an Incorrect Language

Description: After you change the display language using the **Language** menu in the Service Manager console, wizard text might be displayed in your previously selected language.

Workaround: If this problem affects you, do the following:

1. Close the Service Manager console.
2. On the **Start** menu, click **Run**, type **%temp%**, and then click **OK**.
3. Navigate up to the parent LOCAL folder.
4. Open \Microsoft\System Center Service Manager 2010\<ServerName>\<VersionNumber>\, and then delete the contents of the folder.
5. Open the Service Manager console. The wizard text should appear in the language that you selected previously.

Errors Might Occur When You Modify or Delete Service Request Template Items

Description: When you create a service request using a request offering template and you modify or delete activities that are contained in the template, various errors might occur that prevent you from saving the service request.

Workaround: When you create service requests, avoid modifying or deleting activities that are contained in a request offering template. If necessary, you can create a new request offering template with only the activities that are necessary and configured properly for your intended use.

The Service Manager Console Stops When You Attempt to Open a Change Request if the SelectedDate Value Is Not Valid

Description: This problem can occur after upgrading from System Center Service Manager 2010 to Service Manager in System Center 2012 R2 if a change request's scheduled end is set before the scheduled start date. The error message might resemble

```
System.ArgumentOutOfRangeException: SelectedDate value is not valid.
```

Workaround: To display the change request containing a ScheduledStartDate value that is greater than the ScheduledEndDate value, you can use the following sets of commands in a Service Manager module for Windows PowerShell window:

```
$class=get-scclass -Name System.WorkItem.ChangeRequest

$instances= get-scclassinstance $class | where {$_.ScheduledStartDate -gt

$_.ScheduledEndDate}

$instances | Select DisplayName, ScheduledStartDate, ScheduledEndDate
```

To correct the situation, run the following set of cmdlets. These cmdlets set the **ScheduledEndDate** value to the same value as **ScheduledStartDate**.

```
$class=get-scclass -Name System.WorkItem.ChangeRequest

$instances= get-scclassinstance $class | where {$_.ScheduledStartDate -gt

$_.ScheduledEndDate}

$instances | Select DisplayName, ScheduledStartDate, ScheduledEndDate

$instances | %{ $_.ScheduledEndDate = $_.ScheduledStartDate ; $_ } | update-

scclassinstance
```

Double-Byte Characters Might Not Display Correctly if a Knowledge Article Is Created from a TXT File

Description: If you create a knowledge article using a TXT file that contains double-byte characters, the characters might not display correctly.

Workaround: If this problem affects you, do not use TXT files to create knowledge articles. Instead, use RTF files.

Shortcut Keys Have Limited Functionality

Description: Most shortcut keys do not work properly.

Workaround: If a particular shortcut key does not work, on the **Tasks** menu, click **Tasks**, and then try the shortcut key.

Analyze Cube in Excel Does Not Work with Excel Viewer

Description: If you attempt to analyze an OLAP data cube in the Data Warehouse workspace using Microsoft Office Excel Viewer, a dialog box appears, stating erroneously that you can install Microsoft Excel viewer and try again.

Workaround: Close the Service Manager console, install Microsoft Excel, and then try again.

Configuring the Reporting Server Might Take a Long Time

Description: When you install the data warehouse, validation of the default web server URL might take as long as 25 seconds to complete.

Workaround: None.

Double-Byte Characters Are Sent Incorrectly to Search Provider

Description: When you perform a knowledge search and you type double-byte characters in the **Search Provider** box, they are not sent correctly to the search website. Instead, erroneous characters are sent.

Workaround: None.

Data Binding Does Not Work for Class Extension Properties

Description: The value for an extended property is not saved when a form control is bound to an extended property on a class.

Workaround: Restart the Service Manager console after binding to a property.

Sorting Knowledge Articles by Date Does Not Work

Description: When you try to sort knowledge articles by date, sorting does not work.

Workaround: None.

The System Center Alert Management Cube Management Pack Is Not Imported During Operations Manager Registration

Description: When you register Operations Manager as a data source, the System Center Alert Management Cube management pack will not be imported.

Workaround: First, create a data source for Operations Manager. For more information, see How to Register the System Center Data Warehouse to Operations Manager in the Service Manager Administrator's Guide.

Next, make sure that the System Center Data Warehouse Operations Manager management pack has been imported. In the Service Manager console, click **Data Warehouse**, click **Management Packs**, and confirm that **System Center Datawarehouse Operations Manager Library** is listed.

Finally, on the Data Warehouse Management Server, type the following Windows PowerShell commands to manually import the management pack. (This example assumes that Service Manager is on drive C and that you installed Service Manager using the default path).

```
cd 'C:\Program Files\Microsoft System Center\Service Manager 2012'
cd.\PowerShell
Import-Module .\System.Center.Service.Manager.psd1
Import-SCSMManagementPack ..\AlertCube.mpb
```

See Also

Release Notes for System Center 2012 - Service Manager

Release Notes for the Authoring Tool in System Center 2012 - Service Manager

Important
Read these release notes before you install the System Center 2012 – Service Manager Authoring Tool.

Authoring Tool Setup Might Fail Due to Missing Files

For System Center 2012 and System Center 2012 SP1 versions, the Service Manager Authoring Tool Setup might fail due to it missing files such as msvcr100.dll.

WORKAROUND: Download and install the Microsoft Visual C++ 2010 SP1 Redistributable Package (x86) on the computer where you are trying to install the Authoring Tool. Afterward, try installing the Authoring Tool again.

Upgrading to the RTM version of System Center 2012 – Service Manager Authoring Tool

The version of the Authoring Tool that you run must always match the version of Service Manager. If you are running the Release to Manufacturing (RTM) version of System Center 2012 – Service Manager, you must use the RTM version of the System Center 2012 – Service Manager Authoring Tool.

The Authoring Tool does not support a direct upgrade. Therefore, if you are using the RTM version of System Center 2012 – Service Manager, uninstall any older versions of the tool and then install the RTM version of the System Center 2012 – Service Manager Authoring Tool.

For more information, see the Authoring Guide for System Center 2012 - Service Manager.

WORKAROUND: None.

Localized Versions of the Authoring Tool

All localized versions of the System Center 2012 – Service Manager Authoring Tool are named SCSM_AuthoringTool_2012.exe. Ensure that you download and install the version of the tool for the language of your choice.

WORKAROUND: None.

PowerShell Tasks Created with the Authoring Tool Do Not Work Properly

When you use the Service Manager SP1 version of the Authoring tool to create a workflow, then custom scripts called by the workflow fail. This is due to a problem in the Service Manager MonitoringHost.exe.config file.

WORKAROUND: To work around this problem, update the MonitoringHost.exe.config XML file using the following steps.

1. Navigate to %ProgramFiles%\Microsoft System Center 2012\Service Manager\ or the location where you installed Service Manager.
2. Edit the MonitoringHost.exe.config file and add the section in italic type from the example below in the corresponding section of your file. You must insert the section before <publisherPolicy apply="yes" />.
3. Save your changes to the file.
4. Restart the System Center Management service on the Service Manager management server.

   Note
   For System Center 2012 R2 Service Manager, the System Center Management service was renamed to Microsoft Monitoring Agent.

```
<?xml version="1.0"?>

<configuration>

  <configSections>

    <section name="uri" type="System.Configuration.UriSection, System, Version=2.0.0.0,
Culture=neutral, PublicKeyToken=b77a5c561934e089" />

  </configSections>

  <uri>

    <iriParsing enabled="true" />

  </uri>

  <runtime>
```

```
    <assemblyBinding xmlns="urn:schemas-microsoft-com:asm.v1">
      <dependentAssembly>
        <assemblyIdentity name="Microsoft.Mom.Modules.DataTypes"
publicKeyToken="31bf3856ad364e35" />
        <publisherPolicy apply="no" />
        <bindingRedirect oldVersion="6.0.4900.0" newVersion="7.0.5000.0" />
      </dependentAssembly>
      <dependentAssembly>
        <assemblyIdentity
name="Microsoft.EnterpriseManagement.HealthService.Modules.WorkflowFoundation"
publicKeyToken="31bf3856ad364e35" />
        <publisherPolicy apply="no" />
        <bindingRedirect oldVersion="6.0.4900.0" newVersion="7.0.5000.0" />
      </dependentAssembly>
  <dependentAssembly>
         <assemblyIdentity name="Microsoft.EnterpriseManagement.Modules.PowerShell"
publicKeyToken="31bf3856ad364e35" />
        <bindingRedirect oldVersion="6.0.4900.0" newVersion="7.0.5000.0" />
     </dependentAssembly>
      <publisherPolicy apply="yes" />
      <probing privatePath="" />
    </assemblyBinding>
    <gcConcurrent enabled="true" />
  </runtime>
</configuration>
```

The Authoring Tool Does Not Automatically Adjust After You Change the Language of the Operating System

If you install the Authoring Tool and then change the language that the operating system uses on the computer, the Authoring Tool may not work correctly. The Authoring Tool is not supported in this situation.

WORKAROUND: Before you install the Authoring Tool, ensure that the language that the operating system uses on the computer is the correct language. Or, before you change the language of the operating system, if the Authoring Tool is already installed, do the following:

1. Uninstall the Authoring Tool.
2. Uninstall the Microsoft Visual Studio 2008 Shell.
3. Change the language of the operating system.
4. Reinstall the Authoring Tool.

Some Default Forms Are Not Supported for Customizations

The following default forms are not supported for customizations:

- The problem form
- The user form
- The service map form
- The knowledge form

WORKAROUND: None.

Binding Fails If a Property Name Contains a Period

If a class is extended with a property name that contains a period, binding that property to a custom control fails.

WORKAROUND: For extended properties, do not use a period in the property name.

Extended Properties of the Decimal Type Cannot Be Used in a View Criterion

A view that is defined with a criterion that is based on an extended property of the decimal type is not saved correctly and cannot be used.

WORKAROUND: None.

A Decimal Value for an Extended Property Is Not Saved Correctly

If you extend a class with a decimal property and bind a form control to the extended property, a decimal value in that control is truncated when it is saved. For example, the number 1.23 is saved as 1.

WORKAROUND: None.

Workflows That Are Created with Previous Versions of the Authoring Tool Might Need Rebuilding

The *Active Directory Name* property of the Add AD DS Computer To Group activity has been renamed to *Computer Domain*. In addition, the internal name of the same property has been renamed from *ADServer* to *ComputerDomain* for consistency. This can prevent workflows that are authored with the previous version of the Authoring Tool that use the Add AD DS Computer To Group activity from working with the latest version.

WORKAROUND: Rebuild workflows containing the Add AD DS Computer To Group activity with the latest version of the Authoring Tool.

When You Add the IfElse Activity to a Workflow, You Cannot Use Some Properties in the IfElse Condition

When you attempt to set a condition for the **IfElse** activity, the **Rule Condition Editor** dialog box might not display the correct set of available workflow activities. This is due to a refresh issue.

WORKAROUND: Save the respective management pack before you open the **Rule Condition Editor** dialog box.

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