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Operating System Deployment allows you to create operating system images and deploy those images to target computers. Operating System Deployment also provides task sequences which help facilitate the deployment of operating system images, and other Configuration Manager 2007 software packages.

The following topics are included in this section:

- Overview of Operating System Deployment
- Prerequisites for Operating System Deployment
- Administrator Workflows for Operating System Deployment
- Planning for Operating System Deployment
- Configuring Operating System Deployment
- Tasks for Operating System Deployment
- Troubleshooting Operating System Deployment
- Operating System Deployment Security Best Practices and Privacy Information
- About Feature Reports for Operating System Deployment
- Technical Reference for Operating System Deployment

1.0 Overview of Operating System Deployment

Operating system deployment provides the Microsoft System Center Configuration Manager 2007 administrator with a tool for creating images that can be deployed to computers managed by Configuration Manager 2007, and to unmanaged computers using bootable media such as CD set or DVD. The image, in a WIM format file, contains the desired version of a Microsoft Windows operating system and can also include any line-of-business applications that need to be installed on the computer. Operating system deployment provides the following functionality:

- Operating system image capture
- User state migration using the User State Migration Tool
- Operating system image deployment
- Task sequences

The following topics are included in this section:

- Operating System Deployment Terminology
- Supported Operating Systems and Hard Disk Configurations for Operating System Deployment
- Upgrading from Systems Management Server 2003 Operating System Deployment
- About the Operating System Deployment Reference Computer
- About Native Mode Certificates and Operating System Deployment
- About Capturing and Deploying an Operating System Image
- About Creating the Operating System Deployment Packages
- About the Driver Catalog
- About Task Sequences
- About Task Sequence Variables
- Operating System Deployment Checklists

1.1 Operating System Deployment Terminology

The following terms are used when describing concepts and actions related to Microsoft System Center Configuration Manager 2007 operating system deployment.

Image

The image is a collection of files and folders that duplicates the original file and folder structure of an existing computer, including the file and folder structure of the operating system, or that is a file-based replica of a hard disk. An image often contains other files added by the Configuration Manager 2007 administrator. Operating System Deployment supports Windows Image format (WIM).

Target computer

The target computer is the computer on which you install a Microsoft® Windows operating system image using Configuration Manager 2007 Operating System Deployment.

Reference computer

A reference computer is a fully-configured computer from which you generate the WIM file that will be used to distribute operating system images to target computers.

Source Computer

The source computer is an existing computer that is managed by Configuration Manager 2007. The source computer contains the user state data and settings that will be migrated to a new destination computer. The source computer must have a computer association with the destination computer for side-by-side migration scenarios.

Destination Computer

The destination computer is the computer that will receive the user state data and settings that are migrated from a source computer. The destination computer must have a computer association with the source computer for side-by-side migration scenarios.

Sysprep

Sysprep is a Windows system preparation tool that facilitates image creation on reference computers running Windows operating systems, and the preparation of an image for deployment to multiple target computers. Sysprep generalizes the reference computer by removing all computer-specific information such as security identifiers, network addresses, and the computer name. When the generalized image is cloned to other computers, the other computers establish their own identity and don't duplicate the identity of the reference computer.

User State Migration Tool (USMT)

The User State Migration Tool (USMT) is a Windows utility used by administrators to collect a user's documents and settings, called the user state data, before an operating system deployment is performed, and then restores the user state data after the installation.

USMT migrates user files and settings during large deployments of Microsoft Windows 2000, Microsoft Windows XP or Microsoft Windows Vista operating systems. USMT captures desktop, network, and application settings as well as a user's files, and then migrates them to a new Windows installation in order to improve and simplify the migration process.

USMT 3.0 supports the capture of user settings (known as scan state) from computers running the Windows 2000 operating system or later, and the restore of user settings (known as load state) on computers running the Windows XP or Windows Vista operating systems.

USMT 2.61 supports the capture of user settings (known as scan state) from computers running the Windows 9x operating system or later, and the restore of user settings (known as load state) on computers running the Windows 2000 or later operating systems.

For more information about USMT see the Windows XP Professional Deployment Web page, see (http://go.microsoft.com/fwlink/?LinkID=88299). You can download USMT from the Microsoft Download Center, see (http://go.microsoft.com/fwlink/?LinkID=88300).

Windows Preinstallation Environment (Windows PE)

Windows PE 2.0 is a Windows operating system with limited services, built on the Windows Vista operating system platform. Windows PE is the boot image used by Operating System Deployment, and is used only in the preinstallation and deployment of Windows operating systems. Configuration Manager 2007 does not support earlier versions of Windows PE.

You can find detailed documentation about Windows PE, see (http://go.microsoft.com/fwlink/?LinkId=93917).

Windows Image Format file (WIM)

A WIM file represents the file format for an image captured using Operating System Deployment and is a compressed collection of files and folders.

Task sequence

A task sequence is a series of one or more task steps that can be advertised to Configuration Manager 2007 clients to run user-specified actions. Task sequences are used with Operating System Deployment to build source computers, capture an operating system image, migrate user and computer settings, and deploy an image to a collection of target computers. Task sequences can also be used to run other Configuration Manager 2007 actions, such as deploying Configuration Manager 2007 software packages or running custom command lines.

Task sequence step

A task sequence step is a component of a task sequence and represents a user-specified action that is run on a computer that the task sequence is advertised to. Task sequence steps always run entirely on the target computer, and never on a Configuration Manager 2007 site system.

Task sequence group

A task sequence group is a component of a task sequence and represents a collection of one or more task sequence steps.

1.2 Supported Operating Systems and Hard Disk Configurations for Operating System Deployment

This topic lists the operating systems and disk configurations that support the capture, creation, and deployment of operating system images using Configuration Manager 2007.

Supported Operating Systems

- The Microsoft Windows 2000 Professional operating system, with Service Pack 4
- The Microsoft Windows 2000 Server operating system, Service Pack 4
- The Microsoft Windows 2000 Advanced Server operating system, Service Pack 4
- The Microsoft Windows 2000 Datacenter operating system, Service Pack 4
- The Microsoft Windows XP Professional operating system, Service Pack 2
- The Microsoft Windows XP Embedded operating system, Service Pack 1
- The Microsoft Windows Server 2003 operating system, Web Edition, Service Pack 1
- The Microsoft Windows Server 2003 operating system, Standard Edition, Service Pack 1
- The Microsoft Windows Server 2003 operating system, Enterprise Edition, Service Pack 1
- The Microsoft Windows Server 2003 Datacenter operating system, Service Pack 1
- The Windows Vista Business operating system
- The Windows Vista Enterprise operating system
- Windows Server® 2008 Standard operating system
- Windows Server® 2008 Enterprise operating system
- Windows Server® 2008 Datacenter operating system

Supported Disk Configurations

The following hard disk configuration combinations on the reference and target computers are supported for use with Configuration Manager 2007 operating system deployment:

Reference Hard Disk Configuration	Target Hard Disk Configuration
Basic Disk	Basic Disk
Simple volume on a dynamic disk	Simple Volume on a dynamic disk

Configuration Manager 2007 only supports capturing an operating system image from computers configured with simple volumes. There is no support for the following hard disk configurations:

- Spanned volumes

- Striped volumes (RAID 0)
- Mirrored volumes (RAID 1)
- Parity volumes (RAID 5)

The following hard disk configurations on the reference and target computers are also not supported for use with Configuration Manager 2007 operating system deployment:

Reference Hard Disk Configuration	Target Hard Disk Configuration
Basic Disk	Dynamic Disk

1.3 Upgrading from Systems Management Server 2003 Operating System Deployment

The image files and packages that you created with the Operating Deployment Feature Pack are not supported by operating system deployment in Microsoft System Center Configuration Manager 2007. You must create new images for use with Configuration Manager 2007.

1.4 About the Operating System Deployment Reference Computer

The reference computer is used by Configuration Manager 2007 operating system deployment to capture the operating system image that you want to deploy to a collection of one or more target computers.

You can configure the reference computer manually, or you can completely automate the configuration of the reference computer and the capturing of the image. The extent to which you configure the reference computer manually is up to you. You can completely automate the configuration of the reference computer using task sequences, you can manually configure certain aspects of the reference computer and then automate the rest using task sequences, or you can manually configure the reference computer without using task sequences. After you have captured an image from a reference computer, the reference computer should not be used again to capture an operating system image from because of registry entries that are created during the initial configuration. It is recommended that you create a new reference computer from which to capture the operating system image. If you plan to use the same reference computer to create future operating system images, you should uninstall the Configuration Manager 2007 client and then reinstall the Configuration Manager 2007 client.

The following table outlines advantages and disadvantage for an automated and manual configuration of the reference computer:

Reference computer	Advantages	Disadvantages
Automated	The configuration can be completely	The initial action of building a

configuration	unattended eliminating the need for an administrator or user to be present. You can reuse the task sequence to repeat configuration of additional reference computers with a high level of confidence. You can modify the task sequence to accommodate differences in reference computers without having to recreate the entire task sequence. You do not need to create a task sequence or take the time to test and troubleshoot the task sequence.	task sequence can take some time to create and test. If the reference computer requirements change significantly, it can take some time to re-build and re-test the task sequence. The accuracy of the reference computer configuration depends on the administrator or user that is doing the configuration. You'll still need a method to verify and test that the reference computer is properly configured.
Manual configuration	You can install directly from CDs without having to put all the software packages (including Windows itself) into a Configuration Manager 2007 package.	There is no way to "reuse" the configuration method. Requires a person to be actively involved throughout the process.

Steps for Configuring a Reference Computer

The following table lists the basic steps to consider when configuring a reference computer for Operating System Deployment.

Configure the reference computer with the:	Description
Appropriate operating system.	The reference computer must be installed with the operating system that you intend to deploy as an image to a collection of one or more target computers. For all operating system images except Windows Vista, the associated HAL type must match the target computer's HAL type. For example, you can not capture a virtual operating system image and apply that image to a target computer.
Appropriate service pack.	It is recommended that the operating system running on the reference computer should have the most current service pack applied.
Appropriate software updates.	It is recommended that the operating system running on the reference computer should have the most current software updates applied, especially security updates.

You can install all software applications that you would like to include in the image you are deploying to a collection of one or more target computers. You can also install software applications manually or as a custom task sequence step rather than as part of the image when you deploy the captured image. The advantages and disadvantages of each method of installation are described in the section Advantages and Disadvantages of Installing Software Applications and Tools as Part of an Operating Image Deployment.

Appropriate applications.

Important

Configuration Manager 2007 software packages that use **the Run another program first** option to install a dependent program as part of the package are not supported by Operating System Deployment.

Configuration Manager 2007 uses Sysprep to collect information about the applications you installed. However, not all applications are compatible with Sysprep. You must install those applications as a separate task sequence step after the image is deployed, or manually.

Reference computer must be a member of a workgroup

The reference computer must be configured as a member of a workgroup.

When you are preparing a Windows XP, Windows 2000 Professional, Windows 2000 Server, and Windows Server 2003 operating system image, the reference computer must have the version of Sysprep appropriate for that operating system installed, particularly if you are deploying the image to more than one target computer. Configure a C:\Sysprep folder in the reference computer by copying sysprep.exe and setupcl.exe to that folder. You can manually Sysprep the reference computer by running the command:

Appropriate version of Sysprep or another migration tool.

```
sysprep -mini -quiet - reseal -reboot
```

When you are deploying a Windows Vista operating system image, the Sysprep location is created by default. The default location is **%windir%\System32\sysprep**

You can also automate Sysprep using a task sequence step or if you are using capture media. For more information about creating capture media see: How to Capture an Image from a Reference Computer Using Capture Media

Important

The Prepare Windows for Capture task sequence step attempts to reset the local administrator password on the reference

	computer to blank before running Sysprep. If the Local Security policy **Password must meet complexity requirements** is enabled, then this task sequence step fails to reset the administrator password. In this scenario, disable this policy before running the task sequence.
Appropriate tools and scripts you require to mitigate installation scenarios.	You can install the application compatibility tools and scripts necessary to troubleshoot known installation scenarios on target computers as part of the image that you are deploying to a collection of one or more target computers. You can also install these tools and scripts manually or as a custom task sequence rather than as part of the image. The advantages and disadvantages of each method of installation are described in the section Advantages and Disadvantages of Installing Software Applications and Tools as Part of an Operating Image Deployment.
Appropriate desktop customization (wall paper, branding, default user profile).	The reference computer can be configured with the appropriate desktop customization properties that you want to include as part of the image you are deploying to a collection of one or more target computers. Desktop properties include specified wall paper, organizational branding, and a standard default user profile.

1.5 About Native Mode Certificates and Operating System Deployment

When you use Configuration Manager 2007 to deploy operating systems in native mode, you will need to include a public key infrastructure (PKI) certificate if task sequences used as part of the operating system deployment process communicate with the native mode site's management point. Without this certificate, authentication to the management point will fail, and operating system deployments will not succeed.

Additionally, for the certificate to be trusted by the management point, the site must also be configured with a root certification authority for the certificate. For more information about configuring the site with the root certification authority, see How to Specify the Root Certification Authority Certificates for Operating System Deployment Clients.

The certificate that you use with operating system deployments requires client authentication capability, and it does not get installed on the client as part of the operating system deployment. Its use is only temporary for the task sequences to complete. For the client be managed in the native mode site after the operating system deployment, you must independently provision the client with its native mode client certificate. For more information about how to provision the client with its native mode client certificate, see Deploying the Client Computer Certificates to Clients and the Management Point.

For more information about all the certificates used with Configuration Manager 2007 native mode, see Certificate Requirements for Native Mode.

Specify the operating system deployment certificate as part of your boot media, if you are using media initiated operating system deployments, and configure the PXE point to use this certificate if you are using PXE initiated operating system deployments. Specify the certificate by importing a Public Key Certificate Standard (PKCS #12) file, and providing the password that was chosen when the file was created. PKCS #12 files have a .PFX extension.

If you need guidance on how to prepare the PKCS #12 certificate file, see How to Export Certificates For Use With Operating System Deployment.

1.5.1 Protecting the Operating System Deployment Certificate from Unauthorized Use

To help protect unauthorized access to the Configuration Manager site using this certificate, assign a password with media initiated operating system deployments. You can also configure an expiration date that will be assigned to the media, and when this date expires, the media will no longer be valid.

If the PKI deployment is using a certificate revocation list (CRL), the certificate can also be revoked by a certification authority administrator, and this can be another method of protection if the certificate is known to be compromised. Certificate revocation checking is enabled by default on the management point.

1.6 About Capturing and Deploying an Operating System Image

There are three basic actions you need to take when you want to use Configuration Manager 2007 to deploy an operating system image to a collection of one or more target computers as outlined in the Top Level Administrator Workflow:

- Build and capture an image and distribute it to distribution points
- Create and configure the appropriate deployment task sequence
- Advertise the task sequence

1.6.1 Create the image and distribute it to distribution points

Operating system images are .WIM format files and represent a compressed collection of reference files and folders needed to successfully install and configure an operating system on a computer. The operating system image is built and captured from a reference computer which you configure with all required operating system files, support files, software updates, tools, and other software applications. The Create and Distribute Image Workflowprovides a flowchart that identifies each step in this process. You can find additional information about reference computers in the operating system deployment task topic About the Operating System Deployment Reference Computer.

You can build the reference computer manually, or use a task sequence to automate some or all of the build steps.

You can find additional information about building and configuring a reference computer in the topic How to Build a Reference Computer, and information about capturing an image in the OSD Task topic How to Capture an Image from a Reference Computer Using Capture Media and How to Create a Task Sequence to Build and Capture an Operating System Image

1.6.2 Create and configure the appropriate deployment task sequence

After you have created the reference computer and captured an operating system image from that computer, you can use a task sequence to configure how to deploy that image to a target computer. The New Task Sequence Wizard walks you through the process of creating a deployment task sequence. Refer to the topic How to Create a Task Sequence to Install an Existing Operating System Image Package for more information.

1.6.3 Advertise the task sequences

After you have created the necessary deployment task sequences, you can identify the appropriate collections of target computers that you will advertise the task sequences to. Then run the Task Sequence - New Advertisement Wizard.

Important

Operating System Deployment does not distinguish Configuration Manager 2007 site servers, in particular branch distribution points, from other target computers in the collection. If you are advertising the task sequence to a collection that contains a Configuration Manager 2007 site server, the site server will run the task sequence like any other computer in the collection. It is recommended that you remove the site system role from the site server before deploying an operating system image to it, and then assign the site system role back to the site server.

1.7 About Creating the Operating System Deployment Packages

There are several Configuration Manager 2007 packages that you need to create to support the building of a reference computer and the deployment of an operating system image to a target computer.

Building a reference computer:

- Operating system installation package
- Configuration Manager 2007 client installation package
- Sysprep package
- Driver packages
- Other Packages

Deploying an image to a target computer:

- Configuration Manager 2007 client installation package

- USMT packages
- Other Packages
- Operating system image package

1.7.1 Building a reference computer

These packages support the building of a reference computer.

Operating System Installation Package

The Operating System Installation Package must contain all the files necessary to install the desired Windows operating system on a reference computer. For example, this package might contain all of the reference files found on a Microsoft Windows XP Professional installation CD (not just the files in the i386 folder) because the installation must be run unattended. You create this package as you would any other Configuration Manager 2007 package. This package does not require a program. The task sequence will reference the source files as needed.

Sysprep Package

Sysprep is a Windows system preparation tool that facilitates image creation, and the preparation of an image for deployment to multiple destination computers. If the operating system version you are running is Windows Vista, Sysprep is already available on the computer and you do not need to specify a package. If the operating system version you are running is Windows XP or earlier, you must specify a package that contains the version of Sysprep and all its support files (no subfolders) appropriate for that operating system version. This package does not require a program. Operating System Deployment uses the Sysprep files contained in the package.

For more information about using Sysprep, see the Sysprep documentation for the version of Sysprep that supports the version of the operating system running on the Reference computer.

Driver Package

If the reference computer requires device drivers that are not included with the operating system, you must create the packages that contain the necessary Windows drivers to support hardware on the reference computer. Typically, a manufacturer supplies an INF file and other supporting files for a device driver, and sometimes an installation script as well. You should refer to the documentation supplied by the manufacturer of the device driver to ensure that you create a package that includes all supporting files.

Operating System Deployment supports two kinds of device drivers:

- **Auto Apply Drivers** - **Auto Apply Drivers** to specify the categories that should be made available during Windows setup
- **Apply Driver Package** - to specify a package that has all the drivers that should be deployed.

One way to organization driver packages is to create a single package for each computer make and model that has each device driver stored in its own folder.

For example:

\GX240_Drivers

\NetworkInterfaceDrivers

\Intel1000

\Broadcom

\VideoDrivers

\ATI

\AudioDrivers

\SBPro

Important
The path string that the task sequence appends can not be longer than 4KB in length for computers running the Windows XP and Windows 2003 operating systems, and 2KB for computers running the Windows 2000 operating system. You can find the path in the OEMPNPDRIVERS PATH variable in the Sysprep.inf file.

1.7.2 Deploying an image to a target computer

These packages support the operating system image deployed to a target computer.

Configuration Manager 2007 Client Installation Package

Since every operating system deployment installs the Configuration Manager 2007 client, you need to create a Configuration Manager 2007 package to install the Configuration Manager 2007 client. You can use the package definition file included with Configuration Manager 2007 for the Configuration Manager 2007 client Upgrade. This package should have as its source location: \\<*smssiteserver*>\smsclient\i386. Assign the package to the appropriate distribution point(s).

Note
It is required that the program be configured to run unattended when no user is logged on, and from a network share.

USMT Package

If you are migrating user state from one desktop to another, then you should use USMT as your migration tool.

USMT 3.0 supports the capture of user settings (known as scan state) from computers running the Windows 2000 operating system or later, and the restore of user settings (known as load state) on computers running the Windows XP or Windows Vista operating systems.

USMT 2.61 supports the capture of user settings (known as scan state) from computers running the Windows 9x operating system or later, and the restore of user settings (known as load state) on computers running the Windows 2000 or later operating systems.

You can download USMT from the Microsoft Download Center at http://go.microsoft.com/fwlink/?LinkId=88300.

Use Configuration Manager 2007 to create a package that contains the appropriate version of USMT to run on the computer. Include the contents of the USMT BIN folder (c:\USMT\bin). A package program is not required. Distribute the package to the appropriate distribution point(s). When the task sequence step is run, the task sequence will look for and use the appropriate version of USMT in the package you specify. Include the configuration files (.INF) as part of the USMT package. Refer to the documentation for USMT for configuration information.

Other Packages

These packages can support both the reference computer and the target computer depending on your need. You can install all software applications that you would like to include in the image you are deploying to a collection of one or more destination computers using a task sequence. You must create a Configuration Manager 2007 package that can successfully install the application on the taregt computer, and reference that package using the Install Software task sequence step.

The program you select must meet the following criteria:

- It must run under the local system account and not the user account.
- It should not interact with the desktop. The program must run silently or in an unattended mode.
- It must not initiate a reboot on its own. The program must request a reboot using a 3010 return code. This ensures that the task sequence step will properly handle the reboot.

Important

Configuration Manager 2007 software programs that use **the Run another program first** option to install a dependent program as part of the package are not supported by operating system deployment. If **Run another program first** is enabled for a program, and the other program has already been run on the target computer, the task sequence step will complete successfully. However, if the other program has not already been run on the target computer, the task sequence step will fail.

Task sequences sometimes reference packages that contain required files and programs to be used or run on a target computer, for example, the **Package** option for the **Run Command Line** task sequence step. When you specify files or programs on the **Command line** field for this task sequence step that are not already present on the target computer, the **Package** option specifies the Configuration Manager 2007 package that contains the appropriate files. However, this package does not require a program. When the task sequence step is run, the task sequence will look for and use the appropriate files in the package you specify.

You do not need to create a separate package for each file used in this way. In fact, it is recommended that you create one package that contains all the files you might need to use when running a task sequence on a target computer, and then referencing this package when a specific file is required in a task step. The task sequence step will simply look for the appropriate file in whatever package you specify.

1.8 About the Driver Catalog

The driver catalog helps manage the cost and complexity of deploying an operating system in an environment that contains different types of computers and devices. The driver catalog consists of two nodes in the Configuration Manager 2007 administrator console: **Drivers** and **Driver Packages**. Storing device drivers in the driver catalog and not with each individual operating system image greatly reduces the number of operating system images that are required. When you deploy an operating system image, each operating system image can install enabled device drivers that have been imported are available on a distribution point.

You can also store multiple versions of Windows device drivers in the driver catalog. Maintaining multiple versions of device drivers provides an easy way to upgrade existing device drivers when hardware device requirements change on your network.

1.8.1 Driver Catalog Terminology

Windows device driver

> A Windows device driver consists of an INF file and one or more additional files required to support a device. Configuration Manager 2007 will read and obtain the hardware and platform information from the INF file.

Driver Package

> A **Driver Package** is a Configuration Manager 2007 package that contains the content for one or more device drivers. When you add a new device driver the content is added to the driver package share. The driver package can then be copied to a distribution point so that computers can install them.

1.8.2 Importing a New Windows Device Driver

Windows device drivers must be imported into the Configuration Manager 2007 site so that they are available for operating system deployments. You should import only device drivers that you plan to deploy as part of your operating system deployments in your Configuration Manager 2007 environment. For more information about

importing new Windows device drivers into the driver catalog for use with operating system deployments, see How to Import Windows Device Drivers into the Driver Catalog

1.8.3 Device Driver Categories

You can assign device drivers that have been imported into the driver catalog to a category. Device driver categories are helpful with linking similarly used device drivers together in a logical fashion. For example, you can assign all network adaptor device drivers to a specific category. When you initiate an operating system deployment you can you can configure Windows setup to search in only the specified categories when locating device drivers.

1.8.4 Creating Device Driver Packages

Device driver packages group similar device drivers together to help streamline operating system deployments; for example you may decide to create a driver package for each type computer manufacturer on your network.

Driver packages contain the content associated with one or more device drivers. Device drivers should be added to a driver package and copied to an available distribution point so Configuration Manager 2007 client computers can install them. Driver packages also provide you the flexibility to distribute device driver content to only the distribution points that will require them.

When you create a driver package, the source location of the package should point to an empty network share and the Configuration Manager 2007 system account must have read/write permissions to the driver package source location. When you add device drivers to a driver package, Configuration Manager 2007 will copy the device driver to the driver package source location. Only device drivers that have been imported and are enabled in the driver catalog can be added to a new or existing driver package. For more information about creating a driver package use the following link: How to Create a Driver Package

You must copy the driver package to at least one distribution point for computers to be able to access them, and all device drivers in a specific package are copied together. If you want to copy a subset of device drivers from an existing driver package, you must create a new driver package and copy it to a distribution point. If you change the source location of an existing driver package, you will need to manually copy the device drivers to the new location. If the device drivers are not moved to the new location they will be removed as part of the next distribution point update.

1.8.5 Adding Device Drivers to Boot Images

You can add Windows device drivers that have been imported into the driver catalog to a Configuration Manager 2007 boot image. You should only add mass storage and network adaptor device drivers to boot images because other types of drivers are not generally required and will increase the size of the boot image. Only device drivers that are intended for use with Windows Vista should be added to a boot image because the required version of Windows PE is Windows Vista-based. For more

information about adding device drivers to a boot image see: How to Add Windows Device Drivers to a Boot Image

1.8.6 Driver Catalog Task Sequence Steps

There are two task sequence steps that you can use with your operating system deployments to install device drivers that have been imported into the driver catalog. When you use these task sequence steps you can also specify how device drivers will be installed on a target computer.

The following list briefly describes the two device driver task sequence steps:

- **Auto apply drivers** - allows you to automatically match and install device drivers as part of an operating system deployment. You can configure the task sequence step to install only the best matched driver for each hardware device detected, or specify that the task sequence step will install all compatible drivers for each hardware device detected and allow Windows setup to choose the best driver. For more information about using the Auto Apply Drivers task sequence step see: Auto Apply Drivers.
- **Apply Driver Package** - allows you to make all device drivers in a specific driver package available for use by Windows setup. Windows setup will search in the specified driver packages for required device drivers. For more information about using the Apply Driver Package task sequence step see: Apply Driver Package

1.8.7 Driver Catalog Reports

- You can use several device driver reports to determine general device driver information. The reports category **Driver Management** contains reports that can help you inventory available device drivers and evaluate device driver applicability and availability. For more information about the reports that are available with operating system deployment and the driver catalog see: Available Operating System Deployment Reports

1.9 About Task Sequences

Task sequences are the mechanism for performing multiple steps or tasks on a client computer at the command-line level without requiring user intervention. Task sequences do not represent a full scripting language.

After a task sequence is created, it is located as a node in the Configuration Manager console. The task sequence node is replicated to child sites in the Configuration Manager hierarchy. You can also create subfolders to manage or group task sequences; however, these subfolders are not replicated to child sites.

1.9.1 Terminology for Task Sequences

The following list of terms describe task sequences and the components of task sequences:

Action

The command part of a single step within a task sequence. There are two types of task sequence actions: **Custom Actions** and **Built-in Actions**.

Custom action

A command-line string supplied by the administrator that will run a command on the Configuration Manager 2007 client computer.

Built-in action

A Configuration Manager 2007 action that will perform a specific action on the Configuration Manager 2007 client computer.

Condition

A parameter within a task sequence step or task sequence group that determines whether the Configuration Manager 2007 client should process the action.

Step

The basic component of a task sequence or task sequence group. Each step can contain an action and an optional check for the conditions assigned to a task.

It is not required that you group task sequence steps; however, using groups improves the readability of the task sequence and provides better error handling.

Group

A logical arrangement of multiple steps within a task sequence. A task sequence group consists of a name and an optional check for the conditions assigned to a task.

Note

Each task sequence group can contain additional nested task sequence groups.

Task sequence

One or more steps or groups that are linked sequentially to perform an operation or task.

1.9.2 Creating a New Task Sequence

You can create a new task sequence by using the Task Sequence Wizard. For more information about creating custom task sequences, use the following link How to Manage Task Sequences. The wizard contains built-in task sequences and custom task sequences that can perform many different tasks. You can create task sequences that will perform tasks from capturing and installing operating system image packages to changing a registry setting.

Moreover, you can create task sequences that will allow you to install an existing image package, build and capture a reference operating system image, or create a custom task sequence that will perform a customized task using variables. Custom

task sequences can be used to perform specialized operating system deployments or to perform other custom actions or steps.

Custom and built-in task sequences can also be used to run multiple task sequence steps on a target computer that will perform a series of steps to achieve an installation. Task sequence names do not need to be unique.

After you have completed the Task Sequence Wizard, the new task sequence object is created and is visible in the details pane of the Configuration Manager console.

1.9.4 Access Control

You can provide access control to specific task sequences. You can set user rights on individual task sequences in the same fashion as other Configuration Manager 2007 objects using the **Security** tab. For more information about assigning user rights, see How to Assign Rights for Objects to Users and Groups.

To create a new task sequence or folder, you must have Create or Administer permissions to the Task Sequences folder. You must also have at least Read permissions to objects, such as the packages the task sequence will reference. To advertise a task sequence, only Read permissions is required to the task sequence.

1.9.5 Advertising a Task Sequence

You can advertise a task sequence to any Configuration Manager 2007 collection. By default task sequence advertisements are made available to sub collections.

Each target computer will receive the task sequence by way of the advertisement and will the task sequence according to the settings specified in the advertisement. Task sequences do not contain associated files or programs. Any files referenced by a custom task sequence must already be present on the target computer or reside on an accessible distribution point.

Configuration Manager Client will use normal Configuration Manager 2007 client polling methods to locate the task sequence advertisement.

You cannot advertise a task sequence that references a nonexistent program.

For more information about advertising a task sequence, see How to Advertise Task Sequences.

1.9.6 Editing a Task Sequence

You can use the **Task Sequence Editor** to update or change the run-time actions associated with an existing task sequence. You can also change the order of the task sequence steps by using the task sequence editor to change the priority assigned to each task sequence step. You can also specify how the task sequence will handle errors for failed task sequence steps by specifying that the task sequence should continue if there is an error. You can also add conditions to the task sequence by using **If** statements on the **Options** tab.

If the task sequence has any unassociated references to a package or a program as a result of the edit, you will need to fix the reference, delete the unreferenced program from the task sequence, or temporarily disable the failed task sequence step until the broken reference has been fixed or removed.

1.9.7 Task Sequence Steps and Actions

Steps are the basic components of a task sequence. They contain the commands that run on a target computer that perform tasks such as installing an operating system, creating a registry entry, or installing a Configuration Manager 2007 software package.

Task sequence steps are processed sequentially and the conditions assigned to each task sequence step are evaluated. If the step is applicable to a Configuration Manager Client the action is initiated. The next task sequence step will not proceed until the previous action has completed. A task sequence is considered complete when all steps have been completed or when a failed step causes the task sequence to end prematurely.

Important

By default, a task sequence will fail after one step or action fails. To continue after a task sequence step failure, edit the task sequence, click the **Options** tab, and then select **Continue on error**.

1.9.8 Task Sequence Groups

Groups are multiple steps within a task sequence. A task sequence group consists of a name and an optional check for the conditions assigned to a task.

Creating groups will enable you to combine multiple steps within a task sequence. Groups can be nested within each other, and a group can contain a mixture of steps and subgroups. Groups are useful for combining multiple steps that share a common condition. You can also configure the group failure behavior as you do with individual steps.

To allow the task sequence to continue to the next step if one of the steps fails, use the **Options** tab to set the task sequence to **Continue on error**. The following table and example show how the **Continue on error** option works.

In this example, there are two groups of task sequences containing three task sequence steps each.

Task Sequence Group/Step	**Continue on error setting**
Task Sequence Group 1	**Continue on error** selected
Task Sequence Step 1	**Continue on error** selected
Task Sequence Step 2	
Task Sequence Step 3	
Task Sequence Group 2	

Task Sequence Step 4
Task Sequence Step 5
Task Sequence Step 6

- If task sequence step 1 fails, the task sequence will continue with task sequence step 2.
- If task sequence step 2 fails, than the task sequence will not run task sequence step 3 but will continue to run task sequence steps 4 and 5 which are in a different task sequence group.
- If task sequence step 4 fails, no more steps will be run, and the task sequence will fail because the **Continue on error** setting has not been configured for task sequence group 2.

You must assign a name to task sequence groups, although the group name does not need to be unique. You can also provide an optional description for the task sequence group.

1.9.9 Running Task Sequences

Task sequences always run by using the local system account, so there is no option of running a task sequence for each individual user that logs in. The task sequence will check for referenced packages prior to running. If a reference is not validated, the task sequence will return an error. If an advertised task sequence has been configured to download and run, all dependent programs are downloaded to the Configuration Manager Client cache. The necessary packages and programs are obtained from distribution points, and if the Configuration Manager Client cache size is too small or the program cannot be found, the task sequence will fail and a status message will be generated. You can also specify if the content should be downloaded as needed, or you can use the **Run from Net** option to specify that the installations should run across the network.

If a dependent package or program cannot be located by the task sequence, an immediate error will be returned if the advertisement is optional. However, if the advertisement is mandatory the Configuration Manager 2007 client will wait for the necessary package or program to be replicated to the appropriate distribution point.

Important
If a task sequence step requires the client computer to restart, there must be an available formatted disk partition at the time of the computer restart; otherwise, the task sequence will fail regardless of any error handling setting.

When a task sequence dependent object, such as a software distribution package, is updated to a newer version, any task sequence that references the package is automatically updated and will reference the newest version.

Note
All task sequences are checked for possible dependencies and availability on a distribution point prior to initiating. When an object that an existing task sequence

depends on is deleted, an error is issued.

When a task sequence completes successfully or fails, an entry is placed in the Configuration Manager Client history. There is no method to cancel or halt a task sequence once it has initiated on a computer.

1.9.10 Importing and Exporting Task Sequences

You can create a task sequence in one Configuration Manager 2007 site, and use it that task sequence across your Configuration Manager 2007 hierarchy. When you use task sequences in a different site than it was created in you must make sure that all referenced packages in the task sequence are available in the site you plan to run the task sequence or the installation will fail. To import and export task sequences right-click the task sequence, and then clicking **Export**. You will be prompted to provide a name for the task sequence and the location to save the exported task sequence. When you export a task sequence, it does not include the referenced images or packages. When the task sequence is imported and if the referenced packages cannot be located on a distribution point, the task sequence will contain broken references.

Important
You should not attempt to edit a task sequence after it has been exported. You must first import the task sequence into a Configuration Manager 2007 site.

To import a task sequence, click **Import** in the **Actions** pane, and then browse to the location of the task sequence file.

1.9.11 Creating Media for Task Sequences

You can write task sequences and the related files and dependencies to a DVD or CD set or a USB flash drive. Removable media will allow you to run the task sequence on computers that do not have a network connection to your Configuration Manager 2007 site. Task sequence media can be used only in the same site where the media was created. For more information about creating media use the following link: How to Deploy an Operating System Image Using Media

You can create three types of removable media:

- Stand-alone. Stand-alone media contains the task sequence and all associated objects necessary for the task sequence to run. Stand-alone media task sequences can run when the Configuration Manager Client has limited or no connectivity to the network. Stand-alone media can be run in two ways: first, if the target computer is not booted, the Windows PE image associated with the task sequence is used from the stand-alone media and the task sequence begins. Second, the stand-alone media can be manually started if a user is logged on to the network and initiates the installation.

  Important
  Stand-alone media task sequence steps must be able to fully run autonomously from

the network; otherwise, the task sequence step will fail. For example, a task sequence step that requires a distribution point to obtain a package will fail; however if the necessary package is contained on the stand-alone media the task sequence step will succeed.

- Boot. Boot media contains the necessary files to start a target computer so that it can connect to the Configuration Manager 2007 infrastructure and the target computer can determine which task sequences to run based on the target computer's collection membership. The task sequence and dependent objects are not contained on the media; instead, they are obtained over the network from the Configuration Manager 2007 client. This method is useful in bare metal or new deployments, or when no Configuration Manager 2007 client is present on the computer.
- Capture. Capture media is used to capture an operating system image that has been configured and created outside of the Configuration Manager 2007 infrastructure. Capture media can contain custom programs that can run prior to a task sequence. The custom program can interact with the desktop, prompt the user for input values, or create variables that will be used by the task sequence.

You can also specify a password that is assigned to the media and must be entered by a user to access the files contained on the media. If you specify a password to be assigned to the media, a user must be present to enter the password at the target computer.

When you run a task sequence using media, the specified computer chip architecture contained on the media will not be recognized and the task sequence will attempt to run even if the architecture specified does not match what is actually installed on the target computer.

Important

If the chip architecture contained on the media does not match the chip architecture installed on the target computer the installation will fail.

1.9.12 Using Media in Configuration Manager 2007 Native Mode Environments

When you use media created by Configuration Manager 2007 to deploy operating systems in native mode, you will need to include a public key infrastructure (PKI) certificate on the media if task sequences require communication with the native mode site's management point. Without this certificate, authentication to the management point will fail, and operating system deployments will not succeed. For more information about using certificates in native mode for operating system deployment media use the following link: How to Manage Native Mode Certificates and Operating System Deployment

Additionally, for the certificate contained on the media to be trusted by the management point, the site must also be configured with a root certification authority for the certificate. For more information about configuring the site with the root

certification authority, see How to Specify the Root Certification Authority Certificates for Operating System Deployment Clients.

1.10 About Task Sequence Variables

Configuration Manager 2007 task sequence environment variables are a set of name and value pairs that supply configuration and operating system deployment settings for computer, operating system and user state configuration tasks on a Configuration Manager 2007 client computer. Task sequence variables provide a mechanism to configure and customize the steps in a task sequence.

When you create a task sequence in the Configuration Manager 2007 administrator console, it is stored as a sequence of steps. You can edit the task sequence steps and their associated settings in a task sequence using the Task Sequence Editor. When you run the task sequence, many of the task sequence settings are stored as environment variables. You can access or change the values of built-in task sequence variables, and you can create new task sequence variables in order to customize the way a task sequence runs on a target computer.

You can use task sequence variables in the task sequence environment to perform the following actions:

- Configure settings for a task sequence action
- Supply command line arguments for a task sequence step
- Evaluate a condition which determines if a task sequence step or group should run
- Provide values for custom scripts used in a task sequence

For example, you might have a task sequence which includes a Join Domain or Workgroup task sequence step. The task sequence might be advertised to different collections, where the collection membership is determined by domain membership. In that case, you can specify a Per-Collection task sequence variable for each collection's domain name, and then use that task sequence variable to supply the appropriate domain name in the task sequence.

The following sections describe the different methods for creating a variable, and then describe accessing the environment variable value in task sequences.

1.10.1 Creating Task Sequence Variables

You can add new task sequence variables to customize and control steps in a task sequence. For example, you can create a task sequence variable to override a setting for a built-in task sequence step. You can also create a custom task sequence variable to use with conditions, command lines, or custom steps in the task sequence. When you create a task sequence variable, the task sequence variable and the associated value is preserved within the task sequence environment, even when the sequence reboots the target computer. The variable and its value can be used within the task sequence across different environments, for example, in a full Windows operating system and in the Windows Pre-Installation environment.

The following table describes the methods for creating a task sequence environment variable, along with usage implications for each method:

Creation Method	Usage Overview
Task Sequence Editor - setting fields in task sequence steps	Specifies set default values for the task sequence step. The variable and value are accessible only when the step runs in the task sequence; they are not part of the overall sequence environment, and they are not accessible by other task sequence steps in the task sequence. For a list of built-in variables and their associated actions, see: Operating System Deployment Task Sequence Variables.
Adding a set task sequence variable step in a task sequence	Specifies the task sequence variable and value in the task sequence environment when the task sequence step is run as part of a task sequence. All subsequent task sequence steps can access the environment variable and its value.
Defining a Per-Collection variable	Specifies a task sequence and values for a collection of computers. All task sequences targeted to the collection can access the task sequence variable and its value.
Defining a Per-Computer variable	Specifies task sequence variables and values for a particular computer. All task sequences targeted to the computer can access the task sequence variable and its value.
Adding a task sequence variable on the **Variables** page of the **Task Sequence Media** Wizard	Specifies task sequence variables and values for task sequence that is run from media. The task sequence that is run from the media can access the task sequence variable and its value.

To override the default value for a built-in task sequence variable, you must define a task sequence variable with the same name as the built-in task sequence variable. See Operating System Deployment Task Sequence Variables for a list of built-in task sequence variables with the associated actions and usage.

You can delete a task sequence variable from the task sequence environment using the same methods as creating a task sequence variable. To delete a variable from the task sequence environment, you set the task sequence variable value to an empty string, for example no characters.

You can combine methods to set an environment task sequence variable to different values for the same sequence. In an advanced scenario, you might set the default values for steps in a sequence using the Task Sequence Editor, then set a custom variable value using each of the creation methods. The following list describes the rules that determine which value is used when a task sequence variable is created using more than one method:

1. Set Task Sequence Variable overrides all other creation methods.
2. Per-computer variables take precedence over per-collection variables. If you specify the same task sequence variable name for a per-computer variable and

a per-collection variable, the per-computer variable value will be used when the target computer runs advertised task sequence.

3. Task sequences can be run from stand-alone media. Use the media variables in place of per-collection or per-computer variables. If the task sequence is running from stand-alone media, then per-computer and per-collection variables do not apply and will not be used. Instead, task sequence variables defined on the **Variables** page of the **Task Sequence Media** wizard are used to set values specific to a task sequence running from media.
4. If a task sequence variable value is not set in the overall sequence environment, built-in actions use the default value for the step, as set in the Task Sequence Editor. In other words, the value specified in the task sequence step field in the Task Sequence Editor is used if the setting isn't defined in the task sequence environment using one of the other methods.

In addition to overriding values for built-in task sequence step settings, you can also create a new environment variable for use in a task sequence step, script, command line, or condition. When you specify a name for a new task sequence variable, there are several guidelines that you must follow. The following section describes these guidelines and provides examples of valid and invalid task sequence variable names:

- The task sequence variable name you specify may contain letters, numbers, the underscore character (_) and a hyphen (-).
- Task sequence variable names have a minimum length of one character and a maximum length of 256 characters.
- User defined variables must begin with a letter (A-Z).
- User defined variable names can not begin with the underscore character. Only read only task sequence variables are preceded by the underscore character.

Note

Read only task sequence variables can be read by task sequence steps in a task sequence but not set. For example, you can use a read only task sequence variable as part of the command line for a **Run Command Line** task sequence action, but you cannot set a read only variable using the **Set Task Sequence Variable** action.

- Task sequence variable names are not case sensitive. For example; OSDVAR and osdvar represent the same task sequence variable.
- Task sequence variable names can not begin or end with a space or contain embedded spaces. Spaces that are left at the beginning or the end of a task sequence variable name will not be read.
- The following table displays examples of valid and invalid user specified task sequence variables:

Examples of valid user specified variable names	Examples of invalid user specified variable names
	1Variable
MyVariable	**Note** User specified task sequence variables can not

	begin with a number. MyV@riable
My_Variable	**Note** User specified task sequence variables can not contain the **@** character. _MyVariable
My_Variable_2	**Note** User specified task sequence variables can not begin with an underscore.

There are general limitations when creating task sequence variables. The list below describes these limitations:

- Task sequence variable values can not exceed 4000 characters.
- You can not create or override a read only task sequence variable. Read only variables are designated by names starting with an underscore character (_). You can access the value of read only task sequence variables in your task sequence; however you can not change their associated values
- There is no limit to how many task sequence variables that can be created, however the total size of the task sequence environment may not exceed 10 MB.

1.10.2 Accessing Task Sequence Environment Variables

After you have specified the task sequence variable and its value using one of the methods from the previous section, you can use the environment variable value in your task sequences. You can access default values for built-in task sequence variables, specify a new value for a built-in variable, or use a custom task sequence variable in a command line or script.

The following table outlines task sequence operations that can be performed by accessing the task sequence environment variables.

Task Sequence Operation	Usage Overview
	You can specify that a task sequence step setting is provided by a variable value when the sequence runs.
Configure action settings	To supply a task sequence step setting through a task sequence environment variable, use the Task Sequence Editor, edit the step, and specify the variable name as the field value. Typically the variable name must be enclosed in percent signs (**%**) to indicate it is an environment variable.
Supply	You can specify part or all of a custom command line using an

command line arguments	environment variable value. To supply a command line setting using an environment variable, use the variable name as part of the Command Line field of the **Run Command Line** task sequence step. The variable name must be enclosed in percent signs (**%**). For example: The following command line uses a built-in environment variable to write the computer name to **C:\File.txt.** **Cmd /C %_SMSTSMachineName% > C:\File.txt**
Evaluate a step condition	You can use built-in or custom task sequence environment variables as part of a task sequence step or group condition. The environment variable value will be evaluated prior to running the task sequence step or group on a Configuration Manager 2007 computer. To add a condition which evaluates a variable value, select a step or group in the sequence, and use the Add Condition drop down on the Options tab. Select the task sequence variable condition, and specify the variable and the value to evaluate.

Provide information for a custom script	Task Sequence variables can be read and written using the Microsoft.SMS.TSEnvironment COM object while the task sequence is running.
	
	The following example illustrates a Visual Basic script file that queries the **_SMSTSLogPath** task sequence variable to get the current log location. The script also sets a custom variable.
	
	`dim osd: set env = CreateObject("Microsoft.SMS.TSEnvironment")`
	
	`dim logPath`
	
	`' You can query the environment to get an existing variable`
	
	`logPath = env("_SMSTSLogPath")`
	
	`' You can also set a variable in the OSD environment`
	
	`env("MyCustomVariable") = "varname"`
	
	For more information about using task sequence variables in scripts, refer to the SDK documentation.

1.10.3 Computer and Collection Variables

Task sequences can be configured to run on multiple computers or collections simultaneously. You can specify unique per-computer or per-collection information,

such as specifying a unique operating system product key or joining all of the members of a collection to a specified domain.

You can assign task sequence variables to a single computer or a collection. When the task sequence starts to run on the target computer or collection, the values specified will be applied to the target computer or collection.

You can specify task sequence variables for a single computer or a collection. When the task sequence starts to run on the target computer or collection, the variables specified will be added to the environment, and the values will be available to all task sequence steps in the task sequence.

Important

If the same variable name is used for both a per-collection and per-computer variable, the computer variable value takes precedence over the collection variable. Task sequence variables that are assigned to collections take precedence over task sequence variables over built-in task sequence variables.

For more information about creating task sequence variables for a single computer or collection, please use the following links:

How to Create Per-Computer Task Sequence Variables	Select this topic for more information about specifying a task sequence variable to a single computer.
How to Create Per-Collection Task Sequence Variables	Select this topic for more information about specifying a task sequence variable to a collection.

1.10.4 Task Sequence Media Variables

Task sequence variables can be specified for task sequences that are stored and run from media, such as CD/DVD sets, or USB drives. You add the task sequence variables and specify their values when you create the media containing the task sequence; the variables and their values are stored on the media with the task sequence.

Important

When you run a task sequence from media, all custom task sequence variable information must be contained on the media; per-collection and per-computer variables can not used with task sequences running from media.

You can specify task sequence variables on the **Variables** page of the **Task Sequence Media** Wizard. For more information about using the Task Sequence Media, use the following link: Task Sequence Media Wizard.

1.10.5 Task Sequence Variables List

For a list of built-in task sequence variables use the following link: Task Sequence Variables

1.11 Operating System Deployment Checklists

This topic provides links to checklists that provide recommended steps to help you complete essential operating system deployment tasks in Configuration Manager 2007.

The following topics are included in this section:

- Prepare the Configuration Manager Environment

  Provides the basic steps to consider when preparing the Configuration Manager 2007 environment for using operating system deployment.

- Configure the Reference Computer

  Provides a checklist for a recommended method to configure the operating system deployment reference computer.

- Create the Capture Task Sequence

  Provides a checklist for a recommended method to create the operating system deployment capture task sequence.

1.11.1 Prepare the Configuration Manager Environment

The following checklist includes the tasks you perform to prepare the Configuration Manager 2007 environment for operating system deployment.

Task	Reference
Enable DHCP	Refer to your Windows Server documentation for information about configuring DHCP. In particular, you will need to: • Create a scope of available addresses • Enable the DNS scope option • Activate the scope and authorize the server
Enable the Client Network Access account in Active Directory for the Configuration Manager 2007 site	How to Configure the Network Access Account
Create the appropriate packages to use with your operating system deployment task sequences.	About Creating the Operating System Deployment Packages
Distribute the boot image you want to deploy to the appropriate distribution points.	Troubleshooting Operating System Deployment

You can also modify the boot.wim file to gather log information by way of the command-line shell.	
Configure a state migration point	How to Configure the State Migration Point
Add drivers to an operating system image	How to Install Drivers on a Configuration Manager 2007 Client Using a Task Sequence
Configure the site for native mode	Administrator Workflow: Migrating a Site to Native Mode

1.11.2 Configure the Reference Computer

The following checklist includes the basic steps to consider when configuring a reference computer for operating system deployment. You can create a capture CD to capture the operating system image after the reference computer has been configured. For more information about capturing an operating system image see: About Capturing and Deploying an Operating System Image

Configure the reference computer with the following:	Reference
Appropriate operating system, service packs, security updates, applications, settings, tools and desktop customization	About the Operating System Deployment Reference Computer
Configure the reference system to be a member of a workgroup	About the Operating System Deployment Reference Computer

1.11.3 Create the Capture Task Sequence

The following checklist includes the basic steps to consider when creating a task sequence to build a reference computer and capture an operating system image from that reference computer.

Steps	Reference
Identify a Configuration Manager 2007 client that will be the reference computer.	About the Operating System Deployment Reference Computer
Run the New Task Sequence Wizard.	New Task Sequence Wizard - Build and Capture a Reference Operating System image
Customize the task sequence that you created.	Operating System Deployment: Task Sequence Editor

Run the New Task Sequence Wizard

When you run the New Task Sequence Wizard, select the option **Build a Reference Operating System Image**. This table lists the information you need to provide when running the wizard.

Steps	Reference
Create all the support packages that you need to successfully build the reference computer including: • Windows operating system installation • Configuration Manager 2007 client installation • Sysprep • Driver packages • Software applications and support tools	About Creating the Operating System Deployment Packages
Identify the Configuration Manager 2007 package that contains the operating system to install on the reference computer.	New Task Sequence Wizard - Build and Capture a Reference Operating System image
Identify the Configuration Manager 2007 package that contains the Configuration Manager 2007 client to install on the reference computer.	New Task Sequence Wizard - Build and Capture a Reference Operating System image
Specify workgroup or domain information including the account credentials that has permission to join the workgroup or domain.	New Task Sequence Wizard - Build and Capture a Reference Operating System image
Specify appropriate Windows license information.	New Task Sequence Wizard - Build and Capture a Reference Operating System image
Specify whether you'll need to install all software updates targeted to the reference computer by Configuration Manager 2007, mandatory software updates targeted to the reference computer by Configuration Manager 2007, or no software updates.	New Task Sequence Wizard - Build and Capture a Reference Operating System image
Specify any other Configuration Manager 2007 packages that contain software applications or other tools or scripts that you want to install on the reference computer.	New Task Sequence Wizard - Build and Capture a Reference Operating System image
Specify the Configuration Manager 2007 package containing the appropriate version of Sysprep or another migration tool.	New Task Sequence Wizard - Build and Capture a Reference Operating System image
Specify a local or network location for the image to be stored.	New Task Sequence Wizard - Build and Capture a Reference Operating System image

Customize the New Task Sequence

The New Task Sequence Wizard is used to create a default task sequence that you can then customize further by running the Task Sequence Editor. This table lists the items that you can customize for the reference computer.

Add a task sequence that does the following:	Description
Installs a Configuration Manager 2007 package that contains the appropriate service pack.	Install Software
Installs a Configuration Manager 2007 package that contains the appropriate software updates.	Install Software Updates
Installs a Configuration Manager 2007 package that contains the appropriate applications.	Install Software
Installs a Configuration Manager 2007 package that contains the appropriate mass storage drivers (disk, NIC)	Apply Driver Package
Installs a Configuration Manager 2007 package that contains the appropriate tools and scripts you require to mitigate installation scenarios.	Install Software
Installs a Configuration Manager 2007 package that contains the appropriate desktop customization (wall paper, branding, default user profile).	Install Software Run Command Line

2.0 Prerequisites for Operating System Deployment

The following sections describe the external and internal prerequisites or dependencies that are required for Configuration Manager 2007 operating system deployment.

2.1 Dependencies External to Configuration Manager 2007

Dependency	More Information
User State Migration Tool (USMT)	If you plan to capture and restore the user state as part of your operating system deployment you will need to download the USMT. For more information about USMT see: http://go.microsoft.com/fwlink/?LinkId=88299 You can download USMT from the Microsoft Download Center at http://go.microsoft.com/fwlink/?LinkId=88300 You can also find additional scripts to assist you with state migration from the Microsoft Business Desktop Deployment Web site http://go.microsoft.com/fwlink/?LinkId=88302
Windows PE	Windows PE 2.0 is a Windows operating system with limited services built on the Windows Vista operating system platform. Windows PE is the boot image used with operating system deployment and is used only during the pre-installation and deployment of Windows operating systems. Configuration Manager 2007 does not support earlier versions of Windows PE. You can find detailed documentation about Windows PE at http://go.microsoft.com/fwlink/?LinkId=88303

2.2 Configuration Manager 2007 Dependencies

The following table provides information and links about Configuration Manager 2007 operating system deployment prerequisites.

Dependency	More Information
Supported operating systems and hard disk configurations	Use the following link for more information about the operating system versions and hard disk configurations supported by Configuration Manager 2007 operating system deployment. Supported Operating Systems and Hard Disk Configurations for Operating System Deployment
Deploying an operating system image	Depending on the method you plan to use to deploy operating system images, there are several dependencies that must be considered. For more information about these dependencies use the following link: Determine Your Operating System Deployment Method
Driver Catalog	Deploying a device driver requires that the device driver has been imported, enabled, and is available on a distribution point accessible to the Configuration Manager 2007 client. For more information about the driver catalog, use the following link: How to Manage the Driver Catalog
Configuration Manager 2007 Site Systems	There are new Configuration Manager 2007 site system roles for use with operating system deployment. For more information about the new site system roles use the following links: • PXE service point: How to Configure the PXE Service Point • State migration point: How to Configure the State Migration Point

3.0 Administrator Workflows for Operating System Deployment

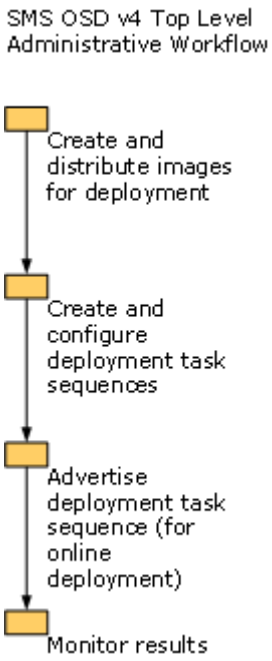
This section provides workflows that walk you through the basic tasks needed to create and deploy an operating system image to a computer.

The following workflows are included in this section:

- Top Level Administrator Workflow
- Create and Distribute Image Workflow
- Create and Configure Task Sequence Workflow
- Image Deployments Using Media Workflow

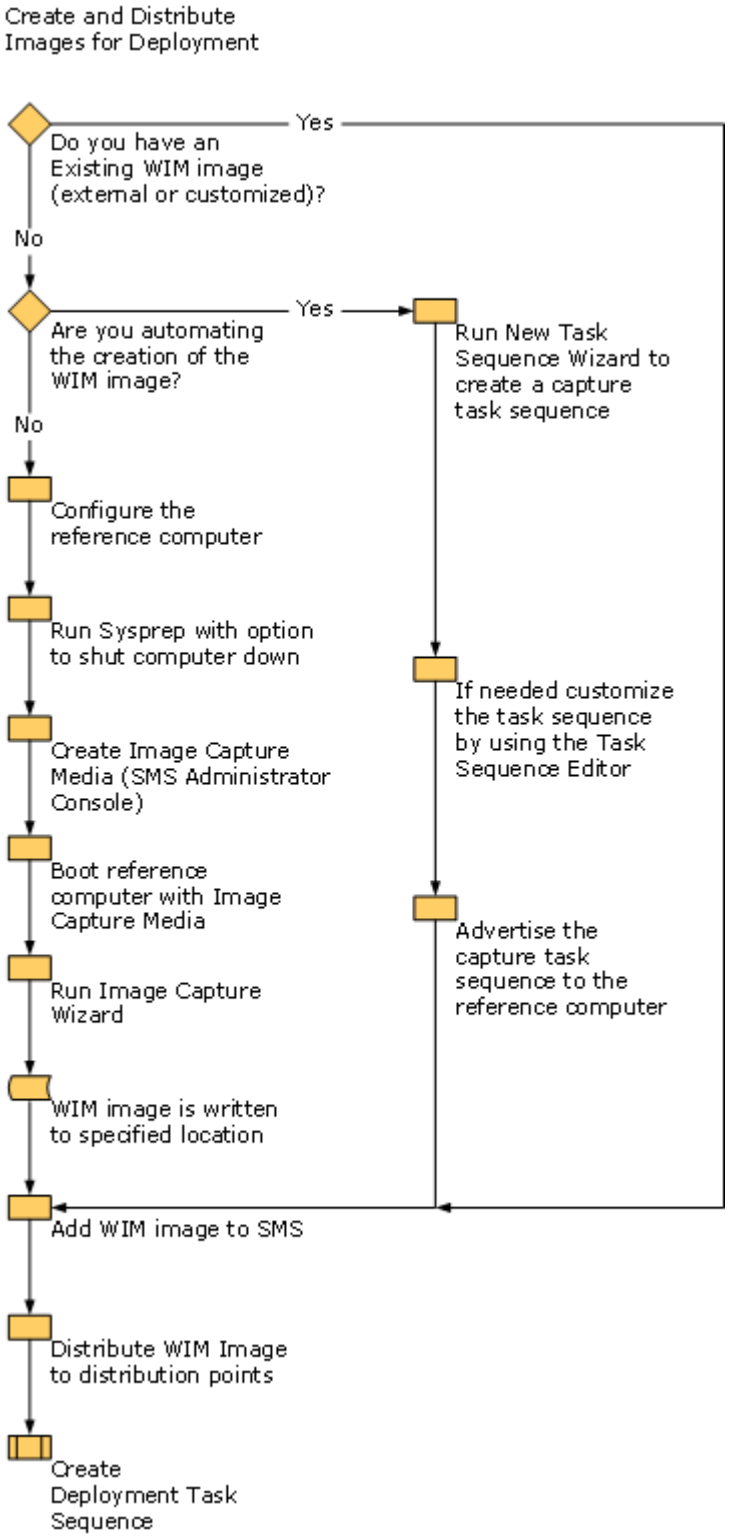
3.1 Top Level Administrator Workflow

There are four main actions that an administrator can take when using the Operating System Deployment feature of Configuration Manager 2007. The following flowchart maps these actions in the order in which they generally take place.



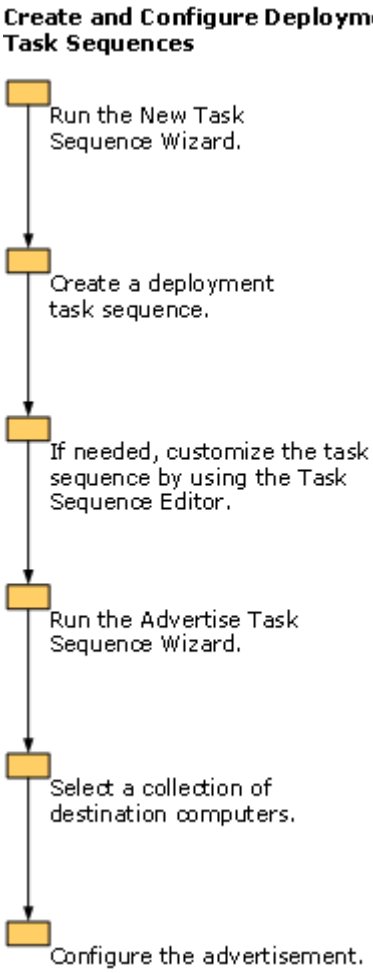
3.2 Create and Distribute Image Workflow

This workflow represents the steps and actions needed to capture and restore computer state for a new computer installation.



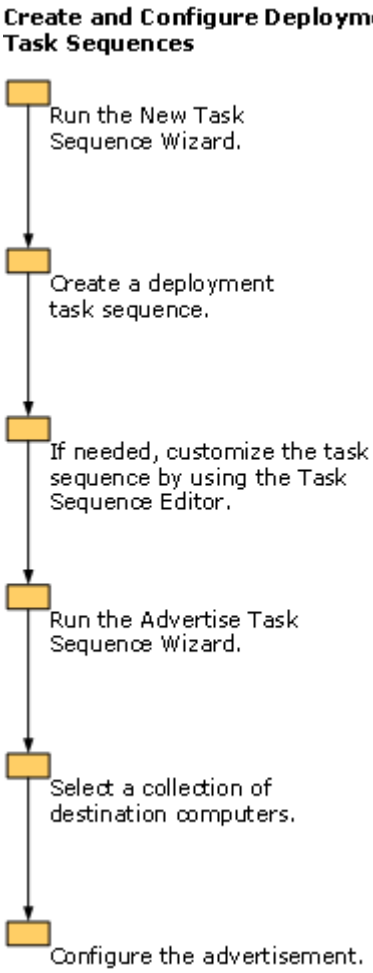
3.3 Create and Configure Task Sequence Workflow

The following workflow builds from the Operating System Deployment Top Level Workflow and identifies the basic steps and actions to take to create and distribute an operating system image using a task sequence.



3.4 Create and Configure Task Sequence Workflow

The following workflow builds from the Operating System Deployment Top Level Workflow and identifies the basic steps and actions to take to create and distribute an operating system image using a task sequence.



4.0 Planning for Operating System Deployment

This section provides the basic planning tasks needed to create and deploy an operating system image to a computer.

The following planning information is included in this section:

- Planning ConfigMgr Site Systems for Operating System Deployment
- Determine Your Operating System Deployment Method
- Planning for the Operating System Image
- Planning for the Boot Image
- Planning for Deploying the Operating System Image
- Planning for PXE Initiated Operating System Deployments

4.1 Planning ConfigMgr Site Systems for Operating System Deployment

The same planning steps that you would consider when setting up Configuration Manager 2007 site systems apply when configuring them for Operating System Deployment. For example, if you are planning to have more than one site system role on a server, you need to consider the aggregate affect of all the site system roles on the server's resources - network performance, memory, disk storage, and processor utilization. Operating System Deployment primarily affects resources for the state migration point and the distribution point.

Consider the following specific items when configuring the state migration point and distribution point for Operating System Deployment.

4.1.1 State Migration Point

The state migration point is used by Operating System Deployment when migrating user state and settings from one computer to another as part of the operating system image deployment. The state migration point requires Internet Information Services (IIS) to be installed.

As you plan for the state migration point, consider the following:

User State Size

The size of the user state directly affects disk storage on the state migration point and network performance during the migration. Consider the size of the user state and the number of computers that you are migrating. Consider also what settings you need to migrate from the computer. For example, if My Documents is already backed up to a server, then perhaps you don’t need to migrate it as part of the image deployment. This can keep the overall size of the user state smaller and decrease the effect it would otherwise have on network performance and disk storage on the state migration point.

User State Migration

Operating System Deployment relies on the User State Migration Tool (USMT) to migrate user state and settings.

USMT 3.0 supports the capture of user settings (known as scan state) from computers running the Windows 9x operating system or later, and the restore of user settings (known as load state) on computers running the Windows 2000 , service pack 4,Windows XP, Windows 2003, or Windows Vista operating systems.

Note
Configuration Manager 2007 supports computers running the Windows 2000, service pack 4 operating system or later. For more information about the supported operating systems for operating system deployment see: Supported Operating Systems and Hard Disk Configurations for Operating System Deployment

For more information about USMT see the Windows XP Professional Deployment Web page at http://go.microsoft.com/fwlink/?LinkId=88299. You can download USMT from the Microsoft Download Center at http://go.microsoft.com/fwlink/?LinkId=88300.

You can also find additional scripts to assist you with state migration from the Microsoft Business Desktop Deployment Web site http://go.microsoft.com/fwlink/?LinkId=88302.

Retention Policy

When you configure the state migration point, you can specify how long to keep user state data that was stored on it. The length of time that you keep the data on the state migration point depends on two considerations: the effect that the stored data has on disk storage, and whether you need to keep the data for a time against the possibility of needing to migrate it again.

There are two phases to state migration: capture and restore.

During capture, the user state data is collected and saved to the state migration point. During restore, the data is located on the state migration point, written to the destination computer, and then released by the task sequence step **Release State Store**. When the data is released, the retention timer starts. If you chose to delete migrated data immediately when you configured the state migration point, the user state data is deleted as soon as it is released. If you configured the state migration point to keep the data for a certain period of time, the data will be deleted when that period of time elapses after the state data is released. The longer you set the retention period, the more disk space you are likely to need.

Selecting drives

When you configure the state migration point, you need to specify the drive on the server that should be used to store user state migration data. You select a drive from a

fixed list of drives. However, the list of available drives shows all drive letters available, some of which may represent non-writable drives, such as the CD drive, or a non-network share drive. Some drive letters might not be mapped to any drives on the computer. It is important that you understand before configuring the state migration point which drives you should use for storing user state migration data.

4.1.2 Distribution Point

You must plan for the appropriate number and placement of distribution points. This kind of planning is basically the same as you would do for any other deployment of Configuration Manager 2007 packages. However, there are some considerations specific to Operating System Deployment.

Consider the number of computers that can be deployed at one time from a given distribution point. The processing speed and disk I/O of the distribution point must be considered along with the available bandwidth on the network, and the effect that the size of the image package will be on those resources.

For example, on a 100Mb Ethernet network, if no other server resource factors are considered, the maximum number of computers that can process a 2GB image package in one hour would be 23.

```
1 Megabit transfers 8 Megabytes of data
100 Megabits/sec = 12.5 Megabytes/sec = 750 Megabytes/min = 45
Gigabytes/hour= 23 images @ 2GB per image.
```

In reality, the number might be far less. So it you need to be able to deploy a specific number of computers within a specific time frame, you will need to distribute the image package to an appropriate number of distribution points, and use Configuration Manager 2007 features such as protected distribution points and branch distribution points to ensure that the appropriate destination computers receive the image.

Important

Operating System Deployment does not distinguish Configuration Manager 2007 site servers, in particular branch distribution points, from other destination computers in the collection. If you are advertising the task sequence to a collection that contains an Configuration Manager 2007 site server, the site server will run the task sequence like any other computer in the collection. It is recommended that you remove the site system role from the site server before deploying an operating system image to it, and then assign the site system role back to the site server. In addition, if you need to deploy an image to a distribution point or branch distribution point, be aware that that server needs to receive its image package from a different distribution point. It cannot receive the package from itself.

4.1.3 PXE Service Point

The PXE service point site role is used to initiate the operating system deployment process. The PXE service point must be configured to respond to PXE boot requests made by Configuration Manager 2007 clients on the network and then interact with Configuration Manager 2007 infrastructure to determine the appropriate deployment actions to take.

Fore more information about deploying operating systems using PXE, use the following link: Planning for PXE Initiated Operating System Deployments

4.2 Determine Your Operating System Deployment Method

There are different methods you can use to deploy an operating system image using Configuration Manager 2007. The following tables describe some of the prerequisites and installation considerations depending on the method of operating system deployment you implement for your Configuration Manager 2007 site.

4.2.1 PXE Initiated Operating System Deployments

Dependencies	Advantages	Disadvantages	Reference
• PXE service point site role. • DHCP considerations when co-located with PXE service point site role. • Windows Deployment Services installation. • Firewall port configuration.	• This method works well when no user is present at the target computer or in datacenter environments.	• Optional PXE advertisements require user intervention.	Planning for PXE Initiated Operating System Deployments

4.2.2 Bootable Media Initiated Operating System Deployments

Dependencies	Advantages	Disadvantages	Reference
• Appropriate image architecture must be available on an accessible distribution point.	• Works well for bare metal operating system deployment scenarios. • Media can be	• You must use bootable media in the same Configuration Manager 2007 site where the media was created.	How to Deploy an Operating System Image Using Media

	password protected for security purposes.		

4.2.3 Stand-alone Media Initiated Operating System Deployments

Dependencies	Advantages	Disadvantages	Reference
• Media set of USB flash drive, CD, or DVD which will contain the necessary installation files.	• Use this method for computers that are connected to the Configuration Manager 2007 site using a low bandwidth connection. • No connection to the Configuration Manager 2007 site is required. • Media should be password protected for security purposes.	• All necessary installation files must be contained on the media. • All required device drivers must be contained on the media. • No method to set an expiration date on the media.	How to Deploy an Operating System Image Using Media

4.2.4 Side by Side Operating System Deployments

Dependencies	Advantages	Disadvantages	Reference
• State migration point site role. • You must create a computer association between the source and destination computer.	• Using the state migration point site role, the user state can be saved and restored to the new computer.	• State migration point must have sufficient hard disk space available to store user state.	How to Perform a Side-by-Side Operating System Deployment How to Create a Computer Association for a Side-by-Side Migration How to Manage the User State

4.2.5 Configuration Manager 2007 Initiated Operating System Deployments

Dependencies	Advantages	Disadvantages	Reference
• Target computer must be a Configuration Manager 2007 client.	• You can deploy an operating system image without creating additional media.	• Requires connection to Configuration Manager 2007 site. • Target computers must be Configuration Manager 2007 clients.	How to Deploy Operating System Images to a Computer How to Capture an Image from a Reference Computer Using Capture Media

Determine Your Operating System Deployment Method

There are different methods you can use to deploy an operating system image using Configuration Manager 2007. The following tables describe some of the prerequisites and installation considerations depending on the method of operating system deployment you implement for your Configuration Manager 2007 site.

4.3 Planning for the Operating System Image

When you create the operating system image to deploy to target computers, the image contains the operating system and related files. Other applications and tools can be installed as a separate task sequence step, or manually, after the operating system is installed, or the supporting applications and tools can be pre-installed as part of the image. Here are some considerations for configuring the operating system image.

4.3.1 Packages that Support an Image Deployment

There are several Configuration Manager 2007 packages that you need to create to support the deployment of an operating system image:

- Configuration Manager 2007 client installation package
- USMT packages
- Other Packages

Important

Configuration Manager 2007 software packages that use **the Run another program first** option to install a dependent program as part of the package are not supported by Operating System Deployment

You should create and test these packages before you create a task sequence to deploy the operating system image.

Configuration Manager 2007 Client Installation Package

If you intend to use a task sequence to install the Configuration Manager 2007 client on a destination computer, you need to create a Configuration Manager 2007 package to install the Configuration Manager 2007 client. This package should have as its source location: C:\SMS\Client\i386. The program associated with this package should reference CCMSetup.exe in the command-line. All parameters needed by Operating System Deployment will be supplied by the task sequence when it is run, although you can customize it further. For more information about the available Configuration Manager 2007 client installation properties, use the following link: About Configuration Manager Client Installation Properties

Note
It is recommended that the program be configured to run when no user is logged on, and from a network share.

USMT Package

If you are migrating user state from one desktop to another, then you must use USMT 3.0 as your migration tool for Configuration Manager 2007. You can download USMT from the Microsoft Download Center at http://go.microsoft.com/fwlink/?LinkId=88300. Use Configuration Manager 2007 to create a package to install and run USMT on the target computer. A package program is not required. Be sure to include the configuration files (.INF) as part of the USMT package. Refer to the documentation for USMT for configuration information.

Other Packages

There are several other packages that you can create to support the operating system image deployment as well as the building of a reference computer. For more information about these packages, see the topic About Creating the Operating System Deployment Packages under the section See Also.

4.3.2 Server-Specific Deployments

Any hardware configuration that needs to be done as part of the image deployment to a server computer must be considered and included as part of the deployment task sequence.

For example, for a new server installation you might need to flash the computer BIOS, or configure the RAID controller.

It is recommended that you include packages that contain the appropriate tools to configure the server computer hardware as part of the deployment task sequence, or include it in the Windows PE image. For example, you could create a package that

runs the vendor's flash bios tool and include that as a **Run Command Line** task sequence step that references the package in the deployment task sequence.

4.3.3 Advantages and Disadvantages of Installing Applications and Tools using a Task Sequence

Applications and tools can be preinstalled as part of the image being deployed, or they can be installed separately (either manually, or as a custom task in a deployment task sequence) after the operating system has been deployed. This table outlines the advantages and disadvantages for each.

Installation method	Advantage	Disadvantage
Install as part of operating system image	Potentially faster deployment to target computers No need to host the application for deployment separately	Need to create a new image when updates are required Need to create an image for each distinct set of installation or setup properties Potentially larger overall image sizes Not all applications can be part of an image. The applications must be able to be generalized by Sysprep to be part of the image.
Install separately from the image	Fewer images to maintain Fewer update images to create	Potentially longer deployment and installation times, using separate Configuration Manager 2007 packages.

4.4 Planning for the Boot Image

Boot images are similar to operating system images except that they contain the appropriate version of Windows PE rather than a full operating system. They are stored with the .WIM file name extension. These WIM files are not captured from reference computers, but are supplied and customized by the Configuration Manager administrator, or obtained from an external source.

Configuration Manager 2007 includes 2 boot images - one to support x86 platforms and one to support x64 platforms. It is recommended that you use these images unless you have specific drivers that you need to include.

Boot images are distributed to distribution points like operating system images. When deployed as a package to a Configuration Manager 2007 client, the image is copied to and booted from the hard drive of the destination computer. When deployed using bootable media, the destination computer boots from the media and loads Windows PE.

It is important that the image contain the appropriate network adaptor (NIC) drivers and mass storage drivers necessary to successfully run on the destination computer.

Important

Boot images should always be stored in a physically secure location.

4.4.1 Updating the boot image

You can update boot images by adding new network adaptor or mass storage device drivers to it or by editing the properties associated with the boot image. Device drivers that you add to an existing boot image must be imported and enabled in the driver catalog before they cane be added to a boot image. When you update a boot image, the boot image does not change any of the associated packages that the boot image references. After you make changes to a boot image, you must update the distribution points that contain a version of the boot image so that the most current version of the boot image is available.

For more information about updating a boot image, use the following link: How to Update Boot Images

To update the boot image on distribution points

1. In the Configuration Manager console, expand **Operating System Deployment** and expand **Boot Images**.
2. Right-click the image you need to update and click **Update Distribution Points**.

4.5 Planning for Deploying the Operating System Image

There are several things to consider when planning for the deployment of an operating system image:

- Image Size
- Configuration Manager 2007 Client Cache Size
- State Migration Point and Distribution Point
- USMT package
- Advertisement Download Options
- Stand-alone Installation.

4.5.1 Image Size

The size of an operating system image can be quite large, often 2GB or more. The size of the image will affect the performance and bandwidth utilization of the network. It is recommended that you test network performance to better gauge the affect that the image deployment might have and the time it will take to complete. Configuration Manager 2007 activities that affect network performance include distributing the image to a distribution point, distributing the image from one site to another, and downloading the image to the Configuration Manager 2007 client.

One way to mitigate excessive use of network bandwidth between Configuration Manager 2007 sites is to use Courier Sender to send image data from a parent Configuration Manager 2007 site to a child Configuration Manager 2007 site. Courier Sender uses physical media instead of sending data over the network. When you have large image packages that would require excessive time or bandwidth to send them over the network, this sender can be useful. You can use Courier Sender at the source Configuration Manager 2007 site to create a parcel (a collection of files transferred from one site to another using Courier Sender), write the parcel to a tape, CD, or other physical medium, and then ship the tape or CD to the destination site by mail or a courier service. At the destination site, you can then use Courier Sender to receive the parcel and import the package data into the site. Other information files associated with the image package are still sent using the existing network connection between the Configuration Manager 2007 sites.

It is also recommended that you plan for an appropriate amount of disk storage space on all targeted distribution points and branch distribution points. Keep in mind that a branch distribution point is often a client desktop computer, and that the size of the image can affect the computer's performance for the desktop user.

4.5.2 Consider the Client Cache Size

Configuration Manager 2007 clients automatically use Background Intelligent Transfer Service (BITS) if it is available. When you advertise a deployment task sequence, you can set an option on the advertisement so that Configuration Manager 2007 clients will download the full image to a local cache before starting to run it. If the distribution point is not local but has BITS enabled, BITS is used to download the image.

In general, when a package, or in this scenario an image, must be downloaded but the cache cannot accommodate the package, Configuration Manager 2007 checks the other packages in cache to determine whether deleting any or all of the oldest packages will free enough space to place the new package into the cache. If deleting any or all of the oldest packages does not free enough space, the new package is not placed into the cache.

This might be the case if there is a package that is currently locked. If deleting any or all of the oldest packages does free enough space in the cache, Configuration Manager 2007 does so, and places the new package into the cache.

The default cache size on Configuration Manager 2007 clients might not be large enough for most operating system image deployments. If you are planning to download the full image to a local cache before starting to run it, you must adjust the Configuration Manager 2007 client cache size on the destination computers to accommodate the size of the image you are deploying.

Users with administrative credentials on the computers they are using can manage the download cache. Users can change the size or location of the cache, or delete all current contents. These options are in the **Temporary Program Download Folder** section of the **Advanced** tab of the **Configuration Manager** item in Control Panel. The download cache can also be managed with scripts.

4.5.3 Configure State Migration Point and Distribution Point

If you are planning to migrate existing user and computer state settings as part of your image deployment, then you need to configure a state migration point to store the settings. You also need to consider the appropriate number and placement of distribution points that will host the image for Configuration Manager 2007 clients. For more information about planning for the state migration point and distribution points, see Planning ConfigMgr Site Systems for Operating System Deployment.

4.5.4 Advertisement Download Options

There are basically two ways to run the image deployment on an Configuration Manager 2007 client computer. You can run the image by downloading it first to the Configuration Manager 2007 client cache from a distribution point and then installing it, or you can install the image from the distribution point. By default, when you create the advertisement for the deployment task sequence, the image is downloaded first to the Configuration Manager 2007 client cache and then installed. For more information about setting these options, refer to the Configuration Manager 2007 Operating System Deployment help topic Task Sequence - New Advertisement Wizard - Advanced Client.

If you choose to download the image to the Configuration Manager 2007 client cache before running it, and the deployment task sequence contains a step to re-partition the hard drive, the re-partition step will fail because re-partitioning the hard drive erases the contents of the Configuration Manager 2007 client cache. If the deployment task sequence must re-partition the hard drive, you must run the image installation from

the distribution point using the **Run program from distribution point** option when the task sequence is advertised.

4.5.5 Stand-alone Installation

You can create stand-alone media to deploy the operating system manually to a destination computer. Configuration Manager 2007 Operating System Deployment supports the use of CD or DVD media. Again, the size of the image might affect your choice of stand-alone media. To create stand-alone media, run the Create Task Sequence Media Wizard from the Operating System Deployment node in the Configuration Manager 2007 Administrator's Console. For more information about running the Create Task Sequence Media Wizard, refer to the Configuration Manager 2007 Operating System Deployment help topic Task Sequence Media Wizard.

To deploy an operating system to a new computer that is not currently managed by Configuration Manager 2007, the new computer must be added to the Configuration Manager 2007 database prior to initiating the operating system deployment process. This is true whether or not the computer has an existing operating system. For more information about importing new computer information into Configuration Manager 2007, see How to Add a New Computer to the ConfigMgr Database.

Planning for PXE Initiated Operating System Deployments

When you use PXE to initiate an operating system image deployment to a target computer there are several configuration decisions that must be considered depending on your network environment.

The sections below outline the various configuration and installation options that should be considered if you plan to use PXE to initiate operating system image deployments.

4.5.6 PXE Service Point

The PXE service point is a Microsoft System Center Configuration Manager 2007 site role that responds to PXE requests from computers that have been imported into Configuration Manager 2007. The PXE service point must be configured to respond to PXE boot requests by Configuration Manager 2007 clients so that Configuration Manager 2007 clients can interact with the Configuration Manager 2007 infrastructure to determine the appropriate installation actions to take.

PXE Service Point Configuration	More Information
Windows Deployment Services (WDS)	The PXE service point site role must be installed on a server with WDS installed. For more information about WDS use the following link: http://go.microsoft.com/fwlink/?LinkId=81031 • Windows Server® 2008 - The WDS services are bundled with the software.

	• **Windows Server 2003** - For Windows Server 2003, Service Pack 1 you must first install the Remote Installation Services (RIS) and then install the Windows Automated Installation Kit (Windows AIK). RIS must be installed however no additional RIS configuration is required. • For Windows 2003 servers running Service Pack 2 and higher, the Windows AIK installation is not necessary the WDS role can be added by using Add or Remove Programs. Use the following link for more information about the Windows AIK: http://go.microsoft.com/fwlink/?LinkId=81030
WDS Configuration Considerations	The WDS installation requires that the administrator is a member of the Local Administrators group on the server where Windows Deployment Services is installed. To boot to the WDS client, the user must be a member of the Domain users group. In addition, your computing environment must meet the following technical requirements: • Active Directory. A WDS server must be either a member of an Active Directory domain or a domain controller for an Active Directory domain. All Windows domain and forest configurations support WDS.
Network PXE Requests	By default, the Configuration Manager 2007 PXE service point is configured to respond immediately to network PXE requests. You can configure a delay when setting up the PXE service point if there are multiple PXE servers on your network so that the Configuration Manager 2007 PXE service point will wait the specified amount of time before responding to network PXE requests.
Available NTFS partition	The PXE service point running WDS requires an available NTFS hard disk partition to store boot images. The stored boot images will be used with the PXE initiated operating system deployments.

4.5.7 Windows Deployment Services (WDS) and DHCP

You should consider the following configuration options if you plan to co-host the PXE service point on a server running DHCP.

PXE Service Point Configuration Item	More Information
DHCP considerations	You must have a functioning DHCP server with an active scope. WDS will utilize PXE which requires a DHCP server.

Whether you plan to co-host WDS and DHCP on the same server or use two different servers you must configure WDS to listen on a specific port. DHCP and WDS both require port number 67. If you have co-hosted WDS and DHCP you can move DHCP or the PXE site role to a separate server or use the procedure below to configure the WDS server to listen on a different port:

Modify the following registry key:

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\WDSServer\Providers\WDSPXE

Set the registry value to:

UseDHCPPorts = 0

For the new configuration to take effect, you will then to run the following command on the co-located DHCP and WDS server:

```
WDSUTIL /Set-Server /UseDHCPPorts:No /DHCPOption60:Yes
```

DNS Considerations

A DNS server is required to run WDS.

Firewall and server port settings

The following UDP ports must be open on the WDS server and on the firewall:

Port 67 (DHCP)

Port 69 (TFTP)

Port 4011 (PXE)

4.5.8 Installing WDS

Task	More Information
WDS components	The WDS installation installs the following components: • The Trivial File Transfer Protocol (TFTP) service • The Windows Deployment Services service • The Windows Deployment Services Management snap-in and tools

WDS Installation Procedures	If you plan to install WDS on a server running Windows Server 2003, Service Pack 1:
	1. Install RIS.
	2. Download and install the Windows AIK.
	3. Perform one of the following tasks:
	  1. Locate and double-click the Windows Deployment Services installation file (**windows-deployment-services-update-amd64.exe** or **windows-deployment-services-update-x86.exe**), and complete the wizard.
	  2. From a command prompt type the following for amd64 installations: **Windows-Deployment-Services-update-amd64.exe /quiet /forcerestart**, for x86 installations: **Windows-Deployment-Services-update-x86.exe /quiet /forcerestart**
	  3. When the installation is complete restart the server to ensure the most current files are available.
	4. If you plan to install WDS on a server running Windows Server 2003, Service Pack 2, WDS is already installed:
	Note
	WDS is included with this version of Windows Server.
	• Install RIS and then install WDS. Restart the server so the correct file versions are available.

4.5.9 PXE Advertisements

The following section describes general PXE advertisement configuration planning considerations.

Advertisement Type	More Information
Mandatory advertisement	Computers that receive a mandatory advertisement that is enabled for PXE will boot using PXE without any user intervention. The user will not be given an option to bypass the PXE boot.

	Note If a user cancels the PXE boot process before the PXE service point responds, the computer will not receive the advertisement.
Optional advertisement	For computers that receive an optional advertisement that is enabled for PXE, a user must be present at the computer to press F12 to continue the PXE boot process or the computer will boot into the current operating system or using the next available boot device.
Clear last PXE Advertisement	If for any reason you want to re-advertise a mandatory advertisement enabled for a PXE device or assigned to a collection you can select this option by right clicking an existing Configuration Manager 2007 collection or a device with an existing PXE advertisement and selecting **Clear last PXE Advertisement**. **Important** Selecting this option will reset the status for the last mandatory PXE advertisements for the collection or device. The most recent mandatory advertisements will be rerun on any computers or devices the advertisement has been assigned to.

5.0 Configuring Operating System Deployment

To configure a site for operating system deployment, you may need to perform certain tasks depending on the method of deployment you choose.

Click any link in the following section for information about configuring your Configuration Manager 2007 site for operating system deployment.

The following information is included in this section:

- How to Add Images
  Contains the steps for adding new operating system images and operating system install packages.

- How to Manage the User State
  Contains the steps to setup a state migration point and capture and restore the user state.

- How to Manage the Driver Catalog
  Contains the steps to import device drivers and create driver packages for use with operating system deployment and device driver management.

- How to Manage Task Sequences
  Contains the steps to create, use, advertise, and copy task sequences.

- How to Manage Task Sequence Variables
  Contains the steps to assign task sequence variables to a computer or a collection.

- How to Manage Operating System Images
  Contains the steps to add and update operating system boot images.

- How to Manage Native Mode Certificates and Operating System Deployment
  Contains information on setting up and importing client certificates.

5.1 How to Add Operating System Images

You can add an operating system image to use with your operating system deployments. The operating system WIM files you import can be used as part of an operating system deployment task sequence.

Use the following procedure to add an operating system image.

To add an operating system image

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment** / **Operating System Images.**
2. To add an operating system image, right-click the **Operating System Images** node, and then click **Add Operating System Image** to open the Add Operating System Image Wizard.
3. On the **Data Source** page, type the network path in (UNC) format to the operating system image WIM file. To browse for a WIM file, click **Browse** button, and then locate the operating system image you want to add.
4. On the **General** page, specify the **Name**, **Version**, and an optional **Comment**. This information is useful when you have multiple operating system images.
5. Click **Next** to view the summary of the operating system that is being created.
6. Click **Next** to complete the wizard. The new operating system image is created and displays in the Details pane when you select the **Operating System Images** node.

How to Add Operating System Install Packages

You can add an operating system install packages for use with your setup initiated operating system deployments. The operating system install packages can be copied to distribution points so that they are available for Configuration Manager 2007 computers to install them.

Use the following procedure to add an operating system install package:

To add an operating system install package

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment** / **Operating System Install Packages**.
2. To launch the **Add Operating System Install Package** Wizard, right -click the **Operating System Install Packages** node and select **Add Operating Install Package** from the context menu.
3. On the **Data Source** page, specify the network path to the operating install package in UNC format. Select the WIM file you want to add.
4. On the **General** page, provide a **Name**, **Version**, and **Comment** for the operating install package. This identifying information is useful when you have multiple operating system install packages available.
5. Click **Next** to view the **Summary** of the operating system installation package that is being created.
6. Click **Next** to complete the wizard. The new operating system install package is created and is visible in the **Details** pane when you select the **Operating System Install Packages** node.

5.2 How to Manage the User State

The state migration point (SMP) is a Configuration Manager 2007 site role that provides a secure location to store user state information before an operating system deployment or migration.

Use the following tasks to manage the user state:

- How to Configure the State Migration Point
- How to Capture and Restore the User State
- How to Save the User State Locally for In-place Operating System Deployments
- Capture User State Workflow
- Restore User State Workflow

5.2.1 How to Configure the State Migration Point

The state migration point is a Configuration Manager 2007 site role that provides a secure location to store user state information before an operating system deployment. You can store the user state on the state migration point while the operating system deployment proceeds and then restore the user state to the new computer from the state migration point. Each state migration point site server can only be a member of one Configuration Manager 2007 site.

Note
It can take up to one hour for the state migration point to be available for user state storage. To expedite the availability of the state migration point after you create the new site role you can adjust any state migration point property setting to trigger a site control file update.

Use this procedure to enable and configure the state migration point.

How to Configure the State Migration Point

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Site Management** / <*site code*> - <*site name*> / **Site Settings** / **Site Systems**.
2. Select **New** from the **Action** menu or **Actions** pane, or right-click **Site System Roles** and select **New Roles** from the context menu.
3. Select **Server** to run the **New Site System Server** wizard.
4. Alternatively, to add the State Migration Point role to an existing site system:
    1. Select the desired site server in the **Site System Roles** pane.
    2. Select **Action** from the menu, or right-click the site system entry, and then select **New role** from the menu to run the **New Site Roles Wizard**.
    3. Continue with Step 5.
5. On the **General** page of the wizard, enter the **Name** of the server that will be the state migration point. Optionally provide the fully qualified host name for the server. Specify which account credentials to use to install the site system.
6. On the **System Role Selection** page, click the check box next to **State migration point**.
7. On the **State Migration Point** page, specify the drives on the server that should be used to store migration data. Click the New button to:
    1. Specify the **Storage drive** letter to use for storing migration data on the site system.

2. Enter the maximum number of clients whose data will be stored on the site system in the **Maximum clients** field.
3. Enter the **Minimum Free Space** that is required on the selected drive, and the unit of measurement (i.e. MB).
4. Or, select an existing drive from the **Drives** list and click the **Edit** button to modify that entry, or the **Delete** button to remove it.

Important

All drives that are available on the server are listed, including non-writable drives such as the CD. Be sure to select a writable drive from the list.

8. On the **State Migration Point** page, specify how the state migration should manage migration data that is marked for deletion. Select the option **Immediately** to remove that data as soon as possible after it is marked for deletion. Select the option **Delete** after and enter the number of days to wait before deleting that data. To configure the state migration point to reject new request select the **Enable restore-only mode**.

Important

When the state migration point site role is deleted or retired all associated user storage paths are also deleted.

5.2.2 How to Capture and Restore the User State

You can capture and restore the user state information by using a custom task sequence. This method is helpful with side-by-side migration and hardware upgrade deployment scenarios so that you can retain the user settings associated with the reference computer. The User State Migration Tool (USMT) version 3.0 is required to complete the necessary capture and restore steps.

Important

You must create a computer association before you can capture the user state from a reference computer. For more information about creating a computer association, use the following link: How to Create a Computer Association for a Side-by-Side Migration

Use the following procedures to capture and restore the user state.

To capture the user state

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment** / **Task Sequences**.
2. To start the New Task Sequence Wizard, right-click the **Task Sequence** node, and then click **New - Task Sequence**.

3. To create a new custom task sequence, on the **Create a New Task Sequence** page, select **Create a new custom task sequence**.
4. On the **Task Sequence Information** page, you can assign a name, version, and an optional description to the custom task sequence.

   Note

   You can associate this custom task sequence with a boot image by clicking **Browse** to open the **Select a Boot Image** dialog box, and then selecting the desired image.

5. To request access and reserve disk space on the state migration point add the **Request State Store** step and select **Capture state from this computer**.
6. To add the capture step to the task sequence, edit the task sequence by right-clicking the new custom task sequence in the details pane and selecting **Edit** from the context menu.
7. To add the capture step, click **Add,** and click **User State,** and then click **Capture User State**. You can do any of the following:
   1. To specify the package that contains the USMT you will use with this task sequence step, click **Browse** to open the **Select a Package** dialog box, and then specify the USMT package. When you select a package, the selected package's ID and version information displays.
   2. To capture all the user profiles with the standard options, select **Capture all user profiles with standard options.**
   3. To customize the user profile capture, select **Customize user profile capture**, click **Files** to open the **Configuration Files** dialog box, specify the name of the configuration file you want to use, and then click **Add**.
   4. To delete an existing configuration file associated with this task sequence step, select the file in the Files pane, and then click **Remove**.
8. To create a location to store the captured user state, add the **Request State Store** step by clicking **Add,** and then clicking **User State/Request State Store**. This will create a UNC connection to state migration point.

To restore the user state

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment** / **Task Sequences**.
2. To open the New Task Sequence Wizard, right-click the **Task Sequence** node, and then click **New - Task Sequence**.
3. To create a new custom task sequence, on the **Create a New Task Sequence** page, select **Create a new custom task sequence**.
4. On the **Task Sequence Information** page, specify a name, version, and an optional description to be assigned to the custom task sequence.

   Note

   You can associate this custom task sequence with a boot image by clicking **Browse** to open the **Select a Boot Image** dialog box and selecting the desired image.

5. To add the restore step to the task sequence, edit the task sequence by right-clicking the task in the details pane, and then clicking **Edit**.
6. To establish a connection to the state migration point add the **Request State Store** task sequence step and select **Restore state from another computer**.
7. In the **Task Sequence Editor**, click **Add - User State**, and then click **Restore User State**.

   Important

   If you are using this task sequence step for a task unrelated to an operating system deployment scenario, you should add the **Restart Computer** task sequence step immediately following this task sequence step.

   1. To specify the package that contains the USMT you will use with this task sequence step, click **Browse** to open the **Select a Package** dialog box, and then specify the USMT package. When you select a package, the selected package's ID and version information displays.
   2. To restore all of the captured user profiles with the standard options, select **Restore all captured user profiles with standard options**.
   3. To customize the user profile restore, select **Customize user profile restore**, click **Files** to open the **Configuration Files** dialog box, specify the name of the configuration file you want to use, and then click **Add**.
   4. To delete an existing configuration file associated with this task sequence step, select the file in the Files pane, and then click **Remove.**
8. To restore the local computer user profiles, select **Restore local computer profiles**. Specify a new password that should be assigned to the local accounts. Existing passwords for local accounts can not be migrated, so the new password specified will be assigned to the local computer accounts.
9. To allow the restore task sequence step to proceed if some of the selected client files can not be restored, select the **Continue if some files cannot be restored** check box.
10. To enable logging for this task sequence step, select the **Enable verbose logging** check box.
11. To release the user state, add the **Release State Store** step by clicking **Add,** and then clicking **User State/Release State Store**.

    Important

    The task sequence action that runs prior to the **Release State Store** task sequence step must be successful before you can run the **Release State Store** task sequence step.

5.2.3 How to Save the User State Locally for In-place Operating System Deployments

When you perform in-place operating system deployments you can create a task sequence to deploy the operating system image to an existing Configuration Manager 2007 client computer and save the user state on the target computer without using a state migration point. After the successful deployment of the new operating system the user state files will be restored to the new operating system and will be deleted form the path specified. The user state is saved using the read-only **_OSDStateStorePath** task sequence variable. For more information about task sequence variables, use the following link: About Task Sequence Variables

Use the following procedure to create an operating deployment task sequence that will save the user state locally to the target computer:

To create an operating system deployment task sequence that will save the user state locally

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment** / **Task Sequences**.
2. To start the **New Task Sequence** Wizard, right-click the **Task Sequences** node, and then click **New/Task Sequence**.
3. On the **Create a New Task Sequence** page, select **Install an existing image package** and click **Next**.
4. On the **Task Sequence Information** page, specify descriptive name for the task sequence and add an optional comment. To specify the boot image that will be associated with the task sequence click the **Browse** button to launch the **Select a Boot Image** dialog box and select the boot image. Click **Next**.

   Important

   The boot image you specify must match the chip architecture installed on the target computer or the task sequence will fail.

5. On the **Install the Windows Operating System** page, specify the operating system image package that will be used to install the operating system image by clicking the **Browse** button to launch the **Select an Operating System Image** dialog box, if there are multiple images in the image package, use the drop-down to specify the **Image** that should be associated with the image package. Clear the **Partition and format the target computer before installing the operating system** check-box option.

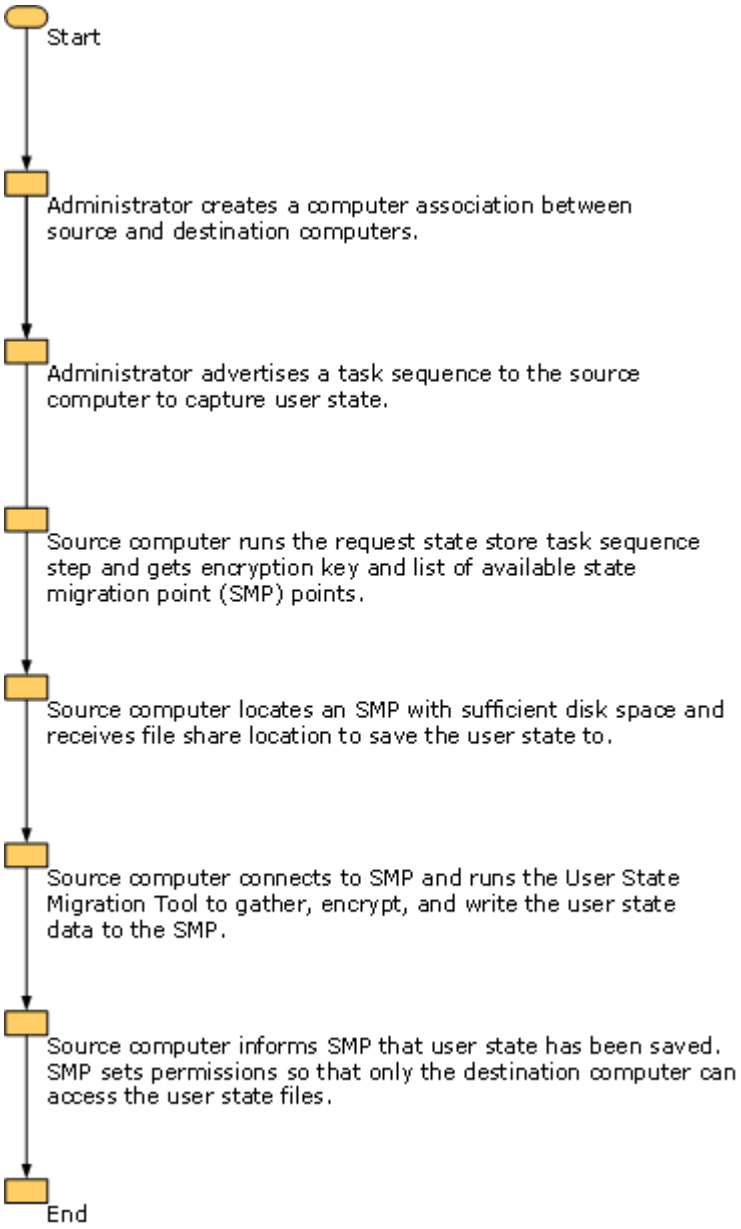
   Important

You must not select the option to format and partition the target computer hard disk. If this selection has not been unchecked the option to save the user state will not be available on the **State Migration** page of this wizard.

6. Additionally, on the **Install the Windows Operating System** page, specify the Windows **Product key** and **Server license mode**. If you specify **Per sever** as the license mode, configure the **Maximum server connections** that will be permitted. You must also specify if the local administrator account should be disabled, or if you want to use the same administrator account for all target computers by selecting the appropriate option. Click **Next**.
7. On the **Configure the Network** page, specify if the target computer will join a **Workgroup** or a Windows **Domain**.
    1. If you are adding the target computer to a **Workgroup**, you must type the name of the workgroup in the space provided.
    2. If you are adding the target computer to a Windows domain, click the **Set** button to launch the **Windows User Account** dialog box and specify the user account and password that should be used to add the computer to the Windows domain. You must also specify the name of the **Windows Domain** and Windows **Domain OU** that the target computer will be added to by clicking the **Browse** button. Click **Next**.
8. On the **Install ConfigMgr** page, click the **Browse** button to launch the **Select a Package** dialog box and select the Configuration Manager 2007 package that will be used to install the Configuration Manager 2007 client. Specify the Configuration Manager 2007 client installation properties that will be used in the **Installation properties** window. Click **Next**.
9. On the **Configure State Migration** page, select the **Save user settings locally** option and click the **Browse** button to select the USMT package that will be used to capture the user state. Additionally, specify the configuration user settings that will be captured by selecting the **Capture network settings** and capture **Microsoft Windows settings** check boxes. Click **Next**.
10. On the **Include Updates in Image** page specify how the target computer will install assigned software updates by selecting the appropriate option.
11. On the **Install Software Packages** page click the New button to launch the **Program Select** Dialog box. Click the Browse button to launch the **Select a Package** dialog box. Select the Configuration Manager 2007 packages you want to include and click **OK**. Use the drop down to select the associated programs that should be used.
12. To complete the creation of the new task sequence, on the **Summary** page, click **Next**.
13. To confirm that the new task sequence was created using the properties specified, review the confirmation on the **Confirmation** page.
14. Click **Close** to close the **New Task sequence** Wizard.
15. After you have created the task sequence, you must edit the task sequence. Select the **Set Local State Location** task sequence step. In the **Value** window specify the directory that the state store will be saved by typing in the network location between the percent symbols. For example: **%C:\MyLocalStateStore%**. For more information about editing an existing task sequence, use the following link: [How to Edit an Existing Task Sequence]

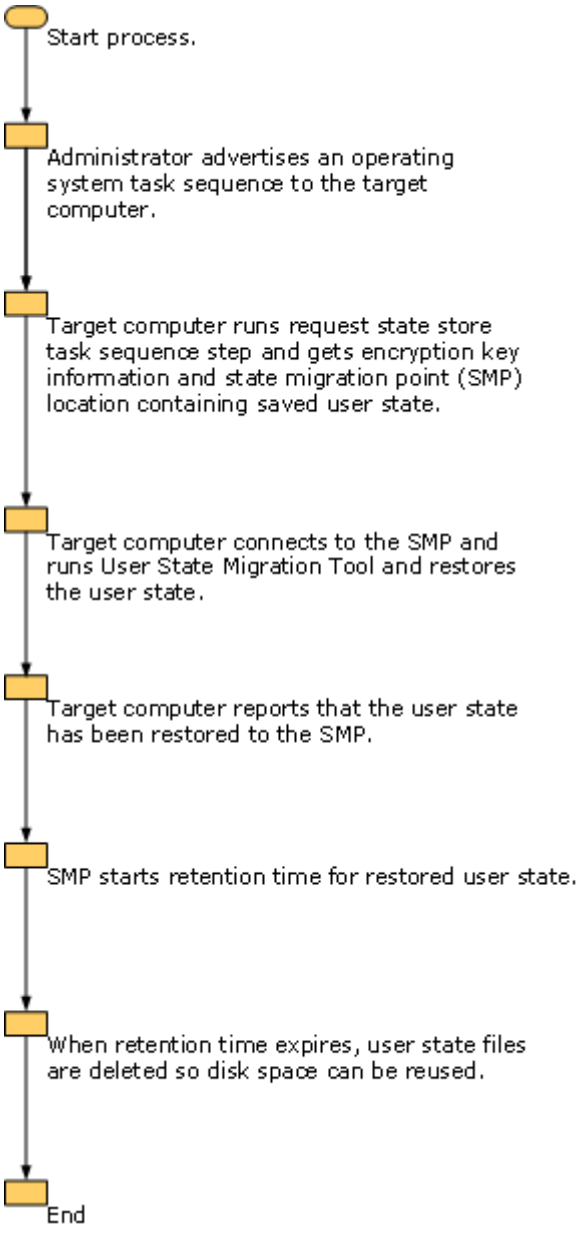
5.2.4 Capture User State Workflow

The following flowchart displays the actions associated with a Configuration Manager 2007 user state capture in the order in which they generally take place.



5.2.5 Restore User State Workflow

The following flowchart displays the actions associated with restoring the user state to a Configuration Manager 2007 computer in the order in which they generally take place.



5.3 How to Manage the Driver Catalog

The driver catalog helps manage the cost and complexity of deploying an operating system in an environment that contains different types of computers and devices. By storing device drivers in the driver catalog and not with each individual operating system image, the number of operating system images needed is greatly reduced.

Use the following tasks to help you manage the driver catalog:

- How to Import Windows Device Drivers into the Driver Catalog
- How to Create a Driver Package
- How to Add Device Drivers to an Existing Driver Package
- How to Install Drivers on a Configuration Manager 2007 Client Using a Task Sequence

5.3.1 How to Import Windows Device Drivers into the Driver Catalog

You can import device drivers for use in your Configuration Manager 2007 site. Imported device drivers can be added to boot image packages or driver packages and can be installed as part of an Operating System Deployment task sequence using the **Auto Apply Driver** and **Apply Driver Package** task sequence steps. Configuration Manager 2007 reads the provider, class, version, signature, supported hardware, and supported platform information associated with the device as part of the import process. By default, the driver is named after the first hardware device it supports, however the device driver can be renamed later. The supported platforms list is determined based on the device driver's definition. However, the accuracy of this can vary so you should manually verify if the device driver is supported after it has been imported.

The SMS Provider must have read permission to the network share where the device driver will be located or the import will fail.

Use the following procedure to import Windows device drivers into the driver catalog.

To import Windows device drivers

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment / Drivers.**
2. To start the Import New Driver Wizard, do any of the following:
    - Click **Action** on the file menu in MMC snap-ins, and then click **Import.**
    - In the Actions pane, click **Import**.
    - Right-click the **Drivers** node, and then click **Import**.
3. On the **Locate Driver** page, specify whether you want to import a specific device driver or all device drivers contained in a specific directory.

- To import a specific driver, select **Import a specific driver** and specify the source file directory in UNC format and the Windows device driver.INF or mass storage txtsetup.oem file to be imported.
- To import all of the device drivers in a specific directory, select **Import all drivers in the following network path (UNC) to its .inf or txtsetup.oem file** and specify the network path to the device driver directory.

Note

To import a subset of device drivers from a large directory, you can create a new subdirectory and copy the desired drivers into the newly created directory. Use the method above to import the contents of that subdirectory. Each device driver should be imported into its own subdirectory.

4. On the **Driver Details** page, specify a descriptive name and optional description for the driver.INF file or files that will be imported. To allow computers to use the device drivers, the **Enable these drivers and allow computers to install them** check box must be checked. This check box is selected by default.

Important

If a device driver is causing a problem or you want to suspend deployment of a device driver, you can disable the device driver by clearing the **Enable these drivers and allow computers to install them** check box. For computers to use and install a driver, this option must be enabled.

5. To assign the device drivers to a category for filtering purposes, such as "Beta" or "Production," click the **Categories** button. The category assignment is also used to configure the device drivers that will be considered by the **Auto Apply Driver** task sequence step.
6. On the **Platforms Applicability** page, confirm the platforms where these drivers will be installed.
   - To make the driver available to all platforms, select **This driver can be run on any platform**.
   - To specify a particular client platform for the device driver to be installed, **select This driver can run only on the specified platforms**, **and then select the applicable platforms**.
7. On the **Add Driver to Packages** page, assign the device driver to an existing package, or create a new package by clicking the **New Package** button to open the **New Driver Package** dialog box.
8. Specify the **Name**, and **Description** that should be associated with the new driver package and provide the source directory in UNC format, and then select **Update distribution points when finished** to update the distribution points immediately.

Important

Drivers must be part of a package and deployed to distribution points before computers can install them. If you do not update distribution points immediately, you

must update the distribution points later using the **Update Distribution Point** wizard.

9. On the **Add Driver to Boot Images** page, specify the boot image or images you would like to add the driver to.

   Note
   Only mass storage and network device drivers should be added to the boot images for operating system deployment scenarios.

10. Select **Update distribution points when finished** to update the distribution points immediately with the updated boot images.
11. On the **Summary** page, review the action details, and then click **Next** to complete the wizard.

5.3.2 How to Create a Driver Package

A driver package contains the content associated with one or more device drivers. Device drivers must to be added to a driver package and copied to a distribution point before Configuration Manager 2007 clients can install them.

Note
Driver packages that are made available to Microsoft Windows 2000-based and Windows XP-based Configuration Manager 2007 clients should not contain more than 150 device drivers in a single driver package.

Use the following procedure to create a new driver package.

To create a new driver package

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment** / **Driver Packages**.
2. To start the New Driver Package Wizard, right-click the **Driver Packages** node, and then click **New - Driver Package**.
3. On the **Name** line, specify a descriptive name for the new driver package. The name you specify should help you determine what device drivers are contained or what the purpose is for the driver package. In the Description window, enter an optional description for the driver package. The description should provide information about the contents or the purpose of the driver package.
4. Specify the driver package source by entering the path to the driver package source directory in Universal Naming Convention (UNC) format. Alternatively, you can specify the source by clicking **Browse** to open the **Browse For Folder** dialog box, and browsing to the correct path. If you need to create a new empty folder for the source directory which will contain the device driver content, click **Make New Folder**. Each driver packages must have a unique source path.

Important

The Configuration Manager 2007 system account must have read/write permissions to the specified driver package source location.

5. To close the New Driver Package Wizard, click **OK**. The new driver package will be visible in the details pane.

Note

You can view the associated general, data source, distribution point, data access, and security information for the driver package by right-clicking the driver package, and then clicking **Properties**.

5.3.3 How to Add Device Drivers to an Existing Driver Package

You can add Windows device drivers that have been imported into the driver catalog to an existing driver package.

Use the following procedure to add Windows device drivers to an existing driver package.

To add a device driver to an existing driver package

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment / Drivers.**
2. In the Drivers pane, right-click the device driver you want to add to a driver package, and then click **Add or Remove to Packages** to open the **Add or Remove Drivers to Packages** dialog box.
3. Select the driver package or packages you want to add the device driver to by selecting the check box associated with the driver package. You can create a new package by clicking **New Package** to open the **New Driver Package** Wizard.
4. To update the distribution points associated with the selected driver packages with the new driver information, select the **Update distribution points when finished** check box.
5. To close the Add or Remove Drivers to Packages dialog box, click OK.

5.3.4 How to Install Drivers on a Configuration Manager 2007 Client Using a Task Sequence

You can add new device drivers to an existing operating system image using the task sequence editor. To allow Configuration Manager 2007 to search in the driver catalog for the new device drivers you should add the **Auto Apply Drivers** task sequence step to an existing task sequence. The auto apply driver task sequence step will search in the Configuration Manager 2007 existing driver categories for the most appropriate device driver to install with the operating system deployment. Configuration Manager 2007 will look in all available categories for the device driver. To limit the device driver search to specific categories, select **Limit driver matching to only consider drivers in selected categories**.

To add an existing driver package to an operating system you should add the **Apply Driver Package** task sequence step. This task sequence step will add all device drivers in a specified directory to the existing task sequence for use with the operating system deployment.

Use the procedure below to add device drivers to an existing operating system image using one of the **Driver** task sequence steps mentioned earlier

How to Add Drivers to an Operating System Image

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment** / **Task Sequences**.
2. To open the task sequence in the task sequence editor, locate the task sequence in the list that contains the operating system image you want to add the device driver to. Right-click the task sequence and select **Edit** from the context menu. Alternatively, you can select the task sequence and click **Edit** in the **Actions** pane or select the **Action** menu and choose **Edit**.
3. To add the desired device driver task sequence step, select the task sequence group that you want to add the driver task sequence step to, or click the Add menu and select **Drivers**.
4. To allow Configuration Manager 2007 to search for the appropriate device drivers, add the **Auto Apply Drivers** task sequence step. Configuration Manager 2007 will search available driver categories for the appropriate device drivers. To allow Configuration Manager 2007 to add a driver package, add the **Apply Driver Package** task sequence step. This option will allow Configuration Manager 2007 to install only device drivers from a specific category.
5. Specify the appropriate information on the **Properties** and **Options** tabs.
6. Click **OK** to save the task sequence.

5.4 How to Manage Task Sequences

Task sequences provide the mechanism for performing multiple steps or tasks on a computer without requiring user intervention.

Use the following tasks to help you manage the Configuration Manager 2007 task sequence environment:

- How to Create a Task Sequence to Install an Existing Operating System Image Package
- How to Create a Task Sequence to Build and Capture an Operating System Image
- How to Create a Custom Task Sequence
- How to Edit an Existing Task Sequence
- How to Advertise Task Sequences
- How to Copy a Task Sequence from one Configuration Manager 2007 Site to Another
- How to Install Software Packages as Part of a Task Sequence

5.4.1 How to Create a Task Sequence to Install an Existing Operating System Image Package

You can create a task sequence to deploy an existing operating system image to a target computer by using the New Task Sequence Wizard. After you have created the task sequence, you can edit the task sequence by selecting the **Task Sequences** node, right-clicking the task sequence you want to change, and then clicking **Edit** to open the Task Sequence Editor.

Use the following procedure to create a new task sequence to install an existing operating system image.

To create the operating system deployment new task sequence

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment** / **Task Sequences**.
2. To start the New Task Sequence Wizard, right-click the **Task Sequences** node, and then click **New/Task Sequence**.
3. On the **Create a New Task Sequence** page, select **Install an existing image package,** and then click **Next**.
4. On the **Task Sequence Information** page, specify a descriptive name for the task sequence, and then add an optional comment. To specify the boot image that will be associated with the task sequence, click **Browse** to open the **Select a Boot Image** dialog box, select the boot image, and then click **Next**.

   Important

   The boot image you specify must match the chip architecture installed on the target

computer or the task sequence will fail.

5. On the **Install the Windows Operating System** page, specify the operating system image package that will be used to install the operating system image by clicking **Browse** button to open the **Select an Operating System Image** dialog box, and then selecting the operating system package. If there are multiple images in the image package, use the drop-down to specify the **Image** that should be associated with the image package. To partition and format the target computer's hard disk prior to installing the operating system image, select the **Partition and format the target computer before installing the operating system** check box.

   Important

   Do not select the option to format and partition the target computer hard disk if you have saved the user state locally or the saved user state will be erased. For more information about saving the user state locally on the target computer for in-place operating system deployment scenarios, see How to Save the User State Locally for In-place Operating System Deployments

6. Additionally, on the **Install the Windows Operating System** page, specify the Windows **Product key** and **Server license mode**. If you specify **Per server** as the license mode, configure the **Maximum server connections** that will be permitted. You must also specify if the local administrator account should be disabled, or if you want to use the same administrator account for all target computers by selecting the appropriate option. Click **Next**.
7. On the **Configure the Network** page, specify if the target computer will join a **Workgroup** or a Windows **Domain**.
   1. If you are adding the target computer to a **Workgroup**, you must type the name of the workgroup in the space provided.
   2. If you are adding the target computer to a Windows domain, click the **Set** button to open the **Windows User Account** dialog box and specify the user account and password that should be used to add the computer to the Windows domain. You must also specify the name of the **Windows Domain** and Windows **Domain OU** that the target computer will be added to by clicking the **Browse** button. Click **Next**.
8. On the **Install ConfigMgr** page, click the **Browse** button to launch the **Select a Package** dialog box and select the Configuration Manager 2007 package that will be used to install the Configuration Manager 2007 client. Specify the Configuration Manager 2007 client installation properties that will be used in the **Installation properties** window. Click **Next**.
9. Configure how you will save the user state information on the **Configure State Migration** page. Click the **Browse** button to select the USMT package that will be used to capture the user settings. Specify the configuration settings that will be captured by selecting the **Capture network settings** and capture **Microsoft Windows settings** check boxes. Click **Next**.
10. On the **Include Updates in Image** page specify how the target computer will install assigned software updates by selecting the appropriate option.
11. On the **Install Software Packages** page, click **New** to open the **Program Select** dialog box. Click **Browse** to open the **Select a Package** dialog box.

Select the Configuration Manager 2007 packages you want to include, and then click **OK**. Use the drop down to select the associated programs that should be used.

12. To complete the creation of the new task sequence, on the **Summary** page, click **Next**.
13. To confirm that the new task sequence was created using the properties specified, review the confirmation on the **Confirmation** page.
14. Click **Close** to close the New Task Sequence Wizard.

5.4.2 How to Create a Task Sequence to Build and Capture an Operating System Image

You can create task sequence to build and capture operating system image for use with operating system deployment using the **New Task Sequence** Wizard. After you have created the task sequence, you can edit the task sequence by selecting the **Task Sequences** node and right-clicking on the task sequence you want to change and selecting **Edit** to launch the **Task Sequence Editor**.

Use the following procedure to create a new task sequence to build and capture operating system image:

To create a new build and capture task sequence

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment** / **Task Sequences**.
2. To start the **New Task Sequence** Wizard, right-click the **Task Sequences** node, and then click **New/Task Sequence**.
3. On the **Create a New Task Sequence** page, select **Build and capture a reference operating system image** and click **Next**.
4. On the **Task Sequence Information** page, specify descriptive name for the task sequence and add an optional comment. Specify the boot image that will be associated with the task sequence by clicking the **Browse** button to launch the **Select a Boot Image** dialog box and select the boot image. Click **Next**.

   Important

   The boot image you specify must match the chip architecture installed on the target computer and the chip architecture specified in the operating system install package or the task sequence will fail.

5. On the **Install Windows Operating System** page, specify the operating system install package that will be used to install the operating system by clicking the **Browse** button to launch the **Select an Operating System Install Package** dialog box and selecting the operating system install package. If there are multiple **Editions** associated with the operating system install package, use the drop-down to specify the edition that should be included with this task sequence.
6. Additionally, on the **Install the Windows Operating System** page, specify the Windows **Product key** and **Server license mode** (if necessary). If you

specify **Per sever** as the license mode, configure the **Maximum server connections** that will be permitted. By default the local administrator account will be disabled, if you want to **Always use the same administrator account** for the computers that will run this task sequence, select the always use the same administrator password option and provide the password that will be used. Click **Next**

7. On the **Configure the Network** page, specify if the target computer will join a **Workgroup** or a Windows **Domain**.
    1. If you are adding the target computer to a **Workgroup**, you must type the name of the workgroup in the space provided.
    2. If you are adding the target computer to a Windows domain, click the **Set** button to launch the **Windows User Account** dialog box and specify the user account and password that should be used to add the computer to the Windows domain. The account you specify must have domain join permissions in the Windows domain you want to add the computer. You must also specify the name of the **Windows Domain** and Windows **Domain OU** that the target computer will be added to by clicking the **Browse** button. Click **Next**.
8. On the **Install ConfigMgr** page, click the **Browse** button to launch the **Select a Package** dialog box and select the Configuration Manager 2007 package that will be used to install the Configuration Manager 2007 client. Specify the Configuration Manager 2007 client installation properties that will be used in the **Installation properties** window. Click **Next**.
9. On the **Include Updates in Image** page specify how the target computer will install assigned software updates by selecting the appropriate option.
10. On the **Install Software Packages** page click the New button to launch the **Program Select** Dialog box. Click the Browse button to launch the **Select a Package** dialog box. Select the Configuration Manager 2007 packages you want to include and click **OK**. Use the drop down to select the associated programs that should be used.
11. On the **System Preparation** page specify the Configuration Manager 2007 package that contains the **Sysprep** tool. The sysprep tool specified must support the operating system install package version selected in step 5.
12. On the **Image Properties** page specify identifying information that will be associated with task sequence you are creating.
13. On the **Capture Image** page, specify where the captured operating system image will be saved on the network. You can click the Browse button to search for a location or type in the path using UNC format. Click the Set button to launch the Windows User Account dialog box and specify the network account that will be used to access the specified operating system image output location.
14. To complete the creation of the new task sequence, on the **Summary** page, click **Next**.
15. To confirm that the new task sequence was created using the properties specified, review the confirmation on the **Confirmation** page.
16. Click Close to close the **New Task sequence** Wizard.

5.4.3 How to Create a Custom Task Sequence

A task sequence consists of a combined series of steps to complete an action. Task sequences can operate across a computer restart, and task sequence steps can be put into groups for more control over run-time behavior. You can create a custom task sequence that will automate and perform tasks on a computer without user intervention. Custom task sequence steps can be added to groups so that multiple task sequence steps will run on a computer. Using task sequence steps in groups will allow you to organize and configure error control for each individual task sequence step and group.

Use the following procedure to create a custom task sequence.

To create a custom task sequence

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment** / **Task Sequences**.
2. To start the New Task Sequence Wizard, right-click the **Task Sequences** node, and then click **New/Task Sequence**.
3. On the **Create a New Task Sequence** page, select **Create a new custom task sequence,** and then click **Next**.
4. On the **Task Sequence Information** page, specify descriptive information about the custom task sequence, type the **Task sequence name**, **Version**, and a **Description** in the spaces provided.
5. To specify the boot image that will be associated with this custom task sequence, click **Browse** to open the **Select a Boot Image** dialog box, and then specify the boot image you want to use.
6. To complete the creation of the new custom task sequence, on the **Summary** page, click **Next**.
7. To confirm that the new task sequence was created using the properties specified, review the confirmation on the **Confirmation** page.
8. To edit or add or remove steps to the custom task sequence, right-click the task sequence, and then click **Edit**.

5.4.4 How to Edit an Existing Task Sequence

You can update, or change an existing Configuration Manager 2007 task sequence.

Use the following procedure to edit an existing task sequence.

To edit an existing task sequence

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment** / **Task Sequences**.
2. To start the Task Sequence Editor, select the task sequence you want to update, right-click the task sequence, and then click **Edit**.

3. To add a new task sequence step or a new task sequence group, click **Add** and select **New Group** or the task sequence step you want to add.
4. To remove a task sequence step, select the task sequence step you want to remove, click **Remove**, and then click **Yes**.
5. You can also click the **Options** tab to update the options associated with the task sequence step.
6. Click **OK** to close the Task Sequence Editor.

5.4.5 How to Advertise Task Sequences

You can advertise task sequences to collections by using the **New Advertisement** wizard.

Before you run the New Advertisement Wizard, you will need to know what target collections and desired run-time behavior you want for the advertisement you are creating. Read access to the task sequence is required to advertise the task sequence, and the task sequence must exist prior to creating the advertisement.

When you have created a successful advertisement, it will be located under the **Software Distribution/Advertisements** node.

Use the following procedure to create a new advertisement of task sequences.

To advertise task sequences to collections

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Collections**.

   Alternatively, you can navigate to the **Task Sequences** node: **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment / Task Sequences**. Right-click the task sequence you want to advertise, and then click **Advertise**.

2. To start the New Advertisement Wizard, right-click the collection that will receive the advertisement, and then click **Advertise Task Sequence**.
3. On the **General** page, specify a **Name** and an optional descriptive **Comment** for the new advertisement.

   Note

   Task sequence advertisement names do not need to be unique, you can assign the same name to more than one task sequence advertisement.

4. Specify the task sequence to be advertised by selecting an existing task sequence from the drop-down list, and then confirm the collection that will receive the advertisement. To change the target collection for the advertisement, click the **Browse,** and specify a different collection.

5. To make the advertisement available to subcollections of the selected collection, select the **Include members of subcollections** check box. To make the advertisement available to boot media and PXE clients, select the **Make this task sequence available to boot media and PXE** check box.

   Note

   The **Make this task sequence available to boot media and PXE** check box is not available if the advertised task sequence will perform a task sequence other than an operating system deployment.

6. On the **Schedule** tab, specify when this task sequence will be available to the target collection.

   You can also assign an expiration date to the advertisement by selecting the **Advertisement will expire** check box, and specifying an expiration date. If you want the specified time to be interpreted as Coordinated Universal Time (UTC) time format, select the **UTC** check box; otherwise, the local time on each target computer will be used.

7. To create mandatory advertisements which must be run on the target computer, click the **New** icon to open the **Assignment Schedule** dialog box. To specify when and how frequently this advertisement is available, click **Schedule** to open the **Custom Schedule** dialog box, and specify the schedule and recurrence behavior.
8. You can specify the desired Wake On LAN (WOL) and maintenance window behavior by selecting the corresponding check boxes, and then use the drop-down list to assign the priority and rerun behavior.
9. On the **Distribution Points** page, specify how clients will retrieve content from packages referenced by the task sequence. Do one of the following:
   - To allow the Configuration Manager 2007 clients to download all required content as needed by the running task sequence, select **Download content locally when needed by running task sequence**. This task sequence action specifies that required content is downloaded to the computer when needed by a task sequence action. This option is useful when you plan on partitioning your hard disk as part of the operating system deployment or you make extensive use of conditions.
   - To configure the Configuration Manager 2007 client to download all content to the client cache before initiating the task sequence, select **Download all contents locally before starting the task sequence**. This option is particularly useful when deploying an operating system to multiple computers at the same time. The required content will be downloaded using BITS where available, which is bandwidth aware and lessens the impact on your network. It also helps improve the reliability of operating system deployments because the task sequence will not start until all content is downloaded and verified. However, this option cannot be used if the advertisement is enabled for PXE and boot media or the task sequence contains a Partition Disk task sequence action that repartitions the drive containing the Configuration Manager 2007 client cache.

- To configure the Configuration Manager 2007 client to access content directly from a distribution point, select **Access content from a distribution point when needed by a running task sequence**. This option can be less reliable and less secure because the content is not downloaded and verified before being used by the running task sequence.

By default Configuration Manager 2007 clients will access content from a local distribution point, you can specify that the Configuration Manager 2007 client should use a remote distribution point if a local distribution point is not available by selecting the **When no local distribution point is available, use a remote distribution point** check box. To specify that the Configuration Manager 2007 client should use an unprotected distribution point if a protected one is not available select the **When no protected distribution point is available, use an unprotected distribution point** check box.

10. On the **Interaction** page, specify how clients will be notified and interact with the advertised task sequence.
11. On the Security page, specify the users that have access to this object and click **Next**.
12. Review the summary on the **Summary** page and click **Next**.
13. On the **Confirmation** page click Close to close the wizard.

5.4.6 How to Copy a Task Sequence from one Configuration Manager 2007 Site to Another

Task sequences are automatically propagated from Configuration Manager 2007 parent sites to Configuration Manager 2007 child sites. However, they are not propagated from child sites to parent sites, or from a Configuration Manager 2007 site in one hierarchy to an Configuration Manager 2007 site in another hierarchy.

A task sequence can be exported as an XML file from one Configuration Manager 2007 site, and imported to another Configuration Manager 2007 site. Only the task sequence itself is exported. No reference packages are exported. Consequently, you must review each imported task sequence using the Task Sequence Editor for any references to packages and ensure that the task sequence references packages that exist in the site you have imported the task sequence to. User passwords and software product keys are also not exported and you will need to create the necessary task sequence steps at the site where the task sequence was imported.

Use this procedure to copy a task sequence from a Configuration Manager 2007 child site to a Configuration Manager 2007 parent site, or from a Configuration Manager 2007 site in one hierarchy to and Configuration Manager 2007 site in another hierarchy.

How to Copy a Task Sequence from one ConfigMgr Site to Another

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment** / **Task Sequences.**
2. In the Task Sequences pane, select the task sequence that you want to copy.
3. In the **Action** menu, or from the **Actions** pane, select **Export**.
4. In the **Save As** dialog box, select the location that the task sequence XML file should be saved and enter a file name for the task sequence file. You must save the task sequence as an **.XML** file.
5. If necessary, place the task sequence XML file on a network share that can be accessed by the other Configuration Manager 2007 site.
6. Using the Configuration Manager 2007 Administrator Console at the other Configuration Manager 2007 site, navigate to Task Sequences.
7. In the **Action** menu, or from the **Actions** pane, select **Import**.
8. Browse to the location of the task sequence XML file that you exported, select it, and click **Open**. Note the path to where the task sequence was imported to and click **OK** to confirm the import.
9. The task sequence should now be visible in the list of task sequences. You can also click **Refresh** the **Actions** pane to reload list of available task sequence.

   Note

   When you import a task sequence into another Configuration Manager 2007 site, it is important to remember that Configuration Manager 2007 only imports the task sequence. It does not import any boot image packages, operating system image packages, or software packages, user passwords, or product keys that are referenced by the task sequence. Consequently, the imported task sequence contains null references to those types of packages.

10. Select the imported task sequence and edit the task sequence at the new site.
    - Fix any broken package and program references that are needed by the task sequence. All associated programs must be accessible by the task sequence at the new site.
    - Reconfigure any task sequence steps that require a user account or password with appropriate credentials so the task sequence can run at the new Configuration Manager 2007 site.
    - If any task sequence steps require a unique product key, reconfigure the task sequence with the product key information that should be used at the new site.
    - If a boot image is required to run the task sequence you need to associate the task sequence with a boot image that is available at the new site. To associate a new boot image for the task sequence, by right-clicking the task sequence and choosing **Properties**. Select the **Advanced** tab and assign the new boot image.
11. Review the task sequence for any broken or null package references. You can do any of the following:
    - Configure the broken reference to specify an appropriate package at the new Configuration Manager 2007 site.
    - Remove the task sequence step that contains the broken reference.

- Disable the task sequence step that contains the broken reference.
- Create a conditional statement for that task sequence step that skips the reference.

Note

If you run a task sequence that has a task sequence step with a broken reference, by default the task sequence will generate an error for that task sequence step and continue to run.

12. Verify that all associated user accounts needed by the task sequence steps have the necessary permissions at the new site. For example; the task sequence may have a step that must have permissions to create a computer account, or connect to a network folder at the new site.

5.4.7 How to Install Software Packages as Part of a Task Sequence

You can use a task sequence to install software as part of any operating system image deployment, or to install software on an existing Microsoft System Center Configuration Manager 2007 client.

Using steps in a task sequence, Configuration Manager 2007 can install one or more Configuration Manager 2007 software packages on a target computer after the new operating system is installed, but before the user is first allowed to login. The installation of each software package in the task sequence completes in order before the next software package is installed. Desktop users cannot login to the computer until all software packages have been installed. Programs associated with each Configuration Manager 2007 package must run under the computer's system account and be configured to install automatically and silently without user interaction.

When you use a task sequence to install an application Configuration Manager 2007 checks the following two conditions:

1. Whether or not a user must be logged in for the installation to proceed.
2. Whether or not user any user input is required.

Use this procedure to add a software package to an existing task sequence that deploys an operating system image to a computer.

How to Install Software Packages as Part of a Task Sequence

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment / Task Sequences**.
2. Select the task sequence that is being used to deploy the operating system image from the **Task Sequences** pane to which the software package should be added.
3. In the **Action** menu, or from the **Actions** pane, select **Edit** to run the **Task Sequence Editor**.

4. Highlight the task sequence step in the tree view pane where you want to install the software package and click **Add**. You can add this new task step to the Install Software group if it exists.
5. Under **General**, select **Install Software**. The new task step is added after the task step you highlighted.
6. To install a single package select **Install a single application** and click the **Browse** button to specify the package id and associated program.
7. To install multiple packages, select **Install multiple applications** and enter the package ID on the **Base variable name** line. This action specifies the base variable name for a series of task sequence variables that each contain a <packageID, program name> pair separated by a colon. The series of variable names is formed by appending a numeric suffix between 001 and 999 to the administrator-defined base name. The associated packages will be installed in the order specified in the list and each package installation will be completed before the installation for the next package begins.
8. Click **OK** to save the task sequence.

5.5 How to Manage Task Sequence Variables

The Configuration Manager 2007 task sequence environment is a set of name and value pairs that perform configuration and operating system deployment tasks on a Configuration Manager 2007 client computer. Task sequence variables provide a mechanism to store and run administrator defined computer and user state configuration tasks.

Use the following tasks to help you manage Configuration Manager 2007 task sequence variables:

- How to Create Per-Computer Task Sequence Variables
- How to Create Per-Collection Task Sequence Variables

5.5.1 How to Create Per-Computer Task Sequence Variables

You can define custom per-computer variables for each computer in the Configuration Manager 2007 database. The maximum number of variables that can be assigned to a specific computer may not exceed 1,000. Per-computer variables do not propagate throughout the hierarchy and per-computer task sequence variables can be hidden so that they are not visible in logs or in the Configuration Manager console. The mask attribute cannot be cleared and must be deleted. When a computer is deleted from the Configuration Manager 2007 database, all associated task sequence variables are also deleted.

Per-computer task sequence variables have a higher precedence than per-collection task sequence variables so task sequence variables that are assigned to a specific computer will have a higher priority than variables assigned to the collection or collections where the Configuration Manager 2007 client is located.

For example: If **collection A** has a variable assigned to it and **computer A** which is a member of **collection A** has a conflicting variable assigned to it, the variable assigned

to **computer A** will receive higher priority than that of the variable assigned to **collection A**.

Use the following procedure to create per-computer task sequence variables.

To create per-computer task sequence variables

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Collections**.
2. To assign a per-computer variable to a computer, locate and expand the collection the computer belongs to, right-click the computer, click **Properties**, and then click the **Variables** tab.
3. To specify custom variables and their associated values, click the **New** icon to open the **<New> Variable** dialog box.
4. In the **<New> Variable** dialog box, specify a name for the variable. Additionally, specify whether this variable will be visible in the Configuration Manager 2007 console.
5. On the **Value** line, specify the **Value** that should be assigned to the variable, confirm the value specified by typing the value again on the **Confirm Value** line, and then click **OK**.

   If you have specified that the value should be hidden from the Configuration Manager 2007 console the confirm value line will not be available.

6. In the Variables window, you can review the per-computer variables assigned to this computer.

5.5.2 How to Create Per-Collection Task Sequence Variables

You can define per-collection task sequence variables for a specific collection in the Configuration Manager 2007 database. Per-collection task sequence variables can be hidden by selecting the **Do not display in the** Configuration Manager 2007 **console** option. When the hidden attribute value is cleared, the associated value of the variable is also cleared. Hidden variables can not be cleared and must be deleted. When you delete a collection from the Configuration Manager 2007 database, all associated task sequence variables are also deleted.

Note

Per-computer task sequence variables have a higher precedence than per-collection task sequence variables so task sequence variables that are assigned to a specific computer will have a higher priority than variables assigned to the collection or collections where the Configuration Manager 2007 client is located..

Use the following procedure to create per-collection variables.

To create per-collection task sequence variables

1. In the Configuration Manager console, **System Center Configuration Manager** / **Site Database** / **Computer Management / Collections**.
2. To assign a variable to a collection, right-click the collection, and then click **Modify Collection Settings**.
3. To define the per-collection variable and the associated value, open the **<New> Variable** dialog box, click the **Collection Variable** tab, and then click the **New** icon.
4. In the **New Variable** dialog box, specify a name for the variable, and then specify whether the value associated with the variable will be visible in the Configuration Manager 2007 administrator console.
5. On the **Value** line, specify the **Value** of the variable, and if the value is masked, enter the value again to confirm the variable on the **Confirm Value** line, and then click **OK**. If you have specified that the value should not be displayed in the Configuration Manager 2007 console, the confirm value line will not be available.
6. You can specify a **Precedence** by selecting a numeric value from the drop-down list, where 1 is the lowest precedence, and 9 to specify the highest precedence. The **Precedence** level will be used when a computer is a member of multiple collections with differing precedence levels assigned.

5.6 How to Manage Operating System Images

Operating system images are .wim format files and represent a compressed collection of reference files and folders needed to successfully install and configure an operating system image on a computer.

Use the following tasks to help you manage the Configuration Manager 2007 operating system images:

- How to Add Windows Device Drivers to a Boot Image
- How to Update Boot Images
- How to Add a Boot Image to Configuration Manager

5.6.1 How to Add Windows Device Drivers to a Boot Image

Windows device drivers that have been imported into the driver catalog can be added to one or more boot images. Only mass storage device drivers and network adaptor device drivers should be added to boot images because other types of drivers are not needed and will increase the size of the boot image. You should only add valid device drivers that are intended for use with Windows Vista because the version of Windows PE is Windows Vista-based.

Note
Adding device drivers to a boot image can increase the memory requirements of the boot image. Only add device drivers to boot images that are absolutely necessary. If the memory requirements of the boot image exceed the memory of the target computer the deployment will fail.

It is recommended that you only add network and mass storage device drivers to a boot image so that the size of the boot image does not get too large. However, there may be situations where you want to selectively install additional device drivers to a boot image. The **Auto Apply Driver** task sequence step will scan for device devices present on the computer and install the compatible device drivers. To address devices like multi-function or child devices that do not have a device driver installed yet it may be necessary to add additional device drivers to the boot image so that these devices can be detected.

Use the following procedure to add Windows device drivers to one or more boot images.

To add Windows device drivers to a boot image

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment** / **Drivers**.
2. To add a driver to a boot image, select the driver you want to add, right-click the selection, and then click **Add or Remove Drivers to Boot Images**. Alternatively, you can drag the selected driver to the desired boot image or images under the **Boot Images** node. You can also add drivers on the **Windows PE** tab on the **Boot Image** properties dialog box.

   Note

   To add multiple drivers to a boot image, select all the drivers you want to add, right-click the selection of drivers, and then select **Add or Remove Drivers to Boot Images from the context menu.**

3. In the **Add or Remove Drivers to Boot Images** dialog box, specify which boot image or images to add the specified driver or drivers to in the **Add or Remove Drivers to Boot Images** dialog box. To select all available boot images, click **Select All**.
4. To update distribution points immediately, select **Update distribution points when finished**. To update distribution points at a later time, right-click the **Distribution Point** node under the boot image to be updated, and then click **Update Distribution Points**. Boot images with the added drivers will not be available to computers until they have been updated on distribution points.

   Note

   To view existing drivers already associated with a boot image, right-click the boot image, click **Properties**, and then click the **Windows PE** tab.

5.6.2 How to Update Boot Images

You can update boot images by adding device drivers to it or editing its properties. Device drivers that you add to an existing boot image must be imported and enabled in the driver catalog. Updating the boot image does not change the associated package that the boot image references.

Important

Any changes made to the **Images** tab of the boot image properties will also update the source image. Changes made on the other boot image tabs will not change the source image.

Use the following procedure to update an existing boot image.

To update a boot image

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment** / **Boot Images**.
2. To view the properties of the boot image you want to update, right-click the boot image, and then click **Properties**. Alternatively, in the Actions pane, you can click **Properties**.
3. To change the **Name**, **Version**, or to add **Comment**, select the **General** tab, and type in the new information.
4. To update the property values on the source image, click the **Image** tab.
5. On the **Image** tab, select the image **Property** you want to update and type in the new information in the **Value** column. If you used an external tool to update the image properties, click the **Reload** button to reload the image properties from the source image.

   Important

   You will lose image property changes if you click the **Reload** button, because that will reload the image properties from the source image.

6. To add a network device driver or mass storage device driver to a Windows PE image, click the **Windows PE** tab, and then click the **New** icon to open the **Select a Driver** dialog box.
7. Select the device driver from the Drivers window, and then click **OK**.
8. Click the **Data Source** tab to schedule the distribution point updates. The updated images must be replicated to the distribution point for computers to install them. You can also change the source directory by selecting the image you want to use.

   Note

   You can update distribution points with only the new information by selecting **Enable binary differential updates**. Enabling binary differential updates will replicate only the changed file information to the distribution point.

5.6.3 How to Add a Boot Image to Configuration Manager

An operating system deployment boot image is a Windows PE image and is used during an operating system deployment. By default, Configuration Manager 2007 creates an **x86** and **x64** boot image for use with operating system deployments. The boot images are displayed in the results pane when you select the **Boot Images** node in the Configuration Manager 2007 administrator console.

You can also import you own custom boot images. You may want custom boot images for any of the following scenarios:

- You want to run scripts or custom actions in Windows PE that require optional Windows PE components that are not enabled in the default Configuration Manager 2007 boot images.
- You would like to include custom tools and scripts in the Windows PE image.
- You would like to initiate operating system deployments using boot media, stand-alone media and PXE initiated deployments.
- If you are deploying operating systems in a complex environment you may require multiple boot images containing different sets of device drivers. Adding device drivers to a boot image increases the size of the boot image so individual boot images should not contain all available device drivers.

To successfully import a custom boot image, the boot image must already be finalized or the SMS Provider will reject it. Configuration Manager 2007 setup puts two finalized boot images in the following directory: **<SMS installation>\OSD\boot\<arch>**. You can import these boot images into the boot image catalog. Use the following procedure to create a new source boot image that can be imported:

Note

Note these steps must be run on a computer running the SMS provider.

1. Copy a boot image from the directory where the Windows Automated Installation Kit (WAIK) is installed.
2. Mount this new copied boot image to a temporary directory. For example; **%systemroot%\temp\bootimages imagex.exe /mountrw c:\winpe\winpe.wim 1 %systemroot%\temp\bootimages**.
3. Import and install the security .dll optional component. To prepare an **X86** boot image you must perform the following steps:
    1. peimg.exe /import=\\<site server>\SMS_<site code>\OSD\bin\i386\Windows6.0-KB939663-x86.cab %systemroot%\temp\bootimages\windows
    2. peimg.exe /install=Package_1_for_KB939663 %systemroot%\temp\bootimages\windows
    3. To prepare an X64 image you must perform the following steps:
    4. peimg.exe /import=\\<site server>\SMS_<site code>\OSD\bin\x64\Windows6.0-KB939663-x86.cab %systemroot%\temp\bootimages\windows

5. %systemroot%\temp\bootimages\windows
6. peimg.exe /install=Package_1_for_KB939663 %systemroot%\temp\bootimages\windows

4. Install the three optional components that are required to perform Configuration Manager 2007 operating system deployments:
    1. peimg.exe /install=WinPE-Scripting-Package %systemroot%\temp\bootimages\windows
    2. peimg.exe /install=WinPE-WMI-Package %systemroot%\temp\bootimages\windows
    3. peimg.exe /install=WinPE-XML-Package %systemroot%\temp\bootimages\windows
5. Install the optional components that should be included with the boot image.
6. Copy the additional required files that are needed to mount the directory.
7. Finalize the boot image using the following command: peimg.exe /prep %systemroot%\temp\bootimages\windows /f
8. Dismount the boot image using the following command: imagex.exe /unmount /commit %systemroot%\temp\bootimages\windows
9. Export the custom boot image. This step is necessary to reduce the image footprint: imagex.exe /export c:\winpe\winpe.wim 1 c:\winpe\boot.wim

Note

Imagex.exe and **peimg.exe** are located in the WAIK installation directory.

You can import the newly created boot image into the Configuration Manager 2007 catalog.

Use the following procedure to add a new boot image.

To add a boot image

1. In the Configuration Manager console, navigate **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment** / **Boot Images**.
2. To start the Add Boot Image Wizard, right-click the **Boot Images** node, and then click **Add Boot Image**.
3. On the **Data Source** page, specify the path to the boot image WIM file. You can click **Browse** to browse for a specific boot image. If the selected WIM file contains multiple images, use the **Boot Image** drop-down list to select the desired image.

    Note

    The specified path must be a valid network path in the UNC format. For example: \\servername\<sharename>\path.

4. On the **General** page, provide a **Name** and **Version** to be associated with the boot image, optionally add an optional descriptive **Comment** for the boot image, and then click **Next**.
5. Review the **Summary,** and then click **Next** to add the new boot image.

5.7 How to Manage Native Mode Certificates and Operating System Deployment

When the Configuration Manager 2007 site is operating in native mode, operating system deployment Configuration Manager 2007 clients and images require root certification authority issued client authentication certificates so that they are able to communicate with the Configuration Manager 2007 site.

Use the following tasks to help you manage operating system deployment certificates in native mode environments:

- How to Prepare the Root Certification Authority Certificates for Operating System Deployment Clients
- How to Specify the Root Certification Authority Certificates for Operating System Deployment Clients
- How to Export Certificates For Use With Operating System Deployment

5.7.1 How to Prepare the Root Certification Authority Certificates for Operating System Deployment Clients

When the Configuration Manager 2007 site is operating in native mode, operating system deployment clients require root certification authority certificates for the certification authorities used with Configuration Management.

If all the computers in the Configuration Manager 2007 primary site (and any secondary sites) use certificates from the same certification authority, you need to specify a single root certification authority certificate. However, if more than one certification authority is used, you must specify a root certification authority certificate for each certification authority that is used by clients, and the following site systems:

- Management points
- Distribution points
- Software update points
- State migration points

Before you can specify the root certification authority certificates in Configuration Manager, you must first prepare the root certification authority certificates by exporting them to a file.

Follow this procedure to prepare the root certification authority certificates by exporting them to a file.

To prepare root certification authority certificates by exporting them to a file - from computers running Windows Vista:

1. On a computer that has the root certification authority certificates installed, log on as a local administrator and click **Start**, type **MMC** into the search box and

press Enter. If you are prompted for an administrator password or confirmation, type the password or provide confirmation.
2. In the empty console, click **File** and then **click Add/Remove Snap-in**.
3. In the **Add/Remove Snap-in** dialog box, select **certificates** and click **Add**.
4. On the **Certificates snap-in page**, select **Computer Account** and then click **Next**.
5. In the **Select Computer** dialog box, ensure the option **Local computer: (the computer this console is running on)** is selected and then click **Finish**.
6. In the **Add Standalone Snap-in** dialog box, click **OK** to close the **Add or Remove Snap-ins** dialog box.
7. In the console, expand **Certificates (Local Computer)** and then expand **Trusted Root Certification Authorities**.
8. Double-click **Certificates** to expand the certificate store. Locate the first trusted root certificate you need for operating system deployment clients.
9. Right-click the certificate you require, select **All Tasks**, and then click **Export** to launch the **Certificates Export** Wizard.
10. In the Certificate Export Wizard, click **Next**.
11. On the **Export File Format** page, ensure **DER encoded binary X.509 (.CER)** is selected and then click **Next**.
12. On the **File to Export** page, specify a path and file name for the exported certificate and then click **Next**.
13. On the **Completing the Certificate Export Wizard** page, click **Finish**.
14. To confirm the successful certificate export, click **OK** in the **Certificate Export Wizard** dialog box.
15. If operating system clients are not using the same root certification authority, repeat steps 10 through 15 until you have exported each root certification authority certificate you require to individual files.

    Note

    Configuration Manager 2007 does not support importing multiple root certification authority certificates in the same file, and it supports only the DER encoded binary X.509 (.CER) format.

16. Store the file where you can access it from the Configuration Manager site properties, **Site Mode** tab.

To prepare root certification authority certificates by exporting them to a file- from computers running Windows XP Professional, or Windows Server 2003:

1. On a computer that has the root certification authority certificates installed, click **Start**, click **Run**, type **MMC** in the **Run** dialog box, and then click **OK**.
2. In the empty console, click **File** and then **click Add/Remove Snap-in**.
3. In the **Add/Remove Snap-in** dialog box, click **Add**.
4. In the **Add Standalone Snap-in** dialog box, select **Certificates** and then click **Next**.
5. In the **Select Computer** dialog box, ensure the option **Local computer: (the computer this console is running on)** is selected and then click **Finish**.
6. In the **Add Standalone Snap-in** dialog box, click **Close**.

7. In the **Add/Remove Snap-in** dialog box, click **OK**.
8. In the console, expand **Certificates (Local Computer)** and then expand **Trusted Root Certification Authorities**.
9. Click **Certificates**, and then in the details pane, locate the first trusted root certificate you need for operating system deployment clients.
10. Right-click the certificate you require, click **All Tasks**, and then click **Export**.
11. In the Certificate Export Wizard, click **Next**.
12. On the **Export File Format** page, ensure **DER encoded binary X.509 (.CER)** is selected and then click **Next**.
13. In the **File to Export** page, specify a path and file name for the exported certificate and then click **Next**.
14. On the **Completing the Certificate Export Wizard** page, click **Finish**.
15. To close the wizard, click **OK** in the **Certificate Export Wizard** dialog box.
16. If operating system clients are not using the same root certification authority, repeat steps 10 through 15 until you have exported each root certification authority certificate you require to individual files.

    Note

    Configuration Manager 2007 does not support importing multiple root certification authority certificates in the same file, and it supports only the DER encoded binary X.509 (.CER) format.

17. Store the file where you can access it from the Configuration Manager site properties, **Site Mode** tab.

5.7.2 How to Specify the Root Certification Authority Certificates for Operating System Deployment Clients

When the Configuration Manager 2007 site is operating in native mode, operating system deployment clients require root certification authority certificates for the certification authorities used with Configuration Management.

Follow this procedure to specify the root certification authority certificates for operating system deployment clients assigned to the primary site and to its secondary sites.

Note

This procedure requires that you have exported the root certification authority certificates. For more information, see How to Prepare the Root Certification Authority Certificates for Operating System Deployment Clients.

To specify the root certification authority certificates for operating system deployment clients:

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Site Management**.
2. Right-click *<site code>* - *<site code>* and then click **Properties**.
3. On the **Site Mode** tab in the site properties dialog box, ensure **Native** is selected for the **Site mode** option.

4. In the **Operating system deployment settings** section, click **Specify Root CA Certificates**.
5. To add a root certification authority certificate to the Configuration Manager site, in the **Set Root CA Certificates** dialog box, click the new icon.
6. In the **Open** dialog box, select a file with a .cer extension that contains the exported certificate and then click **Open**.

   Note

   Configuration Manager 2007 does not support exported certificate formats other than the format DER encoded binary X.509 (.CER).

7. Repeat steps 5 and 6 if you have additional root certification authority certificates to add.
8. To remove a root certification authority certificate from the Configuration Manager site, in the **Set Root CA Certificates** dialog box, select the certificate to remove and then click the delete icon.
9. Repeat step 8 if you have additional root certification authority certificates to remove.
10. In the **Set Root CA Certificates** dialog box, click **OK**.
11. In the **Site Mode** tab, click **OK** to close the site properties dialog box.

5.7.3 How to Export Certificates For Use With Operating System Deployment

When the Configuration Manager 2007 site is operating in native mode, operating system deployments that require communication with the management point must be configured to use a public key infrastructure (PKI) certificate. For more information about the certificate requirements for operating system deployment, see About Native Mode Certificates and Operating System Deployment.

To configure the operating system deployments with the required certificate, import a Public Key Certificate Standard (PKCS #12) file. The creation of this file is external to Configuration Manager 2007; however, you can use the following procedures to create this file.

Before following these procedures, the certificate must already be deployed to a computer. The certificate requirements are as follows:

- Intended use must include client authentication
- The private key must be allowed to be exported

If you need information about how to deploy computer certificates, follow the guidance in the following topic: Deploying the Client Computer Certificates to Clients and the Management Point. This same topic can be used for more information about how to deploy computers with their own client computer certificate that will be needed for Configuration Manager native mode communication after the operating system deployment is complete.

Important

The computer certificate required for operating system deployments is not the same computer certificate that will be required for Configuration Manager 2007 clients in a native mode site.

Considerations for creating and deploying the certificate for operating system deployments:

- If you are using a Microsoft PKI solution, and using an Enterprise Edition of Windows Server 2003 Certificate Services with templates for auto enrollment, you can use either the computer template or the workstation template. However, you must modify the template (duplicate it, and modify the copy) so that the option **Allow Private key to be exported** is enabled on the **Request Handling** tab of the certificate template.
- Unlike most computer certificates, this certificate is not restricted to or owned by a specific computer, but is shared temporarily by all computers that are targeted with operating system deployments in the native mode site. Because of this behavior, consider creating the certificate with a unique attribute for identification (such as custom Subject Name or Subject Alternative Name), and use it only for operating system deployments. Should the certificate ever become compromised, it can then be easily identified and revoked without affecting other computers.
- Consider having a longer than usual validity period to reduce the administrative overheads of reconfiguring operating system deployments in line with the certificate expiry date.

When the certificate is deployed to a computer, you can then use the following procedure to export the certificate so that you can use it with operating system deployments.

To export a certificate for use with operating system deployment - from computers running Windows Vista:

1. On the Windows Vista computer that has the certificate installed, log in as a local administrator, click **Start**, type **mmc** into the **Search** box, and then press Enter.
2. In the empty console, click **File** and then **click Add/Remove Snap-in**.
3. In the **Add/Remove Snap-in** dialog box, select **Certificates** and click **Add**.
4. On the **Certificates snap-in** page, select **Computer account** and then click **Next**.
5. On the **Select Computer** dialog box, ensure the option **Local computer: (the computer this console is running on)** is selected and then click **Finish**.
6. To close the **Add Standalone Snap-in** dialog box, click **OK**.
7. In the console, double-click **Certificates (Local Computer)**.
8. In the console, expand **Personal**.
9. Locate the certificate that you need for use with operating system deployment deployments.
10. Right-click the certificate you require, click **All Tasks**, and then click **Export** to launch the **Certificate Export Wizard**.
11. On the **Certificate Export Wizard** Welcome page, click **Next**.

12. On the **Export Private Key** page, select **Yes, export the private key**, and then click **Next**.

    Note

    If this option is not available, the certificate has been created without the option to export the private key. In this scenario, you cannot export the certificate in the required format.

13. On the **Password** page, specify a strong password to protect the exported certificate with its private key, and then click **Next**.
14. On the **Export File Format** page, ensure that the following option is selected: **Personal Information Exchange - PKCS #12 (.PFX)**.

    Note

    Optionally, select **Delete the private key if the export is successful** which will ensure that the certificate cannot be used on the computer after you have exported it. This will help to ensure that the certificate is used only for operating system deployments. Alternatively, you can manually delete the certificate on the computer after the export procedure is complete.

15. On the **File to Export** page, specify the name of the file that you want to export, and then click **Next**.
16. To close the wizard, click **Finish** in the **Certificate Export Wizard** dialog box.
17. Store the file securely and ensure that you can access it from the **Operating System Deployment** node.

To export a certificate for use with operating system deployment - from computers running Windows XP Professional, or Windows Server 2003:

1. On the Windows XP Professional or Windows Server 2003 computer that has the certificate installed, click **Start**, click **Run**, type **MMC** in the **Run** dialog box, and then click **OK**.
2. In the empty console, click **File** and then **click Add/Remove Snap-in**.
3. In the **Add or Remove Snap-ins** dialog box, click **Add**.
4. Select **Certificates** from **Available snap-ins**, and then click **Add**.
5. In the **Certificates snap-in** dialog box, click **Computer account**, and then click **Next**.
6. In the Select Computer dialog box, ensure that the option **Local computer: (the computer this console is running on)** is selected, and then click **Finish**.
7. In the **Add or Remove Snap-ins** dialog box, click **OK**.
8. In the console, expand **Certificates (Local Computer)**.
9. Expand **Personal**, and then click **Certificates.**
10. In the details pane, locate the certificate that you need for operating system deployment deployments.
11. Right-click the certificate you require, click **All Tasks**, and then click **Export**.
12. In the Certificate Export Wizard, click **Next**.
13. On the **Export Private Key** page, select **Yes, export the private key**, and then click **Next**.

Note

If this option is not available, the certificate has been created without the option to export the private key. In this scenario, you cannot export the certificate in the required format.

14. On the **Password** page, specify a strong password to protect the exported certificate with its private key, and then click **Next**.
15. On the **Export File Format** page, ensure that the following option is selected: **Personal Information Exchange - PKCS #12 (.PFX)**.

Note

Optionally, select **Delete the private key if the export is successful** which will ensure that the certificate cannot be used on the computer after you have exported it. This will help to ensure that the certificate is used only for operating system deployments. Alternatively, you can manually delete the certificate on the computer after the export procedure is complete.

16. On the **File to Export** page, specify the name of the file you want to export and click **Next**.
17. To close the wizard, click **OK** in the **Certificate Export Wizard** dialog box.
18. Store the file securely and ensure that you can access it from the **Operating System Deployment** node.

6.0 Tasks for Operating System Deployment

The links in this section provide the necessary information to complete each associated operating system deployment task.

- How to Deploy an Operating System
- How to Deploy an Operating System Image Using Media
- How to Initiate Operating System Image Deployments Using PXE

6.1 How to Deploy an Operating System

Use the following tasks to help you configure and perform operating system image deployments:

- How to Build a Reference Computer
- How to Add a New Computer to the ConfigMgr Database
- How to Create a Computer Association for a Side-by-Side Migration
- How to Deploy Operating System Images to a Computer
- How to Perform a Side-by-Side Operating System Deployment

6.1.1 How to Build a Reference Computer

Use this procedure to build a reference computer to use to capture an operating system image. You can configure the reference computer manually, or you can build the reference computer and create the capture image using a task sequence. For either method refer to the Configure the Reference Computer for additional guidance in configuring the reference computer. When building the reference computer using a task sequence, refer to the Create the Capture Task Sequence for additional guidance.

How to Build a Reference Computer Manually

1. Identify the computer that will be used as the reference computer.
2. Configure the reference computer with the appropriate operating system and other software needed to create the operating system image.

   Note

   You should minimally install the appropriate operating system and service pack, support drivers, any required software updates, and the appropriate version of Sysprep.

3. Configure the reference computer to be a member of a workgroup.
4. Reset the local administrator password on the reference computer to be blank.
5. Copy the appropriate Sysprep files (sysprep.exe and setupcl.exe) to the C:\Sysprep folder on the reference computer.
6. Run Sysprep using the command: `sysprep -mini -quiet -reseal -reboot`

How to Build a Reference Computer Using a Task Sequence

1. Identify the computer that will be used as the reference computer.
2. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment** / **Task Sequences**.
3. In the **Action** menu, or from the **Actions** pane, select **New**, then **Task Sequence** to run the **New Task Sequence Wizard**.
4. On the **Create a New Task Sequence** wizard page, select **Build and Capture a reference operating system image**.
5. After you successfully complete the wizard, select the new task sequence from the **Task Sequences** pane.
6. In the **Action** menu, or from the **Actions** pane, select **Edit** to run the **Task Sequence Editor** and customize the task sequence steps that are included with the task sequence and to add any additional task sequence steps that are required.
7. If the reference computer is a Configuration Manager 2007 client, in the **Action** menu, or from the **Actions** pane, select **Advertise** to run the **New Advertisement Wizard**. If this is a new computer you can import the computer using the **Import Computer Information** wizard which will add the computer to the Configuration Manager 2007 database.

   Important

   If the task sequence has a disk partitioning task sequence step, do not select a **Download Program** option for the advertisement.

8. If the reference computer is not a Configuration Manager 2007 client, you can run the Task Sequence Media Wizard to create bootable media to use to install the image on the reference computer.
9. If the reference computer is a Configuration Manager 2007 client, Advertise the task sequence to the reference computer:
   1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment** / **Task Sequences**.
   2. Select the task sequence to advertise from the **Task Sequences** pane.
   3. On the **Action** menu, or from the **Actions** pane, select **Advertise** to run the **New Advertisement Wizard**.
10. Alternatively, you can create bootable media such as CD or DVD and use that to manually run the task sequence on the reference computer.

6.1.2 How to Add a New Computer to the ConfigMgr Database

To deploy an operating system to a new computer without stand-alone media that is not currently managed by Configuration Manager 2007, the new computer must be added to the Configuration Manager 2007 database prior to initiating the operating system deployment process. Although Configuration Manager 2007 can automatically discover computers on your network that have a Windows operating system installed, if the computer has no operating system installed you will need to import the new computer information by using the Import Computer Information Wizard**.** This wizard supports importing information about a single computer, or importing information about one or more computers from an external .csv file.

Important

If the computer to be imported already exists in the Configuration Manager 2007 database, the new computer information will overwrite the existing computer information.

Use the following procedures to import multiple computers by using a file or import a single computer.

To import new computer information from a file

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment / Computer Associations**.
2. To start the Import Computer Information Wizard, on the **Action** menu, click **Import Computer Information,** or right-click the **Computer Associations** node, and then click **Import Computer Information**. Alternatively, you can start the wizard in the Actions pane by clicking **Import Computer Information**.
3. To specify the source file that contains the computer information to be imported, select **Import computer information using a file,** and then click **Next**.

   Note

   The import file you specify must be created prior to running this wizard. The file specified file must be created in the comma separated values (CSV) format. Use the following format when entering the computer information with each property value in a separate column: **NEWCOMP1,55555555-5555-5555-5555-555555555555,05:06:07:08:09:0A**. If the computer information is not entered using this format the computer import will fail.

4. On the **Choose Mapping** page, specify the file you have created that containing the new computer information to be imported. You can enter the path and file name on the **Import File** line, or click **Browse** to locate the import file. If the file contains column headings, check the **This file has column headings** check box, which will cause the first line of the file to be ignored. To change the **Source Column** property information associated with

a value, select the column number and use the **Assign as** list to reassign the value.

Note

Each Configuration Manager 2007 property can be used only once. The **Name** field must be assigned to one column. You must also specify a **Computer Name**, **SMBIOS GUID**, or **MAC Address**. Although both values may be used, each property must be assigned to only one column. You can optionally specify the source computer, but it should also be assigned to one column. Multiple MAC addresses should be separated by a colon.

The **Ignore** and **Variable** options can be assigned to multiple columns. **Ignore** is the default option. If you assign a column as a **Variable**, you must also enter the variable that should be used.

5. On the **Data Preview** page, preview the data and the associated values.

   Important

   The specified file to be imported must contain valid data in order to proceed to the next page of the wizard.

6. On the **Choose Target Collection** page, specify which collections the imported computers should be assigned to. By default, the computers are assigned to the **All Systems** collection. To add the imported computers to a specific collection, click **Browse**. The imported computers will be statically added to the specified collection. If you do not want to add the computers to any additional collections, select **Do not add computers to a collection**.

   Important

   For a computer to receive an operating system deployment, it must be a member of a collection.

7. On the **Summary** page, confirm if the computer import was successful. If the import was not successful, this page will display a list of errors that occurred during the import process. Only computers that failed to import into Configuration Manager 2007 are listed on the summary page.

To import computer information for a single computer

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment / Computer Associations**
2. To start the Import Computer Information Wizard, on the **Action** menu, click **Import Computer Information,** or right-click the **Computer Associations** node, and then click **Import Computer Information**. Alternatively, you can start the wizard in the Actions pane by clicking **Import Computer Information**.

3. To import the computer information from a single computer, select **Import single computer,** and then click **Next**.
4. On the **Single Computer** page you must specify the **Computer Name** and either the **SMBIOS GUID** or **MAC Address** of the computer you are importing. Optionally, click **Search** to open the **Search Computer** dialog box. You can create a computer association by entering or specifying the name of a reference computer from which the user state and settings will be migrated to the new computer.
5. On the **Data Preview** page, review the data that will be mapped to each Configuration Manager 2007 property, and then click **Next**.
6. On the **Choose Target Collection** page, specify which collections the imported computer should be assigned to. By default, the computers are assigned to the **All Systems** collection. To add the imported computers to a specific collection, click **Browse**. The imported computer will be statically added to the specified collection. If you do not want to add the computer to any additional collections, select **Do not add computer to a collection**.

   Important

   For a computer to receive an operating system deployment, it must be a member of a collection.

7. On the **Summary** page, confirm that the import was successful. If the import was not successful, this page will display a list of errors that occurred during the import.

6.1.3 How to Create a Computer Association for a Side-by-Side Migration

A computer association creates a relationship between a source and destination computer for the side-by-side migration of user state data. The source computer is an existing computer that is managed by Configuration Manager 2007, and contains the user state data and settings that will be migrated to a specified destination computer. You can also create a computer association when importing new computers into the Configuration Manager 2007 database by using the Import Computer Information Wizard.

Use the following procedures for creating a new computer association.

To create a new computer association

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment** / **Computer Associations**.
2. To create a new computer association, you can do either of the following:
   - Right-click the **Computer Associations** node, click **New**, and then click **Computer Association**.
   - In the Actions pane, click **New**, and then click **Computer Association,**
   - On the Configuration Manager File menu, click **Action**, click **New**, and then click **Computer Association**.

3. On the **Computer Association** tab, specify the name of the source computer that contains the user state data to be migrated to the new computer on the **Source Computer** line. Alternatively, you can click **Search** to open the **Search Computer** dialog box to locate the source computer.
4. To specify the name of the destination computer that will receive the migrated user state data, type the computer name on the **Destination computer** line or click **Search** to open the **Search Computer** dialog box.
5. To specify the user accounts that should be migrated from the source computer to the destination computer, click **New** to open the **Add User Account** dialog box, and then click the **User Accounts** tab.
6. Enter the user account that should be migrated to the destination computer in the space provided or click **Browse** to open the **Select User** dialog box. If no user accounts are specified, all user accounts on the source computer will be migrated.

6.1.4 How to Deploy Operating System Images to a Computer

Use this procedure to deploy an operating system image to a target computer. When you deploy an operating system the target computer should have the same architecture as the boot image that is contained in the operating system image. To complete the operating system deployment successfully you must also create a **sysprep** directory on the reference computer hard drive.

Note

For boot/full media and PXE initiated installations, if there is no formatted partition available the task sequence engine will create and format a temporary partition to use as the local data path.

How to Deploy an Operating System Image to a Computer

1. In the Configuration Manager console, navigate **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment** / **Task Sequences**.
2. In the **Action** menu, or from the **Actions** pane, select **New**, then **Task Sequence** to run the **New Task Sequence Wizard**.
3. On the **Create a New Task Sequence** wizard page, select **Install an existing image package**.
4. After you successfully complete the wizard, select the new task sequence from the **Task Sequences** pane.
5. In the **Action** menu, or from the **Actions** pane, select **Edit** to run the **Task Sequence Editor** and customize the task steps that are included with the task sequence and to add any additional task steps that are required.
6. Ensure that a collection exists that contains the target computer.
7. Advertise the task sequence to the collection that contains the target computer:
    1. In the Configuration Manager console, navigate **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment** / **Task Sequences**

2. Select the task sequence to advertise from the **Task Sequences** pane.
3. On the **Action** menu, or from the **Actions** pane, select **Advertise** to run the **New Advertisement Wizard**.

8. Monitor the progress of the deployment task sequence using the Advertisement Status window on the Operating System Deployment node main screen. This window does not refresh automatically, so be sure to refresh the screen periodically to see the most current information about advertised task sequences.

6.1.5 How to Perform a Side-by-Side Operating System Deployment

You can use Configuration Manager 2007 to perform a side-by-side computer migration. Side-by-side computer migrations are useful in computer upgrade scenarios when you want to move the user state and files from a source computer to a new, destination computer. Before you can perform a side-by-side migration you must import the destination computer into the Configuration Manager 2007 database and create a computer association between the source and destination computers.

Use the following procedure to perform a side-by-side computer migration.

Performing a side-by-side computer migration

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment** / **Computer Associations**.
2. Import the new destination computer into Configuration Manager 2007 database and then create a computer association between the source computer and the destination computer.
3. To capture the user state from the source computer, create a Custom Task Sequence to capture the user state by using the Capture User State task sequence step. This task sequence step should be used in conjunction with the Request State Store task sequence step.
4. To install the new operating system on the destination computer, use the task sequence editor, and then create the necessary installation task sequence steps to install the new operating system.
5. To copy the user state from the state migration point to the destination computer, create a custom task sequence, and then add the Request State Store and Release State Store task sequence steps.

6.2 How to Deploy an Operating System Image Using Media

You can write task sequences and their related files and dependencies to a DVD or CD set or a USB drive. Using media will allow you to run the operating system deployment task sequence steps on computers that do not have a network connection or have a low bandwidth connection to your Configuration Manager 2007 site. You must specify a boot image that should be associated with the media you create, or the task sequence will fail.

If the media you create is going to be used in a different site than the Configuration Manager 2007 site it was created in, you must create a custom task sequence and add the Run Command Line task sequence step. You can add a command line to the **Run** command line task sequence step that will assign the new Configuration Manager 2007 client to the desired site.

Important
Boot media that is created in a parent site can only be used in child sites with no protected distribution points configured.

For more information about creating a custom task sequence, see How to Create a Custom Task Sequence

Use the following tasks to help you manage Configuration Manager 2007 task sequence operating system deployment media:

- How to Create Task Sequence Bootable Media

  Contains the steps necessary to create bootable media that can be used to run a task sequence on a new computer.
- How to Create Stand-alone Media

  Contains the steps necessary to create stand-alone media from which to run your operating system image deployment. The stand-alone media will contain all necessary data to run the specified operating system deployment task sequences without requiring a connection to a Configuration Manager 2007 site.
- How to Capture an Image from a Reference Computer Using Capture Media

  Contains the steps necessary to capture an operating system image from a reference computer using capture media.
- How to Deploy an Operating System Image to a New Computer Using Boot Media

  Contains the steps necessary to deploy an operating system image to a new bare metal computer or a computer that is new to your Configuration Manager 2007 site.
- How to Deploy an Operating System Image to an Offline Computer

Contains the steps necessary to deploy an operating system image to a computer that is not connected to the network or to a computer that is connected by a low bandwidth connection.

6.2.1 How to Create Task Sequence Bootable Media

Use this procedure to create bootable media that can be used to run a task sequence on a new computer. The media types you can create are CD, DVD or USB media. Task sequence bootable media can only be used in the site where the media was created. This will ensure that packages referenced by the task sequence are available to the task sequence.

Use the following procedure to create task sequence bootable media:

How to Create Task Sequence Bootable Media

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management /** **Operating System Deployment** / **Task Sequences.**
2. To launch the **Task Sequence Media** wizard, select the **Actions** menu and then select **Create Task Sequence Media**. Alternatively, you can click **Create Task Sequence Media** in the **Actions** pane.
3. On the **Select Media Type** page, select **Bootable Media** and click **Next**.
4. On the **Media Type** page specify the type of media you want to use with the cooperating system deployment. You can specify CD, DVD, or a USB flash drive as the type of media.
5. Specify the name of the media file that you are creating on the **Media file** line. The media file is where Configuration Manager 2007 will save the files to. If multiple pieces of media are required Configuration Manager 2007 will add a sequence number to each piece of required media. If you are using USB media, specify the **Drive** letter that should be used to save the files using the drop down.

   Note

   If you are initiating a task sequence using USB media you must leave the USB media attached until you have successfully started the full operating system.

6. On the **Security** page, you can specify a password to protect the media or require that the media request a self signed certificate. You can import an existing certificate by selecting **Import Certificate** and clicking the **Browse** button to locate the certificate you want to use. You should always assign a password or request a certificate to protect the bootable media and your Configuration Manager 2007 site.
7. Specify the boot image that will run from the boot media on the **Boot Image** page. The media you specify will be used to boot the new computer, therefore the boot image specified must be of the appropriate architecture (x86, x64, IA-64) and include the appropriate device drivers for the target computer. To

view distribution points from child sites, select the **Show distribution points from child sites check box**.

8. On the **Confirmation** page you can view the summary and click **Finish** to complete the wizard.

6.2.2 How to Create Stand-alone Media

You can create stand-alone media from which to run your operating system image deployment. The stand-alone media will contain all necessary data to run the specified operating system deployment task sequences without requiring a connection to a Configuration Manager 2007 site. Stand-alone media will operate whether or not a Configuration Manager 2007 client is installed on the target computer and it will operate without communicating with a Configuration Manager 2007 server infrastructure, such as a management point or distribution point.

Stand-alone media is suitable for use in environments where it is not practical to copy an operating system image or other large packages over the network or in environments with no network connectivity or low bandwidth network connectivity. You can create a CD set, a DVD set, or USB media to deploy the operating system image. When the media is created for CDs or DVDs, the output is a set of .iso files that need to be burned to the media by using a non-Microsoft program to create the CD or DVD set. Media that is created for a USB drive is written directly to the USB drive, therefore the USB drive must be connected when the media is created.

The following actions are not supported for use with stand-alone media:

- Automatic application of device drivers from the driver catalog.
- Installing software updates.
- Installing software prior to an operating system deployment.

When you advertise a task sequence initiated from stand-alone media you must configure the correct version of the boot image and version of the HAL or the deployment will fail. You must have backup and restore rights on the local computer and the Configuration Manager 2007 user right before you can create a task sequence to create the media.

Use the following procedure to create stand-alone media.

To create stand-alone media

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment** / **Task Sequences.**
2. To start the Task Sequence Media Wizard, click **Actions** on the menu, and then click **Create Task Sequence Media**. Alternatively, in the Actions pane, click **Create Task Sequence Media**.
3. On the **Select Media Type** page, select **Stand-alone Media,** and then click **Next**.
4. On the **Media Type** page, specify the type of media you want to use with the operating system deployment. You can specify **CD**, **DVD**, or a **USB flash**

drive as the type of media. If you select **CD/DVD set** as the type of media you want to create, you then specify the capacity of the media. If the media size specified is too small to store the entire image, you must store the image using multiple CDs or DVDs. A sequence number will be added to the name of each piece of media created.

5. On the **Media file** line, specify the name of the media file that you are creating. The media file is where Configuration Manager 2007 will save the files to. If multiple pieces of media are required, Configuration Manager 2007 will add a sequence number to each piece of required media. If you are using USB media, specify the **Drive** letter that should be used to save the files.
6. On the **Security** page, you can assign a password to protect the task sequence steps and variables contained on your media. If you specify a password, the password will be required to use the media.

   Important

   Only the task sequence steps and variable information is encrypted. The package content is not encrypted; therefore, you should not include sensitive information in task sequence scripts. Sensitive information should be stored and implemented using variables.

7. On the **Stand-alone CD/DVD** page, specify the task sequences you want to run from this media by clicking **Browse** and then selecting the desired task sequences. All associated task sequences and packages must be specified and saved onto the stand-alone media.

   Note

   All task sequences specified must be able to operate without communicating with the Configuration Manager 2007 infrastructure. The wizard does not validate the task sequences and any task sequences that require Configuration Manager 2007 communication will fail when run from stand-alone media.

8. On the **Distribution Points** page, specify the distribution points that contain associated packages. You can display distribution points from child sites by selecting the **Show distribution points from child sites** check box. You can use the **Add** and **Remove** buttons to move packages so that they are available to Configuration Manager 2007 client computers.
9. On the **Variables** page, specify the task sequence variables that should be added to the stand-alone media. For more information about using task sequence variables use the following link: About Task Sequence Variables.

6.2.3 How to Capture an Image from a Reference Computer Using Capture Media

Use this procedure to capture an operating system image from a reference computer using capture media. You can build a reference computer manually and then create media to capture the operating system image.

Important

You should not try to capture an image of a Configuration Manager 2007 site system.

How to Capture an Image from a Reference Computer Manually

1. Build the reference computer.
    1. The computer must be a member of a workgroup.
    2. The local Administrator password must be blank.
    3. Do not require password complexity in the local system policy.
2. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment** / **Task Sequences**.
3. On the Action menu, or from the Actions pane, select **Create Task Sequence Media** wizard. Select the **Capture Media** option and click **Next**.
4. On the **Media Type** page specify the type of media you want to use for the capture media. You can specify a USB flash drive, CD, or DVD as the media type. If you specify a USB flash drive make sure it is connected to the computer so that the necessary files can be written directly to the device.
5. On the **Media file** line, enter the save path and file name of the media that will be used to perform the installation. The ISO file that is created will be written to the media type location specified.
6. Select the boot image that should be associated with the media. Click the **Browse** button to launch the **Select a Boot Image** dialog box. The available boot images are listed. Select the computer architecture you want and click OK. To specify the distribution point that contains the specified boot image, use the drop down.

    Note

    The media you create will run on any available computer architecture regardless of what is specified on the installation media.

7. Create a bootable CD that contains the .ISO file you created by using an appropriate software application.
8. Boot the computer into the full operating system and insert the capture CD.

    Note

    For all supported operating systems except Windows Vista and Windows Server® 2008, the sysprep folder (**%SystemDrive%\Sysprep**) must be present on the computer before you launch the capture CD.

9. Run the Image Capture Wizard and identify the location for the captured image to be stored.

10. Add the captured image to Configuration Manager 2007 as an image package:
    1. Navigate to: **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Operating System Deployment** / **Operating System Images**.
    2. On the **Action** menu, or from the **Actions** pane, select **Add Operating System Image** to launch the **Add Operating System Image wizard**. Complete the wizard to add the operating system image.

6.2.4 How to Deploy an Operating System Image to a New Computer Using Boot Media

You can use Configuration Manager 2007 to deploy an operating system imageto a new bare metal computer or a computer that is new to your Configuration Manager 2007 site by using three basic steps:

1. Import the new computer information into the Configuration Manager 2007 database.
2. Use the Task Sequence Media Wizard to create bootable media that will initiate the operating system deployment.
3. Create a task sequence step that will start the deployment initiated by the media.

Use the following procedure to deploy an operating system to a new computer.

To deploy an operating system to a new computer

1. In the Configuration Manager console, navigate to **System Center Configuration Manager/ Site Database** / **Computer Management** / **Operating System Deployment** / **Computer Associations**.
2. To add the computer to the Configuration Manager 2007 database, right-click the **Computer Associations** node, and then click **Import Computer Information** to start the **Import Computer Information** Wizard. You can import one computer of a set of computers by using the wizard.
3. To create a bootable media set to initiate the operating system deployment, start the Create Task Sequence Media Wizard, and then on the **Select Media Type** page, select **Bootable Media**.
4. Create the necessary task sequence steps that will perform the operating system deployment.
5. Advertise the task sequence to the collection where the new computer was imported.
6. To use the bootable media to initiate the deployment, log in to the computer operating system, insert the media into the target computer, and then start the deployment process.

6.2.5 How to Deploy an Operating System Image to an Offline Computer

You may need to deploy an operating system to a computer that is not connected to the network or to a computer that is connected by a low bandwidth connection. You can use Configuration Manager 2007 to create offline installation media that perform the installation.

Note

The target computer should not have an existing Configuration Manager 2007 client installed on it.

Use the following procedure to deploy an operating system to an offline computer.

To deploy an operating system to an offline computer

1. In the Configuration Manager console, navigate to **System Center Configuration Manager**/ **Site Database** / **Computer Management** / **Operating System Deployment** / **Task Sequences**.
2. To create a stand-alone media set, start the Task Sequence Media Wizard.
3. In the Task Sequence Wizard, on the **Select Media Type** page, select **Stand-alone media**.

   If you selected **CD/DVD set** on the **Media Type** page, the files created are a set of .ISO files that need to be burned onto the media set. You can then use another product to burn the installation files onto the CD or DVD set.

   If you selected a **USB flash drive** on the **Media Type** page, the files will be created and saved directly to the USB flash drive.

   Important

   If you have specified a USB flash drive as the media type the USB flash drive must be connected to the server running the Configuration Manager 2007 administrator console when the image is created because the media files you create will be written directly to the USB flash drive. If there is a task sequence step that will cause the computer to restart, you must also configure the target computer's BIOS to boot from the hard disk or the computer will boot using the attached media.

4. To start the operating system deployment, insert the media into the target computer, and then initiate the installation from the media you created. If there is no existing operating system on the target computer, you should insert or attach the installation media to the computer and restart the computer by using the installation media.

6.3 How to Initiate Operating System Image Deployments Using PXE

You can use the PXE protocol to initiate operating system deployments to Configuration Manager 2007 computers and servers.

Use the following tasks to help you perform PXE initiated operating system deployments:

- How to Configure the PXE Service Point
- How to Deploy an Operating System Image using PXE
- PXE Deployment Workflow

6.3.1 How to Configure the PXE Service Point

You can use the PXE protocol to initiate operating system deployments to Configuration Manager 2007 client computers. Configuration Manager 2007 uses the PXE service point site role to initiate the operating system deployment process. The PXE service point must be configured to respond to PXE boot requests made by Configuration Manager 2007 clients on the network and then interact with Configuration Manager 2007 infrastructure to determine the appropriate deployment actions to take. The PXE service point role should not be assigned to a computer in a secondary site.

You must assign the PXE service point site role to a server running Windows Server 2003.

Important
If you are using Windows Server 2003 you must install the Remote Installation Services (RIS) and the Windows Automated Installation Kit (Windows AIK). If you are using Windows Server 2003, Service Pack 2 you must install the Windows Deployment Services using Add or Remove Programs.

The PXE protocol is not secure. Both the PXE server and the PXE client should be located on a physically secure network, such as in a datacenter to prevent unauthorized access to your site.

Use the following procedure to create the PXE service point site role.

To create the PXE service point

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Site Management** / <*site code*> - <*site name*> / **Site Settings** / **Site Systems.**
2. To start the New Site Role Wizard, click **Action** on the Configuration Manager console, and then click **New Roles**. Alternatively, in the Actions pane, or right-click **Site System Roles**, and then click **New Roles**.

Note

You can deploy and configure multiple PXE service point servers depending on your network topology.

3. On the **General** page of the wizard, optionally provide the fully qualified host name (FQDN) for the server, and then specify which account credentials should be used to install the site system role.
4. On the **System Role Selection** page, select **PXE Service Point**.
5. On the **PXE-General** page, specify whether the PXE service point is enabled to respond to incoming PXE requests.

Note

This option will temporarily disable this PXE server and should be selected only if there are conflicting PXE servers on the network.

6. You can specify a password for computers that boot to PXE.

Important

For unattended deployments, do not specify a password. If a password is specified, a user must be present at the client computer to enter the password or the deployment will fail.

7. Specify whether this server will respond to PXE service requests on all network interface adaptors or a specific network interface adaptor in the **Interfaces** section by entering the MAC address for all applicable interfaces.

   If multiple PXE service points are used, enter the number of seconds the PXE service point should wait before responding to PXE requests in the **Delay** box. Use this option only when there are multiple PXE servers on the same subnet.

8. On the **PXE-Database** page, specify the account the PXE service point should use to connect with the Configuration Manager 2007 database. The account specified must have the necessary permissions on the client computers running Microsoft SQL Server and Configuration Manager 2007 client permissions. You will also need to specify whether the PXE service point will create a self-signed certificate or whether a certificate should be imported by the user. If you import a certificate it must be issued by a certification authority (CA) trusted by the site.

6.3.2 How to Deploy an Operating System Image using PXE

You can use the pre-boot execution environment (PXE) to initiate operating system deployments to computers and servers that are known by the Configuration Manager 2007 environment.

PXE is used to initiate the operating system installation. The PXE service point site system will respond to PXE requests from computers on the network and then work with the Configuration Manager 2007 environment to determine the next appropriate

action to take. For new operating system deployments the first step is usually to download a version of Windows PE to the target computer.

Important

By default, when you create the PXE service point an associated distribution point is also created with a network share called **SMSPXEIMAGES$**. This network share contains the boot images and must be accessible by the target computers. You should only add boot images that will be used as part of your PXE initiated deployment to this share.

You will need at least one boot image for each type of processor architecture present in your Configuration Manager 2007 environment on the distribution point. For example, if you have computers with **x64** processors in your environment you will need at least one **x64** boot image assigned to the PXE distribution point even if you only plan to deploy **x86** operating systems. This is because PXE stub needs some of the native files contained in the boot image to identify the computer before the task sequence can be started.

To use PXE to initiate operating system deployments you must have a PXE service point site role installed and configured properly. For more information about setting up the PXE service point site role, click the following link: How to Configure the PXE Service Point

Use the following procedure to deploy an operating system using PXE:

To Deploy an Operating System using PXE

1. Import the target computer information and assign the computer to a Configuration Manager 2007 collection. For more information about importing new computers into Configuration Manager 2007 see: How to Add a New Computer to the ConfigMgr Database
2. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Site Management** / <*site code*> - <*site name*> / **Site Settings** / **Site Systems.**
3. Establish the Configuration Manager 2007 PXE service point site role. For more information about creating the PXE service point site role see: How to Configure the PXE Service Point.
4. Create and advertise the PXE operating system deployment task sequence to the target collection or device. You can assign a mandatory or optional advertisement. If you specify an optional advertisement there must be a user present to PXE boot the computer. You can only assign one mandatory advertisement to a target computer and you must specify the time when the mandatory advertisement should be run.
5. To initiate the operating system image installation, you must configure the target computer BIOS to PXE boot. PXE boot the target computer. For mandatory PXE advertisements the computer will automatically boot using PXE. For optional advertisements there must be a user present to PXE boot the computer.

- If you have specified that no password is required to establish the connection to the PXE service point, PXE boot the computer to initiate the operating system deployment.
- For additional security, you can assign a password to establish a connection to the PXE service point. If you have specified that a password is required to establish a connection to the PXE service point, PXE boot the computer to initiate the operating system deployment and enter the password. For the operating system deployment to continue the password must be entered at the Configuration Manager 2007 client computer or the task sequence will not run.

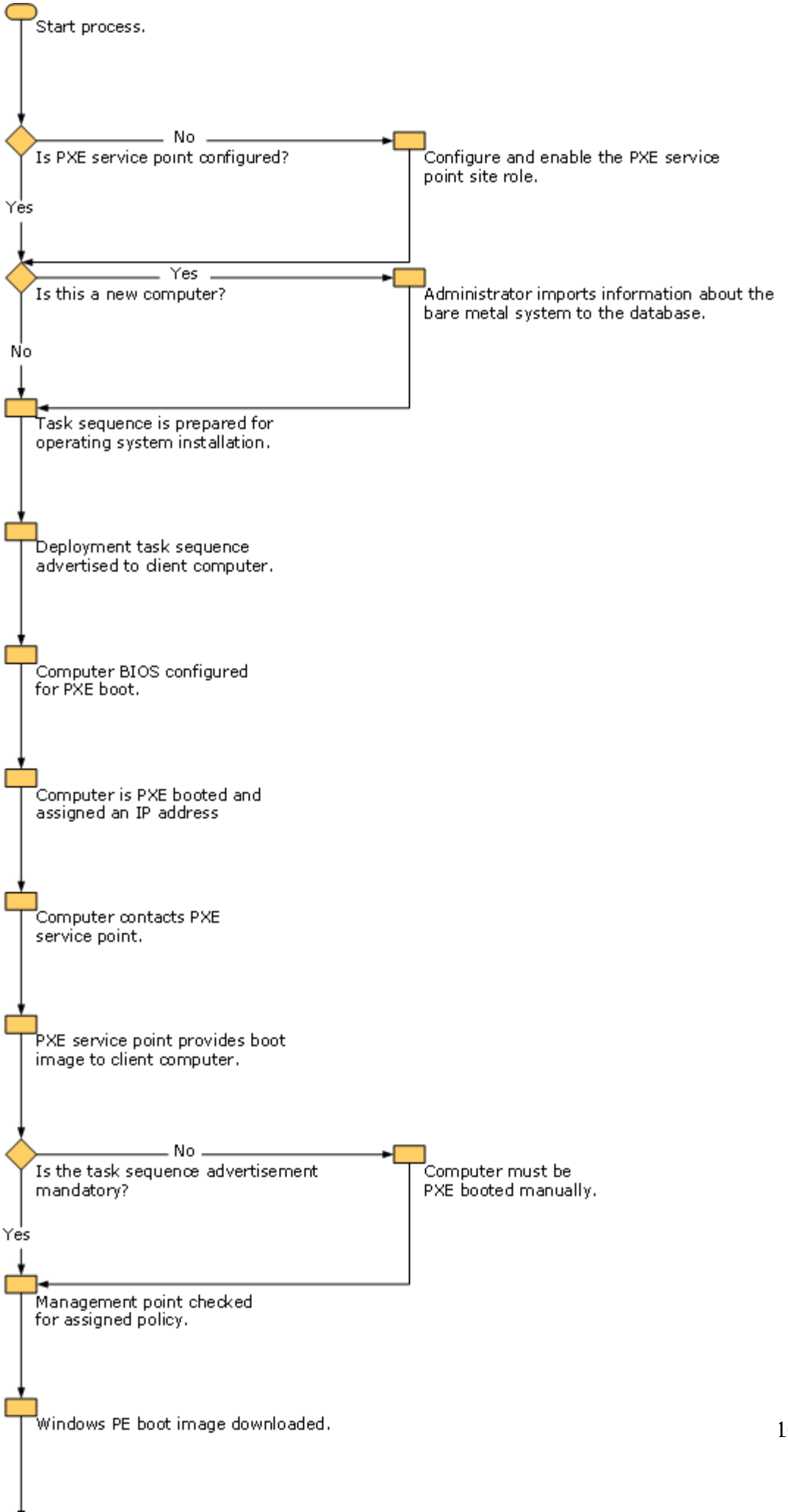
Important

If you are using the English version of Windows PE and communicating with a Configuration Manager 2007 site server running a double bite character set you should assign a password containing only simple characters or not require a password for PXE initiated deployments.

6. Configuration Manager 2007 will connect to the assigned management point and retrieve the assigned policy and complete the operating system deployment.

6.3.3 PXE Deployment Workflow

The following flowchart displays the actions associated with a PXE initiated operating system deployment in the order in which they generally take place.


Start process.
Is PXE service point configured?
No
Configure and enable the PXE service point site role.
Yes
Is this a new computer?
Yes
Administrator imports information about the bare metal system to the database.
No
Task sequence is prepared for operating system installation.
Deployment task sequence advertised to client computer.
Computer BIOS configured for PXE boot.
Computer is PXE booted and assigned an IP address
Computer contacts PXE service point.
PXE service point provides boot image to client computer.
Is the task sequence advertisement mandatory?
No
Computer must be PXE booted manually.
Yes
Management point checked for assigned policy.
Windows PE boot image downloaded.

7.0 Troubleshooting Operating System Deployment

This section provides information to help troubleshoot the operating system deployment feature in Configuration Manager 2007. This content might have been updated. For the most recent version, see http://go.microsoft.com/fwlink/?LinkId=93781.

You cannot install Windows XP or Windows Server 2003 successfully after you use Windows Vista or Windows PE 2.0 to create partitions on a hard disk

You use Windows Vista or the Windows Preinstallation Environment (Windows PE) 2.0 to create partitions on a hard disk. After you do this, you try to install Microsoft Windows Server 2003 or Windows XP.

Solution

This problem occurs because and Windows Vista and Windows PE 2.0 create disk partitions differently than Windows XP and Windows Server 2003. This problem occurs only on computers that use certain BIOS firmware. For more information about the required workaround see:

Windows XP - http://go.microsoft.com/fwlink/?LinkId=94633

Windows Server 2003 - http://go.microsoft.com/fwlink/?LinkId=94635

Computers Are Not Running Software Distribution Advertisements

Software distribution advertisements are failing on Configuration Manager 2007 clients running all versions of the following operating systems:

- Windows 2000
- Windows XP
- Windows 2000 Server
- Windows 2003 Server

When you deploy a Windows 2000, Windows XP, Windows 2000 Server (All versions), Windows 2003 Server (All versions) operating system image, Configuration Manager 2007 software distribution advertisements could be one hour behind due to revised Daylight Savings Time laws in many countries.

Solution

Use the following link to install an update to your computer that will automatically adjust the computer clock to the correct date in 2007 due to revised Daylight Savings Time laws. For more information about the required update see http://go.microsoft.com/fwlink/?LinkId=94809

7.1 Log Files

Operating System Deployment uses the following log files when recording information related to its components.

Log file	Location	Description
CreateTSMedia.log	On the SMS Provider server: If the SMS Provider is installed on the site server: C:\sms\logs If the SMS Provider is installed on another server: C:\smsprov\logs	Records information during the creation of bootable media and capture media.
SMSTS.log	On the Configuration Manager 2007 client • If task sequence completes when running in the full operating system with an Configuration Manager 2007 client installed on the computer: <CCM Install Dir>\logs • If task sequence completes when running in the full operating system with no Configuration Manager 2007 client installed on the computer: %temp%\SMSTSLOG • If task sequence completes when running in WindowsPE: <largest fixed partition>\SMSTSLOG **Note** <CCM Install Dir> is %windir%\system32\ccm\logs for most Configuration Manager 2007 clients, and <Configuration Manager 2007 installation drive>\SMS_CCM for the Configuration Manager 2007 site server	General location for all operating system deployment and task sequence log events.
Setupact.log, Setupapi.log, Setuperr.log	%windir%	Windows Sysprep and setup logs
CCMSetup.log	%windir%\system32\ccmsetup	Used to record client-based operating system actions.
USMT Log scanstate.log	%windir%	Used to log information from USMT regarding the capture of user state data.

USMT Log loadstate.log	%windir%	Used to log information from USMT regarding the restore of user state data.

7.2 Reports

Configuration Manager 2007 provides several reports that provide information about operating system deployments to all target computers in a specified collection. Each report lets you drill down to see detailed status of individual computers. For example, you can see what step of the deployment task sequence failed to run.

To find reports related to task sequences:

1. In the Configuration Manager console, navigate to **System Center Configuration Manager** / **Site Database** / **Computer Management** / **Reporting / Reports**.
2. In the **Reports** pane, enter **task sequence** in the **Look for** field.
3. Select Category from the Search in drop down list.
4. Click **Find Now**.
5. Select the report you want to run, and choose the Action **Run**.

Validate when running Windows PE

There is no built in condition variable that lets you detect when you a computer is running under Windows PE. For example, if you wanted to run a disk utility on the computer while it is booted in Windows PE, you could not set a task sequence condition to test for Windows PE. However, you can use a task sequence variable instead. Use the task sequence variable **_SMSTSInWinPE** to test for Windows PE. If the value of **_SMSTSInWinPE** is **True**, then the computer is running under Windows PE.

Deploying Operating Systems to Computers with no NTFS Boot Partition

When you deploy an operating system image with no NTFS boot partition the operating system deployment fails and returns an error.

Solution

You must convert the hard disk to NTFS format before staging a boot image. You can use the **Run Command Line** task sequence step to perform the hard disk conversion. Enter the following command for the **Command Line** of the **Run Command Line** task sequence step:

%windir%\system32\convert.exe c: /fs:ntfs /x

This command assumes that the boot partition is on hard drive "**C**".

The two potential results returned from this action are:

- **0**: Indicates the hard disk was successfully converted to NTFS.
- **4**: Indicates that the hard disk was already formatted as NTFS and no action was taken.

Windows PE Connectivity

The following list displays several reasons why the Windows PE image might not be able to obtain the necessary network connectivity to communicate with the Configuration Manager 2007 site:

- Network adaptor device drivers - The Windows PE image may not have access to the appropriate network adaptor device drivers.
- IPSec - The network may be running in IPSec require mode. If IPSec is running the Windows PE image will not be able to communicate with a management point, state migration point or distribution point.
- Network Access - The network access account may not have sufficient access to the required network resources.

Clients Lose Historical Data or are Unmanaged and Missing from the All Systems Collection

Configuration Manager 2007 helps to ensure that each Configuration Manager 2007 client is uniquely identified. If a duplicate hardware ID is identified, by default Configuration Manager 2007 automatically create a new client record for the duplicate record. This setting allows you to easily upgrade or deploy clients that might have duplicate hardware IDs, without requiring manual intervention. However, with this setting, a computer that has been re-imaged or restored from backup will have a new record created, which results in all previous information about that client being no longer available for reporting purposes.

An alternative configuration is to require the administrator to manually reconcile all conflicting records when they are detected. This setting results in affected clients being unmanaged and no longer displaying in collections, but displaying in the **Conflicting Records** node. These clients will remain unmanaged until the administrator resolves the conflict.

For more information, see the section "Managing Client Identity" in What's New in Client Deployment for Configuration Manager.

Solution

When a new record has been created, you cannot get back previous data for the client, but you can reconfigure Configuration Manager so that it does not automatically create new records in future.

If clients are unmanaged and missing from collections, check the **Conflicting Records** node so that you can manually reconcile the records by merging them, creating a new record, or by blocking the new record.

For more information about how to configure the site-wide setting, and how to manually resolve conflicting records, see How to How to Manage Conflicting Records for Configuration Manager Clients.

Task sequence fails and there are no policy assignments when assigned sccmshortname management point is running replicated Microsoft SQL Server

When you run replicated Microsoft SQL server on a management point, task sequences are failing and no policy assignments are available.

Solution

When you import a computer entry or create a computer entry using the SDK, wait until the next Microsoft SQL replication time has elapsed before trying to run the task sequence.

Deploying or Updating a Package using Binary Delta Replication

When you deploy a package using binary delta replication the SMSPXE.log can fill in less than one minute.

Solution

When the SMSPXE.log is full a new log file is created and the date and time are appended to the title. The new log file is created in the following directory:

Configuration Manager 2007 Site Server: **%windir%\sms\logs**

Other Computer: **%windir%\system32\ccm\logs**

Missing Operating System Error When Booting Using USB Media

When you start a target computer using USB media and you receive a "**Missing Operating System**" error.

Solution

Some computer BIOS versions do not recognize all USB media as bootable. Use different USB media to start the computer.

8.0 Operating System Deployment Security Best Practices and Privacy Information

Operating system deployment can be a convenient way to deploy bring your environment to the most secure operating systems and configurations. However, if an attacker could get control of your Microsoft System Center Configuration Manager 2007 site infrastructure, he could run the task sequence of his choice, including formatting the hard drives of all client computers. Task sequences can be configured

to contain sensitive information such as accounts with permissions to join the domain and volume licensing keys, presenting the risk of information disclosure.

Another important tenet of operating system deployment security is protecting the client authentication certificate used for bootable task sequence media and for PXE boot deployment. Capturing client authentication certificate gives the attacker the private key to impersonate a valid client on the network.

Best Practices

Implement access controls to protect bootable media When you create bootable media, you should always assign a password to help secure the media. However, even with a password, only files containing sensitive information are protected. You should also control physical access to the media to prevent an attacker from using cryptographic attacks to obtain the client authentication certificate.

If the client certificate is compromised, block the certificate To deploy client using bootable media and PXE service points you must have a client authentication certificate with a private key. If that certificate is compromised, you should block the certificate under **Site Settings** / **Certificates** / **Boot Media** node or **PXE** node.

Secure the communication channel between the site server and the PXE service point When the PXE service point is being configured with the client authentication certificate by the site server, the certificate is vulnerable to capture on the network. Use IPsec or some other form of encryption between the site server and the PXE service point.

Use PXE service points only on secure network segments When a client sends out a PXE boot request, there is no way to guarantee that the request is being serviced by a valid PXE service point. A rogue PXE service point could provide a tainted image to clients. An attacker could launch a man-in-the-middle attack against the TFTP protocol used by PXE and send malicious code with the operating system files, or create a rogue client to make TFTP requests directly to the PXE service point. An attacker could use a malicious client to launch a denial of service attack against the PXE service point. Use defense in depth to protect the network segments where clients will access PXE service points.

Important

Although it is supported to configure the PXE service point in a perimeter network, it is not recommended.

Configure the PXE service point to respond to PXE requests only on specified network interfaces Allowing the PXE service point to respond on all network interfaces could allow the PXE service point to respond to an unsecured network.

Require a password to PXE boot Client identifies have to be entered into the database, so completely unknown computers are not allowed to PXE boot. Requiring a password adds an extra level of security to the PXE boot process, which is inherently insecure.

Manually delete state migration point folders when they are decommissioned When you remove a state migration point folder in the Configuration Manager 2007 console on the state migration point properties, the physical folder is not deleted. You must manually remove the network share and delete the folder.

Do not configure the deletion policy to delete user state immediately If you set the deletion policy on the state migration point to remove data marked for deletion immediately, and if an attacker manages to retrieve the users state before the valid computer, the user state data would be deleted immediately. Set the **Delete after** interval to be long enough to verify the successful restore of user state data.

Control physical access to computers using USB flash drives for task sequences In an unattended installation using BitLocker to write to USB flash drives, a task sequence with the Disable BitLocker action stores the BitLocker key protectors in cleartext to allow access to the volume from Windows PE and to disable boot integrity checking by the TPM. After this action has run, an attacker with physical access to the computer could gain access to the encrypted volume. Also, if the task sequence is using a USB flash drive, the attacker could just steal the USB drive.

Implement access controls to protect the reference computer imaging process Ensure that the reference computer used to capture operating system images is in a secure environment with appropriate access controls so that unexpected or malicious software cannot be installed and inadvertently included in the captured image. When capturing the image, ensure that the destination network file share location is secure so that the image cannot be tampered with after it is captured.

Always install the most recent security updates on the reference computer Starting with an up-to-date reference computer helps lessen the window of vulnerability for new computers coming online.

Privacy Information

In addition to deploying operating systems to computers with no operating system, Configuration Manager 2007 can be used to migrate users' files and settings from one computer to another. The administrator configures which information to transfer, including personal data files, configuration settings, and browser cookies.

The information is stored on a state migration point and is encrypted during transmission and storage. The information is allowed to be retrieved by the new computer associated with the state information. If the new computer loses the key to retrieve the information, a Configuration Manager administrator with the View Recovery Information right on computer association instance objects can access the information and associate it with a new computer. After the new computer restores the state information, it deletes the data after one day by default. You can configure when the state migration point removes data marked for deletion. The state migration information is not stored in the site database and is not sent to Microsoft.

If you use boot media to deploy operating system images, you should always use the default option to password protect the boot media. The password encrypts any variables stored in the task sequence, but any information not stored in a variable might be vulnerable to disclosure.

Operating system deployment can use task sequences to perform many different tasks during the deployment process, including software distribution and software updates. When you configure task sequences, you should also be aware of the privacy implications of software distribution and software updates.

Configuration Manager 2007 does not implement operating system deployment by default and requires several configuration steps before you collect state information or create task sequences or boot images. Before configuring operating system deployment, consider your privacy requirements.

9.0 About Feature Reports for Operating System Deployment

Reports have been created for Operating System Deployment in Configuration Manager 2007. These reports provide information about operating system deployment and task sequence status.

9.1 Available Operating System Deployment Reports

There are four operating system deployment report categories, each with available reports that retrieve data used to accomplish a variety of objectives. This section lists each of the operating system deployment reports by category and provides a brief description for each.

Task Sequence - Progress

- **Progress of OS Deployment task sequences:**
  This report returns information about overall progress for all operating system deployment task sequences.
- **Chart - Progress of all task sequences:**
  This report returns a chart depicting the overall progress of all task sequences in a graphical format.
- **Progress of all task sequences:**
  This report returns the progress information for all task sequences.
- **Chart - Weekly progress of a task sequence:**
  This report returns a chart depicting the overall progress of a task sequence since the task sequence was first advertised.

Task Sequence - Advertisements

- **Progress of a running task sequence:**
  This report returns the progress of a specific task sequence that is currently running in the various task sequence phases/groups.
- **Progress of a running task sequence advertisement:**
  This report returns the progress of a specific task sequence advertisement that is currently running in the various task sequence phases/groups.
- **Count of failures in each phase/group of a specific task sequence:**
  This report returns the number of failures in each phase/group of a specific task sequence.
- **All task sequence advertisements:**
  This report provides detailed information about all task sequence advertisements initiated from the Configuration Manager 2007 site.
- **All system resources that failed in a specific group/phase of a specific task sequence advertisement:**
  This report returns a list of all computers that failed within a specific group/phase of the specified task sequence advertisement.
- **Count of failures in each phase/group of a specific task sequence advertisement:**

This report returns a list of the number of failures in each phase/group of a specific task sequence advertisement.

- **All system resources currently in a specific group/phase of a specific task sequence advertisement:**
  This report returns a list of computers that are currently running in a specific group/phase of the specified task sequence advertisement.
- **Summary report for a task sequence advertisement:**
  This report returns the summary information for a specific task sequence.
- **Deployment status for all task sequence advertisements:**
  This report returns the progress of all task sequence advertisements.
- **Progress of all advertisements for a specific task sequence:**
  This report returns the progress of all advertisements for a specific task sequence.

Task Sequence - Advertisement Status

- **Count of all system resources that have task sequence advertisements assigned but not yet run:**
  This report returns information about each computer that has accepted information about an assigned task sequence but has not yet run the task sequence.
- **Task run time history for a specific computer and a specific task sequence advertisement:**
  This report returns information about the run time status for each task sequence step. If no record is returned, the task sequence has not started yet.
- **All system resources for a specific task sequence advertisement in a specific state:**
  This report returns a list of computers that are targeted by the specified task sequence advertisement and are currently in the specified state.
- **List of computers that took longer than a specified length of time to run a task sequence advertisement:**
  This report returns a list of computers that took longer than the specified length of time to run a task sequence advertisement. The length of time is displayed in hours as a parameter for this report.
- **Run time for each step of a specific task sequence advertisement on a specific computer:**
  This report returns the time required to complete each task sequence step contained in a specific task sequence advertisement on a specific computer.
- **Run time for a specific OS deployment task sequence advertisement on a specific target computer:**
  This report returns the total time necessary to successfully complete an operating system deployment task sequence on a target computer.
- **Run time status of a specific task sequence advertisement for a specific computer:**
  This report returns the run time status summary of a specific task sequence advertisement on a specific computer.
- **Status summary of a specific task sequence advertisement:**
  This report shows the status summary of all resources that have been targeted by a specific task sequence.

Operating System

- **Count operating systems and service packs:**
  This report returns the number of computers sorted by operating system version and service pack level.
- **Windows server computers:**
  This report returns a list of computers and the associated versions of the Windows Server operating system.
- **Computers with a specific operating system and service pack:**
  This report returns a list that displays computers with a specific operating system and service pack.
- **Count of operating systems:**
  This report retunes the number of computers inventoried by operating system deployment.
- **History - operating system history for a specific computer:**
  This report returns the inventory history for the operating system on a single computer.
- **Computers with a specific operating system:**
  This report returns a list of computers with a specific operating system installed
- **Services - Services information for a specific computer:**
  This report returns summary information about the services running on a single computer.
- **Services - Computers running Remote Access Server:**
  This report returns a list of computers running remote access server.
- **Services - Computers running a specific service:**
  This report returns a list of computers running a specified service.

10.0 Technical Reference for Operating System Deployment

Click any link in the following section for technical references for Configuration Manager 2007 operating system deployment.

- Operating System Deployment Task Sequence Variables
  Provides a list of task sequence variables for use with operating system deployment.

- Sample Operating System Deployment Task Sequence Scenarios
  Provides sample task sequence scenario. These samples can help you decide how to setup new and custom task sequences in your environment.

- Operating System Media Pre-Execution Hook
  Provides information on how to configure boot media, stand-alone media, and PXE to run a script or executable that can interact with the user in Windows PE before the task sequence is selected

10.1 Operating System Deployment Task Sequence Variables

The following sections describe task sequence action variables (action variables) and task sequence built-in variables (built-in variables). The following lists display Configuration Manager 2007 task sequence variables and how you can use them to control and customize a task sequence. Task sequence variables supply configuration settings for computer, operating system and user state configuration tasks that are performed on a Configuration Manager 2007 computer. Task sequence variables provide a mechanism to configure and customize individual task sequence steps within a task sequence. Use the following link for more information about task sequence variables: About Task Sequence Variables

When a computer runs a task sequence, the task sequence environment is initialized using general configuration settings. As individual task sequence steps are run within the task sequence, settings specific to the current task sequence action are added to the task sequence environment. After each task sequence step is completed, any settings specific to the task sequence step are removed from the task sequence environment.

Using action variables you can change the associated default values of a task sequence to customize how the task sequence step will be run on a target computer.

Note

Task sequence variables with names that begin with an underscore (_) character are read-only. You can access the values associated with read-only task sequence variables, however you cannot change the associated values.

10.1.1 Task Sequence Action Variables

Task sequence action variables (action variables) specify configuration properties for a particular task sequence step. By default, the default task sequence step settings are initialized and available only when the associated task sequence step is run. In other words, the task sequence variable setting is added to the task sequence environment before the task sequence step is run, and the value is removed after the task sequence has run.

For example; using the task sequence editor you can specify a start-in directory for a command line action by specifying the **Start In** property value in the **Run Command Line** task sequence step. The default value specified is stored in the task sequence environment as the **WorkingDirectory** variable, which is specific to the **Run Command Line** task sequence action. The **WorkingDirectory** environment variable is initialized before running the **Run Command Line** task sequence action. During the **Run Command Line** step, the specified directory value can be accessed through the environment variable named **WorkingDirectory**. After the task sequence step completes, the variable is removed from the task sequence environment. If the sequence contains another **Run Command Line** task sequence step, the new **WorkingDirectory** variable is initialized and set to the starting value for that task sequence.

While the default value for a task sequence action setting is present while the task sequence step is run, any new value you set can be used by multiple steps in the sequence. If you use one of the task sequence variable creation methods to override a built-in variable value, the new value remains in the environment and overrides the default value for other steps in the task sequence. In the previous example, if a **Set Task Sequence Variable** step is added as the first step of the task sequence, and sets the **WorkingDirectory** environment variable to the value **C:**, both **Run Command Line** steps in the task sequence will use the new starting directory value.

The following tables describe the Configuration Manager 2007 action variables which are grouped by their associated task sequence action:

Run Command Line Task Sequence Action

Action Variable Name	Description
SMSTSDisableWow64Redirection	Set this variable to **"true"** to disable Wow64 file redirection and 64bit registry redirection when the task sequence is evaluating file, folder and registry condition in a 64bit operating system.
WorkingDirectory	Specifies the starting directory for a command-line action. **Note** The specified directory name must not exceed 255 characters. Examples:

- **"C:\"**
- **"%SystemRoot%"**

Restart Computer Task Sequence Action

Action Variable Name	Description
SMSRebootMessage	Specifies that an administrator configurable message to users before rebooting the computer will be displayed. If you don't specify a message, default message text is used. **Note** The message specified must not exceed 512 characters. Example: • "This computer will be restarted; please save your work."
SMSRebootTimeout	Specifies the number of seconds that the warning is displayed to the user before the computer will restart. Specify zero seconds to indicate that no reboot message should be displayed. Examples: **"0"** (default) **"5"** **"10"**

Install Software Updates Task Sequence Action

Action Variable Name	Description
SMSInstallUpdateTarget	Installs assigned software updates. You can specify all updates, or mandatory updates. Valid values: **"All"** **"Mandatory"**

Apply Operating System Task Sequence Action

Action Variable Name	Description
OSDConfigFileName	Specifies the file name of the operating system deployment answer file associated with the operating system deployment package
OSDImageIndex	Specifies the image index value of the WIM file that should be applied to the target computer.
OSDInstallEditionIndex	Specifies the version of Windows Vista operating system that will be installed. If no version is specified Windows setup will determine which version to install using the referenced product key. **Note** You should only use a value of zero (0) if the following conditions are true: • You are installing a pre-Windows Vista operating system or, • You are installing Windows Vista and, • No product key is specified and, • The operating system you are installing is a volume license edition. Valid values: **"0"** (default)

Apply Data Image Task Sequence Action

Action Variable Name	Description
OSDDataImageIndex	Specifies the image index value of the WIM file that should be applied to the target computer.
OSDWipeDestinationPartition	Specifies if the files located on the target partition should be deleted. Valid values: **"true"** (default) **"false"**

Setup Windows and ConfigMgr Task Sequence Action

Action Variable Name	Description
SMSClientInstallProperties	Specifies the client installation properties that should be used when installing the Configuration Manager 2007 client.

Capture Operating System Image Task Sequence Action

Action Variable Name	Description
OSDCaptureAccount	Specifies a Windows account name that has permissions to the network share where the captured image will be stored.
OSDCaptureAccountPassword	Specifies the password for the Windows account used to store the captured image on a network share.
OSDCaptureDestination	Specifies the location where a captured operating system image will be saved. **Note** The directory specified must be between 1 and 255 characters.
OSDImageCreator	An optional name of the user that created the image, stored in the WIM file. **Note** The specified user name must be between 1 - 255 characters.
OSDImageDescription	An optional user-defined description of the captured operating system image that is stored in the WIM file. **Note** The specified description must be between 1 - 255 characters.
OSDImageVersion	An optional user-defined version number to assign to the captured operating system image. This value can be any combination of letters and numbers and is stored in the WIM file. **Note** The specified version must be between 1 - 32 characters.
OSDTargetSystemRoot	Stores the path to the currently running operating system for the **Prepare ConfigMgr Client for Capture** task sequence action. The task sequence action uses this task sequence variable to find the path to the operating system so that it can be verified as a supported operating system for capture by

Configuration Manager 2007.

Capture Network Settings Task Sequence Action

Action Variable Name	Description
	Specifies if the network adaptor settings (TCP/IP, DNS, and WINS) configuration information should be captured. Examples: **"true"** (default) **"false"**
OSDMigrateAdapatorSettings	
	Specifies if the workgroup or domain membership information should be migrated as part of the operating system deployment. Examples: **"true"** (default) **"false"**
OSDMigrateNetworkMembership	

Apply Network Settings Task Sequence Action

Action Variable Name	Description
OSDAdapterCount	Specifies the number of network adapters installed on the target computer.
OSDDNSDomain	Specifies the primary DNS server that will be used by the target computer. **Note** This value is set by the Apply Network Settings action, but it remains in the environment and is available to all subsequent task sequence actions.
OSDDomainName	Specifies the name of the Windows domain that the target computer should join. **Note** The specified length must be between 1 - 32 characters.
OSDDomainOUName	Specifies the RFC 1779 format name of the organizational unit (OU) which the target computer should join. If specified, the value must contain the full path. Example: **LDAP://OU=MyOu,DC=MyDom,DC=MyCompany,DC=com**

OSDEnableTCPIPFiltering	Specifies if TCP/IP filtering should be enabled. **Note** This value is set by the **Apply Network Settings** action, but it remains in the environment and is available to all subsequent task sequence actions. Valid values: **"true"** **"false"** (default)
OSDJoinAccount	Specifies the network account that should be used to add the target computer to a Windows domain.
OSDJoinPassword	Specifies the network password that should be used to add the target computer to a Windows domain.
OSDNetworkJoinType	Specifies the type of network the target computer should join as part of the operating system deployment. **"0"** indicates that the target computer should join a Windows domain. **"1"** specifies that the computer should join a workgroup. Valid values: **"0"** **"1"**
OSDSuffixSearchOrder	Specifies the DNS search order for the target computer. **Note** This value is set by the Apply Network Settings action, but it remains in the environment and is available to all subsequent task sequence actions.
OSDWorkgroupName	Specifies the name of the workgroup that the target computer should join. You must specify either this value, or the **OSDDomainName** value. **Note** The specified length must be between 1 - 32 characters. Example: **"Accounting"**

Prepare Windows for Capture Task Sequence Action

Action Variable Name	Description
OSDBuildStorageDriverList	Builds a mass storage device driver list. Valid values: **"true"** **"false"** (default)
OSDKeepActivation	Specifies whether the product activation flag should be reset. Valid values: **"true"** **"false"** (default)

Capture User State Task Sequence Action

Action Variable Name	Description
_SMSTSUserStatePath	Creates a location and allows you to save the user state locally. You must also set the **OSDStateStorePath** task sequence variable to **_SMSTSUserStatePath**.
OSDMigrateConfigFiles	Specifies the configuration files used to capture user profiles. This value is set for customized user profile migration.
OSDMigrateContinueOnLockedFiles	Allows the user state capture to proceed if some files can not be captured. Valid values: **"true"** (default) **"false"**
OSDMigrateEnableVerboseLogging	Enables verbose logging for the user state migration tool (USMT). Valid values: **"true"** **"false"** (default)
OSDMigrateMode	Allows you to customize the files that are captured by the USMT. Valid values:

	"Simple" **"Advanced"**
OSDMigrateSkipEncryptedFiles	Specifies if encrypted files should be captured. Valid values: **"true"** **"false"** (default)

Restore User State Task Sequence Action

Action Variable Name	Description
OSDMigrateContinueOnRestore	Specifies that the user state restoration should continue even if some files cannot be restored. Valid values: **"true"** (default) **"false"**
OSDMigrateEnableVerboseLogging	Enables verbose logging for the USMT tool. **Note** This value is required by the action; it must be set to "true" or "false" Valid values: **"true"** **"false"** (default)
OSDMigrateLocalAccountPassword	Specifies if the local user account password should be reset for restored local user profiles.
OSDMigrateLocalAccounts	Specifies if the local computer account should be restored. Valid values: **"true"** **"false"** (default)

Request State Store Task Sequence Action

Action Variable Name	Description
OSDStateFallbackToNAA	Specifies if the task sequence step should use the Network Access Account as a fallback when the computer account fails to connect to the state migration point. Valid values: **"true"** **"false"** (default)
OSDStateSMPRetryCount	Specifies the number of times that the task sequence step should try to find a state migration point before failing. **Note** The specified count must be between 0 - 600.
OSDStateSMPRetryTime	Specifies number of seconds that the task sequence step should wait between retry attempts. **Note** The specified number of seconds must be between 0 - 30.

Format and Partition Disk Task Sequence Step

Action Variable Name	Description
OSDDiskIndex	Specifies the physical disk number to be partitioned. **Note** This value is required by the task sequence action.
OSDDiskpartBiosCompatibilityMode	Specifies whether or not to disable cache alignment optimizations when partitioning the hard disk for compatibility with certain types of BIOS. Valid values: **"true"** **"false"** (default)
OSDGPTBootDisk	Specifies whether or not to create an EFI partition on a GPT hard disk so that it can be used as the startup disk on EFI-based computers. **Note**

	This value is required by the action; it must be set to "True" or "False" Valid values: **"true"** **"false"** (default)
OSDPartitions	Specifies an array of partition settings; see the SDK topic for accessing array variables in the task sequence environment. **Note** This value is required by the task sequence action. This task sequence variable is an array variable. Each element in the array represents the settings for single partition on the hard disk. The settings defined for each partition can be accessed by combining the array variable name with the zero-based disk partition number and the property name. For example, the following variable names can be used to define the properties for the first partition that will be created by this task sequence action on the hard disk: **Note** If multiple partitions will be defined with this task sequence action the properties for the second partition can be defined by using their index in the variable name; for example; **OSDPartitions1Type**, **OSDPartitions1FileSystem**, **OSDPartitions1Bootable**, **OSDPartitions1QuickFormat**, **OSDPartitions1VolumeName** and so on. • **OSDPartitions0Type** - Specifies the type of partition and is a required property. Valid values are "**Primary**", "**Extended**", "**Logical**", and "**Hidden**". • **OSDPartitions0FileSystem** - Specifies the type of file system to use when formatting the partition. This is an optional property, if no file system is

specified the partition will not be formatted. Valid values are "**FAT32**" and "**NTFS**".

- **OSDPartitions0Bootable** - Specifies if the partition is bootable and is a required property. If this value is set to "**TRUE**" for MBR disks then this will be made the active partition.
- **OSDPartitions0QuickFormat** - Specifies the type of format that should be used and is a required property. If this value is set to "**TRUE**", a quick format will be performed otherwise a full format will be performed.
- **OSDPartitions0VolumeName** - Specifies the name that should be assigned to the volume when it is formatted. This is an optional property.
- **OSDPartitions0Size** - Specifies the size of the partition. Units are specified by the **OSDPartitions0SizeUnits** variable. This is an optional property. If this property is not specified the partition is created using all remaining free space.
- **OSDPartitions0SizeUnits** - Specifies the units that will be used when interpreting the **OSDPartitions0Size** task sequence variable. This is an optional property. Valid values are "**MB**" (default), "**GB**", and "**Percent**".
- **OSDPartitions0VolumeLetterVariable** - Partitions will always use the next available drive letter in Windows PE when they are created. Use this optional property to specify the name of another task sequence variable which will be used to save the new drive letter for future reference.

OSDPartitionStyle

Specifies the partition style to use when partitioning the disk. "**MBR**" indicates the master boot record partition style, and "**GPT**" indicates the GUID Partition Table style.

Note

This value is required by the task sequence action; it must be set to "GPT" or "MBR"

Valid Values:

"GPT"

"MBR"

Convert Disk to Dynamic Task Sequence Action

Action Variable Name	Description
OSDConvertDiskIndex	Specifies the physical disk number to be converted. **Note** This value is required by the task sequence action.

Connect to Network Folder Task Sequence Action

Action Variable Name	Description
SMSConnectNetworkFolderAccount	Specifies the administrator account that should be used to connect to the network share. **Note** This value is required by the task sequence action.
SMSConnectNetworkFolderDriveLetter	Specifies the network drive letter to connect to. This value is optional; if it is not specified, then the network connection is not mapped to a drive letter. **Note** If this value is specified the value must be in the range from D: to Z: Examples: **"D:"** **"E:"**
SMSConnectNetworkFolderPassword	Specifies the network password that should be used to connect to the network share. **Note** This value is required by the task sequence action.
SMSConnectNetworkFolderPath	Specifies the network path for the connection. **Note** This value is required by the task sequence

action.

Example:

"\\servername\sharename"

Join Domain or Workgroup Task Sequence Action

Action Variable Name	Description
OSDJoinAccount	Specified the account that should be used by the target computer to join the Windows domain.
OSDJoinDomainName	Specifies the name of a Windows domain the target computer will join. **Note** The specified Windows domain name must be between 1 - 255 characters
OSDJoinDomainOUName	Specifies the RFC 1779 format name of the organizational unit (OU) which the target computer should join. If specified, the value must contain the full path. Example: **LDAP://OU=MyOu,DC=MyDom,DC=MyCompany,DC=com** **Note** The specified Windows domain OU name must be between 0 - 32,767 characters. This value should not be set if the variable OSDJoinType is set to "1" (join workgroup).
OSDJoinPassword	Stores the network password that should be used by the target computer to join the Windows domain. **Note** This value is required if the variable **OSDJoinType** is set to "**0**" (join domain)
OSDJoinSkipReboot	Specifies whether the target computer should be restarted after joining the domain or workgroup. Valid values: **"true"** **"false"**
OSDJoinType	Specifies if the target computer should join a Windows domain or a workgroup. "**0**" will configure the target computer to join a specified Windows domain. "**1**" will

	configure the target computer to join a specified workgroup. Valid values: **"0"** **"1"**
OSDJoinWorkgroupName	Specifies the name of a workgroup the target computer will join. **Note** The specified workgroup name must be between 1 to 32 characters. Example: **"Accounting"**

Capture Windows Settings Task Sequence Action

Action Variable Name	Description
OSDMigrateComputerName	Specifies if the computer name should be migrated. **Note** This value is required by the action; it must be set to "true" or "false". Valid values: **"true"** (default) **"false"**
OSDMigrateRegistrationInfo	Specifies if the computer user and organizational information should be migrated. **Note** This value is required by the task sequence action; it must be set to "true" or "false". Valid values: **"true"** (default) **"false"**
OSDMigrateTimeZone	Specifies if the computer time zone settings should be migrated.

	Note This value is required by the task sequence action; it must be set to "true" or "false". Valid values: **"true"** (default) **"false"**

Apply Windows Settings Task Sequence Action

Action Variable Name	Description
OSDComputerName	Specifies the default name of the target computer. This can be overwritten when the task sequence runs by the **Capture Windows Settings** task sequence action if the **Migrate computer name** option is selected. Example: **"%_SMSTSMachineName%"** (default)
OSDProductKey	Specifies the Windows product key. **Note** The specified value must be between 1 - 255 characters.
OSDRegisteredUserName	Specifies the default registered user name in the new operating system. This can be overwritten when the task sequence runs by the **Capture Windows Settings** task sequence action if the **Migrate registered user and organization name** option is enabled. **Note** This value is required by the task sequence; the specified value must be between 1 - 255 characters.
OSDRegisteredOrgName	Specifies the default registered organization name in the new operating system. This can be overwritten when the task sequence runs by the **Capture Windows Settings** task sequence action if the **Migrate registered user and organization names** option is enabled. **Note** This value is required by the task sequence; the

	specified value must be between 1 - 255 characters.
OSDTimeZone	Specifies the default time zone setting that should be used in the new operating system. This can be overwritten when the task sequence runs the **Capture Windows Settings** action if the **Migrate time zone** option is enabled. **Note** This value is required by the task sequence.
OSDServerLicenseMode	Specifies the Windows Server license mode that should be used. Valid values: **"PerSeat"** **"PerServer"**
OSDServerLicenseConnectionLimit	Specifies the maximum number of connections allowed. **Note** The specified must be in the range between 5 - 9999 characters.
OSDRandomAdminPassword	Specifies a randomly generated password for the administrator account in the new operating system. If set to **“true”**, the local administrator account will be disabled on the target computer. If set to **“false”**, the local administrator account will be enabled on the target computer, and the local administrator account password will be assigned the value of the variable **OSDLocalAdminPassword**. Valid values: **"true"** (default) **"false"**
OSDLocalAdminPassword	Specifies the local administrator password. This value is ignored if the **Randomly generate the local administrator password and disable the account on all supported platforms** option is enabled. **Note** The specified value must be between 1 and 255

characters.

Auto Apply Drivers Task Sequence Action

Action Variable Name	Description
OSDAutoApplyDriverCategoryList	Specifies the driver catalog category unique ID's the task sequence action will search in for required device drivers. This value is optional and it is not set by default. The available category ID's can be obtained by enumerating the list of **SMS_CategoryInstance** objects on the site.
OSDAllowUnsignedDriver	Specifies whether Windows should be configured to allow unsigned device drivers to be installed. This task sequence variable is not used when deploying the Windows Vista operating system. **Note** This value is required by the action; it must be set to "true" or "false". Valid values: **"true"** **"false"** (default)
OSDAutoApplyDriverBestMatch	Specifies what the task sequence action should do if there are multiple device drivers in the driver catalog that are compatible with a hardware device. If set to **"true"**, only the best device driver will be installed. If **"false"**, all compatible device drivers will be installed, and the operating system will choose the best driver to use. **Note** This value is required by the action; it must be set to "true" or "false". Valid values: **"true"** (default) **"false"**

Apply Driver Package Task Sequence Action

Action Variable Name	Description
OSDApplyDriverBootCriticalContentUniqueID	Specifies the content ID of the mass storage device driver in the driver package to install. If this is not specified, no mass storage driver is installed.
OSDApplyDriverBootCriticalINFFile	Specifies the INF file of the mass storage driver to be installed **Note** This task sequence variable is required if the OSDApplyDriverBootCriticalContentUniqueID is set. Specifies if a mass storage device driver is being installed, this must be **"scsi"**.
OSDApplyDriverBootCriticalHardwareComponent	**Note** This task sequence variable is required if the OSDApplyDriverBootCriticalContentUniqueID is set. Specifies the boot critical ID of the mass storage device driver to be installed. This is listed in the "**scsi**" section of the device driver's txtsetup.oem file.
OSDApplyDriverBootCriticalID	**Note** This task sequence variable is required if the OSDApplyDriverBootCriticalContentUniqueID is set. Specifies whether Windows should be configured to allow unsigned device drivers to be installed. This task sequence variable is not used when deploying the Windows Vista operating system.
OSDAllowUnsignedDriver	**Note** This value is required by the action; it must be set to "true" or "false". Valid values: **"true"**

"false" (default)

Enable BitLocker Task Sequence Action

Action Variable Name	Description
OSDBitLockerRecoveryPassword	Specifies instead of generating a random recovery password, the **Enable BitLocker** task sequence action will use the specified value as the recovery password. The value must be a valid numerical BitLocker recovery password.
OSDBitLockerStartupKey	Specifies instead of generating a random startup key for the key management option "**Startup Key on USB only**", the **Enable BitLocker** task sequence action will use the value as the startup key. The value must be a valid, Base64-encoded BitLocker startup key.

Task Sequence Built-in Variables

Task sequence built-in variables (built-in variables) are produced by the underlying task sequence engine and their associated values are generally read-only. Built in variables provide information about the environment where the associated task sequence is running. The values associated with a built-in variable are available in the task sequence environment throughout the entire task sequence. Typically, built-in variables are initialized before any task sequence steps are run in the task sequence. For example, the built-in variable **_SMSTSLogPath** is used to set the path that Configuration Manager 2007 components use to write log files while the task sequence runs; any task sequence step can access this environment variable.

The following list describes the Configuration Manager 2007 built-in variables available for use within a Configuration Manager 2007 task sequence:

Built-in Variable Name	Description
_SMSTSAdvertID	Stores the current running task sequence advertisement ID. It uses the same format as a Configuration Manager 2007 software distribution advertisement ID. If the task sequence is running from a stand-alone media, this variable is un-defined. Example: **"ABC20001"**
_SMSTSBootImageID	Stores the Configuration Manager 2007 boot image package ID if there is a boot image package associated with the current running task sequence. The variable will not be set if there is no Configuration Manager 2007 boot image package associated.

	Example: "**ABC00001**"
_SMSTSClientGUID	Stores the value of Configuration Manager 2007 client GUID. This variable is not set if the task sequence is running through a stand-alone media. Example: "**0a1a9a4b-fc56-44f6-b7cd-c3f8ee37c04c**"
_SMSTSCurrentActionName	Specifies the name of currently running task sequence step. This variable will be set before the task sequence manager runs each individual step. Example: "**run command line**"
_SMSTSDownloadOnDemand	Set to **"true"** if the current task sequence is running in download on demand mode which means the task sequence manager downloads content locally only when it needs to access the content.
_SMSTSInWinPE	This variable is set to **"true"** when the current task sequence step is running in the Windows PE environment and set to **"false"** if not. You can test this task sequence variable to determine the current operating system environment.
_SMSTSLastActionRetCode	Stores the return code returned by the last action that was run. Example: "**0**"
_SMSTSLastActionSucceeded	The variable is set to "**true**" if the last action is succeeded and to "**false**" if the last action failed. If the last action is skipped because the step is disabled or the associated condition is evaluated to false, this variable is not reset which means it still holds the value for the previous action of the last action.
_SMSTSLaunchMode	Specifies the task sequence launch method. The task sequence can have the following values: • "**SMS**" - specifies that the task sequence is launched using the Configuration Manager 2007 client. • "**UFD**" - specifies that the task sequence is launched using USB media. • "**CD**" - specifies that the task sequence is launched using CD/DVD sets.

	• "**PXE**" - specifies that the task sequence is launched from PXE
_SMSTSLogPath	Stores the full path to the log directory. This is specified by the TSM and can be used to determine where actions should be logged. This value cannot be set when no hard drive is available.
_SMSTSMachineName	Stores and specifies the computer name. Stores the name of the computer that the task sequence will use to log all status messages. To change the computer name in the new operating system use the **OSDComputerName** variable. Example: "**ABC**"
_SMSTSMediaType	Specifies the type of media that will be used to initiate the installation. Examples of types of media are Boot Media, Full Media, and PXE.
_SMSTSMP	Stores the name or IP address of a Configuration Manager 2007 management point.
_SMSTSMPPort	Stores the management point port number of a Configuration Manager 2007 management point. Example: "**80**"
_SMSTSOrgName	Stores the branding title name which will be displayed in task sequence progress UI dialog. Example: "**XYZ Organization**"
_SMSTSPackageID	Stores the current running task sequence ID. This ID uses the same format as a Configuration Manager 2007 software package ID. Example: **"HJT00001"**
_SMSTSPackageName	Stores the current running task sequence name specified by the Configuration Manager 2007 administrator when the task sequence is created. Example: **"Deploy xpsp2 task sequence"**
_SMSTSRunFromDP	Set to **"true"** if the current task sequence is running

	in run from distribution point mode, which means the task sequence manager will obtain required packages from distribution point shares.
_SMSTSSiteCode	Stores the site code of the Configuration Manager 2007 site. Example: "**ABC**"
_SMSTSType	Specifies the type of the current running task sequence. It can have following values: "**1**" - indicates the generic task sequence. "**2**" - indicates the operating system deployment task sequence.
_SMSTSUseCRL	Specifies if the task sequence uses the certificate revocation list when using SSL to communicate with the management point.
_SMSTSUserStarted	Specifies whether a task sequence is started by a user. This variable will only be set if the task sequence is started from the Configuration Manager 2007 client. For example, if **_SMSTSLaunchMode** is set to **"SMS"**. The variable can have following values: • **"true"** - specifies that the task sequence is manually started by a user from client RAP. • **"false"** - specifies that the task sequence is initiated automatically by the Configuration Manager 2007 scheduler.
_SMSTSUseSSL	Specifies if the task sequence uses SSL to communicate with the Configuration Manager 2007 management point. If your site is running in native mode set the value to **"true"**.
SMSTSErrorDialogTimeout	Specifies that a dialog indicating an error occurred. The dialog will be dismissed automatically in 15 minutes by default. Users can set this task sequence variable to control the timeout value in seconds.
SMSTSRebootDelay	Specifies how many seconds to wait before the computer will reboot. The task sequence manager will display a notification dialog before reboot if this variable is not set to 0. Examples: **"0"**

	"30" Specifies the message to display in the shutdown dialog box when a reboot is requested. If this variable is not set, then a default message will be shown. Examples: **This computer is being rebooted by the task sequence manager**.
SMSTSRebootRequested	Indicates that a reboot is requested after completing the current task sequence step. If a reboot is needed, simply set this variable to **"true"** and the task sequence manager will restart the machine after this task sequence step. The task sequence does not support an individual task sequence step to reboot the computer. The task sequence step must set this task sequence variable if it requires a reboot to complete the task sequence step. After the computer is rebooted, the task sequence will continue running from the next task sequence step.
SMSTSRetryRequested	Requests a retry after the completion of the current task sequence step. If this task sequence variable is set, the **SMSTSRebootRequested** must also be set to **"true"**. After the computer is rebooted, the task sequence manager will rerun the same task sequence step.

10.2 Sample Operating System Deployment Task Sequence Scenarios

Use the following reference documents as a guide as you create various Configuration Manager 2007 operating system deployment task sequence scenarios.

Click any link in the following section for more information about the available scenarios that provide a recommended path for creating operating system deployment task sequences.

- Sample Stand-alone Media Operating System Deployment Task Sequence

  Provides a sample task sequence to deploy an operating system image using stand-alone media.
- Sample Existing Operating System Image Deployment Task Sequence

  Provides a sample task sequence to deploy an operating system image using an existing operating system image.
- Sample Build and Capture Operating System Image Task Sequence

Provides a sample task sequence that will build and capture an operating system image for deployment.

- Sample Stand-alone Media Operating System Deployment Task Sequence

Use the table as a guide as you create a task sequence to deploy an operating system using stand-alone media. The table will help you decide the general sequence for your task sequence steps and how to organize and structure those task sequence steps into logical groups.

Note
You should always use the **Task Sequence Media** Wizard to create stand-alone media from which to run your operating system deployment.

The task sequence you create may vary from this sample and can contain more or less task sequence steps and groups.

10.2.1 Sample stand-alone media task sequence

Task Sequence Group/Step	Reference
Capture File and Settings - **(New Task Sequence Group)**	You can create a task sequence group using the task sequence editor. A task sequence group helps keep similar task sequence steps together for better organization and error control.
Capture Windows Settings	Use this task sequence step to identify the Microsoft Windows settings that should be captured from the computer that will receive the task sequence. You can capture the computer name, user and organizational information and the time zone settings.
Capture Network Settings	Use this task sequence step to capture network settings from the computer that will receive the task sequence associated with this task step. You can capture the computer's domain or workgroup membership and the network adaptor setting information.
Capture User Files and Settings - **(New Task Sequence Sub-Group)**	You can create a task sequence group within a task sequence group using the task sequence editor. A task sequence sub-group helps keep similar task sequence steps together for better organization and error control.
Set Local State Location	You can use this task sequence step specify a local location using the protected path task sequence variable. The user state will be stored on a protected directory on the hard drive.
Capture User State	You can use this task sequence step to capture the user files and settings you want to migrate to the new operating system.
Install Operating System - **(New Task Sequence Group)**	You can create a task sequence group using the task sequence editor. A task sequence group helps keep similar task sequence steps together for better organization and error control.
Reboot to Windows PE or hard disk	Use this task sequence step to specify restart options for the target computer that will receive this task sequence. This step will display a message to the user that the computer will be

	restarted so that the installation can continue.
	This step uses the read-only **_SMSTSInWinPE** task sequence variable. If the associated value equals **false** the task sequence step will continue.
Apply Operating System	Use this task sequence step to install a specified operating system image onto target computer. This step applies all volume images contained in the WIM file to the corresponding sequential disk volume on the target computer after first deleting all files on that volume (with the exception of Configuration Manager 2007-specific control files). You can specify a **sysprep** answer file and also configure which disk partition should be used for the installation.
Apply Windows Settings	Use this task sequence step to configure the Windows settings configuration information for the target computer. The windows settings you can apply are user and organizational information, product or license key information, time zone, and the local administrator password.
Apply Network Settings	Use this task sequence step to specify the network or workgroup configuration information for the target computer. You can also specify if the computer should use a DHCP server or you can statically assign the IP address information.
Apply Driver Package	The **Apply Driver Package** task sequence step allows you to make all device drivers in a driver package available for use by Windows setup. All necessary device drivers must be contained on the stand-alone media.
Setup Operating System - **(New Task Sequence Group)**	You can create a task sequence group using the task sequence editor. A task sequence group helps keep similar task sequence steps together for better organization and error control.
Setup Windows and ConfigMgr	Use this task sequence step to install the Configuration Manager 2007 client software. Configuration Manager 2007 installs and registers the Configuration Manager 2007 client GUID. You can assign the necessary installation parameters in the **Installation properties** window.
Restore User Files and Settings - **(New Task Sequence Group)**	You can create a task sequence group using the task sequence editor. A task sequence group helps keep similar task sequence steps together for better organization and error control.
Restore User State	Use this task sequence step to initiate the User State Migration Tool (USMT) to restore user state and settings to a target computer.

Sample Existing Operating System Image Deployment Task Sequence

Use the table as a guide as you create a task sequence to deploy an operating system using an existing operating system image. The table will help you decide the general

sequence for your task sequence steps and how to organize and structure those task sequence steps into logical groups.

Important
You should always use the **New Task Sequence** Wizard to create this task sequence. For more information about deploying an operating system to a new computer use the following link: How to Deploy Operating System Images to a Computer

The task sequence you create may vary from this sample and can contain more or less task sequence steps and groups.

10.2.2 Sample existing operating system image task sequence

When you use the **New Task Sequence** Wizard to create this new task sequence some of the task sequence step names are different than what than what they would be if you manually added these task sequence steps to an existing task sequence. The following table displays the naming differences:

New Task Sequence Wizard Task Sequence Step name	Equivalent Task Sequence Editor Step Name
Request User State Storage	Request State Store
Capture User Files and Settings	Capture User State
Release User State Storage	Release State Store
Restart in Windows PE	Reboot to Windows PE or hard disk
Partition Disk 0	Format and Partition Disk
Restore User Files and Settings	Restore User State

10.2.3 Sample existing operating system image task sequence:

Task Sequence Group/Step	Reference
Capture File and Settings - **(New Task Sequence Group)**	You can create a task sequence group using the task sequence editor. A task sequence group helps keep similar task sequence steps together for better organization and error control. This group contains actions that capture files and settings from the reference computer operating system.
Capture Windows Settings	Use this task sequence step to identify the Microsoft Windows settings that should be captured from the computer that will receive the task sequence. You can capture the computer name, user and organizational information and the time zone settings.
Capture Network Settings	Use this task sequence step to capture network settings from the computer that will receive the task sequence associated with this task step. You can capture the computer's domain or workgroup membership and the network adaptor setting information.
Capture User Files and Settings - **(New**	You can create a task sequence group within a task sequence group using the task sequence editor. A task sequence sub-group

Task Sequence Sub-Group)	helps keep similar task sequence steps together for better organization and error control.
	This group contains the actions to capture user files and settings.
Request User State Storage	Use this task sequence step to request access to a state migration point when capturing state from a computer. You can configure this task sequence step to capture or restore the user state information.
Capture User Files and Settings	Use this task sequence step to use the User State Migration Tool (USMT) to capture user state and settings from the computer that will receive the task sequence associated with this task step. You can use the standard options or configure the options you want to capture.
Release User State Storage	This task sequence step notifies the state migration point that the capture or restore action has been completed.
Install Operating System - **(New Task Sequence Group)**	You can create a task sequence group using the task sequence editor. A task sequence group helps keep similar task sequence steps together for better organization and error control.
	This group contains actions that will run in the Windows PE environment to install and configure the image.
Restart in Windows PE	Use this task sequence step to specify restart options for the target computer that will receive this task sequence. This step will display a message to the user that the computer will be restarted so that the installation can continue.
	This step uses the read-only **_SMSTSInWinPE** task sequence variable. If the associated value equals **false** the task sequence step will continue.
Partition Disk 0	This task sequence step specifies the actions necessary to format the hard drive on the target computer. The default disk number is **0**.
	This step uses the read-only **_SMSTSClientCache** task sequence variable. This step will run if the Configuration Manager 2007 client cache does not exist.
Apply Operating System	Use this task sequence step to install a specified operating system image onto target computer. This step applies all volume images contained in the WIM file to the corresponding sequential disk volume on the target computer after first deleting all files on that volume (with the exception of Configuration Manager 2007-specific control files). You can specify a **sysprep** answer file and also configure which disk partition should be used for the installation.
Apply Windows Settings	Use this task sequence step to configure the Windows settings configuration information for the target computer. The windows settings you can apply are user and organizational information, product or license key information, time zone, and the local

	administrator password.
Apply Network Settings	Use this task sequence step to specify the network or workgroup configuration information for the target computer. You can also specify if the computer should use a DHCP server or you can statically assign the IP address information.
Apply Device Drivers	This task sequence step allows you to match and install drivers as part of an operating system deployment. You can allow Windows Setup to search all existing driver categories by selecting **Consider drivers from all categories** or limit which driver categories Windows Setup should search by selecting **Limit driver matching to only consider drivers in selected categories**. This step uses the read-only **_SMSTSMediaType** task sequence variable. If the associated value does not equal **FullMedia** this task sequence step will run.
Apply Driver Package	The **Apply Driver Package** task sequence step allows you to make all device drivers in a driver package available for use by Windows setup.
Setup Operating System - **(New Task Sequence Group)**	You can create a task sequence group using the task sequence editor. A task sequence group helps keep similar task sequence steps together for better organization and error control. This group of task sequence steps will setup the operating system.
Setup Windows and ConfigMgr	Use this task sequence step to install the Configuration Manager 2007 client software. Configuration Manager 2007 installs and registers the Configuration Manager 2007 client GUID. You can assign the necessary installation parameters in the **Installation properties** window.
Install Updates	Use this task sequence step to specify how software updates should be installed on a target computer. The target computer is not evaluated for applicable software updates until this task sequence step runs. At that point, the target computer is evaluated for software updates as any other Configuration Manager 2007-managed client. This step uses the read-only **_SMSTSMediaType** task sequence variable. If the associated value does not equal **FullMedia** this task sequence step will run.
Restore User Files and Settings - **(New Task Sequence Sub-Group)**	You can create a task sequence group within a task sequence group using the task sequence editor. A task sequence sub-group helps keep similar task sequence steps together for better organization and error control. This group contains the steps necessary to restore the user files and settings.
Request User State	Use this task sequence step to request access to a state migration

Storage	point when restoring the user state to a computer.
Restore User Files and Settings	Use this task sequence step to initiate the User State Migration Tool (USMT) to restore user state and settings to a target computer.
Release User State Storage	This task sequence step notifies the state migration point that the capture or restore action has been completed and disconnects the target computer from the state migration point.

Sample Build and Capture Operating System Image Task Sequence

Use the table as a guide as you create a task sequence to build and capture an operating system image. The table will help you decide the general sequence for your task sequence steps and how to organize and structure those task sequence steps into logical groups.

Important

You should always use the **New Task Sequence** Wizard to create this type of task sequence.

The task sequence you create may vary from this sample and can contain more or less task sequence steps and groups.

10.2.4 Sample build and capture operating system image task sequence

When you use the **New Task Sequence** Wizard to create this new task sequence some of the task sequence step names are different than what they would be if you manually added these task sequence steps to an existing task sequence. The following table displays the naming differences:

New Task Sequence Wizard Task Sequence Step name	Equivalent Task Sequence Editor Step Name
Restart in Windows PE	Reboot to Windows PE or hard disk
Partition Disk 0	Format and Partition Disk
Apply Device Drivers	Auto Apply Drivers
Install Updates	Install Software Updates
Join Workgroup	Join Domain or Workgroup
Prepare ConfigMgr Client	Prepare ConfigMgr Client for Capture
Prepare Operating System	Prepare Windows for Capture
Capture the Reference Machine	Capture Operating System Image

Sample Build and Capture Task sequence:

Task Sequence	Reference

Group/Step	
Build the Reference Computer - **(New Task Sequence Group)**	You can create a task sequence group using the task sequence editor. A task sequence group helps keep similar task sequence steps together for better organization and error control. This group contains the actions necessary to build a reference computer.
Restart in Windows PE	Use this task sequence step to specify restart options for the target computer that will receive this task sequence. This step will display a message to the user that the computer will be restarted so that the installation can continue. This step uses the read-only **_SMSTSInWinPE** task sequence variable. If the associated value equals **false** the task sequence step will continue.
Partition Disk 0	This task sequence step specifies the actions necessary to format the hard drive on the target computer. The default disk number is **0**. This step uses the read-only **_SMSTSClientCache** task sequence variable. This step will run if the Configuration Manager 2007 client cache does not exist.
Apply Operating System	Use this task sequence step to install a specified operating system image on a target computer. This step applies all volume images contained in the WIM file to the corresponding sequential disk volume on the target computer after first deleting all files on that volume (with the exception of Configuration Manager 2007-specific control files).
Apply Windows Settings	Use this task sequence step to configure the Windows settings configuration information for the target computer.
Apply Network Settings	Use this task sequence step to specify the network or workgroup configuration information for the target computer.
Apply Device Drivers	This task sequence step allows you to match and install drivers as part of an operating system deployment. You can allow Windows Setup to search all existing driver categories by selecting **Consider drivers from all categories** or limit which driver categories Windows Setup should search by selecting **Limit driver matching to only consider drivers in selected categories**. This step uses the read-only **_SMSTSMediaType** task sequence variable. If the associated value does not equal **FullMedia** this task sequence step will run.
Setup Windows and ConfigMgr	Use this task sequence step to install the Configuration Manager 2007 client software. Configuration Manager 2007 installs and registers the Configuration Manager 2007 client GUID. You can assign the necessary installation parameters in the **Installation properties** window.

Install Updates	Use this task sequence step to specify how software updates should be installed on a target computer. The target computer is not evaluated for applicable software updates until this task sequence step runs. At that point, the target computer is evaluated for software updates as any other Configuration Manager 2007-managed client. This step uses the read-only **_SMSTSMediaType** task sequence variable. If the associated value does not equal **FullMedia** this task sequence step will run.
Capture the Reference Computer - **(New Task Sequence Group)**	You can create a task sequence group using the task sequence editor. A task sequence group helps keep similar task sequence steps together for better organization and error control. This group contains the necessary steps to prepare and capture a reference computer.
Join Workgroup	Use this task sequence step to specify information needed to have the target computer join a workgroup.
Prepare ConfigMgr Client for Capture	This task sequence step takes the Configuration Manager 2007 client on the reference computer and prepares it for capture as part of the imaging process
Prepare Operating System	Use this task sequence step to specify the Sysprep options to use when capturing Windows settings from the reference computer. This task sequence step runs Sysprep and then reboots the computer into the Windows PE boot image specified for the task sequence.
Capture Operating System Image	Use this task sequence step to enter a specific existing network share and .WIM file to use when saving the image. This location is used as the package source location when adding an operating system image package using the **Add Operating System Image Package Wizard**. It is also referenced on the **Operating System Images - Data Source Tab** of the properties of the Operating System Package you add.

10.3 Operating System Media Pre-Execution Hook

The following section describes how to configure boot media, stand-alone media, and PXE to run a script or executable that can interact with the user in Windows PE before the task sequence is selected. This can be used to prompt for information and save it in the task sequence environment before the task sequence is started. For example, you can use this to prompt for user credentials to join the domain.

When the target computer boots, the command-line will be run before policy is downloaded.

10.3.1 To configure media to run a script or program that can interact with the user

1. Create a TSConfig.INI file that contains the command-line to run. For example:
2.
```
[CustomHook]
CommandLine=”WScript.exe X:\MyScript.vbs”
```

3. Create a Windows PE image that contains the **TSConfig.ini** and any files required in the root folder.
4. Use the procedure How to Add a Boot Image to Configuration Manager to import the boot image into the Configuration Manager 2007 site.
5. Create boot media or stand-alone media using the boot image you imported in step 3.

Source: Microsoft.com