



Lenovo Deployment Pack for Microsoft System Center Configuration Manager Installation and User's Guide



Version 6.3

Note

Before using this information and the product it supports, read the information in Appendix G “Notices” on page 141.

Third Edition (September 2016)

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About this publication

This book provides instructions for installing the Lenovo Deployment Pack for Microsoft System Center Configuration Manager 2007 and using the integrated features to deploy operating systems to Lenovo servers in your environment.

Conventions and terminology

Paragraphs that start with a bold **Note**, **Important**, or **Attention** are notices with specific meanings that highlight key information.

Note: These notices provide important tips, guidance, or advice.

Important: These notices provide information or advice that might help you avoid inconvenient or difficult situations.

Attention: These notices indicate possible damage to programs, devices, or data. An attention notice appears before the instruction or situation in which damage can occur.

Table 1. Terms, acronyms and abbreviations

| Term, acronym, or abbreviation | Definition |
|--------------------------------|--|
| RAID | Redundant Array of Independent Disks |
| RSA | Remote Supervisory Adapter |
| OSD | Operating System Deployment |
| SCCM | Microsoft System Center Configuration Manager 2007 |
| LenovoSEP | Lenovo System Enablement Pack |

World Wide Web resources

The following web pages provide resources for understanding, using, and troubleshooting Lenovo System x, BladeCenter servers, and systems management tools.

Lenovo XClarity Integrator

Learn more about how Lenovo System x Lenovo XClarity Integrator for Microsoft System Center provides IT administrators with the ability to integrate the management features of the System x and BladeCenter Servers with Microsoft System Center.

Lenovo website for Microsoft Systems Management Solutions for Lenovo servers

Locate the latest downloads for the Lenovo XClarity Integrator Add-in for Microsoft System Center Virtual Machine Manager:

- [Lenovo XClarity Integrator for Microsoft System Center website](#)

System Management with Lenovo XClarity Solutions

This website provides an overview of the Lenovo XClarity solutions that integrate System x and Flex System hardware to provide system management capability:

- [System Management with Lenovo XClarity Solution website](#)

Lenovo technical support portal

This website can assist you in locating support for hardware and software:

- [Lenovo Support Portal website](#)

Lenovo ServerProven pages

Obtain information about hardware compatibility with Lenovo System x, BladeCenter, and IBM IntelliStation hardware.

- [Lenovo ServerProven: Compatibility for BladeCenter products](#)
- [Lenovo ServerProven: Compatibility for Flex System Chassis](#)
- [Lenovo ServerProven: Compatibility for System x hardware, applications, and middleware](#)

Microsoft System Center Configuration Manager

Refer to the following Microsoft sites for information about System Center Configuration Manager and related documentation.

- [Microsoft System Center Technical Documentation Library website](#)
- [Microsoft System Center Configuration Manager 2007 website](#)
- [Microsoft System Center Configuration Manager 2007 SP1 Update webpage](#)
- [Microsoft System Center Configuration Manager 2007 Documentation Library webpage](#)
- [Microsoft System Center Configuration Manager 2012 website](#)

Chapter 1. Product introduction

The Lenovo Deployment Pack for Microsoft Configuration Manager enables you to tailor and build custom hardware deployment solutions for installing the Windows operating system on the following hardware: LenovoSystem x, BladeCenter, and Blade Servers hardware.

When integrated with the Microsoft System Center Configuration Manager 2007 (SCCM) Operating System Deployment component (including SCCM 2007 and SCCM 2012), the Lenovo Deployment Pack simplifies the steps for creating and customizing jobs to deploy hardware configurations and operating systems.

The Lenovo Deployment Pack, v6.3 supports the following types of deployment:

- Policy-based Redundant Array of Independent Disks (RAID) configuration using PRAID, a built-in tool used to configure RAID
- Configuration of the following system settings by using the ASU
 - BIOS/uEFI
 - BMC/IMM (including multiple nodes)
 - RSA
- Automated deployment of the following operating systems:
 - Windows 2003 32bit/X64
 - Windows 2003 R2 32bit/X64
 - Windows 2008 32bit/X64
 - Windows 2008 R2 SP1 (X64)
 - Windows 2012 (X64) - SCCM 2012 SP1 or above required

Note: If the version of SCCM is earlier than 2012 SP1, Lenovo Deployment Pack will not import the Windows 2012 drivers and packages into SCCM.

 - Windows 2012 R2

The Lenovo Deployment Pack, v6.3 also provides the following components and functionality:

- Custom WinPE boot image with all required drivers, including WinPE x86 boot image and WinPE x64 boot image
- Sample configuration files and scripts for Windows 2003, Windows 2008, and Windows 2012
- A command-line tool to import the Lenovo System Enablement PackSEP into the SCCM server
- Transparent upgrade from Lenovo Deployment Pack v1.3
- Support for license controller
- Support for automatically importing the Lenovo System Enablement Pack into the SCCM server

License support

If no product license is activated when this product is installed, the trial license is automatically activated.

Lenovo Deployment Pack for Microsoft System Center Configuration Manager is a fee-based release that includes a trial version. Lenovo Deployment Pack has one premium feature: the ability to automatically import the Lenovo System Enablement Pack (SEP) into the SCCM server. If no product license is activated when this product is installed for the first time, the trial license is automatically activated. Ensure that your system time is correct, to take advantage of the full trial period.

After the trial license is activated, it is valid for 90 days. During the trial period, the premium features are available. In the last 5 days of the trial period, you will receive a notification about the trial license expiration, which will display every 24 hours. After the trial license expires, the product license should be activated or the premium features will be disabled.

Information about the product license is located on the Passport Advantage and Passport Advantage Express website.

Chapter 2. Installing and importing the Lenovo Deployment Pack

This section describes the steps to install and import the Lenovo Deployment Pack. It includes information about prerequisites, as well as instructions for installing, upgrading, removing, reinstalling, and importing the Lenovo Deployment Pack into SCCM.

System enablement packs (SEPs) add support for hardware released after the current release of the Lenovo Deployment Pack. This chapter includes information about importing and configuring SEPs.

Prerequisites

Before installing the Lenovo Deployment Pack, make sure that your system meets these prerequisites.

- The SCCM site server or administrative console is in a normal status

Note: Before installing the Lenovo Deployment Pack, be sure that all SCCM components are up and running correctly on the SCCM server. If there are errors listed in the SCCM status, resolve those errors first. For more information about how to check SCCM status and resolve errors, see the Microsoft System Center Technical Documentation Library website.

- An installation account with the corresponding administrative authority, such as system administrator and SCCM administrator authority
- For SCCM 2012 SP1 or later, Windows Assessment and Deployment Kit (Windows ADK) must already be installed. For SCCM 2012 and SCCM 2007, Windows Automated Installation Kit (WAIK) must be installed. If Windows ADK and WAIK coexist, Lenovo Deployment Pack selects Windows ADK when creating the boot image.
- If the SCCM server is running on Windows 2008, ensure that hotfix 979492 is installed on the SCCM server. For more information, see the Microsoft support – An .inf file cannot be validated when an application uses the "SetupVerifyInfFile" function in Windows Vista and in Windows Server 2008 webpage.

The Lenovo Deployment Pack can be installed on the SCCM site server or on the SCCM administrative console. Installation on the administrative console only adds Lenovo custom interface related components to the console, rather than adding other components into the SCCM site infrastructure. If you only install Lenovo Deployment Pack on the administrative console, the Lenovo Deployment Pack functionality cannot be used, although Lenovo-related task sequences are shown on the administrative console.

Note: To use the Lenovo Deployment Pack through the administrative console, the same version of the Lenovo Deployment Pack has to be installed on both the corresponding SCCM site server and the SCCM administrative console.

Installing the Lenovo Deployment Pack into SCCM

This topic describes how to install the Lenovo Deployment Pack.

Before you begin

Download the Lenovo Deployment Pack from the Lenovo XClarity Integrator for Microsoft System Center website

About this task

Lenovo Deployment Pack can be installed from either the Lenovo Deployment Pack installation file or the Lenovo XClarity Integrator for Microsoft System Center bundle installation file.

Procedure

- Step 1. Double-click the setup executable file (.exe) to start the installation wizard.
- Step 2. Follow the installation wizard instructions until the Finish page is displayed.

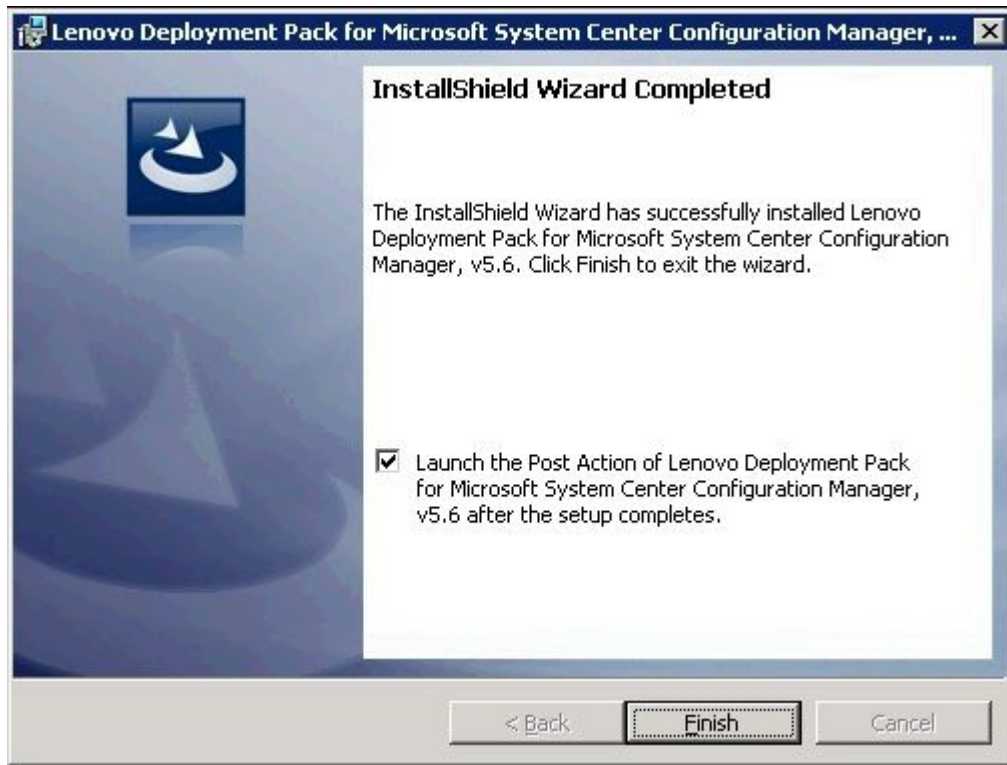


Figure 1. InstallShield Wizard Completed

- Step 3. From the InstallShield Wizard Completed page, make sure the **Launch the Post Action of Lenovo Deployment Pack** check box is selected, and click **Finish** to start the post-installation wizard. The post-installation wizard imports the Lenovo Deployment Pack onto the SCCM server. For more information, see "Importing the Lenovo Deployment Pack into SCCM" on page 4.

Importing the Lenovo Deployment Pack into SCCM

After running the installation wizard, you must import the Lenovo Deployment Pack into SCCM. This task is considered a post-installation procedure.

Before you begin

Close the SCCM administrative console before running the import wizard.

Procedure

- Step 1. Start the wizard by clicking **Start → All Programs → Lenovo Upward Integration → Lenovo Deployment Pack → Lenovo Deployment Pack - Import Wizard**.

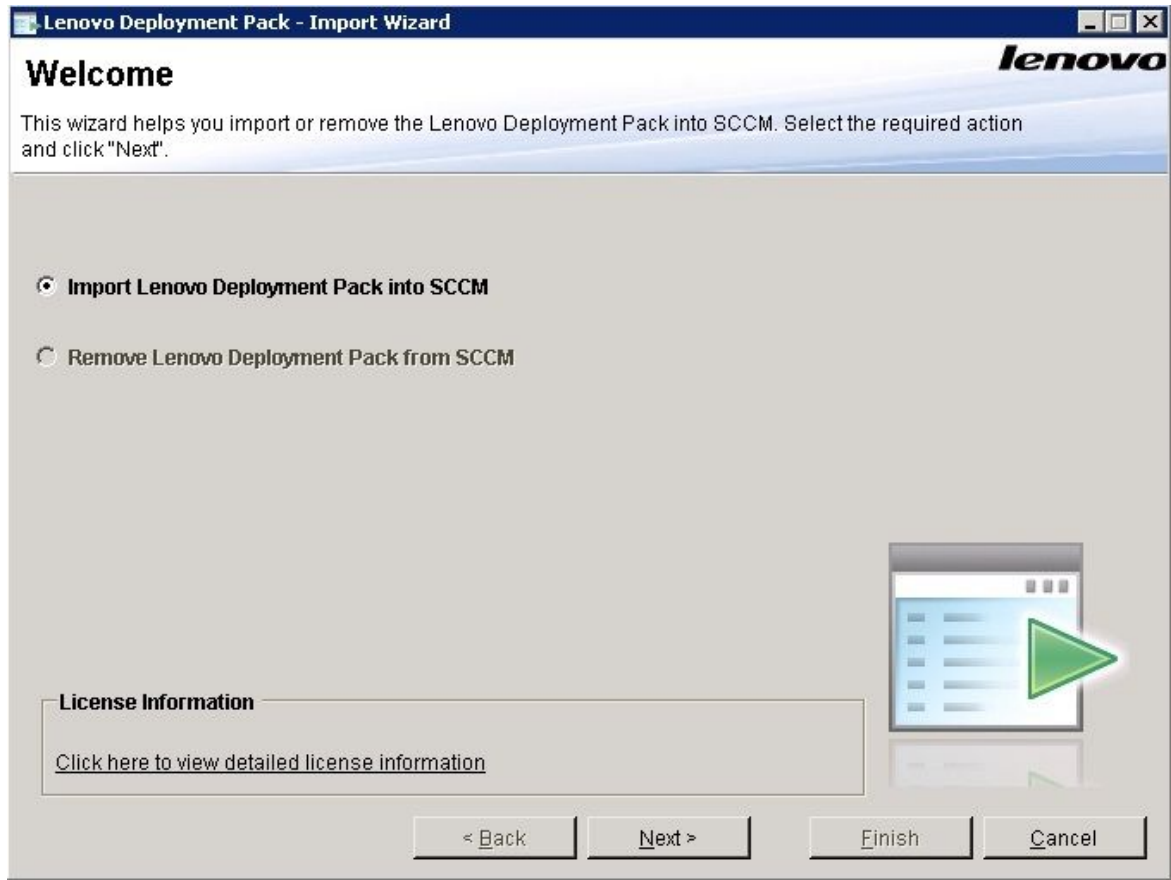


Figure 2. Lenovo Deployment Pack *Import Wizard* Welcome page

- Step 2. On the Welcome page, select **Import Lenovo Deployment Pack to SCCM**, and click **Next**. The Target Systems page opens.

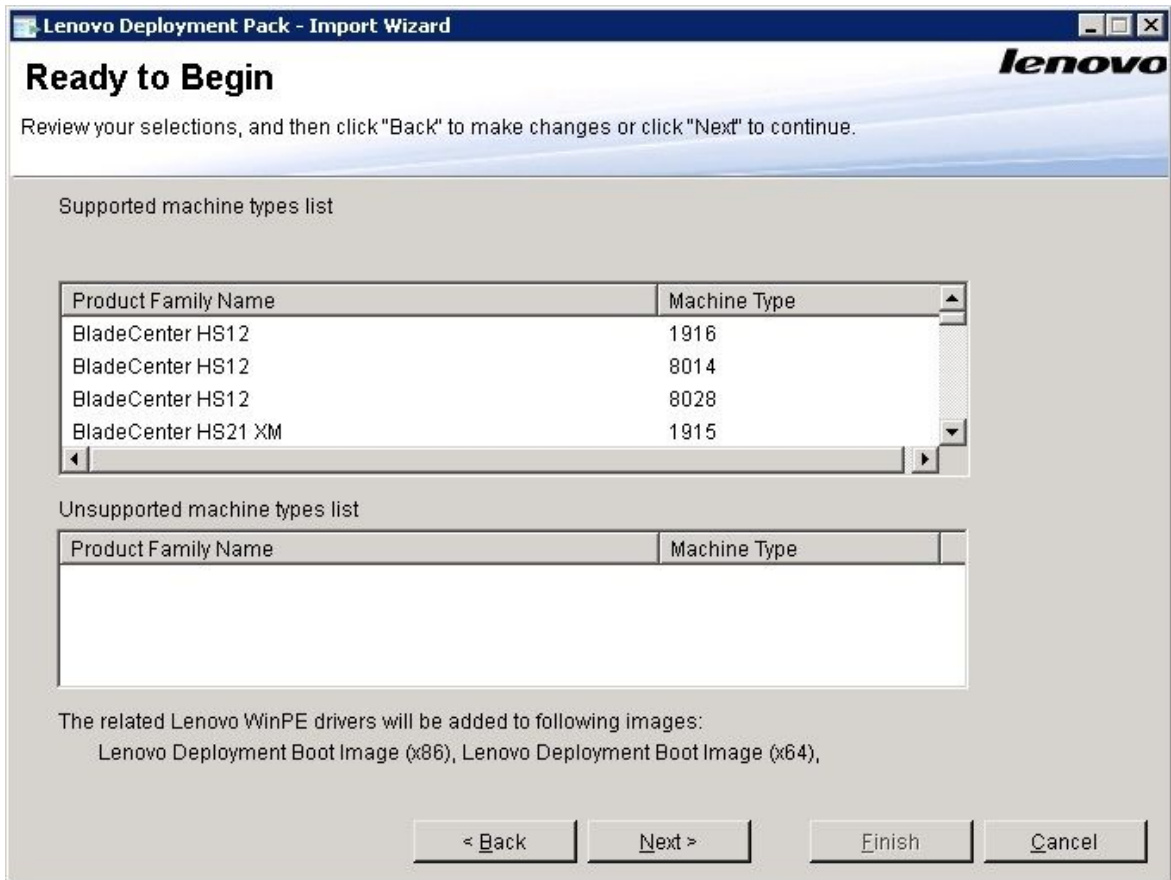


Figure 3. Target Systems page

- Step 3. Either select the supported machine types or add new machine types:
- On the Target Systems page, click **Next**. The Boot Image page opens.

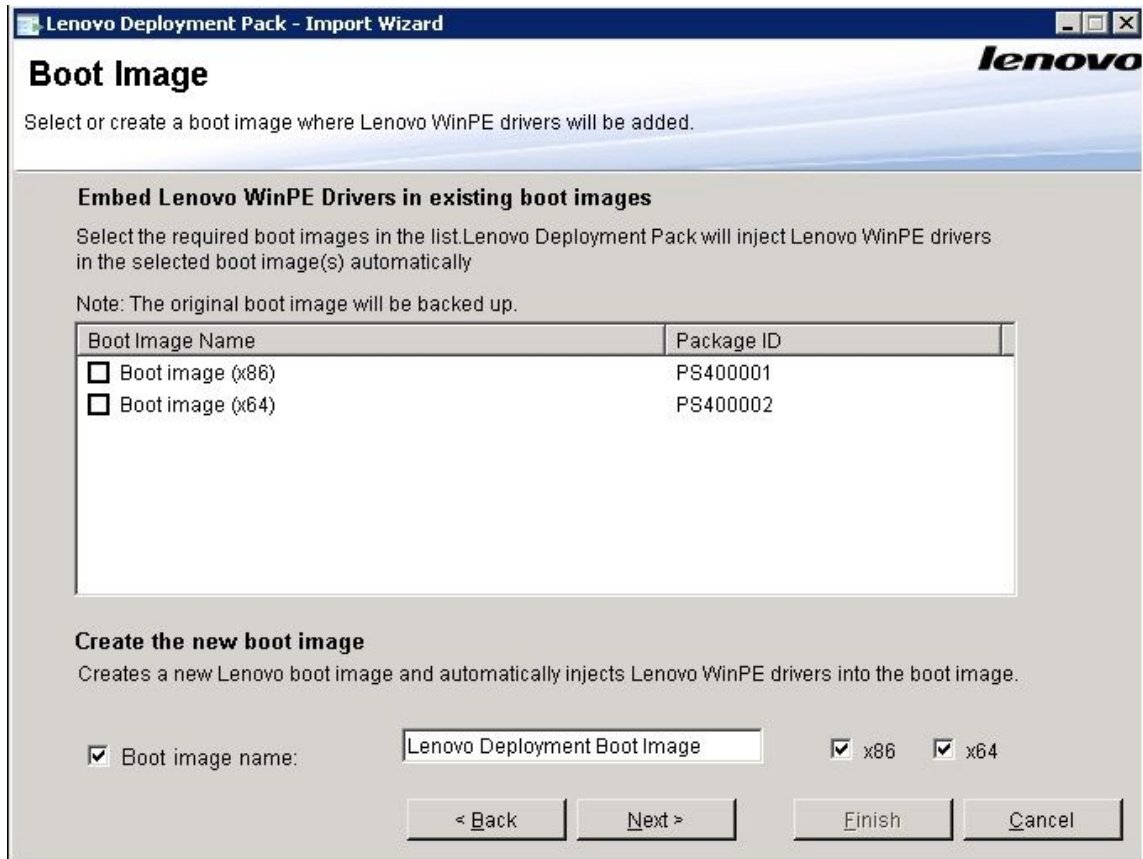


Figure 4. Boot Image page

- If the product license is purchased and installed, or the product is in a trial stage, you can add new machine types by selecting **Add new machines** on the Target System page, as shown in Figure 2. Click **Next**. The Additional SEP Packages page is displayed.

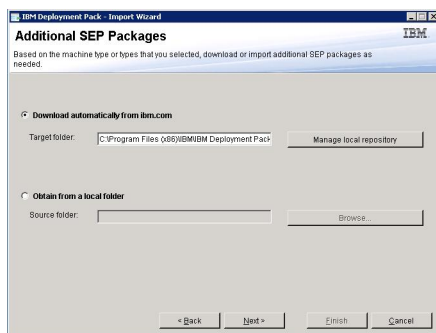


Figure 5. Additional SEP Packages page

- On the Additional SEP Packages page, select one of these two options:
 - To download the SEP from the Lenovo website, select **Download automatically from ibm.com**, navigate to the target folder, and click **Next**.

- To import the SEP from a local disk, select **Obtain from a local folder**, browse to the source folder to select the package, and click **Next**

The Boot Image page opens.

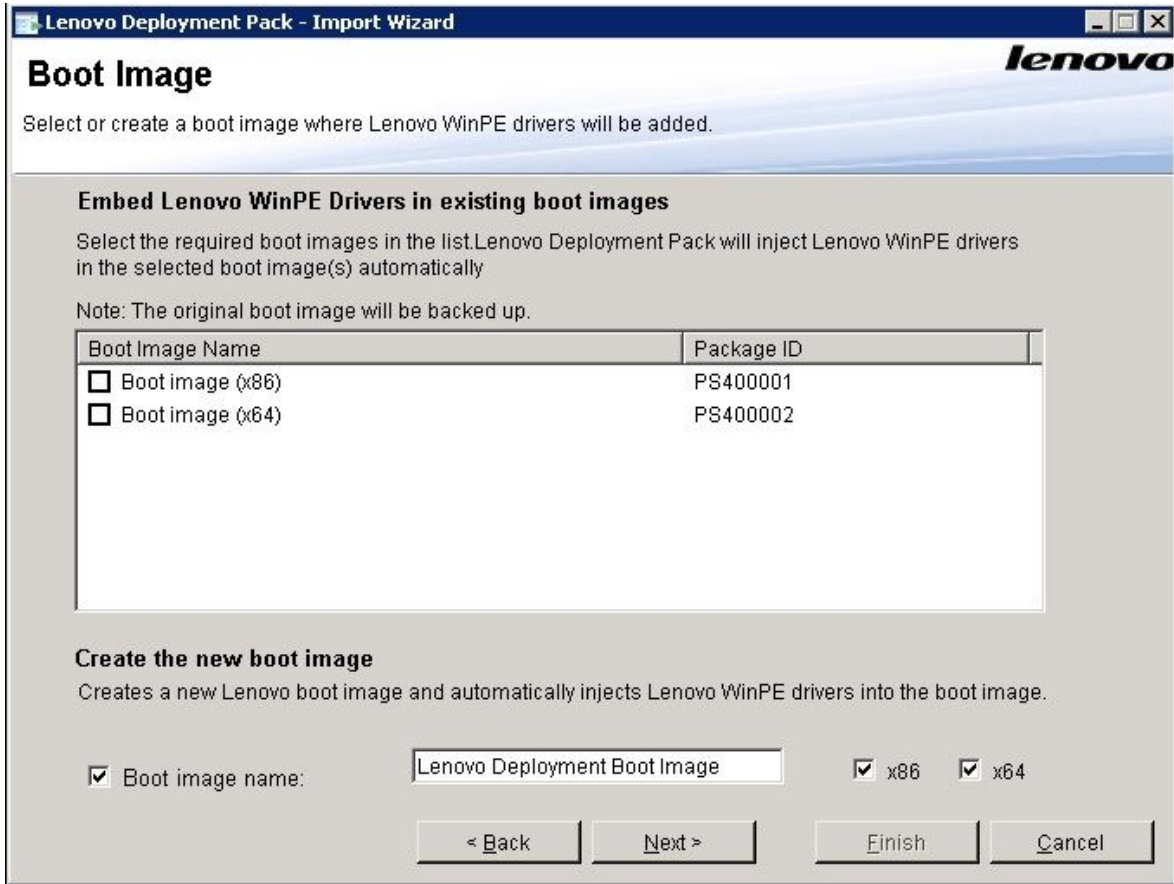


Figure 6. Boot Image page

- Step 4. Either select an existing boot image or create a new Lenovo boot image and inject Lenovo WinPE drivers into the Lenovo boot image automatically, and then click **Next**. The Ready to Begin page is displayed.

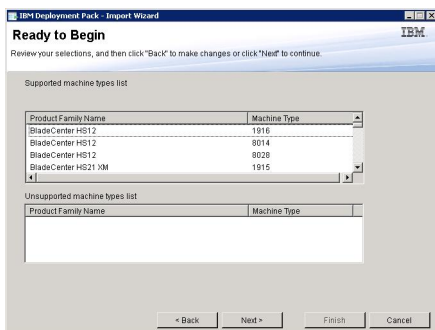


Figure 7. Ready to Begin page

Step 5. On the Ready to Begin page, confirm your selections, and click **Next** to proceed with the import, or click **Back** to make corrections if needed. The Progress page is displayed with the status of the selected items.

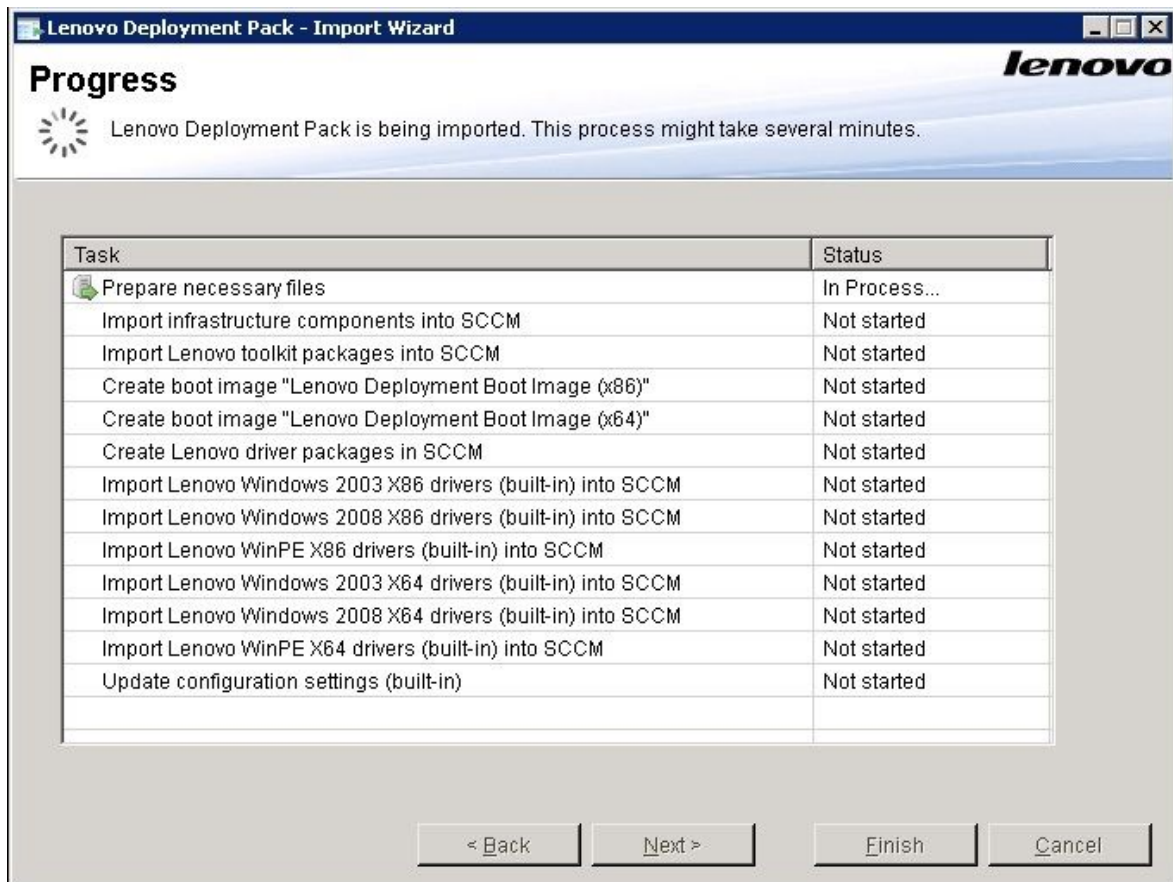


Figure 8. Progress page

Note: The tasks take a few minutes. Do not interrupt the import process.

After all tasks have been performed, the Completed page is displayed.

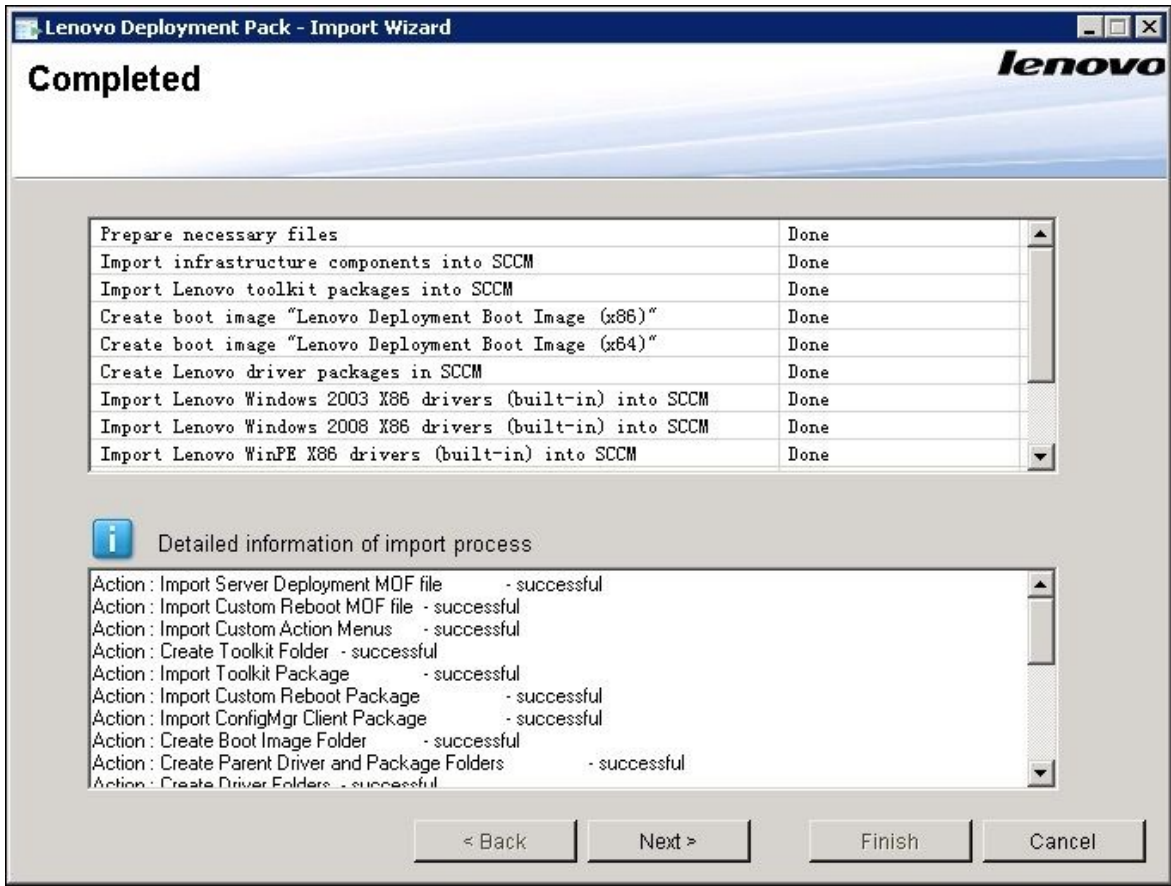


Figure 9. Completed page

Note: You also can use this wizard to remove the built-in and SEP packages from the SCCM server. For the SEP package, Lenovo Deployment Pack can process it automatically if the license is activated on this server. If the license is not activated, Lenovo Deployment Pack provides a tool named IBMOSDTool that you can use.

Note: Lenovo Deployment Pack will import drivers for Windows 2012 and WinPE 4.0 only if the version of the SCCM server is 2012 SP1 or later.

Before using the wizard, ensure that the SCCM administrative console is closed.

Step 6. Click **Next**. The Post Import Instruction page is displayed.

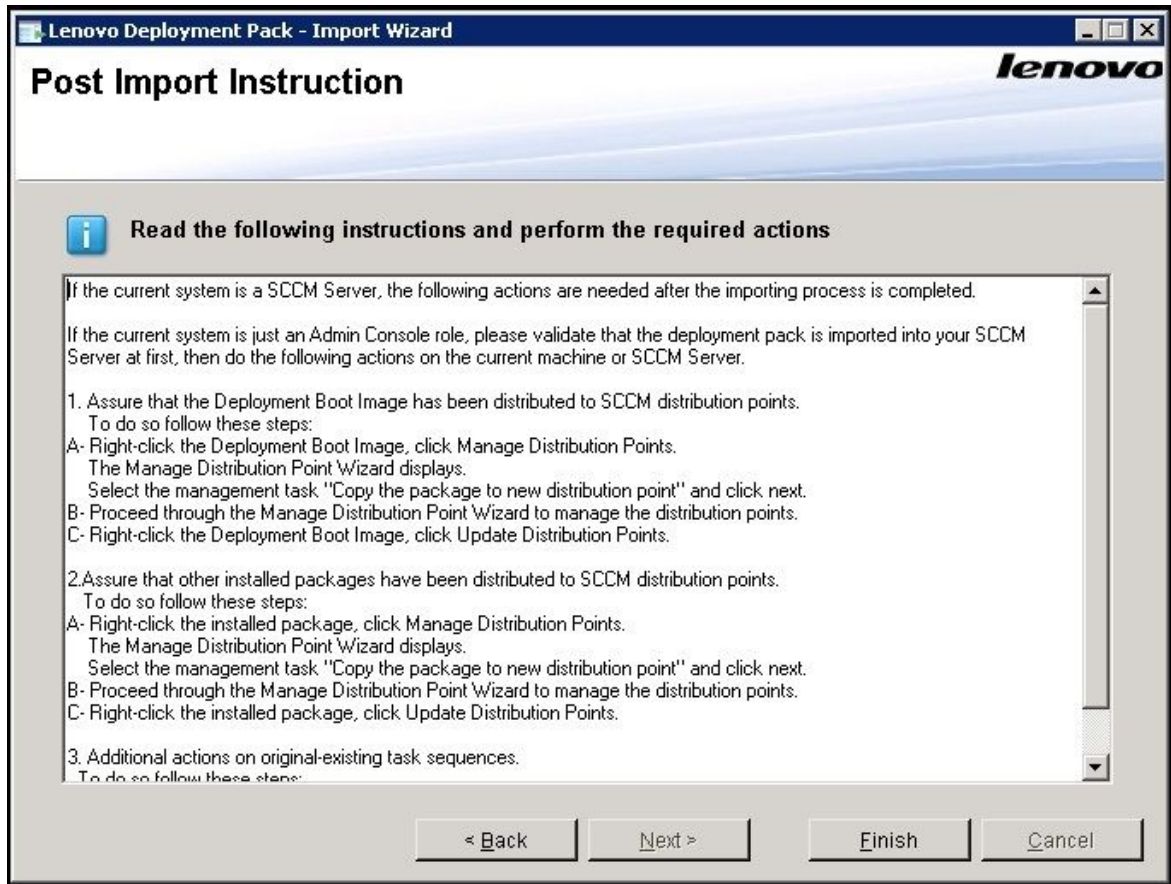


Figure 10. Post Import Instruction page

Step 7. After the import procedure is finished, ensure that all components are installed on the SCCM server. The image below shows components that were added to the SCCM site server after importing.

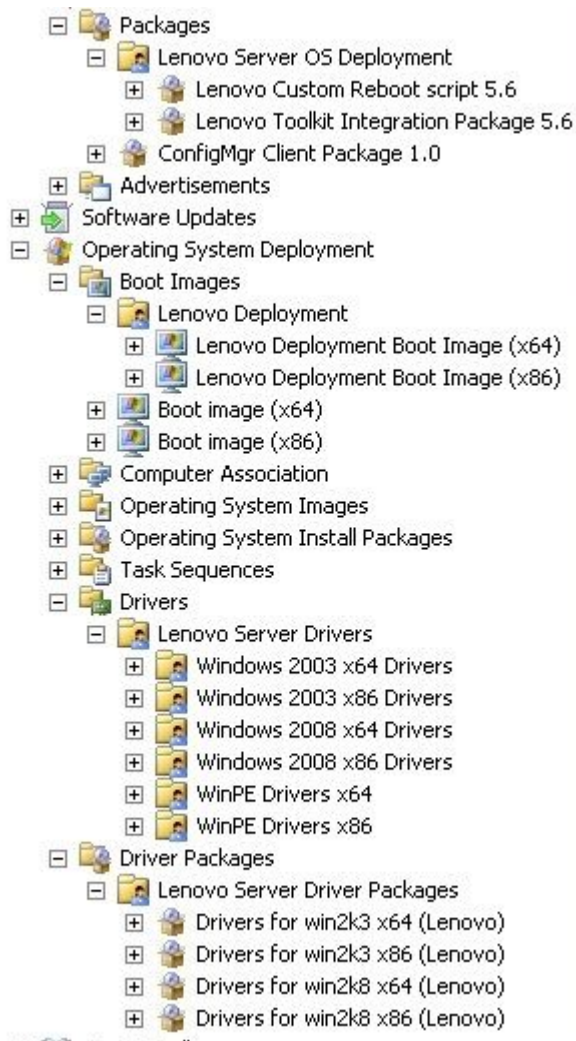


Figure 11. Items added to the SCCM 2007 console after installing the Lenovo Deployment Pack

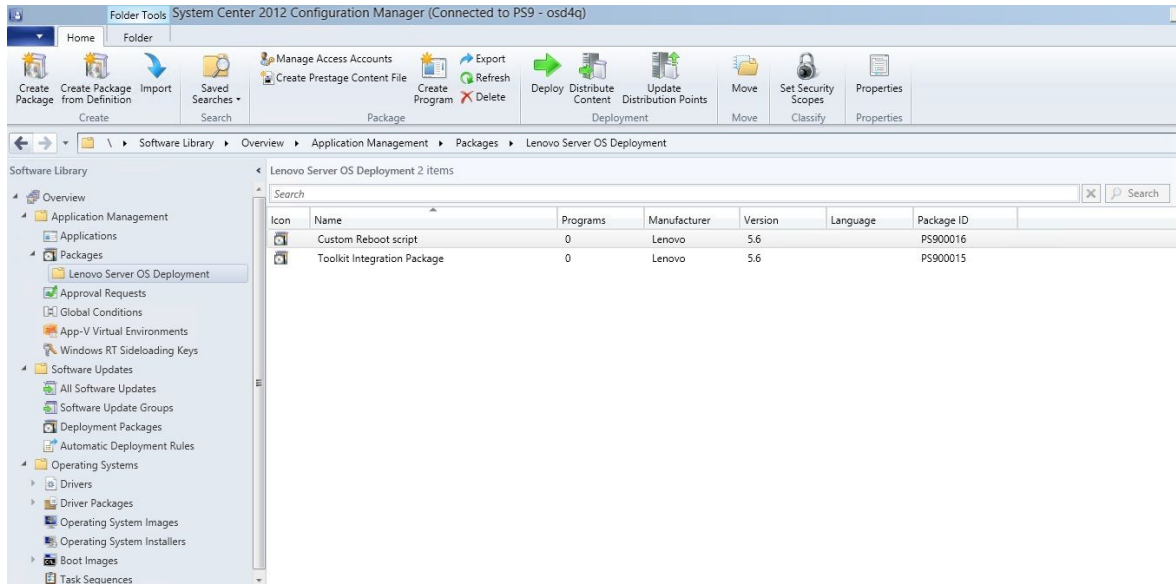


Figure 12. Items added to the SCCM 2012 console after installing the Lenovo Deployment Pack

Step 8. Ensure that a Lenovo Deployment Pack task sequence has been added to the task sequence **Bare Metal Server Deployment** menu. The image below shows the new options.

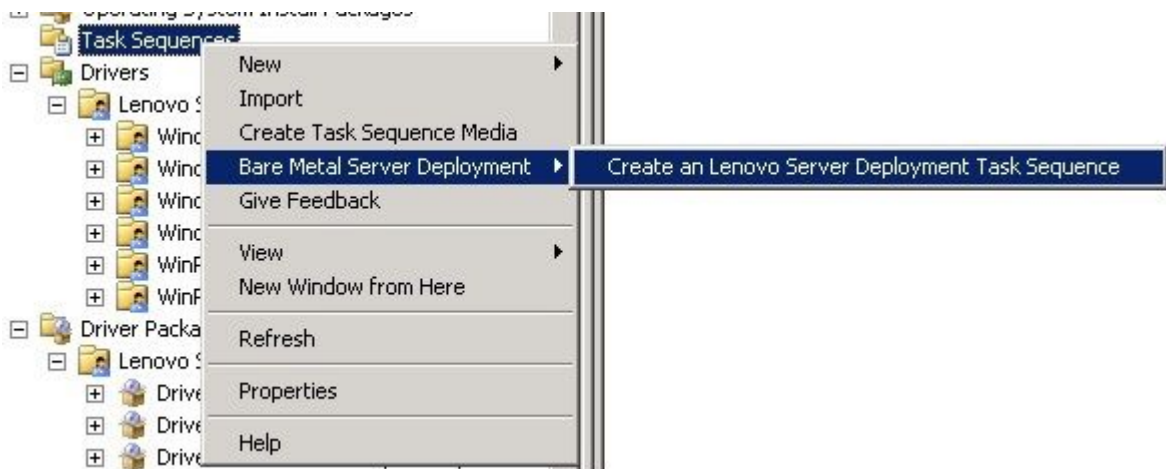


Figure 13. New Bare Metal Deployment option added in SCCM 2007

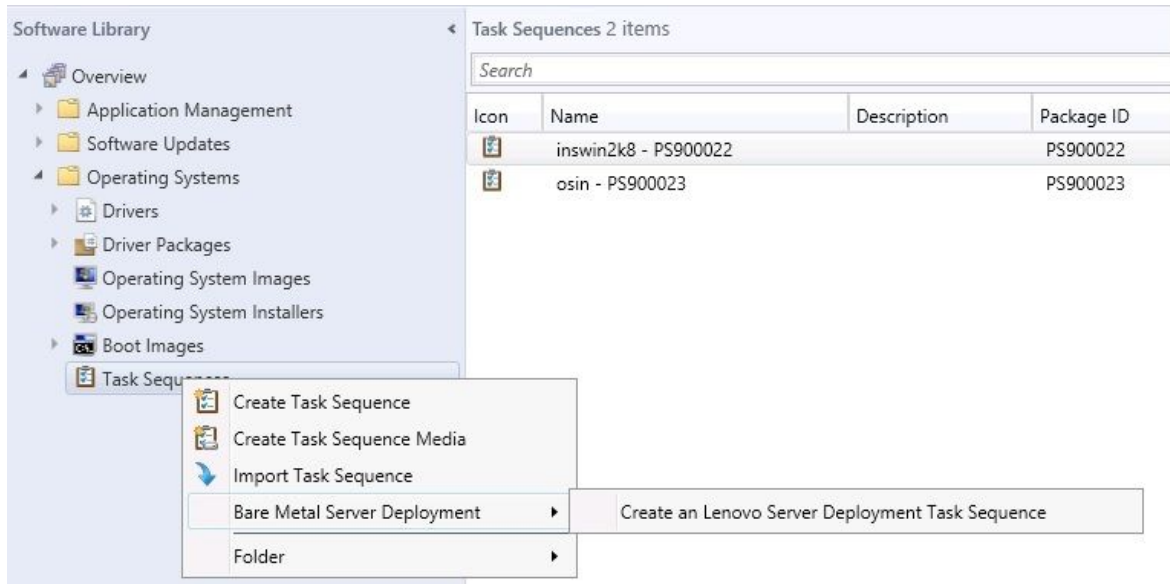


Figure 14. New Bare Metal Deployment option added in SCCM 2012

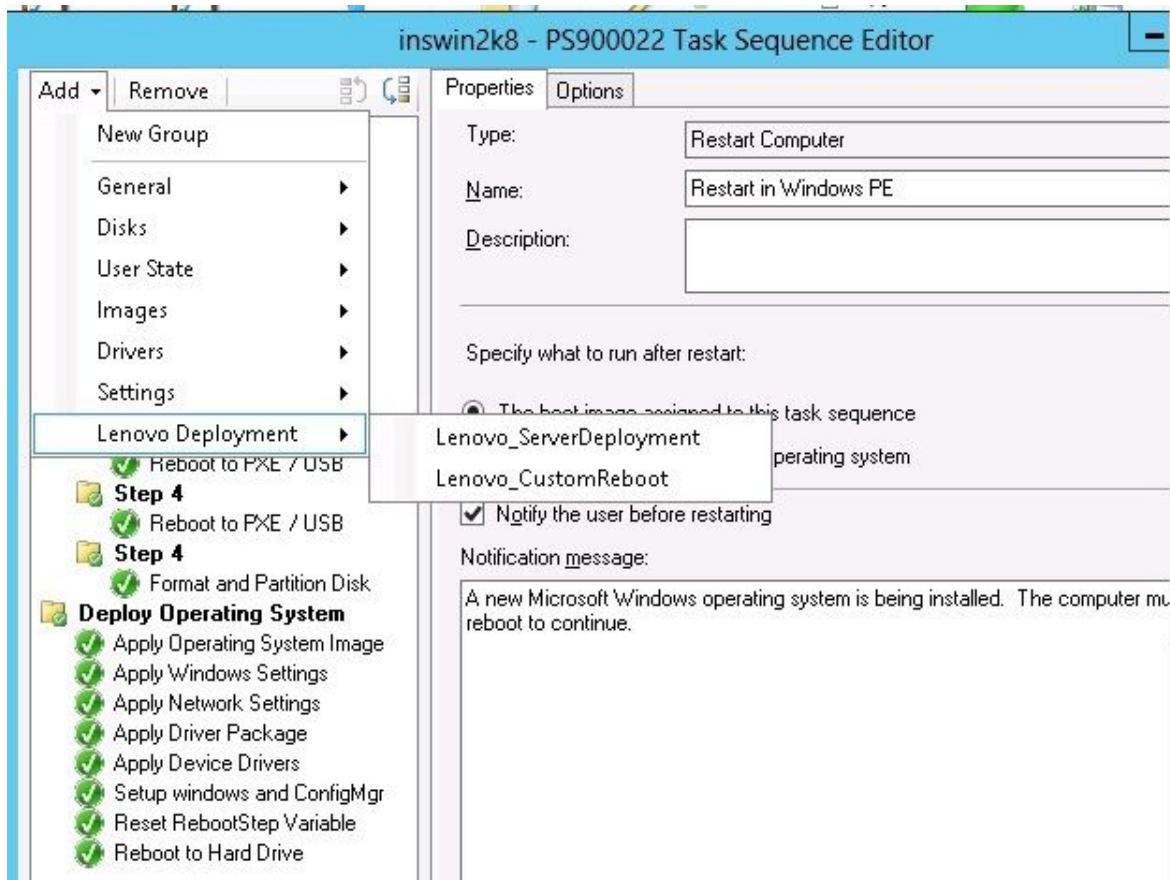


Figure 15. New action in Task Sequence Editor

Note: To import the Lenovo Deployment Pack into SCCM on a console-only server, choose **Import Lenovo Deployment Pack into SCCM** and accept the default configuration on the import wizard to complete the process.

What to do next

To remove the Lenovo Deployment Pack from SCCM, select **Remove Lenovo Deployment Pack from SCCM** on the welcome page. Follow the prompts in the wizard to completely remove the files.

Upgrading the IBM Deployment Pack from version 1.4, 3.0, 3.1, 3.2, 4.0, 4.5, 5.0, or 5.5 to Lenovo Deployment Pack v6.3

If you are currently running version 1.4, 3.0, 3.1, 3.2, 4.0, 4.5, 5.0, or 5.5 and want to upgrade to version v6.3 of the Lenovo Deployment Pack, follow the instructions in this section.

Before you begin

Download the Lenovo Deployment Pack from the Lenovo XClarity Integrator for Microsoft System Center website.

- Step 1. Double-click the setup executable file (.exe) to start the installation wizard. The Previous version detected window opens.

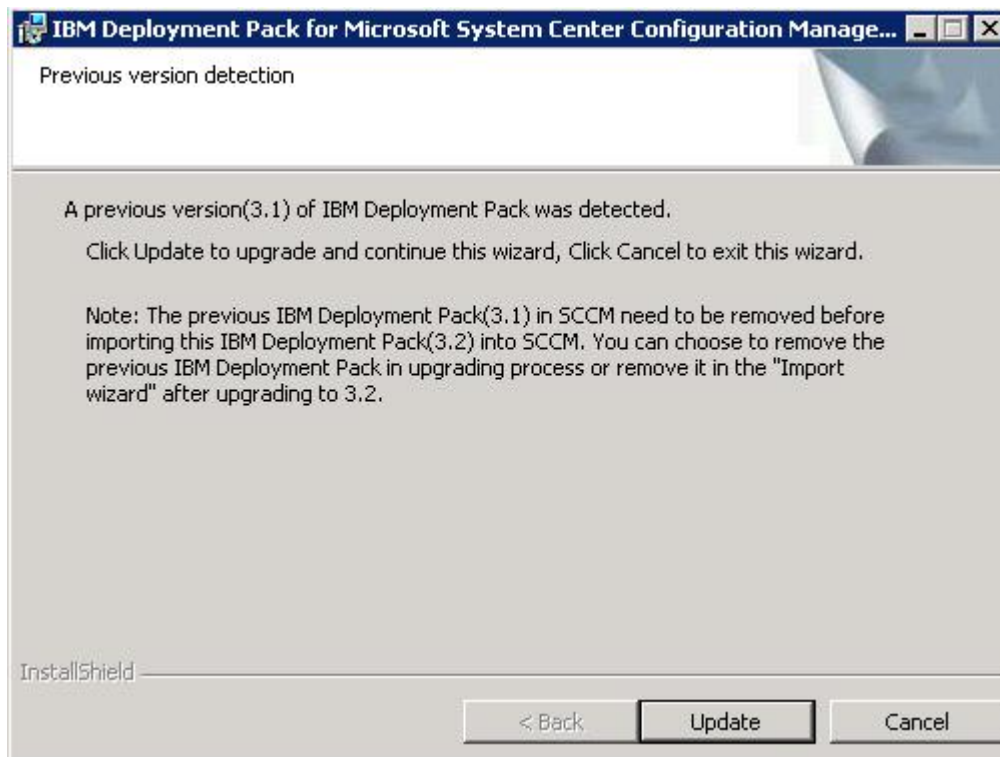


Figure 16. Previous version detection

Note: Because only one version of the Lenovo Deployment Pack can exist on the SCCM server, the earlier version must be removed before the upgrade continues.

- Step 2. At the prompt to remove the previous version, click **Update**.

IBM Deployment Pack version 1.4, 3.0, 3.1, 3.2, 4.0 or 5.0 is uninstalled and Lenovo Deployment Pack is installed on the SCCM server.

- Step 3. On the Finish page, start the post-installation wizard. Using the post-installation wizard, you can import the Lenovo Deployment Pack built-in packages onto the SCCM server. For more information, see “Installing the Lenovo Deployment Pack into SCCM” on page 3.

Uninstalling the Lenovo Deployment Pack

This topic describes how to uninstall the Lenovo Deployment Pack.

About this task

The Lenovo Deployment Pack can be uninstalled by clicking **Start → All Programs → Lenovo Upward Integration → Lenovo Deployment Pack → Uninstall**

Note: You can also uninstall the Lenovo Deployment Pack by either clicking **Control Panel → Add or Remove Programs** or by running the `setup.exe` file

Procedure

Step 1. After clicking the uninstallation shortcut in the system **Start** menu, a confirmation window opens. Click **YES** to continue.

Step 2. Indicate if you want to remove or keep the settings from the previous version.

- If you want to keep the settings from the previous version, select **Keep previous settings in SCCM**. The settings remain without any modification.
- If you want to remove the settings from the previous version, select **Remove previous settings from SCCM**. All imported SEP packages and built-in packages are uninstalled at the same time; however, the Lenovo-specific boot image (x86 and x64) is retained.

Note: By design, the uninstallation procedure does not remove the Lenovo-specific boot images that were created during installation that are tied to task sequence packages. Removing the boot image might invalidate some workable task sequences that you are using.

Reusing the task sequence after reinstalling the Lenovo Deployment Pack

After uninstalling the Lenovo Deployment Pack, you can reinstall it, but you must perform a few extra steps to reuse your existing task sequence.

About this task

Because of how the operating system deployment feature works with Configuration Manager, task sequences require some manual steps after you reinstall the deployment pack.

Procedure

Step 1. Right-click the task sequence that you want to reuse, and click **Edit**.

Step 2. Identify the source package for the **Diskpart clean** custom action.

If the task sequence used the **Diskpart clean** custom action, the Missing Objects window opens.

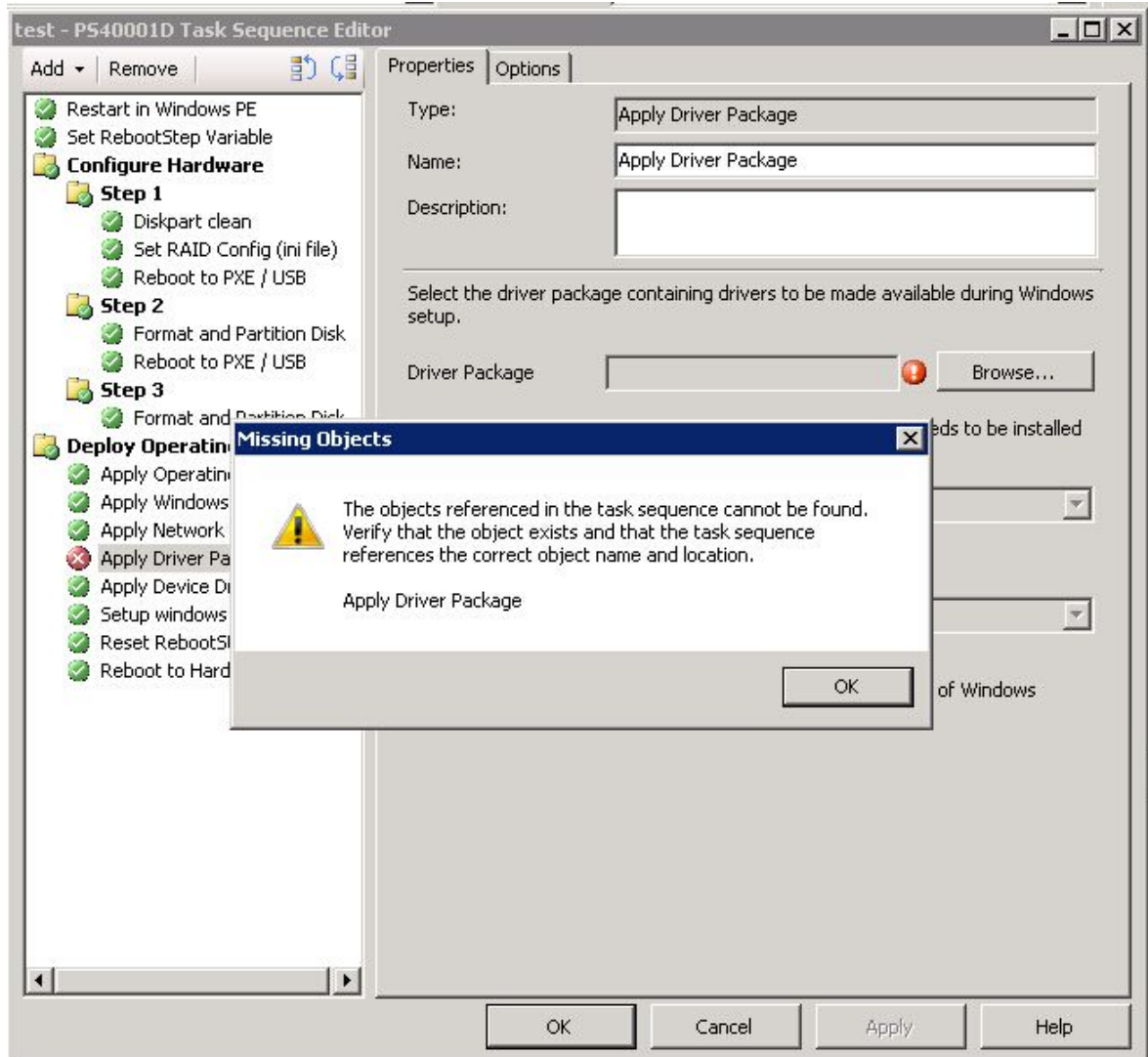


Figure 17. Missing Objects window

Note in the preceding image that the **Diskpart clean** item is flagged with a red X, which indicates that it needs attention.

- Step 3. Click **OK** to dismiss the Missing Objects warning.
- Step 4. Click **Diskpart clean** to edit the item.
- Step 5. Click **Browse (for Package)**, and select the **Lenovo Custom Reboot script 5.6** package.

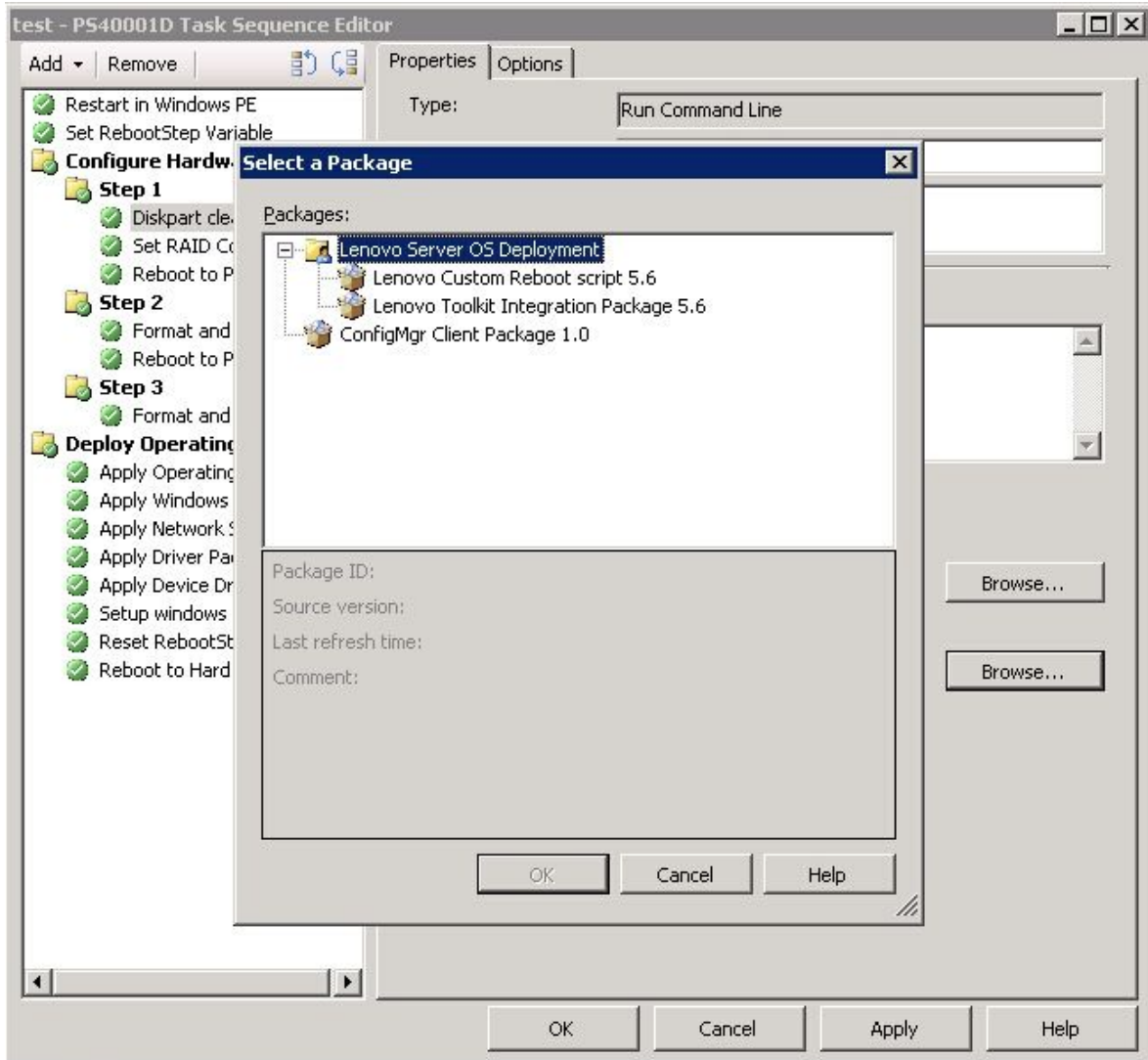


Figure 18. Selecting the Lenovo Custom Reboot script 5.6 package

After you identify the source package for the **Diskpart clean** custom action, the **Diskpart clean** custom action is flagged with a green checkmark.

Step 6. Import the custom drivers that the task sequences might use.

Note: An uninstallation removes any drivers that were imported during the previous installation of the Lenovo Deployment Pack. Because the drivers are removed from the driver repository, they are no longer shown in any existing driver packages.

- a. Re-import the custom drivers into the driver repository.
- b. In the task sequence, check the **Add Driver Package** step to ensure that the correct driver is still selected.

Note: Unlike the **diskpart clean** step, the **Apply Driver Package** step might not be flagged with a red X, but it fails at run time.

- c. Because you uninstalled and are reinstalling the Lenovo Deployment Pack, check the **Apply Driver Package** step for any task sequence that uses the Lenovo Deployment Pack.

- d. Update the distribution points with the updated driver packages.

Integrating the Lenovo System Enablement Pack

The topics in this section explain how a Lenovo System Enablement Pack is integrated into Configuration Manager.

Lenovo Deployment Pack

The Lenovo Deployment Pack uses Lenovo ToolsCenter tools to provide specific functionality, such as configuring the System BootOrder and RAID.

ToolsCenter tools are changing the means of delivery code. Because Lenovo System Enablement Pack uses system-specific codes that are separate from tools, new hardware is supported without requiring a new version of the tools.

How SEP works in Configuration Manager

To use SEP in Configuration Manager, you must install Lenovo Deployment Pack first. To use SEP in Configuration Manager, you must install Lenovo Deployment Pack first. The following figure illustrates the workflow for importing an SEP.

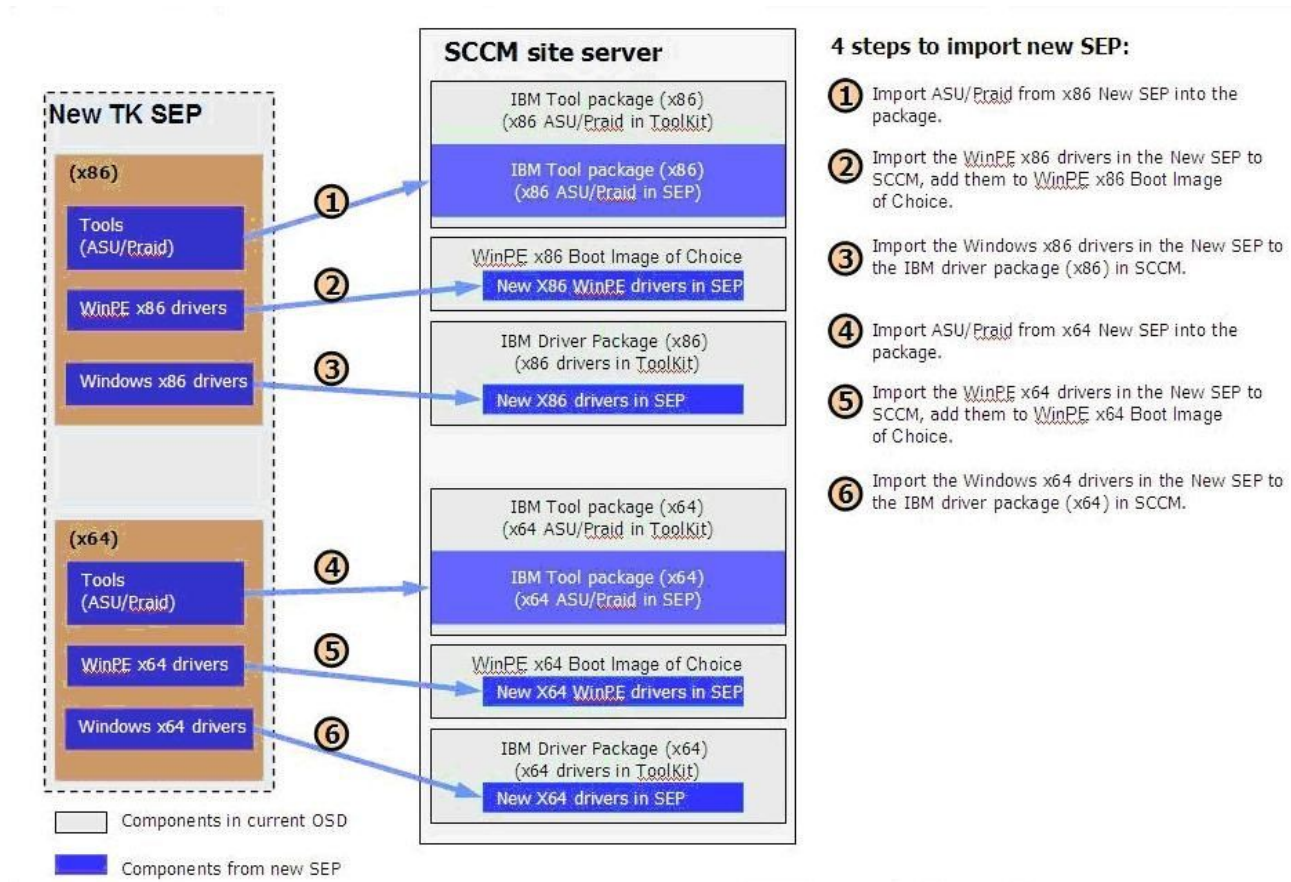


Figure 19. SEP workflow

Chapter 3. Preparing for deployment

Now that the Lenovo Deployment Pack is installed, you can perform the configuration steps required to prepare for a full deployment, including those for SCCM OSD initial configuration, post-installation configuration and updating distribution points.

Preparing for deployment in SCCM 2007

Before deploying SCCM 2007, you must perform some procedures as a prerequisite, which include configuring OSD, updating distribution points, and selecting the boot image.

The following sections guide you through the process step by step.

SCCM OSD initial configuration

This topic refers you to detailed information about how to configure your operating system deployment (OSD) environment by describing the actions you should take in SCCM.

The following information about configuring OSD is provided as a general reference. For more detailed information about setting up OSD in SCCM, see the Microsoft System Center Configuration Manager 2007 Documentation Library webpage.

Setting the network access account

To set the network access account, use the Configuration Manager console. The network access account should be set up for use during operating system deployment.

Procedure

- Step 1. Start Microsoft System Center Configuration Manager 2007.
- Step 2. From the Configuration Manager console, select **Site Database** → **Site Management** → [*Site Server Name*] → **Client Agents**.

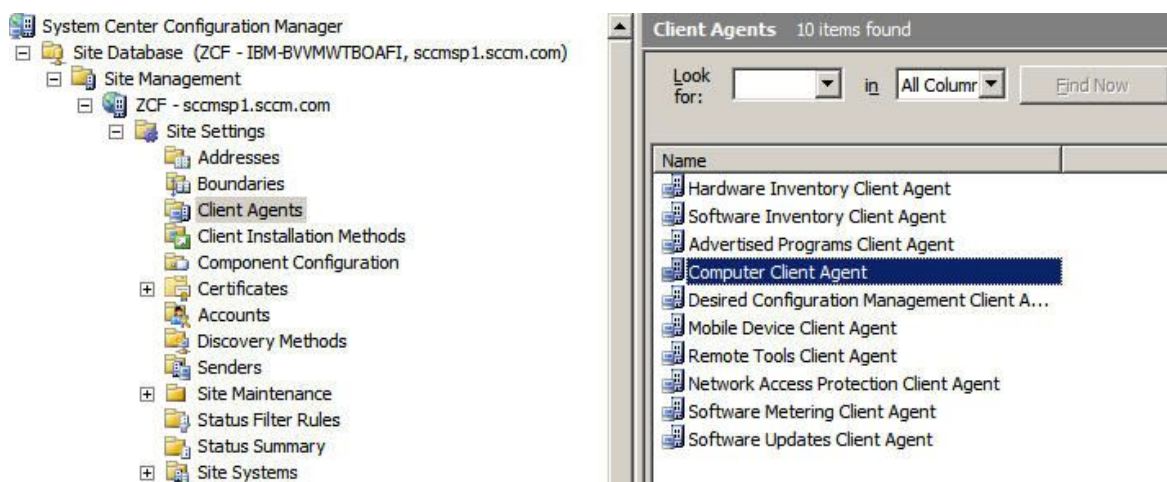


Figure 20. Select Client Agents

- Step 3. From the Client Agents panel, shown in the preceding figure, double-click **Computer Client Agent**.
- Step 4. On the **General** tab, click **Set**. The Windows User Account window opens.

Step 5. Enter the user name and password, and click **OK**.

Note: The account must have appropriate permissions to access the corresponding resources from site servers.

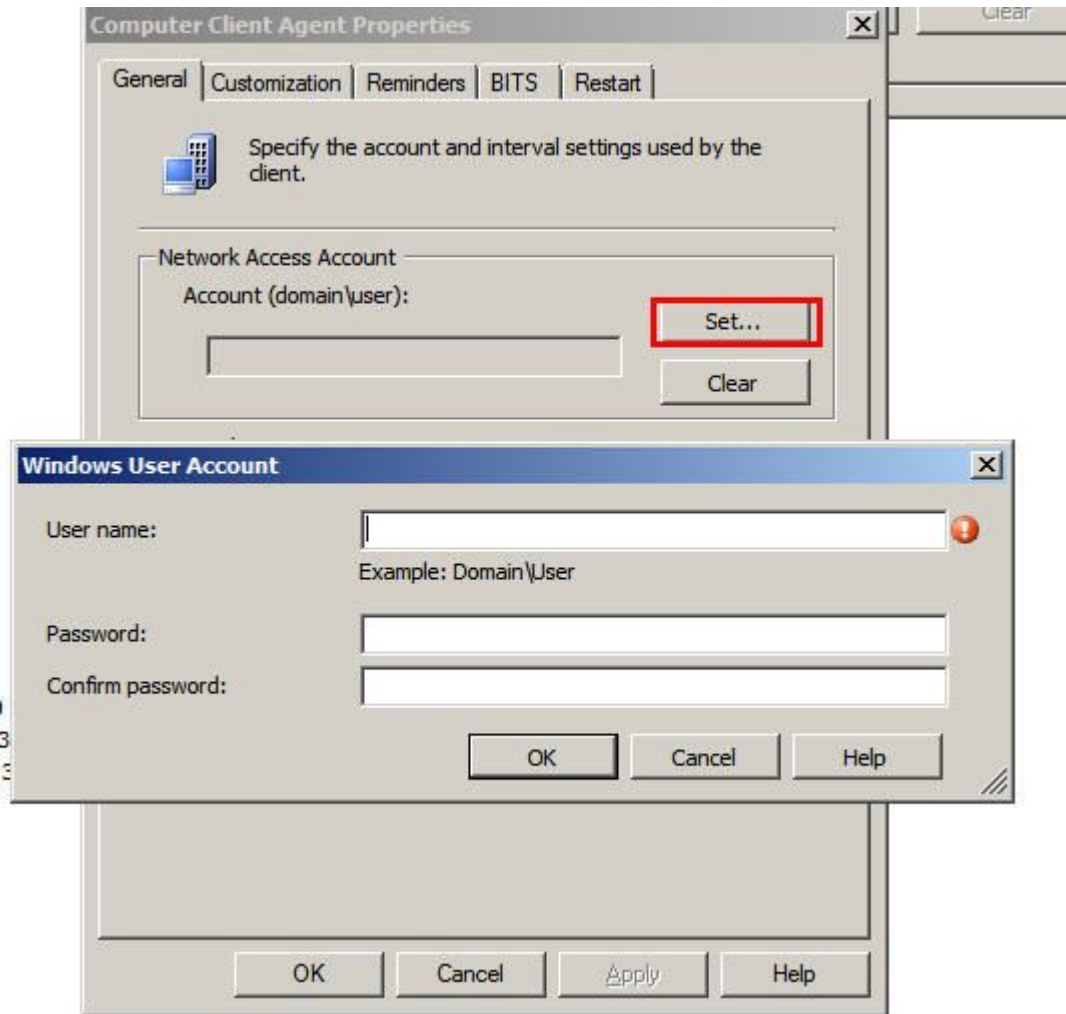


Figure 21. Computer Client Agent Properties window

Step 6. Click **OK**.

Setting up the Preboot Execution Environment service point

The Preboot Execution Environment (PXE) service point is a site system role that initiates operating system installations from computers that have a network interface card that is configured to allow PXE boot requests.

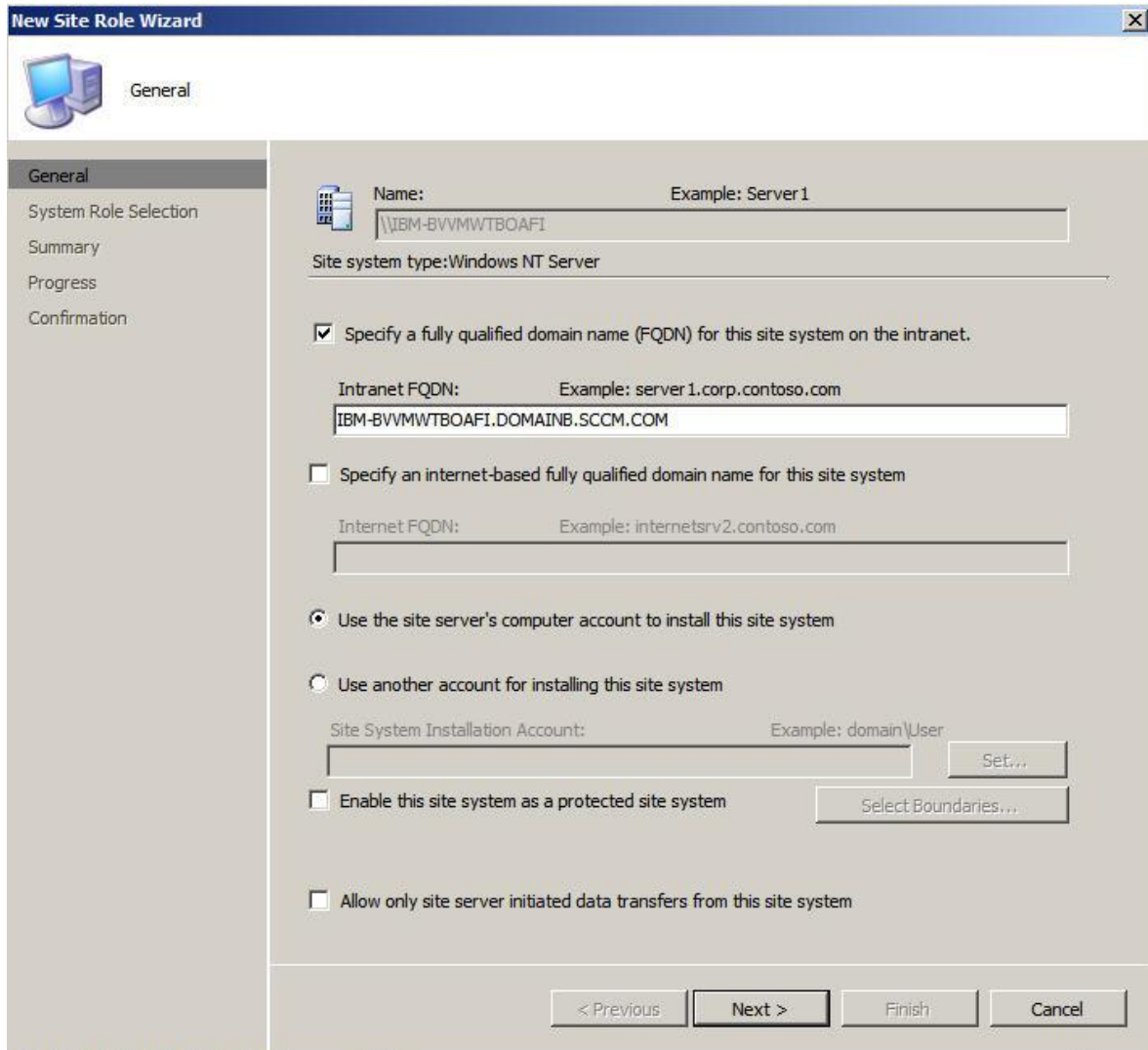
About this task

This service point is required when deploying an operating system using PXE boot requests.

Service point acts as a PXE server. When the target machine wants to boot from the PXE and sends the PXE a request, service point responds.

Procedure

- Step 1. Start Microsoft System Center Configuration Manager 2007.
- Step 2. From the Configuration Manager console, click **System Center Configuration Manager → Site Database → Site Management → site_name → Site Settings → Site Systems → SCCM → New Roles**.
- Step 3. Use the New Site Role wizard to create a new PXE service point.



The screenshot shows the 'New Site Role Wizard' dialog box with the 'General' tab selected. The wizard is titled 'New Site Role Wizard' and has a 'General' icon. The left sidebar contains the following options: General (selected), System Role Selection, Summary, Progress, and Confirmation. The main area contains the following fields and options:

- Name:** Example: Server 1. The text box contains '\\IBM-BVVMWTBOAFI'.
- Site system type:** Windows NT Server.
- Specify a fully qualified domain name (FQDN) for this site system on the intranet.
 - Intranet FQDN:** Example: server1.corp.contoso.com. The text box contains 'IBM-BVVMWTBOAFI.DOMAINB.SCCM.COM'.
- Specify an internet-based fully qualified domain name for this site system.
 - Internet FQDN:** Example: internetsrv2.contoso.com. The text box is empty.
- Use the site server's computer account to install this site system.
- Use another account for installing this site system.
 - Site System Installation Account:** Example: domain\User. The text box is empty, and there is a 'Set...' button to its right.
- Enable this site system as a protected site system. There is a 'Select Boundaries...' button to its right.
- Allow only site server initiated data transfers from this site system.

At the bottom of the dialog, there are four buttons: '< Previous', 'Next >', 'Finish', and 'Cancel'.

Figure 22. New Site Role wizard

- Step 4. After the previous steps are completed, the PXE service point is shown in the console. Right-click this service point, and select **Properties** from the list.
- Step 5. On the **General** tab, select **Allow this PXE service point to respond to incoming PXE requests** to enable the service point to handle the incoming boot requests.

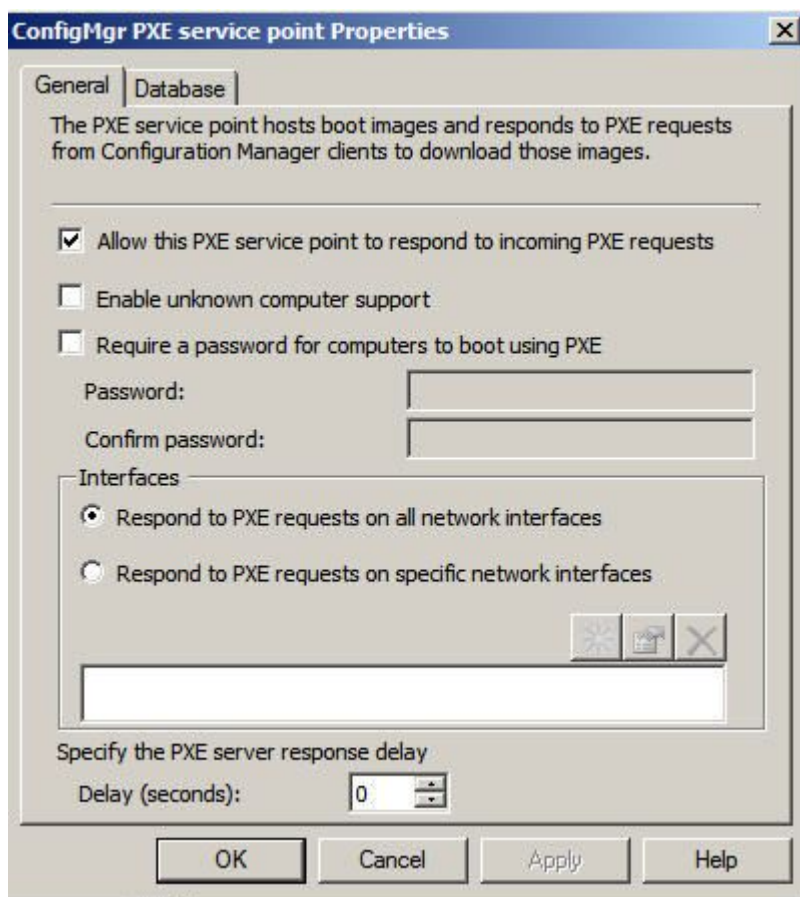


Figure 23. PXE service point Properties General tab

Step 6. Click the **Database** tab to specify settings for controlling the user account and certificate.

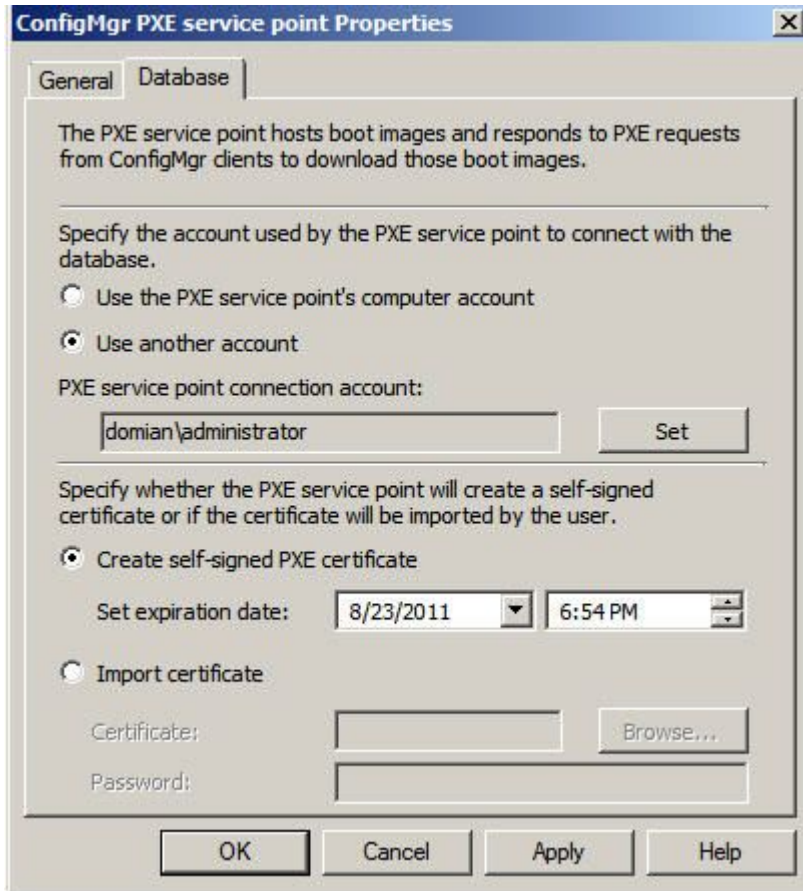


Figure 24. PXE service point Properties Database tab

Step 7. Click **OK**.

Post-installation configuration

After the Lenovo Deployment Pack has been installed, copy the newly-imported driver packages, toolkit packages and boot image to the distribution points.

By copying the new items to the distribution points, you make them available for the target servers to deploy. Copy the following packages to the distribution points:

- All packages under **Computer Management** → **Software Distribution** → **Packages** including Lenovo Server Deployment, the Configuration Manager client package, and any SEP packages that have been added.
- The Lenovo boot image located at **Computer Management** → **Operating System Deployment** → **Boot Images**. If the generic boot image has not been updated, update it now.
- Driver packages that are located at **Computer Management** → **Operating System Deployment** → **Driver Packages** → **Lenovo Server Drivers**.

To copy the content to a distribution point, you must first manage the distribution point and then update it. For detailed instructions, refer to the following topics: “Managing distribution points” on page 26 and “Updating distribution points” on page 26.

Managing distribution points

This topic describes how to copy distribution points using the Manage Distribution Points Wizard.

Procedure

- Step 1. Right-click each of the items listed in “Post-installation configuration” on page 25 and select **Manage Distribution Points**.
- Step 2. Select the distribution points for which you want to copy the content and complete the wizard.

Note: For the Boot Images package, on the page labeled **Select the distribution points that you want to copy the package to**, select `[site server name]\SMSPXEIMAGES$`. For the other packages, select `[site server name]`.

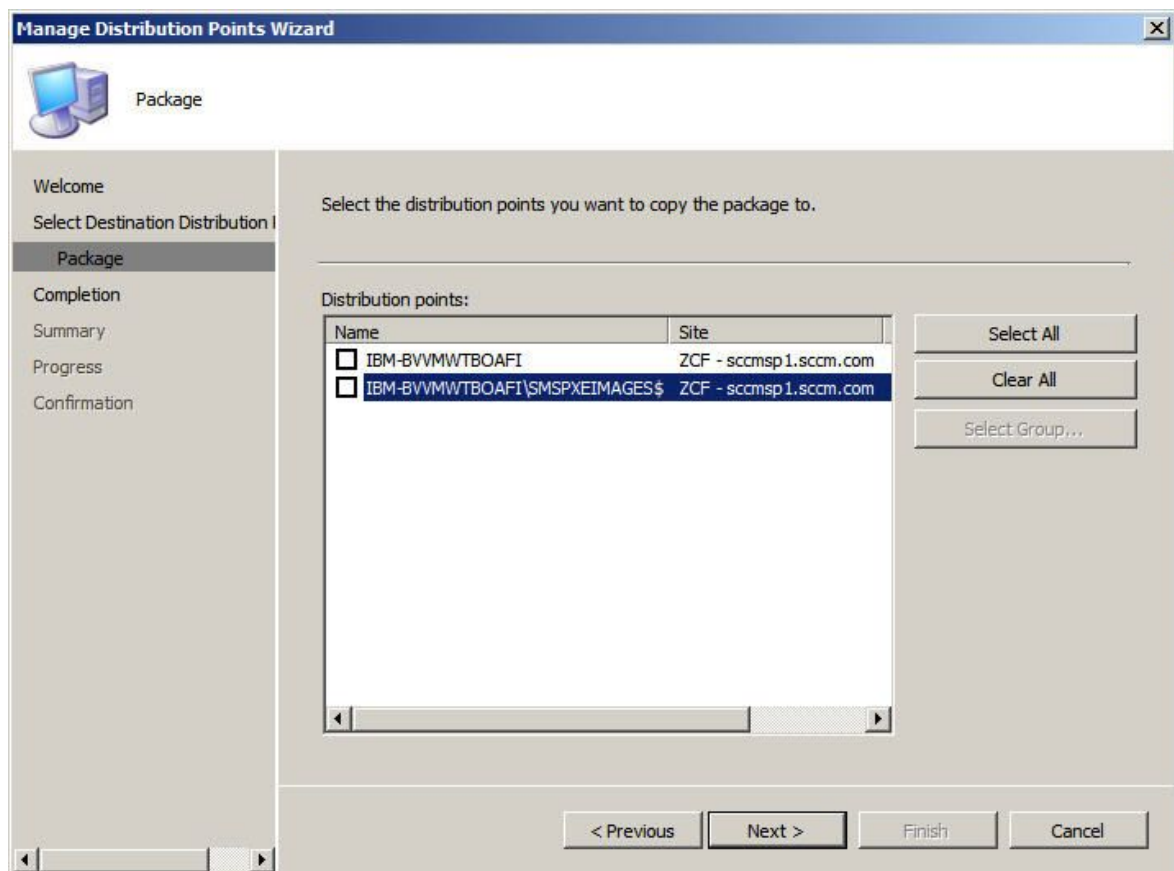


Figure 25. Manage Distribution Points Wizard

Updating distribution points

This topic describes how to update distribution points by using the Update Distribution Points Wizard.

Procedure

- Step 1. After performing the steps in “Managing distribution points” on page 26, right-click each item, and select **Update distribution points**.
- Step 2. Complete the Update Distribution Points Wizard for each package. A progress window will open before the process completes, as shown in the following figure.

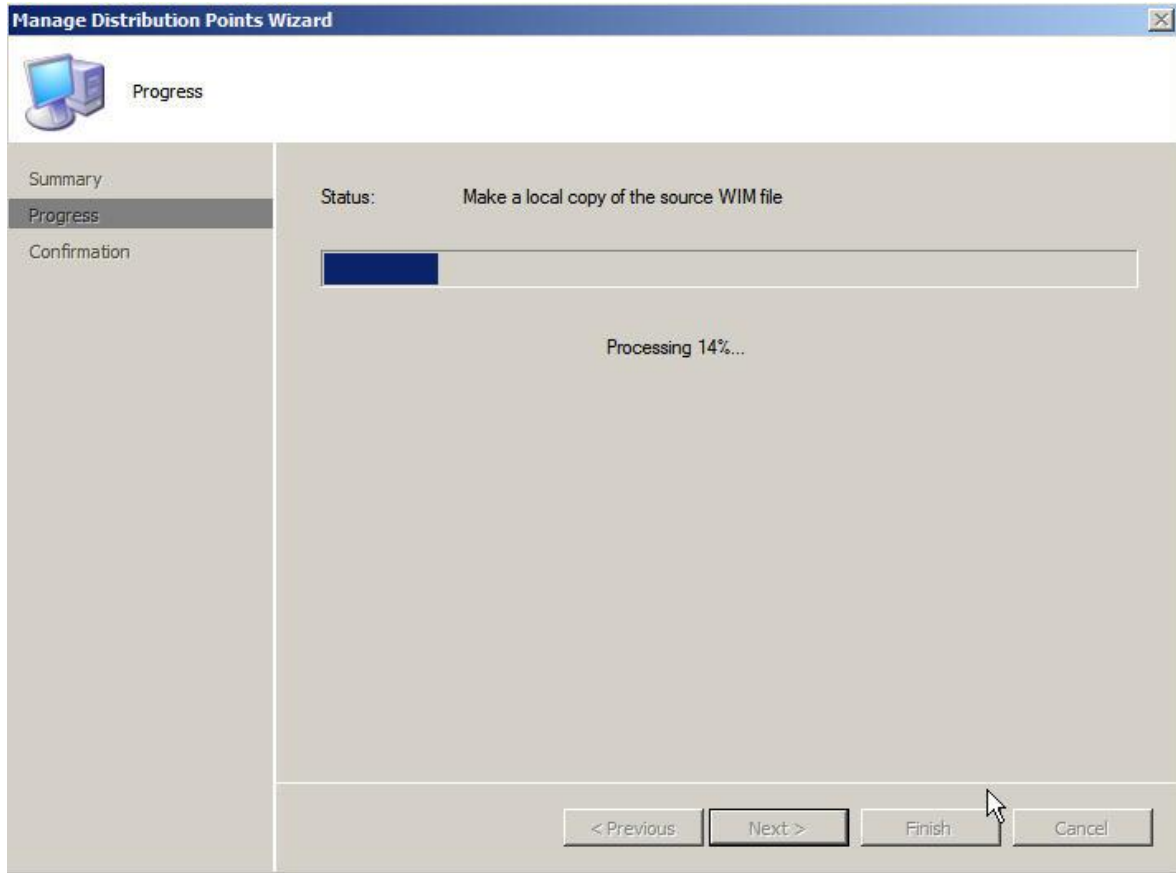


Figure 26. Manage Distribution Points Wizard

Adding command-line support to the boot images for troubleshooting

Add command-line support to a boot image for easier troubleshooting on the target server. Command-line support also provides quick access to the task sequence logs.

About this task

When a task sequence is running in Windows PE on a target server, you can open a command shell on the server by pressing F8. As long as the command shell is open, the task sequence will not reboot the server. You can verify components of the boot image and network connectivity. You can also view task log files.

Procedure

To enable the debug command shell, select **Enable command support (testing only)** in the boot image.

- Step 1. Click the **Software Library** tab, then click **Overview** → **Operating System** → **Boot Images** → **Lenovo Deployment** → **Lenovo Deployment Boot Image (x86)** or **Lenovo Deployment Boot Image (x64)**.
- Step 2. Right-click the boot image, and select **Properties**.
- Step 3. Click the **Windows PE** tab.
- Step 4. Select the **Enable command support (testing only)** check box.

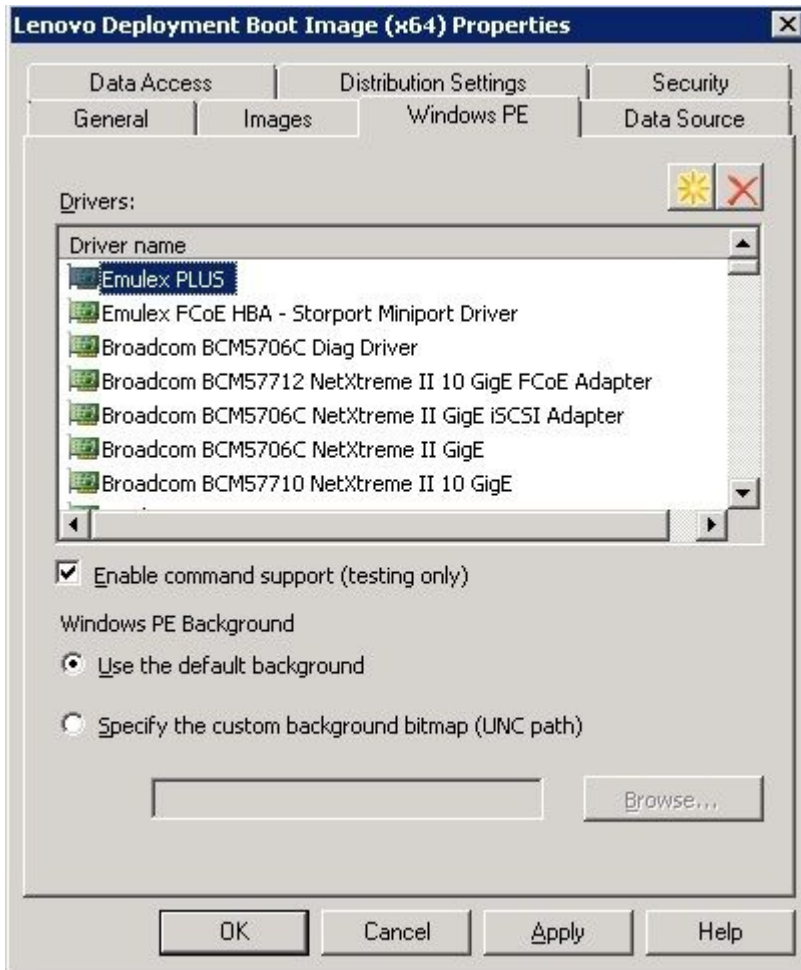


Figure 27. Enabling command-line support

Step 5. Click **OK**.

What to do next

After completing this procedure, update the distribution points. See “Updating distribution points” on page 26.

Creating a task sequence for Lenovo servers

The Lenovo Server Deployment Task Sequence template can help you create a task sequence for the Lenovo servers.

- Step 1. Open the Configuration Manager Console and navigate to **Operating System Deployment** → **Task Sequence**.
- Step 2. Right-click **Task Sequence** → **Bare Metal Server Deployment** → **Create a Lenovo Server Deployment Task Sequence**. The Create Server Deployment Task Sequence wizard opens.

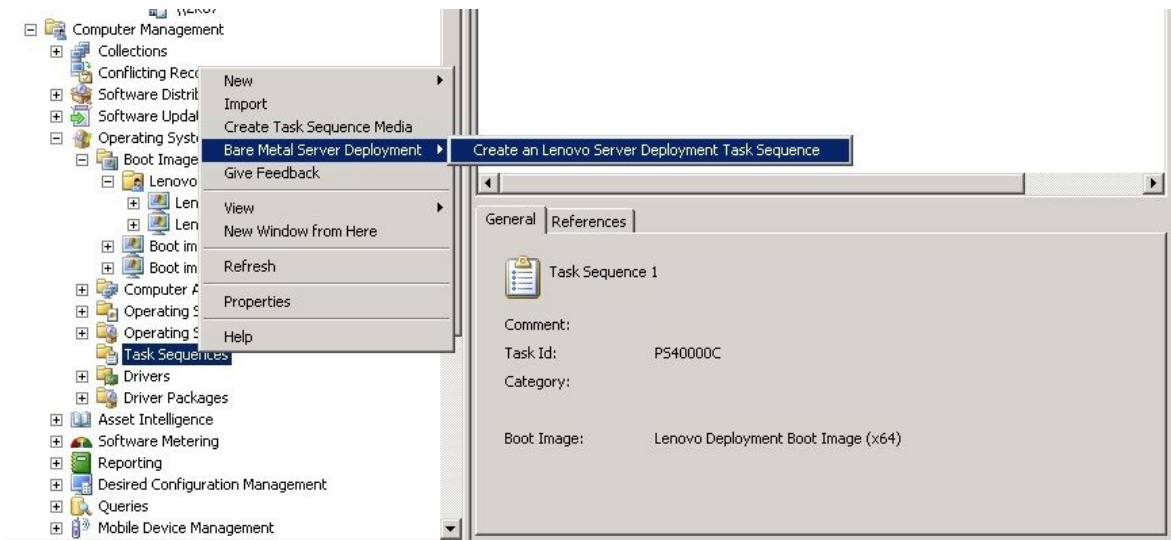


Figure 28. “Create a Lenovo Server Deployment Task Sequence” menu

- Step 3. In the Create Server Deployment Task Sequence wizard, select the device driver, or drivers, that you want to set during deployment, and enter the administrator account name and password for the SCCM server.

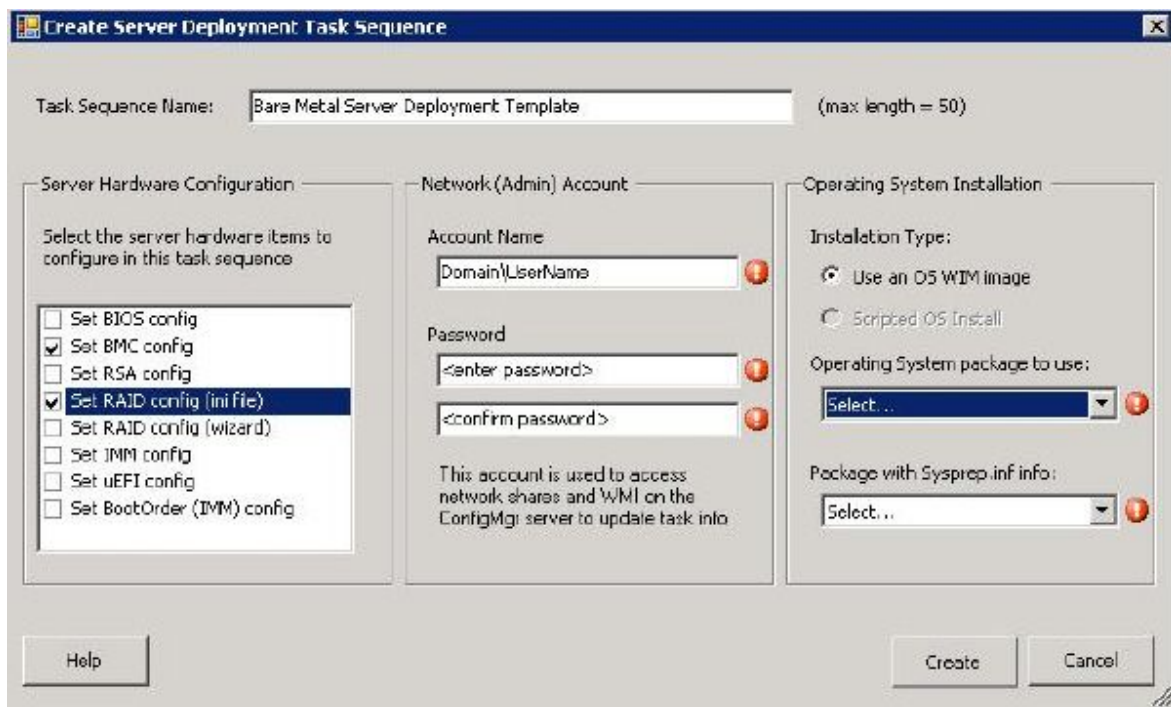


Figure 29. The Create Server Deployment Task Sequence wizard

- Step 4. Click **Create**.
- Step 5. In the SCCM console, navigate to **Operating System Deployment → Task Sequence**, select the task sequence you created, and right-click **Edit**.

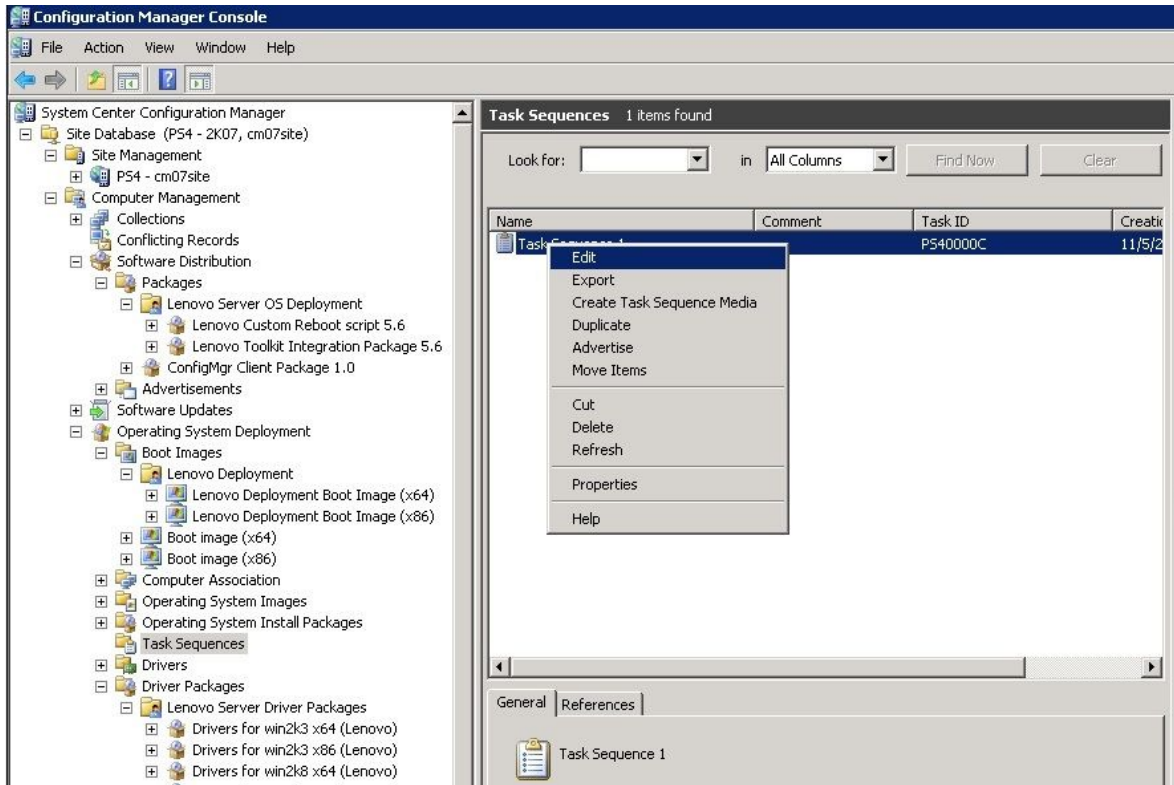


Figure 30. Opening the Task Sequence Editor

Step 6. Click **OK** on the Missing Objects window that opens. Do not worry about the message. If you have not imported the operating system image to SCCM yet, you will need to configure some steps, such as applying the operating system image.

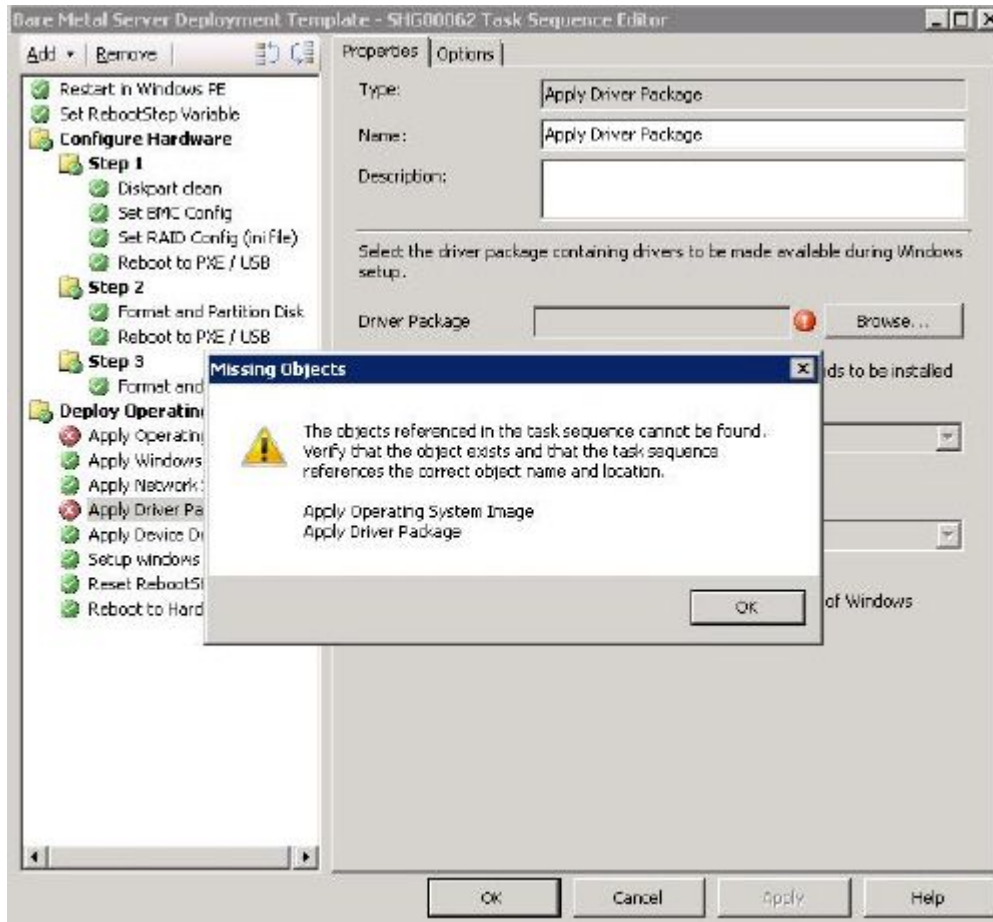


Figure 31. Missing Objects dialog box

Step 7. Configure the settings for **Apply Operating System Image** and **Apply Driver Package** settings, and click **OK**.

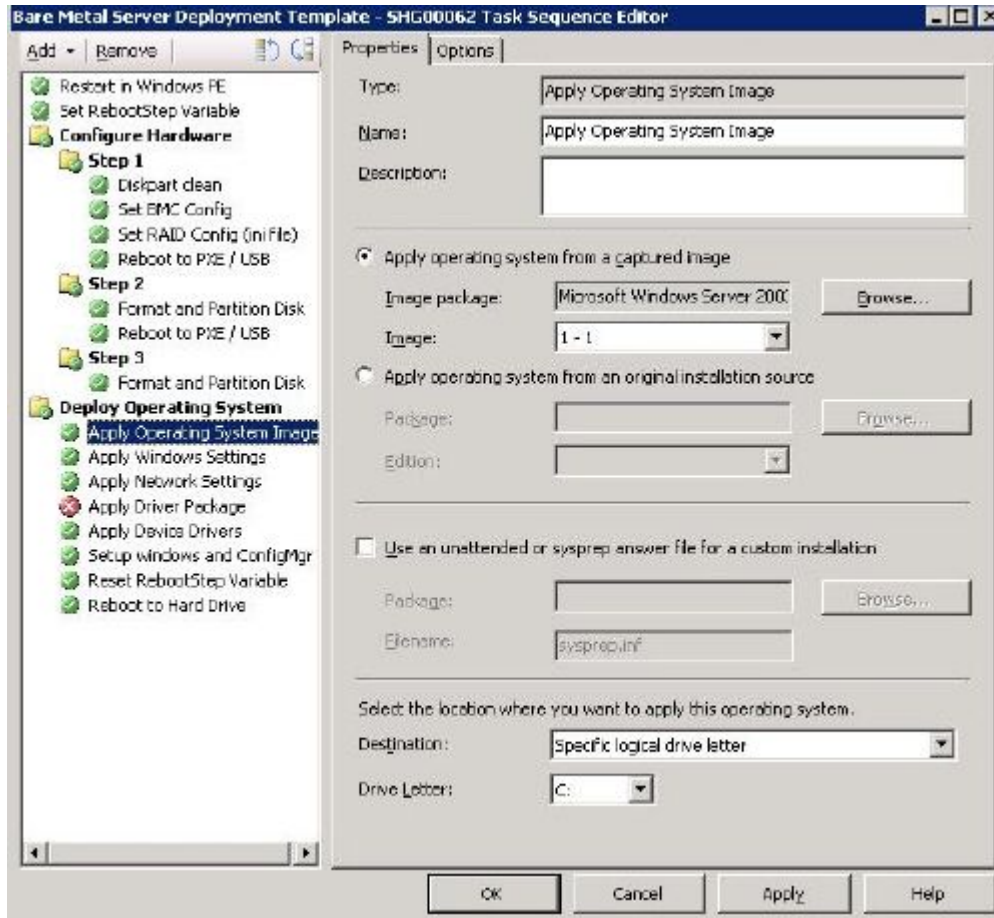


Figure 32. Apply Operating System Image settings

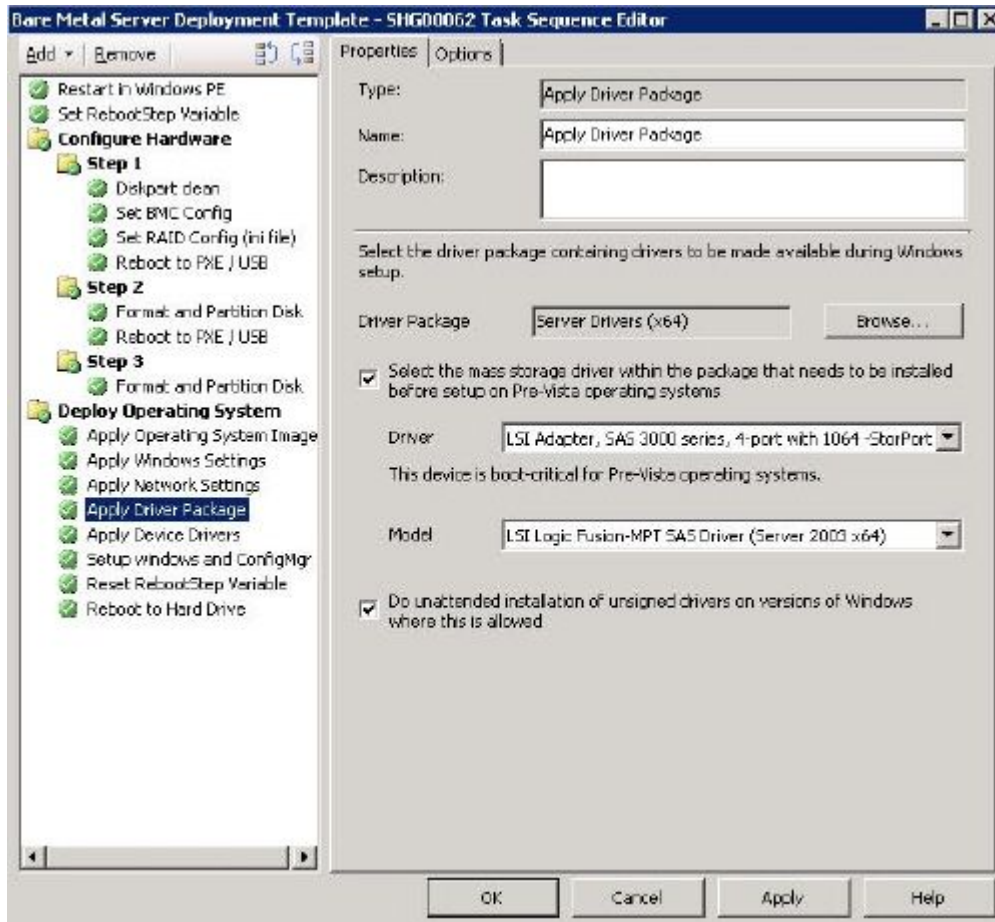


Figure 33. Apply Driver Package settings

Step 8. Advertise the task sequence to the target server. For information about how to advertise the task sequence to the target server, see step 9 in “Capturing operating system images” on page 35.

Updating the distribution points for a boot image

After a new image is added or a change is made to an image, you must copy the new image to the Preboot Execution Environment (PXE) distribution point.

Procedure

- Step 1. Launch **Microsoft Configuration Manager 2007** to open the Configuration Manager console.
- Step 2. From the console, select **Operating System Deployment → Boot Images**.
- Step 3. Right-click the boot image you want to update, and click **Update Distribution Points** from the context menu. After the update completes, the Finish page opens.

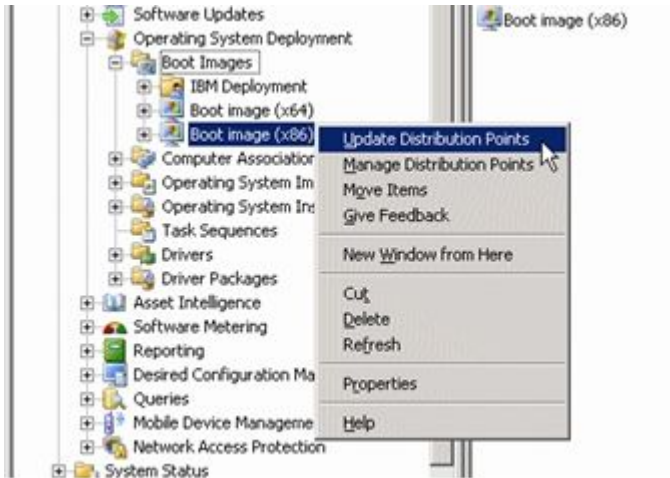


Figure 34. Update Distribution Points option

Advertising the task sequence to the new servers

After saving the task sequence, you need to assign it to the collection of servers before advertising it.

Procedure

- Step 1. Launch **Microsoft Configuration Manager 2007** to open the Configuration Manager console.
- Step 2. Click **System Center Configuration Manager → Site Database → Computer Management → Operating System Deployment → Task Sequences**.
- Step 3. Right-click the task sequence, and select **Advertise**. Use the New Advertisement Wizard to assign the task sequence.
- Step 4. When using PXE, always configure advertisements with the following settings:

| | |
|---------------|--|
| General page | Select Make this task sequence available to boot media and PXE . Otherwise, the network client cannot receive the intended task from the Configuration Manager server. |
| General page | Browse to select the collection of the target server. |
| Schedule page | Mandatory assignments: As soon as possible |
| Schedule page | Program rerun behavior: Always rerun program |

| | |
|--------------------------|--|
| Distribution Points page | Select Access content directly from a distribution point when needed by the running task sequence. In WinPE, the default option "Download content locally when needed by running task sequence" does not work. WinPE causes the task sequence engine to ignore all actions that have packages set for this option. |
| Interaction page | Select Show task sequence progress. |

Capturing operating system images

You can capture an operating system image by using the task sequence.

About this task

The recommended way to build an operating system image for deployment is to build a reference server with everything installed that is required for the image. You need to build a reference server with the tools, drivers, agents, service packs, updates, and so on. After the server is built, run **sysprep** and shut down the server.

Procedure

Step 1. Build the reference server with everything installed that is required for the image. Generally, the Windows operating system is ready, and all the necessary drivers are installed.

Include everything that a new system might require, such as tools, drivers, agents, service packs, and updates.

Step 2. Run the **sysprep /generalize** command on the reference server to prepare the image for installation onto other machines, as described in Appendix C "Running Sysprep" on page 121.

Step 3. To capture the operating system on a server with Configuration Manager, you must add the computer name, MAC address, and GUID information for the target reference server to the Configuration Manager database and to a collection.

Open the Import Computer Information Wizard by clicking **Devices → Import Computer Information**. Add the computer name, the MAC address, and the GUID. To find a specific server, you only need to add the computer name and the MAC address.

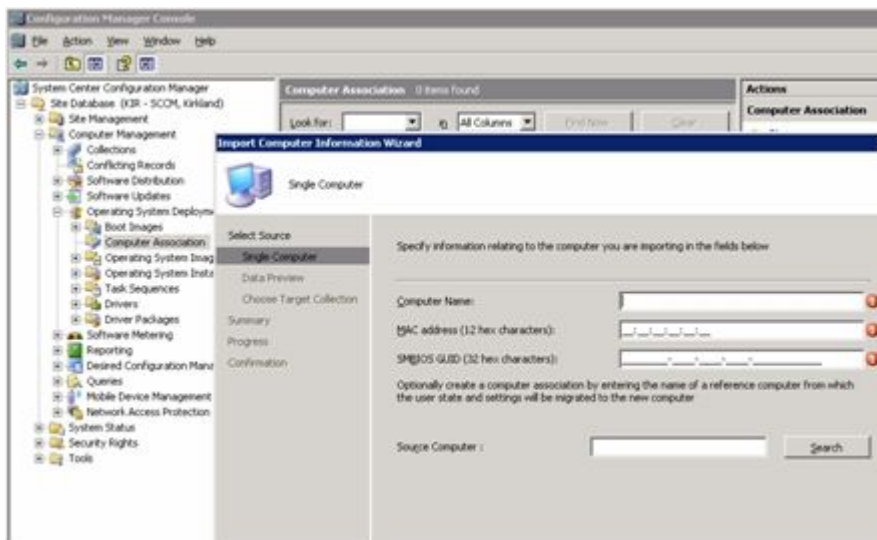


Figure 35. Import Computer Information Wizard

- Step 4. On the target server (the server that is to be captured, in this case), set the variable that contains the location of the operating system to be captured.
- a. Go to the collection with the target reference server. Right-click the sever object, then select the **Variables** tab.

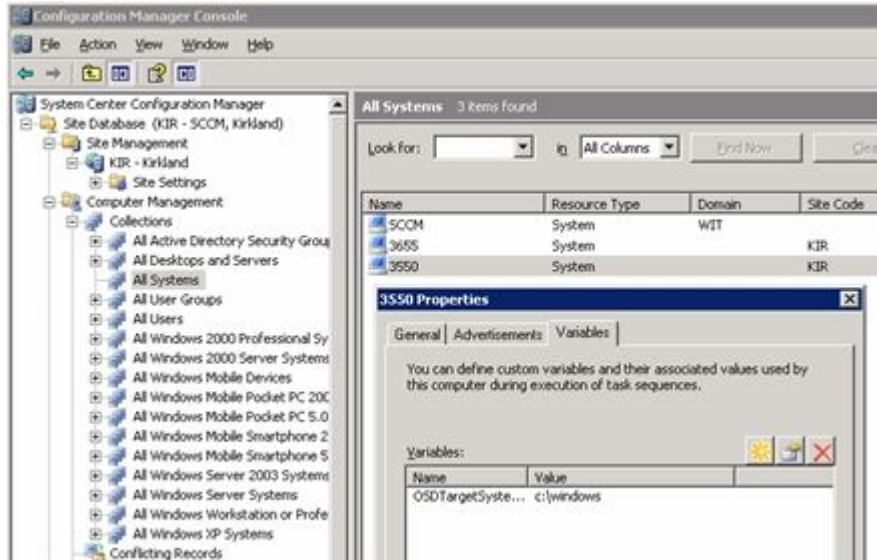


Figure 36. Setting the operating system location on the target server

- b. Set the `OSDTargetSystemRoot` variable to the system driver, for example, `OSDTargetSystemRoot=c:\windows`.

Step 5. Set up a share folder on the Configuration Manager site server to store the captured images.

For example, create a directory on the Configuration Manager server called `c:\images`.

Create a share and assign everyone **Full Control** for the share permissions.

Step 6. Create a task sequence for capturing the image.

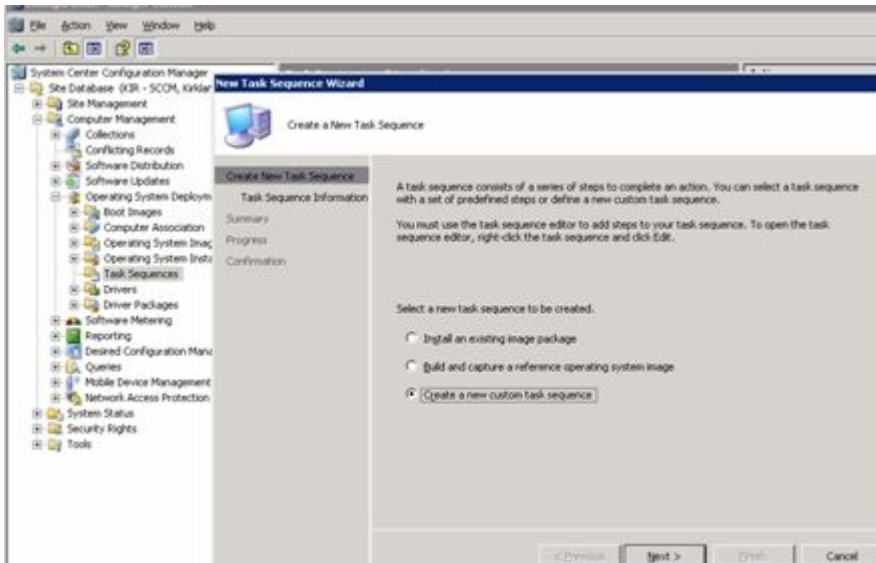


Figure 37. New Task Sequence Wizard

Step 7. Name the task sequence.

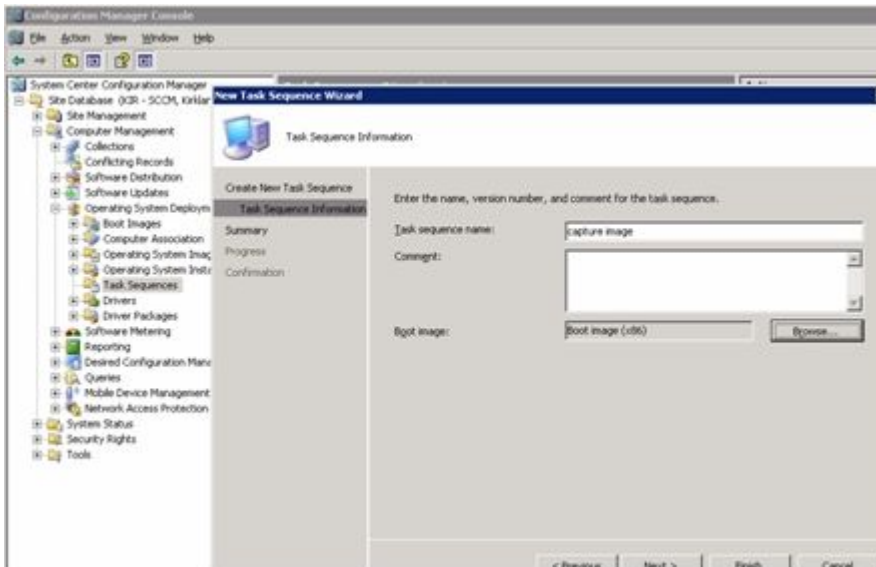


Figure 38. Naming the task sequence in the New Task Sequence Wizard

Step 8. Edit the task sequence information to include all steps for capturing the image.

For example, fill in the path for storing the image using the share that you created in an earlier step.

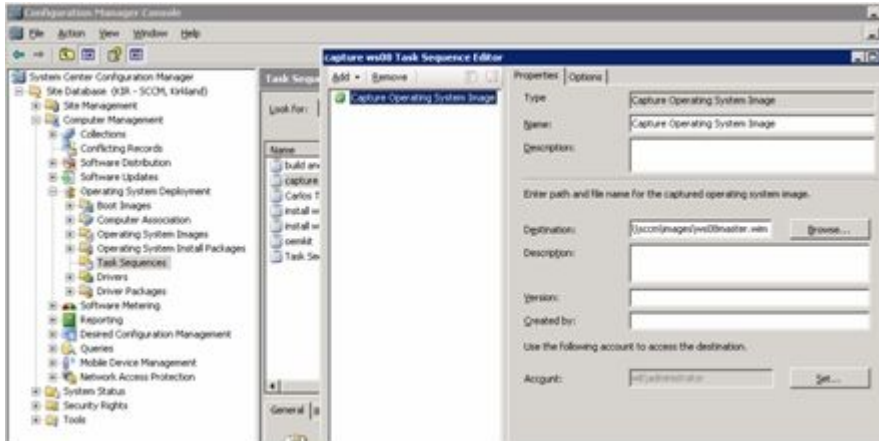


Figure 39. Editing the OS capture task sequence to identify the share

Once the task sequence has been completed, an advertisement must be made. Advertisements are used in Configuration Manager to assign jobs to particular client machines in this case, the machine that is being captured.

Step 9. Right-click the task sequence, and select **Advertise**.

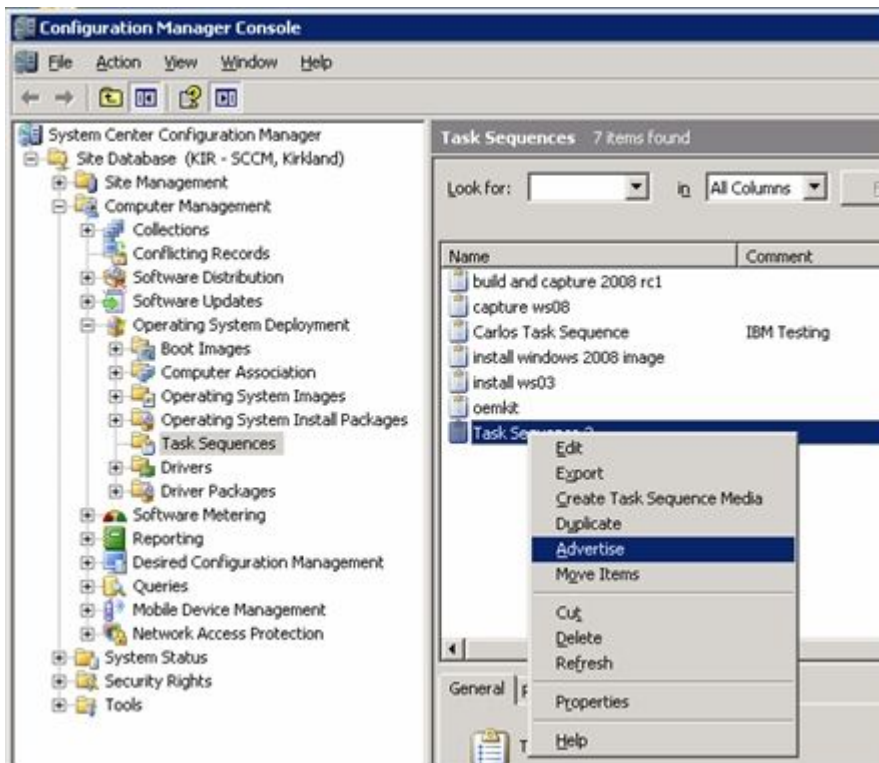


Figure 40. Advertising the OS capture task sequence

Step 10. Use the New Advertisement Wizard to assign the task sequence.

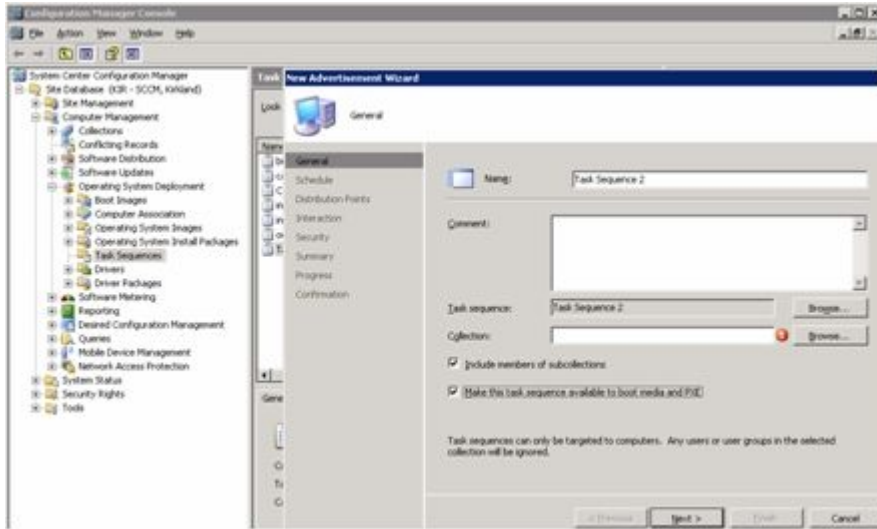


Figure 41. New Advertisement Wizard

Make sure the task sequence is made available to PXE. (As shown in the example in Figure 41 “New Advertisement Wizard” on page 39.) Also select the collection that contains the target system. This is the machine that was added to the database earlier. Without being added to the database and to a collection, the machine will never pick up the advertisement.

Step 11. Fill in the settings on the Schedule page.

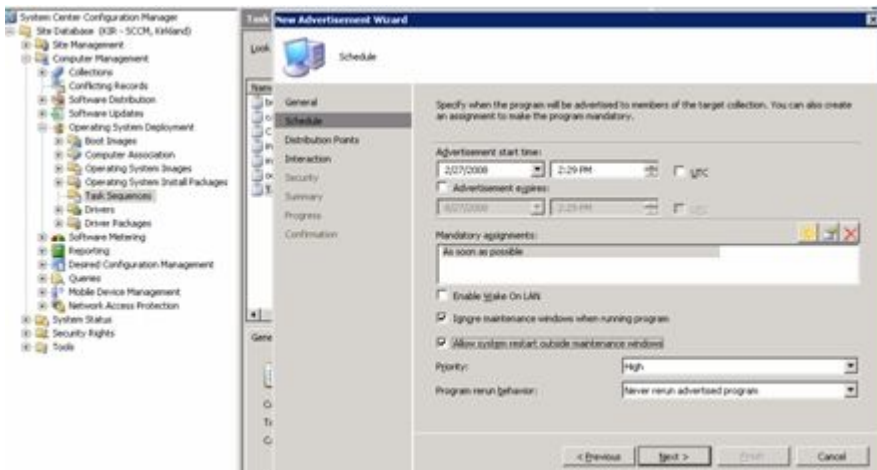


Figure 42. New Advertisement Wizard: Schedule page

Step 12. Fill in the settings on the Distribution Points page.

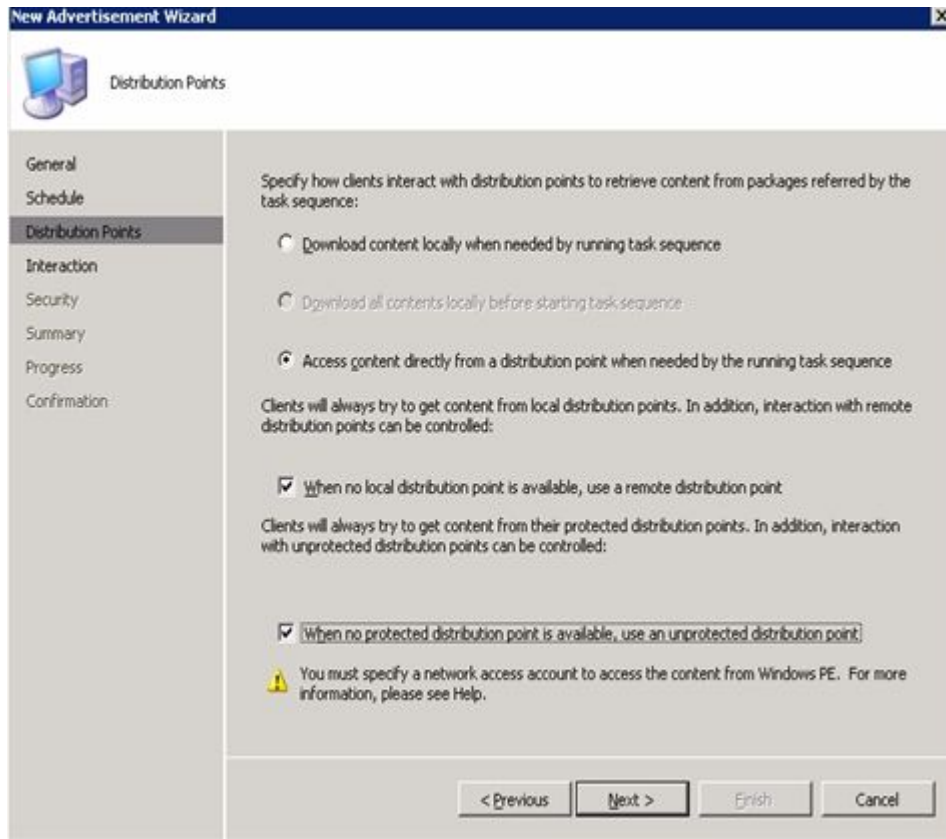


Figure 43. New Advertisement Wizard: Distribution Points page

Step 13. Boot the reference server that is being captured.

Now that the advertisement is waiting, boot the server that is being captured to PXE. Verify that the site server and the target server make a connection and that the site server transfers the boot image to the site server share.

The target server connects to the Configuration Manager site server and loads the boot image from the share. Then, the target server starts the task sequence to capture the operating system image on the target server back to the share on the Configuration Manager site server.

Step 14. After the capture process has completed go back to the Configuration Manager server and verify that the *image_name.wim* file is stored in the shared images directory.

At this point, you can use Configuration Manager to deploy the image to other servers.

Note: It is possible to use images captured manually (without using Configuration Manager to do the capture), but using Configuration Manager can prevent future problems when the image is deployed using Configuration Manager. The best practice is to capture the image using Configuration Manager.

For more information, see the Microsoft System Center – About the Operating System Deployment Reference Computer webpage.

Lenovo Deployment Pack feature reference

This section describes the features and functionality that are available in the Lenovo Deployment Pack. Some functionality or capabilities might differ from other Configuration Manager deployment kits with which you might be familiar. Such differences are based on the capabilities of existing tools or additional integration that Lenovo has included in this Configuration Manager deployment kit.

Preparing the operating system image

This section describes how to capture operating system images and prepare reference servers. You can use the operating system image in the operating system deployment task sequence.

Note: You can use images captured manually (without using Configuration Manager to do the capture). However, using Configuration Manager to capture the image can prevent problems when the image is deployed using Configuration Manager. The best practice is to capture the image using Configuration Manager.

Capturing operating system images

Use Configuration Manager to capture operating system images.

Lenovo Deployment Pack supports the clone method to install operating systems. To use this method, you must prepare an operating system image.

Preparing the reference server

This topic directs you to information about building the reference server, which is required when capturing operating system images.

Procedure

- Step 1. Build the reference server with everything installed that is required for the image. Include everything that a new system might require, such as tools, drivers, agents, service packs, and updates.
- Step 2. On the reference server, run the **sysprep /generalize** command to prepare the image for installation onto other servers. For instructions, see Appendix C “Running Sysprep” on page 121.

Adding a target server to Configuration Manager

This topic describes how to create a collection and add one or more servers to it.

About this task

To enable SCCM to recognize the target server, use the MAC address of the system's primary network interface (the interface used for deployment). To group servers, SCCM uses collections. A number of default collections are already created based on operating system version and other attributes. Use the following procedure to create a new collection to use for deployments.

Procedure

- Step 1. Right-click **Site Database**, and then select **Computer Management → Operating System Deployment → Computer Association → Import Computer Information**. The Import Computer Information Wizard opens. You can add one or multiple servers to a collection at the same time. Here is an example of how to add a single server.

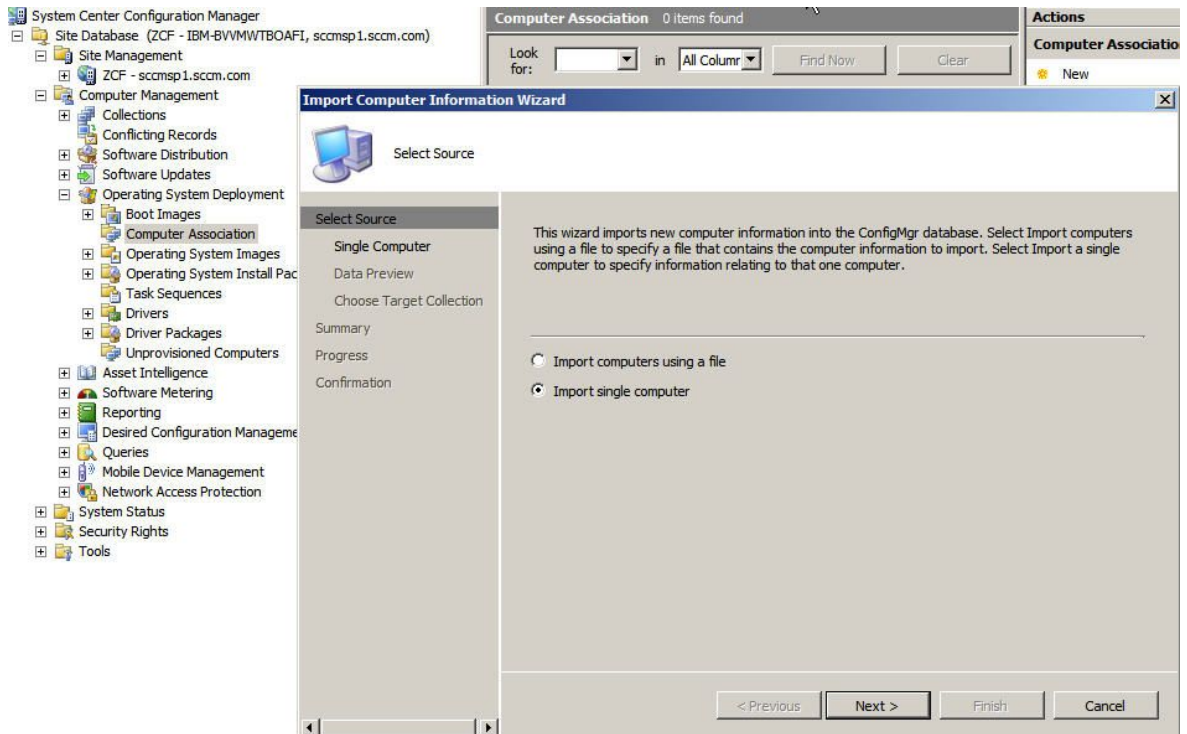


Figure 44. Import Computer Information Wizard

- Step 2. Select **Import single computer**.
- Step 3. Click **Next**.
- Step 4. Either enter the computer name and MAC address or GUID information, or click **Search** to navigate to the source computer.

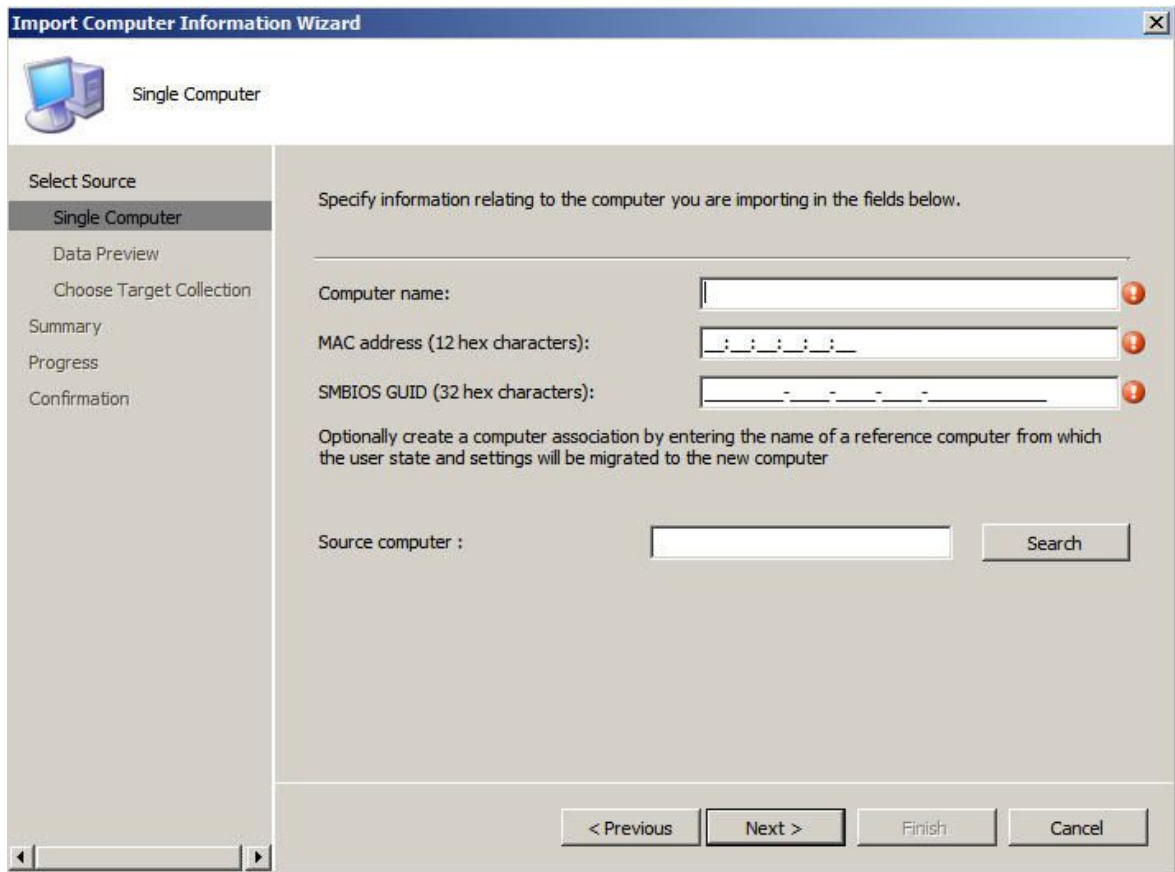


Figure 45. Adding a single computer

- Step 5. Click **Next**.
- Step 6. Select whether to add the new computer to the All Systems collection, or designate a different existing collecting by selecting **Add computers to the following collection** and clicking **Browse**.

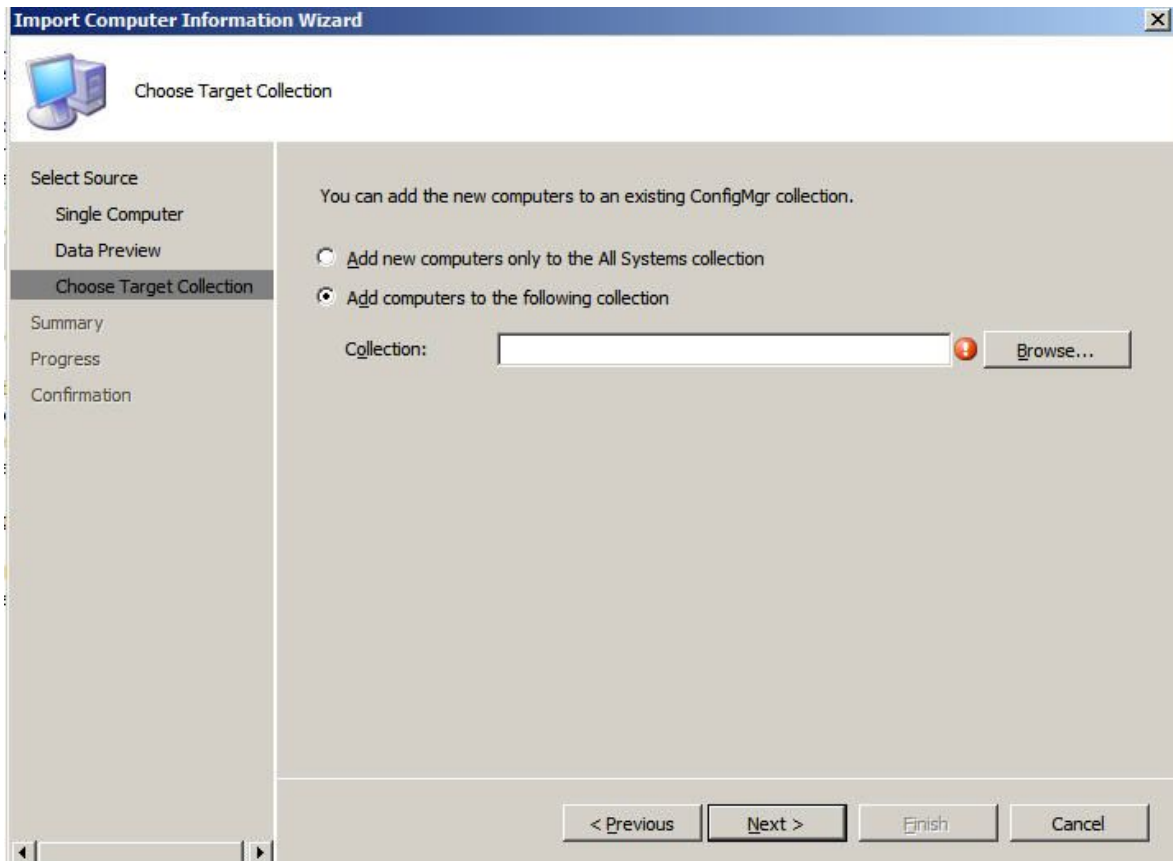


Figure 46. Adding the new computer to a collection

- Step 7. Click **Next**.
- Step 8. Continue through the remaining pages by clicking **Next**.
- Step 9. On the last page, click **Finish**.

Preparing Configuration Manager

This topic describes how to prepare the target server for the operating system captured in Configuration Manager.

Procedure

- Step 1. On the target server (in this case, the server that is to be captured), set the variable that contains the location of the operating system to be captured.
 - a. Go to the collection with the target reference server. Right-click the server object, then select the **Variables** tab.
 - b. Set the `OSDTargetSystemRoot` variable to the system driver, for example:
`OSDTargetSystemRoot=c:\windows`

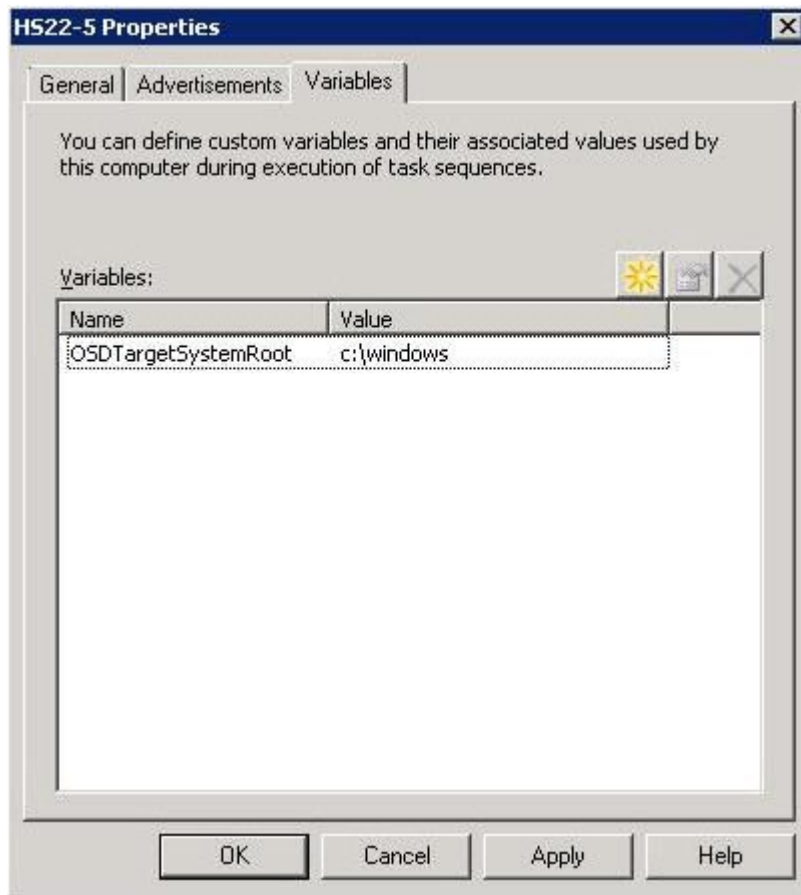


Figure 47. Setting the location variable

- Step 2. Set up a share folder on the Configuration Manager site server to store the captured images. For example, create a directory on the Configuration Manager server called `c:\images`. Create a share and assign everyone full control for the share permissions.
- Step 3. Create a task sequence for capturing the image:
 - a. Go to **Site Database** → **Computer Management** → **Operating System Deployment** and right-click **Task Sequences**.
 - b. Select **New**, then select **Task Sequence**.
 - c. When the wizard opens, select **New custom task sequence** and follow the prompts. This action creates an empty task sequence.
 - d. Select the Lenovo custom boot image, and make sure that **PXE media** is selected.
- Step 4. To bring up the task sequence editor, right-click the newly created task sequence and select **Edit**.
- Step 5. From the **Add** menu, select **Images** → **Capture Operating System Image**. A window opens similar to the one in the following example.

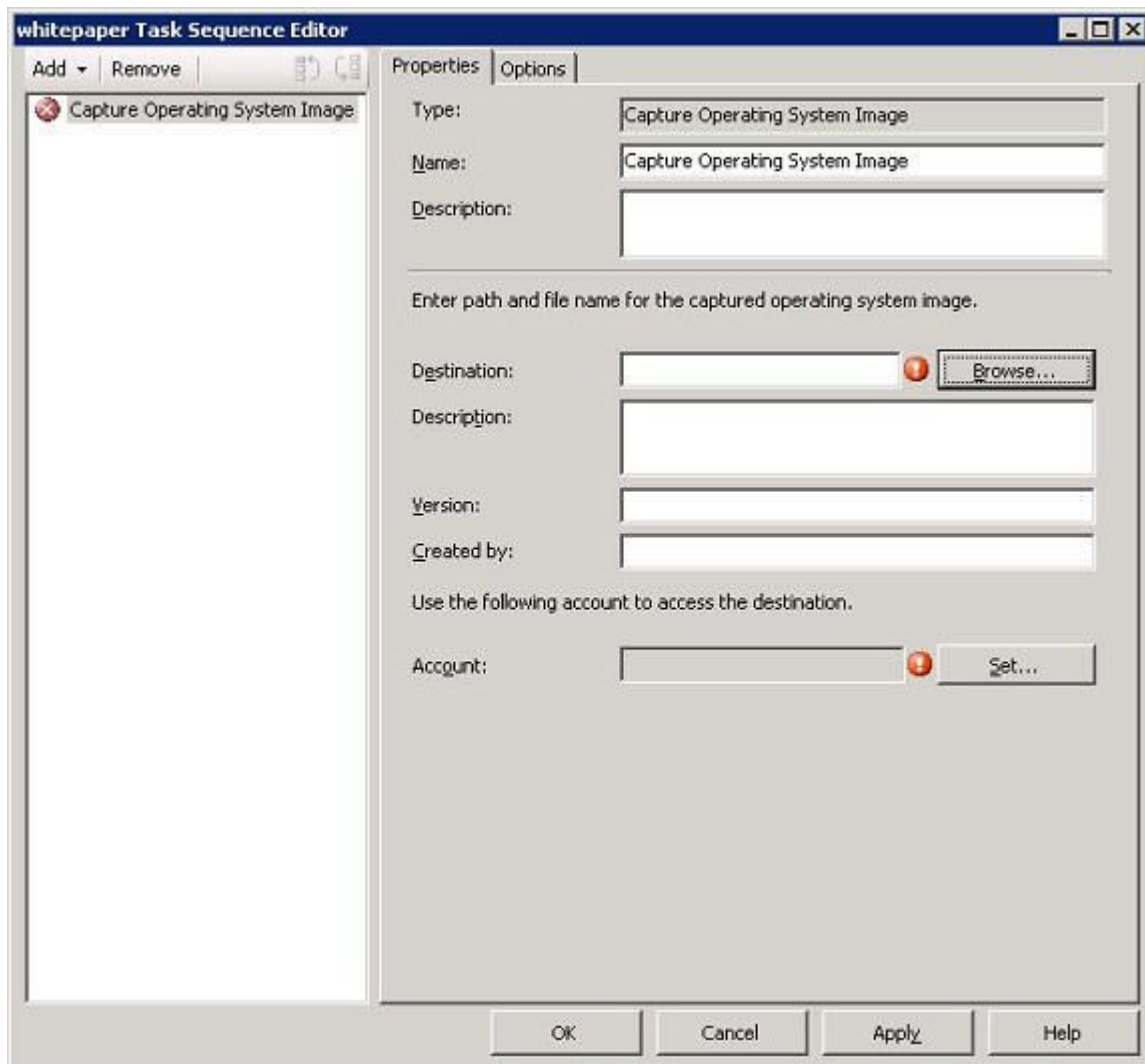


Figure 48. Capture Operating System Image

- Step 6. Enter the destination file name for the image and the access account information, and click **OK**. Make sure the folder is shared with the appropriate permissions so that the image can be accessed by the task sequence. You can now use this simple task sequence to capture the operating system from the reference server that was built earlier.

Now that a capture task sequence exists, it must be advertised to the reference server. All task sequences in SCCM are advertised to the target or client server so that the appropriate job can be run against the intended server.

- Step 7. To create an advertisement, right-click the task sequence, select **Advertise**, and follow the wizard prompts. See the following images for the recommend settings.

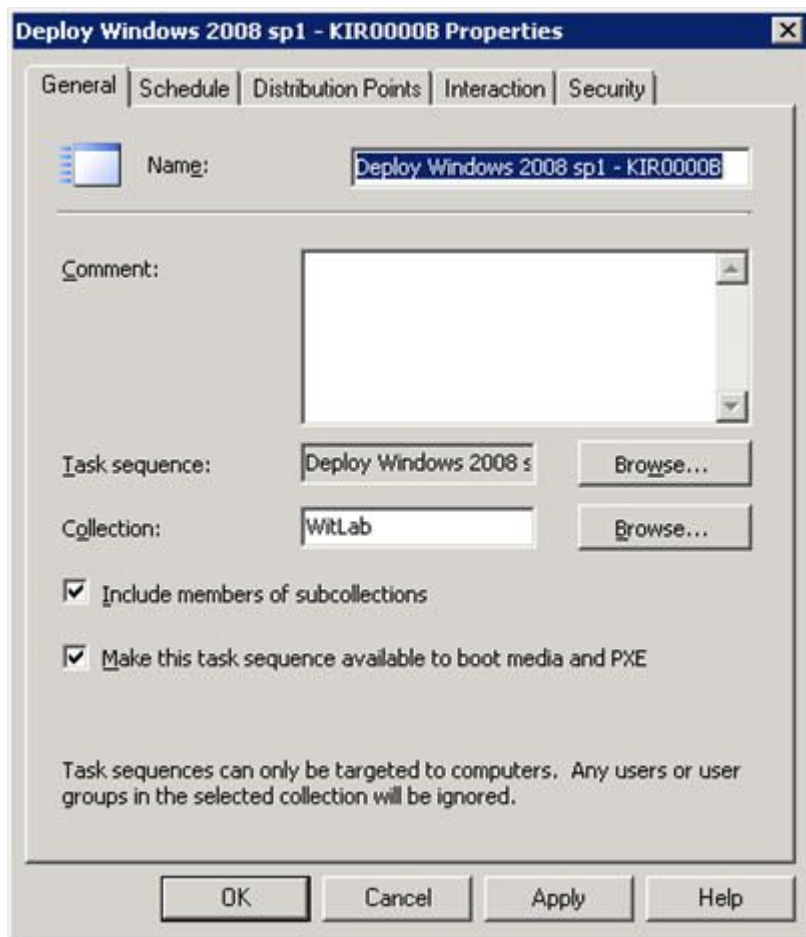


Figure 49. Advertisement settings, **General** tab

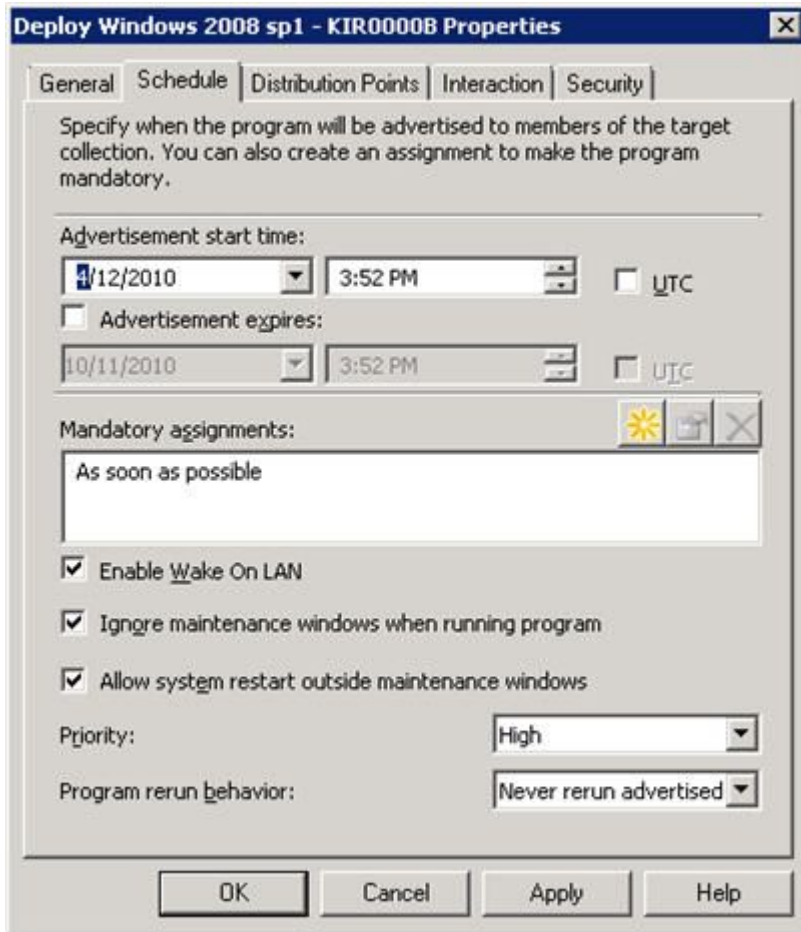


Figure 50. Advertisement settings, **Schedule** tab

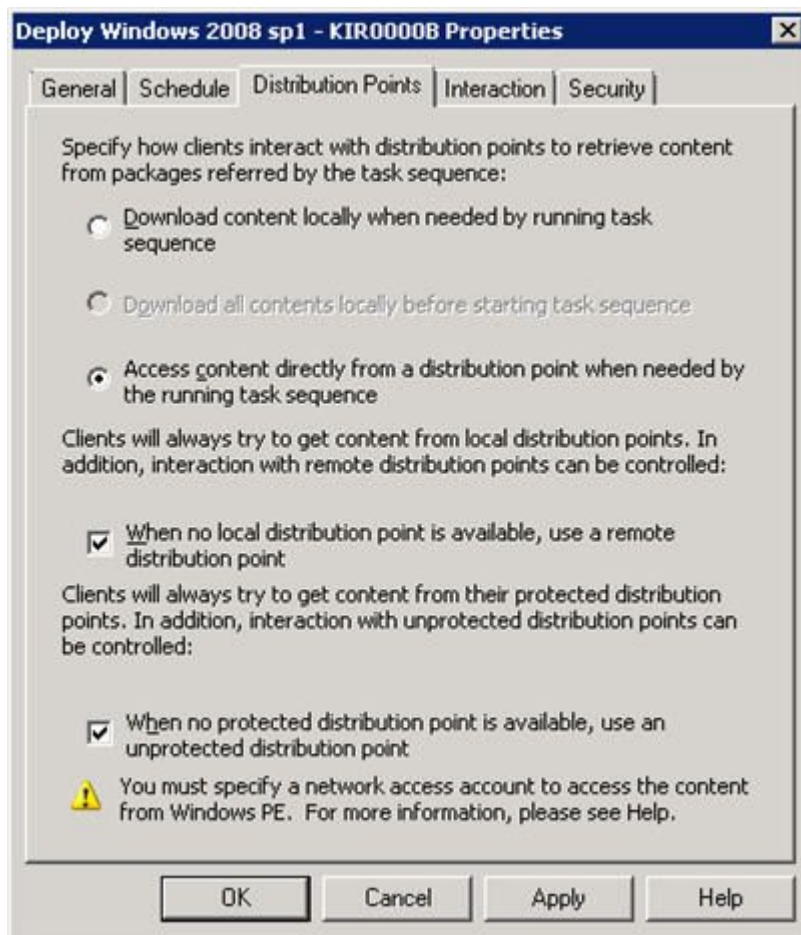


Figure 51. Advertisement settings, **Distribution Points** tab

Starting the reference server

This topic explains how to start the reference server that is being captured.

Now that the advertisement is waiting, start the server that is being captured to the Preboot Execution Environment (PXE). Verify that the site server and the target server connect, and ensure that the site server transfers the boot image to the site server shared drive. The target server connects to the Configuration Manager site server and loads the boot image from the shared drive. Then, the target server starts the task sequence to capture the operating system image from the target server to the shared drive on the Configuration Manager site server.

Verifying the image on Configuration Manager

After the capture process is complete, you must verify that the image exists on the Configuration Manager server.

After the capture process has completed, go back to the Configuration Manager server and verify that the `image_name.wim` file is stored in the shared images directory. Now, use Configuration Manager to deploy the image to other servers.

Adding, managing, and updating operating system images

After the operating system image has been captured, add it into the SCCM distribution point for delivery.

To add the operating system image to the SCCM distribution point for delivery, you must first add the operating system image and then manage and update the distribution points.

Adding operating system images

Use these steps to add the operating system images.

Procedure

Step 1. Right-click **Site Database** → **Computer Management** → **Operating System Deployment** → **Operating System Images**, and then select **Adding operating system images**.

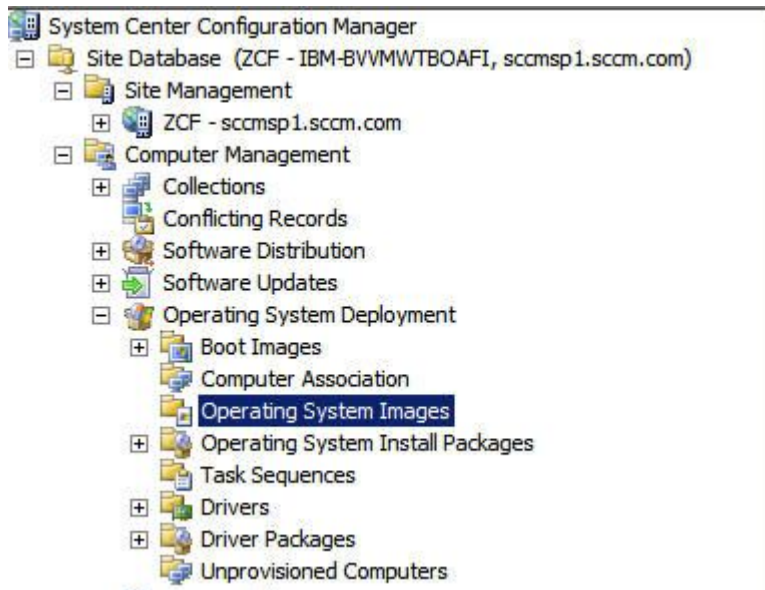


Figure 52. Adding operating system images

Step 2. Click through the wizard prompts to finish.

Managing and updating distribution points for operating system images

This topic describes how to manage and update operating system images. After you perform these steps, the operating system image is copied and updated to the distribution point, where the client system can access and download them.

About this task

This procedure is similar to the procedures “Managing distribution points” on page 26 and “Updating distribution points” on page 26.

Procedure

Step 1. Right-click the newly-added operating system image, and select **Manage Distribution Points**.

Step 2. Complete the Manage Distribution Points wizard for the image.

Step 3. Right-click the newly-added operating system image, and select **Update Distribution Points**.

Step 4. Complete the Update Distribution Points wizard for the image.

Preparing for deployment in SCCM 2012

Before deploying SCCM 2012, you must perform some procedures as a prerequisite, which include configuring OSD, updating distribution points, and selecting the boot image.

The following sections will guide you through the process step by step.

SCCM OSD initial configuration

This topic refers you to detailed information about how to configure your operating system deployment (OSD) environment by describing the actions you should take in SCCM.

The following information about configuring OSD is provided as a general reference. For more detailed information about setting up OSD in SCCM, see the Microsoft System Center Configuration Manager 2007 Documentation Library webpage.

Setting the network access account

To set the network access account, use the Configuration Manager console.

Procedure

- Step 1. Click start Microsoft System Center Configuration Manager 2007 2012.
- Step 2. From the Configuration Manager console, select the **Administration** tab, then select **Overview** → **Site Configuration** → **Sites** → **Configure Site Components** → **Software Distribution**.

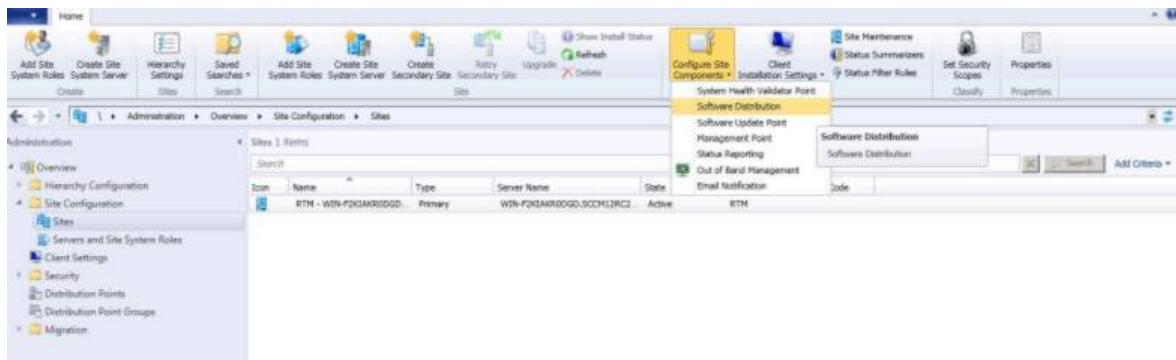


Figure 53. Select Software Distribution

- Step 3. Click **Software Distribution**.
- Step 4. On the **Network Access Account** tab, select **Specify the account that access network locations** and click **Set**. The Windows User Account window opens.
- Step 5. Complete the fields to set the network access account.

The account must have appropriate permissions to access the corresponding resources from site servers.

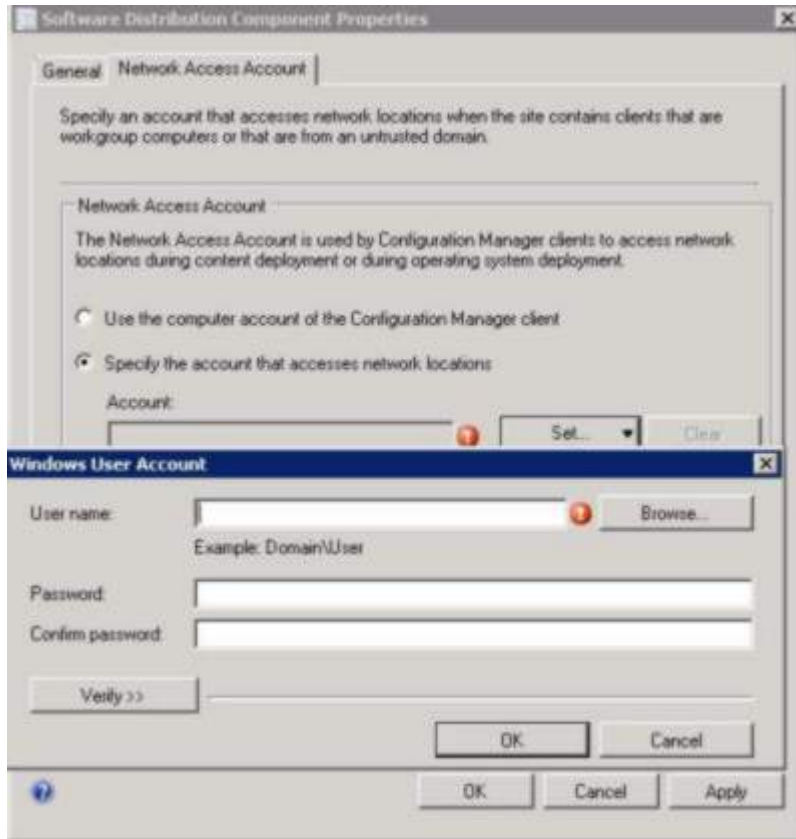


Figure 54. Windows User Account window

Step 6. Click **OK**.

Enabling the Preboot Execution Environment service point

The Preboot Execution Environment (PXE) service point is a site system role that initiates operating system installations from computers that have a network interface card configured to allow PXE boot requests.

About this task

The service point is required when deploying an operating system using PXE boot requests.

Procedure

- Step 1. Start Microsoft System Center Configuration Manager 2007 2012.
- Step 2. From the Configuration Manager console, click the **Administration** tab, then select **Overview** → **Site Configuration** → **Servers and Site System Roles**.
- Step 3. Double-click the **Distribution point**, and select the **PXE** tab.

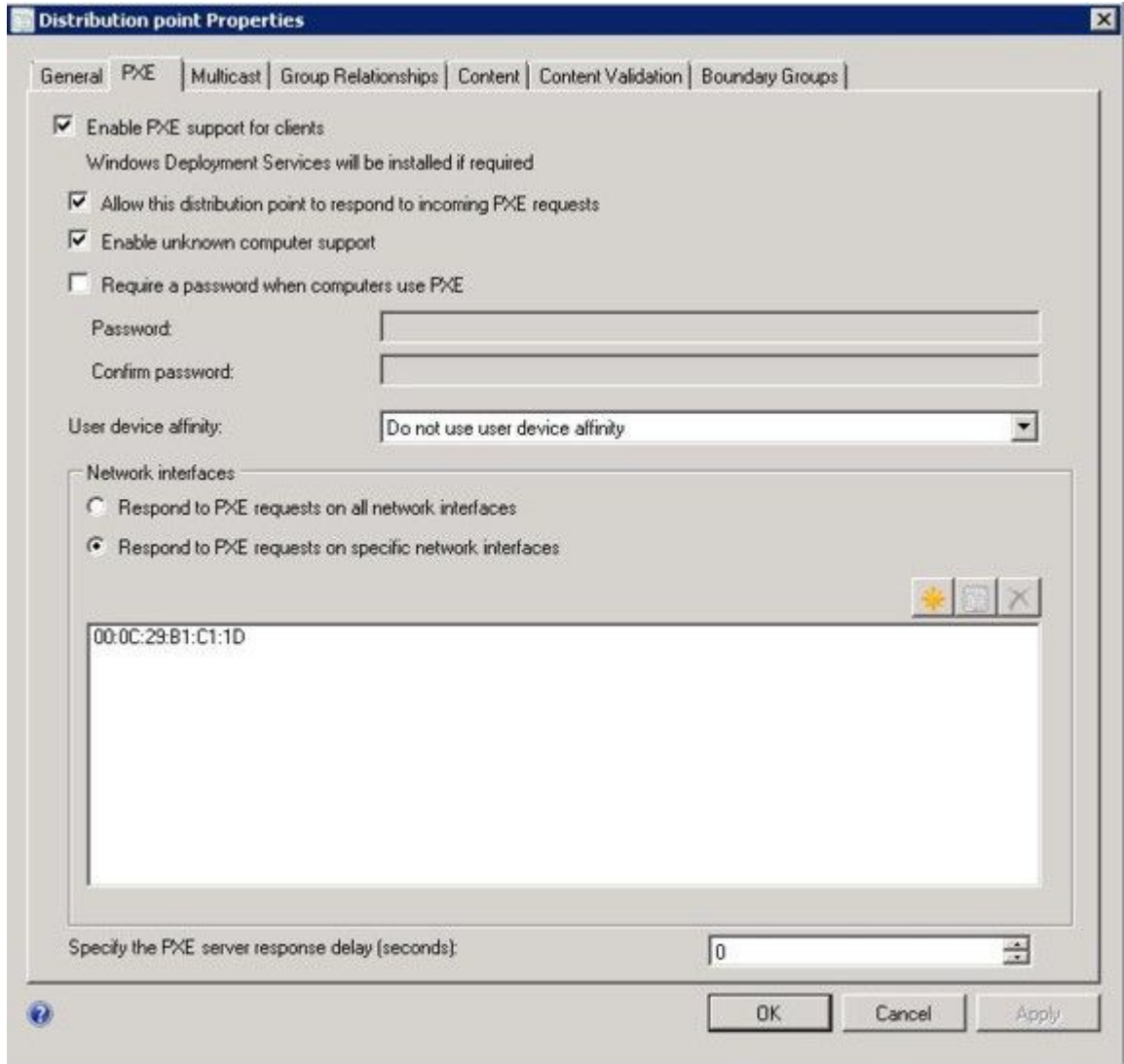


Figure 55. Enable PXE role

Step 4. Select the **Enable PXE support for clients** check box, and select **Allow this distribution point to respond to incoming PXE requests**.

Step 5. Click **OK**.

Post-installation configuration

After the Lenovo Deployment Pack has been installed, copy the newly imported driver packages, toolkit packages and boot image to the distribution points to make them available for the target servers to deploy.

Copying the new items to the distribution points makes them available for the target servers to deploy. Copy the following packages to the distribution points:

- All packages under **Overview** → **Application Management** → **Packages** including Lenovo Server Deployment, the Configuration Manager client package, and any SEP packages that have been added.
- The Lenovo boot image located at **Overview** → **Operating System** → **Boot Images**. If the generic boot image has not been updated, update it now.

- Driver packages that are located at **Overview → Operating System → Driver Packages → Lenovo Server Driver Packages**.

Before copying the new items to distribution points, verify that the configurations are correct for each item:

- If you are updating the boot images, right click the boot image, click **Properties**, and then select **Deploy this boot image from the PXE service point**, as shown in the following figure.

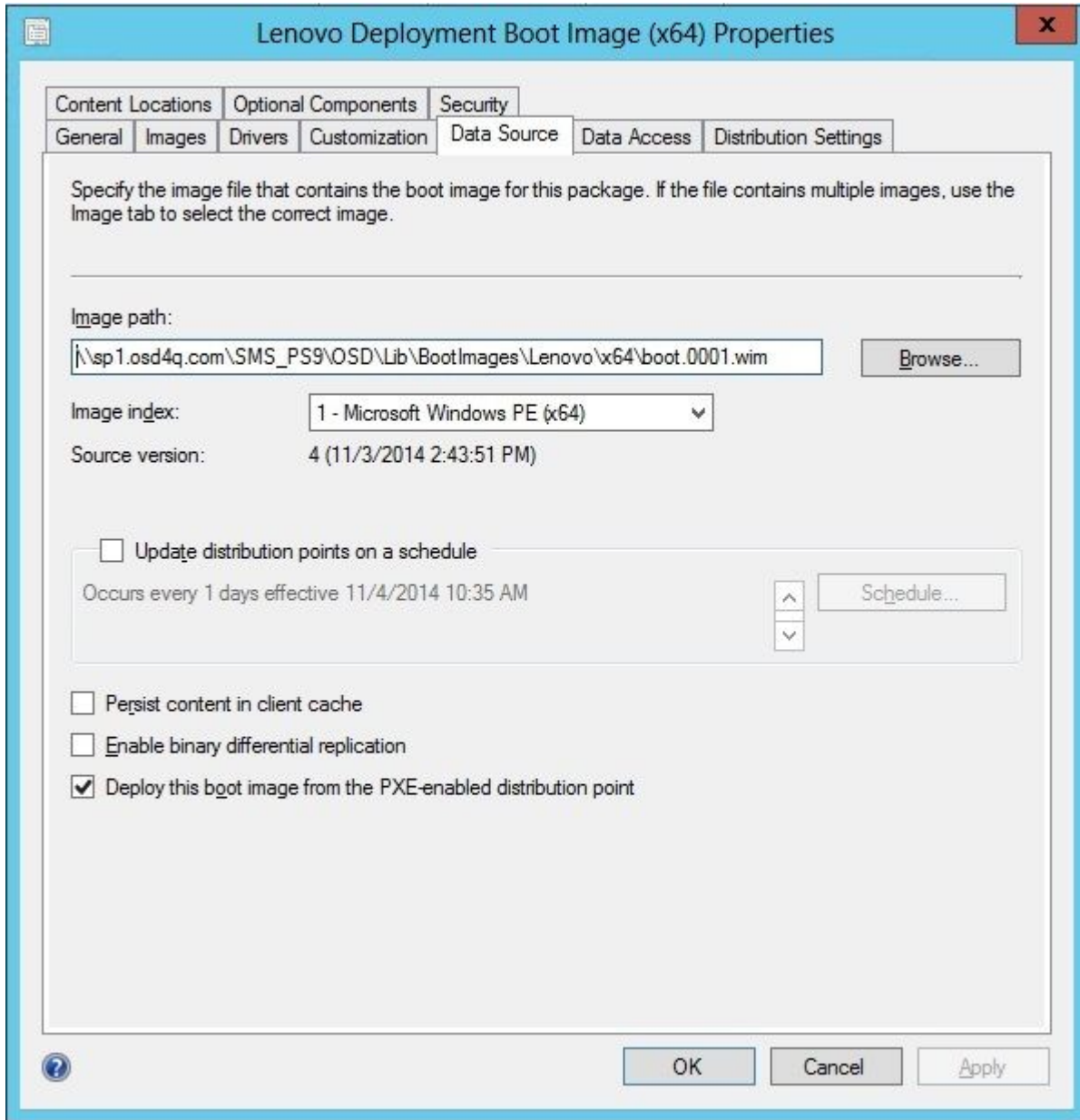


Figure 56. Configuring the data source

- On the **Data Access** tab, select **Copy the content in this package to a package share on distribution points** as shown in the following figure.

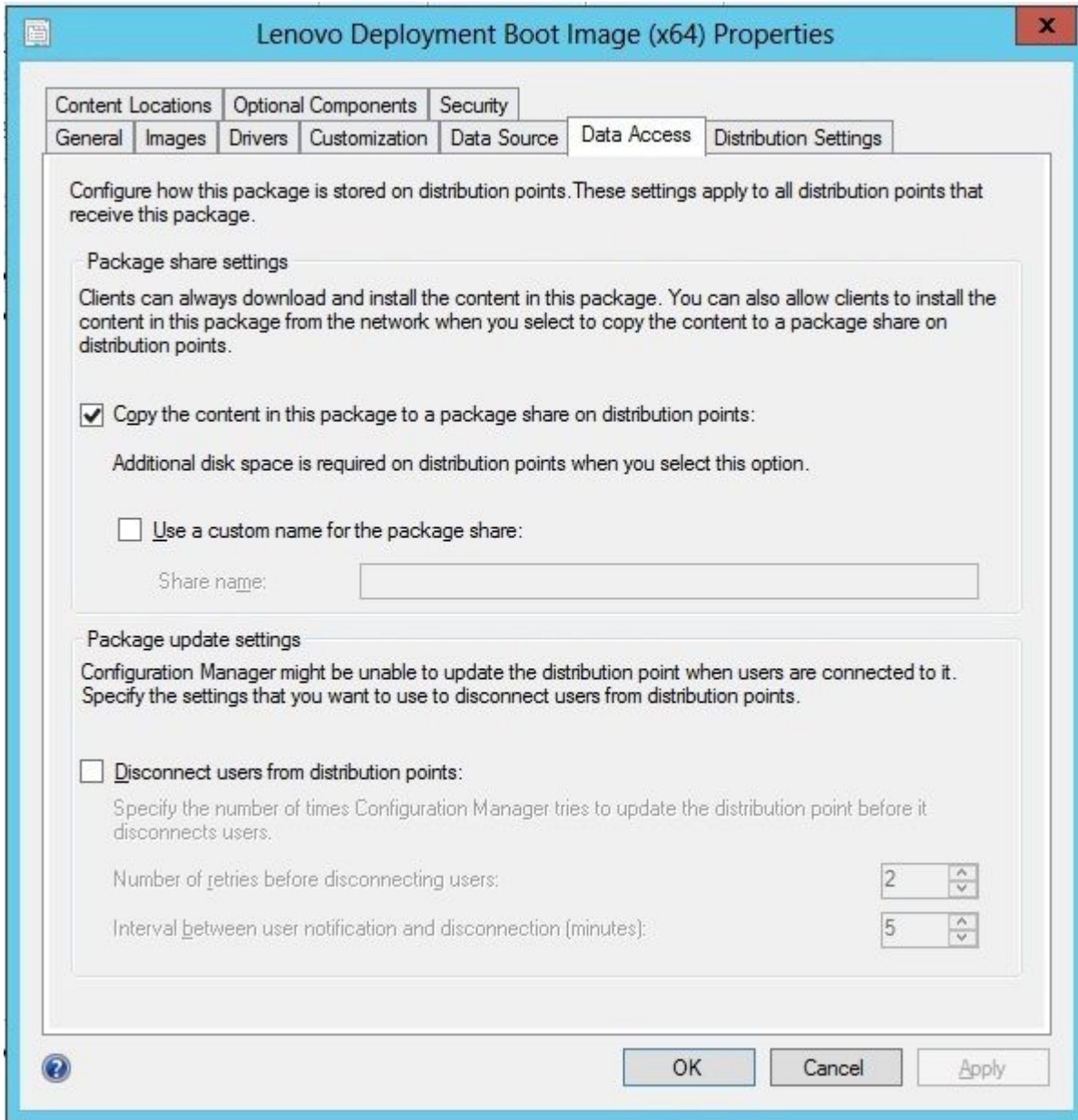


Figure 57. Package share settings

- If you are using SCCM 2012 SP1, select a size of 64 MB or more for the **Windows PE Scratch Space [MB]** menu, as shown in the following figure.

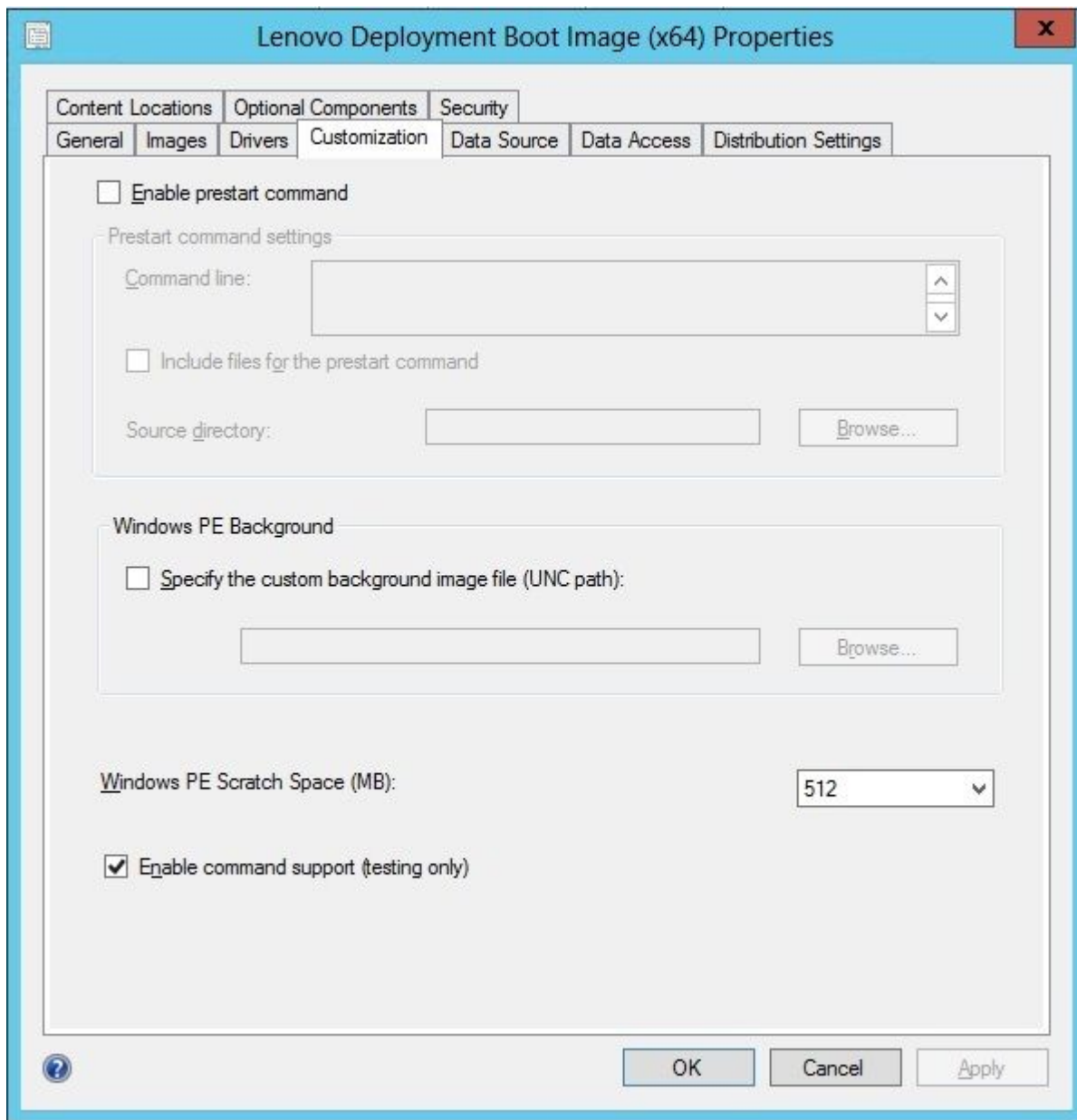


Figure 58. Set Windows PE Scratch Space

Refer to the following topics for instructions about copying and updating distribution points: “Managing distribution points” on page 56 and “Updating distribution points” on page 26.

Managing distribution points

This topic describes how to copy distribution points using the Manage Distribution Points Wizard.

- Step 1. Right-click each of the items listed in “Post-installation configuration” on page 53 and select **Distribution Content**.
- Step 2. Select the distribution points for which you want to copy the content and complete the wizard.

Note: For the Boot Images package, select the **Deploy this boot image from PXE service point** check box on the **Data source** tab beneath Property.

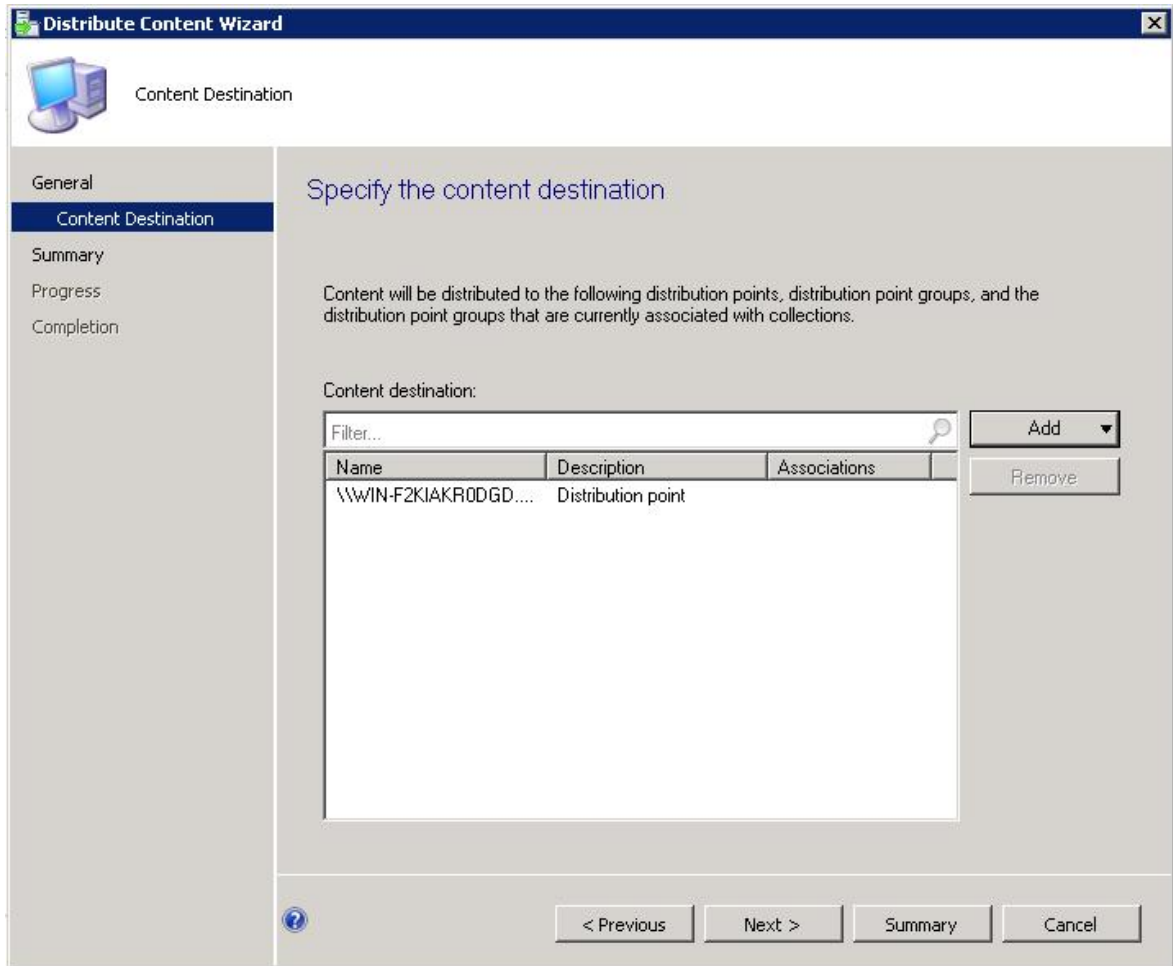


Figure 59. Distribution Content Wizard

Updating distribution points

This topic describes how to update distribution points using the Update Distribution Points Wizard.

- Step 1. After performing the steps in “Managing distribution points” on page 56, right-click each item and select **Update distribution points**.
- Step 2. Complete the Update Distribution Points Wizard for each package. A progress window showing the status of the update opens.

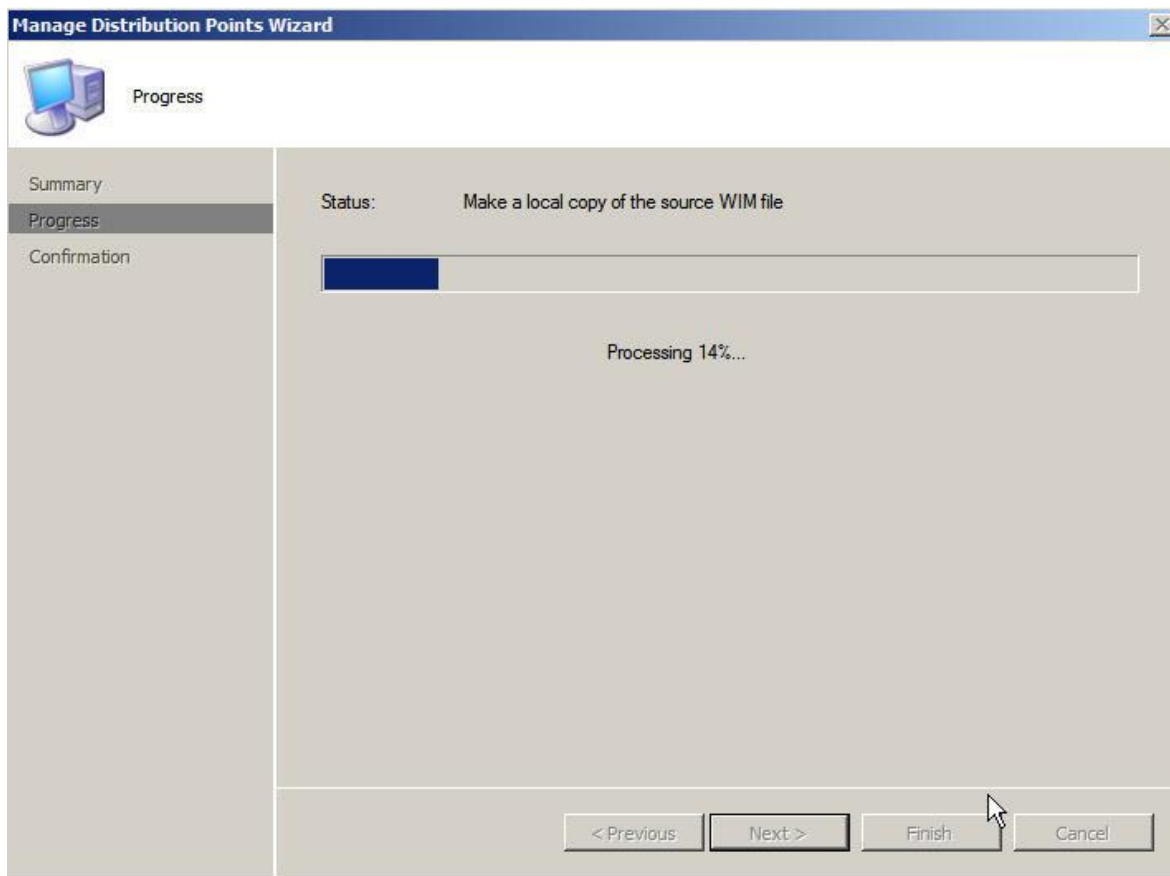


Figure 60. Update Distribution Points Wizard

Adding command-line support to the boot images for troubleshooting

Add command-line support to a boot image for easier troubleshooting on the target server and for quick access to the task sequence logs.

About this task

When a task sequence is running in Windows PE on a target server, you can open a command shell on the server by pressing F8. As long as the command shell is open, the task sequence will not reboot the server. You can verify components of the boot image and network connectivity. You can also view task log files.

Procedure

To enable the debug command shell, select **Enable command support (testing only)** in the boot image.

- Step 1. Click the **Software Library** tab, then click **Overview** → **Operating System** → **Boot Images** → **IBM Deployment** → **Lenovo Deployment Boot Image (x86)** or **Lenovo Deployment Boot Image (x64)**.
- Step 2. Right-click the boot image and select **Properties**.
- Step 3. Select the **Customization** tab.
- Step 4. Select the **Enable command support (testing only)** check box.

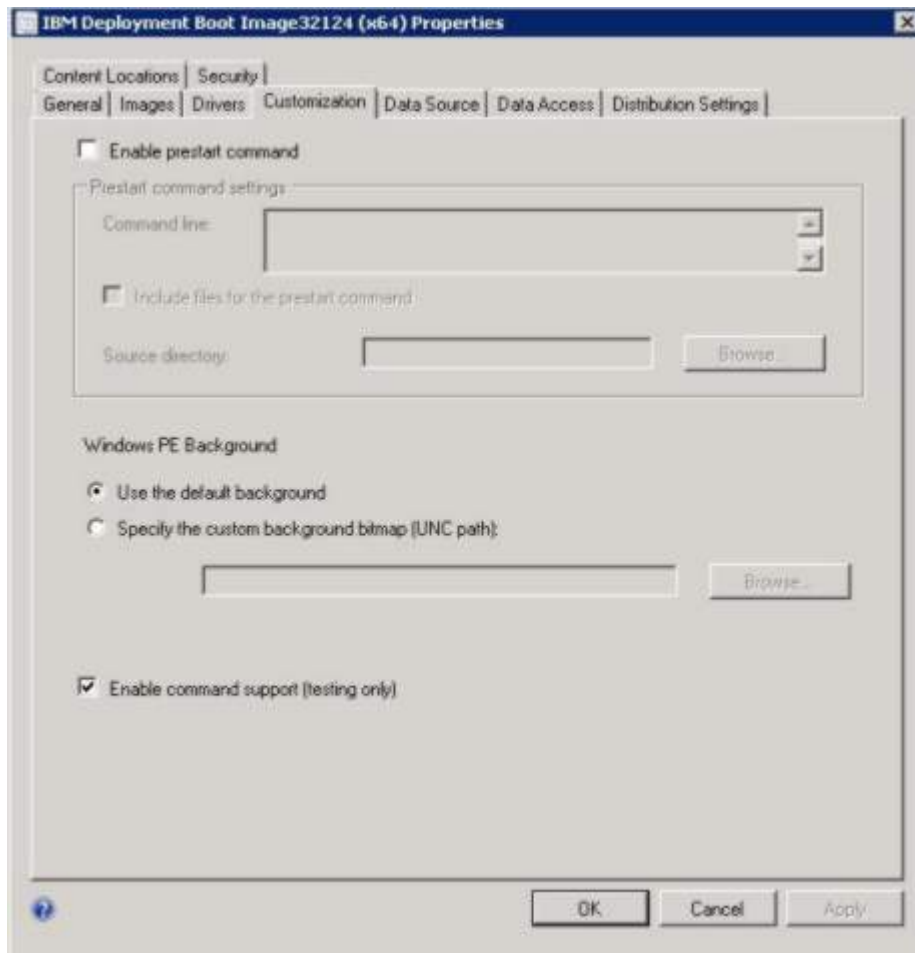


Figure 61. Enabling command-line support

Step 5. Click **OK**.

What to do next

After completing this procedure, update the distribution points. See “Updating distribution points” on page 57.

Preparing the operating system image

This section describes how to capture operating system images and prepare reference servers. You can use the operating system image in the operating system deployment task sequence.

Note: You can use images captured manually (without using Configuration Manager to do the capture). However, using Configuration Manager to capture the image can prevent problems when the image is deployed using Configuration Manager. The best practice is to capture the image using Configuration Manager.

Capturing operating system images

Use Configuration Manager to capture operating system images.

Lenovo Deployment Pack supports the clone method to install operating systems. To use this method, you must prepare an operating system image.

Preparing the reference server

This topic directs you to information about building the reference server, which is required when capturing operating system images.

Procedure

- Step 1. Build the reference server with everything installed that is required for the image. Include everything that a new system might require, such as tools, drivers, agents, service packs, and updates.
- Step 2. On the reference server, run the **sysprep /generalize** command to prepare the image for installation onto other servers. For instructions, see Appendix C “Running Sysprep” on page 121.

Adding a target server to Configuration Manager

This topic describes how to create a collection and add one or more servers to it.

About this task

To enable SCCM to recognize the target server, use the MAC address of the system's primary network interface (the interface used for deployment). To group servers, SCCM uses collections. A number of default collections are already created based on operating system version and other attributes. Use the following procedure to create a new collection to use for deployments.

Procedure

- Step 1. Select the **Assets and Compliance** tab, then right-click **Overview → Devices → Import Computer Information**. The Import Computer Information Wizard dialog opens. You can add one or more servers to a collection at the same time. The following figure is an example of adding a single server.

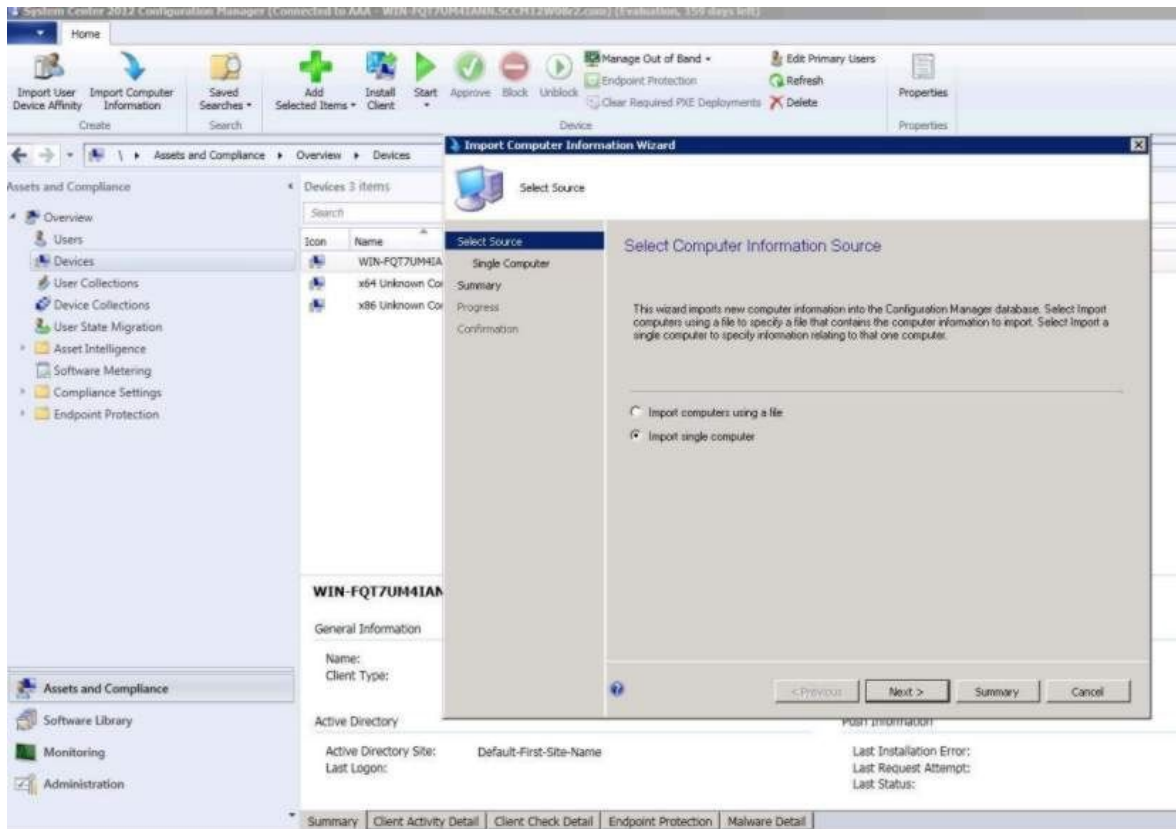


Figure 62. Import Computer Information Wizard

- Step 2. Select **Import single computer**, then click **Next**.
- Step 3. Enter the computer name and MAC address or GUID information of the target server, or click **Search** to navigate to the source computer.

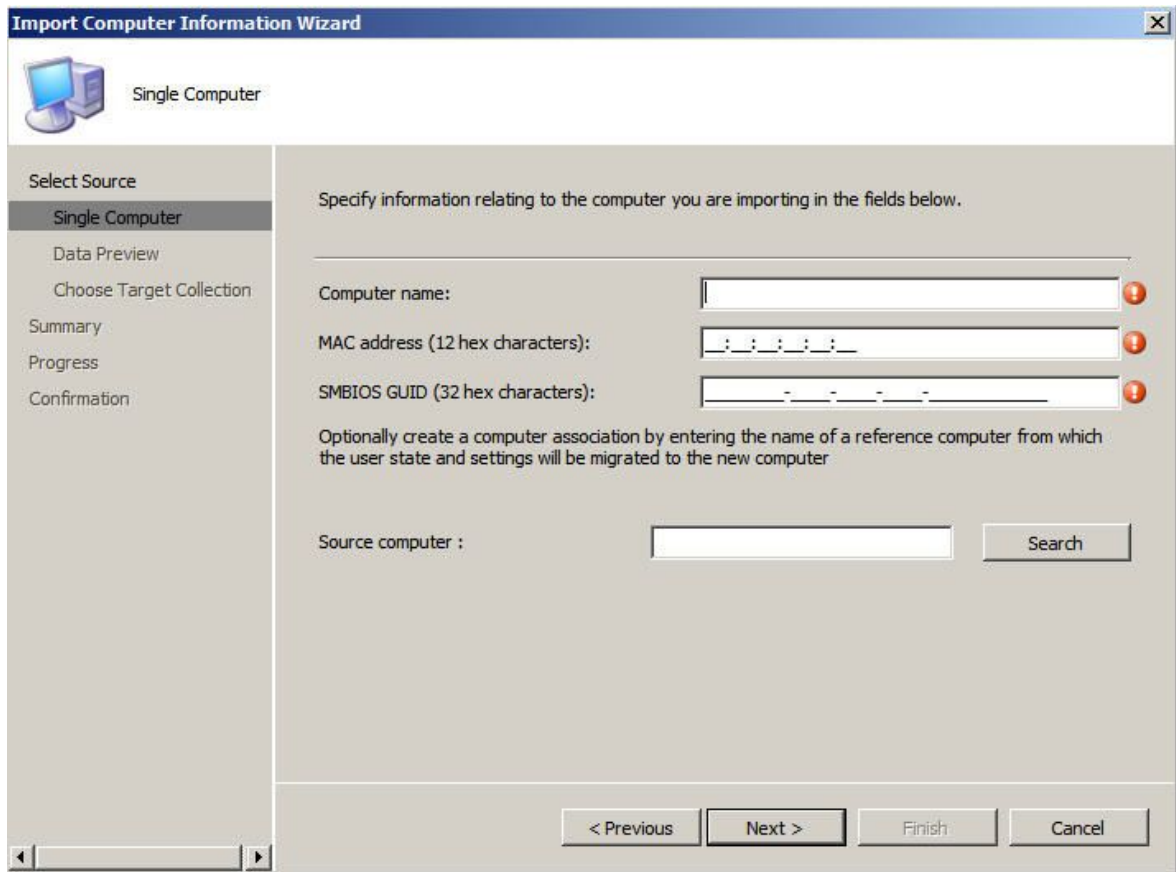


Figure 63. Adding a single computer

- Step 4. Click **Next**.
- Step 5. Select whether to add the new computer to the All Systems collection, or click **Browse** to select an existing collection to add the computer to.

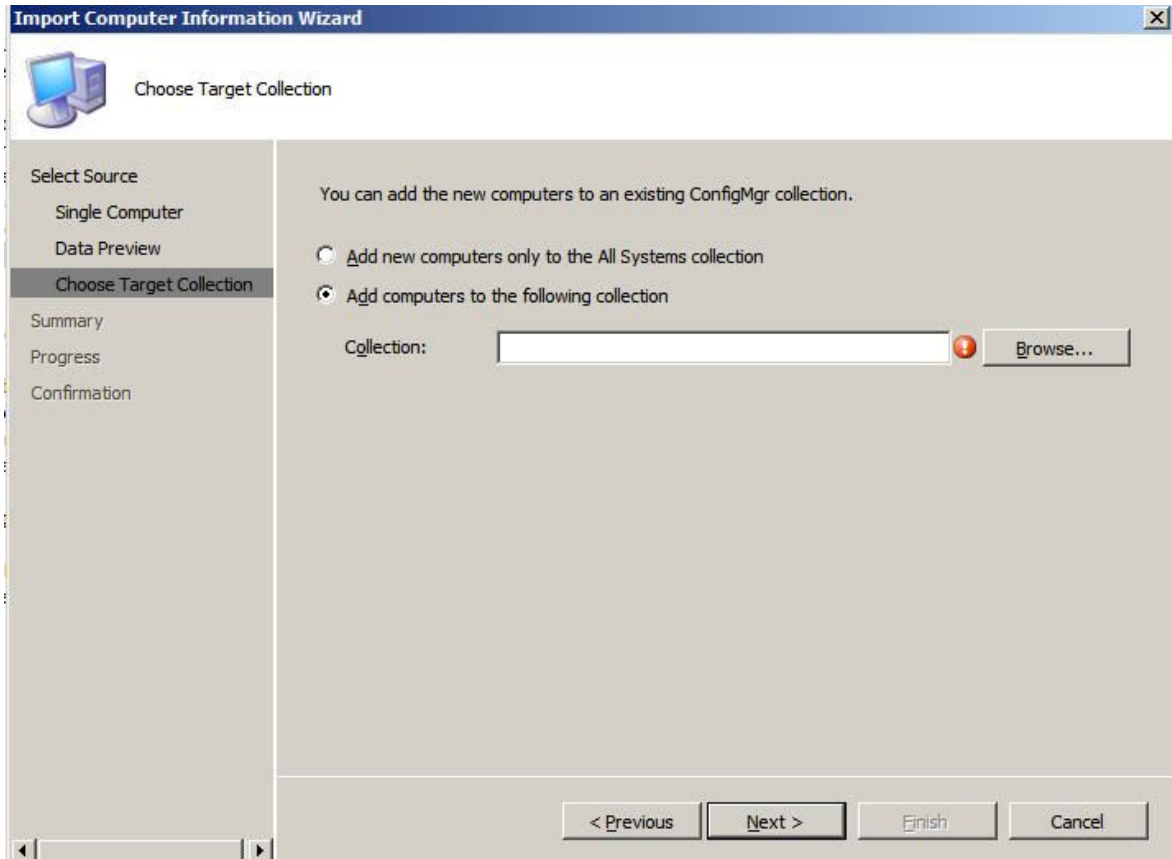


Figure 64. Adding the new computer to a collection

- Step 6. Click **Next**.
- Step 7. Continue through the remaining pages by clicking **Next**.
- Step 8. On the last page, click **Finish**.

Preparing Configuration Manager

This topic describes how to prepare the target server for the operating system captured in Configuration Manager.

Procedure

- Step 1. On the target server (in this case, the server that is to be captured), set the variable that contains the location of the operating system to be captured.
 - a. Go to the collection with the target reference server.
 - b. Right-click the server object, then select the **Variables** tab.
 - c. Set the `OSDTargetSystemRoot` variable to the system driver, for example:
`OSDTargetSystemRoot=c:\windows`

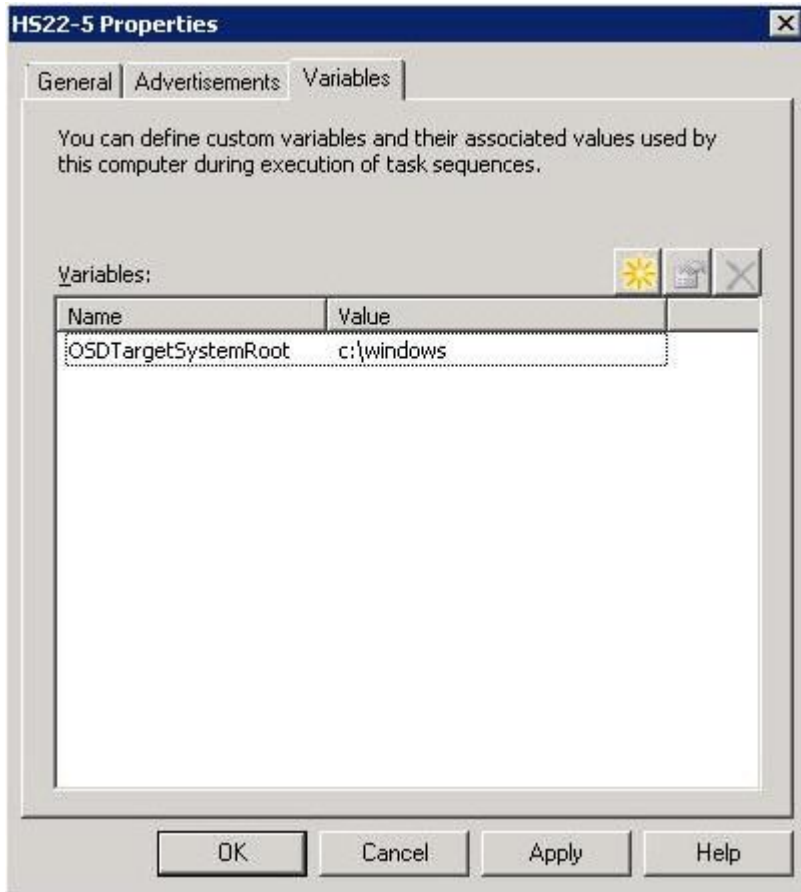


Figure 65. Setting the location variable

- Step 2. Set up a shared folder on the Configuration Manager site server to store the captured images. For example, create a directory called `c:\images`. Create a share and assign everyone full control for the share permissions.
- Step 3. Create a task sequence for capturing the image:
- Go to the **Software Library** tab, and then go to **Overview** → **Operating System** and right-click on **Task Sequences**.
 - Select **New** and then select **Task Sequence**.
 - When the wizard opens, select **New custom task sequence** and follow the prompts.
- Note:** This action creates an empty task sequence.
- Select the Lenovo custom boot image, and make sure that **PXE media** is selected.
- Step 4. Open the task sequence editor by right-clicking the newly-created task sequence, and select **Edit**.
- Step 5. From the **Add** menu, select **Images** → **Capture Operating System Image**. A screen similar to the following one opens.

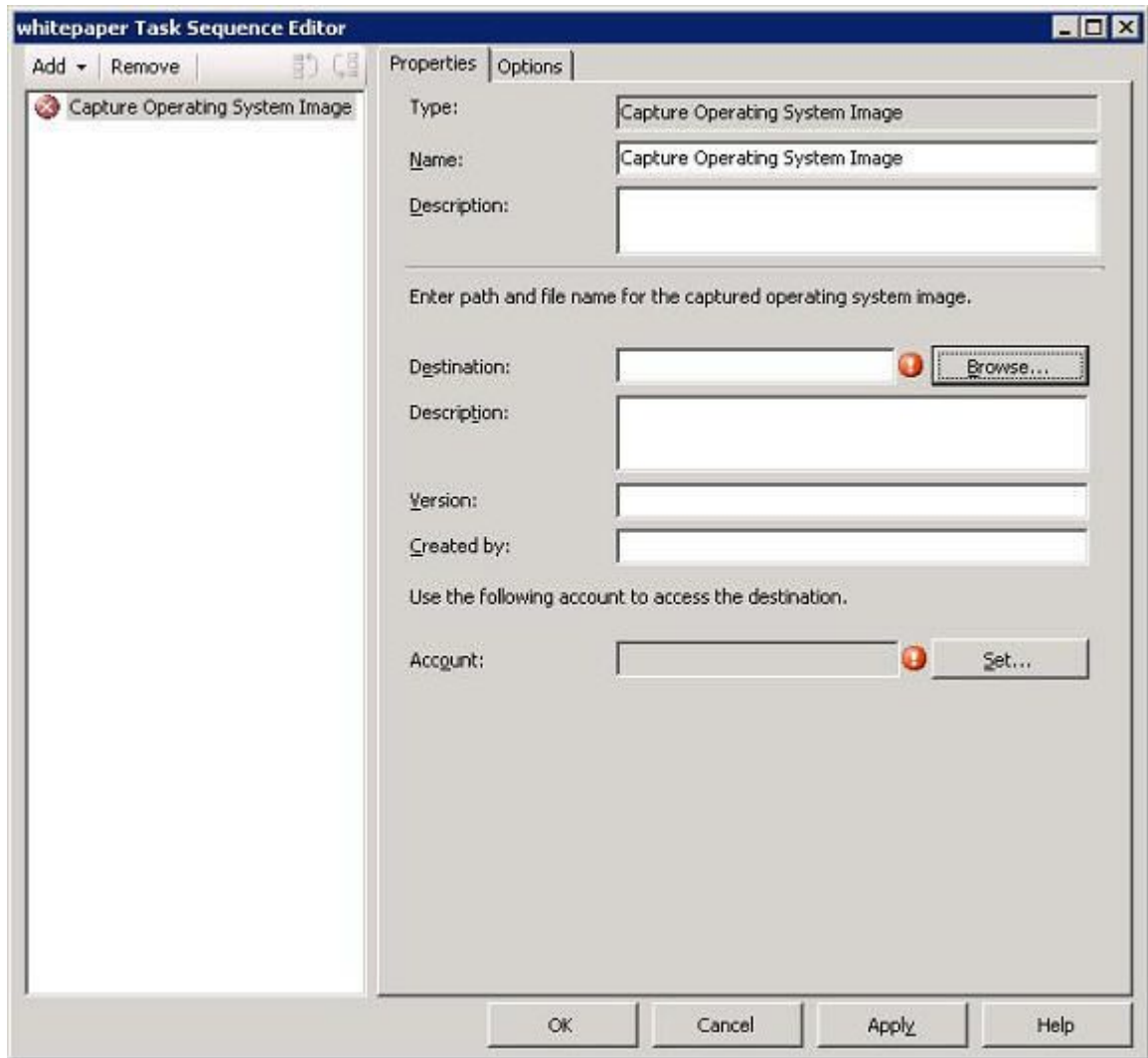


Figure 66. Capture Operating System Image

- Step 6. Enter the destination file name for the image and the access account information and click **OK**. Make sure the folder is shared with the appropriate permissions so that the image can be accessed by the task sequence. You can now use this simple task sequence to capture the operating system from the reference server built earlier.

Now that a capture task sequence exists, it must be advertised to the reference server. All task sequences in SCCM are advertised to the target or client server so that the appropriate job can be executed against the intended server.

- Step 7. To create an advertisement, right-click on the task sequence, select **Deploy**, and follow the wizard prompts. See the following images for the recommend settings.

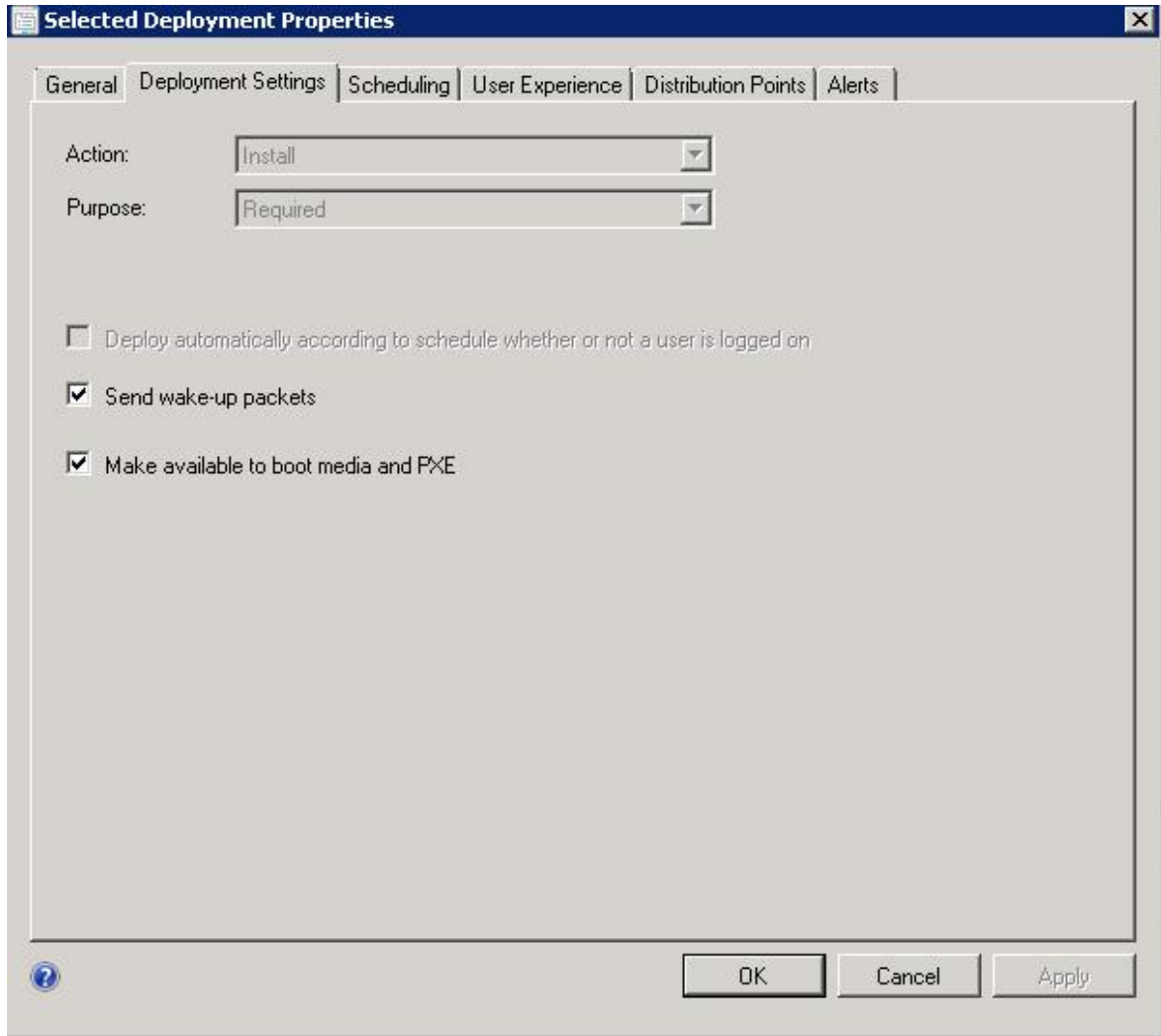


Figure 67. Deployment properties, Deployment Settings tab

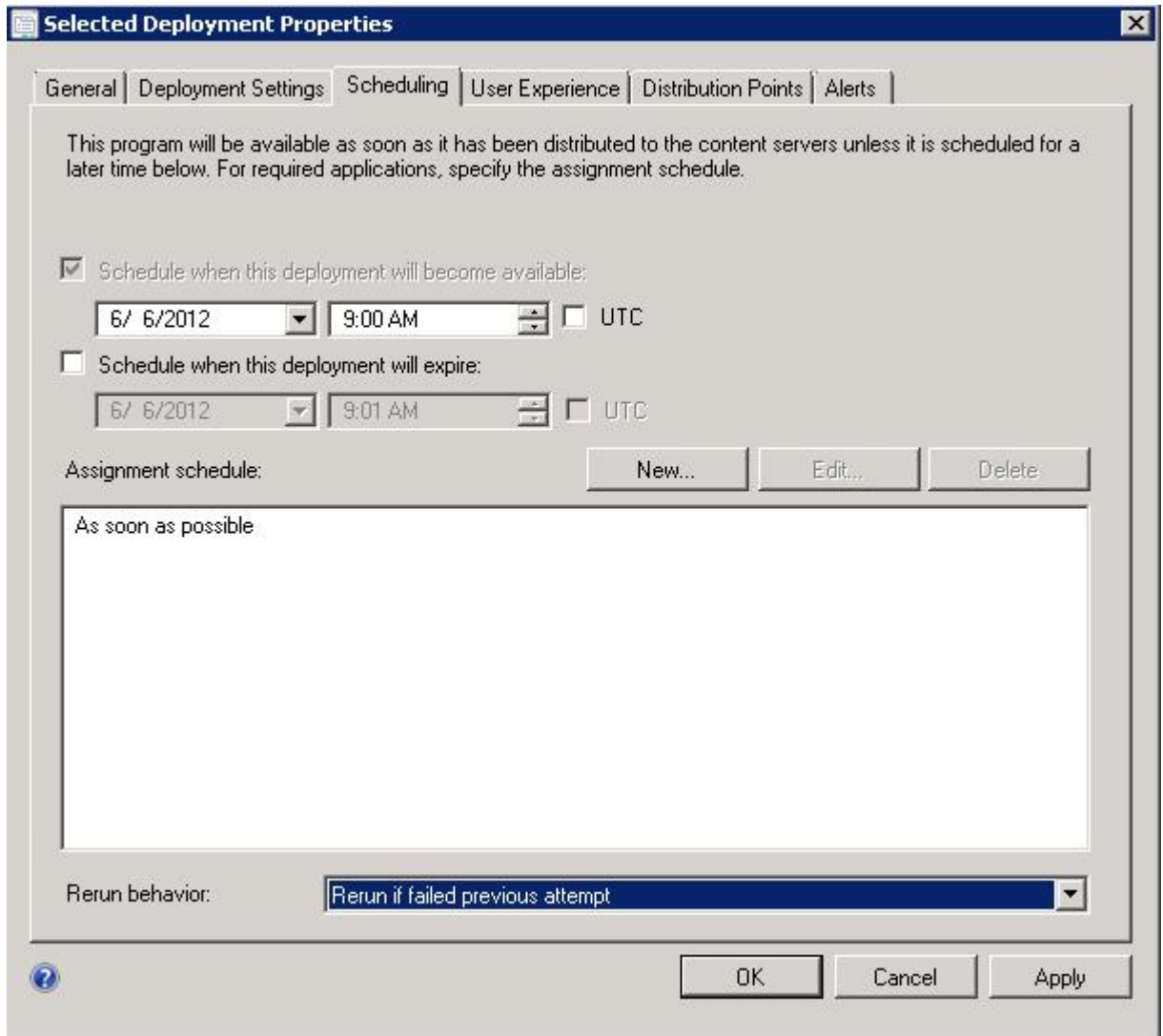


Figure 68. Deployment properties, Scheduling tab

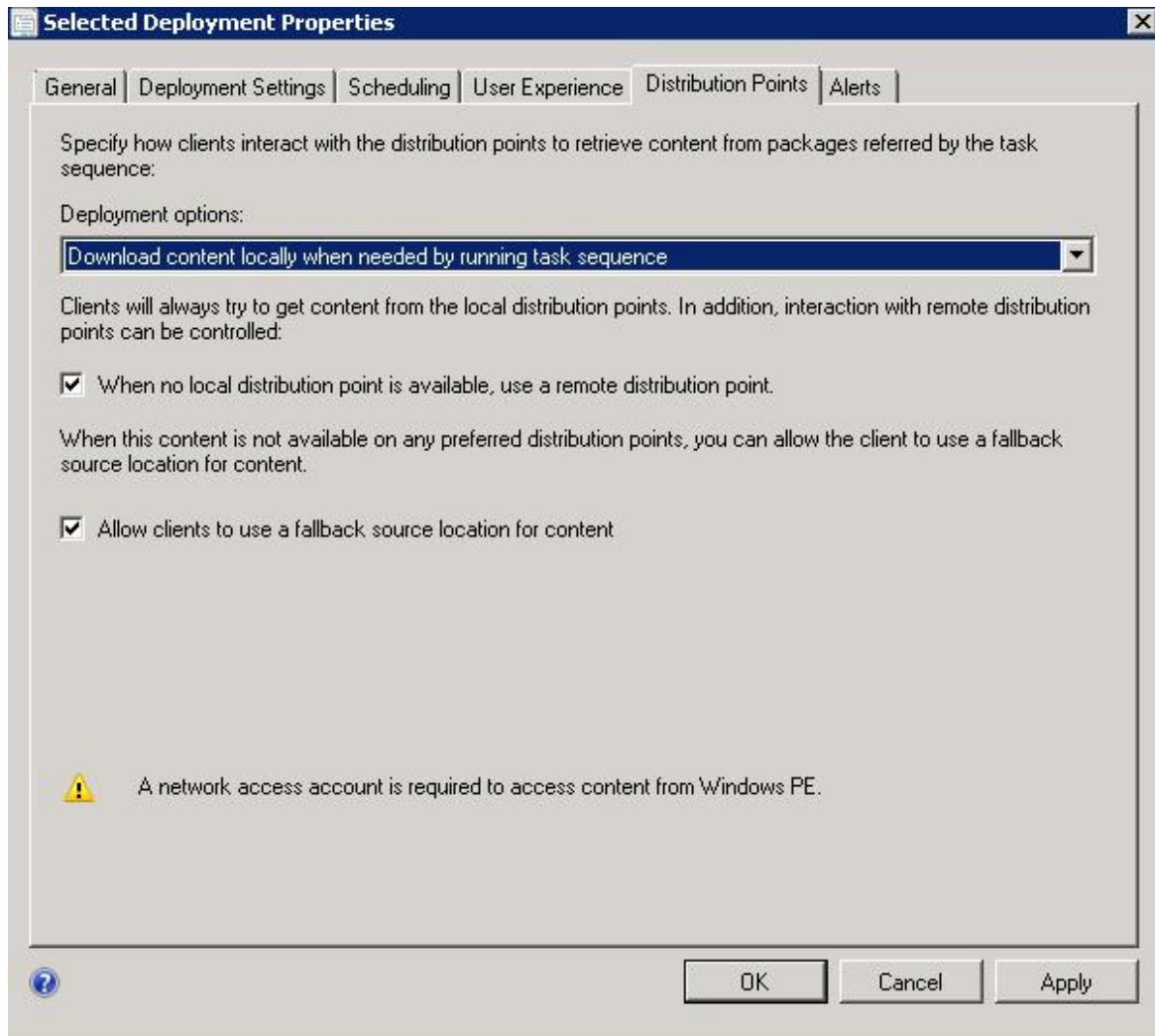


Figure 69. Deployment properties, Distribution Points tab

Step 8. Click **OK**.

Starting the reference server

This topic explains how to start the reference server that is being captured.

Now that the advertisement is waiting, start the server that is being captured to the Preboot Execution Environment (PXE). Verify that the site server and the target server connect, and ensure that the site server transfers the boot image to the site server shared drive. The target server connects to the Configuration Manager site server and loads the boot image from the shared drive. Then, the target server starts the task sequence to capture the operating system image from the target server to the shared drive on the Configuration Manager site server.

Verifying the image on Configuration Manager

After the capture process is complete, you must verify that the image exists on the Configuration Manager server.

After the capture process has completed, go back to the Configuration Manager server and verify that the `image_name.wim` file is stored in the shared images directory. Now, use Configuration Manager to deploy the image to other servers.

Adding, managing, and updating operating system images

After the operating system image has been captured, add it into the SCCM distribution point for delivery.

To add the operating system image to the SCCM distribution point for delivery, you must first add the operating system image and then manage and update the distribution points.

Adding operating system images

Use these steps to add the operating system images to the distribution point for delivery.

Procedure

- Step 1. On the **Software Library** tab, click **Overview** → **Operating System** → **Operating System Images** → **Adding Operating System Images**.

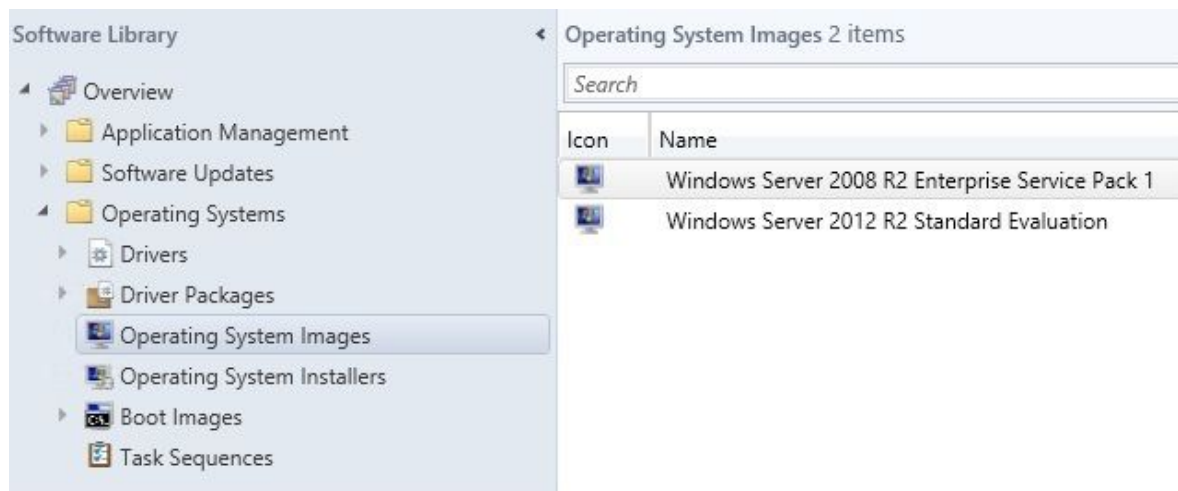


Figure 70. Adding operating system images

- Step 2. Click through the wizard prompts to finish.

Managing and updating distribution points for operating system images

This topic describes how to manage and update operating system images. By performing these steps, the operating system image is copied and updated to the distribution point, where the client system can access and download it.

About this task

This procedure is similar to the procedures “Managing distribution points” on page 56 and “Updating distribution points” on page 57.

Procedure

- Step 1. Right-click the newly added operating system image, and select **Distribution Content**.
- Step 2. Complete the Manage Distribution Points wizard for the image.
- Step 3. Right-click the newly added operating system image, and select **Update Distribution Points**.
- Step 4. Complete the Update Distribution Points wizard for the image.

Chapter 4. End-to-end deployment scenario

Although the Lenovo Deployment Pack provides various hardware configuration and operating system deployment functionality, the execution process is similar. This section describes how to deploy the task sequence and explains the end-to-end deployment scenario. Use this scenario to deploy different scripts to fulfill different Deployment Pack functions.

End-to-end deployment scenario in SCCM 2007

This section covers the end-to-end deployment scenario in SCCM 2007.

Adding a target server to Configuration Manager

The first task in the scenario is to add the target server to Configuration Manager so that Configuration Manager will recognize the target server as a known server when deploying the task sequence.

About this task

For detailed steps, refer to “Adding a target server to Configuration Manager” on page 41.

Preparing a task sequence

This topic explains how to create a task sequence by using the template provided in the Lenovo Deployment Pack.

About this task

The template provided by Lenovo Deployment Pack makes it quick and easy to create a task sequence. A completed task sequence template that includes hardware configuration, operating system deployment, driver feeding and more will be automatically created.

Procedure

- Step 1. Open the Configuration Manager console and navigate to **Operating System Deployment → Task Sequence**.
- Step 2. Right-click Task Sequence, then select **Bare Metal Server Deployment → Create a Lenovo Server Deployment Task Sequence**. The template shown in the following figure opens.



Figure 71. Creating a task sequence

- a. From the list of Lenovo specific hardware configuration actions that can be performed on System x servers, select the hardware items to configure for the task sequence.
- b. In the center panel, enter the security information in the **Account Name** and **Password** fields.
- c. On the right, select the operating system image to be used for this deployment.

Step 3. When you are finished, select **Create** to create the task sequence.

Step 4. Because you must specify some configuration information for the steps in the created task sequence, such as RAID level and operating system password, you must edit this task sequence. In the left navigation panel, right-click the new task sequence and select **Edit**. A window similar to that shown below opens.

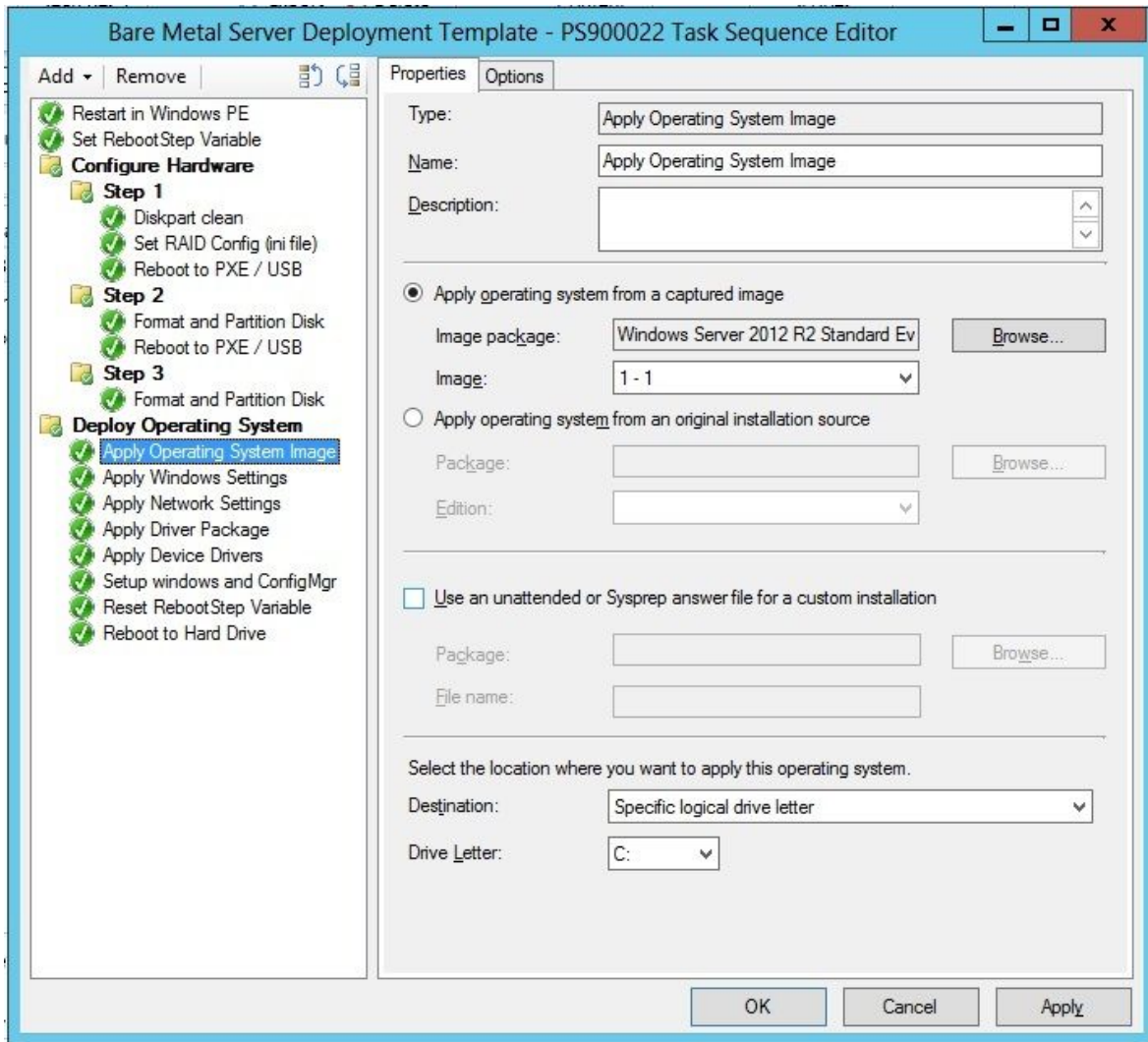


Figure 72. Applying driver package properties

Step 5. Depending on the operating system you are deploying, you may need to manually select the mass storage driver as you create the task sequence:

- If you are deploying Windows 2003 to the client server, ensure that the mass storage driver is selected from the Windows 2003 driver package in the Apply Driver Package step during the process for creating a task sequence for Lenovo servers, as described in “Creating a task sequence for Lenovo servers” on page 28.
- If you are deploying another operating system, Lenovo Deployment Pack transparently selects the mass storage driver.

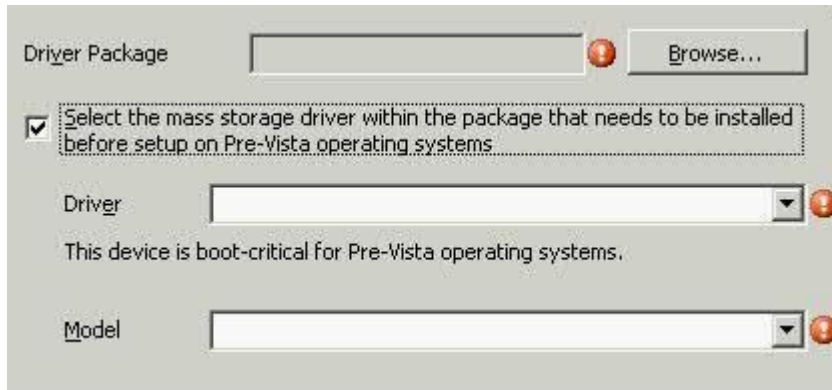


Figure 73. Selecting the mass storage driver

The actions from configuring hardware are provided by the Lenovo Deployment Pack pre-operating system load. In these examples, Deploy Operating System is a Windows® installation with the Lenovo driver packages added.

Step 6. Click **OK**.

Note: For Lenovo specific hardware configuration, refer to Chapter 5 “Lenovo Deployment Pack features” on page 89.

Note: Prepare the operating system deployment image file by using the instructions in “Preparing the operating system image” on page 59.

Advertising a task sequence

After creating and saving a task sequence, create an advertisement and deploy it to a collection.

About this task

Advertisements are used in Configuration Manager to assign jobs to client servers, in this case, the server that is being deployed, such as running a task sequence to deploy a Windows operating system on a client server.

Procedure

- Step 1. Right-click the task sequence, and select **Advertise**.
- Step 2. Select the collection that contains the target server.
- Step 3. Select **Make this task sequence available to boot media and PXE**.

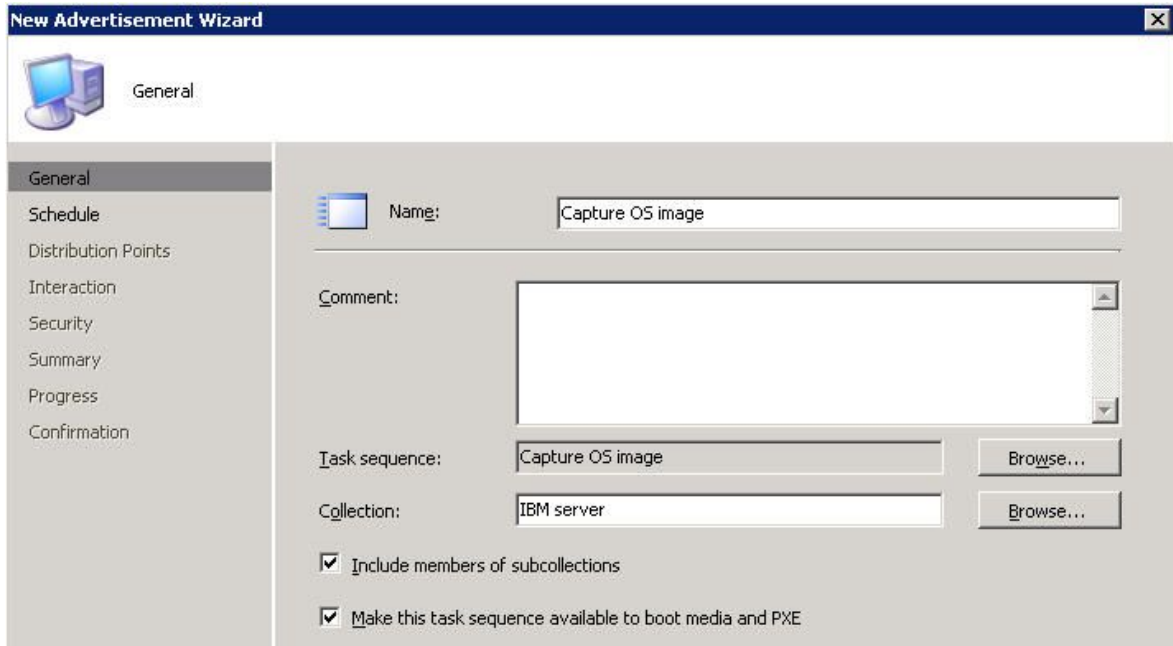


Figure 74. Selecting the collection containing the target server

Step 4. Click **Next**.

Step 5. On the Schedule panel:

- a. In the **Mandatory assignments** field, select **As soon as possible**.
- b. Select all check boxes.
- c. From the **Priority** field list, select **High**.
- d. From the **Program rerun behavior** list, select the any of the options.
- e. Click **Next**.

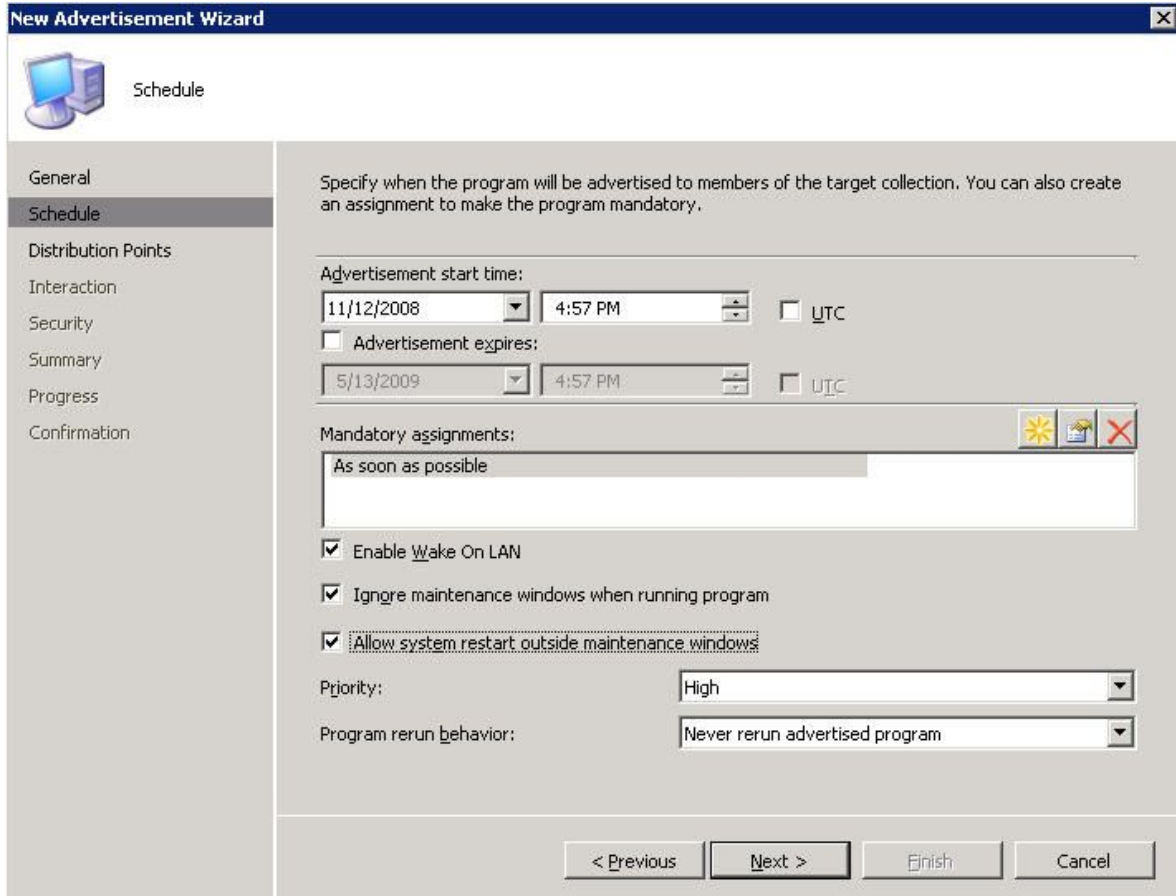


Figure 75. Scheduling the advertisement

- Step 6. On the Distribution Points panel:
- Select **Access content directly from a distribution point when needed by the running task sequence.**
 - Select the **When no local distribution point is available, use a remote distribution point** check box.
 - Select the **When no protected distribution point is available, use an unprotected distribution point** check box.

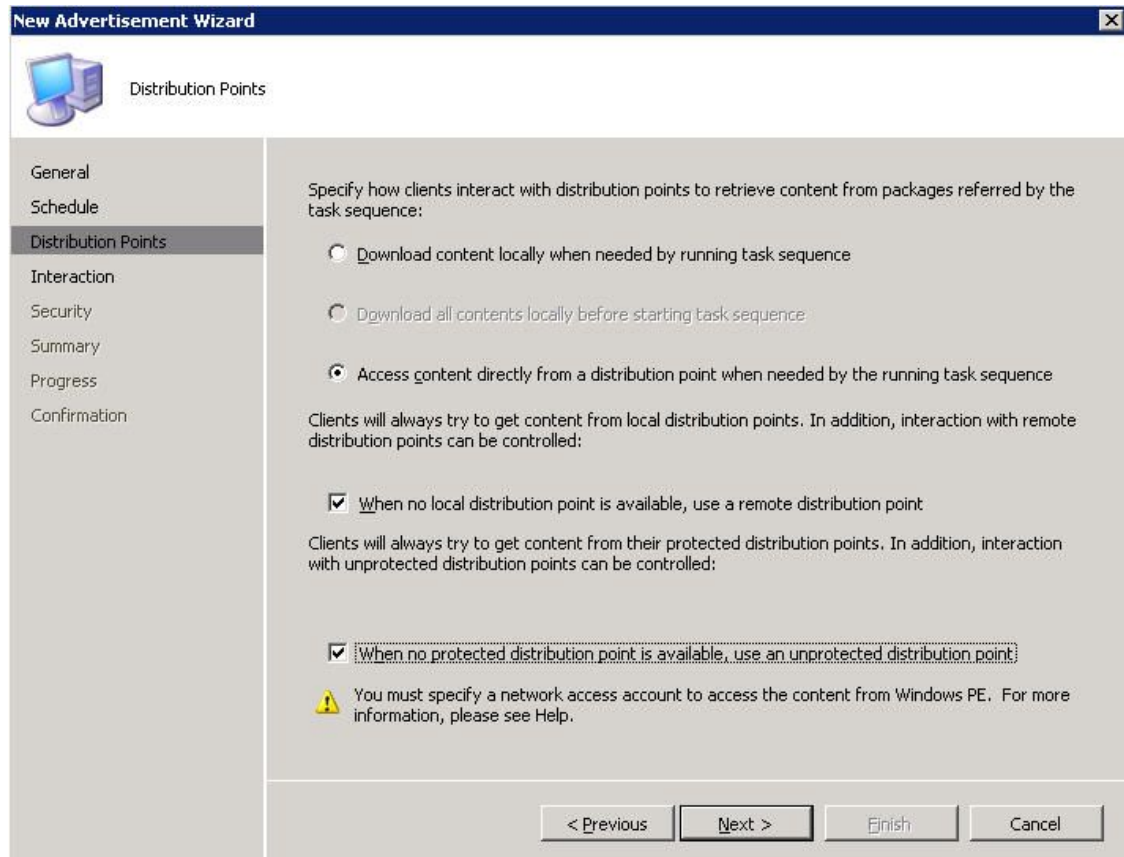


Figure 76. Specifying distribution points options

Step 7. Click **Next**.

Step 8. Click **Finish**.

Checking the task sequence execution result

Ensure that the task sequence can be started successfully.

Procedure

Step 1. After performing the procedure in “Advertising a task sequence” on page 74, restart the target server from PXE.

PXE is a boot option in the target server. After the target server is booted from PXE, it receives the PXE message from the SCCM server and begins loading the boot image, as shown in the following figure.

```
CLIENT MAC ADDR: 00 1A 64 21 36 90 GUID: 84C21702 6A5B DD11 99E1 B884D4733EA1
CLIENT IP: 9.125.90.16 MASK: 255.255.255.0 DHCP IP: 9.125.90.211
GATEWAY IP: 9.125.90.1

Downloaded WDSNBP...

Architecture: x64

The details below show the information relating to the PXE boot request for
this computer. Please provide these details to your Windows Deployment Services
Administrator so that this request can be approved.

Pending Request ID: 830

Contacting Server: 9.125.90.86..
TFTP Download: smsboot\x64\pxeboot.n12
```

Figure 77. Restarting the target server from PXE

After the target server starts on PXE, the download process starts automatically from the SCCM server.

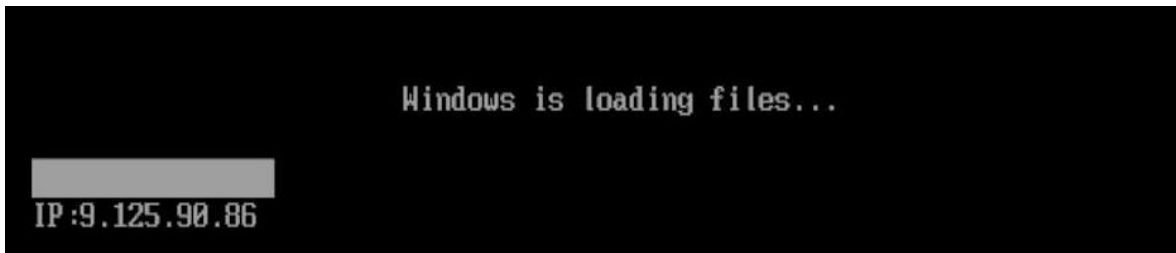


Figure 78. Starting the download process

- Step 2. The first action is run. In this example of the operating system deployment task sequence, the first action to run is the Format and Partition Disk action.



Figure 79. Running the Format and Partition Disk action

Step 3. The second action runs.

In this example, it is Apply Operating System Image.

Note: Different task sequences might have different actions. The windows are similar to those in the figures except for the different actions.

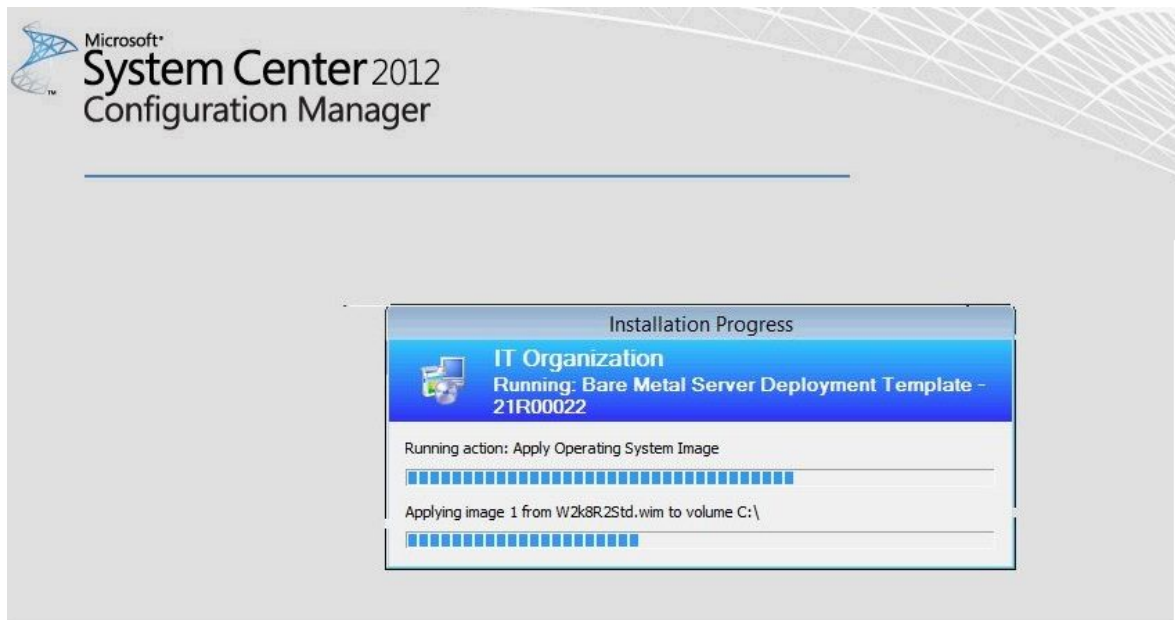


Figure 80. Running the Apply Operating System Image action

Step 4. After the task sequence is finished, the target server restarts to set up Windows and the corresponding hardware is configured.

End-to-end deployment scenario in SCCM 2012

This section covers the end-to-end deployment scenario in SCCM 2012.

Adding a target server to Configuration Manager

The first task in the scenario is to add the target server to Configuration Manager so that Configuration Manager will recognize the target server as a known server when deploying the task sequence.

About this task

For detailed steps, refer to “Adding a target server to Configuration Manager” on page 60.

Preparing a task sequence

This topic explains how to create a task sequence by using the template in the Lenovo Deployment Pack.

About this task

The Lenovo Deployment Pack includes a template to make it quick and easy to create a task sequence.

Procedure

- Step 1. Open the Configuration Manager console, and navigate to **Operating System → Task Sequence**.
- Step 2. Right-click **Task Sequence → Bare Metal Server Deployment → Create a Lenovo Server Deployment Task Sequence**. The template shown in the following figure opens.

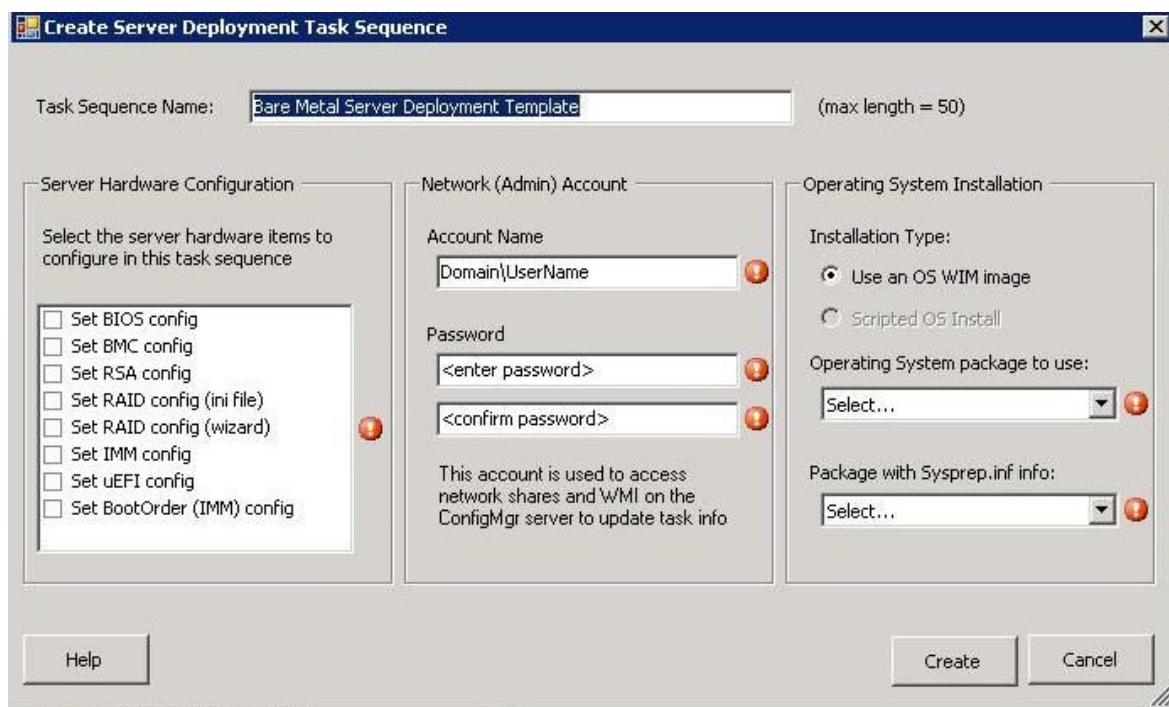


Figure 81. Creating a task sequence by using the template

- a. From the list of Lenovo specific hardware configuration actions that can be performed on System x servers, select the hardware items to configure for the task sequence.
- b. In the center panel, enter the security information in the **Account Name** and **Password** fields.
- c. On the right, select the operating system image to be used for this deployment.

Step 3. When you are finished, select **Create** to create the task sequence.

Step 4. In the left navigation panel, right-click the new task sequence, and select **Edit**. The Task Sequence Editor window opens, as shown in the following figure.

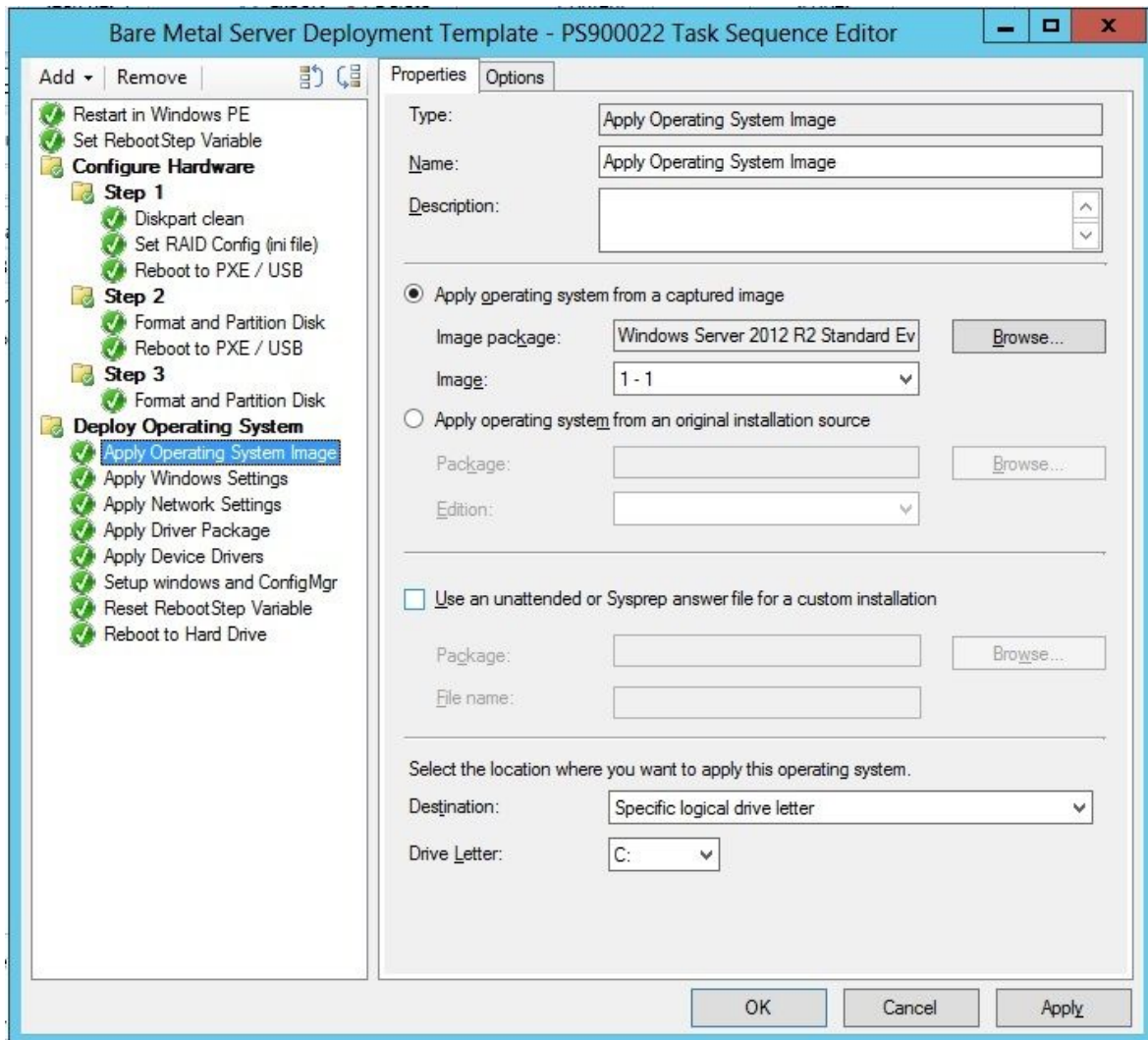


Figure 82. Applying driver package properties

Step 5. Depending upon the operating system you are deploying, you may need to manually select the mass storage driver:

- If you are deploying Windows 2003 to the client server, ensure that the mass storage driver is selected from the Windows 2003 driver package in the Apply Driver Package step described in “Creating a task sequence for Lenovo servers” on page 28.
- If you are deploying a different operating system, Lenovo Deployment Pack transparently selects the mass storage driver.

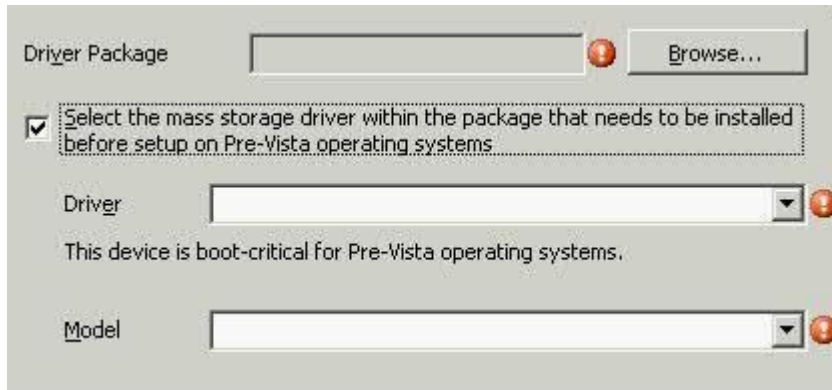


Figure 83. Selecting the mass storage driver

The action items in the hardware configuration panel are provided by the Lenovo Deployment Pack pre-operating system load. In these examples, Deploy Operating System is a Windows® installation with the Lenovo driver packages added.

Step 6. Click **OK**.

Note: For Lenovo specific hardware configuration, refer to Chapter 5 “Lenovo Deployment Pack features” on page 89.

Note: Prepare the operating system deployment image file by using the instructions in “Preparing the operating system image” on page 59.

Advertising a task sequence

After creating and saving a task sequence, create an advertisement and deploy it to a collection.

About this task

Advertisements are used in Configuration Manager to assign jobs to particular client servers, in this case, the server that is being deployed, such as running a task sequence to deploy a Windows operating system on a client server.

Procedure

- Step 1. Right-click the task sequence, and select **Deploy**.
- Step 2. Select the collection that contains the target server.
- Step 3. Select **Required** in the **Purpose** box, and select **Send wake-up packets** and **Make available to boot media and PXE**.

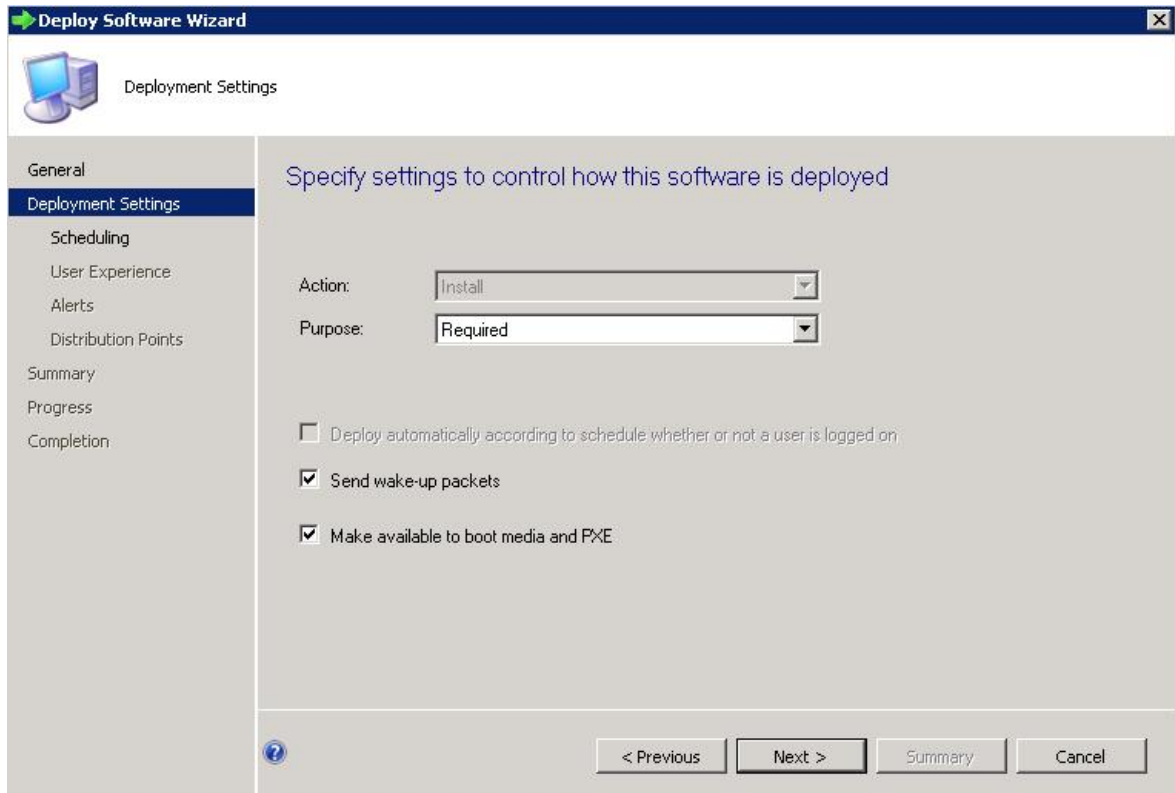


Figure 84. Select the deployment settings

Step 4. Click **Next**.

Step 5. On the Scheduling panel:

- a. In the **Assignment schedule** field, select **As soon as possible**.
- b. In the **Return behavior** field, select **never return deployed program**.
- c. Click **Next**.

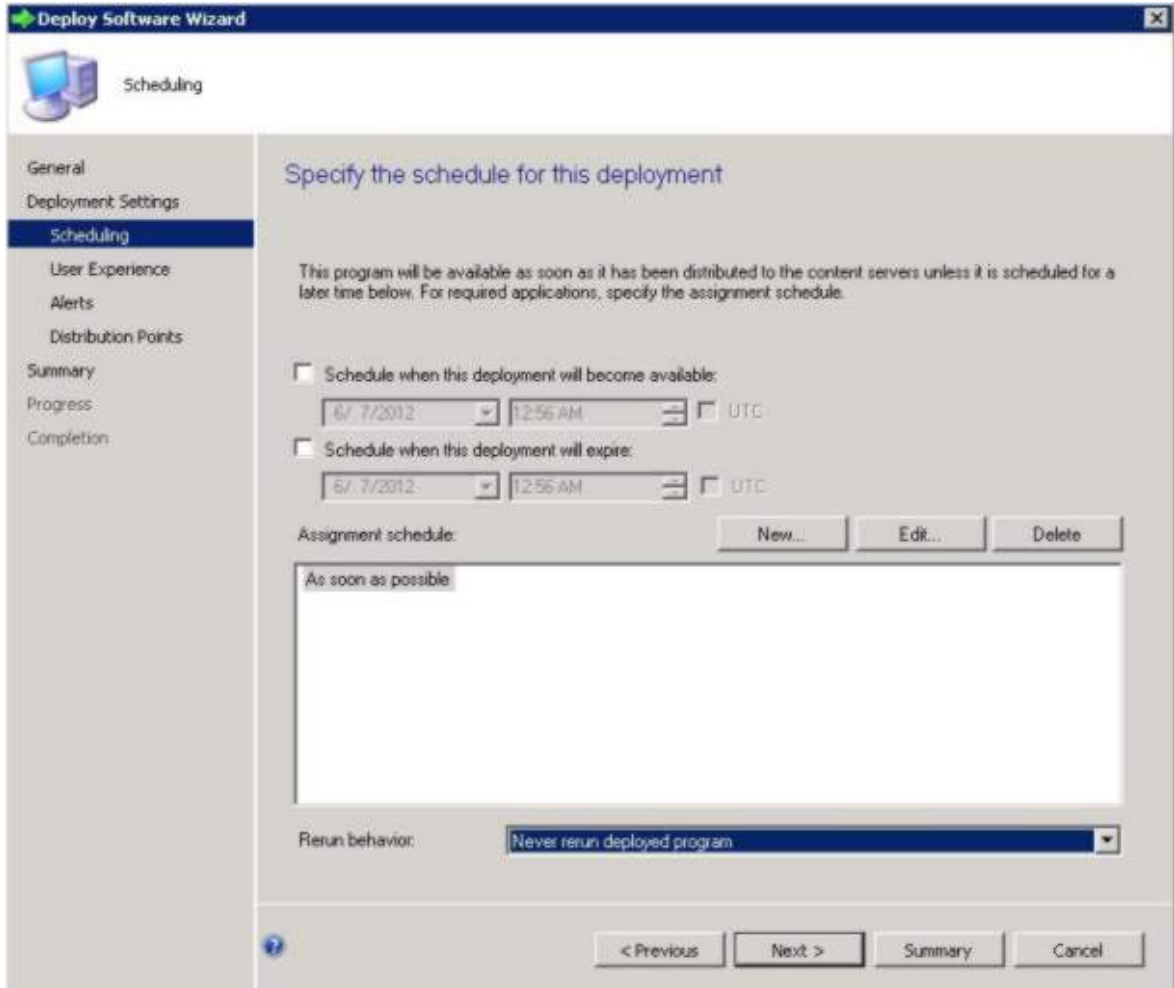


Figure 85. Schedule the deployment

- Step 6. Select **User Experience** from the left side of the window, and on that panel, select **Show Task Sequence progress**.

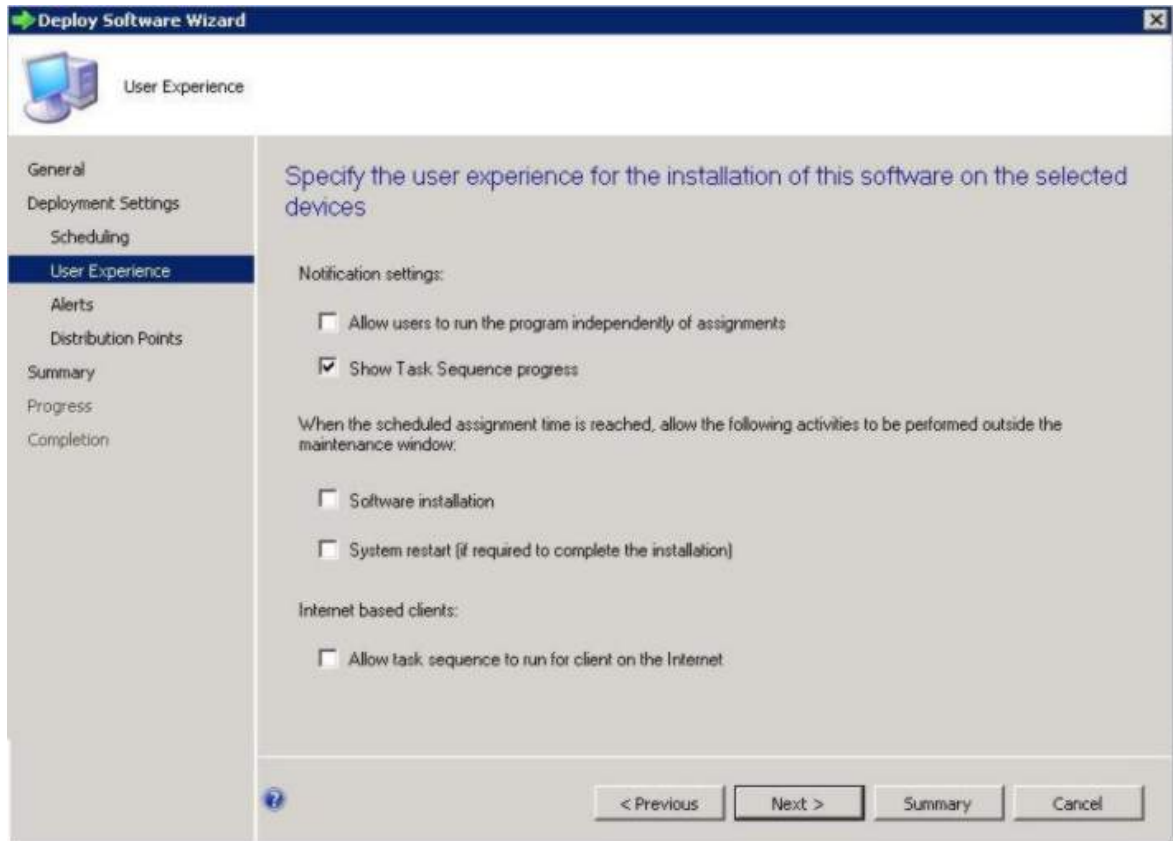


Figure 86. Select the user experience

Step 7. Skip the Alerts panel, and select **Distribution Points**.

Step 8. On the Distribution Points panel:

- a. Select Access content directly from a distribution point when needed by the running task sequence from the **Deployment options:** list.
- b. Select the **When no local distribution point is available, use a remote distribution point.** check box.
- c. Select the **Allow clients to use a fallback source location for content** check box.

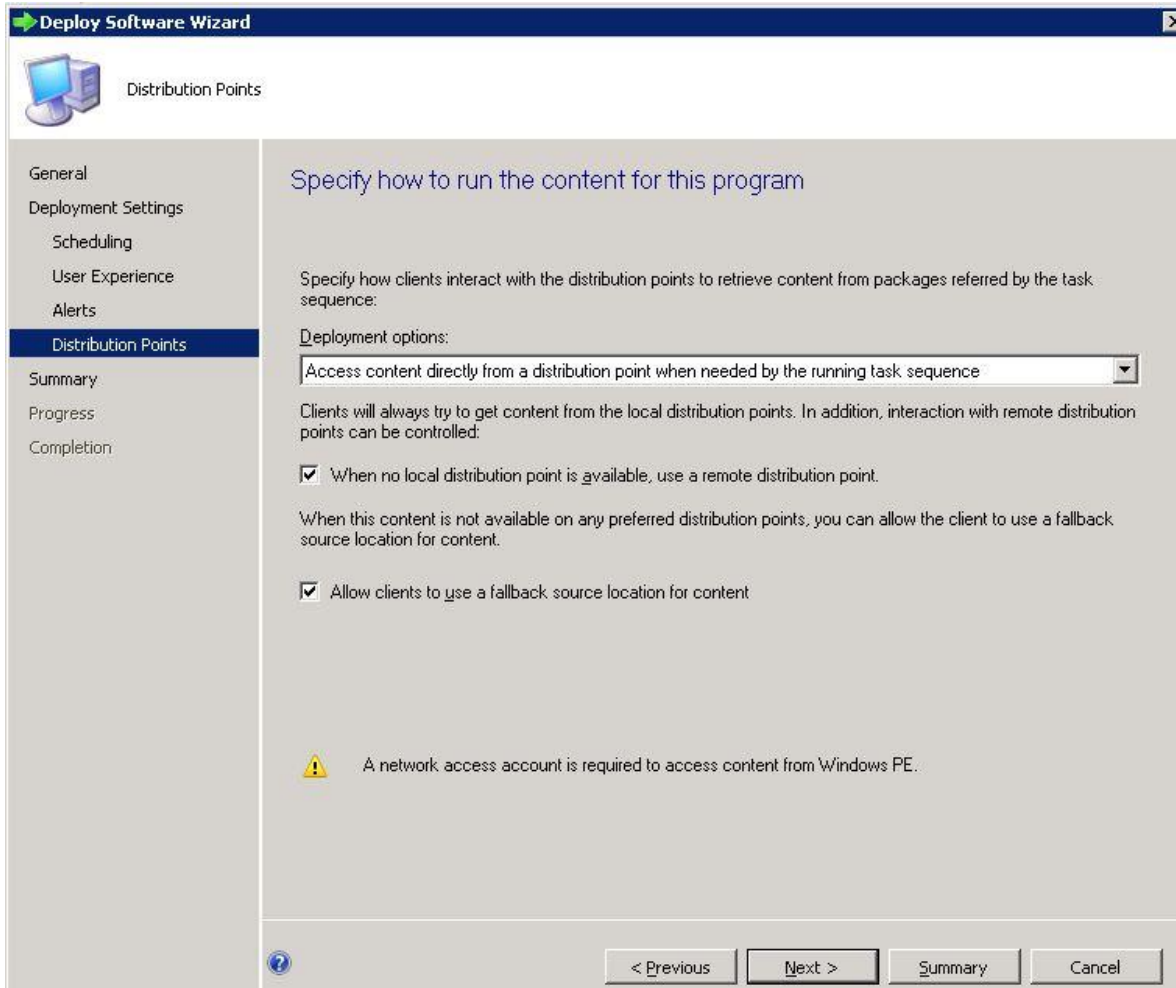


Figure 87. Specify distribution points options

Step 9. Click **Next**.

Step 10. Click **Finish**.

Checking the task sequence execution result

Ensure that the task sequence can be started successfully.

Procedure

Step 1. After performing the procedure in “Advertising a task sequence” on page 82, restart the target server from PXE.


```
CLIENT MAC ADDR: 00 1A 64 21 36 90  GUID: 84C21702 6A5B DD11 99E1 B884D4733EA1
CLIENT IP: 9.125.90.16  MASK: 255.255.255.0  DHCP IP: 9.125.90.211
GATEWAY IP: 9.125.90.1

Downloaded WDSNBP...

Architecture: x64

The details below show the information relating to the PXE boot request for
this computer. Please provide these details to your Windows Deployment Services
Administrator so that this request can be approved.

Pending Request ID: 830

Contacting Server: 9.125.90.86..
TFTP Download: smsboot\x64\pxeboot.n12
```

Figure 88. Restarting the target server from PXE

- Step 2. After the target server starts on PXE, the download process starts automatically from theSCCM server to the target machine.

```
Windows is loading files...

IP:9.125.90.86
```

Figure 89. Starting the download process

- Step 3. The first action is run. In this example of the operating system deployment task sequence, it is the Format and Partition Disk action.

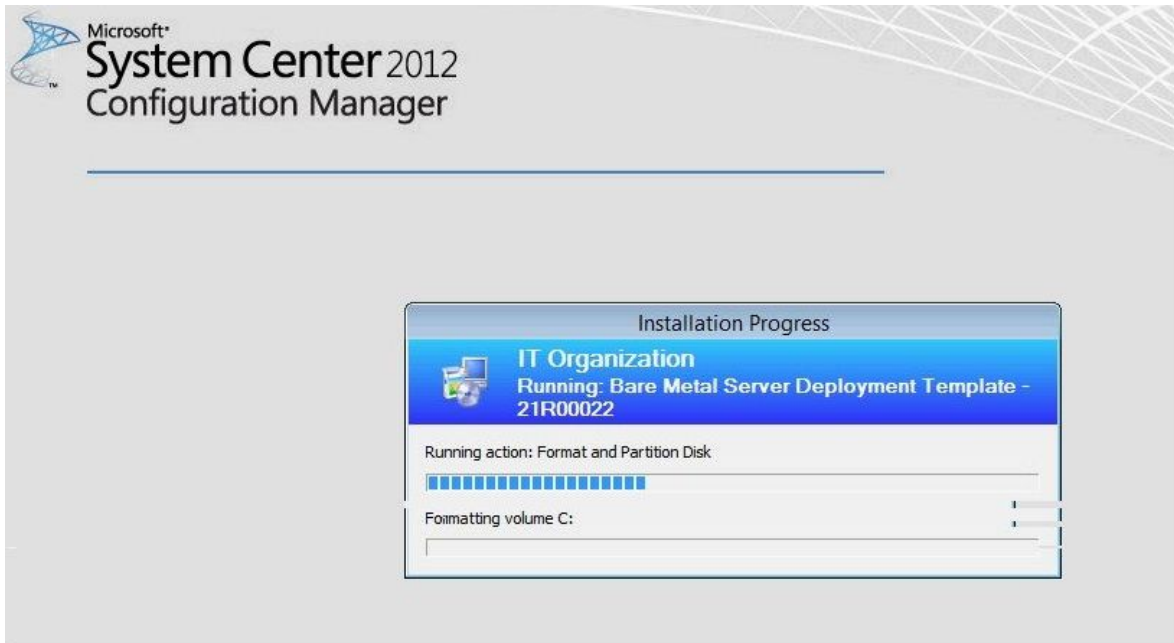


Figure 90. Running the Format and Partition Disk action

Step 4. The second action is run. In this example, it is Apply Operating System Image.

Note: Different task sequences might have different actions. The windows used for the task sequences are similar to those shown here, only with different actions.

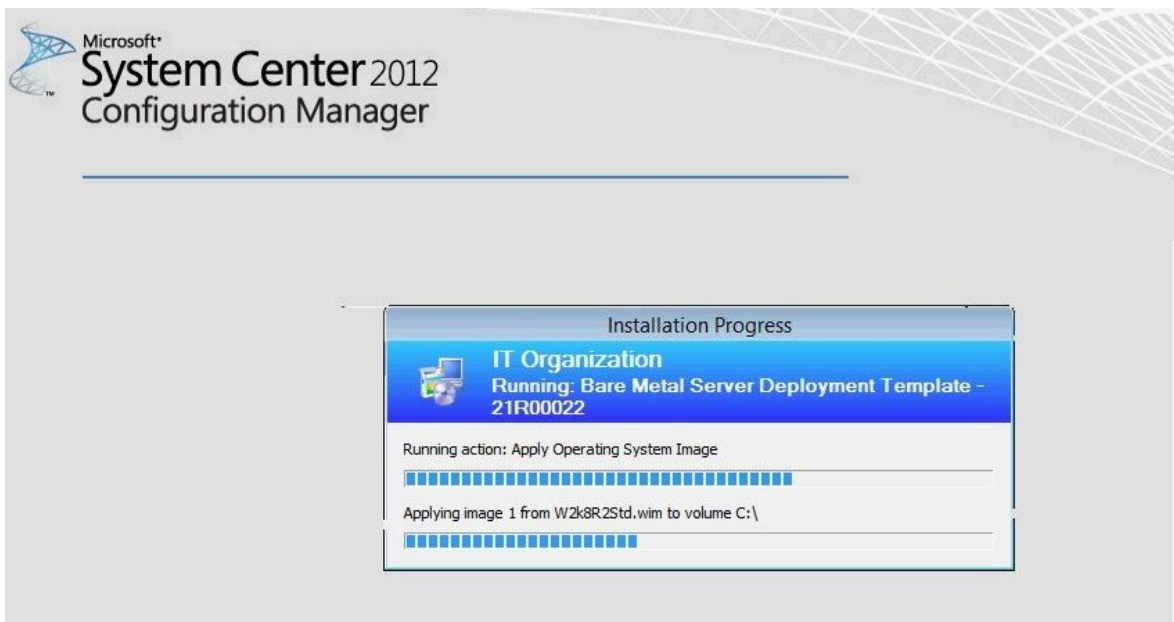


Figure 91. Running the Apply Operating System Image action

Step 5. After the task sequence is finished, the target server restarts to set up Windows, and the corresponding hardware is configured.

Chapter 5. Lenovo Deployment Pack features

Customize the two primary tools used by the Lenovo Deployment Pack to perform tasks used for deployment: PRAID and the ASU tool.

To configure RAID through PRAID, refer to “Configuring RAID through PRAID” on page 89.

To configure hardware settings through the ASU tool, refer to “Configuring hardware settings through ASU” on page 94.

Configuring RAID through PRAID

Use the PRAID utility to configure the RAID adapter.

There are two methods to configure RAID through the array wizard, a GUI-based editor, and through the policy file utility. Both use the PRAID utility to configure the RAID adapter.

PRAID is a scriptable utility that offers a single user interface for both configuring and replicating all RAID controllers supported by the WinPE Scripting Toolkit.

PRAID has three modes of operation:

- Deploy mode: for scripted configuration of RAID controllers
- Capture mode: for replicating RAID controller settings
- Restore defaults mode: for resetting RAID controllers to factory-default settings

When used in Deploy mode, the policies file directs how PRAID configures the RAID controllers in a system by using keywords and values that you can customize. In Capture mode, PRAID creates or appends to the end of a policies file the parameters that can configure other RAID controllers identical to the ones in the current system.

The Lenovo Deployment Pack leverages the PRAID utility provided by LenovoWinPE Scripting Toolkit. For more information about the policy file and the RAID controllers support matrix, see the IBM ServerGuide Scripting Toolkit, Windows Edition online documentation.

Configuring RAID through the policy file

Use this topic to configure the task sequence.

Procedure

- Step 1. In the Task Sequence Editor, go to the new task sequence you created.
- Step 2. Right-click the task sequence and select **Edit**.
A window similar to the one in the following figure is displayed.

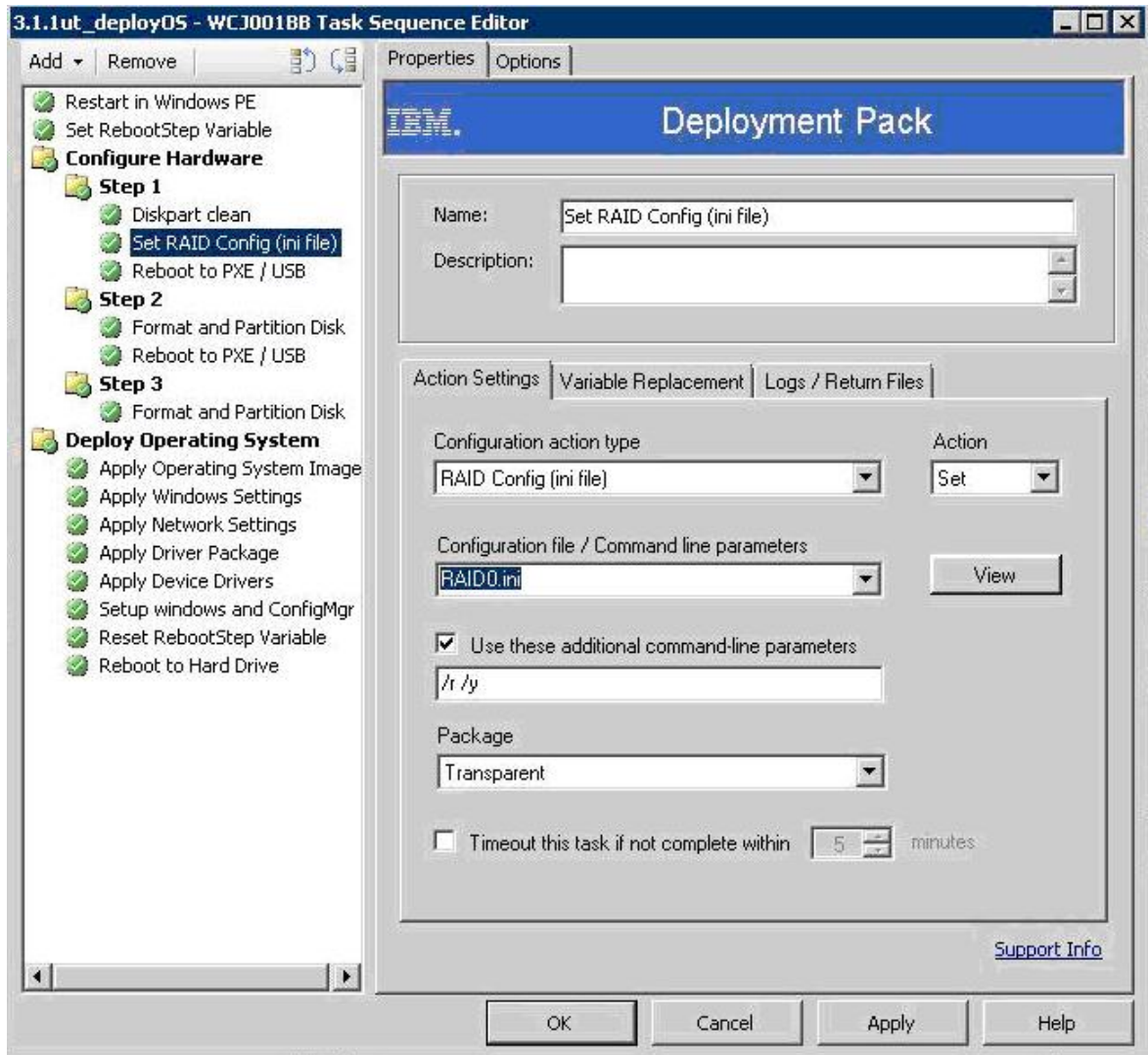


Figure 92. Editing the task sequence

- Step 3. Edit the task **Set RAID Config (ini file)**.
The following window opens.

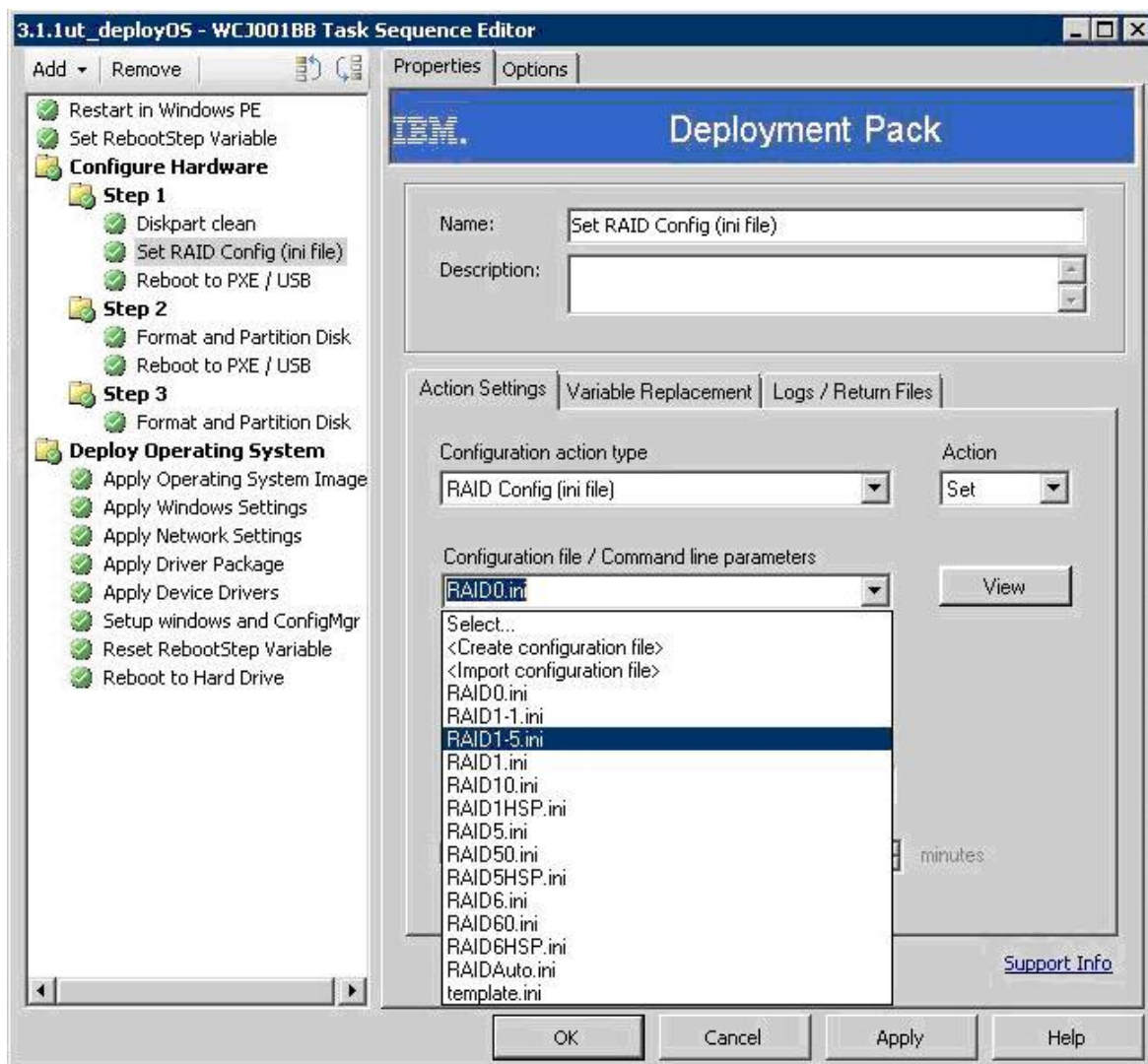


Figure 93. Editing the Set RAID Config (ini file) task

Pre-configured policy files handle the different RAID levels, for example:

- RAID0.ini configures RAID Controller as RAID level 0.
- RAID-auto.ini selects the best option based on the drivers and controller present.
- RAID1-5.ini creates a RAID-1 array using the first two drives and a RAID-5 array using the remaining drives. It is valid for ServeRAID-6M and 8i.
- RAID5HSP.ini creates a single RAID-5 array with a single hot-spare drive using all available drives. It is valid for ServeRAID-6M and 8i.
- Template.ini provides a policies file template that contains all parameters and details about each parameter.

Advanced users can customize the policy file themselves.

Notes:

- Make sure that the RAID level is supported by the RAID controller on the target server.

- The Lenovo Deployment Pack software invokes PRAID with the /r switch and the /y switch for all Set operations using the wizard. These switches tell PRAID to remove the array configuration from all controllers attached to the server being deployed before applying the new configuration. These switches avoid failures due to pre-configured arrays, and they operate similarly on older versions of PRAID. You can add these switches manually to RAID configurations using the command line or when using INI files. The following figure illustrates how to add the switches when using an INI file. You can also add other switches. For other parameters, refer to *WinPE Scripting Toolkit User Guide*.

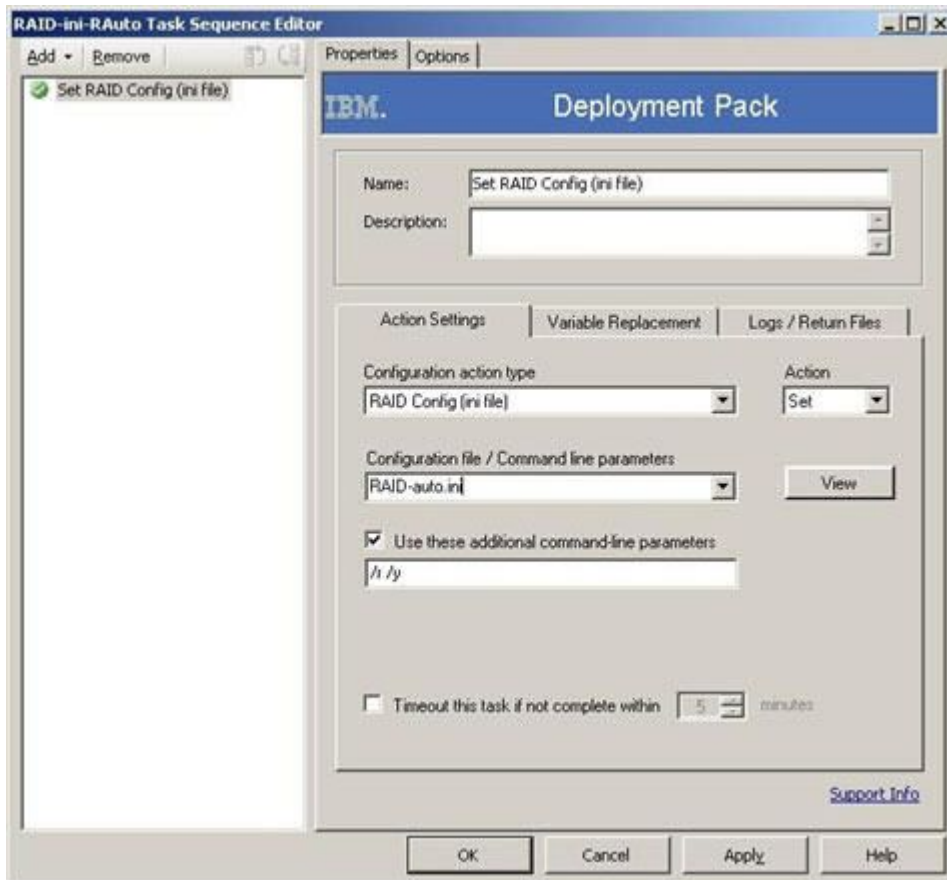


Figure 94. RAID configuration task sequence for INI files

Configuring RAID through the Array Builder Wizard

Another way to configure RAID is through the Array Builder Wizard provided by MicrosoftSCCM.

To configure RAID, the Lenovo Deployment Pack creates a policy file according to input from the Array Builder Wizard and deploys the policy file and the PRAID utility to the target server.

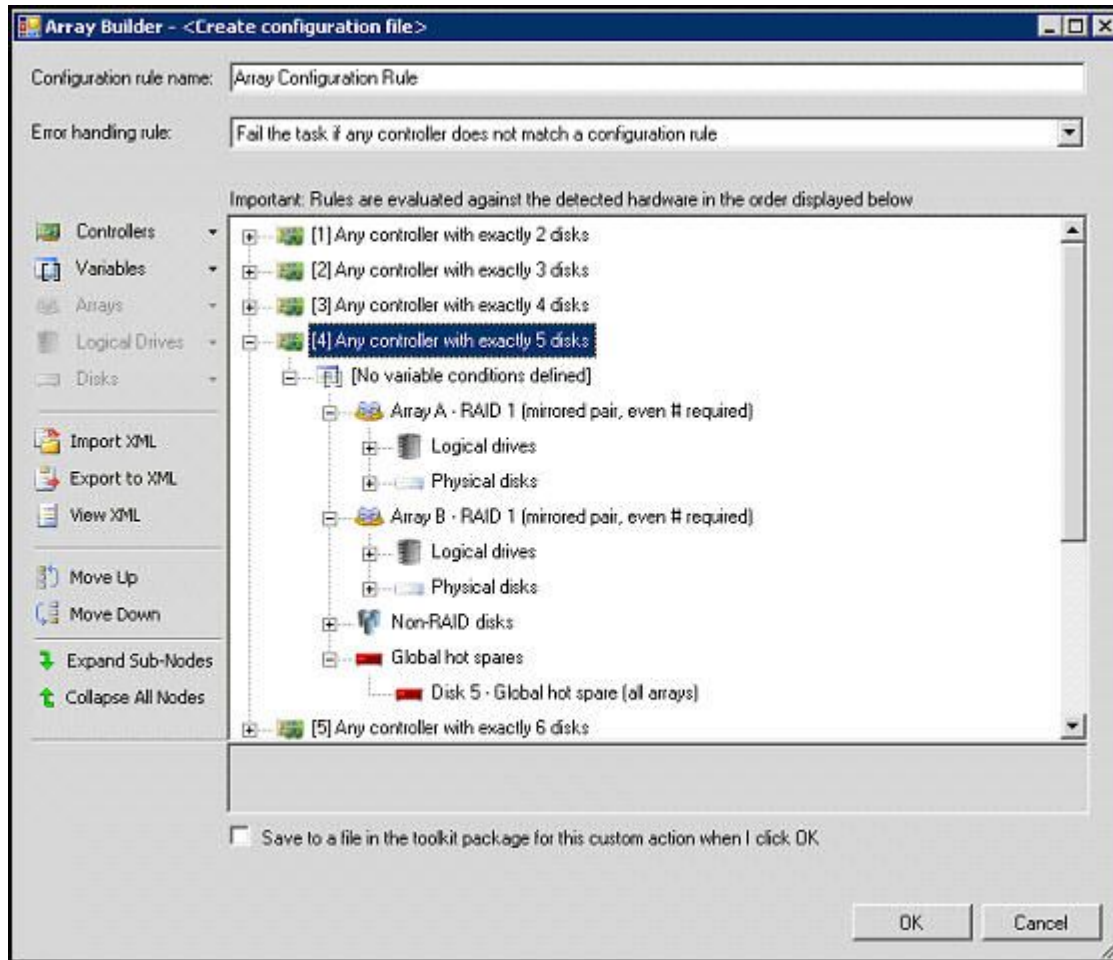


Figure 95. Array Builder Wizard

In Lenovo Deployment Pack, the RAID Array Builder Wizard supports the following features:

- Global Hot Spare: You can use the RAID Array Builder Wizard to configure Global Hot Spare.
- Dynamic RAID configuration: Apply different RAID configurations dynamically according to the controller slot and disk number.



Figure 96. Dynamic RAID configuration

Configuring hardware settings through ASU

By using the Lenovo Advanced Settings Utility, you can modify hardware settings from the command line on multiple operating system platforms. The ASU tool supports scripting environments through its batch-processing mode.

The Lenovo Deployment Pack leverages the ASU to provide the following functions:

- Modify the CMOS settings of the Basic Input/Output System (BIOS) or the settings of the Unified Extensible Firmware Interface (UEFI), without having to restart the system to access these settings on the BIOS or UEFI menus. (Usually, you have to press F1 in the beginning of the system startup to access these menus.)
- Set up the Baseboard Management Controller (BMC) and Integrated Management Module (IMM).

The ASU depends on internal code for IMM functions and definition files for BIOS functions; therefore, your results might vary with different hardware. Depending on your specific server population, you might have to create hardware-specific task sequences. Support for BMC settings is consistent across the product line, except for blade servers, where the management module in a given chassis overrides most of the blade BMC settings. The hardware release notes for the Lenovo Deployment Pack might contain more specific information.

Note: Command lines passed to the ASU tool might not return error codes or explanatory feedback, so be careful when creating your commands. For more information about ASU, including a list of the ASU commands and their descriptions, see the Advanced Settings Utility (ASU) website.

Note: All set actions for IMM, UEFI, BIOS, and BMC support the multiple-nodes function. There are only four nodes, with the default setting Node-1 (main).

Configuring IMM through the ASU

This topic describes how to configure the Integrated Management Module (IMM) by using the Lenovo Advanced Settings Utility (ASU).

The following figure is an example of how to configure the IMM.

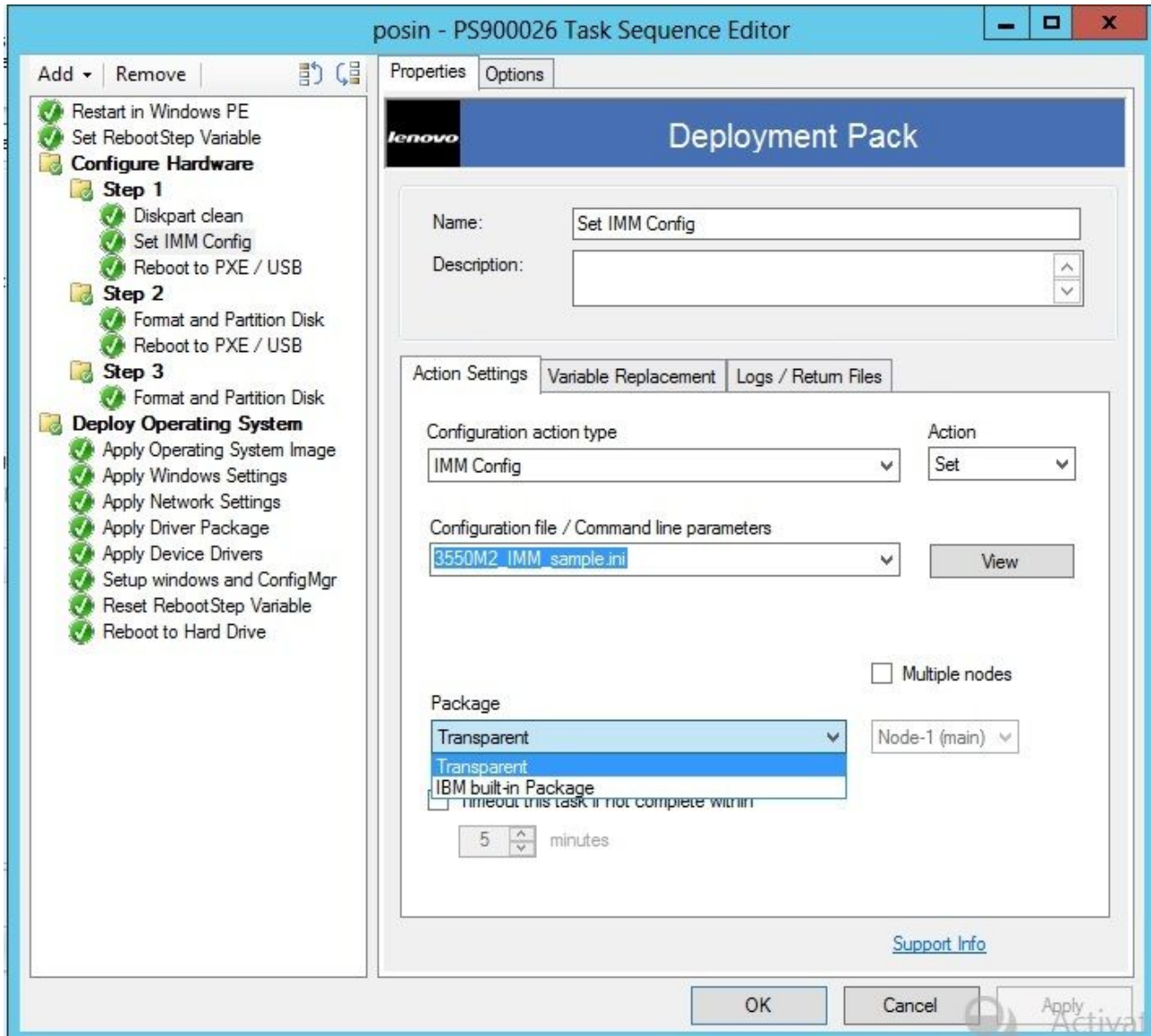


Figure 97. Selecting an IMM ini file

Sample .ini files are provided for IMM configuration. To view or modify the available settings for the .ini file, click **View**.

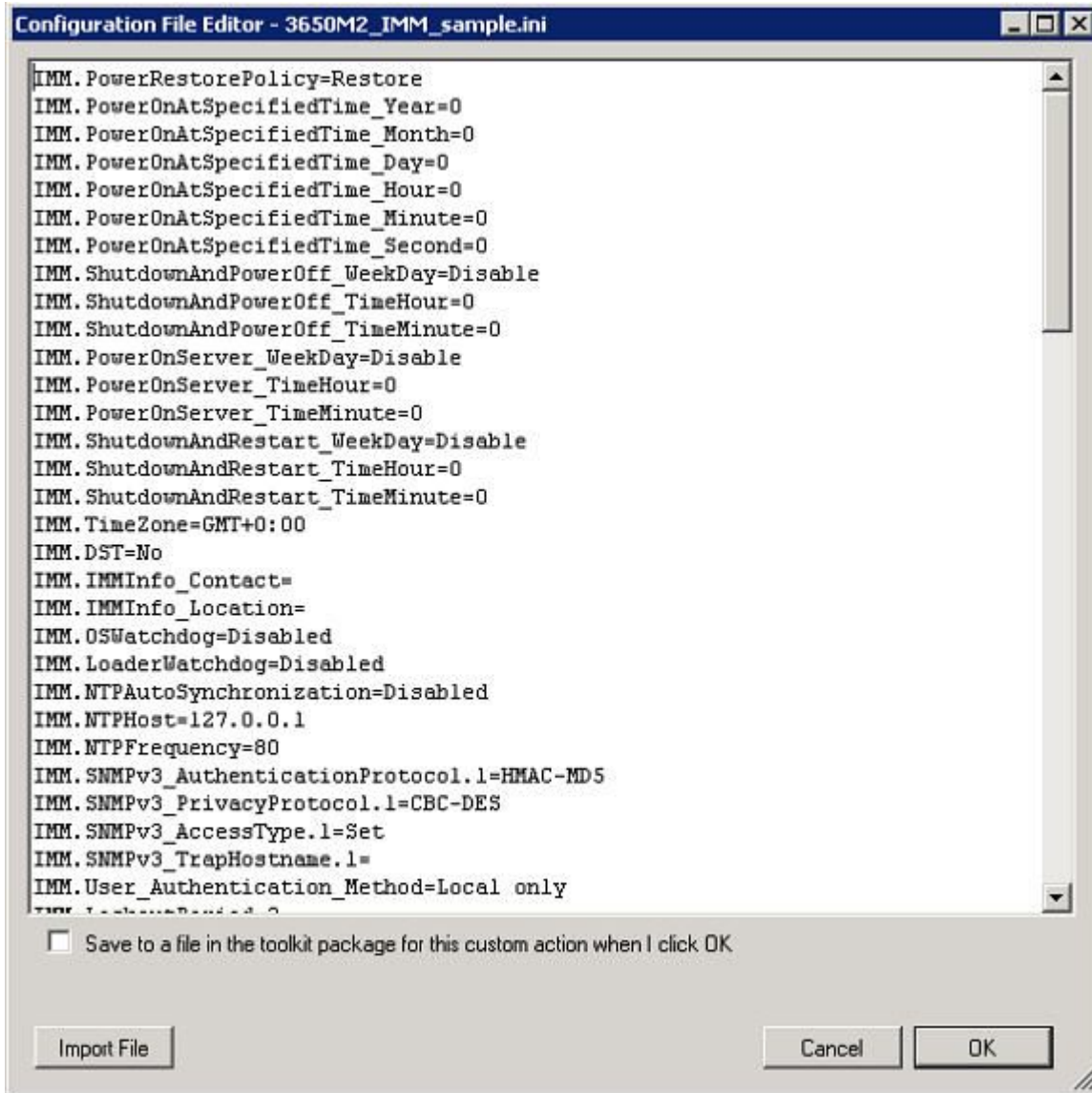


Figure 98. Sample settings in an IMM.ini file

You can either edit the file or create a new one. Follow the instructions in the topic “Updating distribution points” on page 26 for the package to make the file available.

Note: The option to select a package is available. If an SEP has been added, choose the appropriate package for the server being deployed.

Configuring uEFI through the ASU

Similar to IMM, the uEFI action contains sample .ini files that you can modify.

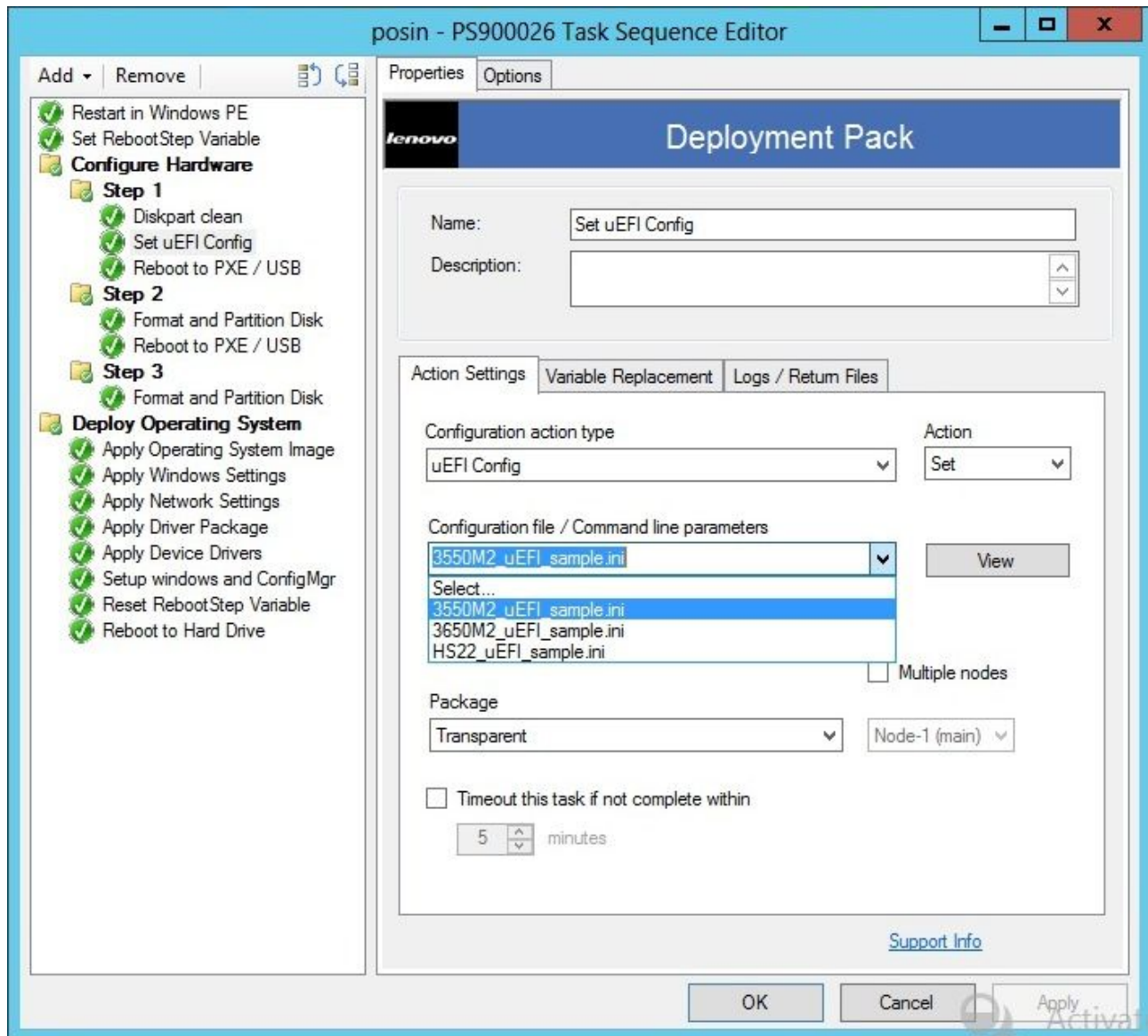


Figure 99. Selecting a uEFI .ini file

The configuration of other hardware is similar to the process for configuring the IMM and uEFI.

Supported Lenovo hardware-specific configuration list

This topic provides a summary and a detailed description of the hardware-specific configuration list.

Summary

The following actions are supported in Lenovo Deployment Pack. Each of these actions are described in more detail in the Detailed description table that follows.

- Set/get BIOS configuration
- Set/get RAID configuration
- Set/get BMC configuration
- Reboot BMC

- Reset/Reboot RSA
- Get/Set RSA configuration
- Set/get IMM configuration
- Reboot IMM
- Set/get uEFI configuration
- Set/get BootOrder [IMM] configuration
- Set default state for all BIOS, BMC, RSA, IMM, and uEFI configuration
- Support for the ASU command line

Detailed description

| Configuration action type | Action | Parameters | Command |
|-----------------------------------|--------|---|--|
| RAID Configuration (wizard) | Set | n/a | MS array builder |
| RAID Configuration (.ini file) | Get | n/a | Praid.exe /c /f:raid.ini /e1/e2 /e3 |
| | Set | Policy files from toolkit package | Praid.exe /f:policy.ini /r /y /1/e2 /e3 |
| RAID Configuration (command line) | Set | n/a | Custom PRAID command |
| BMC Configuration | Get | n/a | Asu.exe show bmc > bmc.ini |
| | Set | Generic BMC.ini template file | Asu.exe replicat e bmc.ini |
| Reboot BMC | Set | n/a | Asu.exe rebootbmc |
| Reset RSA | Set | n/a | Asu.exe resetrsa |
| RSA Configuration | Get | n/a | Asu.exe show rsa > rsa.ini |
| | Set | Generic RSA.ini template file | Asu.exe replicat e rsa.ini |
| Reboot RSA | Set | n/a | Asu.exe rebootrsa |
| BIOS Config | Get | n/a | Asu.exe show bios > bios.ini |
| | Set | Generic BMC.ini template file | Asu.exe replicat e bios.ini |
| IMM Configuration | Get | n/a | Asu.exe show IMM > imm.ini |
| | Set | Generic IMM.ini template file | Asu.exe replicat e imm.ini |
| Reboot IMM | Set | n/a | Asu.exe rebootbmc |
| uEFI Configuration | Get | n/a | Asu.exe show uEFI > uefi.ini |
| | Set | Generic uEFI.ini template file | Asu.exe replicat e uefi.ini |
| BootOrder (IMM) Configuration | Get | n/a | Asu.exe show BootOrder > bo.ini |
| | Set | Generic BootOrder .ini template file | Asu.exe replicat e bo.ini |
| Set Default State | Set | All, BIOS, BMC, RSA, uEFI, IMM, BootOrder | Asu.exe loaddefault <> |
| ASU Command Line | Set | n/a | Custom command |

Operating system deployment

After you have configured RAID on the target server, use the task provided by Lenovo Deployment Pack to install a supported operating system.

About this task

Lenovo Deployment Pack supports the following operating systems:

- Windows 2003 32bit/X64
- Windows 2003 R2 32bit/X64
- Windows 2008 32bit/X64
- Windows 2008 R2 SP1 (X64)
- Windows 2012 (X64) - SCCM 2012 SP1 or above is required

Lenovo Deployment Pack supports deploying the captured operating system image to the target server. The process conducts end-to-end deployment scenarios with the operating system selected. Refer to the topic, Chapter 4 “End-to-end deployment scenario” on page 71.

Chapter 6. Supported hardware and software

This chapter lists the servers, operating systems, adapters, and RAID controllers supported by the Lenovo Deployment Pack.

The most current support information is contained in the `readme.htm` file. You can download the latest version of the `readme.htm` file from the Lenovo ServerProven web pages:

- Lenovo ServerProven: Compatibility for BladeCenter products
- Lenovo ServerProven: Compatibility for Flex System Chassis
- Lenovo ServerProven: Compatibility for System x hardware, applications, and middleware

Server support

This topic lists the servers associated with the products supported in this release.

For complete information about supported combinations of servers and operating systems, visit the LenovoServerProven web pages:

- Lenovo ServerProven: Compatibility for BladeCenter products
- Lenovo ServerProven: Compatibility for Flex System Chassis
- Lenovo ServerProven: Compatibility for System x hardware, applications, and middleware

Table 2. Supported Lenovo systems

| Product family name | Server type |
|---|------------------------|
| Lenovo Flex System x240 M5 Compute Node | 2591, 8956, 9532 |
| Lenovo Flex System x440 Compute Node | 7167, 2590 |
| Lenovo NeXtScale nx360 M4 | 5455 |
| Lenovo NeXtScale sd360 M5 | 5493 |
| Lenovo NeXtScale nx360 M5 | 5465 |
| Lenovo NeXtScale nx360 M5 DWC | 5467, 5468, 5469 |
| Lenovo Smart Analytics System | 7949 |
| Lenovo ThinkServer SD350 | 5493 |
| Lenovo System x3100 M4 | 2582 |
| Lenovo System x3200 M2 | 4367, 4368 |
| Lenovo System x3200 M3 | 7327, 7328 |
| Lenovo System x3250 M2 | 7657, 4190, 4191, 4194 |
| Lenovo System x3250 M3 | 4251, 4252, 4261 |
| Lenovo System x3250 M4 | 2583 |
| Lenovo System x3250 M5 | 5458 |
| Lenovo System x3250 M6 | 3633,3943 |
| Lenovo System x3300 M4 | 7382 |
| Lenovo System x3400 | 7973, 7974, 7975, 7976 |
| Lenovo System x3400 M2 | 7836, 7837 |

Table 2. Supported Lenovo systems (continued)

| Product family name | Server type |
|---------------------------------|------------------------|
| Lenovo System x3400 M3 | 7378, 7379 |
| Lenovo System x3500 | 7977 |
| Lenovo System x3500 M2 | 7839 |
| Lenovo System x3500 M3 | 7380 |
| Lenovo System x3500 M4 | 7383 |
| Lenovo System x3530 M4 | 7160 |
| Lenovo System x3550 | 1913, 7978 |
| Lenovo System x3550 M2 | 4198, 7946 |
| Lenovo System x3550 M3 | 4254, 7944 |
| Lenovo System x3550 M4 | 7914 |
| Lenovo System x3550 M5 | 5463 |
| Lenovo System x3620 M3 | 7376 |
| Lenovo System x3630 M3 | 7377 |
| Lenovo System x3630 M4 | 7158 |
| Lenovo System x3650 | 1914, 7979 |
| Lenovo System x3650 M4 HD | 5460 |
| Lenovo System x3650 M2 | 4199, 7947 |
| Lenovo System x3650 M3 | 4255, 5454, 7945 |
| Lenovo System x3650 M4 | 7915 |
| Lenovo System x3650 M5 | 5462 |
| Lenovo System x3690 X5 | 7147, 7148, 7149, 7192 |
| Lenovo System x3755 M3 | 7164 |
| Lenovo System x3850 M2/x3950 M2 | 7141, 7144, 7233, 7234 |
| Lenovo System x3850 X5/x3950 X5 | 7143, 7145, 7146, 7191 |
| Lenovo System x3850 X6 | 3837 |

Table 3. Supported IBM systems

| Product family name | Server type |
|---------------------------|------------------------|
| IBM BladeCenter HS12 | 1916, 8014, 8028 |
| IBM BladeCenter HS21 | 1885, 8853 |
| IBM BladeCenter HS21 XM | 1915, 7995 |
| IBM BladeCenter HS22 | 1911, 1936, 7809, 7870 |
| IBM BladeCenter HS22V | 1949, 7871 |
| IBM BladeCenter HS23 | 1929, 7875 |
| IBM BladeCenter HS23E | 8038, 8039 |
| IBM BladeCenter HX5 | 1909, 7872, 7873 |
| IBM BladeCenter LS21/LS41 | 7971 7972 |
| IBM BladeCenter LS22/LS42 | 7901 7902 |

Table 3. Supported IBM systems (continued)

| Product family name | Server type |
|------------------------------------|------------------|
| IBM Flex System x220 Computer Node | 7906, 2585 |
| IBM Flex System x222 Computer Node | 7916 |
| IBM Flex System x240 Computer Node | 8737, 8738, 7863 |
| IBM Flex System x440 Computer Node | 7917 |
| IBM System x iDataPlex dx360 M2 | 7321, 6380, 7323 |
| IBM System x iDataPlex dx360 M3 | 6391 |
| IBM System x iDataPlex dx360 M4 | 7912,7913 |

RAID controller support

The following RAID controllers are supported in this release.

| RAID Controller |
|--------------------------|
| ServeRAID 8E-SAS |
| ServeRAID 8E-SATA |
| ServeRAID 8i |
| ServeRAID 8k SAS |
| ServeRAID 8k-I SAS |
| ServeRAID 8s |
| ServeRAID B5015 |
| ServeRAID BR10i |
| ServeRAID BR10il |
| ServeRAID BR10il v2 |
| ServeRAID M1015 |
| ServeRAID M5014 |
| ServeRAID M5015 |
| ServeRAID M5025 |
| ServeRAID MR10i |
| ServeRAID MR10ie |
| ServeRAID MR10is |
| ServeRAID MR10k |
| ServeRAID MR10m |
| ServeRAID MR1015/MR105-R |
| ServeRAID M1110 |
| ServeRAID M1115 |
| ServeRAID M5110 |
| ServeRAID M5016 |
| ServeRAID M5110 |
| ServeRAID M5110e |

| RAID Controller |
|------------------------|
| ServeRAID M5115 |
| ServeRAID M5120 |
| Lenovo 3Gb SAS HBA v2 |
| Lenovo-SAS 1068 |
| LSI-SAS 1064/1064E |
| LSI-SAS 1078 |
| LSI-SCSI 1020/1030 |
| LSI MegaRAID 8480 |
| LSI SR C100 |

Appendix A. Hints and tips

The hints and tips provided in this section are designed to help you address common issues you might experience when installing and using the Operating System Deployment feature.

Create the installation or uninstallation log file

When the Lenovo Deployment Pack is either installed or uninstalled, the log file with a random name is created in the %Temp% folder. To specify the log file name, use the following methods.

- To create the installation log file, run the .exe file from the command line with this parameter: **/v"/i install.log"**
- To create the uninstallation log file, run the .exe file from command line with this parameter: **/v"/i uninstall.log"**

Set the log level in the register

OSD supports five log levels: debug, info, warning, error, and fatal. The default log level is info.

To change the level, set the **LogLevel** value as another one of the five types under this register path: HKEY_LOCAL_MACHINE\SOFTWARE\Lenovo\System Management Integrations\Log.

Test WinPE-based sequence actions

When using PXE, always configure advertisements with the settings shown in the following table.

Table 4. PXE-required settings for advertisements

| | |
|--------------------------|---|
| General page | Make this task sequence available to boot media and PXE. Otherwise, the network client cannot receive the intended task from the Configuration Manager server. |
| General page | Browse to select the collection of the target server. |
| Schedule page | Mandatory assignments. As soon as possible |
| Schedule page | Program rerun behavior: Never rerun advertised program (default). |
| Distribution Points page | Access content directly from a distribution point when needed by the running task sequence. In WinPE, the default option, Download content locally when needed by running task sequence , does not work. WinPE causes the task sequence server to ignore all actions that have packages set for this option. |
| Interaction page | Show task sequence progress |

Always configure WinPE boot images with the following setting:

Table 5. WinPE boot image-required settings

| | |
|------------|---|
| Windows PE | Enable command support (testing only). |
|------------|---|

PXE issues

To troubleshoot a "File not found PXE error," re-create the PXE service point. You can also use the Reboot to PXE/USB custom action to circumvent a problem that might occur after rebooting a target system multiple times.

About this task

If the following error is displayed in the log file, it might be related to one of several common PXE issues:
File not found PXE error #.

Refer to the information that follows for possible solutions.

If the PXE service was operational at one time, the issue might be caused by changes to a boot image that were not distributed to the PXE service distribution points. Distributing boot image changes is described in “Updating the distribution points for a boot image” on page 33.

Also, it could be that there is not a valid advertisement for this server. Creating an advertisement is described in “Advertising a task sequence” on page 74.

You must also add the target server MAC address and GUID to the Configuration Manager database, as described in “Advertising the task sequence to the new servers” on page 34.

PXE-initiated deployments require a Preboot Execution Environment (PXE) service point role (and some NTFS-formatted disk space), a DHCP server, Windows Deployment Services (WDS), and a firewall port configuration. Using DHCP and WDS on the same server requires you to configure WDS to listen on a port other than port 67. See Microsoft System Center – Planning for PXE Initiated Operating System Deployments webpage for more information.

If you have problems getting the PXE service to work from the beginning, check that Windows Deployment Services (WDS) is installed and that it is correctly configured for the environment. If the error still exists, try the following actions:

1. Stop the Windows WDS.
2. Either delete or rename the windows\Temp folder and create a new windows\Temp folder.
3. Restart the WDS.

If the DHCP server is on the same server as WDS, make sure that DHCP option 60 is enabled. In some cases, you might have to restart the DHCP server.

If the prerequisites are met, use the following procedure to re-create the PXE service point.

Procedure

- Step 1. From the console, remove the PXE service role.
- Step 2. Check the Program Files\Microsoft Configuration Manager\Logs\PXESetup.log to verify that the role is removed successfully.
- Step 3. Remove the WDS.
- Step 4. Reboot the Configuration Manager site server, if WDS was installed on the site server.
- Step 5. Reinstall WDS but do not configure it.

It is not necessary to import images. However, make sure that WDS is installed correctly.

- Step 6. Assuming DHCP and WDS are installed on the Configuration Manager server, make sure that DHCP Option 60 is enabled and choose **Don't listen on port 67**.
- Step 7. Reinstall the PXE service role.
- Step 8. Check the PXESetup.log file to verify that the role was installed successfully.
- Step 9. Update the PXE distribution points for the boot images now that the new role is installed.

The target client should now be able to PXE boot to the Configuration Manager server.

Tips when rebooting to PXE or USB

When deploying a new unconfigured server, there are no configured disks from which to boot. Therefore, the system must boot from other media, such as a CD or DVD drive, from a USB port, or from the network using the Preboot Execution Environment (PXE). At times, the installation might reboot the server being deployed during the task sequence to complete initialization of a configuration, such as defining array disks.

If the disks on a system are defined or redefined after the Windows Preinstallation Environment (WinPE) boots, WinPE does not recognize the new system partition, which means a reboot is necessary to successfully complete a deployment.



Figure 100. Properties page for a Reboot to PXE / USB action

When using a reboot computer standard action within the task sequence editor, the action requires a writeable partition, either to reboot into the existing operating system or to copy WinPE to the disk and reboot to WinPE again. If you assign a reboot task to a server and these conditions do not exist, the task sequence fails at that action. Without a valid boot partition, the machine cannot be rebooted in the middle of a task sequence.

If you use PXE and the server simply ends the task sequence and reboots on its own, Configuration Manager does not readvertise the PXE boot to the computer. The PXE advertisement must be reset if it is to run the same task sequence again. Therefore, the server will likely reboot into an unknown state and stop at a No Operating System prompt. You could assign a second task sequence to the server, but when the first task sequence ends, the second starts immediately, without a reboot between them.

If you used boot media such as CD, DVD, or a USB drive, the result is the same; the task fails when the reboot task runs because a valid boot partition does not exist. If you make the task sequence end instead of rebooting, the system reboots and starts the task sequence again. Without some sort of conditional flow control, the installation reruns the same tasks.

Tips to resolve problems when starting the Lenovo Deployment Pack

Lenovo provides a state variable during the task sequence to control which steps are run in the sequence. The installation uses Windows Management Instrumentation (WMI) remote calls to reset the PXE advertisement for the computer so that when it restarts, it reruns the task sequence appropriately.

To control the flow of the task sequence across restarts, groups are created that have conditions set on the state variable. This state variable is a task sequence variable set through the Configuration Manager server or, for a disconnected deployment, by using a file-based method.

The following example shows what a task sequence flow might look like:

First start sequence

1. The computer starts WinPE through PXE. The task sequence variable is not set. (RebootStep = null)
2. The **Set RebootStep Variable** action sets the variable to 1.
3. The Configure Hardware group runs.
4. The group Step 1 condition is set to true. (RebootStep = 1)
 - a. Actions inside this group run.
 - b. The **Reboot to PXE/USB** action resets the PXE advertisement.
5. The group Step 2 condition is set to false, which skips some steps.
6. The group Step 3 condition is set to false, which skips some steps.
7. The **Deploy Operating System** group condition is set to false.
8. The task sequence ends and the computer restarts.

Second start sequence

1. The computer starts and uses PXE or USB to load WinPE again. (RebootStep = 1)
2. The **Set RebootStep Variable** action sets the variable to 2. (RebootStep = 2)
3. The Configure Hardware group runs.
4. The group Step 1 condition is set to false, which skips some steps.
5. The group Step 2 condition is set to true. (RebootStep = 2).
 - a. Actions inside group 2 run.
 - b. The **Reboot to PXE/USB** resets the PXE advertisement.
6. The group Step 3 condition is set to false, which skips some steps.
7. The **Deploy Operating System** group condition is set to false.
8. The task sequence ends and the computer restarts.

Third start sequence

1. The computer starts and uses PXE or USB to load WinPE again. (RebootStep = 2)
2. The **Set RebootStep Variable** action sets the variable to 3. (RebootStep = 3)
3. The Configure Hardware group runs.
4. The group Step 1 condition is set to false, which skips some steps.
5. The group Step 2 condition is set to false, which skips some steps.
6. The group Step 3 condition is set to true. (RebootStep = 3)
 - a. Actions inside group 3 run without restarting at the end.
7. The **Deploy Operating System** group condition is set to true.
 - a. Actions inside this group run.
 - b. The **Reset RebootStep Variable** action sets the variable to 0. (RebootStep = 0)
8. The task sequence ends and the computer restarts on the final operating system loaded on the disk.

Manual workaround method

You can manually work around the PXE reboot issue by creating the task sequence steps and groups and using the procedure that the Lenovo Deployment Pack uses to solve the problem.

The solution also involves creating a custom script that connects remotely to the Configuration Manager server (with appropriate credentials), accessing WMI, and resetting the PXE advertisement for the specific computer running the task sequence.

However, there is no need to do this work manually because the custom action described in the topic “The Reboot to PXE/USB custom action” on page 109 sets up the task sequence for you.

The Reboot to PXE/USB custom action

Insert the PXE/USB custom action to control multiple reboots when booting to PXE or USB.

After Lenovo Deployment Pack is installed on the Configuration Manager server, this custom action is automatically installed. You can also insert the custom action into a task sequence by performing the following steps:

1. Right-click the task sequences folder to create a sample task sequence that includes all of the tasks needed (including reboots) for deploying a server from bare metal.
2. When inserting a new OEM custom action, use the dialog box about reboots to create a new task sequence with the appropriate actions using the current task sequence actions.
3. Manually insert the Reboot to PXE/USB action into a task sequence from a selection on the task sequence editor menu to create a new task sequence.

Preventing a server from looping during multiple reboot processing

During multiple reboot processing, the target server might loop and be unable to run the task sequence correctly. The problem is due to an improper setting for the state variable that controls the installation. The improper setting can occur when an error occurs that does not stop the installation.

About this task

The sample task sequence templates in the Lenovo Deployment Pack provide for multiple reboots back to USB or PXE, and they use a computer variable to track the current boot stage in the process.

The computer variable determines which groups or steps are run during each phase of the deployment. If an error occurs during a task sequence, this variable is not automatically reset, and your task sequence might not restart from the beginning or even the current phase of deployment.

To ensure that the computer restarts the sequence from the beginning, remove the computer variable for any computer that has failed the task sequence.

Reset the computer variable by performing the following procedure.

Procedure

- Step 1. Start **Microsoft Configuration Manager** to open the Configuration Manager console.
- Step 2. From the console, click **Computer Management → Collections**.
- Step 3. Right-click the computer resource in the appropriate collection.
- Step 4. Click **Properties → Variables**.

- Step 5. Select the **RebootStep** variable.
- Step 6. Click **Delete**.
- Step 7. Click **Apply**.
- Step 8. Click **OK**.

Appendix B. Troubleshooting

Frequently, the reason for a problem you are experiencing is due to a faulty setting or unintended omission during setup. The symptoms of a problem that you have often provide clues to the reason for the problem. In general, troubleshooting begins with making sure that you performed certain tasks.

About this task

To begin troubleshooting, follow these basic steps.

Procedure

Step 1. Read the documentation.

The majority of issues related to the use of this product are covered in the documentation. Check the documentation before calling support.

Some sections of the Configuration Manager documentation that you should be familiar with include those related to related Microsoft TechNet:

- Microsoft System Center – Troubleshooting Operating System Deployment webpage
- Microsoft System Center – Troubleshooting Operating System Image Deployment Using USB Devices webpage

Step 2. Check your action settings.

The primary cause of task sequence failures is related to the settings you entered in the task sequence steps.

Check the task sequence steps for:

- Valid environment or task sequence variable references
- Valid file references. Use DOS 8.3 naming whenever possible. Never use file names with embedded spaces.
- Valid directory references. When capturing files from a target computer, ensure that the destination directory already exists. The process does not automatically create directory structures.

Step 3. Check the log files and use debug logging.

The custom actions in this deployment kit provide for capturing the SMSTS.LOG file from WinPE and sending it back to the Configuration Manager server.

To help with troubleshooting issues, you can also perform extended logging with the custom action. Enable this logging on the **Logs/Return Files** tab in the sequence action.

Step 4. When all else fails, contact Lenovo support, as described in Appendix D “Getting help and technical assistance” on page 129. Before contacting support, however, gather appropriate information related to your problem. When you call Lenovo support, you must have a set of information to provide them so that they can efficiently work your issue. Before calling, gather the appropriate information. Here are suggestions for what to collect.

- a. Export the task sequence you were using by right-clicking the task sequence and selecting **Export**.
- b. If the issue is visible in the interface, collect screen captures of the relevant portions.

- c. If the issue is related to installation of the product or follows closely after installation:
 1. Gather a copy of the MSI installation log located in the temporary files directory (identified in the `%TEMP%` environment variable). This file is usually located in a 1 directory and has a random name formatted as `MSIrandom_characters.LOG`.
 2. Gather a copy of the `_Installer.Log` file and the `_InstalledComponents.Xml` file, which are located in the following directory: `AdminUI Install Directory\XmlStorage\Extensions\bin\Deployment\Lenovo\Lenovo Deployment Pack\setup`

Note: The location of the log file varies by machine.
- d. If the issue occurred while running a task sequence:
 1. Gather a copy of the `SMSTS.LOG` file from WinPE. The log might be in the `X:\Windows\Temp\Smstslog` directory for a PXE boot. The log might also be in the `\Smstslog` directory on the local drive. The format of the log name might be `SMSTSLOGtime_based_name>.LOG`.
 2. Gather a copy of the custom action logs saved using the **Retrieve the task sequence log file from the client when this action runs** check box on the custom action **Logs / Return Files** tab. You should also select the check box for **Enable extended/debug logging by this action**.
 3. Gather a copy of the files used as input to the configuration task, such as configuration INI or XML files.
- e. A complete, detailed explanation of the issue, including:
 1. The exact point of failure, such as the action running when the process failed, a description or screen captures of error messages, error codes, and other relevant facts.
 2. A detailed description of the computers being configured, such as model, hardware configuration, RAID controllers, and other characteristics.
 3. A description of circumstances related to the following questions:
 - Has this task sequence or action ever worked? When did it stop working?
 - If it worked before, what is different now? Is the task sequence is being applied to different computer types? Is it using different configuration files, different task sequence variables, or has something else been modified?

Troubleshooting installation issues

Some common installation issues are presented along with information about how to troubleshoot them.

A custom action does not appear on the Configuration Manager console

Configuration Manager uses information stored in Windows Management Instrumentation (WMI) to load the custom action assemblies from disk. This WMI information is imported into the site system's WMI database during installation through the use of Managed Object Format (.mof) files. If an error occurred during importation or for some reason the WMI information is incorrect, the MMC might generate an exception when trying to load the assembly. The cause might be that the file name or assembly name was not found.

Check WMI under `root\SMS_site_code\SMS_TaskSequenceStep\SMS_TaskSequenceAction` for the appropriate WMI class for the product installed. For example the product might be `Lenovo_DeploymentPack`.

If the desired class does not exist, the custom action cannot appear in the menu. Use the installer to try reinstalling the site server files.

If you are familiar with the contents of the WMI classes, you can modify the class as appropriate to correct the error. A good tool for viewing and editing WMI information is WMI CIM Studio, which is part of the WMI Administrative Tools.

The Lenovo Deployment Pack is not completely removed from SCCM

By design, boot images are not removed because they are tied to task sequence packages. Removing the boot image might invalidate other working task sequences that you are using.

If you are no longer using the boot images created by this product, delete them from the console.

How to delete remaining physical folders created by Lenovo Deployment Pack

1. Locate the SCCM installation folder.
2. Find the subfolder `AdminUI\XmlStorage\Extensions\bin\Deployment`, and delete the folder named `Lenovo`.
3. Find the subfolder `OSD\lib\Drivers`, and delete the folder named `Lenovo`.
4. Find the subfolder `OSD\lib\Packages\Deployment`, and delete the folder named `Lenovo`.

Troubleshooting administrator console issues

Some common administrator console issues are presented here along with information about how to resolve them.

Enabling user interface debug logging

If you customized the configuration XML but the XML is not correct, the actions in the user interface might not work properly.

Turn on debug logging on the administrative console part of the custom action. Set the **Debug Logging** key to 1, which is the `DWORD` value in the base registry key for the Lenovo Deployment Pack.

MMC crash, exception, or Property Not Found errors occur when loading custom action

Configuration Manager uses information stored in WMI to load the custom action assemblies from disk. This WMI information is imported into the site system WMI database during installation through the use of MOF files. If an error occurred during importation, or for some reason the WMI information is incorrect, the MMC might generate an exception when trying to load the assembly, likely because the file name or assembly name is not found.

Check WMI under `root\SMS_site_code\SMS_TaskSequenceStep\SMS_TaskSequenceAction` for the appropriate WMI class for the product installed, such as: `Lenovo_DeploymentPack`.

If the desired class does not exist, the custom action cannot appear in the menu. Use the installer to reinstall the site server files to correct the problem.

If you are already familiar with the contents of the WMI classes, you can modify the class as appropriate to correct the error. A good tool for viewing and editing WMI information is WMI CIM Studio, which is part of the WMI Administrative Tools.

Troubleshooting device driver issues

In many instances, you must import drivers into your WinPE boot image for the OEM utilities to function. In some circumstances, the driver packages available from the OEM include an installation program to install the drivers, but do not include instructions about how to import the driver into WinPE.

Configuration Manager imports drivers into WinPE using the standard driver injection process available in the WinPE tool set. This requires a driver INF file (or `txtsetup.oem` file) along with the driver and other necessary files. The INF file is used in the standard driver installation process to insert the driver into WinPE.

In addition, trying to automatically import the driver into the Configuration Manager Driver Catalog and then inserting the driver into the boot image might fail due to one or more of the following issues.

Renamed files

Some driver files are named differently depending on the operating system to which they apply: `driver_w2k.sys`, `driver_w2k3.sys`, and `driver_w2k3_64.sys`, for example, might apply to Windows 2000, Windows Server 2003, and Windows Server 2003 64-bit.

The installation program might rename the files to base names before installing the driver, such as `driver.sys`. If the installation program renames files before installing them, the driver cannot be injected into the WinPE image because the correct file names are not present.

Modified boot image

During the installation of the Lenovo Deployment Pack, the installation program performs several modifications to a WinPE boot image to insert drivers and other changes that allow the Lenovo Deployment Pack utilities to function.

By default, the installation program makes a copy of the Configuration Manager default boot image (`boot.wim`), mounts the file, makes changes, and unmounts the file.

This modified `boot.wim` file contains the base set of changes needed by the Lenovo Deployment Pack. In addition, network and storage drivers are added for boot devices, such as array controllers, and network drivers to be able to communicate with the network in WinPE.

Drivers should be added through the driver catalog within the **Operating System Deployment** node of the Configuration Manager administrative console.

Configuration Manager stores two boot images for distributing to machines booting to PXE. The `boot.wim` file is the base boot image that contains no Configuration Manager specific files.

When you add drivers to a boot image and then update the boot image on a distribution point, Configuration Manager takes the base `boot.wim` file and adds the drivers from the driver catalog, along with other Configuration Manager files to create a new WIM file named `boot.packageID.wim`, for example, `boot.SMS00001.wim`.

The new WIM file is then distributed to the assigned PXE distribution points for your site.

Failing imported drivers

Often, several drivers are loaded together in a common directory and contain a `TXTSETUP.0EM` file. However, when you try to update the WinPE boot image after these drivers are injected, it might fail. This issue can also occur with only one driver in a directory. By default, Configuration Manager chooses the `TXTSETUP.0EM` file for its source of import information for the drivers. If this file exists, Configuration Manager does not display any associated INF files.

It is better to load drivers individually by using their respective INF files. To do this, rename any `TXTSETUP.0EM` files in the driver directory so that Configuration Manager prompts you to select the INF files and import the drivers individually.

Troubleshooting WinPE and task sequence issues

Some common WinPE and task sequence issues are presented along with information about how to troubleshoot them.

WinPE never starts the task sequence

Check the SMSTS.LOG file at X:\windows\temp\smstslog\smsts.log. If a package never downloaded, it is likely that you do not have the appropriate network drivers installed, which prevents the server from communicating with Configuration Manager.

Check your driver catalog to ensure that you have the right network drivers available and installed in the boot image, and update the boot image to your distribution points.

Additional network or storage drivers might be needed in the boot image to enable the WinPE boot to function correctly. Add those through **Drivers** in the Operating System Deployment node.

The right drivers have been added to the boot image, but are not loading

The original boot.wim file (WinPE boot image) created when Configuration Manager was installed is copied and modified with Lenovo specific drivers and other files. Your task sequences that use the Lenovo Deployment Pack must use this boot image, or the tools might not work properly.

Check to make sure the image into which you loaded the drivers is the same image being used by the task sequence.

This error is common for administrators who maintain multiple boot images.

Servers will not boot using PXE

PXE is an extension of DHCP, which uses a broadcast type of communication. Broadcast communication uses standard timeout values that are not readily changeable. As a result, a computer waits for a default timeframe to receive a DHCP or PXE response before timing out and causing a failure condition.

Each time a server is rebooted, it must renegotiate the connection to the switch. Some network switches arrive configured with default settings that might incur connectivity delays. That is, the settings on the switch might cause a DHCP or PXE timeout because they fail to negotiate a connection in time.

One of the features that can be affected by this issue is Spanning Tree Protocol (STP). STP is a protocol that prevents loops and provides redundancy within a network. A networking device using this algorithm might experience some latency as it collects information about other network devices. During this period, servers might boot to PXE and time out while waiting for a response from Windows Deployment Services. Disable the STP or enable PortFast on end-node ports for the target server to prevent such occurrences. Refer to the manufacturer's user guide for further information.

Another feature that can be affected by this issue is the EtherChannel or Port Aggregation Protocol (PAgP). EtherChannel allows multiple links between devices to act as one fast link that shares the load between the links. Running the EtherChannel Protocol in automatic mode can cause a connectivity delay of up to 15 seconds. To eliminate the delay, either switch to a manual mode or turn off this feature.

Speed and duplex negotiation can also play a role in negotiation time outs. If auto-negotiation on the switch is set to off, and the server is not configured to that speed and duplex setting, the switch will not negotiate with that server.

For more information, see the Cisco website and the following Cisco documents:

- Cisco: Using PortFast and Other Commands to Fix Workstation Startup Connectivity Delays webpage

- Cisco: Configuring and Troubleshooting Ethernet 10/100/1000Mb Half/Full Duplex Auto-Negotiation webpage

Default boot order does not allow PXE to boot when a valid drive exists

When an active partition is created on a hard drive, it automatically becomes a bootable device if a valid operating system has been installed. If your PXE NIC comes after the hard drive in the boot order, the hard drive tries to boot before PXE and boots to Windows, or causes an Invalid System Partition error if Windows is not installed.

To resolve this issue, be sure that PXE is placed before the hard drive in the boot order. Keep in mind that even if PXE is first in the boot order, the computer does not actually boot to PXE unless Configuration Manager has a task sequence for it to run.

When using a Reboot action after initializing an array controller, the task sequence fails

Configuration Manager 2007 does not allow a task sequence to reboot back to PXE. It can reboot back to WinPE or to an installed operating system, both of which require a disk partition and the appropriate installed software.

Without a disk partition, Configuration Manager fails when attempting to reboot during a task sequence because it expects to copy WinPE to the disk. Additionally, the management point tracks when a machine has booted to PXE to run a task sequence, and after a server has booted to PXE for a task sequence, it cannot use PXE as a boot method again for that task sequence unless the advertisement is reset.

To perform a reboot to PXE if you need to within a task sequence, use the custom action called "Reboot To PXE." This custom action, written using C# and VBScript, connects to the Configuration Manager 2007 SDK, and contains custom code to drive actions in the admin console as well as the machine being deployed. This custom action performs all the steps necessary to perform the reboot to PXE and allow for proper program flow when it occurs.

The only other way to accomplish a reboot to PXE is to use more than one task sequence, let the computer fall off the end of the first task sequence and manually reset the PXE advertisement for the computer.

Task sequence fails with Failed to Download Policy and code 0x80093102 or 0x80004005

This error code typically refers to a certificate validation issue.

The SMSTS.LOG file will show an entry with the following text:

```
CryptDecryptMessage ( &DecryptParams, pbEncrypted,  
nEncryptedSize, 0, &nPlainSize, 0 ), HRESULT=80093102
```

or

no cert available for policy decoding

Possible causes are:

- Misconfiguration of your domain or a site server, such as DNS not pointing to the site server, or the site server not specifying a valid FQDN (which is referred to by the DNS listing). If your site server does not specify a FQDN (and only specifies the NETBIOS name), and your DNS server refers to the FQDN, a faulty lookup might cause this error.
- The certificate being used for PXE and boot media. Check the certificates under the Site Settings node and see if any certificates are blocked or missing. Open the certificates and ensure that they are actually installed into the certificate store. If not, install them.

If these actions do not work, remove the package from the distribution point (through **Manage Distribution Points**) and add the package again to regenerate the package hash.

Task sequence fails with Failed to Download Policy and code 0x80004005

This error code typically refers to a certificate validation issue.

The SMSTS.LOG file will show an entry with the following text:
failed to download policy

Check the certificates under the **Site Settings** node to if any certificates are blocked or missing. Open the certificates to ensure that the certificates are installed into the certificate store. If not, install the certificates.

Task sequence fails because the package is not downloading

In WinPE, the default option **Download content locally when needed by running task sequence** does not work. When in WinPE, the task sequence engine ignores (and fail) all actions that have packages set for this option.

Set all packages needed for use in WinPE to **Access content directly from a distribution point when needed by the running task sequence**.

Task sequence does not run again even after clearing the PXE advertisement

You must set the advertisement to **Always rerun** so that any time you reset the PXE advertisement, the advertisement is applied to the computer regardless of whether it ran the task sequence before.

Task sequences fail or act incorrectly after an upgrade

When upgrading from a previous version of this product, existing task sequences using custom actions are not automatically updated.

To function correctly, open each task sequence action that uses a custom action in an editor. Add a . to the description and remove it to enable the **Apply** button. Click **Apply** to refresh the properties of the custom action and save any new automatic data or formatting that is required to function with the new version.

Files and logs are not returned from the client

A number of issues can prevent the task sequence from returning files or logs from the client.

Among the possible issues that might prevent the task sequence from returning files or logs from the client are:

- Failure of the client-side script prior to the file copy, which is usually evident in the log file. Repeat the task and press **F8** during the task to get to a command prompt, if you selected the check box for **Enable command support** on the **boot image properties → Windows PE** page.

Then open the SMSTS.LOG file. The location varies. In WinPE via PXE, the location is at X:\Windows\Temp\Smstslog\smsts.log.

- Malformed XML in the Lenovo Deployment Pack configuration file. Correct the XML file according to the original format.
- The command being run has an error but exits with code 0. This can occur when a severe error is encountered in the script while the script is set to ignore errors and use programmatic error handling. The error handling did not catch the same error.

Report such issues to the Lenovo support site, as described in Appendix D “Getting help and technical assistance” on page 129.

- The task sequence cannot access the share or mapped drive that is the target drive for copying the files or logs. Ensure that the network is connected and that the user ID and Password that are required to access the share are correct.

Logs are returned but not output files

A number of issues can prevent the task sequence from returning output files while allowing the task sequence to return log files.

Among the possible causes for the task sequence not returning output files from the client are:

- No return file parameters are specified in the configuration XML.
- Return file parameters in the configuration XML are incorrect.
- An error is occurring with the operation of the utility that generates the output file.
- A null variable is causing an error in the file name of the file to be returned.

Task steps do not automatically change after a change is made to the configuration XML file

If you change the configuration XML file, previously existing task steps do not automatically change unless you edit them.

To fix the existing task steps, open the task sequence editor and make a minor edit to each custom action step in the sequence. For example, you can add a period to the description and then delete it to enable the **Apply** button. Click **Apply**. The task sequence steps are now saved with the automatically updated information from the new XML file.

Task sequence fails at Apply Operating System with Failed to make volume X:\ bootable

This issue is indicated by log content similar to the following text:

```
MakeVolumeBootable( pszVolume ),  
HRESULT=80004005  
(e:\nts_sms_fre\sms\client\osdeployment\applyos\installcommon.cpp,759)
```

```
Failed to make volume E:\ bootable.  
Please ensure that you have set an active partition on the boot  
disk before installing the operating system.
```

```
Unspecified error (Error: 80004005; Source: Windows)
```

```
ConfigureBootVolume(targetVolume),  
HRESULT=80004005  
(e:\nts_sms_fre\sms\client\osdeployment\applyos\applyos.cpp,326)
```

```
Process completed with exit code 2147500037
```

Several problems can cause this error.

This issue can be related to two different scenarios:

- If you are using a **Format & Partition** action in your task sequence to partition the hard drives, make sure that you select the check box for **Make this the boot partition** on one of the partitions. If you do not make a drive bootable and the computer has only the single drive, the task sequence engine automatically makes one of the partitions the boot partition. But if there are multiple drives, the task sequence engine cannot determine which drive should be bootable, and you see this error.
- If you upgraded from the Configuration Manager RTM to SP1, you might have a problem if both hard drives are completely raw. If you have never partitioned the drives, a known bug in Windows PE prevents Windows PE from determining the drive where it was booted, and you see this error. This situation is likely on a server with a RAID controller where you have just formed two or more RAID sets. The new RAID sets are completely raw because they have never existed before.

The only workaround to the problem of multiple raw drives is to manually boot into Windows PE and run diskpart to partition at least one of the drives. Then run the task sequence again. The task sequence should work.

The known problem with Windows PE is fixed in Windows Vista SP1 and hence in the Windows PE that is derived from Vista SP1.

Install Configuration Manager 2007 SP1

Configuration Manager 2007 SP1 includes the SP1 version of the Windows Automated Installation Kit. Download and install Configuration Manager SP1 to get the new version.

Upgrading to Configuration Manager 2007 SP1 automatically updates your default boot images, but does not automatically upgrade the Lenovo boot images.

Upgrade the Lenovo boot images by re-running the Lenovo Deployment Pack installer and selecting **Modify** on the window that opens. You must also update your distribution points so that the new images are used and update the distribution points for the default boot images as well.

The product installer detects the version of WinPE that is currently in use by the default boot images. If the default boot images are not Vista SP1, the product cannot install.

How to tell if your boot images are upgraded to Vista SP1

Boot image properties contain an identifier for OS Version.

Perform the following procedure to see the version of WinPE in your boot images:

1. Click **Computer Management → Operating System Deployment → Boot Images → IBM Deployment**.
2. Right-click the boot image and select **Properties**.
3. Click **Images**.
4. Check the OS Version property for a value of 6.0.6001.18000 or greater.

What to do if your boot images are not upgraded to Vista SP1

You can manually re-create your boot images using the Windows AIK and following the steps listed in Microsoft System Center – How to Add a Boot Image to Configuration Manager.

If your Configuration Manager processes permit, you might find it easier to remove the old boot image packages using the Admin Console, delete the files in the `OSD\boot` directories, and rerun the SP1 upgrade installation.

How to tell if WAIK was upgraded to Vista SP1

1. Click **Start → Run**; then run the **Regedit** command.
2. Navigate to `HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\ComponentStudio`.
3. There should be a single key under this key, which is named with the number of the Windows AIK version.

Note: Only one version of Windows AIK can be installed. However, an uninstall operation might have failed to remove the registry key. In such a case, the registry key with the highest version number should be the correct version number.

What to do if Windows AIK was not upgraded to Vista SP1

Configuration Manager is supposed to automatically upgrade the Windows AIK version during an upgrade to Configuration Manager SP1. If that did not occur, try manually uninstalling Windows AIK and rerunning the Configuration Manager SP1 upgrade.

To download Windows AIK, see the Microsoft System Center – Automated Installation Kit (AIK) for Windows Vista SP1 and Windows Server 2008 page.

System environment variables are not carried over to the next action in the task sequence

When a task sequence runs, commands run in a command shell. When the task ends, so does the command shell environment, which causes the loss of any system variables that are defined in the task.

To pass variables between tasks, set the variables as Task Sequence variables, Collection variables, or Machine variables.

Troubleshooting general issues

Some general installation issues are presented along with information for addressing them.

When viewing logs with the Trace32 utility, the logs appear to be cut off

Trace32 does not always display the entire log file. The log might appear to have lost large periods of time, when in fact the entries are in the log. Try viewing the logs using WordPad, because Notepad does not show tab characters correctly.

Restarting a failed PXE-based task sequence

To troubleshoot a failed PXE-based task sequence, follow these steps.

1. Right-click on the computer you are testing, and select **Clear last PXE advertisement**. Select the advertisement, and click **OK**.
2. If you updated anything in the package used by the client, find the package under **Software Distribution**, right-click the package, then select **Update Distribution Points**.
3. If you updated any DLL associated with task sequences, go back through the task sequences and edit each step that uses that DLL. Task steps do not change automatically, but require that you edit them to pick up the updated DLL. All that is required is a keystroke in the **Description** box so that you can click **Apply**.
4. If you updated anything in the WinPE Boot Image, find the boot image by clicking **Operating System Deployment** → **Boot Images**, right-clicking the image, and selecting **Update Distribution Points**.

Appendix C. Running Sysprep

The System Preparation Tool (Sysprep) generalizes the operating system image on the reference computer to remove machine-identifying data and enable the image to run on other bare metal machines.

Running Sysprep on Windows Server 2003

You can run Sysprep on a reference computer running Windows Server 2003.

About this task

The System Preparation Tool (Sysprep) utility is located on the Windows product CD in the /Support/Tools/Deploy.cab file. Extract this CAB file to get sysprep.exe, setupcl.exe, setupmgr.exe, deploy.chm, ref.chm, and other programs and help files.

Procedure

- Step 1. Make sure that the operating system and applications are installed and configured on the reference computer in the same way that they should exist in the final installation.
- Step 2. Log on to the computer as a local administrator and make sure that the local administrator's password is blank.
- Step 3. Extract theDeploy.cab file (located in the Support\Tools folder on the Windows product CD) to the %SYSTEMDRIVE%\sysprep folder, such as C:\sysprep.
- Step 4. Create a sysprep.inf file by issuing the setupmgr.exe command to start the Setup Manager dialog.

The sysprep.inf file is used to customize each computer and to specify the information for the prompts during setup.

The following page opens:



Figure 101. Welcome to Setup Manager

- Step 5. Click **Next**.

The following page opens:

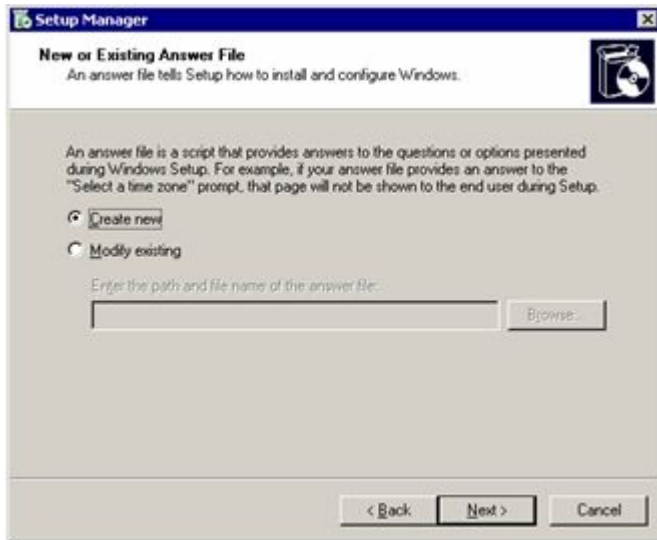


Figure 102. Setup Manager: Creating a new answer file

Step 6. Click **Create new**, and then click **Next**.

The following page opens:

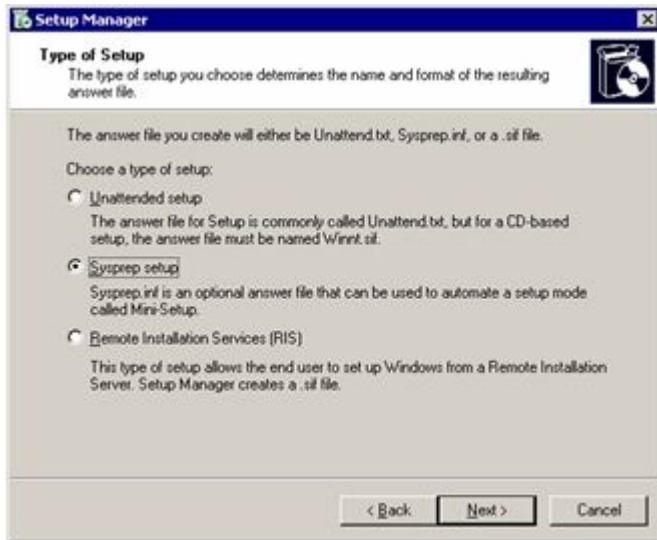


Figure 103. Setup Manager: Type of Setup

Step 7. Click **sysprep setup**, and then click **Next**.

The following page opens:

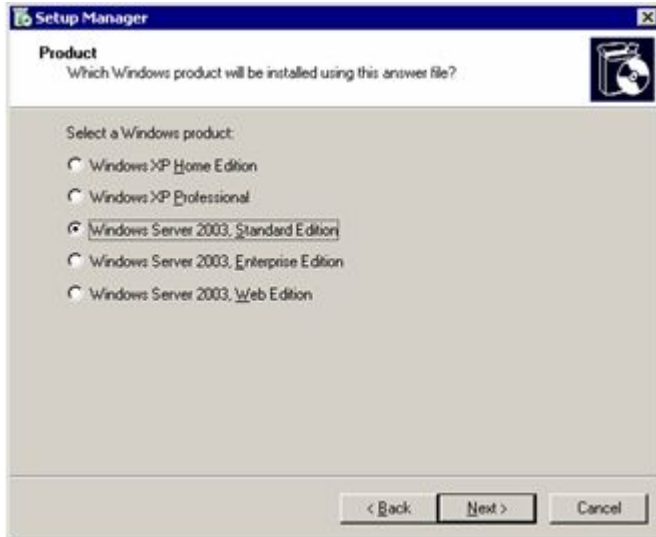


Figure 104. Setup Manager: Windows product

Step 8. Click the Windows product version, such as Windows Server 2003 Standard Edition.

The following page opens:



Figure 105. Setup Manager: License Agreement

Step 9. Click **Yes, fully automate the installation.**

Step 10. Click **Next.**

The following page opens:

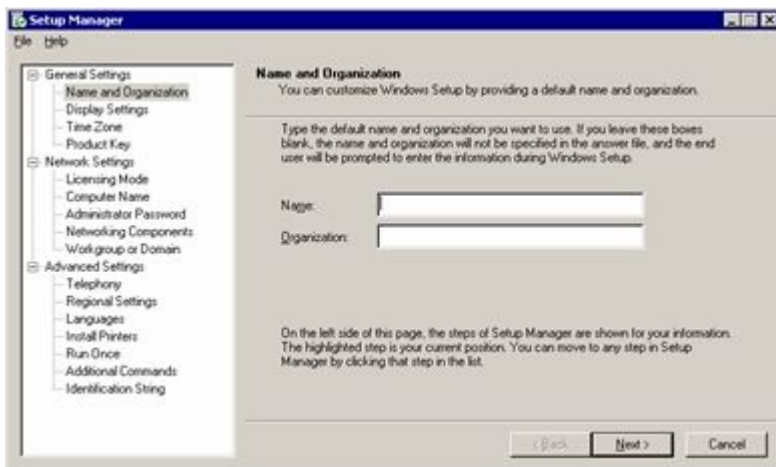


Figure 106. Setup Manager: Name and Organization

Step 11. Enter information into the **Name** and **Organization** fields, then click **Next**.

The following page opens:

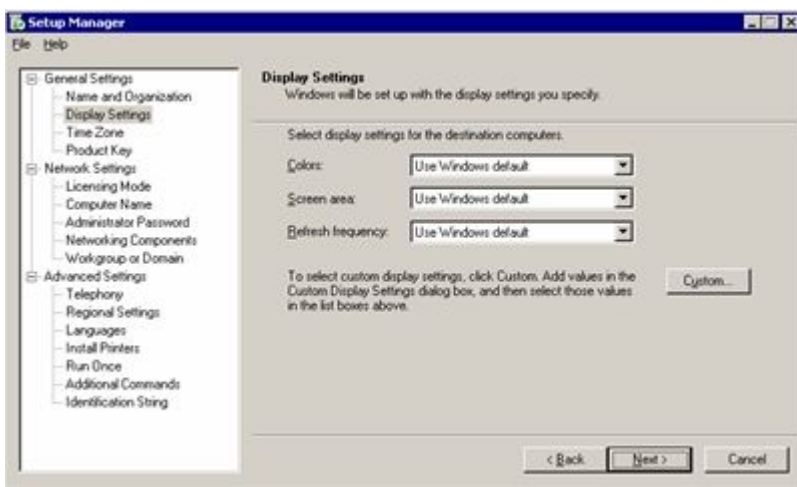


Figure 107. Setup Manager: Display Settings

Step 12. Select display settings, and then click **Next** to accept the default settings.

Step 13. Select a time zone, and then click **Next**.

The following page opens:

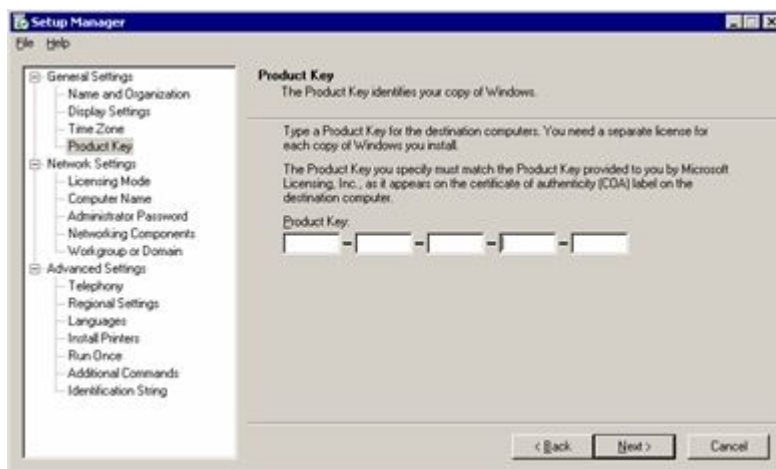


Figure 108. Setup Manager: Product Key

- Step 14. Enter the product key that matches the operating system that you installed, and then click **Next**.
- Step 15. Click **Next** to accept the defaults for **Licensing Mode**.
- Step 16. Click **Next** to accept the defaults for **Computer Name**.

The following page opens:

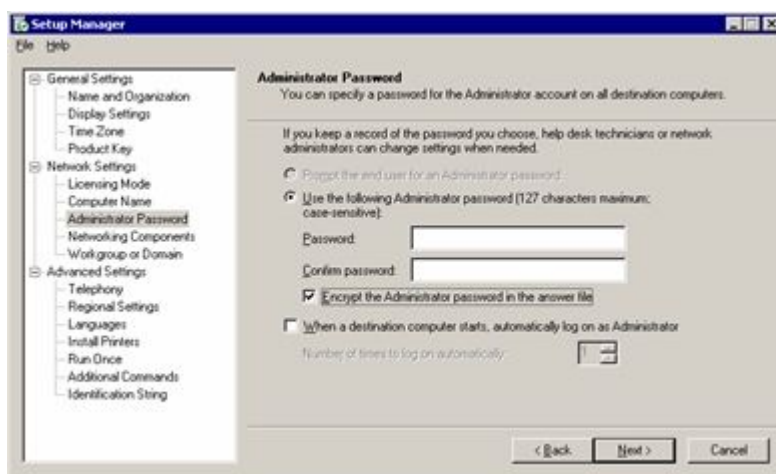


Figure 109. Setup Manager: Administrator Password

- Step 17. Leave the **Password** and **Confirm password** fields blank.
- Step 18. Select the **Encrypt the Administrator password in the answer file** check box.
- Step 19. Click **Next**.
- Step 20. Click **Next** to accept the defaults for **Networking Components**.
- Step 21. Click **Next** to accept the defaults for **Workgroup or Domain**.
- Step 22. Click **Next** to accept the defaults for **Telephony**.
- Step 23. Click **Next** to accept the defaults for **Regional Settings**.
- Step 24. Click **Next** to accept the defaults for **Languages**.

- Step 25. Click **Next** to accept the defaults for **Install Printers**.
- Step 26. Click **Next** to accept the defaults for **Run Once**.
- Step 27. Click **Next** to accept the defaults for **Additional Commands**.
- Step 28. Click **Next** to accept the defaults for **Identification String**.
- Step 29. Click **Next** to accept the defaults for **Run Once**.

The following page opens:

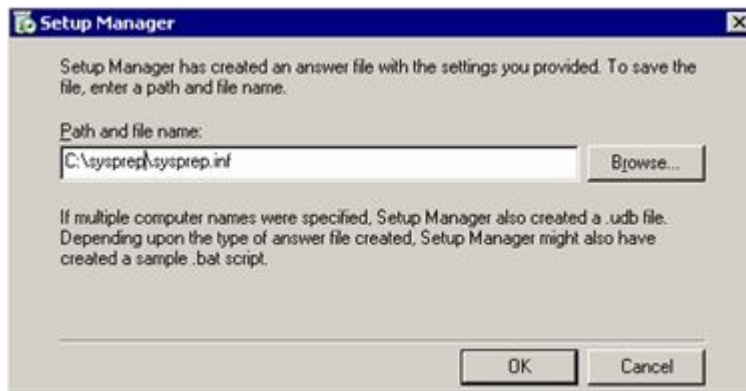


Figure 110. Setup Manager: Path and file name

- Step 30. Accept the default path, and click **OK** to save the sysprep.inf file.

The Setup Manager program creates the sysprep.inf file in the folder specified in the GUI.

- Step 31. Open a command window and change directories to the C:\sysprep directory. Then run the **sysprep.exe** command: **sysprep -reseal -nosidgen**

Make sure that both the sysprep.exe file and the Setupcl.exe file exist in the %SYSTEMDRIVE%\sysprep folder on the local hard disk. To use the answer file that you created, the sysprep.inf file must also be in the folder.

- Step 32. If the computer is ACPI-compliant, the computer shuts down by itself. If not, shut down the computer when a dialog box opens that states that it is safe to shut down the computer.

Now the system is ready for capturing.

- Step 33. Build the capture task sequence and advertise the task sequence from the Configuration Manager server, as described in “Capturing operating system images” on page 35.
- Step 34. Start the system. During the system boot, press F1 to enable a system boot from the network.

After finishing the capture task, the system restarts. The local sysprep folder containing sysprep.exe and sysprep.inf in %SYSTEMDRIVE% is deleted.

Running Sysprep on Windows Server 2008 or Windows Server 2012

You can run the System Preparation Tool (Sysprep) on a reference computer running Windows Server 2008 or Windows Server 2012.

Procedure

- Step 1. Build the capture task sequence and advertise the task sequence from the Configuration Manager server, as described in “Capturing operating system images” on page 35.
- Step 2. Make sure the operating system and applications are installed and configured on the reference computer in the same way that they should exist in the final installation.
- Step 3. Log on to the computer as an administrator.
- Step 4. Open a command window and change directories to the C:\windows\system32\sysprep directory. Then run the **sysprep.exe** command:
sysprep

The following page opens:

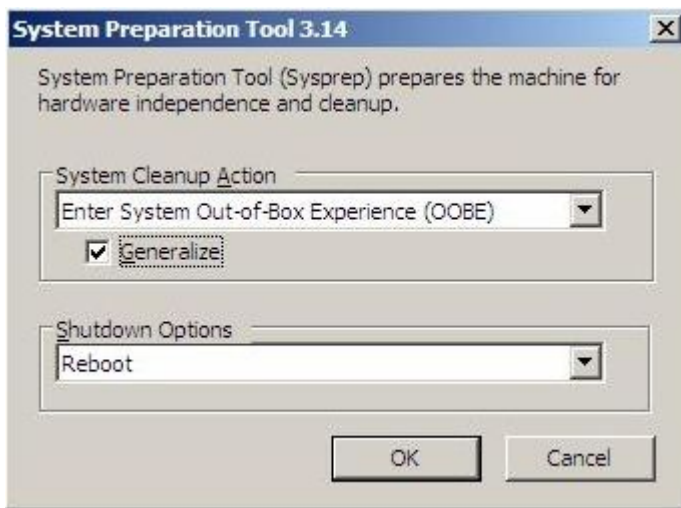


Figure 111. System Preparation Tool (Sysprep)

- Step 5. Click **OK** to run the System Preparation Tool and reboot the computer.

Now the system is ready for capturing.

- Step 6. While the system is rebooting, press F1 to enable a system boot from the network.

After finishing the capture task, the system restarts.

Appendix D. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about Lenovo products, you can find a wide variety of sources available from Lenovo to assist you.

About this task

This information describes where to go for additional information about Lenovo and Lenovo products, what to do if you experience a problem with your system, and who to call for service, if it is necessary.

Before you call

Before you call, make sure that you tried to solve the problem yourself.

About this task

Make sure that you have taken these steps to try to solve the problem:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system and any optional devices are turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system. Information about diagnostic tools is in the *Problem Determination and Service Guide* on the *Lenovo Documentation CD* that comes with your system.
- Go to [Lenovo Deployment Pack for Microsoft System Center Configuration Manager website](#) to check for technical information, hints, tips, and new device drivers or to submit a request for information.

You can solve many problems without outside assistance by following the troubleshooting procedures that Lenovo provides in the online help or in the documentation that is provided with your Lenovo product. The documentation that comes with Lenovo systems also describes the diagnostic tests that you can perform. Most systems, operating systems, and programs come with documentation that contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the documentation for the operating system or program.

Using the documentation

Information about your Lenovo system and preinstalled software, if any, or optional device is available in the documentation that comes with the product. That documentation can include printed documents, online documents, readme files, and help files.

About this task

See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. Lenovo maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates.

To access these pages, go to [Lenovo Deployment Pack for Microsoft System Center Configuration Manager website](#) and follow the instructions.

Getting help and information from the World Wide Web

The Lenovo web site has up-to-date information about Lenovo systems, optional devices, services, and support, including <http://www.ibm.com/systems/x/>, <http://www.ibm.com/systems/bladecenter/>, and <http://www.ibm.com/intellistation/>.

About this task

You can find service information for Lenovo systems and optional devices at Lenovo Deployment Pack for Microsoft System Center Configuration Manager website.

Hardware service and support

You can receive hardware service through your Lenovo reseller or Lenovo Services.

About this task

To locate a reseller authorized by Lenovo to provide warranty service, go to the IBM PartnerWorld website and click **Find a Business Partner** on the right side of the page. For Lenovo support telephone numbers, see IBM Directory of worldwide contacts webpage.

In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378). In the U.S. and Canada, hardware service and support is available 24 hours a day, 7 days a week.

In the U.K., these services are available Monday through Friday, from 9 a.m. to 6 p.m.

Appendix E. Capturing and deploying Windows 2008 R2

These topics describe tasks required to capture and deploy the Windows 2008 R2 image.

When you install Windows 2008 R2, the system sometimes creates one more reserved partition based on your installation settings. You must configure both partitions for your operating system installation. If you see only one partition, skip the steps in the following topics and follow the common steps to capture and deploy operating systems.

The following image shows two partitions, the reserved and C:

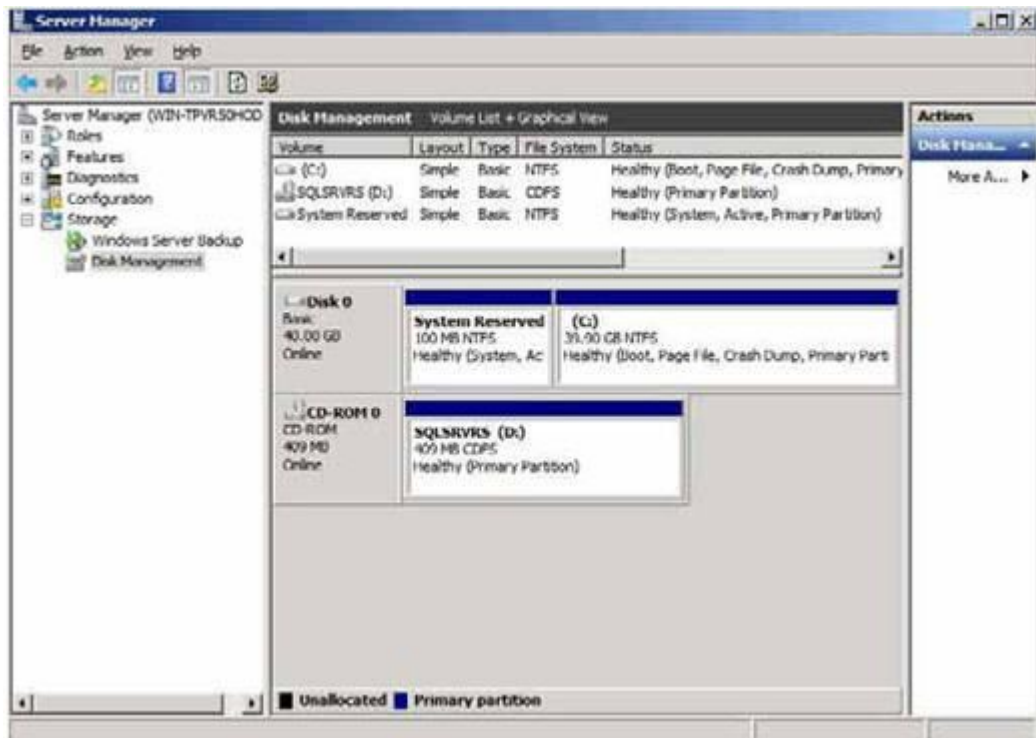


Figure 112. Two partitions

Changing the OSDTargetSystemRoot property

Before capturing the Windows 2008 R2 image, you must change the value of the OSDTargetSystemRoot property.

About this task

Changing the value of the OSDTargetSystemRoot property is necessary for capturing the Windows 2008 R2 image, which is used when SCCM tries to identify the system root of the target server.

Procedure

- Step 1. Open the SCCMConfiguration Manager console.
- Step 2. Expand **Computer Management**, and click **Collections**.

- Step 3. Click on the custom collection, right-click the target computer that you are capturing, and click **Properties**.
- Step 4. Select **Variables** and add the OSDTargetSystemRoot property with the value [SystemDisk]:\Windows. In the example below, the D disk drive is the system disk drive.

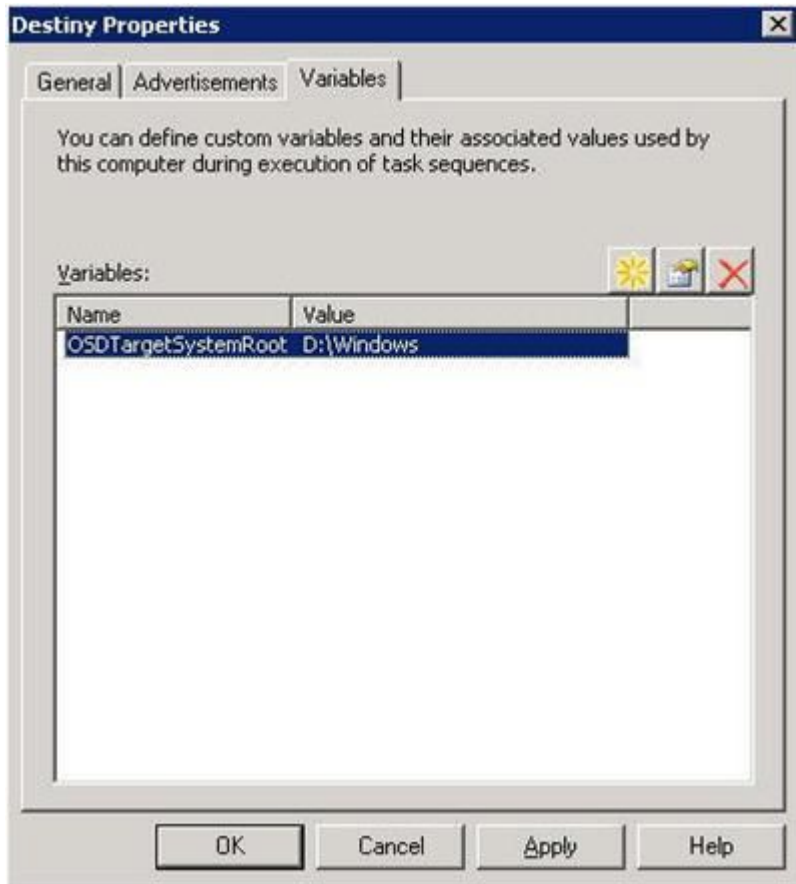


Figure 113. OSDTargetSystemRoot property

- Step 5. Follow the common steps to capture the Windows 2008 R2 image.

Deploying the Windows 2008 R2 image

After capturing the operating system image, import the Windows Imaging Format (WIM) file to the SCCM server.

About this task

After you import the WIM file, two volumes are displayed in the **Images** list, as shown in the following figure.

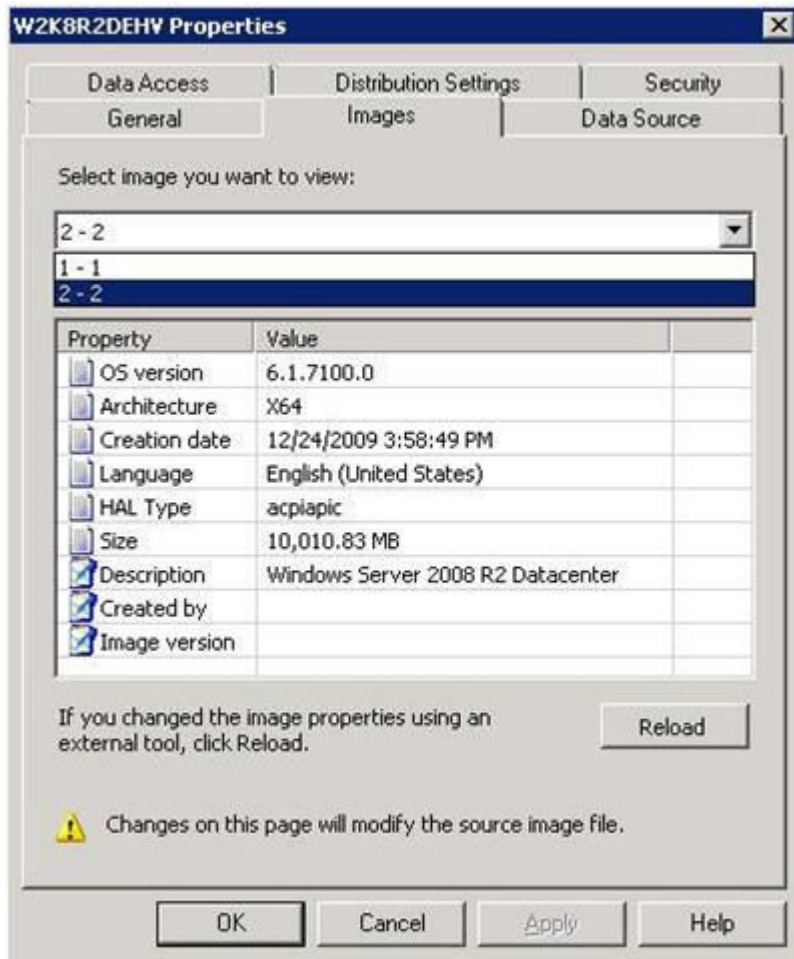


Figure 114. Image list

The first volume, 1-1, contains the 100 MB partition. The second one, 2-2, contains the operating system image. To create a task sequence for deployment, complete the following steps.

Procedure

- Step 1. Use the Lenovo Task Sequence template to create the Lenovo Server Deployment Task Sequence.
- Step 2. To edit the task sequence, right-click the task sequence and choose Edit.
- Step 3. On the navigation panel under Step 3, click **Format and Partition Disk** as shown in the following figure.

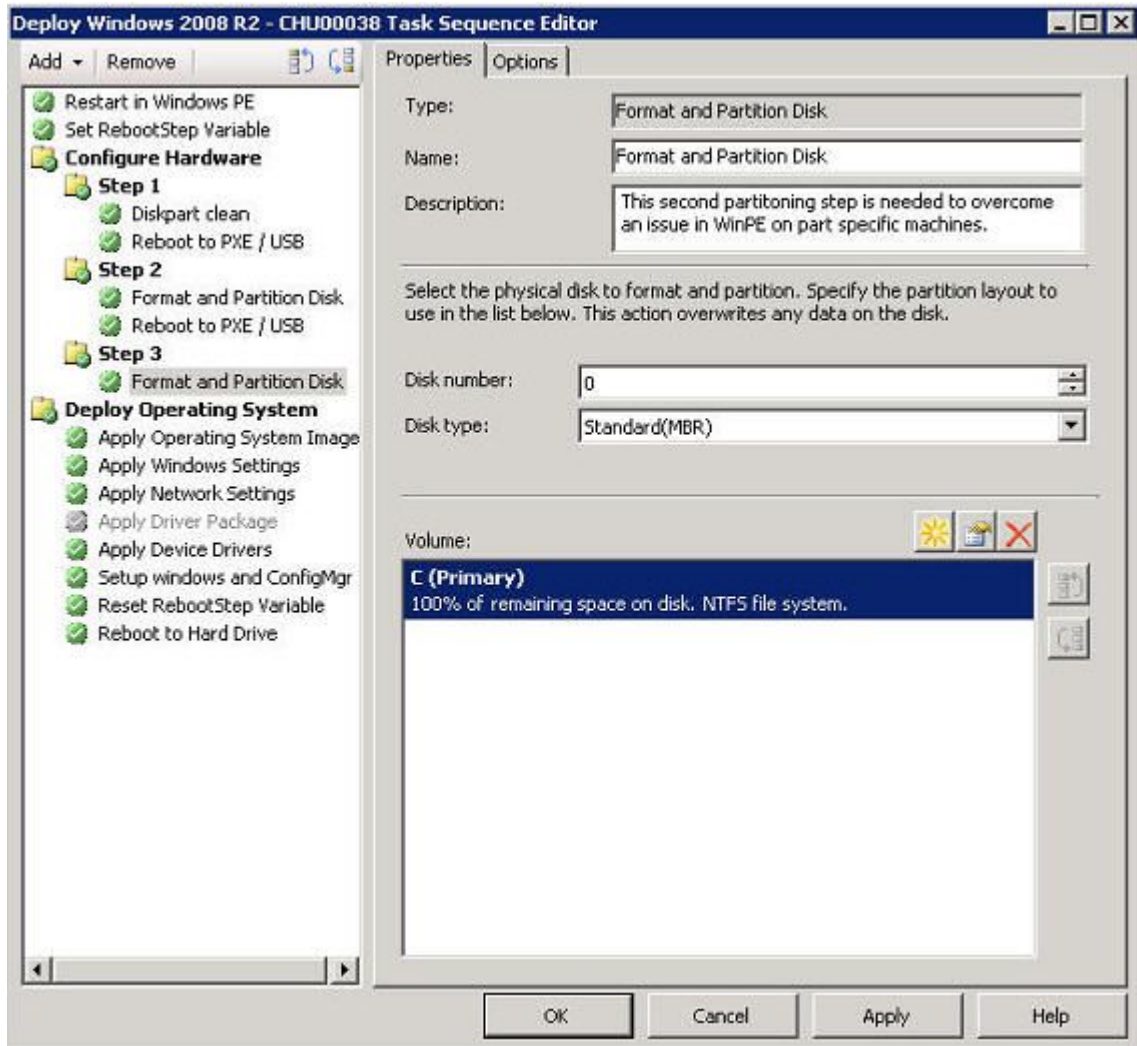


Figure 115. Format and partition disk

- Step 4. In the Volume portion of the window, double-click the first item. The **Partition Properties** menu opens.
- Step 5. Select **Mark this the boot partition**.
- Step 6. Select **Quick Format**.
- Step 7. In the **Variable** field, enter **BOOTPART**, and click **OK**.

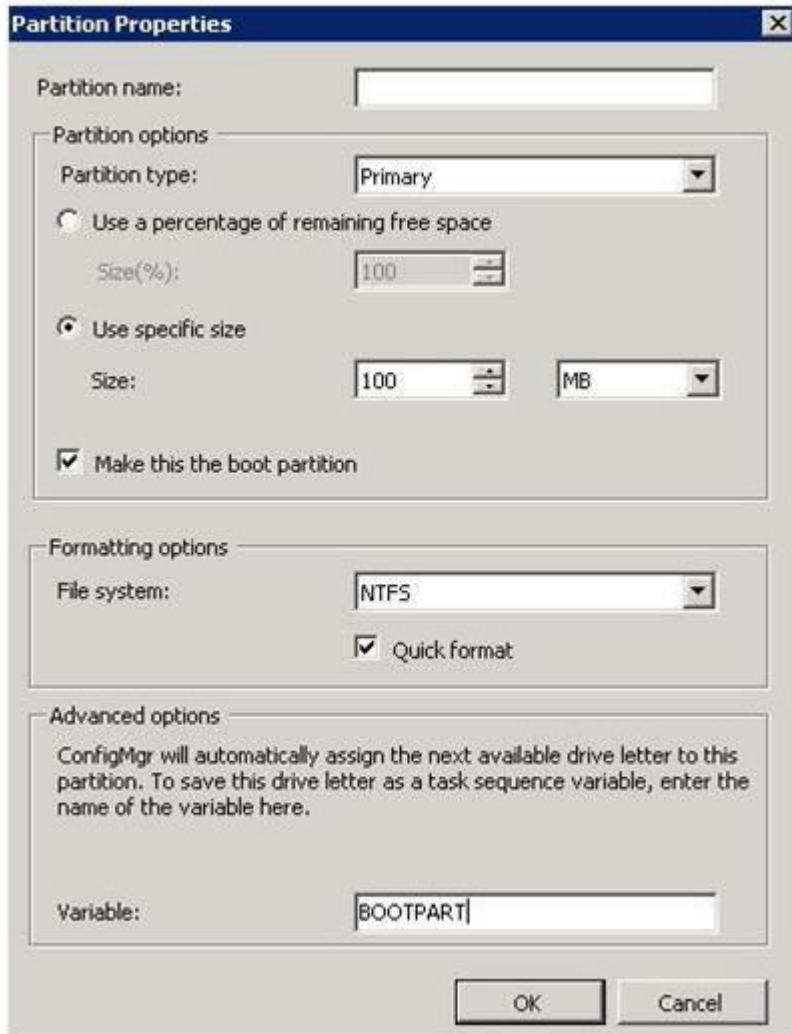


Figure 116. Partition properties

- Step 8. On the Partition Properties page, add a second volume:
- In the Partition Options section, select **Use a percentage of remaining free space**.
 - Select the **Use specific size** check box, and enter 100 in the **Size** field.
 - In the Formatting options section, select the **Quick format** check box, and enter 0SPART in the **Variable** field.

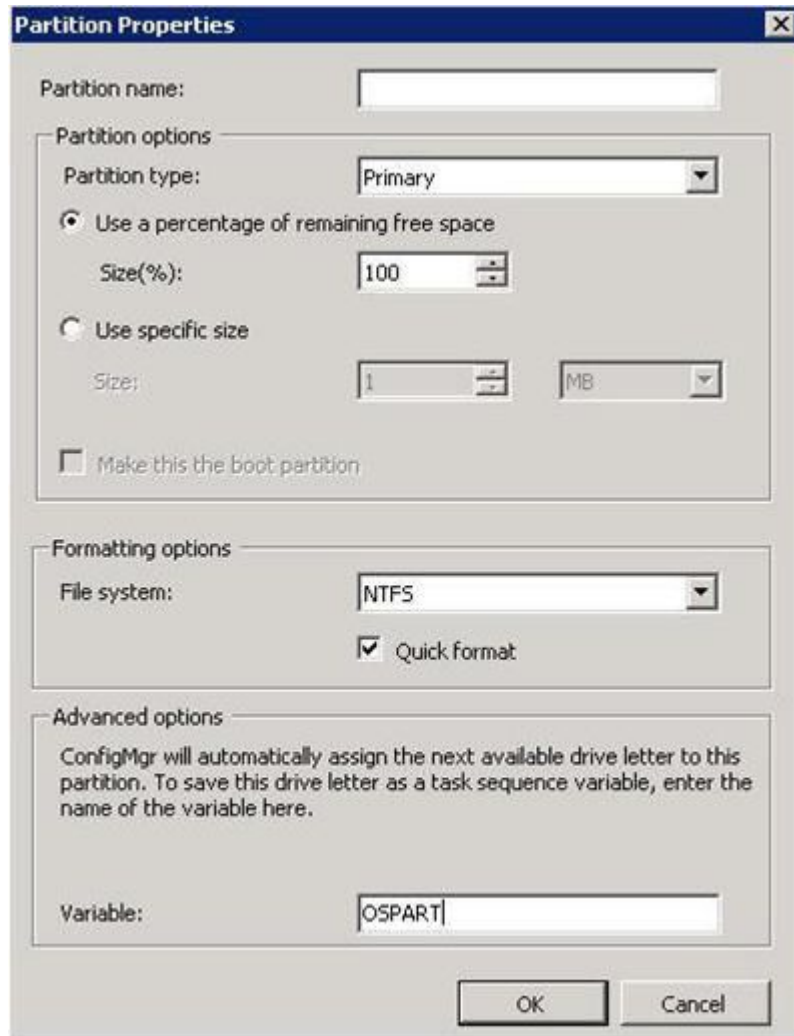


Figure 117. Partition properties for the second volume

- d. To submit the changes, click **OK**.
The following window opens.

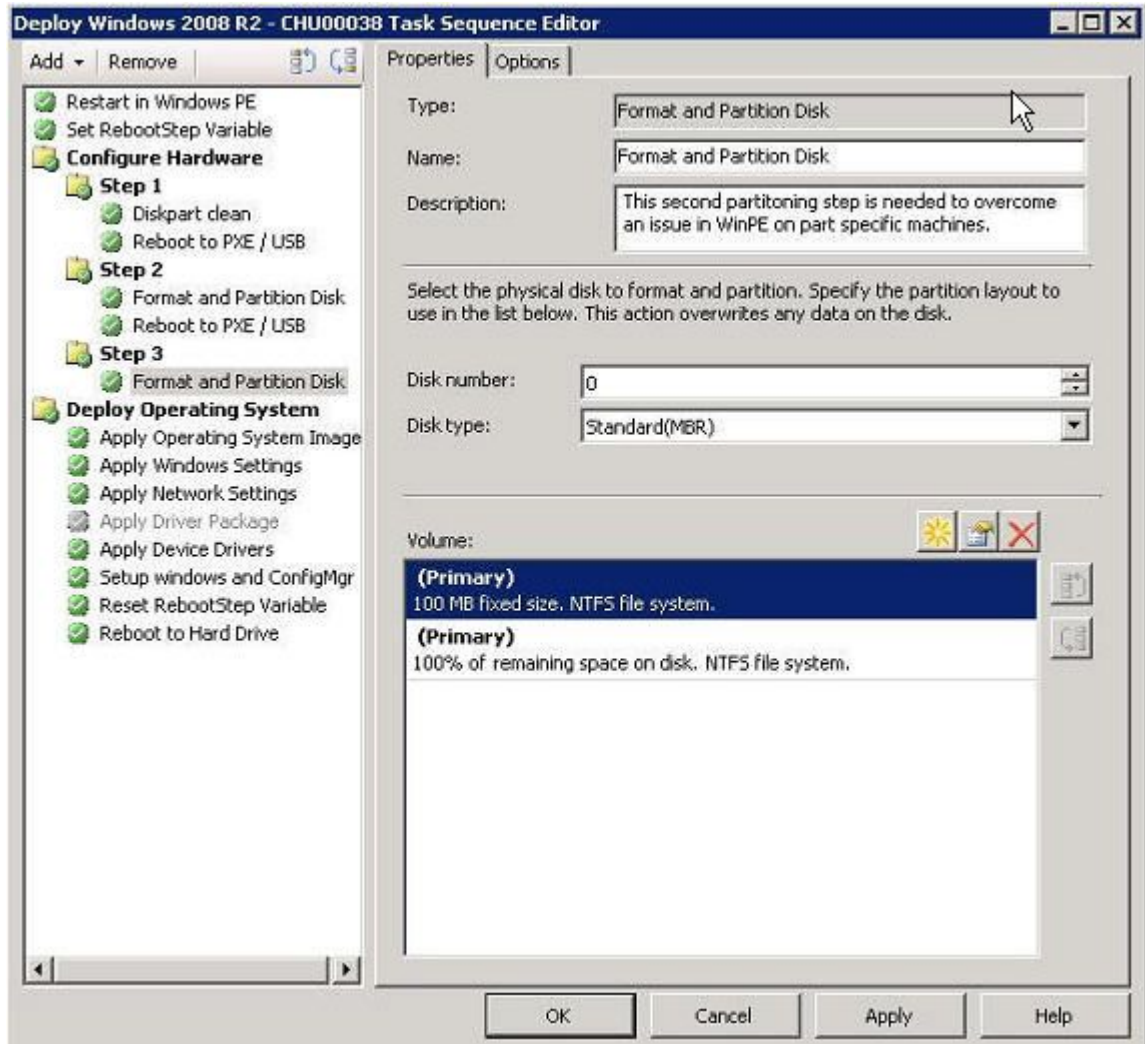


Figure 118. Task sequence

- Step 9. In the navigation panel, select **Apply Operating System Image**, and click **OK**. The Deploy Windows 2008 R2 page opens.

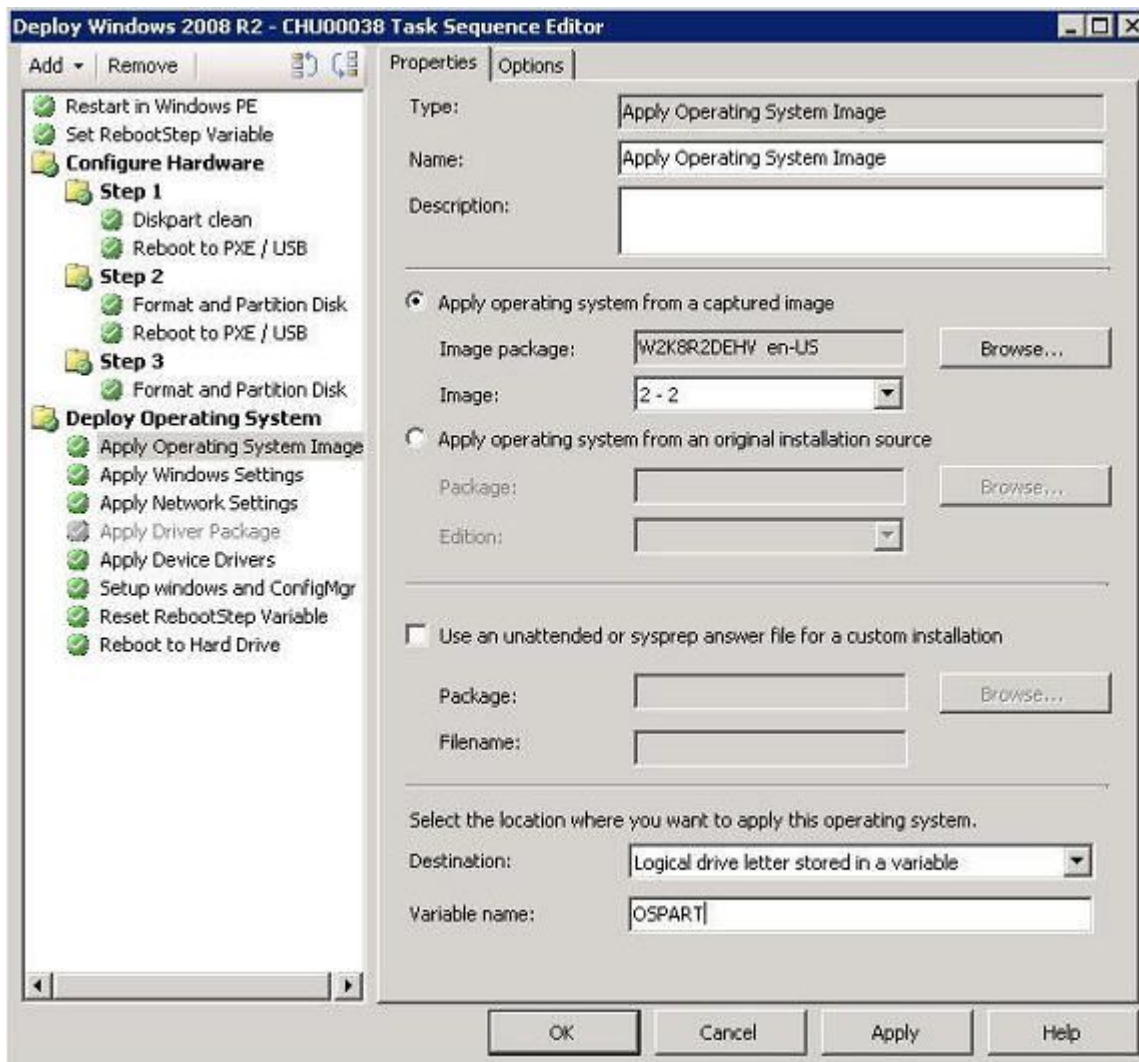


Figure 119. Deploy Windows 2008 R2 page

- Step 10. In the **Image** field, select **2-2** from the list, and click **Apply**.
- Step 11. Follow the common steps to deploy the WS08 R2 image.
- Step 12. In the **Destination** field, select **Logical drive letter stored in a variable** from the list.
- Step 13. In the **Variable** field, enter OSPART.
- Step 14. To submit the changes, click **OK**.

Appendix F. Accessibility features for the Lenovo Deployment Pack

Accessibility features help users who have a disability, such as restricted mobility or limited vision, to use information technology products successfully.

Accessibility features

The following list includes the major accessibility features in the Lenovo Deployment Pack:

- Can be operated using only the keyboard
- Communicates all information independent of color
- Inherit system settings for font, size, and color
- Supports interfaces commonly used by screen readers and screen magnifiers

Keyboard navigation

This product uses standard Microsoft® Windows navigation keys.

Lenovo and accessibility

See the [Lenovo Accessibility website](#) for more information about the commitment that Lenovo has to accessibility.

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Processor speed indicates the internal clock speed of the microprocessor; other factors also affect application performance.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for 1 024 bytes, MB stands for 1 048 576 bytes, and GB stands for 1 073 741 824 bytes.

When referring to hard disk drive capacity or communications volume, MB stands for 1 000 000 bytes, and GB stands for 1 000 000 000 bytes. Total user-accessible capacity can vary depending on operating environments.

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