Technical white paper

HP Device Manager 4.7

Imaging Guide

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Overview

This white paper demonstrates how to capture and deploy images.

Note
Before capturing images from and deploying images to thin clients, you need to make sure that the repository has been configured. See the "Repository management" chapter of the *HP Device Manager Administrator Guide* for more information.

Imaging support matrix

For information on imaging support for specific thin-client platforms, see the *Release Notes* for your current HPDM version.

Capturing an image without PXE

HPDM supports two modes to capture an image without PXE: non-cached mode and cached mode. If the thin client uses an advanced network, such as wireless or 802.1x, use the Cached Imaging mode to capture an image.

The following table shows which formats are supported when capturing images from thin clients.

Operating system	Imaging method	Captured image format
Windows Embedded 8 Standard	File-based	.ibr
Windows Embedded Standard 7	File-based	.ibr
Windows Embedded Standard 2009	File-based	.ibr
Windows XP Embedded	Disk-based	.img
HP ThinPro 5	Disk-based	.dd.gz
HP ThinPro 4	Disk-based	.dd.gz
HP ThinPro 3	Disk-based	.dd.gz
HP Smart Zero Core (x86)	Disk-based	.dd.gz
HP Smart Zero Core (ARM)	Disk-based	.dd.gz
Windows Embedded CE 6.0	Disk-based	.dd.gz

Capturing an image using the non-cached mode

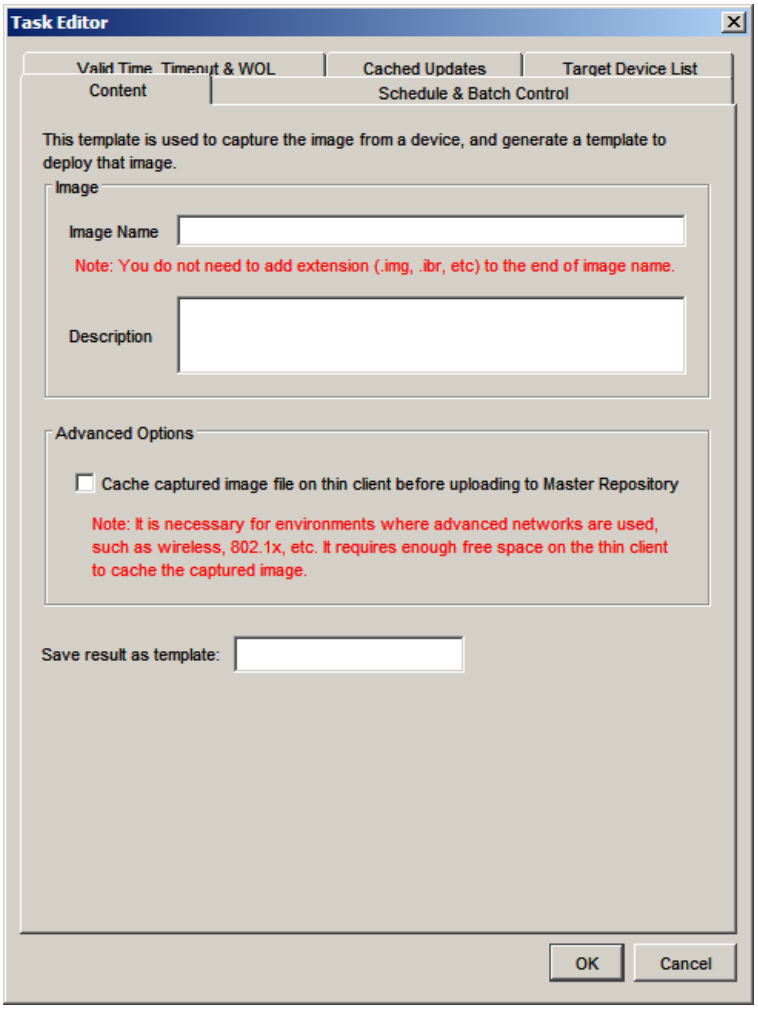
Note

If you want to capture images from Windows-based thin clients using the non-cached mode, a Shared Folder is required.

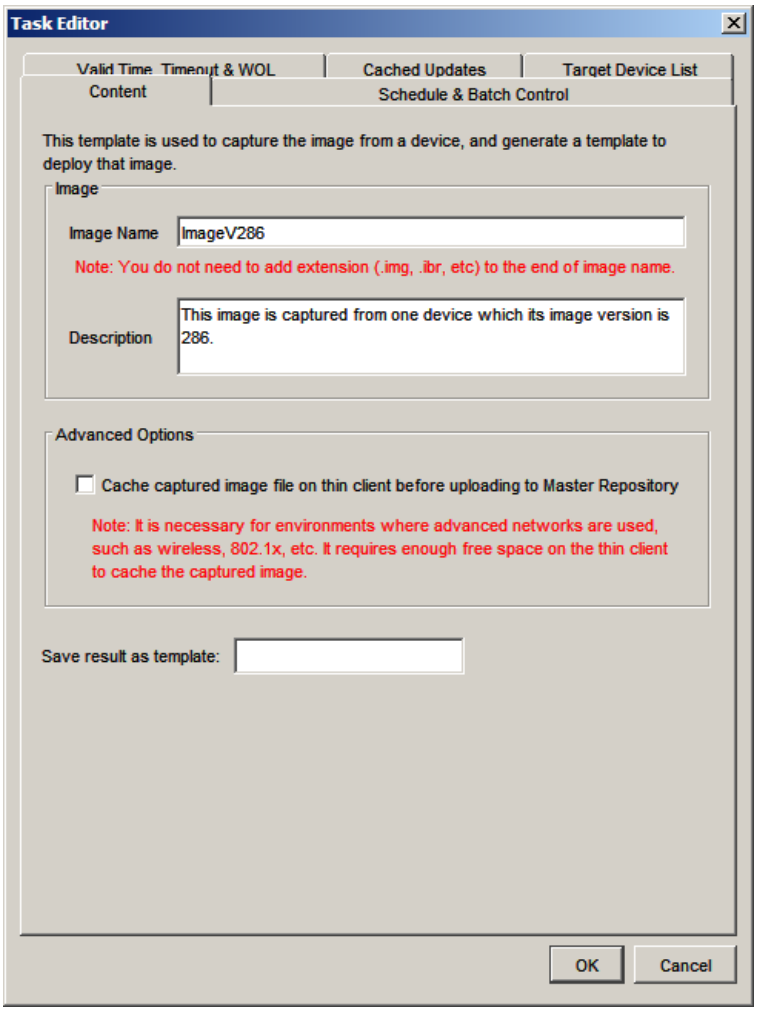
Capturing images using the non-cached mode cannot be done when using a wireless connection.

When capturing an image from a Windows Embedded Standard 7- or Windows Embedded 8 Standard-based device, there must be at least 300 MB of free disk space on the thin client. When capturing an image from a Windows Embedded Standard 2009-based device, there must be at least 200 MB of free disk space on the thin client. When capturing an image from an HP t410, there must be at least 40 MB of free disk space on the thin client.

1. Select the **Task Templates** tab in the Task pane, and then drag the **_Capture Image** template onto the device in the Device pane whose image you wish to capture. The Task Editor dialog appears.

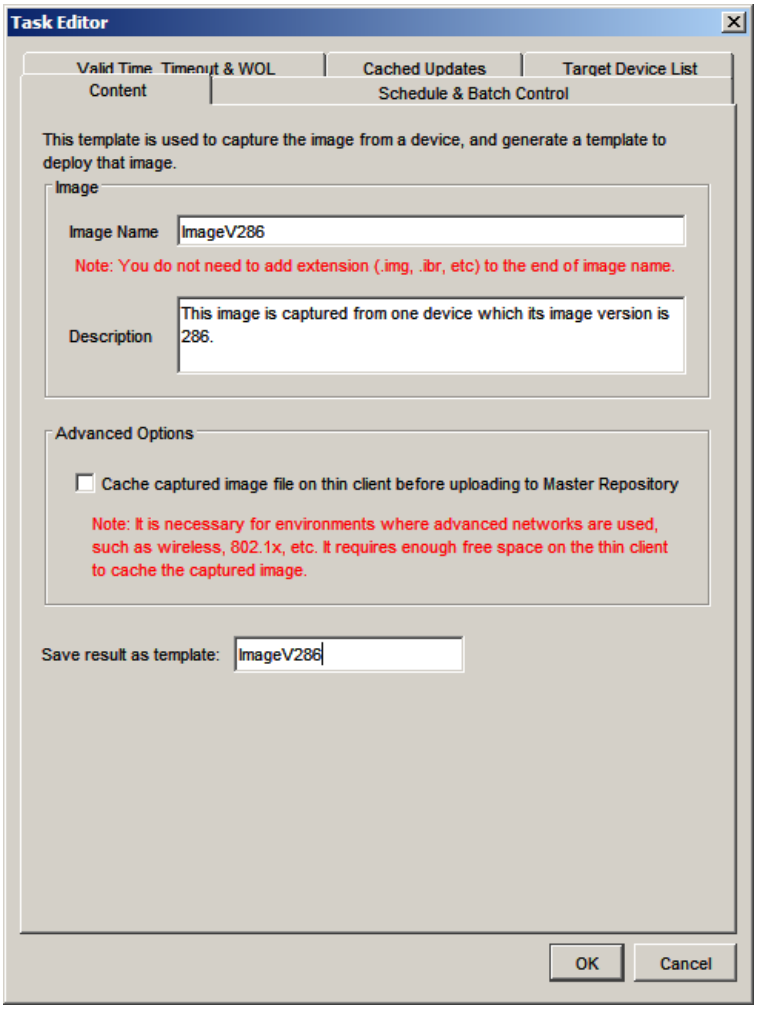


2. In the Task Editor dialog box, enter a name in the **Image Name** field for the captured image, and then enter a description of the captured image in the **Description** field.



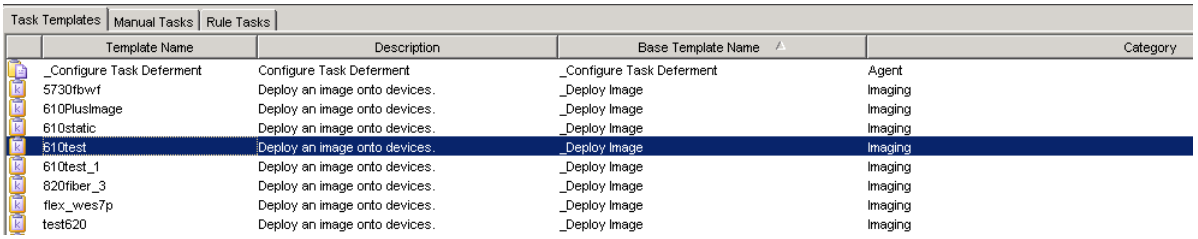
Note
Do not select the option **Cache captured image file on thin client before uploading to Master Repository**.

3. In the **Save result as template** field, enter a name for the resulting template.



4. Click **OK** to apply the task to the device immediately.

   The task pane in the HPDM Console indicates that the task is processing. The captured image is being compressed. When the task is sent, a new template appears in the task pane with the name you specified for the resulting template. It appears disabled with a status of transferring. If the task fails to finish, the status changes to failed. If the task finishes successfully, the status changes to enabled.



5. You can now use this template to apply the captured image to other devices by performing a drag-and-drop operation on devices in the device pane or folders in the device tree.

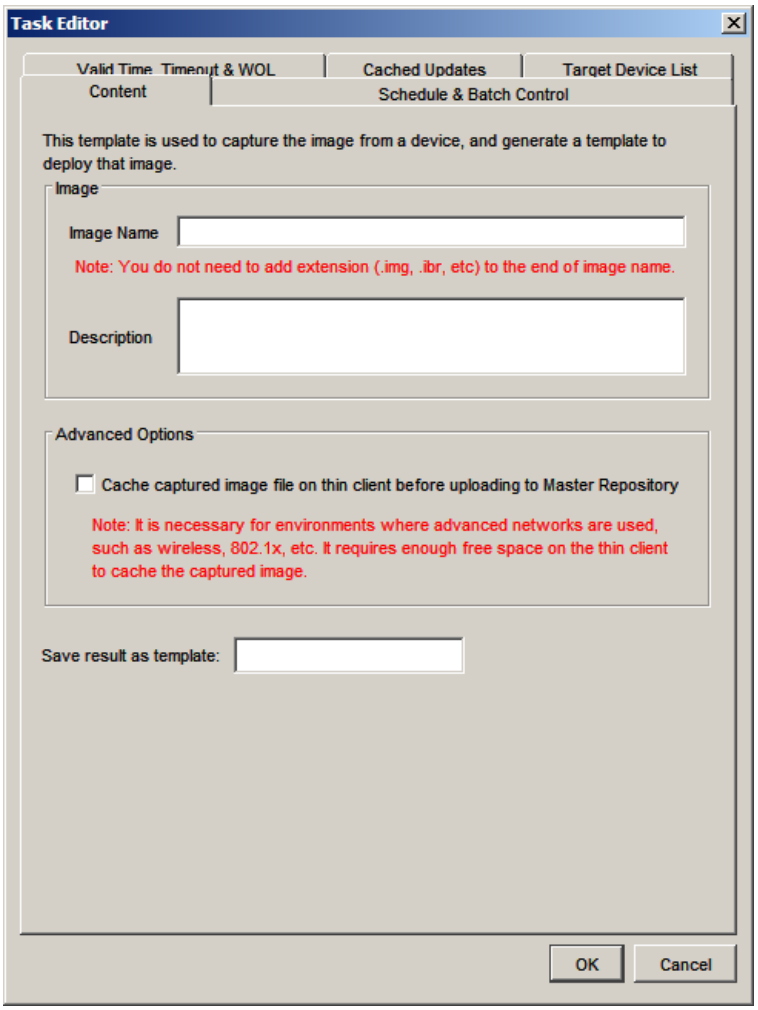
Capturing an image using the cached mode

Note

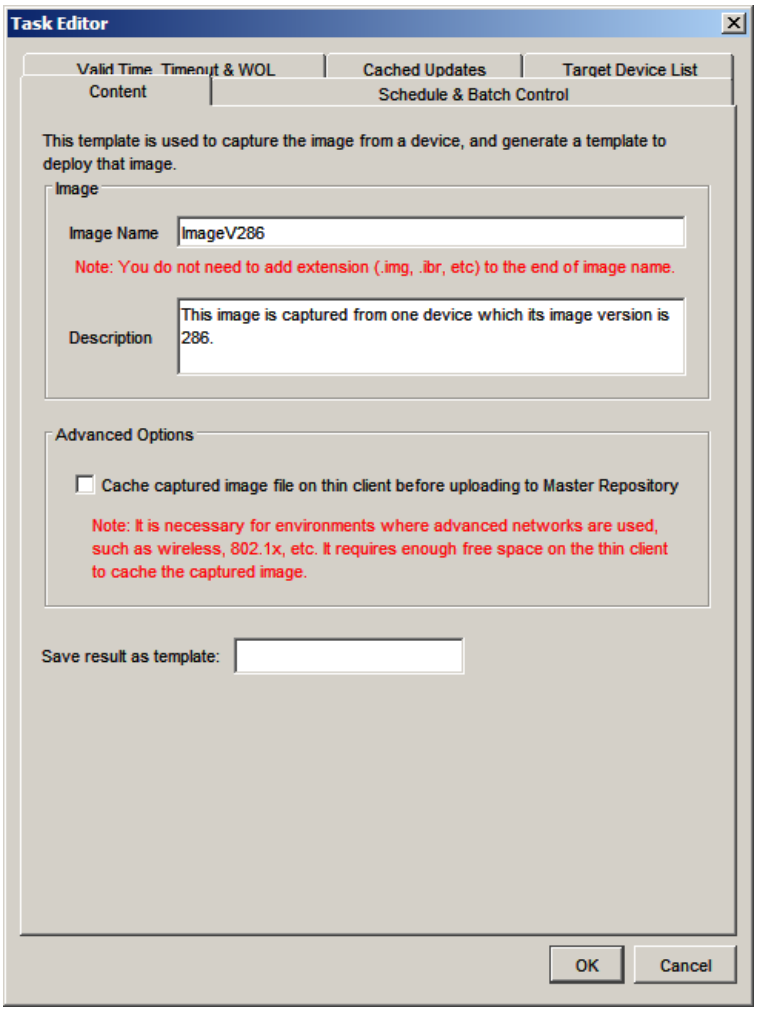
HPDM does not support Cached Imaging on devices running the Windows XP Embedded or Windows Embedded CE 6.0 operating system.

When capturing an image from a Windows-based device, the free disk space must be at least 70% of the total file system size. When capturing an image from an HP ThinPro device, the free disk space must be at least 50% of the total disk size and the available RAM needs to be at least 1 GB. When capturing an image from an HP Smart Zero Core device, the free disk space must be at least 50% of the total disk size and the available RAM needs to be at least 512 MB.

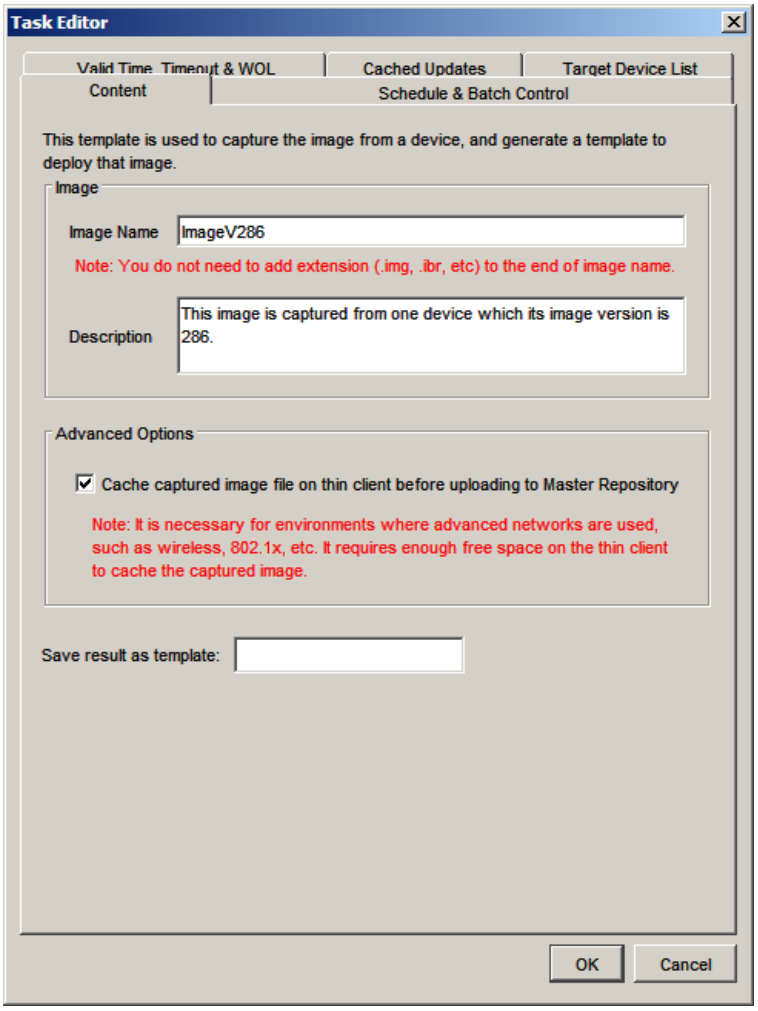
1. Select the **Task Templates** tab in the Task pane, and then drag the **_Capture Image** template onto the device in the Device pane whose image you wish to capture. The Task Editor dialog appears.



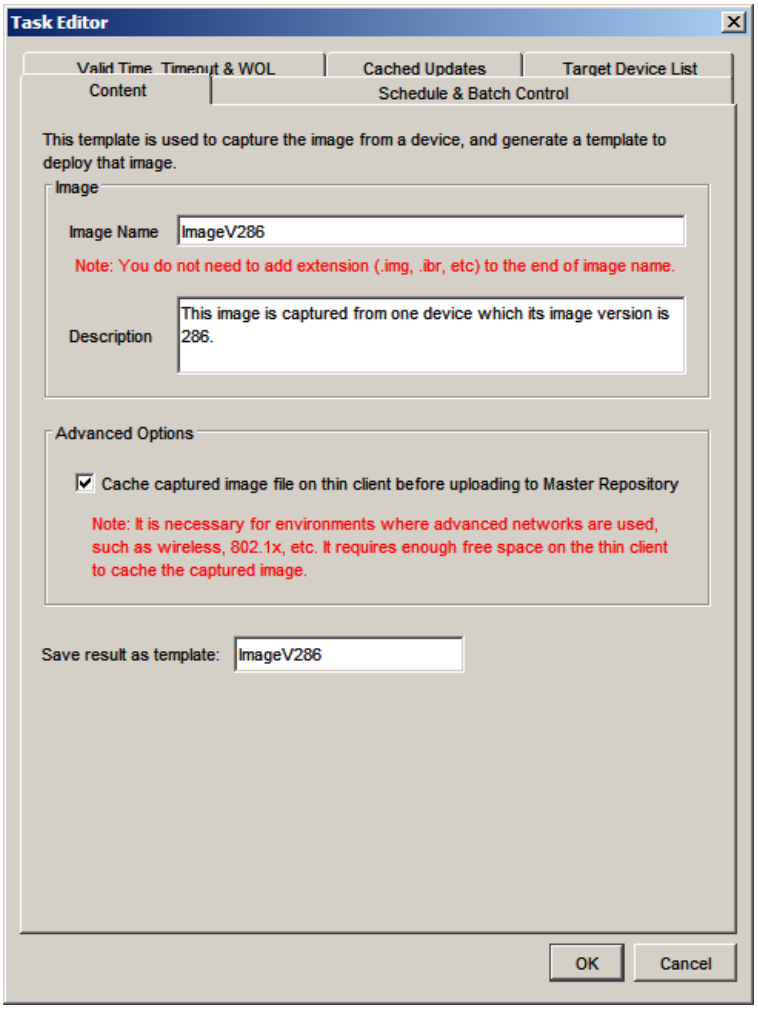
2. In the Task Editor dialog box, enter a name in the **Image Name** field, and then enter a description for the captured image in the **Description** field.



3. Select the option **Cache captured image file on thin client before uploading to Master Repository**. If the thin client uses an advanced network, such as wireless or 802.1x, this option is necessary.

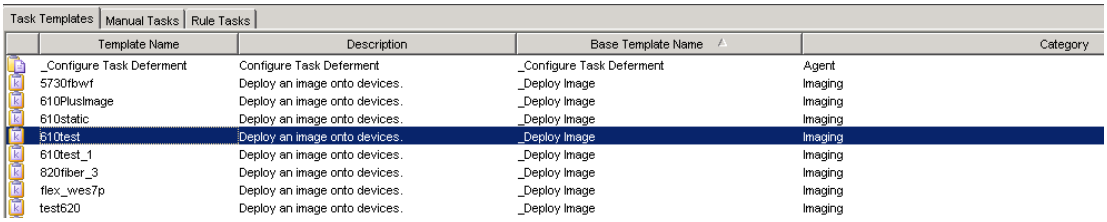


4. In the **Save result as template** field, enter a name for the resulting template.



5. Click **OK** to apply the task to the device immediately.

   The task pane in the HPDM Console indicates that the task is processing. The captured image is being compressed. When the task is sent, a new template appears in the task pane with the name you specified for the resulting template. It appears disabled with a status of transferring. If the task fails to finish, the status changes to failed. If the task finishes successfully, the status changes to enabled.



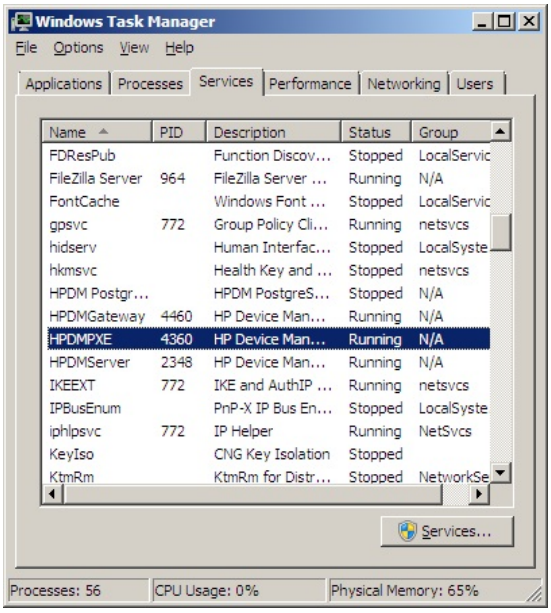
6. You can now use this template to apply the captured image to other devices by performing a drag-and-drop operation on devices in the device pane or folders in the device tree.

Capturing an image with PXE

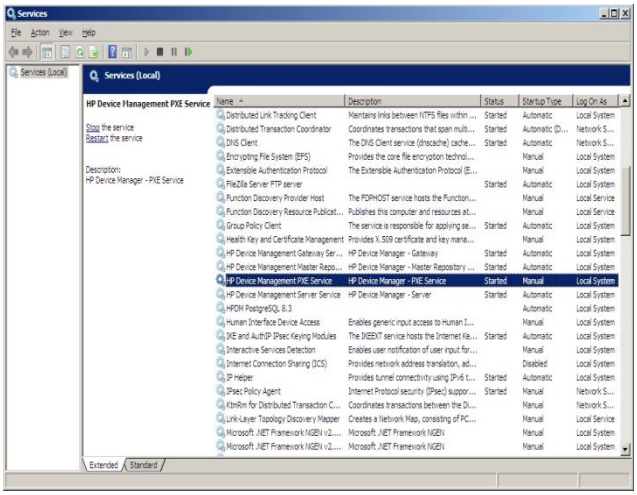
HPDM supports capturing images with PXE on devices running the Windows Embedded Standard 2009, Windows XP Embedded, HP ThinPro 3, or HP ThinPro 4 operating system. The captured image is in the .dd.gz format.

1. Verify that the PXE server is running. If not, start it. The PXE server is a service. You can view its status and start it using the Windows Task Manager **(A)**, the Windows Services window **(B)**, or the HPDM Gateway Configuration window **(C)**.

   A. Windows Task Manager



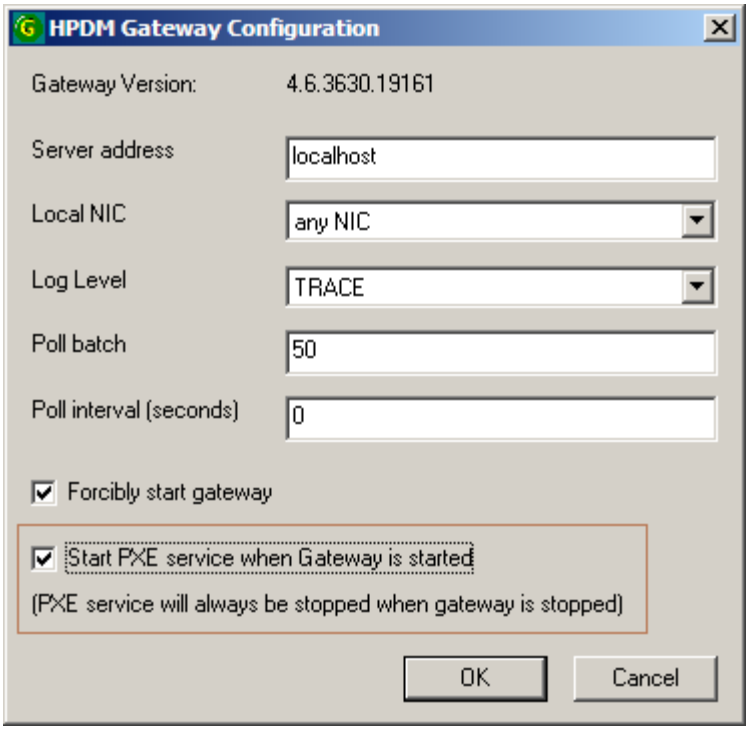
   B. Windows Services window



C. HPDM Gateway Configuration window

i. Right-click the HPDM Gateway tray icon, and the following menu will appear. Click **Configure Device Management Gateway**.

ii. In the HPDM Gateway Configuration window, select **Start PXE service when Gateway is started**, and then click **OK**.



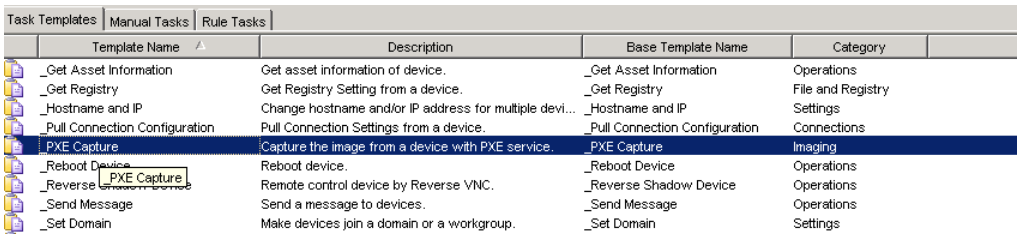
iii. Right-click the HPDM Gateway tray icon, and then click **Restart Device Management Gateway**. The PXE server will start.

2. Send a **_PXE Capture** task from the HPDM Console.

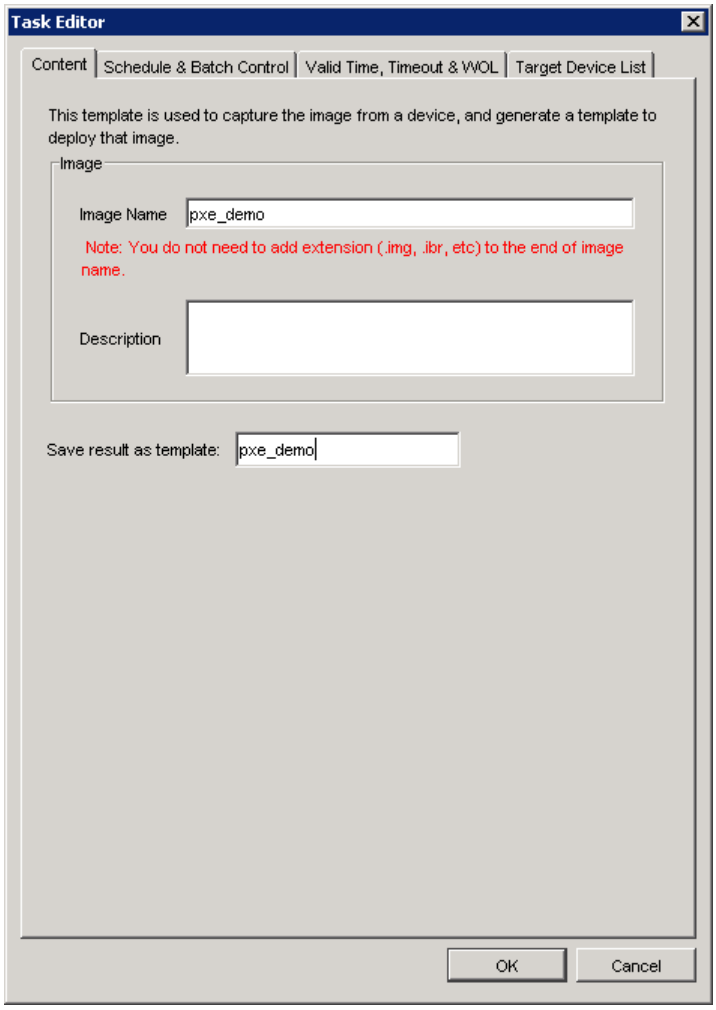
Note

A **_PXE Capture** task cannot be done when a device is shut down or using a wireless connection.

A. Select the **_PXE Capture** template under the **Task Templates** tab, and drag it onto a device. A Task Editor dialog appears.

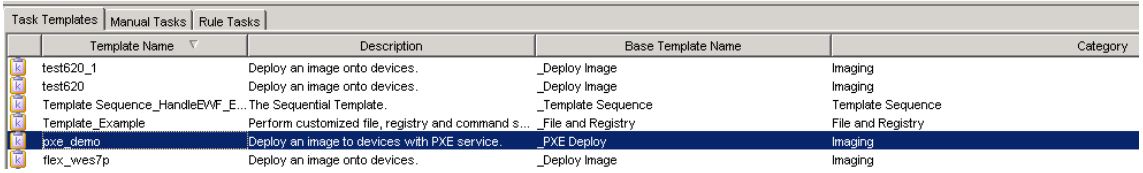


B. Enter values in the **Image Name**, **Description**, and **Save result as template fields**.



C. Click **OK**, and the _PXE Capture task is sent to the device.

3. When the task is sent, a PXE Deploy template is generated in the Task Templates tab using the name you specified. (The following example uses **pxe_demo**.) It appears disabled with a status of transferring. If the task fails to finish, the status changes to failed. If the task finishes successfully, the status changes to enabled.

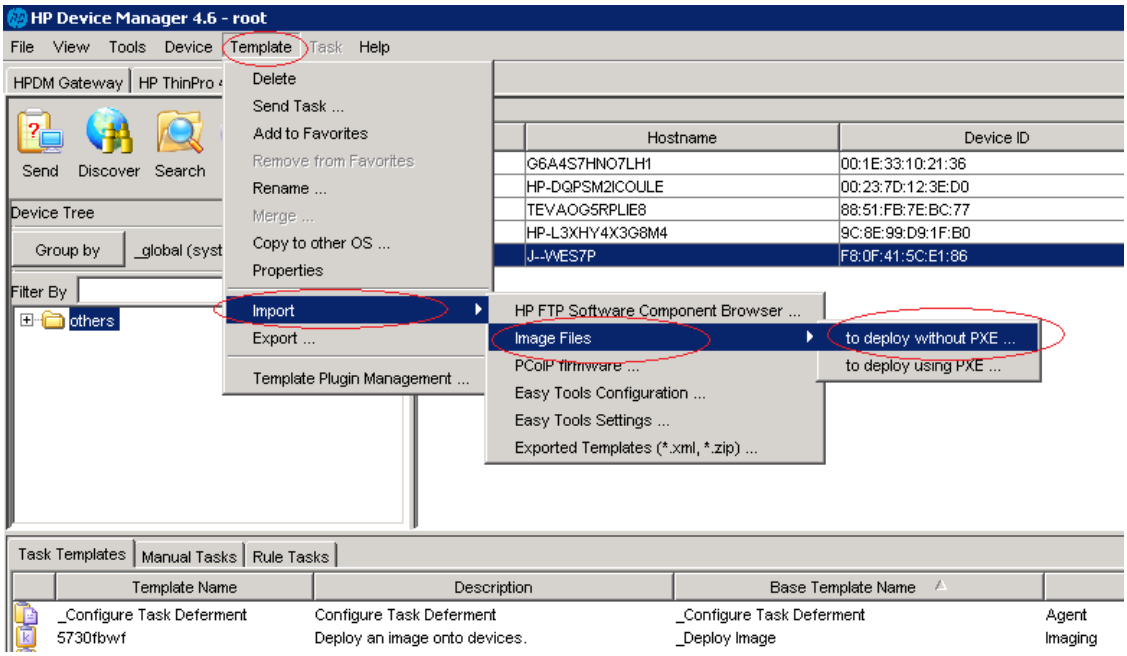


Deploying an image

There is no “Deploy Image” or “PXE Deploy Image” base template. However, you can create a Deploy Image or PXE Deploy Image template by capturing and importing an image.

Importing an image file for deployment without PXE

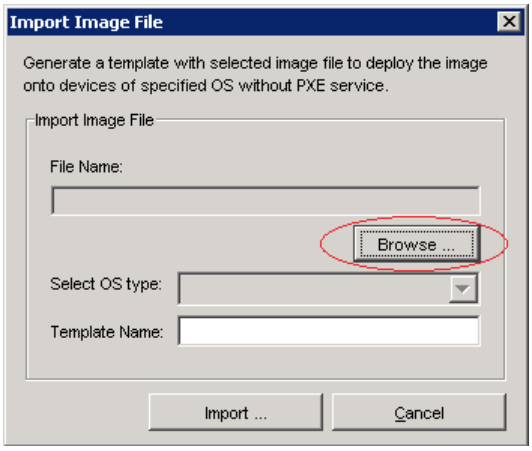
1. In the Template menu of the HPDM Console, select **Import > Image Files > to deploy without PXE**. The Import Image File dialog box appears.



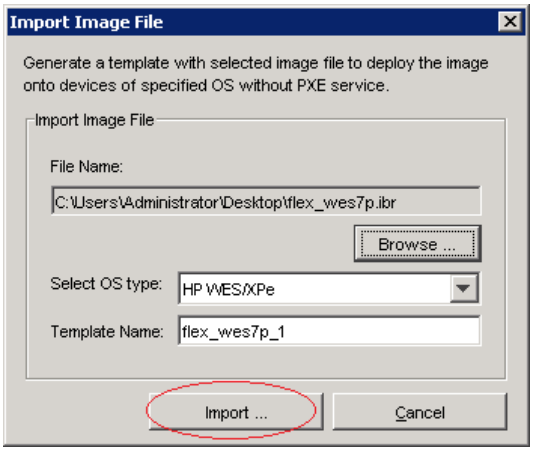
Note

This step is used only to import an image file to generate a Deploy Image template. If you want to generate a PXE Deploy Image template, select **Import > Image Files > to deploy using PXE**. The other steps are the same.

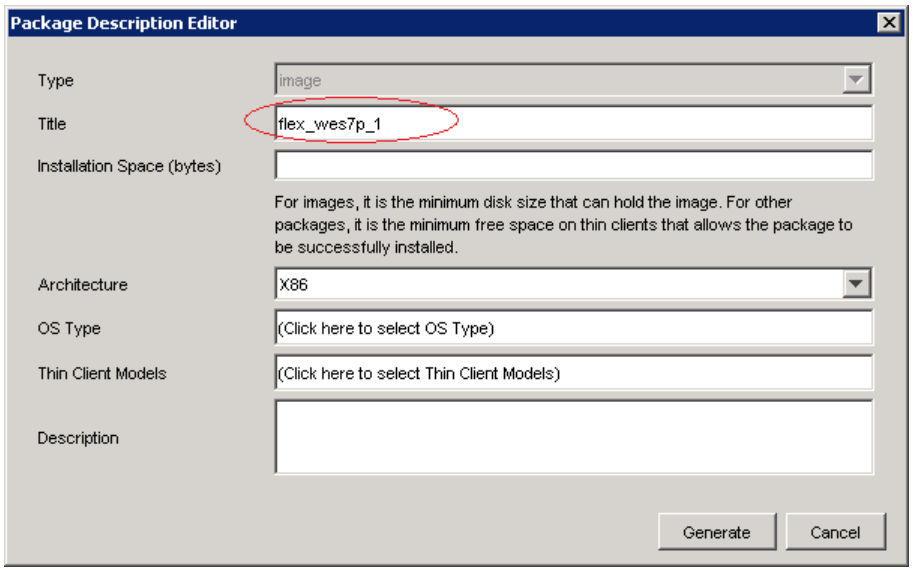
2. In the Import Image File dialog box, click **Browse** to select the image file that you want to import.



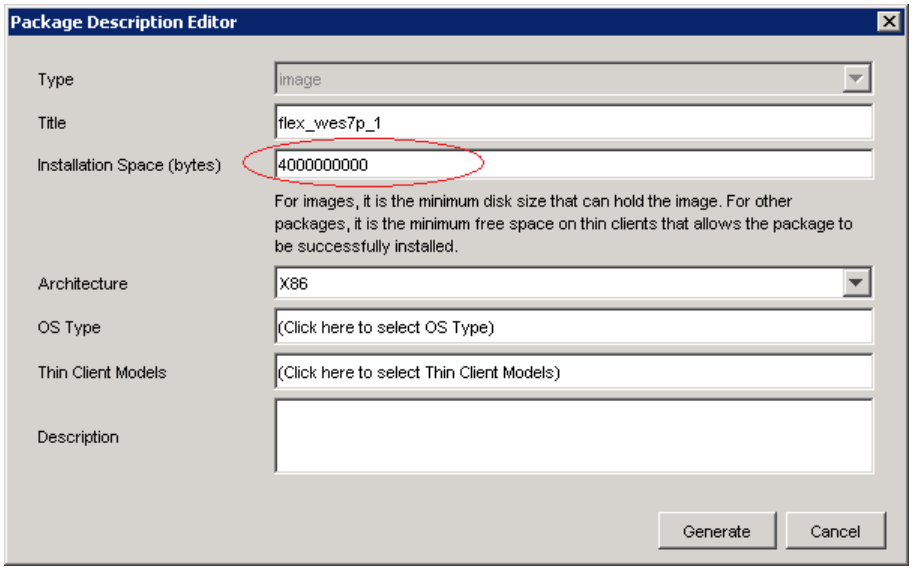
3. After selecting the desired image file, click **Import**.



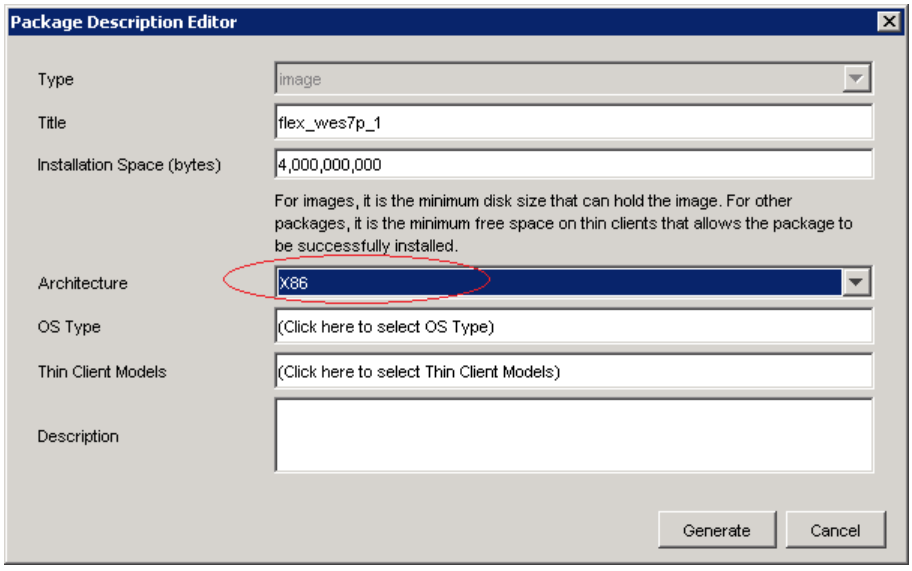
4. In the Package Description Editor, enter the necessary information about this image file.
   A. Enter a title for this package in the **Title** field.



   B. Enter the **Installation Space** in bytes. This is the minimum disk size required to install this image. For example, if installing image flex_wes7p.ibr on a device requires at least 4 GB of free space, you would enter `4000000000`.

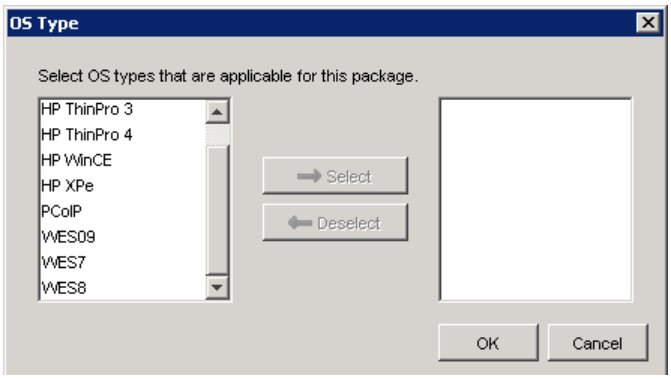


C. Select the **Architecture**.

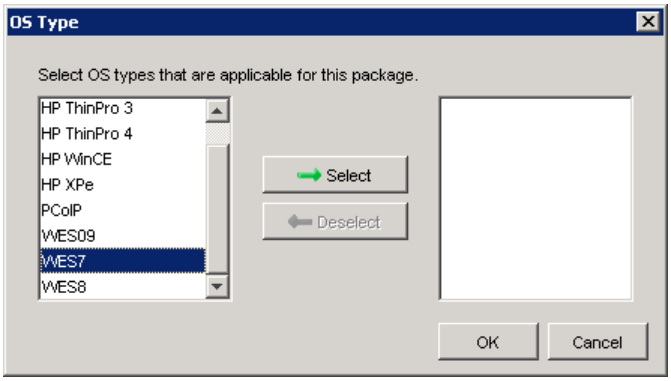


D. Select the **OS Type**. This is the image file's operating system. You can select the operating system using the following steps.

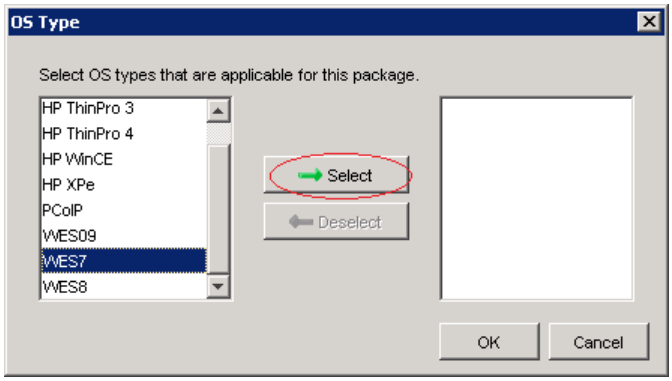
i. Click the **OS Type** field, and the OS Type dialog appears.



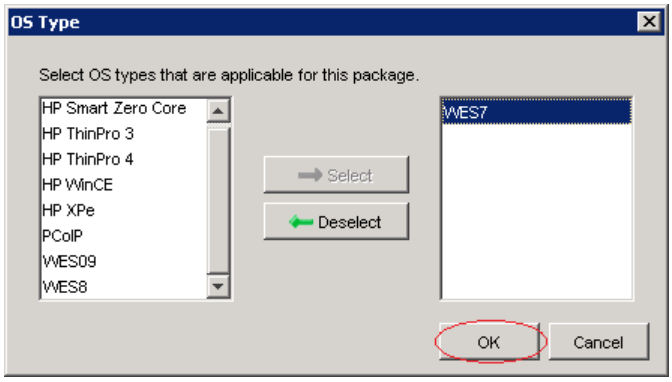
ii. Select the desired operating system in the left pane, such as Windows Embedded Standard 7.

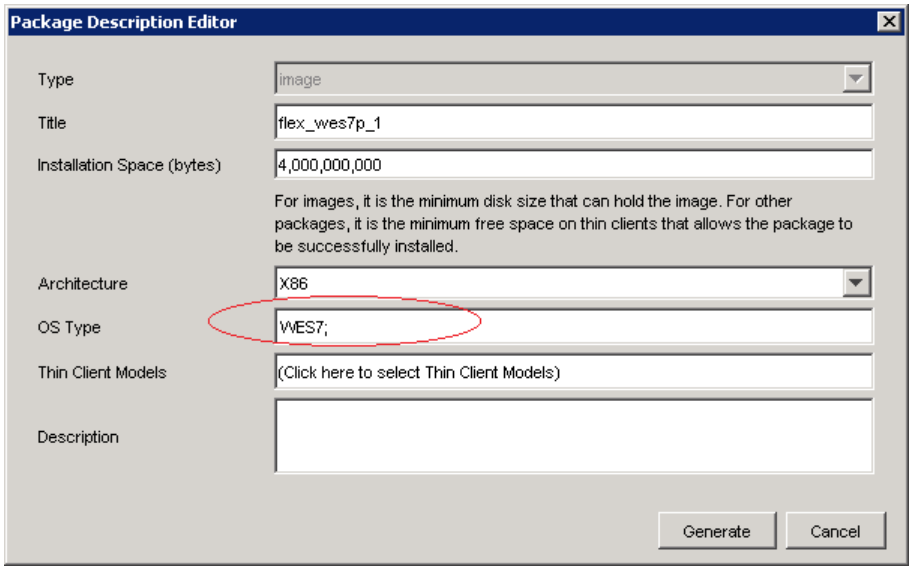


iii. Click **Select**.



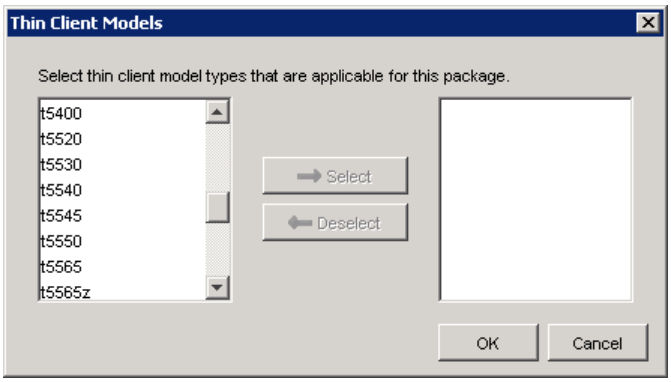
iv. Click **OK** to return to the Package Description Editor.



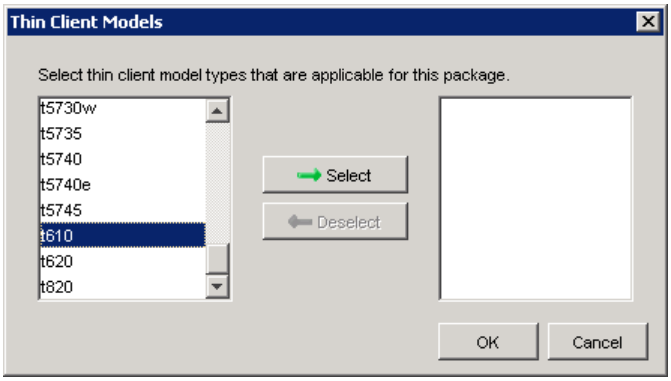


E. Select the **Thin Client Models** that the image supports. You can select the thin client models using the following steps.

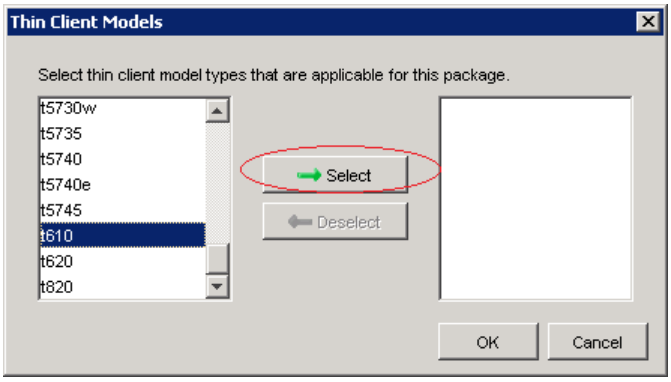
i. Click the **Thin Client Models** field, and the Thin Client Models dialog appears.



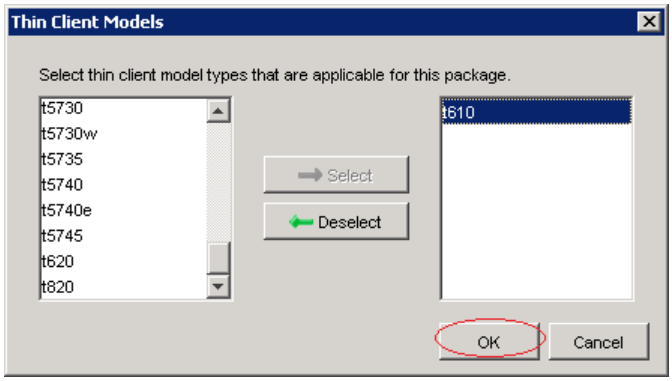
ii. Select the desired thin client model from the left pane, such as t610.

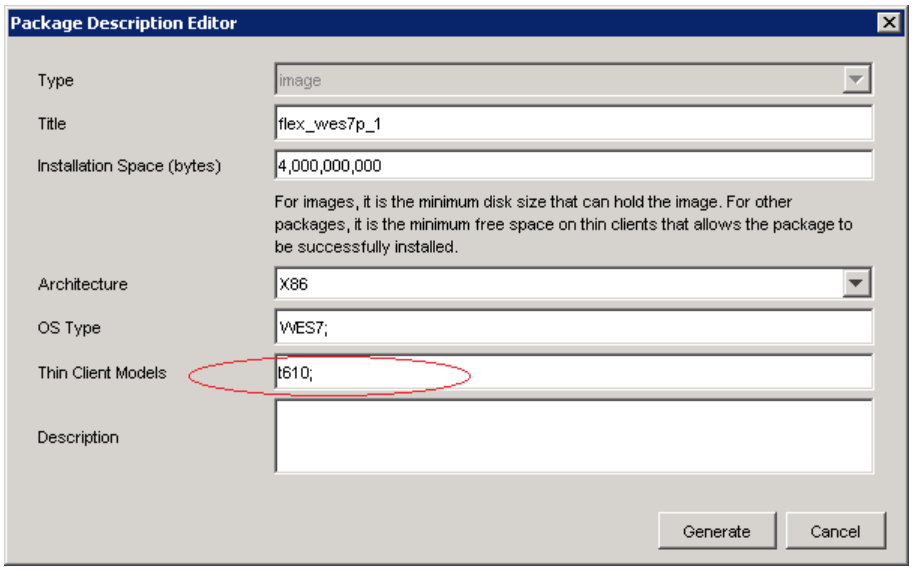


iii. Click **Select**.

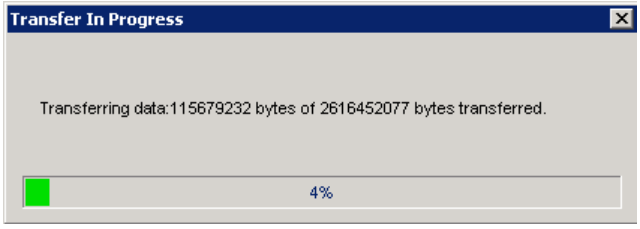


iv. Click **OK** to return to the Package Description Editor.

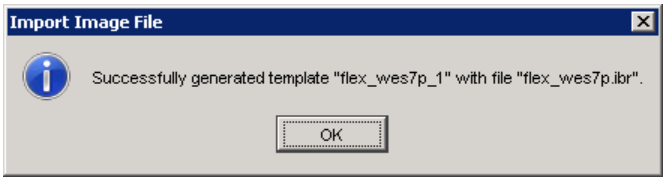




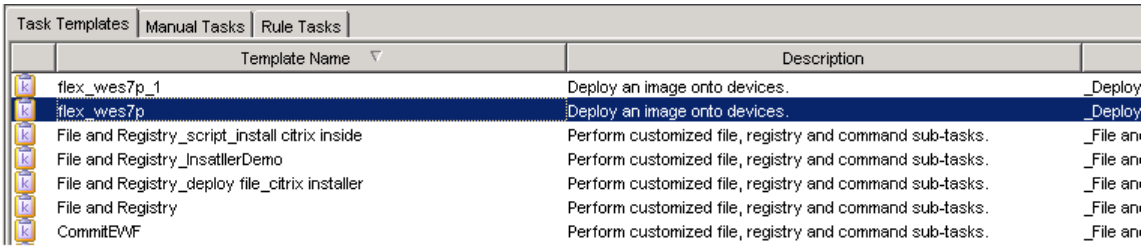
5. Click **Generate** to begin uploading the image file to the repository.



6. After the upload is complete, a confirmation message appears. Click **OK** to finish this operation.



If the image file imported successfully, a new Deploy Image template appears in the task pane.



Deploying an image without PXE

HPDM supports two modes to deploy an image: non-cached mode and cached updates mode. If the thin client uses an advanced network, such as wireless or 802.1x, use the cached updates mode to capture an image. For more information about cached updates, see the *HP Device Manager 4.7 Cached Updates* white paper.

The following table shows which formats are supported when deploying images to thin clients.

Operating system	Image format (non-cached mode)	Image format (cached updates mode)
Windows Embedded 8 Standard	.ibr	.ibr
Windows Embedded Standard 7	.ibr	.ibr
Windows Embedded Standard 2009	. ibr	.ibr
Windows XP Embedded	.img	Unsupported
HP ThinPro 5	.dd.gz	.dd.gz
HP ThinPro 4	.dd.gz	.dd.gz
HP ThinPro 3	.dd.gz	.dd.gz
HP Smart Zero Core (x86)	.dd.gz	.dd.gz
HP Smart Zero Core (ARM)	.dd.gz	.dd.gz
Windows Embedded CE 6.0	.dd.gz	Unsupported

Deploying an image using the non-cached mode

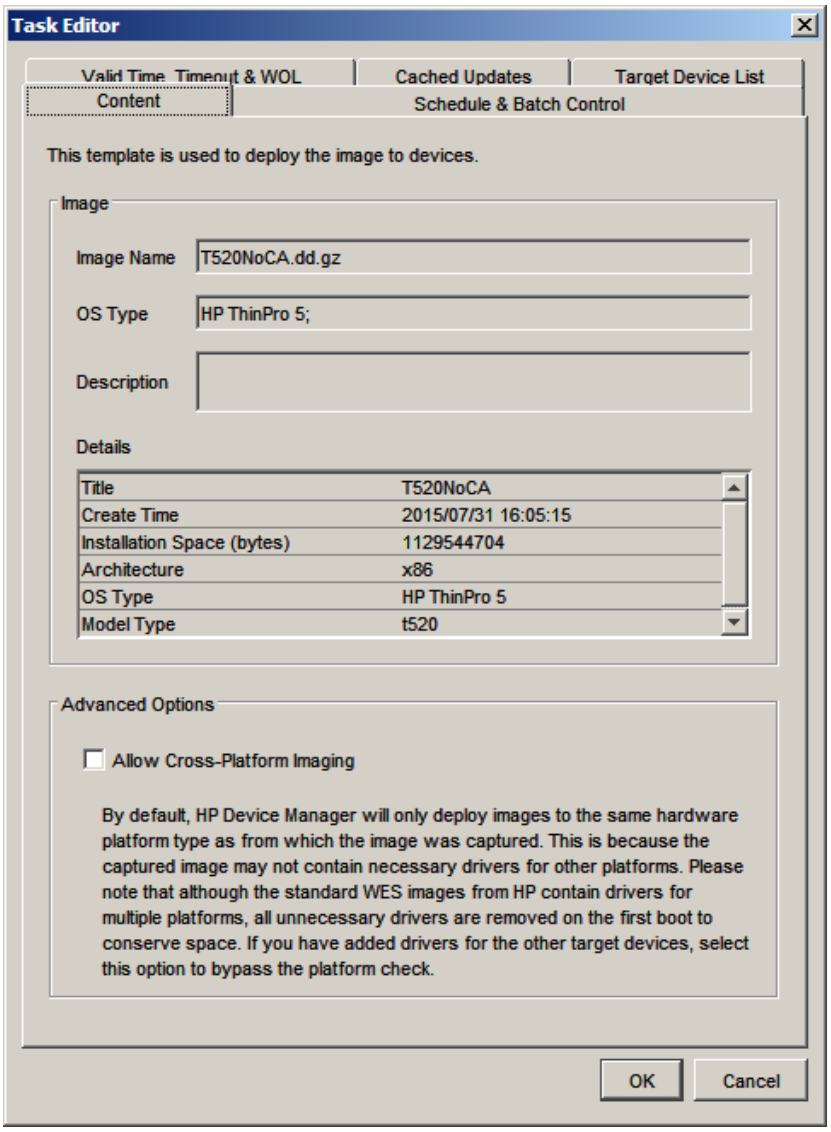
Note the following requirements for deploying an image using the non-cached mode:

- A shared folder is required to deploy an .ibr image to a Windows-based thin client
- Deployment cannot be done via a wireless connection.
- When deploying an .ibr image to a Windows Embedded Standard 7- or Windows Embedded 8 Standard-based device, there must be at least 300 MB of free disk space on the thin client. When deploying an .ibr image to a Windows Embedded Standard 2009-based device, there must be at least 200 MB of free disk space on the thin client. When deploying an image to an HP t410, there must be at least 40 MB of free disk space on the thin client.

To deploy an image using the non-cached mode:

1. In the HPDM Console, open the operating system tab.
2. Select the **Task Templates** tab in the Task pane, and then select the Deploy Image template that you created by capturing or importing an image.

3. Drag and drop the template onto the devices to which you want to deploy the image. The Task Editor dialog box appears and displays detailed information about the image.



4. To deploy the image to a device with a different hardware platform than the source device, select **Allow Cross-Platform Imaging**.

Note

For example, if you captured an image from an HP t510 and want to deploy it to an HP t610, you need to select this option. Otherwise, this Deploy Image task will fail. If you select this option, you need to ensure that the captured image will work well on the target device.

5. Click **OK** to apply the Deploy Image task to the devices.

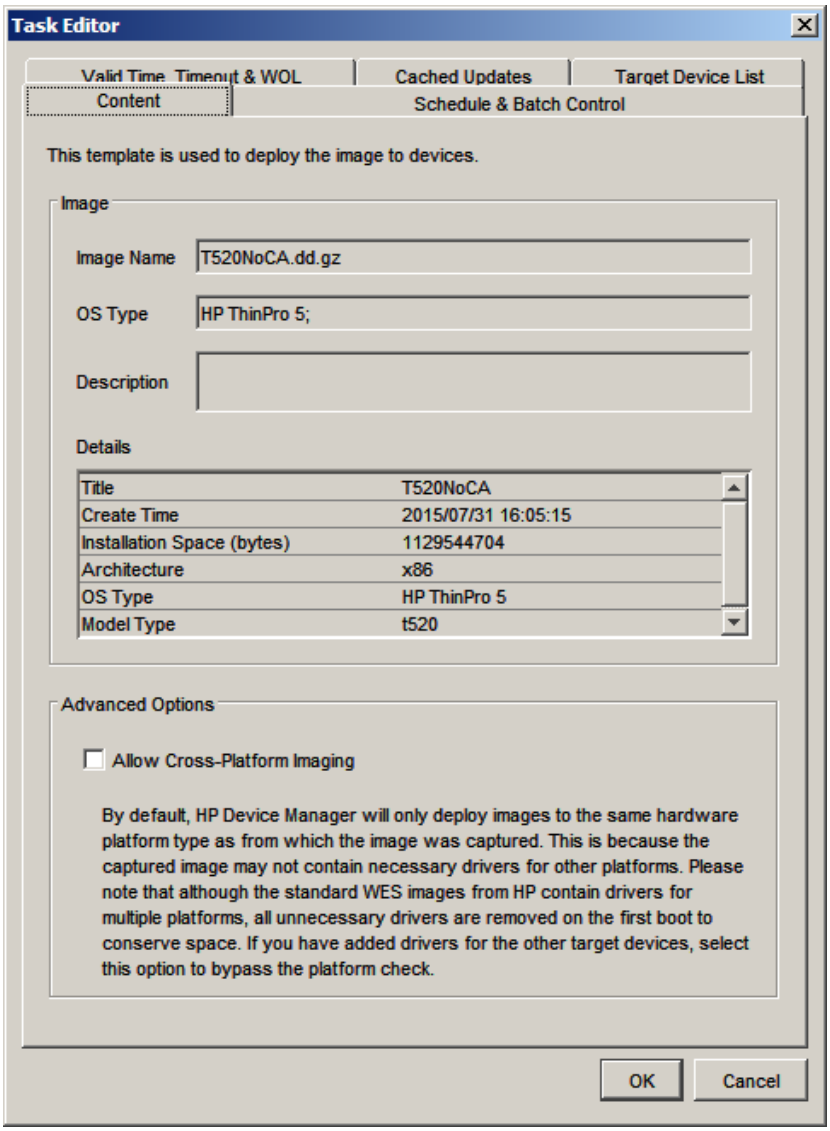
Deploying an image using the cached updates mode

Note the following requirements for deploying an image using the cached updates mode:

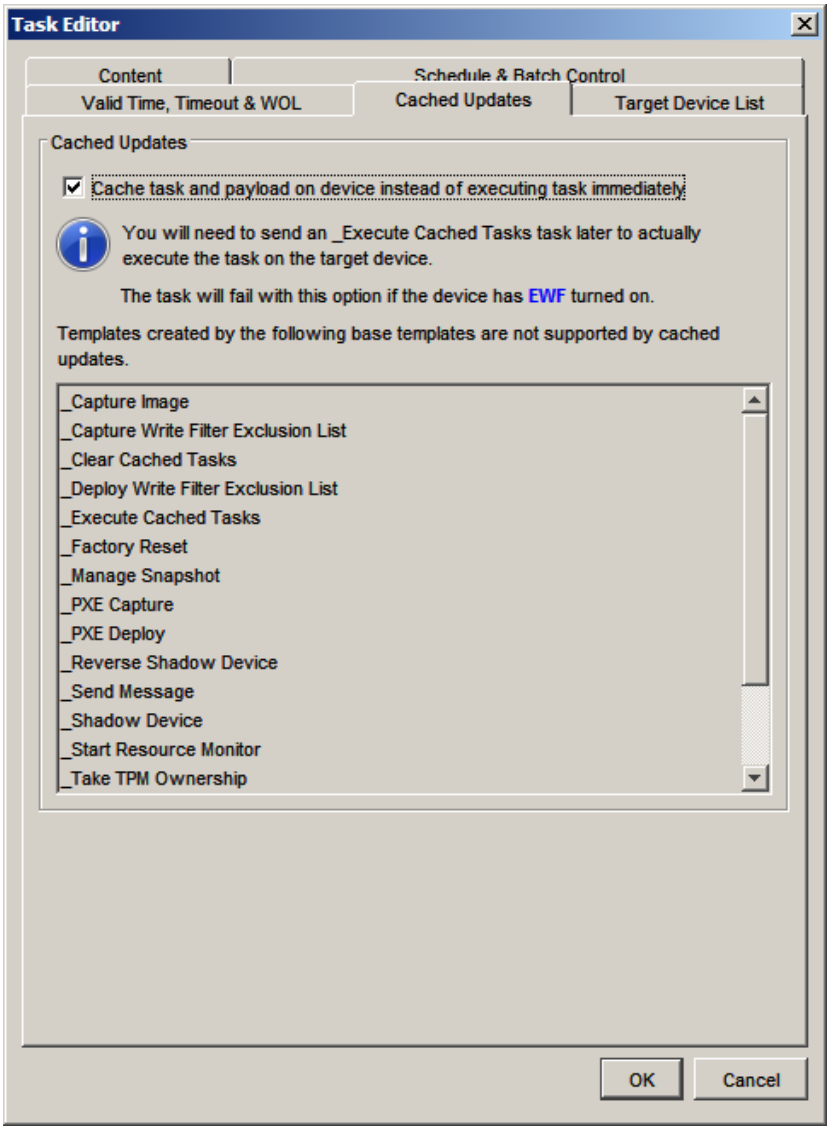
- HPDM does not support imaging using the cached updates mode on the Windows XP Embedded or Windows Embedded CE 6.0 operating system.
- When deploying an image to a Windows-based device, the free disk space must be greater than the image file size. When deploying an image to an HP ThinPro device, the free disk space must be greater than the image file zie and the available RAM needs to be at least 1 GB. When deploying an image to an HP t410 device, the free disk space must be greater than the image file size and the available RAM needs to be at least 512 MB.
- To deploy an image to a device that uses a wireless network, ensure that the image file contains wireless network credentials and can connect to the wireless network after the image is deployed.

To deploy an image using the cached updates mode:

1. In the HPDM Console, open the operating system tab.
2. Select the **Task Templates** tab in the task pane, and then select the Deploy Image template that you created by capturing or importing an image.
3. Drag and drop the template onto the devices to which you want to deploy the image. The Task Editor dialog box appears and displays detailed information about the image.



4. On the Cached Updates tab, select **Cache task and payload on device instead of executing task immediately**. If the thin client uses an advanced network, such as wireless or 802.1x, or if you want to deploy an image with cached updates, this option is necessary.



5. To deploy the image to a device with a different hardware platform than the source device, select **Allow Cross-Platform Imaging**.

Note

For example, if you captured an image from an HP t510 and want to deploy it to an HP t610, you need to select this option. Otherwise, this Deploy Image task will fail. If you select this option, you need to ensure that the captured image will work well on the target device.

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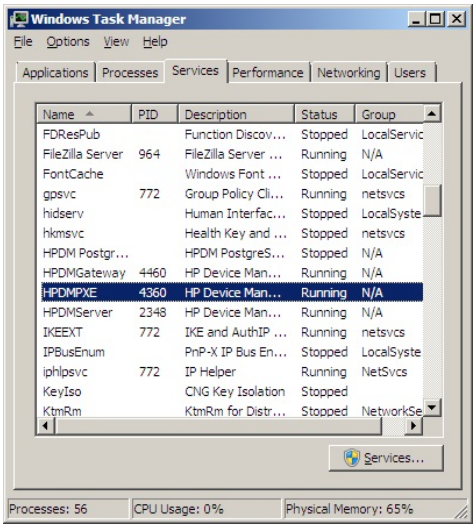
6. Click **OK** to apply the Deploy Image task to the devices.
7. Send the **_Execute Cached Tasks** task to the device to execute this cached imaging task.

Deploying an image with PXE

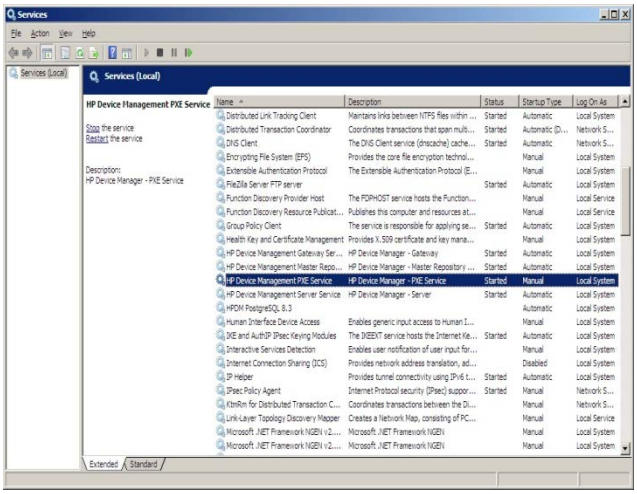
HPDM supports deploying images with PXE on devices running the Windows Embedded Standard 2009, Windows XP Embedded, HP ThinPro 3, or HP ThinPro 4 operating system. The deployed image format can be .dd.gz, .img, .hpimg, or .dd.

1. Verify that the PXE server is running. If not, start it. The PXE server is a service. You can view its status and start it using the Windows Task Manager **(A)**, the Windows Services window **(B)**, or the HPDM Gateway Configuration window **(C)**.

   A. Windows Task Manager



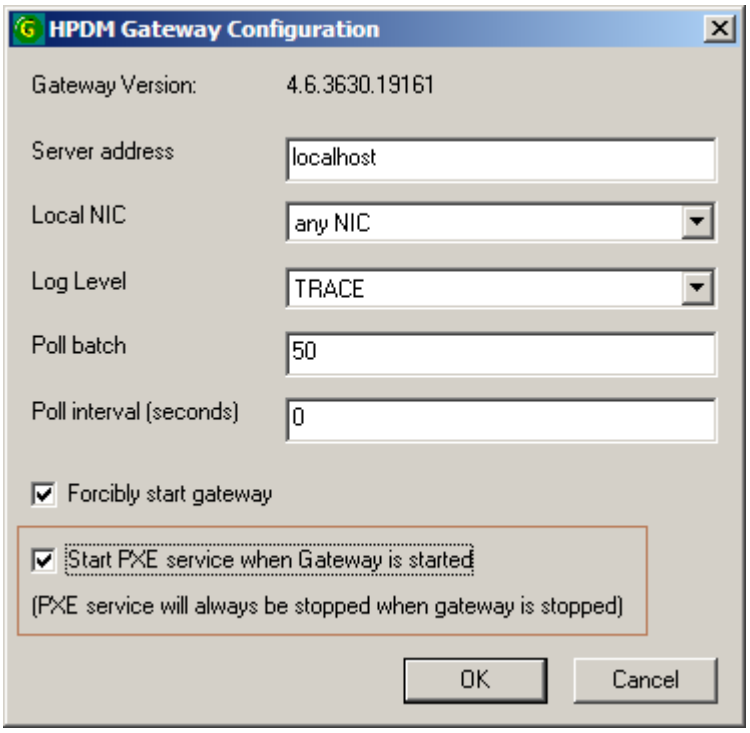
   B. Windows Services window



   C. HPDM Gateway Configuration window

      i. Right-click the HPDM Gateway tray icon, and the following menu appears. Click **Configure Device Management Gateway**.

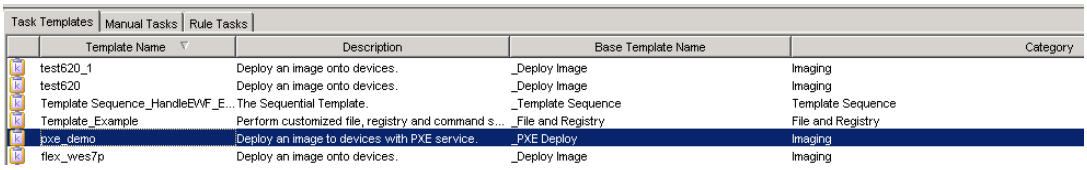
ii. In the HPDM Gateway Configuration window, select **Start PXE service when Gateway is started**, and then click **OK**.



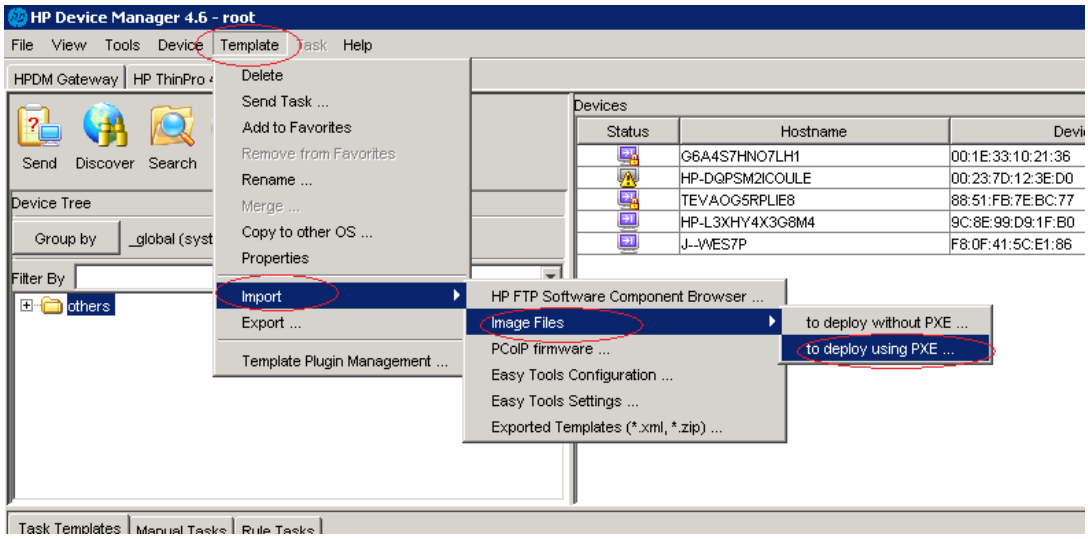
iii. Right-click the HPDM Gateway tray icon, and then click **Restart Device Management Gateway**. The PXE server starts.

2. From the HPDM Console, click the **Task Templates** tab, and then drag a PXE Deploy template onto a device. A PXE Deploy template can be created in one of the following ways.

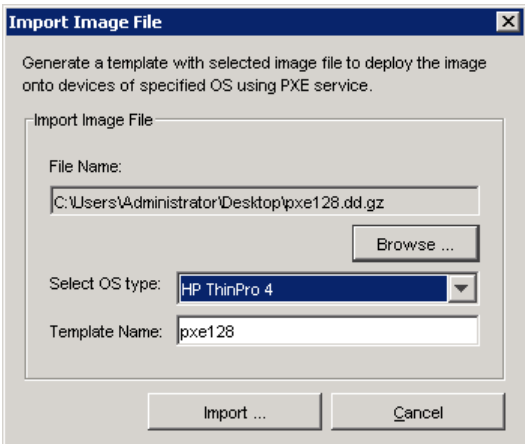
   A. A PXE Deploy template can be generated using a **_PXE Capture** task. See the pxe_demo template in the following example.



B. A PXE Deploy template can also be generated by importing an image from the **Template** menu and then clicking **Import > Image Files > to deploy using PXE**.



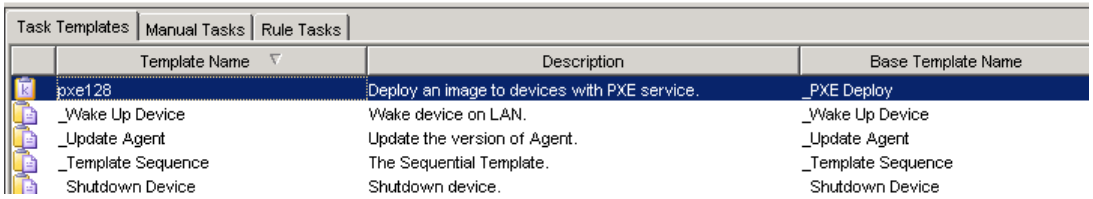
In the following example, the image named pxe128.dd.gz will be imported.



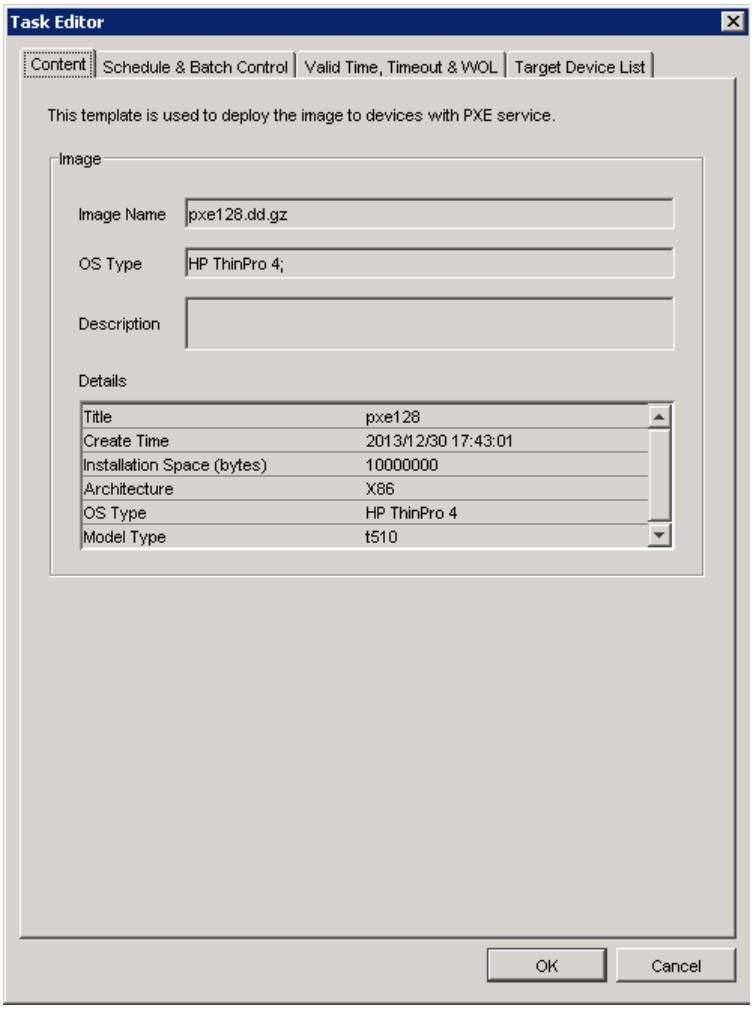
Note

For more information, see Importing an image file.

After importing the image, a PXE Deploy template appears in the **Task Templates** tab.



3. The Task Editor appears. Click **OK** to send the PXE Deploy task to the device.



Note

When deploying an image to a device that is shut down, the device must support Network boot first so that it can be woken up. This operation does not preserve any settings on the target device, which is usually used to deploy an image to a crashed device. You can deploy an image with PXE to a Windows Embedded Standard 7 device that is shut down.

A PXE Deploy task fails when using a wireless connection.

Appendix

Preserved settings during imaging

- **Source device**—The device from which the image will be captured.
- **Target device**—The device to which the captured image will be deployed.

Settings preserved when capturing an image

Windows Embedded 8 Standard:
All settings from the source device are preserved on both the source device and the captured image, except the hostname, network settings, domain settings, and Write Filter status.

Windows Embedded Standard 7:
For devices running the Windows Embedded Standard 7, Windows Embedded Standard 7E, or Windows Embedded Standard 7P operating system, all settings from the source device are preserved on both the source device and the captured image, except the hostname, network settings, domain settings, and Write Filter status.

Windows Embedded Standard 2009:
All settings from the source device are preserved on both the source device and the captured image, except the hostname, network settings, domain settings, and Write Filter status.

HP ThinPro:
All settings from the source device are preserved on both the source device and the captured image, except the hostname and network settings.

Settings preserved when deploying an image

When deploying an image, the following settings on the target device will be preserved and restored after the image deployment.

Windows Embedded 8 Standard / Windows Embedded Standard 7 / Windows Embedded Standard 2009:

- Writer Filter status
- Hostname
- Network
- Terminal Service License
- Windows Activation License (Windows Embedded 8 Standard only)

HP ThinPro:

- Hostname
- Network

Imaging task performance

This section introduces the time spent on imaging tasks. HP gathered this data from the HP test environment for reference only. The time spent on imaging tasks depends on the network environment, protocol, and hardware. The HP data was retrieved using the following environment:

- Network bandwidth: 100 MB bandwidth
- File Transfer Protocol: FTP and Shared Folder

Table 1. Windows Embedded Standard 7 imaging task performance

Operating system	Connection type	Mode	Device model	Disk size (GB)	Image clone duration (minutes)	Deploy Image duration for image cloned via HPDM (minutes)	Deploy Image duration for image downloaded from HP.com (minutes)
Windows Embedded Standard 7E	Wireless	Cached	t510	16	59	73	N/A
			t610	16	45	58	N/A
	Wired	Cached	t510	4+16	42	53	58
			t610	16	38	48	48
			t620	16+32	26	25	
			t820	16	16	20	
			t5740e	16	31	42	
		Non-cached	t510	16	30	46	52
			t610	16	30	35	
			t620	64	24	17	
			t820	16	15	22	
			t5570e	4	35	40	45
			t5740e	4	43	37	47
Windows Embedded Standard 7P	Wireless	Cached	t610	16	56	77	
	Wired	Cached	t610	16	45	65	
		Non-cached	t610	16	41	50	
Mobile	Wireless	Cached	mt40	16	49	50	N/A
	Wired	Cached	mt40	16	22	23	
			mt41	16	18	29	
		Non-cached	6360t	4	28	24	27
			mt41	16	17	20	
			mt40	16	27	20	

Table 2. Windows Embedded Standard 2009 imaging task performance

Operating system	Connection type	Mode	Device model	Disk size (GB)	Image clone duration (minutes)	Deploy Image duration for image cloned via HPDM (minutes)	Deploy Image duration for image downloaded from HP.com (minutes)
Windows Embedded Standard 2009	Wireless	Cached	t510	4	30	36	N/A
			t610	16	23	37	N/A
			t5740	4	25	28	N/A
	Wired	Cached	t510	4	24	32	30
			t610	16	16	21	27
			t5740	4	19	26	30
			6360t	4	18	20	25
		Non-cached	t510	4	22	24	31
			t610	16	16	19	23
			t5570	2	18	26	26
			t5740	4	16	20	24
			t5400	2	18	21	28
			6360t	4	16	21	23

Table 3. HP ThinPro imaging task performance

Operating system	Connection type	Mode	Device model	Disk size (GB)	File system size (GB)	Image clone-zero duration (minutes)	Image clone-clone duration (minutes)	Image deploy-deploy duration (minutes)	Image deploy-resize duration (minutes)
HP ThinPro	Wired	Non-cached	t610	4	1	0.33	3	4	1
				4	4	2	4	15	0.03
				16	1	0.13	2.5	2.5	13.5
				16	16	28.5	8.5	13	0.03

Known issues

- When deploying an image using PXE, if a device is shut down and not set to Network boot first, the device receives the reboot task circularly.

  Workaround:
  1. Go into the BIOS and enable **Network boot first**.
  2. Cancel the task from the HPDM Console.

- For Windows Embedded Standard 7E, Windows Embedded Standard 7P, and Windows Embedded Standard 2009, if the source thin client was joined to a domain prior to a Capture Image task, the domain membership is lost after cloning the image. HP recommends removing the source device from any domain before a Capture Image task.

- The group policy that controls the domain password complexity affects local user accounts, resulting in a requirement to change the password to meet stricter criteria.

- HPDM does not support deploying a Windows Embedded Standard 7P image downloaded from HP.com.

  Workaround:
  1. Deploy this image to a device using a local image tool, such as HP ThinState or Ghost by Symantec.
  2. Capture the image from this device via HPDM.
  3. Deploy the newly captured image to other devices.

- HPDM does not support deploying an image file downloaded from HP.com to a thin client that uses a wireless network.

  Workaround:
  1. Deploy this image to a device using a local image tool, such as HP ThinState or Ghost by Symantec.

     – or –

     Configure the device to use a wired network, and then deploy the image to this device via HPDM.
     A. Configure the wireless network settings after deploying the image.
     B. Capture the image from this device via HPDM.
     C. Deploy the newly captured image to other devices that use a wireless network.

- The resize partition operation cannot be done when deploying image to an HP t410.

- The Shared Folder protocol is not supported when capturing an image from or deploying an image to an HP t410.

For more information

To read more about HP Device Manager, go to hp.com/go/hpdm.

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hp.com/go/getupdated

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