



SmartDeploy®

How to Capture Images with SmartDeploy Enterprise

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Abstract

SmartDeploy® Enterprise provides a comprehensive, easy-to-use deployment toolset that can help organizations overcome the challenges associated with operating system migration. SmartDeploy Enterprise makes it possible to efficiently deploy operating systems—reducing or even eliminating redundancy, wasted time, unnecessary effort, and superfluous infrastructure. This white paper describes the third step of the deployment process: capturing the operating system image.

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INTRODUCTION

In the simplest terms, SmartDeploy® Enterprise follows a basic five-step process, as shown in Figure 1.

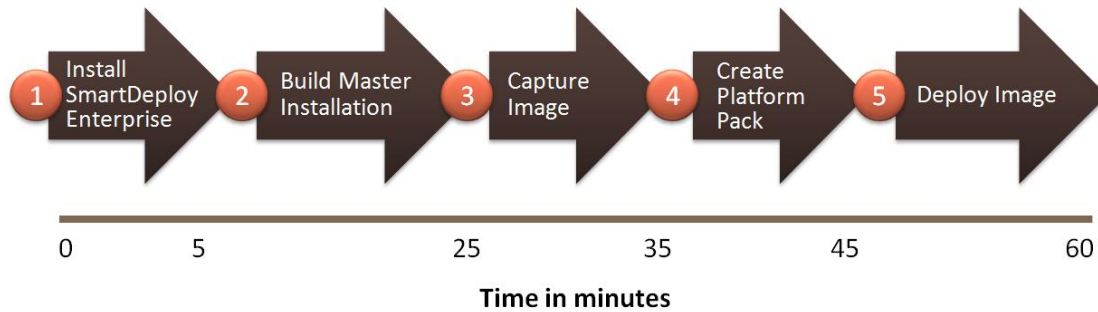


Figure 1 How SmartDeploy works

1. Install SmartDeploy Enterprise.
2. Build the master installation.
3. Capture an image.
4. Create or add a preconfigured platform pack.
5. Deploy an image.

This white paper describes the third step of the deployment process: capturing the operating system image. For more information on using SmartDeploy Enterprise, see the [SmartDeploy Enterprise User's Guide](#).

CHOOSE HOW TO CAPTURE IMAGES

You create a computer image by capturing a source image from a virtual machine that is either powered off or powered on. The following table explains the advantages and disadvantages of both methods.

Table 1 Advantages and disadvantages of power state capture methods

Capture Method	Advantages	Disadvantages
Virtual machine powered off	<ul style="list-style-type: none"> Fastest capture method. No need to power on the virtual machine and wait for all services to start. Eliminates virtual networking issues or bottlenecks. 	<ul style="list-style-type: none"> The virtual machine must use one virtual hard disk; you cannot capture a virtual machine that uses multiple virtual hard disks. You can only create images from .hdd, .vdi, .vhd, and .vmdk virtual disk formats.
Virtual machine powered on	<ul style="list-style-type: none"> Virtual machine can use multiple virtual hard disks. Virtual hard disk file format does not affect the capture process. 	<ul style="list-style-type: none"> Slowest capture method. Virtual machine must be powered on and all necessary services started. Capture method is susceptible to virtual networking issues or bottlenecks, slowing down the process further.

CHOOSE HOW TO SAVE THE CAPTURES IMAGES

Regardless of the method you choose, you can save the captured virtual machine in a new Windows® Imaging Format (WIM) image file or in an existing WIM file. Each WIM file acts as a single-instance store database, keeping track of common and unique files among the different virtual machines you capture. The first time you save a virtual machine file to the WIM, the entire file is copied to the image. Identical files from subsequent virtual machines are not copied; only a pointer to the original file is created. This makes it possible to keep multiple configurations of common desktops in one WIM file.

There are two different ways you can store and manage your images. The first method keeps all your virtual machine images in one WIM file; the second method uses one image per WIM file plus differencing images for image updates.

Capture All Images to One File

When you capture all your virtual machine images to one file, you have the advantage of maintaining diverse desktops with less effort and easier tracking. This approach is ideal where moderate to large changes exist at the desktop level between images.

For example, suppose a school district runs the Windows® XP operating system on all of its desktops. Three different desktop configurations are required: one for students, one for teachers, and one for administrators. Each desktop runs different applications and is configured differently. With SmartDeploy Enterprise, only one copy of the common files is kept within the image file (Windows XP operating system, 2007 Microsoft® Office system). Because these files comprise the majority of all the files needed, the single image size is roughly one third of the three separate images. (See Figure 1.)

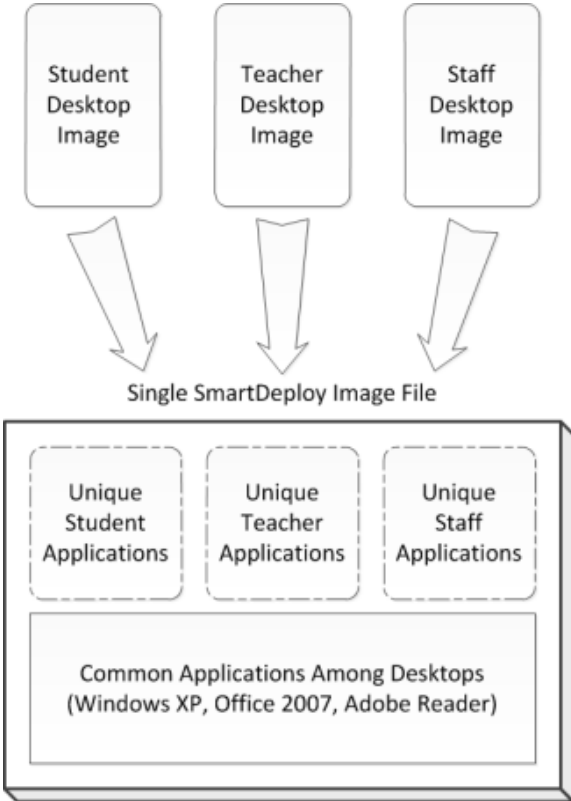


Figure 2 Capturing all images to one file

When the school district wants to make large-scale updates, such as applying service packs to the operating system or shared desktop applications, they only need to make the updates to the virtual machine one time and then capture the updates to the WIM. The school district can make changes to the applications used by only one of the groups, such as the teachers, to the WIM, or directly to the desktop, depending on the other image and update management tools that the organization uses. Note that the school district would need to maintain separate reference computers (in this case for student, teacher, and staff).

Capture One Image to One File

When you capture a virtual machine image to a single file, it becomes easier to manage changes and updates to the operating system and applications. This is done through differencing, or delta, files, where small or incremental changes can be applied to computers in your organization. Note that using differencing files is optional; you also have the alternative of simply recapturing and replacing the image.

For example, some organizations use a thorough test, review, and approval process for operating systems and applications. Large-scale changes such as untested products or new product versions are not permitted on desktops until they have been thoroughly tested for

compatibility. However, security updates or product updates for specific fixes might be needed throughout the organization. Using differencing images, you can deploy a set of limited changes to computers in your organization without requiring a re-evaluation of the standard desktop. (See Figure 2.)

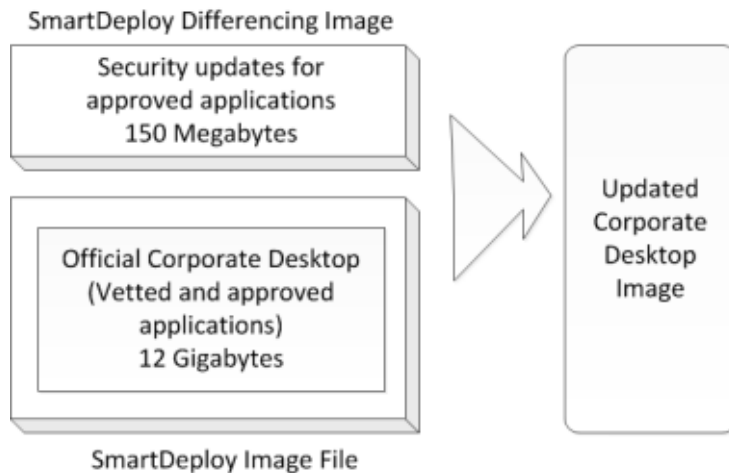


Figure 3 Capturing an image to one file

One of the benefits of using differencing images becomes clear when you deploy images to new computers. During this process, the differencing image is merged with the standard image, and the new image has the approved updates applied to it. No further updates or intervention are required.

CAPTURE AN IMAGE WITH THE VM POWERED OFF

Using the SmartDeploy Enterprise Capture Wizard, you can create an image of a virtual machine (VM) while it is powered off. This method, also called cold imaging mode, is typically the faster capture method.

Note that the Capture Wizard can only create images from virtual machines that have one virtual hard disk; it cannot create images from virtual machines with more than one virtual hard disk. If you want to create an image from a virtual machine with more than one virtual hard disk, follow the steps in [Capture an Image with the VM Powered On](#).

Note: If your source computer has multiple partitions (such as C: and D:) on one virtual hard disk, you can still use the Capture Wizard to create an image.

To create an image using the Capture Wizard:

1. Start the Capture Wizard by clicking **Start > All Programs > Prowess > SmartDeploy Enterprise > Capture Wizard**.
2. On the **Welcome to the Capture Wizard** page, click **Next**.
3. On the **Virtual Hard Disk** page, click **Browse**, and then go to the shared folder containing your virtual hard disk.
4. Select the virtual hard disk, click **Open**, and then click **Next**.

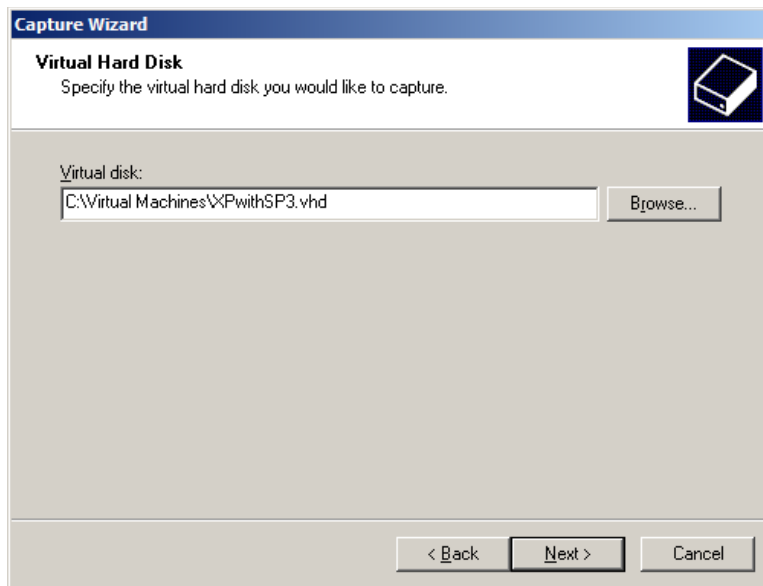


Figure 4 Virtual Hard Disk page

- On the **Select Disks** page, make sure the **Local Disk (C:)** volume is selected, and then click **Next**. For more information about the displayed volumes, click **Show details**.

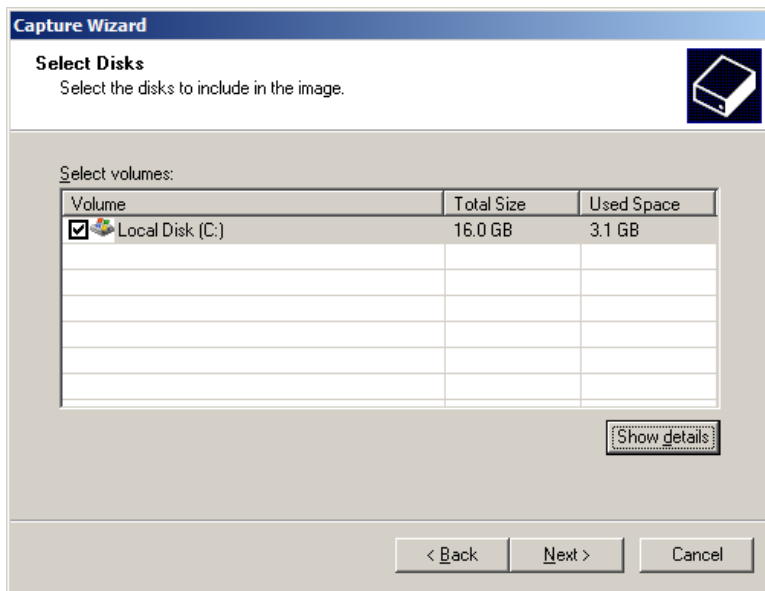


Figure 5 Select Disks page

- On the **Operating System** page, type the product key.

Note: If you do not enter a product key, you are prompted for one the first time the operating system starts.

- In the **Password** box, type the local administrator account password. In the **Confirm** box, type the password again, and then click **Next**.

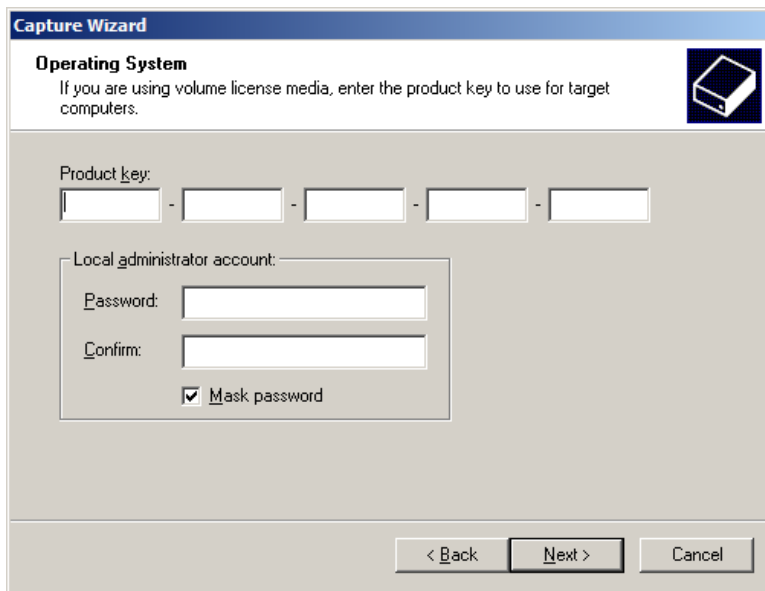


Figure 6 Operating System page

- On the **Image Type** page, select **Standard image**, and then click **Next**.

Note: A standard image contains all the files needed for the target computer, while a differencing image contains only the files that have been changed between a standard image and an updated virtual machine.

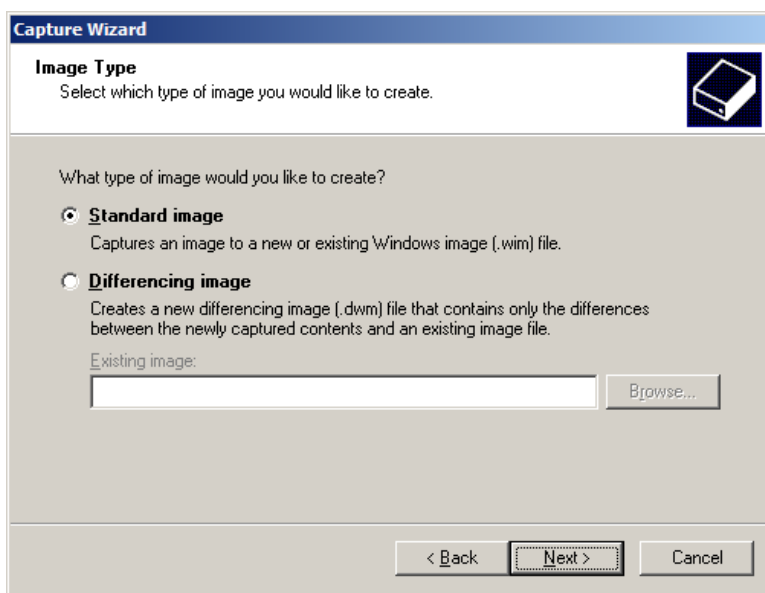


Figure 7 Image Type page

9. On the **Save Image** page, browse to where you want to save your image file. When you select an existing WIM image file that contains your captured images, the Capture Wizard asks if you want to add the captured image to the existing image file. Do one of the following:
 - a. In the **Image name** box, type a name for the image that makes it easy to recognize when you deploy or update the image.
 - b. In the **Image description (optional)** box, you have the option to type a more detailed description of the image. This information might help you or others identify any special or unique characteristics of the image when deciding whether or not to deploy or update it. Click **Next**.

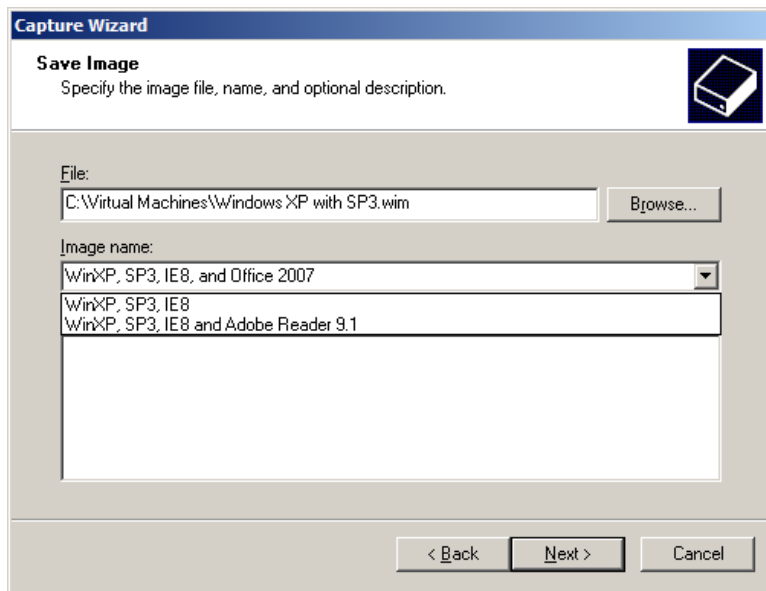


Figure 8 Save Image page

10. On the **Completing the Capture Wizard** page, click **Finish**.
11. When the process is complete, a **Capture Wizard** dialog box appears. Click **OK**.
12. To confirm that the capture is complete and that the capture file was saved in the correct place, open **Windows® Explorer**, and go to **C:\Virtual Machines**.

CAPTURE AN IMAGE WITH THE VM POWERED ON

You can create images from a virtual machine while it is powered on. The main advantage of this approach, also called warm imaging mode, is that you can capture images from virtual machines that have more than one virtual hard disk. In this scenario, the computers are usually running Windows Server® with multiple virtual hard disks to emulate separate physical disks that would be installed on physical hardware. The warm imaging mode is the preferred method for capturing complex disk layouts.

To create an image from a virtual machine with multiple virtual hard disks, the SmartDeploy Preinstallation Environment (SmartPE) is mounted to the virtual machine. The virtual machine is powered on, and SmartPE loads the necessary networking and hard disk drivers. You can then run the Capture Wizard in this environment to create an image of the virtual machine.

Note: You do not have to use this approach to capture a virtual machine that has different partitions on one virtual hard disk, such as separate boot and system volumes. If you are creating an image from one virtual hard disk, use the method described in [Capture an Image with the VM Powered Off](#).

1. Mount SmartPE on the virtual machine. If your virtual machine is running on the same computer as SmartDeploy Enterprise, edit your virtual machine settings so that the CD/DVD drive mounts the file, **SmartDeploy.iso**.

On x86 versions of Windows®, you can find SmartDeploy.iso at C:\Program Files\Prowess\SmartDeploy Enterprise.

On x64 versions of Windows, you can find SmartDeploy.iso at C:\Program Files (x86)\Prowess\SmartDeploy Enterprise.

2. Start the virtual machine. If prompted, start SmartPE from the CD/DVD drive.

3. Click **Capture an image**.

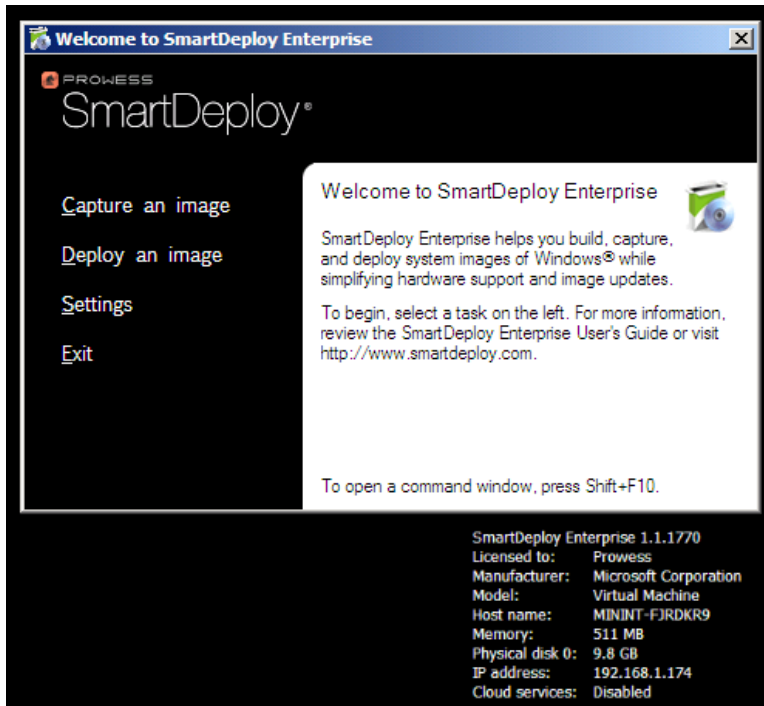


Figure 9 Welcome to SmartDeploy Enterprise page

4. On the **Welcome to the Capture Wizard** page, click **Next**.
5. On the **Select Disks** page, make sure the **Local Disk (C:)** volume is selected, and then click **Next**. For more information about the displayed volumes, click **Show details**.

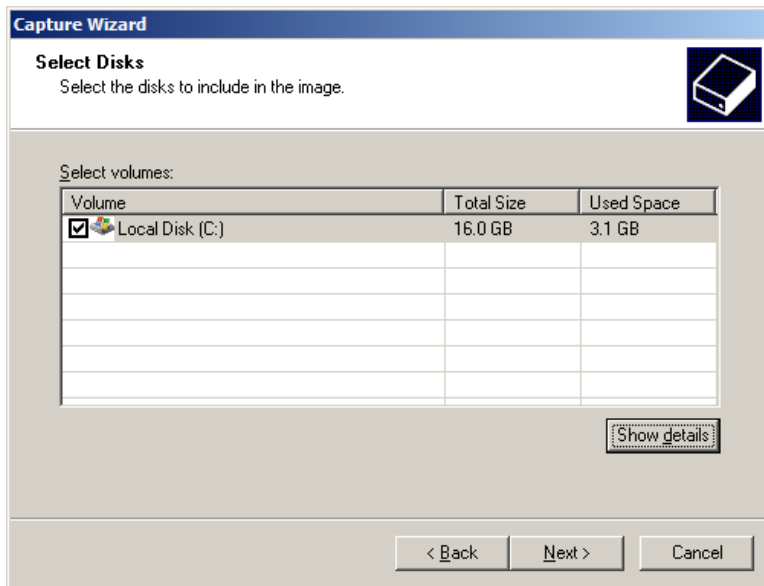


Figure 10 Select Disks page

6. On the **Operating System** page, type the product key.

Note: If you do not enter a product key, you are prompted for one the first time the operating system starts.

7. In the **Password** box, type the local administrator account password. In the **Confirm** box, type the password again, and then click **Next**.

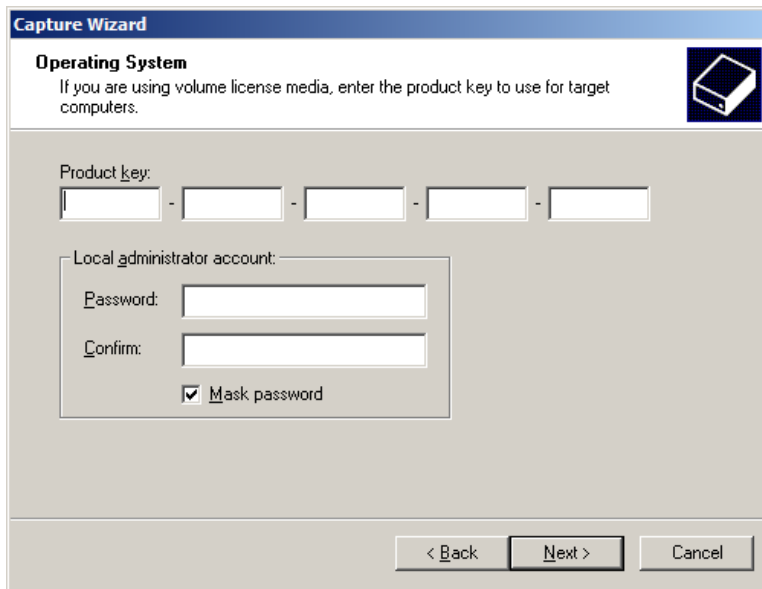


Figure 11 Operating System page

8. On the **Image Type** page, select **Standard image**, and then click **Next**.

Note: A standard image contains all the files needed for the target computer, while a differencing image contains only the files that have been changed between a standard image and an updated virtual machine.

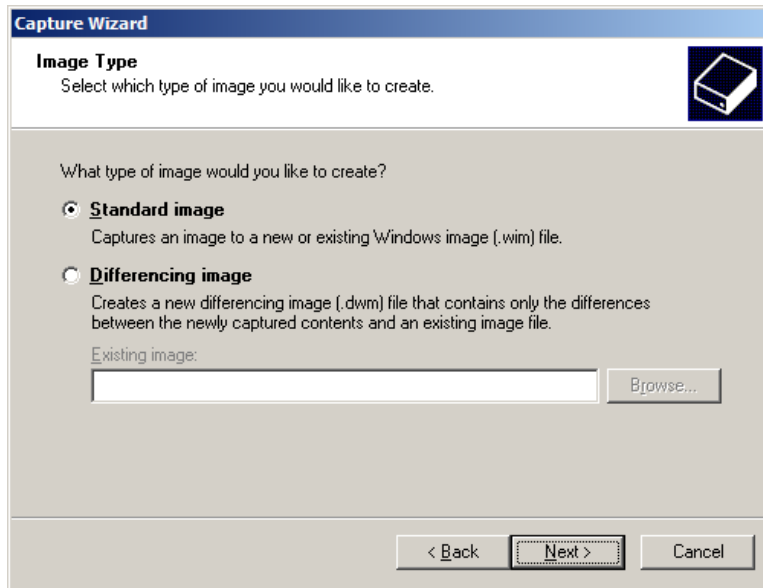


Figure 12 Image Type page

9. On the **Save Image** page, browse to where you want to save your image file. When you select an existing WIM image file that contains your captured images, the Capture Wizard asks if you want to add the captured image to the existing image file. Do one of the following:
 - a. In the **Image name** box, type a name for the image that makes it easy to recognize when you deploy or update the image.

- b. In the **Image description (optional)** box, you have the option to type a more detailed description of the image. This information might help you or others identify any special or unique characteristics of the image, when deciding whether or not to deploy or update it.

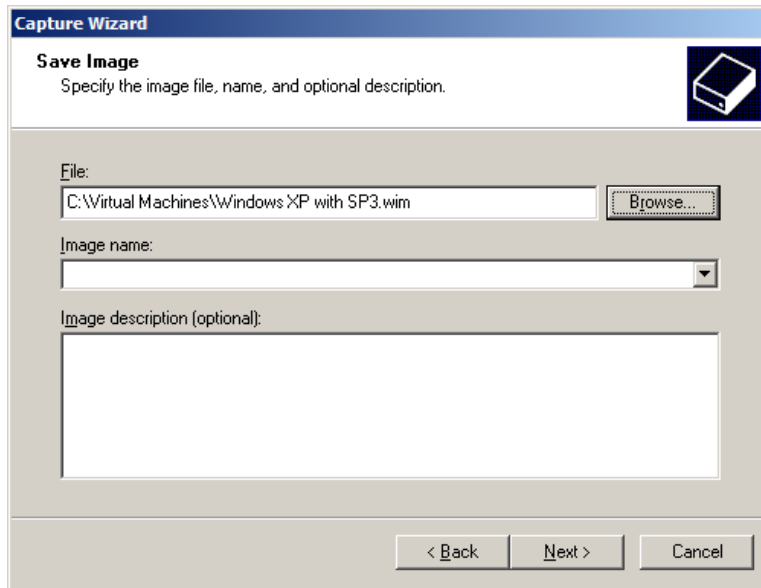


Figure 13 Save Image page

10. On the **Completing the Capture Wizard** page, click **Finish**.
11. When the process is complete, a **Capture Wizard** dialog box appears. Click **OK**.

SUMMARY

By using SmartDeploy Enterprise, organizations can now deploy almost all versions of the Windows operating system—including Windows® 7—quickly and easily without having to make expensive, time-consuming compromises. There is no need to delay migration or implement a protracted, phased approach to accommodate legacy applications and specific user scenarios. There is also no need to acquire specialized IT skills in imaging and deployment. Migration can be achieved more quickly and easily than with previous tools and guidance.

- SmartDeploy Enterprise retains legacy applications seamlessly in a virtual machine that runs on the new desktop.
- User settings and data are retained either in a protected folder or in a virtual machine that can be run from the desktop.
- SmartDeploy Enterprise isolates hardware platform data from the system image. Images are deployed to each target using platform packs to insert drivers in the Windows® Preinstallation Environment (WinPE). A different Windows Vista® operating system image is not required for each hardware platform.
- After the Windows Vista master image is distributed, it can be easily updated far into the future with small differencing images replicated over the network.

This white paper describes how to capture operating system images with SmartDeploy Enterprise. For more information, see the links in the section that follows.

MORE INFORMATION

The following links provide further information:

- [SmartDeploy Enterprise User's Guide](#)
- [Windows Deployment Services Getting Started Guide](#)
- [Prowess SmartDeploy Home Page](#)
- [DeployCentral Forum](#)