Windows Vista Beta 2 Deployment Step-by-Step Guide

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Abstract

Microsoft® Windows Vista™ introduces new and updated deployment features and technologies, bringing changes to the way you deploy to your client computers. This document covers a basic end-to-end deployment scenario to demonstrate how to create, capture, and deploy an installation to new hardware in a network environment.

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This document provides instructions for implementing a basic image-based deployment of Microsoft® Windows Vista™ operating system. We recommend that you first use the steps provided in this guide in a test lab environment as a means to become familiar with new and updated deployment features and technologies available in Windows Vista.

Step-by-step guides are not necessarily meant to be used to deploy Windows Vista operating system features without accompanying documentation (as listed in the Additional Resources section) and should be used with discretion as stand-alone documents.

Windows Vista Deployment Overview

This document is designed for IT professionals and deployment specialists who are responsible for deploying Windows® operating systems in an organization.

Deployment scenario

You will use the steps in this scenario and the procedures in the examples to implement a basic image-based deployment of Windows Vista on hardware without an operating system installed. For more information about the tools and technologies referenced in this section, see Tools and Technologies later in this document.

The process for the deployment scenario includes:

- Building a lab environment.
- Creating an answer file by using Windows System Image Manager (Windows SIM).
- Building a master installation by using the product DVD and your answer file.
- Creating an image of the master installation by using the Windows Preinstallation Environment (Windows PE) and ImageX technologies.
- Deploying the image from a network share onto a destination computer using Windows PE and ImageX technologies.

At the end of this example, you should have a working lab environment that includes a technician computer, a valid answer file, a CD that you can use to start Windows PE, and your first custom Windows image.

In addition, you will gain a basic understanding of the Windows AIK toolset. With this knowledge, you can modify your answer file to include additional customizations. You can also automate parts of the process by scripting some of the manual steps in this example.

In this document

Topics covered in this document include:

Tools and Technologies

A set of new and updated deployment tools and technologies is available with Windows Vista.

Name	Description
Windows System Image Manager (Windows SIM)	The tool that enables you to create answer files (Unattend.xml) and network shares or to modify the files contained in a configuration set. You use Windows SIM on the technician computer, and then transfer your Unattend.xml file to the master computer before creating your installation image.

Name	Description
answer file	A text file that scripts the answers for a series of graphical user interface (GUI) dialog boxes. The answer file for Windows Setup is commonly called Unattend.xml. You can create and modify this answer file by using Windows System Image Manager (Windows SIM) or the CPI APIs.
catalog	A catalog (.clg) is a binary file that contains the state of the settings and packages in a Windows image.
Windows Preinstallation Environment (Windows PE)	A minimal 32-bit operating system with limited services, built on the Windows Vista kernel. Windows PE is used only in the preinstallation and deployment of Windows.
ImageX	A command-line tool that captures, modifies, and applies installation images for deployment in a manufacturing or corporate environment.
Windows Setup	The program that installs the Windows operating system.
System Preparation Tool (Sysprep)	Sysprep facilitates image creation and prepares an image for deployment to multiple destination computers.
Windows image	A single compressed file containing a collection of files and folders that duplicate a Windows installation on a disk volume. Windows Vista is built and distributed as a single image with the new Windows imaging (.wim) file format. The .wim file format can contain multiple images, enabling you to package several custom installations into one file. Windows Vista is released as a multiple SKU image.

Requirements and Prerequisites

This guide assumes that you have a working knowledge of common desktop deployment technologies and networking components.

To complete this scenario and the procedures in the examples, you need:

- A Windows Vista product DVD
- The Windows Automated Installation Kit (Windows AIK), including accompanying documentation and the Windows AIK help file, Waik.chm
- A technician computer
- A master computer
- Network connectivity to simulate deployment
- A floppy disk or Universal Flash Device (UFD), such as a USB memory key
- One blank, writable CD-ROM

For information about downloading the Windows AIK, go to the Microsoft Web site (http://go.microsoft.com/fwlink/?LinkID=53552).

The technician computer is the computer in your lab on which you will install the Windows AIK. The technician computer can be running Windows XP, Windows Server™ 2003, or Windows Vista. Hardware requirements for the technician computer include a DVD-ROM drive and CD-R/RW-capable drive, or a combination drive that supports both.

A master computer, sometimes called a reference computer, is a fully assembled computer on which you will install a customized installation of Windows Vista using the Windows product DVD and your custom answer file. Once it is installed, you will capture and store an image of the installation on a network share. There are no software requirements for this computer.

Requirements for both technician and master computers include a network card and working network environment.

Note

For the purposes of this example, the master computer will be repurposed later as your destination computer. After you build a master installation, you will capture and store an image of that installation on a network share. Then, you will reformat the computer's hard drive, returning it to a blank state. That computer will become your destination computer. You will deploy the image from the network share back onto the same computer. This process simulates an image-based deployment.

Step 1: Building a Lab Environment

A lab environment is where you will define and build your installation. For the scenario in this document, your lab environment should consist of two computers: a technician computer and a master computer.

To build a technician computer

1. Download the Windows Automated Installation Kit (Windows AIK) from the Microsoft Web site (http://go.microsoft.com/fwlink/?LinkID=53552).
2. Follow the on-screen setup instructions.

To build a master computer

1. Assemble the computer hardware. There are no preinstalled software requirements.
2. Ensure that the new computer has a DVD-ROM drive, network card, and a floppy disk drive or USB support.

The lab environment is ready. Next you will build the answer file.

Step 2: Building an Answer File

The way to create a custom installation is to build an answer file. An answer file stores the custom settings that are applied during Windows Setup. The primary method for creating an answer file is to use Windows SIM.

The process

The basic process of building an answer file includes the following steps:

1. Creating a new answer file. In this step, you build a catalog and then create a new blank answer file.
2. Adding components.
3. Configuring Windows settings. In this step, you define basic disk configuration and Windows Welcome options.
4. Validating the answer file and then saving it to removable media such as a Universal Flash Device (UFD) or floppy disk.

Tools

You will need the following software and hardware tools:

- Windows System Image Manager (Windows SIM)
- Writable, removable media such as a Universal Flash Device or floppy disk

After you have successfully created a basic answer file, you will use it to build a master installation. (See Step 3: Building a Master Installation.)

To create a new answer file on the technician computer

1. Insert the Windows Vista product DVD into the local DVD-ROM drive on the technician computer.
2. Navigate to the \Sources directory on your DVD-ROM drive. Copy Install.wim from the product DVD to a location on your technician computer, for example, C:\Vista_Installation.
3. Open Windows SIM by clicking **Start**, **All Programs**, **Microsoft Windows AIK**, and then clicking **Image Manager**.
4. On the **File** menu, click **Select Windows Image**.
5. Navigate to the location where you saved install.wim, and then click **Open**.
6. In **Select an Image**, select the appropriate version of Windows Vista, and then click **OK**.
7. On the **File** menu, click **New Answer File**. If you see a message that a catalog does not exist, click **OK** to create a new one.

Note

You must create a catalog for each version of Windows Vista.

To add components

1. In **Windows SIM**, on the **Windows Image** pane, expand the **Component** node to display available settings
2. Add the components in the following table to your answer file by right-clicking the component and then selecting the appropriate configuration pass.

Component	Configuration Pass
Microsoft-Windows-Setup\DiskConfiguration\Disk\CreatePartitions\CreatePartition	1 Windows PE
Microsoft-Windows-Setup\DiskConfiguration\Disk\ModifyPartitions\ModifyPartition	1 Windows PE
Microsoft-Windows-Setup\ImageInstall\OSImage\InstallTo	1 Windows PE
Microsoft-Windows-Setup\UserData	1 Windows PE
Microsoft-Windows-Shell-Setup\OOBE	7 oobeSystem

Note

You can expand the component list until you see the lowest setting listed above, and then add that setting to your answer file. This shortcut adds the setting and all parent settings to your answer file in one step.

To configure Windows settings

- In the **Answer File** pane, all the settings you added are displayed. Select and configure each setting as specified in the following table.

Component	Value
Microsoft-Windows-Setup\DiskConfiguration	WillShowUI = OnError
Microsoft-Windows-Setup\DiskConfiguration\Disk	DiskID = 0 WillWipeDisk = true
Microsoft-Windows-Setup\DiskConfiguration\Disk\CreatePartitions\CreatePartition	Extend – false Order = 1 Size = 20000 (Note: This example creates a 20 GB partition.) Type = Primary

Component	Value
Microsoft-Windows-Setup \DiskConfiguration\Disk\ModifyPartitions\ModifyPartition	Active = true Extend = false Format = NTFS Label = OS_Install Letter = C Order = 1 PartitionID = 1
Microsoft-Windows-Setup\ImageInstall\OSImage\	WillShowUI = OnError
Microsoft-Windows-Setup\ImageInstall\OSImage\InstallTo	DiskID = 0 PartitionID = 1
Microsoft-Windows-Setup\UserData	AcceptEula = true
Microsoft-Windows-Setup\UserData\ProductKey	Key = *Product key* WillShowUI = OnError
Microsoft-Windows-Shell-Setup\OOBE	HideEULAPage = true ProtectYourPC = 3 SkipMachineOOBE = true SkipUserOOBE = true

- The settings above outline a basic unattended installation; no user input is required during Windows Setup.

To validate the settings in the answer file and save the file to removable media

1. In Windows SIM, click **Tools**, and then click **Validate Answer File**. The setting values in the answer file are compared with the available settings in the Windows image.
2. Messages appear to indicate a successful validation. Error messages appear in the same location if the validation was not successful.
3. To fix errors, double-click the error in the **Messages** pane, change the setting,

and then revalidate.

4. On the **File** menu, click **Save Answer File**. Save the answer file as Autounattend.xml.
5. Copy Autounattend.xml to the root of removable media such as a Universal Flash Device or floppy disk.

- You now have a basic answer file that automates Windows Setup. For more information about building answer files, see "Phase 3: Preinstallation Customization" under "Windows Preinstallation Phases" in the Windows AIK Help (Waik.chm).

Step 3: Building a Master Installation

- A master computer is a customized installation of Windows that you plan to duplicate onto one or more destination computers.
- You will create a master installation using the answer file you created in Step 2 and the Windows Vista product DVD.

The process

The basic process of building a master installation includes the following steps:

1. Assembling new hardware.
2. Installing Windows from the Windows Vista product DVD and answer file.
3. Verifying installation and customizations.
4. Shutting down the computer when the installation is complete.

Tools

You will need the following software and hardware tools:

- A Windows Vista product DVD
- The answer file you created and saved to removable media in the previous step.
- The computer that will be the master computer

Note

This procedure assumes that the hard drive of this computer is blank.

After you have created your master installation, you will use it to create an image. (See Step 4: Creating an Image.)

To install Windows from the product DVD

1. Turn on the new computer and insert the removable media containing the answer file (Autounattend.xml) and the Windows Vista product DVD.
2. Restart the computer (CTRL+ALT+DEL). Windows Vista Setup (Setup.exe) starts automatically and searches all removable media for an answer file named Autounattend.xml.
3. After Setup is complete, ensure that all customizations in the answer file were applied as specified.
4. From the command prompt, type the following command to reseal (generalize) and shut down the computer:

   C:\Windows\System32\Sysprep.exe /oobe /generalize /shutdown

   The Sysprep tool (Sysprep.exe) in this command prepares the image for capture by cleaning up various user and machine settings and log files.

The master installation is complete and ready to be imaged.

Step 4: Creating an Image

After you build a master installation, you could deliver the computer to a user, and then repeat the process of building the master installation again on each new computer. However, it is more efficient to capture an image of the master installation and then deploy that image onto other new computers.

In this step, you will create a Windows PE CD that you can use to start Windows PE. You use this CD to capture an image of your master computer, which you will then store on a network share.

The process

The basic process for capturing an image of the master installation includes the following steps:

1. Creating a CD you can use to start Windows PE.
2. Starting the master installation by using Windows PE media.
3. Capturing the installation image by using ImageX.
4. Storing the image on a network share.

Tools

You will need the following software and hardware tools for this step:

- Windows PE: software that provides an environment from which you can capture and deploy an image
- ImageX, a command-line tool that enables you to capture, modify, and apply file-based disk images
- A network share location for storing the image of the master installation
- One blank, writable CD-ROM

For more information about these tools, see the Deployment Tools Technical Reference in the Windows AIK help file, Waik.chm.

After you capture the image of the master installation and store it on a network share, you will deploy the image onto a destination computer. (See Step 5: Deploying an Image.)

To create Windows PE media

1. From your technician computer, open a command-line window and run Copype.cmd to create a local Windows PE build directory:

   Cd Program Files\Windows AIK\Tools\PETools

   Copype.cmd *arch destination*

   Where *arch* can be x86, amd64,or ia64 and *destination* is a path to a local directory, for example, type:

   Copype.cmd x86 C:\WinPE_x86

2. Copy additional tools such as ImageX into your Windows PE build directory. For example, type:

   Copy "C:\Program files\Windows AIK\Tools\x86\imagex.exe" C:\WinPE_x86\iso*subfolder*

   Where*subfolder***is any folder structure required to support your tools.**

3. Using Notepad or any text editor, create the following configuration file, and then save it with the name **wimscript.ini**:

   [ExclusionList]

   ntfs.log

   hiberfil.sys

pagefile.sys

"System Volume Information"

RECYCLER

Windows\CSC

[CompressionExclusionList]

***.mp3**

***.zip**

***.cab**

\WINDOWS\inf*.pnf

Note

This configuration file instructs ImageX to exclude certain files during the capture operation you will do in the next step.

4. Save the configuration file to the same location as Imagex as specified in the previous step. For example:

   C:\WinPE_x86\iso*subfolder*

   ImageX automatically detects **wimscript.ini** if it is located in the same location.

5. Create an image file (.iso) by using the Oscdimg tool. To do this, type:

   Cd Program Files\Windows AIK\Tools\PETools

   Oscdimg -n –bc:\winpe_x86\etfsboot.com c:\winpe_x86\ISO c:\winpe_x86\winpe_x86.iso

6. Burn the image (Winpe.iso) onto the blank CD-ROM. You now have a Windows PE CD with ImageX.

Note

Windows AIK does not include the CD-ROM burning software needed in the following procedure. You can use the CD Writing Wizard in Windows or your favorite third-party software to burn the image to a CD-ROM.

Important

In the following procedure, when you start the master computer, you must override the boot order so that the computer starts from the CD/DVD-ROM drive. To do this, when the computer starts, select the appropriate function key to override the boot order.

To capture the installation and store it on a network share

1. On the master computer, insert your Windows PE media and restart the computer. Windows PE starts and launches a command-line window.
2. Capture an image of the master installation by using ImageX located on your Windows PE media. For example, from the Windows PE command prompt, type:

   D:\Tools\Imagex.exe /compress fast /capture C: C:\Myimage.wim "my Vista Install" /verify
3. Copy the image to a network location. Windows PE provides network support. For example, from the Windows PE command prompt, type the following commands and provide network credentials for appropriate network access:

   Net use Y: ***network_share*\Images**

   Copy C:\Myimage.wim y:

The master installation image is ready to deploy from the network location to a destination computer.

Step 5: Deploying an Image

- After you have an image of your master installation, you can deploy the image onto new hardware by using ImageX and Windows PE.

The process

The basic process for deploying an image of the master installation onto a destination computer includes the following steps:

1. Assembling new hardware.
2. Starting the hardware using Windows PE media.
3. Formatting the hard drive.
4. Connecting to your network share and copying the custom image down to the destination computer's local hard drive.
5. Applying the image by using ImageX.

Tools

You will need the following software and hardware tools:

- The Windows PE RAM CD with ImageX that you created in the previous step.
- The destination computer. This step assumes that you repurpose the computer you used for the master installation.

Important

If you are using your master computer as your destination computer in this step, the hard drive contains an active partition. You must override the boot order to start the computer from the CD/DVD-ROM drive. To do this, when the computer starts, select the appropriate function key to override the boot order. If you are using newly assembled hardware without an installed operating system, the hard drive would be unformatted and you do not need to override the boot order.

To deploy a custom image from a network share

1. On your destination computer, insert your Windows PE media and restart the computer. Windows PE starts and launches a command-line window
2. Use the **diskpart** command to format the hard drive to reflect the required disk configuration. For example, from Windows PE **Command Prompt**, type the following commands:

   diskpart

   select disk 0

   clean

   create partition primary size=20000

   select partition 1

   active

   format

   exit
3. Copy the image from the network share to your local hard drive. For example, type the following commands and provide network credentials for appropriate network access:

   net use Y: ***network_share*\Images**

   copy Y:\Myimage.wim c:
4. Apply the image to the hard drive using ImageX located on your Windows PE media. For example, from the Windows PE command prompt, type:

D:\Tools\Imagex.exe /apply C:\Myimage.wim c:

5. Your custom image is now deployed onto your destination computer. The computer is ready for customer delivery. You can repeat the previous steps for each additional machine you want to ship.

Additional Resources

If you are a beta tester and part of the special Technology Adoption Program (TAP) beta program, you can also contact your appointed Microsoft development team member for assistance.

Windows Vista takes full advantage of Windows Deployment Services in Microsoft Windows Server™ Code Name "Longhorn" to streamline image-based deployment. To learn more about Windows Deployment Services, see the "Windows Server "Longhorn" Beta 2 Windows Deployment Services Step by Step Guide" on the Microsoft Web site (http://go.microsoft.com/fwlink/?LinkId=66145).