

# Sun Netra X6270 M2 Server Module

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Installation Guide for Windows Operating Systems



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# Using This Documentation

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This guide explains how to install and configure a Windows operating system on Oracle's Sun Netra X6270 M2 server module. This document is written for technicians, system administrators, authorized service providers (ASPs), and users who have experience with installing Windows operating systems.

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## Product Information

For information about the Sun Netra X6270 M2 server module, go to the following web site:

<http://www.oracle.com/goto/netrax6270m2>

At that site, you can find links and navigate to the following information and downloads:

- Product information and specifications
- Supported operating systems
- Software and firmware downloads
- Supported option cards
- Supported Network Express Modules
- External storage options
- Systems Handbook

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# Related Documentation

The related documents listed in the following table are available online at:

(<http://docs.sun.com/app/docs/prod/nt6270.m2.srvrmod?l=en#hic>)

<b>Title</b>	<b>Content</b>	<b>Format</b>
<i>Sun Netra X6270 M2 Server Module Product Notes</i> , 821-0936	Late-breaking information about the server module	PDF HTML
<i>Sun Netra X6270 M2 Server Module Getting Started Guide</i> , 821-2123	Basic installation information for setting up the server module	PDF Print
<i>Sun Netra X6270 M2 Server Module Installation Guide</i> , 821-0937	Detailed installation information for setting up the server module	PDF HTML Print option
<i>Sun Netra X6270 M2 Server Module Installation Guide for Windows Operating Systems</i> , 821-0941	Installation instructions for the Windows Server operating systems	PDF HTML
<i>Sun Netra X6270 M2 Server Module Service Manual</i> , 821-0939	Information and procedures for maintaining and upgrading the server module	PDF HTML
<i>Sun Installation Assistant 2.3 Through 2.4 User's Guide for x64 Systems</i> , 821-0694	Instructions for using the Sun Installation Assistant to install the Windows and Linux operating systems	PDF HTML
<i>Oracle x86 Servers Diagnostics Guide</i> , 820-6750	Information for diagnosing and troubleshooting the server module	PDF HTML
<i>Sun Server CLI Tools and IPMI Tool 2.0 User's Guide</i> , 821-1600	Information for using applications and utilities common to x64 servers	PDF HTML
<i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Documentation Collection</i> , 820-5523, 820-6410, 820-6411, 820-6412, 820-6413 (formerly called Sun Integrated Lights Out Manager Documentation Collection)	Documents covering ILOM features and tasks that are common to servers and server modules that support ILOM 3.0	PDF HTML
<i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Supplement for Sun Netra X6270 M2 Server Module</i> , 821-0943	ILOM 3.0 information that is specific to the Sun Netra X6270 M2 server module	PDF HTML
<i>Sun Netra X6270 M2 Server Module Safety and Compliance Guide</i> , 821-0938	Hardware safety and compliance information for the server module	PDF
<i>Important Safety Information for Sun Hardware Systems</i> , 821-1590	Multilingual hardware safety and compliance information for all Sun hardware systems	Print



Translated versions of some of these documents are available at the product site documentation URL identified earlier in this section. English documentation is revised more frequently and might be more up-to-date than the translated documentation.

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## Documentation, Support, and Training

These web sites provide additional resources:

- Documentation (<http://docs.sun.com>)
- Support (<http://www.sun.com/support>)
- Training (<http://www.sun.com/training>)

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## Product Downloads

To download the latest product software, go to the following web site:

(<http://www.oracle.com/goto/netrax6270m2>)

At that site, you can find links and navigate to the following items:

- Tools and Drivers DVD image
- Sun Installation Assistant DVD image
- Sun Validation Test Suite (SunVTS) Update



# PART I Windows Server Installations

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This section lists the topics that describe how to install the Windows 2008 (SP2 or R2) operating systems on your server module.

Description	Link(s)
<b>Novice or Experienced Users.</b> Use SIA to perform an assisted installation of the Windows operating system. SIA provides the appropriate system drivers and platform-specific software.	<ul style="list-style-type: none"><li>• <a href="#">Chapter 1</a>, Assisted OS Installation With Sun Installation Assistant (SIA)</li></ul>
<b>Experienced Users.</b> Manually install the Windows operating system and the required system drivers.	<ul style="list-style-type: none"><li>• <a href="#">Chapter 2</a>, Getting Started</li><li>• <a href="#">Chapter 3</a>, Windows Server 2008 Installation</li><li>• <a href="#">Chapter 4</a>, Post Installation of Windows Server 2008</li></ul>
<b>Experienced Users.</b> Reference content for manual Windows operating system installations.	<ul style="list-style-type: none"><li>• <a href="#">Appendix A</a>, Supported Installation Methods</li><li>• <a href="#">Appendix B</a>, Supported Operating Systems</li><li>• <a href="#">Appendix C</a>, BIOS Defaults For New Installs</li><li>• <a href="#">Appendix D</a>, Downloading the ISO Image for the Tools and Drivers DVD</li><li>• <a href="#">Appendix E</a>, Incorporating Device Drivers Into WDS Images</li><li>• <a href="#">Appendix F</a>, Identifying Network Interfaces in Windows</li></ul>



# Assisted OS Installation With Sun Installation Assistant (SIA)

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SIA makes operating system installation easy. With SIA, all you need to begin is a licensed copy of Linux or Windows OS distribution media supported for your server module. All software and required server-specific drivers are supplied by SIA. With a graphical wizard interface and flexible installation options, SIA brings simplicity, speed, and reliability to your server module deployments.

To use SIA, simply boot the SIA program from the server module's DVD drive, a USB flash drive, or from a network image. Check for the latest SIA updates available. Select your OS distribution from the menu and follow the on-screen instructions. SIA scans your system to ensure that it has the drivers it needs to configure your server module components[1]. It also provides you the option of having SIA check for the latest drivers available. SIA will prompt you for the appropriate media as needed and any other required information during the OS installation process (such as license keys).

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**Note** – [1] Some option card drivers are downloaded to the server module, but require manual installation. Feature enhancements are made to SIA regularly; therefore, you should check the SIA information page for the latest SIA updates and supported features (<http://www.sun.com/systemmanagement/sia.jsp>).

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Topics discussed in this chapter include:

- “SIA Task Overview” on page 4
- “How to Obtain SIA” on page 4
- “SIA Documentation Resources” on page 5

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# SIA Task Overview

You can perform the following tasks using SIA:

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**Note** – The supported SIA installation and recovery tasks listed below are server module-dependent and may vary.

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- Perform an assisted installation of a Linux or Windows operating system on your Sun x86 server module from Oracle. SIA provides the appropriate drivers and platform-specific software, eliminating the need to create a separate driver disk.
- Optionally create RAID-1 volumes on internal storage devices.
- Optionally upgrade your system's Integrated Lights Out Manager (ILOM) service processor (SP), BIOS, and storage device firmware (regardless of the OS on your server module).
- Optionally update your SIA session with the latest firmware and drivers.
- Optionally recover from a corrupt or inaccessible ILOM service processor.

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## How to Obtain SIA

SIA is provided with most x86 Oracle server module platforms on the SIA DVD. It is also available as a web download. Regular updates are made available to ensure that the latest OS versions are supported. To download the latest version of SIA for your server module, refer to the SIA information page at:

(<http://www.sun.com/systemmanagement/sia.jsp>)

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# SIA Documentation Resources

If you have determined that you want to install a Windows or Linux operating system on your server module using SIA, refer to the following resources for detailed installation instructions and forum discussions.

- *Sun Installation Assistant 2.3 Through 2.4 User's Guide for x64 Systems, 821-0694*  
(<http://docs.sun.com/app/docs/prod/install.x64svr>)
- Sun BigAdmin Feature Article: *How to Use the Sun Installation Assistant*  
([http://www.sun.com/bigadmin/features/articles/install\\_assistant.jsp](http://www.sun.com/bigadmin/features/articles/install_assistant.jsp))





## Getting Started

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This chapter describes how to get started installing the Microsoft Windows Server 2008 SP 2 or the Microsoft Windows Server 2008 R2 operating system manually on your server module.

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**Note** – The term “manually” refers to performing the installation by following the instructions provided in Chapters 2 through 4 of this guide, and not using the Sun Installation Assistant (SIA). If you prefer to perform an assisted Windows installation by using SIA, see [Chapter 1](#) of this guide.

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Topics discussed in this chapter include:

- [“Supported Windows Server Operating Systems”](#) on page 8
- [“Windows Installation Prerequisites”](#) on page 9
- [“Windows Server Installation Task Overview”](#) on page 10
- [“SAS HBAs Requiring LSI Mass Storage Driver for Windows Server 2008 SP2”](#) on page 11

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# Supported Windows Server Operating Systems

The Sun Netra X6270 M2 server module supports the following Microsoft Windows operating systems.

Windows OS	Edition
<ul style="list-style-type: none"><li>Windows Server 2008 SP2</li></ul>	<ul style="list-style-type: none"><li>Standard Edition (64-bit)</li><li>Enterprise Edition (64-bit)</li><li>Datacenter edition (64-bit)</li></ul>
<ul style="list-style-type: none"><li>Windows Server 2008 R2</li></ul>	<ul style="list-style-type: none"><li>Standard Edition (64-bit)</li><li>Enterprise Edition (64-bit)</li><li>Datacenter edition (64-bit)</li></ul>

For a complete and updated list of all the supported operating systems on the server module, see the following web site:

(<http://www.oracle.com/goto/netrax6270m2>)

# Windows Installation Prerequisites

Refer to the following important prerequisites before beginning the Windows Server 2008 operating system installation on your server module.

**TABLE 2-1** Windows Installation Prerequisites

Requirement	Description	For more information, see:
Established deployment method that enables you to boot the Windows install program	Guidelines for selecting a local or remote deployment method for installing a Windows operating system.	<ul style="list-style-type: none"><li>• <a href="#">Appendix A</a></li></ul>
RAID volume creation	If you are using the LSI mass storage controller and you want to include your boot drive as part of a RAID configuration, you need to configure a RAID volume on it. Use the LSI integrated RAID controller setup utility before you install Windows.	<ul style="list-style-type: none"><li>• <i>LSI MegaRAID Software SAS User's Guide</i> at: (<a href="http://www.lsi.com/support/sun/">http://www.lsi.com/support/sun/</a>)</li></ul>
Verification of BIOS settings for new OS installations	Prior to installing the Windows Server 2008 operating system, you should verify that the BIOS factory-default properties are set.	<ul style="list-style-type: none"><li>• <a href="#">Appendix C</a></li></ul>
Installation of server-specific device drivers and optional supplemental software	After performing the Windows Server 2008 installation, you might need to: <ul style="list-style-type: none"><li>• Install server module-specific device drivers to support additional hardware. Note the Windows 2008 SP2 does not include the LSI mass storage drivers for the SAS host bus adapters (HBAs). If you have a SAS HBA option installed, the LSI mass storage driver for the SAS HBA option must be made accessible from the Tools and Drivers DVD during installation. For a list of supported SAS HBAs, see <a href="#">TABLE 2-2</a></li><li>• Install Windows Server optional supplemental software that is available for your server module.</li></ul>	<ul style="list-style-type: none"><li>• <a href="#">Chapter 4</a></li><li>• “SAS HBAs Requiring LSI Mass Storage Driver for Windows Server 2008 SP2” on page 11</li></ul>
Incorporate server-specific device drivers in a WIM image	Advanced users can incorporate the post installation system device drivers into WDS boot and install images.	<ul style="list-style-type: none"><li>• <a href="#">Appendix E</a></li></ul>
Access to late-breaking information and patches for OS installations	Review the product notes for late-breaking information about supported operating system software and patches.	<ul style="list-style-type: none"><li>• <i>Sun Netra X6270 M2 Server Module Product Notes</i>, 821-0936</li></ul>

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# Windows Server Installation Task Overview

To manually install Windows Server 2008 (SP2 or R2), complete the following procedures in order:

1. Obtain the Tools and Driver DVD provided or download the latest drivers and utilities available for your server module as described in [Appendix D](#).

The install program for the Windows Server 2008 SP2 does not include the LSI drivers for the Sun Storage SAS HBA options. Therefore, if you have a SAS HBA configured on your server module and you are installing Windows 2008 SP2, the LSI mass storage driver for the SAS HBA option must be made accessible from the Tools and Drivers DVD during the installation process.

For a list of SAS HBAs supported on the server module, see “[SAS HBAs Requiring LSI Mass Storage Driver for Windows Server 2008 SP2](#)” on page 11.

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**Note** – Optionally, advanced users might prefer to incorporate the drivers into WDS images. For instructions on how to incorporate the drivers into WDS images, see [Appendix E](#).

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2. Choose and set up an installation method for deploying the Windows Server installation as described in [Appendix A](#).
3. Follow the instructions for performing a manual installation of the Windows Server operating system as described in [Chapter 3](#).
4. Follow the instructions for performing the Windows Server post installation tasks as described in [Chapter 4](#).

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# SAS HBAs Requiring LSI Mass Storage Driver for Windows Server 2008 SP2

TABLE 2-2 identifies the SAS host bus adapter options that are supported on the server module at the time of this publication. If you have one of these SAS HBA options configured on your server module and you are installing Windows Server 2008 SP2, you will need to load the LSI mass storage driver for the HBA option from the Tools and Drivers DVD during installation.

**TABLE 2-2** Supported SAS HBAs Requiring LSI Mass Storage Driver

Supported SAS HBAs	Option Number	Driver Required During Installation
Sun Storage 6 Gb SAS REM RAID HBA	SG-SAS6-R-REM-Z SGX-SAS6-R-REM-Z	LSI MegaRAID SAS 92xx-xx
Sun Storage 6 Gb SAS REM HBA	SG-SAS6-REM-Z SGX-SAS6-REM-Z	LSI MegaRAID SAS 92xx-xx
Sun Storage 6 Gb SAS ExpressModule RAID HBA	SGX-SAS6-R-EM-Z	LSI Adapter SAS 2008 Falcon
Sun Storage 6 Gb SAS ExpressModule HBA	SGX-SAS6-EM-Z	LSI Adapter SAS 2008 Falcon

Instructions for loading the LSI mass storage driver during the Windows Server 2008 SP2 installation are provided in Step 8 of the “[Install Windows Server 2008 \(SP2 or R2\) Using Local or Remote Media](#)” on page 14.

If you do not have a copy of the Tools and Drivers DVD, you can download the ISO image for the Tools and Driver DVD. For details, see [Appendix D](#).

For an up-to-date list of options supported on the server module, see:

(<http://www.oracle.com/goto/netrax6270m2>)



## Installing Windows Server 2008

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This chapter provides information about manually installing the Windows Server 2008 SP2 or Windows Server 2008 R2 operating system.

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**Note** – The term “manually” refers to performing the installation by following the instructions provided in Chapters 2 through 4 of this guide, and not using the Sun Installation Assistant (SIA). If you prefer to perform an assisted Windows installation by using SIA, see [Chapter 1](#) of this guide for details.

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This chapter includes the following topics:

- “Before You Begin” on page 13
- “Installing Windows Server Using Local or Remote Media” on page 14
- “Windows Server Installation Using a PXE Network Boot” on page 24

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### Before You Begin

Ensure that the following requirements are met before you proceed with the instructions in this chapter for manually installing the Windows Server operating system.

- All applicable installation prerequisites for installing an operating system should have been met. For further information about these prerequisites, see “[Windows Installation Prerequisites](#)” on page 9.
- An installation method (for example: console output, boot media, and install target) should have been chosen and established prior to performing the installation. For more information about these setup requirements, see [Appendix A](#).

- Use the Microsoft Windows Server 2008 (SP2 or R2) operating system documentation in conjunction with the Windows Server operating system instructions provided in this chapter. You can obtain a copy of Microsoft's Windows Server 2008 installation documentation at:  
(<http://www.microsoft.com/windowsserver2008/en/us/product-documentation.aspx>)

After completing this procedure, you should review and perform the required post installation tasks described later in this guide. For more details, see [Chapter 4](#).

---

## Installing Windows Server Using Local or Remote Media

The procedures in this section describe how to boot the Windows Server 2008 (SP2 or R2) operating system from local or remote media. It assumes that you are booting the Windows installation media from one of the following sources:

- Windows Server 2008 SP2 or Windows Server 2008 R2 (or subsequent release) CD or DVD
- Windows Server 2008 SP2 or Windows Server 2008 R2 (or subsequent release) ISO image

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**Note** – The Windows Server 2008 (SP 2 or R2) ISO image can be used for remote installation or for creating an installation CD or DVD.

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**Note** – If you are booting the installation media from a PXE environment, refer to [“Windows Server Installation Using a PXE Network Boot”](#) on page 24 for instructions.

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### ▼ Install Windows Server 2008 (SP2 or R2) Using Local or Remote Media

#### 1. Ensure that the installation media is available to boot.

- **For Distribution CD/DVD.** Insert the Windows 2008 Distribution media (CD labeled number 1 or the single DVD) into the local or remote USB CD/DVD-ROM drive.



- **For ISO image.** Ensure that the ISO images are available and that the ILOM Remote Console application is aware of the first ISO image location.
- For additional information about how to set up the installation media, see [TABLE A-2](#).

## 2. Reset or power on the server module.

For example:

- **From the ILOM web interface,** select Remote Control --> Remote Power Control tab, then select Reset option from the Select Action list box.
- **From the local server module,** press the Power button on the front panel of the server module to power off the server module, then press the Power button again to power on the server module.
- **From the ILOM CLI,** type: **reset /SYS**
- **From the ILOM CLI on a CMM,** type: **reset /CH/BLn/SYS**  
Where *n* is the number of the server module in the chassis.

The BIOS screen appears.

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**Note** – The next events occur very quickly; therefore, focused attention is needed for the following steps. Watch carefully for these messages as they appear on the screen for a brief time. You might want to enlarge the size of your screen to eliminate scroll bars.

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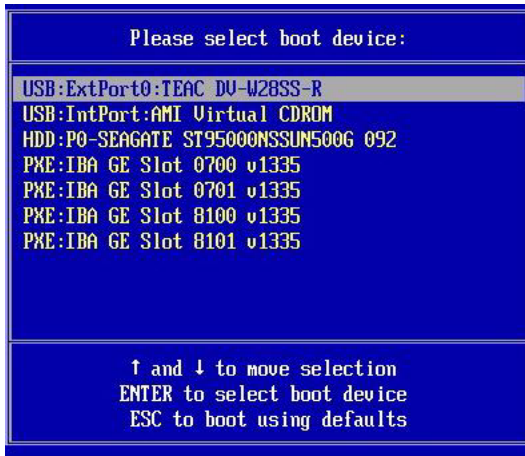
## 3. In the BIOS power-on self-test screen, press F8 to specify a temporary boot device for the Windows installation.

The Please Select Boot Device dialog appears.

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**Note** – The dialog that appears in your installation might differ depending on the type of disk controller installed in your server module.

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4. In the Please Select Boot Device dialog, select the menu item according to the Windows media installation method you elected to use, then press Enter.

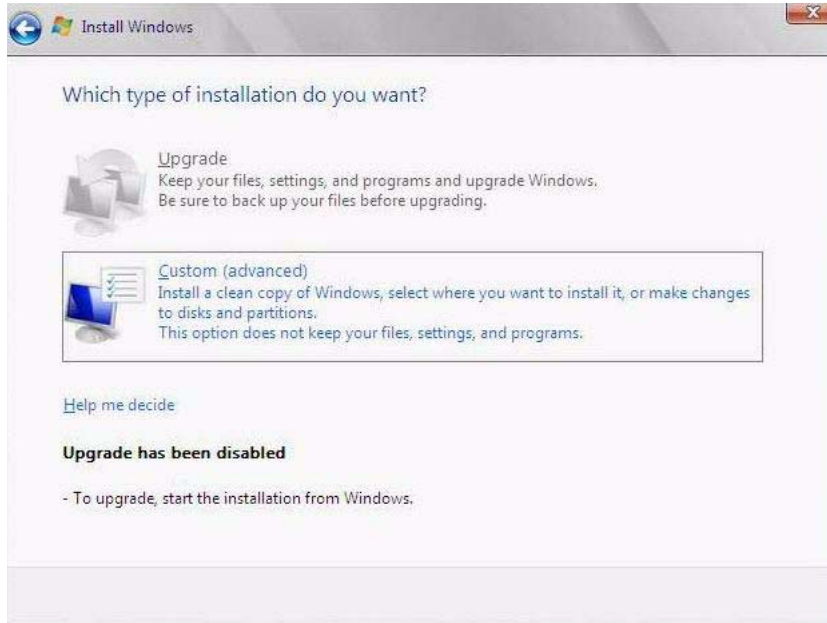
For example:

- If you elected to use the Windows local delivery method, select TEAC as the physical DVD device (or select CD/DVD if this option is shown in boot device dialog).
- If you elected to use the ILOM Remote Console delivery method, select Virtual CDROM.

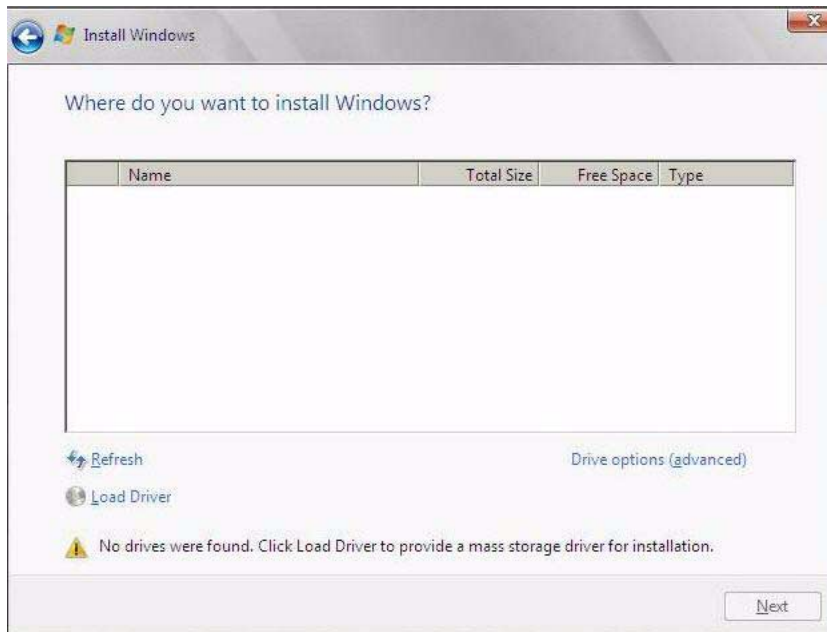
5. When prompted with Press any key to boot from CD, press any key.

The Windows installation wizard starts.

Continue the Windows installation wizard until the Installation Type dialog appears.



6. In the Installation Type dialog, click Custom (advanced).  
The Where Do You Want to Install Windows dialog appears.



**7. In the Where Do You Want to Install Windows dialog, perform one of the following tasks in the table below to specify a storage target for the Windows Server operating system edition.**

For Windows Server Edition	Task
Windows Server 2008 SP2 (or subsequent Windows 2008 SP release)	<p>Perform one of the following:</p> <ul style="list-style-type: none"> <li>• If you do not see any storage targets listed and have a Sun Storage SAS RAID HBA option configured on your server, click Load Driver then proceed to <b>Step 8</b>.</li> <li>- or -</li> <li>• If you see the storage target where you want to install the operating system but want to change the default partition settings associated with that target, select the target, click Drive Options, then proceed to <b>Step 9</b>.</li> <li>- or -</li> <li>• If you see the storage target where you want to install the operating system and do not want to change the default partition settings for that target, select the target and click Next, then proceed to <b>Step 10</b>.</li> </ul>
Windows Server 2008 R2 (or subsequent Windows 2008 R2 release)	<p>Perform one of the following:</p> <ul style="list-style-type: none"> <li>• If you see the storage target where you want to install the operating system but want to change the default partition settings associated with that target, select the target, click Drive Options, then proceed to <b>Step 9</b>.</li> <li>- or -</li> <li>• If you see the storage target where you want to install the operating system and do not want to change the default partition settings for that target, select the target and click Next, then proceed to <b>Step 10</b>.</li> </ul>

**8. (Load HBA Storage Driver) In the Load Drive dialog, do the following:**



**a. Ensure the storage driver(s) are accessible according to the installation method chosen (described in [Appendix A](#)).**

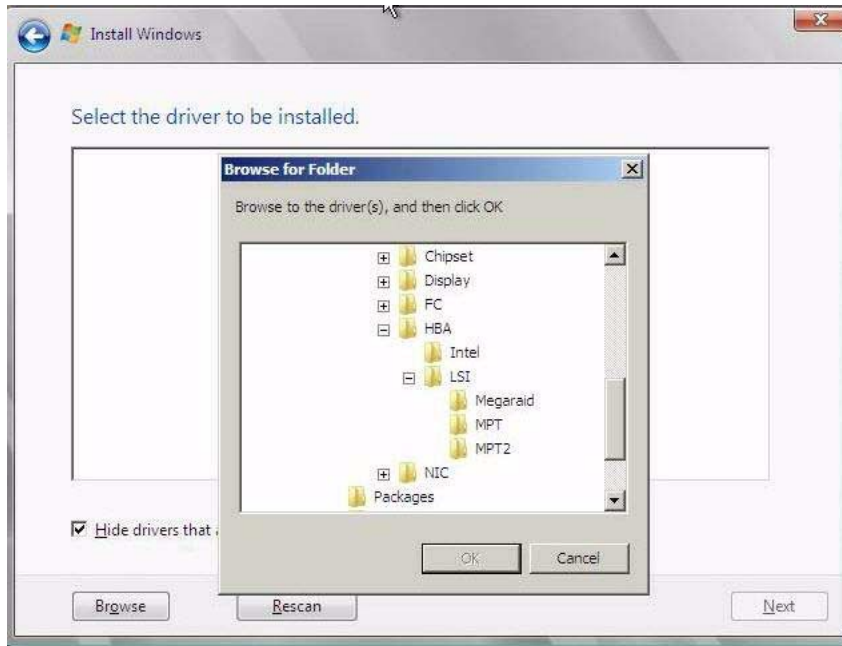
For example:

- **Floppy Disk Local.** Storage driver(s) on a floppy disk in floppy drive A on the server.
- **Floppy Disk Remote.** Storage driver(s) on a floppy disk in a floppy drive mounted as a device from the ILOM Remote Console.
- **Floppy Image.** Storage driver `floppy.img` file is mounted as a device from the ILOM Remote Console.
- **Non-floppy Media.** Storage driver(s) are on a local physical storage media (USB flash drive or CD/DVD) or virtual media mounted from the ILOM Remote Console.

**b. In the Load Driver dialog, click Browse to navigate to the appropriate driver media folder as described below.**

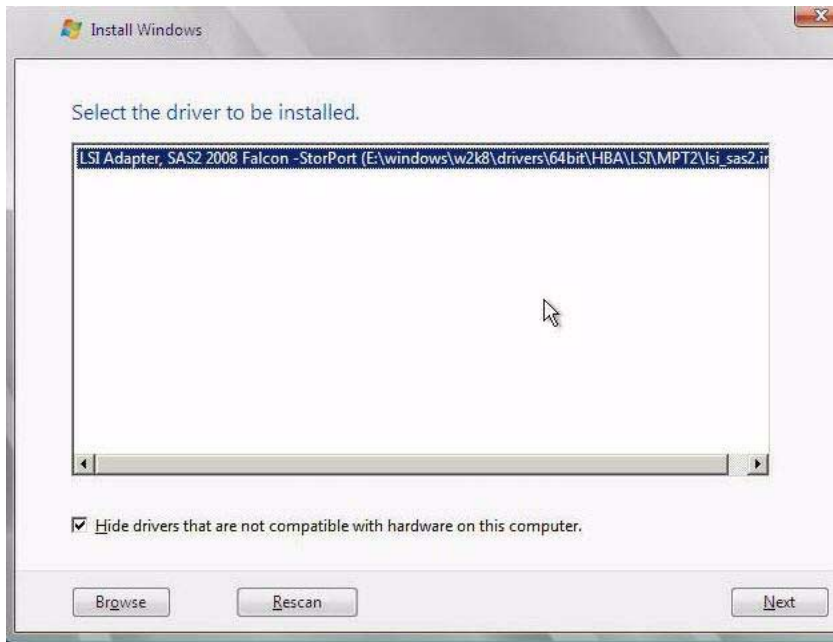
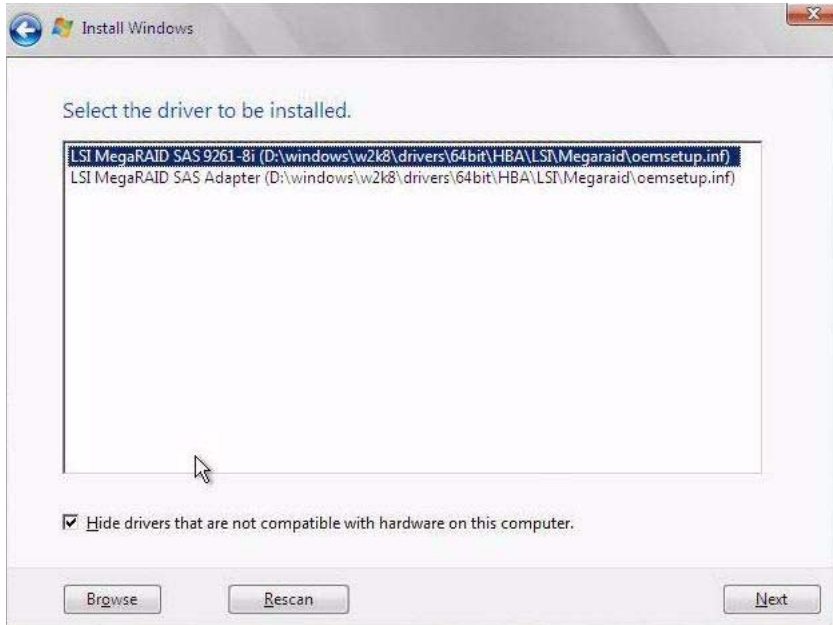
- For systems configured with either of these SAS RAID HBA options—`SG-SAS6-R-REM-Z/SGX-SAS6-R-REM-Z`, or `SG-SAS6-R-EM-Z/SGX-SAS6-R-EM-Z`—navigate to the following directory on the Tools and Drivers DVD to load the appropriate LSI driver:  
`windows/w2k8/drivers/64bit/hba/lsi/megaraid`

- For a system configured with either of these SAS HBA options—SG-SAS6-REM-Z/SGX-SAS6-REM-Z, or SG-SAS6-EM-Z/SGX-SAS6-EM-Z—navigate to the following directory on the Tools and Driver DVD to load the appropriate LSI driver:  
windows/w2k8/drivers/64bit/hba/lsi/mpt2



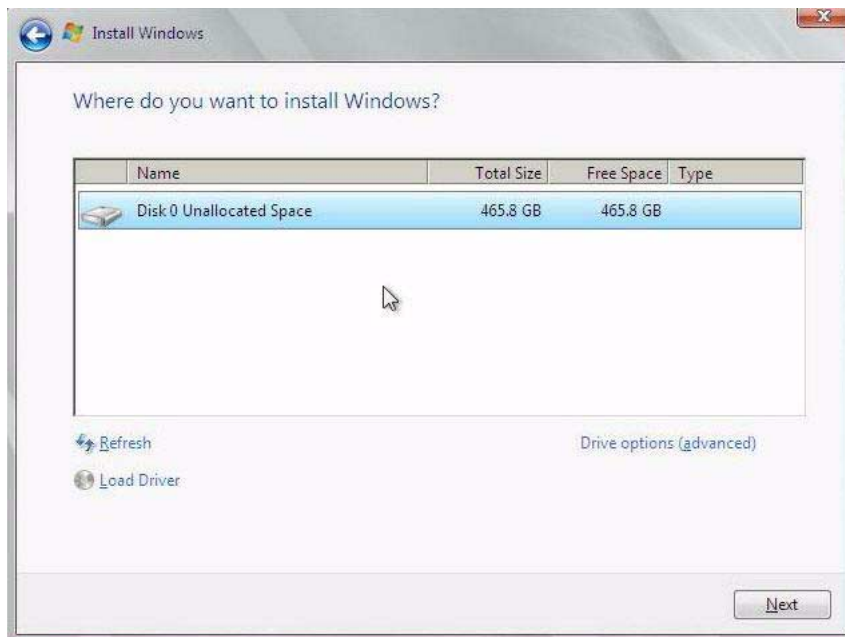
- c. In the Browse for Folder dialog, select the appropriate driver, then click OK to load the driver.**

The selected driver appears in the Select the Driver to Be Installed dialog. Example dialogs follow showing a selected mass storage driver for a SAS HBA.



d. In the **Select the Driver to Be Installed** dialog, click **Next** to install the driver.

The **Where Do You Want to Install Windows** dialog appears.



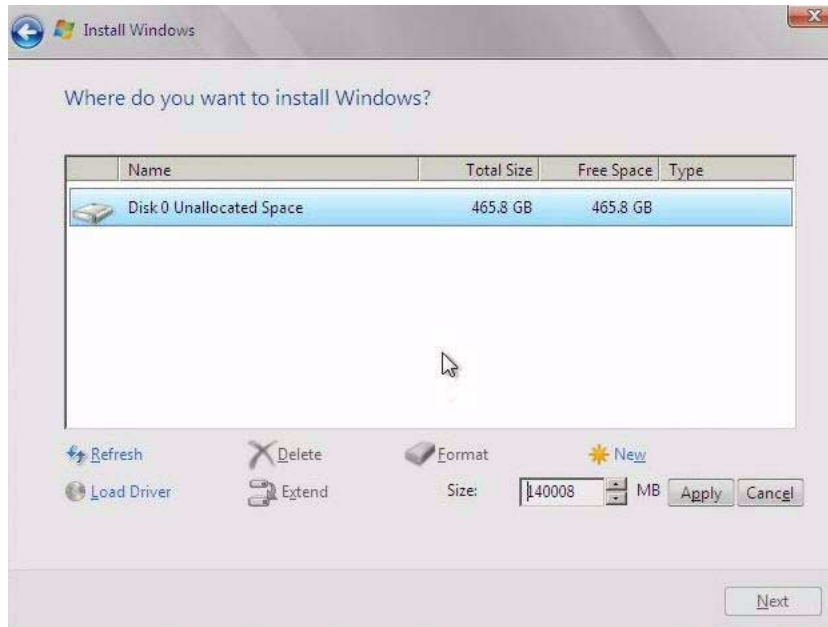
e. In the **Where Do You Want to Install Windows** dialog, do one of following:

- Select the storage target listed and click **Next** to install the operating system, then proceed to Step 10.
- or -
- Select the storage target listed and click **Drive Options (Advanced)** to view and change the default partition settings, then proceed to Step 9.

The partition settings for the selected target appear at the bottom of the **Where Do You Want to Install Windows** dialog.

9. **(Partition Drive, advanced)** In the lower portion of the **Where Do You Want to Install Windows** dialog, do the following:





- a. Click **Delete** to delete the selected storage target existing partition configuration.  
A confirmation window appears.
  - b. Click **OK** to confirm the partition deletion.
  - c. Click **New** to create a new partition on the selected storage target.
  - d. In the **Size** scroll box, increase or decrease the partition size as needed, then click **Apply**.  
The partition is created.
  - e. Click **Next** to install the operating system to the selected storage target.
10. The Windows installation program begins and will reboot the server module multiple times during the installation process.
  11. When the Windows installation is complete, Windows starts and prompts you to change the user password.
  12. In the user password dialog, click **OK** and set up the initial user login account.

---

**Note** – Windows Server 2008 enforces stronger password schemes for user accounts. Password standards include restrictions on length, complexity, and history. For more details, click the [Accessibility](#) link at the account creation page.

---

After the initial user account is created, the Windows Server 2008 desktop appears.

13. Proceed to [Chapter 4](#) to perform the post installation tasks.

---

## Windows Server Installation Using a PXE Network Boot

This section explains the initial information you will need to install the Windows Server 2008 (SP2 or R2) operating system over an established PXE-based network using a customer-provided Windows Imaging Format (WIM) image.

Topics included in this section:

- [“Before You Begin”](#) on page 24
- [“Install Windows Server 2008 \(SP2 or R2\) Using PXE”](#) on page 25

Note that the procedure presented in this section documents the initial steps to install Windows Server 2008 over the network using a Windows Deployment Services (WDS). Specifically, it explains the steps for selecting the server PXE network interface card that will communicate with your WDS installation server. For further information about using WDS to install the Windows Server 2008 operating system, see Microsoft’s Windows Deployment Services documentation.

### Before You Begin

- To use PXE to boot the installation media over the network, you must:
  - Configure the network (NFS, FTP, HTTP) server to export the installation tree.
  - Configure the files on the TFTP server that are necessary for PXE booting.
  - Configure the server’s MAC network port address to boot from the PXE configuration.
  - Configure Dynamic Host Configuration Protocol (DHCP).
- To use WDS to perform the installation, you must:
  - Add the required system device drivers to the `install.wim` image and, if necessary, the `boot.wim` image.

For guidelines for adding drivers to the WIM installation image(s), see [Appendix E](#).

- Obtain the WIM Administrator password.

## ▼ Install Windows Server 2008 (SP2 or R2) Using PXE

### 1. Reset or power on the server module.

- **From the ILOM web interface**, select Remote Power --> Remote Power Control tab, then select Reset from the Select Action list box.
- **From the local server module**, press the Power button on the front panel of the server module to turn off the server module, then press the Power button again to power on the server module.
- **From the ILOM CLI**, type: `reset /SYS`
- **From the ILOM CLI on a CMM**, type: `reset /CH/BLn/SYS`
- Where *n* is the number of server module in the chassis.

The BIOS screen appears.

---

**Note** – The next events occur very quickly; therefore, focused attention is needed for the following steps. Watch carefully for these messages as they appear on the screen for a brief time. You might want to enlarge the size of your screen to eliminate scroll bars.

---

### 2. Press F8 to specify a temporary boot device.

The Please Select Boot Device menu appears.

### 3. In the Please Select Boot Device menu, select the appropriate PXE installation boot device and press Enter.

Note that the PXE installation boot device is the physical network port configured to communicate with your network installation server.

The Boot Agent dialog appears.

### 4. In the Boot Agent dialog, press F12 for a network service boot.

### 5. Continue the normal Windows Server 2008 SP2 or 2008 R2 WDS network installation.

For additional information, consult Microsoft's Windows Deployment Services product documentation.

### 6. When the installation completes, proceed to [Chapter 4](#) to perform the post installation tasks.



# Post Installation of Windows Server 2008

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After completing the installation of the Windows Server 2008 (SP2 or R2) operating system and rebooting the server module, you should review the following post installation tasks and, if necessary, perform the tasks that are applicable to your server module.

- “Installing Critical Device Drivers and Supplemental Software” on page 28
- “Installing Supplemental Software” on page 29
- “Configuring Support for TPM” on page 31
- “Configuring Intel NIC Teaming” on page 31

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## Before You Begin

The procedures in this chapter assume that you have:

- Installed the Microsoft Windows Server operating system
- Obtained a copy of the Tools and Drivers DVD.

If you do not have a copy of the Tools and Drivers DVD, you can download the latest ISO image of the Tools and Drivers DVD from the product download site. For Instructions see, [Appendix D](#).

---

# Installing Critical Device Drivers and Supplemental Software

An installation wizard is provided on the Tools and Drivers DVD to install server module-specific device drivers and Supplemental Software. The server module-specific device drivers are provided to support optional hardware devices that can be installed on your server module.

## ▼ Install Server Module-Specific Device Drivers

1. **Insert the Tools and Drivers DVD into a local or remote USB DVD drive and do one of the following:**
  - **If the DVD automatically starts**, click `Install Drivers and Supplement Software`.
  - **If the DVD does not automatically start**, navigate to one of the following folders containing the appropriate `InstallPack` file (for example, `InstallPack_1_0_1.exe`), and double-click it.
    - `<DVD>/Windows/W2K8/Packages`
    - `<DVD>/Windows/W2K8R2/Packages`The Server Installation Package dialog appears.
2. **In the Install Pack dialog, click `Next` to accept the default installable items.**

---

**Note** – You should always accept the “default installable items” to ensure that the most recent versions of the drivers are installed.

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The Install Pack notice dialog appears.

3. **In the Install Pack notice dialog, read the message, then click `Next`.**

The Welcome to the Sun Fire Installation Wizard appears.
4. **In the Welcome to the Sun Fire Installation Wizard dialog, click `Next`.**

The End User License Agreement page appears.
5. **In the End User License Agreement page, select `I Accept This Agreement`, then click `Next`.**

The platform-specific drivers are installed. A green check mark verifies that each driver was installed successfully.

6. In the Driver Installation Pack dialog, click *Finish*.

The System Settings Change dialog appears.

---

**Note** – If you plan on installing Supplemental Software (highly recommended), do not restart your system at this time. Once the Supplemental Software has been installed, you will be prompted to restart the system.

---

7. Perform one of the following:

- If you accepted the default installable settings in [Step 2](#), click *No* to proceed to “Installing Supplemental Software” on page 29.
- If you are not installing the Supplemental Software, click *Yes* to restart your computer.

---

## Installing Supplemental Software

There are several Supplemental Software components available for your server module. You have two options for installation:

- **Typical:** Installs all Supplemental Software applicable for your server module.
- **Custom:** Installs only the Supplement Software selected for installation.

TABLE 4-1 identifies the optional Supplemental Software components available for your server module.

**TABLE 4-1** Install Pack Optional Supplemental Software

Available Supplemental Software Components	Server modules With LSI Integrated RAID Controller	Server modules With Intel Integrated Disk Controller
<p><b>LSI MEGARAID Storage Manager</b>, click <b>Yes</b> to restart your computer</p> <p>Enables you to configure, monitor, and maintain RAID on the SAS internal RAID host bus adapter (HBA).</p>	Typical	Not applicable
<p><b>IPMItool command-line utility</b></p> <p>The IPMItool command-line utility reads the sensor data repository (SDR) and displays sensor values, system event log (SEL), and field-replaceable unit (FRU) inventory information; gets and sets LAN configuration parameters; and performs chassis power control operations via the BMC (also called the service processor (SP)).</p>	Typical	Typical
<p><b>Intel NIC Teaming</b></p> <p>Enables the network interfaces on a server module to be grouped together into a team of physical ports called a virtual interface.</p>	Typical	Typical

## ▼ Install the Supplemental Software



**Caution** – If you have already installed the Supplemental Software, running the installation again will not necessarily reinstall the Supplemental Software. It might result in the components being removed. Carefully review the dialog boxes during Supplemental Software installation to ensure that the results are as expected.

### 1. Do one of the following:

- If you *did not* select the **Supplemental Software** when you ran the procedure “Installing Critical Device Drivers and Supplemental Software” on page 28, refer back to that procedure and run it again, but this time accept the default settings in Step 2 (the default is to install the Supplemental Software), and select **No** in Step 7.
- If you *did* select **Supplemental Software** at the Server Installation Package dialog box in Step 2 of “Installing Critical Device Drivers and Supplemental Software” on page 28, and selected **No** in Step 7, the Install Pack Supplemental Software dialog appears. Proceed to Step 2.



2. In the **Install Pack Supplement Software** dialog, click **Next** to accept the typical settings; or select **Custom** to choose the options to install (see descriptions of the Supplemental Software in TABLE 4-1).

The Component Installation wizard will guide you through the installation of each of the selected Supplemental Software components.

3. After the Supplemental Software has been installed, click **Finish**.

4. Click **Yes** at the **System Setting Change** dialog to restart your system.

If you ran the Sun Server Installation Package software from the Tools and Drivers DVD, remove the DVD from your system.

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## Configuring Support for TPM

If you intend to use the Trusted Platform Module (TPM) feature set that is provided in Windows 2008, you must configure the server module to support this feature. For instructions, see the configuring support for TPM information in the *Sun Netra X6270 M2 Server Module Service Manual*, 821-0939.

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**Note** – TPM enables you to administer the TPM security hardware in your server module. For additional information about implementing this feature, refer to the Windows Trusted Platform Module Management documentation provided by Microsoft.

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## Configuring Intel NIC Teaming

For more information on setting up NIC teaming for your environment, refer to the Intel Connectivity web page on Advanced Networking Services Teaming at:

(<http://support.intel.com/support/network/sb/CS-009747.htm>)

Additionally, you can download the complete set of Intel Network Connections User Guides for your server module's network adapters at:

(<http://support.intel.com/support/network/sb/cs-009715.htm>)



## PART II Windows Server System Administrator References

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Refer to the following system administrator references as needed to perform or complete the installation of the Windows Server 2008 (SP2 or R2) operating system.

Description	Link
Guidelines for selecting and setting up an installation environment for deploying the Windows Server installation program	<a href="#">Appendix A</a>
A complete list of operating systems supported on the Sun Netra X6270 M2 server module at the time of this publication	<a href="#">Appendix B</a>
Instructions for ensuring that the BIOS default properties are set prior to performing the Windows Server installation	<a href="#">Appendix C</a>
Instructions for downloading the latest version of the ISO image for the Tools and Drivers DVD	<a href="#">Appendix D</a>
Instructions for advanced users who prefer to incorporate the server module-specific drivers in a Windows Imaging Format (WIM) file	<a href="#">Appendix E</a>
Guidelines for determining your server module active network ports and matching them to Windows device names.	<a href="#">Appendix F</a>



## Supported Installation Methods

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To determine which installation method is best for you when installing Windows on your server module, consider the following options summarized in this appendix:

- “Console Outputs” on page 36
- “Installation Boot Media” on page 38
- “Installation Targets” on page 41

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# Console Outputs

TABLE A-1 lists the consoles you can use to capture the output and input of the operating system installation.

**TABLE A-1** Console Options for Performing an OS Installation

Console	Description	Setup Requirement
Local console	<p>You can install the OS and administer the server module by attaching a local console directly to the server module SP.</p> <p>Examples of local consoles include:</p> <ul style="list-style-type: none"><li>• Serial console</li><li>• VGA console, with USB keyboard and mouse</li></ul>	<ol style="list-style-type: none"><li>1. Attach a local console to the server module. For details, see “Attaching Devices to the Server Module” in the <i>Sun Netra X6270 M2 Server Module Installation Guide</i>, 821-0937, and Appendix C in the <i>Sun Netra X6270 M2 Server Module Service Manual</i>, 821-0939.</li><li>2. At the ILOM prompt, type your ILOM user name and password.</li><li>3. For serial console connections only, establish a connection to the host serial port by typing <code>start /SP/console</code>. The video output is automatically routed to the local console.</li></ol> <p>For further details about establishing a connection to the server module SP, see the <i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Concepts Guide</i>, 820-6410.</p>

**TABLE A-1** Console Options for Performing an OS Installation (Continued)

Console	Description	Setup Requirement
Remote console	<p>You can install the OS and administer the server module from a remote console by establishing a network connection to the server module SP.</p> <p>Examples of remote consoles include:</p> <ul style="list-style-type: none"><li>• Web-based client connection using the ILOM Remote Console application</li><li>• SSH client connection using a serial console</li></ul>	<ol style="list-style-type: none"><li>1. View or establish an IP address for the server module SP. For details, see the <i>Sun Netra X6270 M2 Server Module Installation Guide</i>, 821-0937.</li><li>2. View or establish a connection between a remote console and the server module SP:<ul style="list-style-type: none"><li>• <b>For web-based client connection</b>, perform these steps: 1) In a web browser, type the IP address for the server module SP; 2) log in to the ILOM web interface; 3) redirect the video output from the server module to the web client by launching the ILOM Remote Console; 4) enable device redirection (mouse, keyboard, etc.) in the Device menu.</li><li>• <b>For SSH client connection</b>, perform these steps: 1) From a serial console, establish an SSH connection to the server module SP (<code>ssh root@ipaddress</code>); 2) log in to ILOM; 3) redirect the serial output from the server module to the SSH client by typing <code>start /SP/console</code>.</li></ul></li></ol> <p>For additional information about establishing a remote connection to the ILOM SP or using the ILOM Remote Console, see the <i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Concepts Guide</i>, 820-6410).</p>

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# Installation Boot Media

You can start the operating system installation to a server module by booting a local or remote installation media source. [TABLE A-2](#) identifies the supported media sources and the setup requirements for each source.

**TABLE A-2** Boot Media Options for Performing an OS Installation

Installation Media	Description	Setup Requirement
Local boot media	<p>Local boot media requires a built-in storage device on the server module, or an external storage device attached to the server module.</p> <p>Supported OS local boot media sources can include:</p> <ul style="list-style-type: none"><li>• CD/DVD-ROM installation media, and, if applicable, floppy device driver media</li></ul>	<ol style="list-style-type: none"><li>1. If your server module does not contain a built-in storage device, attach the appropriate storage device to the front panel using the dongle cable.</li><li>2. For more information about how to attach local devices to the server module, see “Attaching Devices to the Server Module” in the <i>Sun Netra X6270 M2 Server Module Installation Guide</i>, 821-0937, and Appendix C in the <i>Sun Netra X6270 M2 Server Module Service Manual</i>, 821-0939.</li></ol>



**TABLE A-2** Boot Media Options for Performing an OS Installation (Continued)

Installation Media	Description	Setup Requirement
Remote boot media	<p>Remote media requires you to boot the install over the network. You can start the network install from a redirected boot storage device or another networked system that exports the installation over the network using a Pre-Boot eXecution environment (PXE).</p> <p>Supported OS remote media sources can include:</p> <ul style="list-style-type: none"> <li>• CD/DVD-ROM installation media, and, if applicable, floppy device driver media</li> <li>• CD/DVD-ROM ISO installation image and, if applicable, floppy ISO device driver media</li> <li>• Automated installation image (requires PXE boot)</li> </ul>	<p>To redirect the boot media from a remote storage device, perform these steps:</p> <ol style="list-style-type: none"> <li>1. Insert the boot media into the storage device, for example: <ul style="list-style-type: none"> <li><b>For CD/DVD-ROM</b>, insert media into the built-in or external CD/DVD-ROM drive.</li> <li><b>For CD/DVD-ROM ISO image</b>, ensure that ISO image(s) are readily available on a network shared location.</li> <li><b>For device driver floppy ISO image</b>, ensure that ISO image, if applicable, is readily available on a network shared location or on a USB drive.</li> <li><b>For device driver floppy media</b>, if applicable, insert floppy media into the external floppy drive.</li> </ul> </li> <li>2. Establish a web-based client connection to the server module ILOM SP and launch the ILOM Remote Console application. For more details, see the Setup Requirements for web-based client connection in <a href="#">TABLE A-1</a>.</li> <li>3. In the Device menu of the ILOM Remote Console application, specify the location of the boot media, for example: <ul style="list-style-type: none"> <li><b>For CD/DVD-ROM boot media</b>, select CD-ROM.</li> <li><b>For CD/DVD-ROM ISO image boot media</b>, select CD-ROM Image.</li> <li><b>For floppy device driver boot media</b>, if applicable, select Floppy.</li> <li><b>For floppy image device driver boot media</b>, if applicable, select Floppy Image.</li> </ul> </li> </ol> <p>For more information about the ILOM Remote Console, see the <i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Concepts Guide</i>, 820-6410.</p>

**TABLE A-2** Boot Media Options for Performing an OS Installation (*Continued*)

Installation Media	Description	Setup Requirement
Remote Boot Media ( <i>continued</i> )	<p><b>Note</b> - An automated installation image enables you to perform the OS installation on multiple servers. By using an automated image, you can ensure configuration uniformity among many systems.</p> <p>Automated installations use a Pre-boot eXecution Environment (PXE) technology to enable the clients without an operating system to boot remotely to the automated install server that performs the installation of the operating system.</p>	<p>To perform the installation using PXE, perform these steps:</p> <ol style="list-style-type: none"><li data-bbox="672 302 1139 354">1. Configure the network server to export the installation via PXE boot.</li><li data-bbox="672 362 1215 388">2. Make the OS install media available for PXE boot. If you are using an automated OS installation image, you will need to create and provide the automated OS install image, for example:<ul style="list-style-type: none"><li data-bbox="696 487 1048 513">— Oracle Solaris JumpStart Image</li><li data-bbox="696 522 958 548">— RHEL KickStart Image</li><li data-bbox="696 557 958 583">— SLES AutoYaST Image</li><li data-bbox="696 591 953 618">— Windows WDS Image</li></ul>For detailed instructions for automating the installation setup process, consult the operating system vendor documentation.</li><li data-bbox="672 710 1215 770">3. To boot the installation media, select the PXE boot interface card as the temporary boot device. For details, see <a href="#">“Windows Server Installation Using a PXE Network Boot”</a> on page 24.</li></ol>

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# Installation Targets

TABLE A-3 identifies the supported installation targets you can use to install an operating system.

**TABLE A-3** Installation Targets for OS Installation

Install Target	Description	Setup Requirement	Supported OS
Local hard disk drive (HDD) or Solid state drive (SSD)	You can choose to install the operating system to any of the hard drives or solid state drives installed in the server.	<ul style="list-style-type: none"><li>• Ensure that the HDD or SSD is properly installed and powered-on in the server module.</li></ul> For more information about installing and powering on an HDD or SSD, refer to the <i>Sun Netra X6270 M2 Server Module Service Manual</i> , 821-0939.	<ul style="list-style-type: none"><li>• All supported operating systems listed in <a href="#">Appendix B</a>.</li></ul>
Fibre Channel (FC) Storage Area Network (SAN) device	For server modules equipped with Fibre Channel Host Bus Adapters (HBAs), you can choose to install the operating system to an external FC storage device.	<ul style="list-style-type: none"><li>• Ensure FC HBA is properly installed in the server module.</li></ul> For more information about installing a HBA option in your server module, refer to the <i>Sun Netra X6270 M2 Server Module Service Manual</i> , 821-0939. <ul style="list-style-type: none"><li>• The SAN must be installed and configured to make the storage visible to the host.</li></ul> For instructions, refer to the documentation supplied with the FC HBA.	<ul style="list-style-type: none"><li>• All operating systems listed in <a href="#">Appendix B</a>.</li></ul>



## Supported Operating Systems

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TABLE B-1 in this appendix describes the operating systems supported on the Sun Netra X6270 M2 server module at the time this document was published.

For an up-to-date list of the latest operating systems supported on the server module, see the following web site:

(<http://www.oracle.com/goto/netrax6270m2>)

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# Supported Operating Systems

The Sun Netra X6270 M2 server module supports the installation and use of the following operating systems, or a subsequent release of the operating system.

**TABLE B-1** Supported Operating Systems

Operating System	Supported Version	Additional Information
Windows	<ul style="list-style-type: none"><li>• Microsoft Windows Server 2008 SP2, Standard Edition (64-bit)</li><li>• Microsoft Windows Server 2008 SP2, Enterprise Edition (64-bit)</li><li>• Microsoft Windows Server 2008 SP2, Datacenter Edition (64-bit)</li><li>• Microsoft Windows Server 2008 R2, Standard Edition (64-bit)</li><li>• Microsoft Windows Server 2008 R2, Enterprise Edition (64-bit)</li><li>• Microsoft Windows Server 2008 R2, Datacenter Edition (64-bit)</li></ul>	<ul style="list-style-type: none"><li>• <a href="#">Chapter 3</a></li></ul>
Linux, Oracle Solaris, Virtual Machine Software	<ul style="list-style-type: none"><li>• Oracle Enterprise Linux (OEL) 5.4 (64-bit)</li><li>• SUSE Linux Enterprise Server (SLES) 10 SP 3 (64-bit)</li><li>• SUSE Linux Enterprise Server (SLES) 11 (64-bit)</li><li>• Red Hat Enterprise Linux Server (RHEL) 5.4 (64-bit)</li><li>• Oracle Solaris 10 10/09</li><li>• Oracle VM 2.2.1</li><li>• VMware ESX and ESXi 4.0 Update 1</li></ul>	<ul style="list-style-type: none"><li>• <i>Sun Netra X6270 M2 Server Module Installation Guide for Linux, Virtual Machine Software, and Oracle Solaris Operating Systems, 821-0940</i></li></ul>

## BIOS Defaults for New Installations

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When installing a new operating system on a disk drive, you should verify that the following BIOS settings are properly configured before you perform the operating system installation:

- System time
- System date
- Boot order

---

## Verification of BIOS Factory Defaults

In the BIOS Setup Utility, you can set optimal defaults, as well as view and edit BIOS settings as needed. Any changes you make in the BIOS Setup Utility (by pressing F2) are permanent until the next time you change them.

In addition to using the F2 key to view or edit the system's BIOS settings, you can use F8 during the BIOS start-up to specify a temporary boot device. If you use F8 to set a temporary boot device, this change is only in effect for the current system boot. The permanent boot device specified through F2 will be in effect after booting from the temporary boot device.

## Before You Begin

Ensure that the following requirements are met prior to accessing the BIOS Setup Utility.

- The server module is equipped with a hard disk drive (HDD) or solid state disk drive (SDD).

- The HDD or SDD is properly installed in the server module. For details, see the *Sun Netra X6270 M2 Server Module Service Manual*, 821-0939.
- A console connection is established to the server module. For details, see [“Console Options for Performing an OS Installation”](#) on page 36.

## ▼ View or Edit BIOS Settings for New Installations

### 1. Reset the power on the server module.

For example:

- **From the ILOM web interface**, select Remote Control --> Remote Power Control tab, then select Reset option from the Select Action list box.
- **From the local server module**, press the Power button on the front panel of the server module to power off the server module, then press the Power button again to power on the server module.
- **From the ILOM CLI**, type: **reset /SYS**
- **From the ILOM CLI on a CMM**, type: **reset /CH/BLn/SYS**

Where *n* is the number of server module in chassis.

### 2. When prompted in the BIOS screen, press F2 to access the BIOS Setup Utility.

After a few moments, the BIOS Setup Utility appears.

### 3. To ensure that the factory defaults are set, do the following:

#### a. Press F9 to automatically load the optimal factory default settings.

A message appears prompting you to continue this operation by selecting OK or to cancel this operation by selecting CANCEL.

#### b. In the message, highlight OK then press Enter.

The BIOS Setup Utility screen appears with the cursor highlighting the first value in the system time field.

### 4. In the BIOS Setup Utility, do the following to edit the values associated with the system time or date.

#### a. Highlight the values you want to change.

Use up or down arrow keys to change between the system time and date selection

#### b. To change the values in the highlighted fields, use these keys:

- PLUS (+) to increment the current value shown
- MINUS (-) to decrement the current value shown
- ENTER to move the cursor to the next value field



**5. To access the boot settings, select the `Boot` menu.**

The Boot Settings menu appears.

**6. In the Boot Settings menu, use the down arrow key to select `Boot Device Priority`, then press `Enter`.**

The Boot Device Priority menu appears listing the order of the known bootable devices. The first device in the list has the highest boot priority.

**7. In the Boot Device Priority menu, do the following to edit the first boot device entry in the list:**

**a. Use the up and down arrow keys to select the first entry in the list, then press `Enter`.**

**b. In the Options menu, use the up and down arrow keys to select the default permanent boot device, then press `Enter`.**

---

**Note** – You can change the boot order for other devices in the list by repeating Steps 7a and 7b for each device entry you want to change.

---

The device strings listed on the Boot Device Priority menu and Options menu are in the format of: *device type, slot indicator, and product ID string*.

**8. To save changes and exit the BIOS Setup Utility, press `F10`.**

Alternatively, you can save the changes and exit the BIOS Setup Utility by selecting `Save` on the `Exit` menu. A message appears prompting you to save changes and exit setup.

In the message dialog, select `OK`, then press `Enter`.

---

**Note** – When using the ILOM Remote Console, `F10` is trapped by the local OS. You must use the `F10` option listed in the Keyboard drop-down menu that is available at the top of the console.

---



## Downloading the ISO Image for the Tools and Drivers DVD

---

Use the download instructions in this appendix if a Tools and Driver DVD was not shipped with your server module or, if you need to verify that the Tools and Drivers DVD shipped with your server module contains the latest tools and firmware for your server module.

---

### ISO Image Download Procedure

Follow the steps in the procedure below to download the ISO image for the Tools and Drivers DVD.

#### ▼ Download the Tools and Drivers DVD Image

1. Go to Oracle's Sun Netra X6270 M2 server module web site and navigate to the Tools and Driver DVD download link:  
<http://www.oracle.com/goto/netrax6270m2>
2. Select and download the ISO image for the Tools and Drivers DVD to an accessible network location or local storage location.
3. Prepare the ISO image for installation by using one of the following methods:
  - Create a Tools and Drivers DVD using third-party software.
  - Use remote KVMS (ILOM Remote Console) to mount the ISO image.



# Incorporating Device Drivers Into Windows Server 2008 WIM Images for Windows Deployment Services

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This section is for advanced system administrators who need to incorporate Windows Server 2008 (SP2 or R2) device drivers into Windows Imaging Format (WIM) files.

This appendix assumes that the system administrator is using Microsoft's Windows Deployment Services (WDS) to deploy the installation of Windows Server 2008 (SP2 or R2) over a network.

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**Note** – This appendix is not intended as a tutorial for WDS or Microsoft's Windows System Imaging Manager (WSIM). For detailed information about WDS or WSIM, refer to Microsoft's WDS and WSIM documentation.

---

Topics in this section include:

- "Getting Started" on page 52
  - "Location of Device Drivers on Tools and Drivers DVD" on page 52
  - "Which Device Drivers to Incorporate Into WIM Image(s)" on page 53
  - "Prerequisites and Task Overview" on page 54
- "Procedures for Incorporating Drivers Into WIM Image(s)" on page 57
  - "Create an ImageUnattend.xml Setup Script – Windows Server 2008 (SP2 or R2)" on page 57
  - "Add Device Driver(s) to Boot WIM – Windows Server 2008 SP2 Only" on page 62
  - "Map ImageUnattend.xml Setup Script to Windows Server 2008 (SP2 or R2) Install Image" on page 65

---

# Getting Started

Topics included in this section include:

- “Location of Device Drivers on Tools and Drivers DVD” on page 52
- “Which Device Drivers to Incorporate Into WIM Image(s)” on page 53
- “Prerequisites and Task Overview” on page 54

## Location of Device Drivers on Tools and Drivers DVD

TABLE E-1 identifies the location of the device driver directories on the Tools and Drivers DVD.

---

**Note** – If you do not have a copy of the Tools and Drivers DVD, you can download the ISO image for the Tools and Driver DVD. For details, see [Appendix D](#)

---

**TABLE E-1** Device Driver Directory Location on Tools and Drivers DVD

Device Drivers	Directory Location on Tools and Driver DVD
Intel Network Driver	<ul style="list-style-type: none"><li>• For Windows 2008 R2: windows\W2K8R2\drivers\NIC\intel</li><li>• For Windows 2008 SP2: windows\w2K8\drivers\NIC\intel</li></ul>
Aspeed Driver	<ul style="list-style-type: none"><li>• For Windows 2008 R2: windows\W2K8R2\drivers\display\aspeed</li><li>• For Windows 2008 SP2: windows\w2K8\drivers\display\aspeed</li></ul>

**TABLE E-1** Device Driver Directory Location on Tools and Drivers DVD (*Continued*)

Device Drivers	Directory Location on Tools and Driver DVD
LSI MegRAID Driver: <ul style="list-style-type: none"><li>• Sun Storage 6 Gb SAS RAID HBA, SG-SAS6-R-REM-Z</li><li>• Sun Storage 6 Gb SAS RAID HBA, SGX-SAS6-R-REM-Z</li><li>• Sun Storage 6 Gb SAS RAID HBA, SG-SAS6-R-EM-Z</li></ul>	<ul style="list-style-type: none"><li>• windows/w2k8/drivers/64bit/hba/lsi/megaraid</li></ul>
LSI MPT2 Driver: <ul style="list-style-type: none"><li>• Sun Storage 6 Gb SAS HBA, SG-SAS6-REM-Z</li><li>• Sun Storage 6 Gb SAS HBA, SGX-SAS6-REM-Z</li><li>• Sun Storage 6 Gb SAS HBA, SG-SAS6-EM-Z</li></ul>	<ul style="list-style-type: none"><li>• windows/w2k8/drivers/64bit/hba/lsi/mpt2</li></ul>
Intel ICH10 Controller	<ul style="list-style-type: none"><li>• For Windows 2008 R2: windows\W2K8R2\drivers\64bit\HBA\intel</li><li>• For Windows 2008 SP2: windows\w2K8\drivers\64bit\HBA\intel</li></ul>

## Which Device Drivers to Incorporate Into WIM Image(s)

**TABLE E-2** identifies the device drivers to incorporate in the Windows Server 2008 (SP2 or R2) WIM image(s). Note, the `boot` WIM image identified in the table is only required for Windows Server 2008 SP2 installations, and the `install` WIM image identified in the table is required for both Windows Server 2008 SP2 and Windows Server 2008 R2 installations.

Some of the SAS PCIe HBA option cards listed in [TABLE E-2](#) might not be available for purchase at the time of this publication. To determine which SAS PCIe HBA option cards are supported and available for purchase on the server module, go to the following web site and navigate to the appropriate page:  
<http://www.oracle.com/goto/netrax6270m2>.

**TABLE E-2** Device Drivers to Add to WIM Image(s)

<b>Device Drivers to Incorporate</b>	<b>Windows Server 2008 (SP2 and R2) Add to install.wim</b>	<b>Windows Server 2008 SP2 Only Add to boot.wim</b>
Intel Network Drivers	X	X
Aspeed Graphic Driver	X	
SAS HBA option installed on server module: <ul style="list-style-type: none"> <li>• Sun Storage 6 Gb SAS RAID HBA, SG-SAS6-R-REM-Z</li> <li>• Sun Storage 6 Gb SAS RAID HBA, SGX-SAS6-R-REM-Z</li> <li>• Sun Storage 6 Gb SAS RAID HBA, SG-SAS6-R-EM-Z</li> <li>• Sun Storage 6 Gb SAS HBA, SG-SAS6-REM-Z</li> <li>• Sun Storage 6 Gb SAS HBA, SGX-SAS6-REM-Z</li> <li>• Sun Storage 6 Gb SAS HBA, SG-SAS6-EM-Z</li> </ul>	X	X
Intel ICH10 Controller	X	

## Prerequisites and Task Overview

Prior to creating the device driver WIM image(s) for Windows Server 2008 (SP2 or R2), ensure that the following tasks are completed in the order specified.

1. Install and configure the Windows Deployment Services on a server in your network. For details, you can download *Microsoft's Windows Deployment Services Step-by-Step Guide* at:

<http://www.microsoft.com/downloads/details.aspx?familyid=14CA18B1-B433-4F62-8586-B0A2096460EB&displaylang=en>.

2. Install the Windows Automated Installation Kit (WAIK). The WAIK contains applications to mount and modify WIM images as well as applications to create and modify XML unattended setup scripts.



Microsoft provides separate WAIK downloads for Windows Server 2008 SP2 and Windows Server 2008 R2. The URLs for these downloads are as follows:

- Windows Server 2008 SP2 at:  
(<http://www.microsoft.com/downloads/details.aspx?displaylang=en&FamilyID=94bb6e34?d890?4932?81a5?5b50c657de08>)
- Windows Server 2008 R2 at:  
(<http://www.microsoft.com/downloads/details.aspx?displaylang=en&FamilyID=696dd665?9f76?4177?a811?39c26d3b3b34>)

3. Locate the Windows device drivers on the Tools and Driver DVD. For information about where the device drivers on the Tools and Drivers DVD are located, see [“Location of Device Drivers on Tools and Drivers DVD”](#) on page 52.
4. Establish a network-shared device driver repository. For example:

- Create a device driver repository containing the Windows Server 2008 (SP2 or R2) device drivers.

Note that for Windows Server 2008 WDS installation environments, a device driver repository is provided, which you can modify. For Windows Server 2003 SP2 WDS installation environments, a device driver repository is not provided and you must manually create one. The following is an example of how you might want to set up the directory structure for a new device driver repository:

```
C:\unattend\drivers\{w2k8|w2k8R2}\catalogs\vendor\version
```

*Where:*

- unattend is the unattend device driver store
  - drivers is the name for device driver directory
  - {w2k8 or w2k8R2} is the name for Windows Server 2008 (SP2 or R2) device drivers directory
  - catalogs is the name for Windows Server 2008 (SP2 or R2) catalog files
  - vendor is the name of directory for device driver vendor
  - version is the name of directory for device driver version
- Ensure that the directories (folders) in the device driver repository are shared and accessible to the Windows Deployment Services (WDS) during the network installation.

For example, the device driver repository network shares referenced in this appendix are setup as follows:

Repository Folder	Network Shares
C:\Unattended\Drivers\W2K8	\\wds-server\W2K8-Drivers
C:\Unattended\Drivers\W2K8R2	\\wds-server\W2K8R2-Drivers

- Extract the Windows Server 2008 device drivers on the Tools and Drivers DVD and place them into the device driver repository.

For details about where the Windows Server 2008 device drivers are located on the Tools and Driver DVD, see [“Location of Device Drivers on Tools and Drivers DVD”](#) on page 52.

If you do not have a copy of the Tools and Drivers DVD, you can download the ISO image for the Tools and Driver DVD. For details, see [Appendix D](#).

The following example demonstrates the directory structure of the device driver repository after copying a SAS HBA driver (example version number: 1.19.2.64) from the Tools and Drivers DVD to the device driver repository:

Operating System	Tools and Driver DVD	Device Driver Repository
Windows Server 2008 SP2	DVDDevice:\windows\ W2K8\drivers\64bit\ hba\lsi\mpt2	C:\unattend\drivers\ W2K8\lsi\1.19.2.64
Windows Server 2008 R2	DVDDevice:\windows\ W2K8R2\drivers\64bit\ hba\lsi\mpt2	C:\unattend\drivers\ W2K8R2\lsi\1.19.2.64

5. Create an `imageunattend.xml` Setup Script for Windows Server 2008 (SP2 or R2). For details, see [“Create an ImageUnattend.xml Setup Script – Windows Server 2008 \(SP2 or R2\)”](#) on page 57.
6. For Windows Server 2008 SP2 (only) installations, add the required boot device drivers described in [TABLE E-2](#) to `boot.wim`. For details about adding the device drivers to the `boot.wim`, see [“Add Device Driver\(s\) to Boot WIM – Windows Server 2008 SP2 Only”](#) on page 62.
7. Map the `imageunattend.xml` Setup Script to the Windows Server 2008 image. For details, see [“Map ImageUnattend.xml Setup Script to Windows Server 2008 \(SP2 or R2\) Install Image”](#) on page 65.
8. For Windows Server 2008 SP2 and Windows Server 2008 R2 installations, add the required device drivers described in [TABLE E-2](#) to the `install.wim` image.

---

# Procedures for Incorporating Drivers Into WIM Image(s)

The following procedures presented are guidelines you can use to add device drivers to the WIM image file(s). These procedures should be performed in the order described.

- [“Create an ImageUnattend.xml Setup Script – Windows Server 2008 \(SP2 or R2\)” on page 57](#)
- [“Add Device Driver\(s\) to Boot WIM – Windows Server 2008 SP2 Only” on page 62](#)
- [“Map ImageUnattend.xml Setup Script to Windows Server 2008 \(SP2 or R2\) Install Image” on page 65](#)

## Before you Begin

Prior to performing the procedures in this section, you should ensure that all the prerequisites as described in [“Prerequisites and Task Overview” on page 54](#) have been met.

### ▼ Create an ImageUnattend.xml Setup Script – Windows Server 2008 (SP2 or R2)

Follow these steps to create an ImageUnattend.xml Setup Script for a Windows Server 2008 (SP2 or R2) installation. After the setup script is generated, it will be saved to the device driver repository.

---

**Note** – The ImageUnattend.xml Setup Script (in a later procedure described in this section) will be mapped to a Windows Server 2008 (SP2 or R2) install image. After the setup script is mapped to the install image, the install image will install the specified device drivers during the Windows Server 2008 (SP2 or R2) network installation.

---

- 1. Insert the Windows Server 2008 (SP2 or R2) DVD media into the DVD reader of the system that is hosting the Windows Deployment Services.**

2. **Copy all the Windows Server 2008 (SP2 or R2) catalog files into the Catalogs folder of the device driver repository.**

For example:

```
copy DVDDrive:\source\*.clg C:\Unattend\Drivers\{WSK8|W28R2}\Catalogs
```

3. **Launch the Windows System Manager application and create a new ImageUnattend.xml Setup Script by doing the following:**

- a. **Click** Start-->All Programs -->Microsoft Windows AIK -->Windows System Image Manager.

- b. **In the Answer File pane, right-click and select** New Answer File.

- c. **If a message dialog appears asking to open a new Windows image now, click** No.

4. **Do the following to specify the Windows Server 2008 (SP2 or R2) Catalog file that matches the Windows Server 2008 (SP2 or R2) edition (Standard, Datacenter, or Enterprise) that you are installing:**

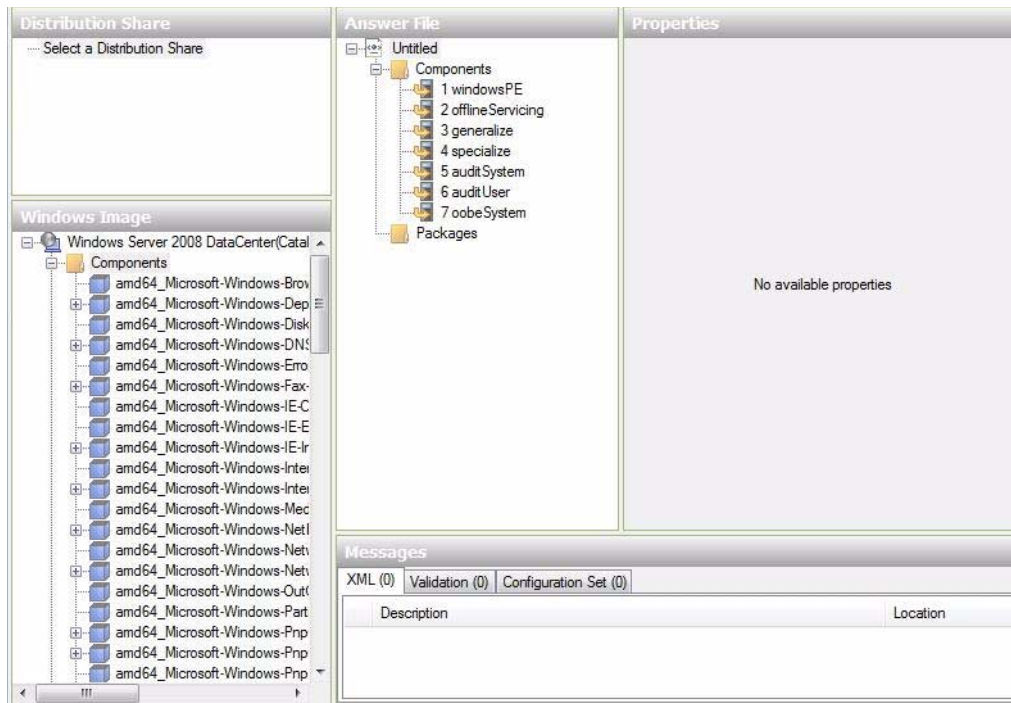
- a. **In the Windows Image pane, right-click and select** Select Windows Image.

- b. **In the Files Type list box, select** Catalog files (\*.clg), **then click** Browse **to specify the Catalogs folder in the device driver repository.**

Ensure that you select the Catalog file that matches the Windows Server 2008 (SP2 or R2) edition you are installing

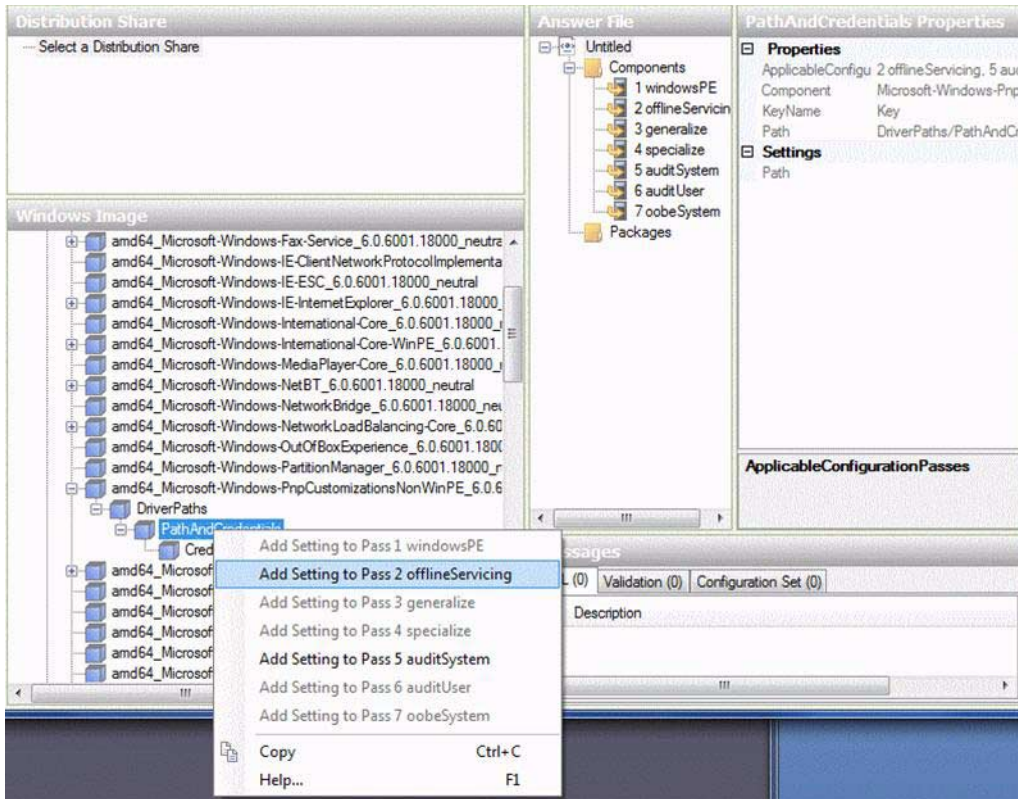
For example, for Windows Server 2008 SP2 Datacenter, select:

```
C:\Unattend\Drivers\{W2K8|W2K8R2}\Catalogs\install_Windows_Server_2008_SERVERDATACENTER.clg
```



5. Do the following to set the component packages to pass 2 offlineServicing.

- a. In the Windows Image pane, click and expand the architecture\_Microsoft-Windows-PnPCustomizationNonWinPE\_version.
- b. Right-click PathAndCredentials and select Add Setting to Pass 2 OfflineServicing.



**6. Repeat Step 5 for each device driver you want installed during the Windows Server 2008 (SP2 or R2) installation.**

Refer to [TABLE E-2](#) for the list of device drivers to include in the `install.wim` file.

**7. Do the following to specify an installation key value.**

**a. In the Answer File pane, click and expand 2 offlineServicing, architecture\_Microsoft-Windows-PnPCustomizationsNonWinPE\_version.**

**b. Click and expand PathAndCredentials and enter a sequence key value as well as the UNC device driver path in the repository.**

For example, to add the device driver for the Sun Storage SAS RAID HBA option, enter:

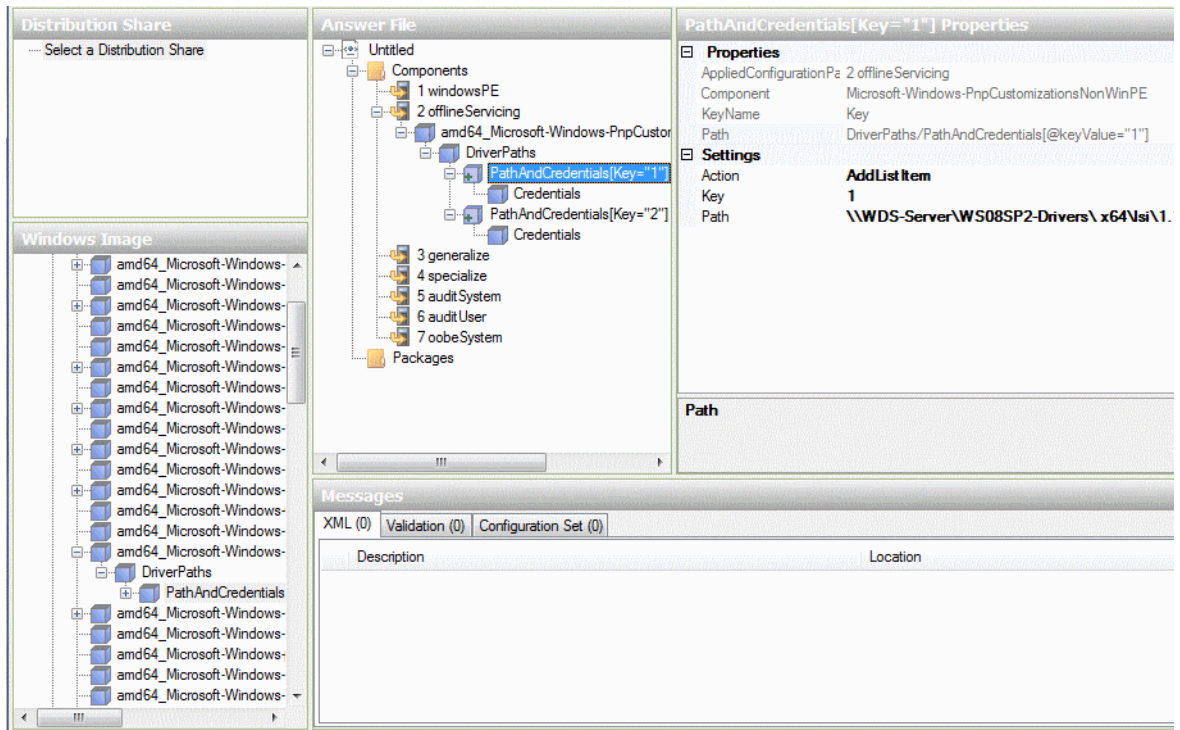
Key 1

Path \\wds-server\W2K8-Drivers\Lsi\1.19.2.64

- c. In the Credential section for each PathAndCredentials component, click and expand the component to insert the UNC domain, logon, and password (if required), which allow access to the device drivers stored in the repository.

For example:

Domain	UNC_domain
Password	UNC_password
Username	UNC_username



- d. Repeat Steps 7a through 7c for each device driver you want installed during the Windows Server 2008 (SP2 or R2) installation.

**8. Validate the ImageUnattend.xml file using the Windows System Image Manager application:**

- In the Windows System Image Manager application, click the **Tools** menu and select **Validate Answer File**.

A message appears in the Message pane indicating that No Warnings or Errors are found.

9. **Save the .xml Setup Script as ImageUnattend.xml using the Windows System Manager application:**
  - a. **In the Windows System Image Manager application, click the File menu and select Save Answer File as.**
  - b. **Save the .xml Setup Script in the device driver repository as:**  
c:\Unattend\Drivers\W2K8\Catalogs\ImageUnattend.xml
  - c. **Exit the Windows System Image Manager application.**
10. **The creation of the ImageUnattend.xml Setup Script is complete. Proceed to one of the following:**
  - For Windows Server 2008 R2 installation, proceed to “[Map ImageUnattend.xml Setup Script to Windows Server 2008 \(SP2 or R2\) Install Image](#)” on page 65.
  - For Windows Server 2008 SP2 installations, proceed to “[Add Device Driver\(s\) to Boot WIM – Windows Server 2008 SP2 Only](#)” on page 62 prior to mapping the ImageUnattend.xml Setup Script to the install.wim image.

## ▼ Add Device Driver(s) to Boot WIM – Windows Server 2008 SP2 Only

---

**Note** – If you are performing a Windows Server 2008 R2 installation, skip this procedure. Device drivers are not required at boot time for Windows Server 2008 R2 installations.

---

For Windows Server 2008 SP2 installations only, perform the following steps to add the appropriate SAS HBA LSI device driver (MegaRAID or MPT2) to the boot.wim image. Note that if the required SAS HBA device driver (as described in [TABLE E-1](#) and [TABLE E-2](#)) is not added to the boot.wim image, the Windows Server 2008 SP2 installation will fail.

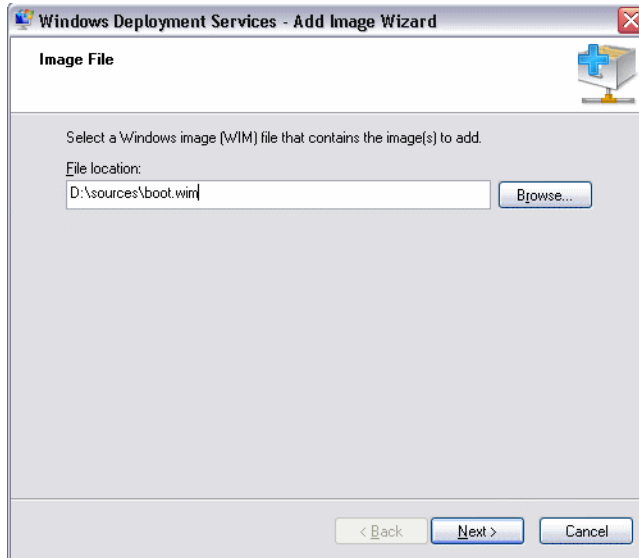
1. **Insert the Windows Server 2008 SP2 DVD media into the DVD reader of the system that is hosting the Windows Deployment Services.**
2. **Perform the following to launch the Windows Deployment Services Administration tool and import the Windows Server 2008 SP2 Boot WIM.**
  - a. **Click Start -->All Programs -->Windows Deployment Services.**



- b. Right-click Boot Images and select Add a Boot Image, then click Browse to specify the Windows Server 2008 SP2 boot WIM file.**

For example: `DVDDrive:\sources\boot.wim`

Click Open then Next.



- 3. To import the Windows Server 2008 SP2 boot image, click Next twice then click Finish.**
- 4. Disable the Windows Server 2008 SP2 boot WIM using the Windows Deployment Services Administration:**
  - Click and expand Boot Images, right-click Microsoft Windows Server (Setup)x64, then select Disable.
- 5. Launch and run the Deployment Tools Command Prompt as Administrator.**

For example:

  - Click Start -->All Programs -->Microsoft Windows AIK, then right-click Deployment Tools Command Prompt, and select Run as Administrator.

```
Administrator: Deployment Tools Command Prompt
Updating path to include dism, osceding, imagex
C:\Program Files\Windows AIK\Tools\PETools\
C:\Program Files\Windows AIK\Tools\PETools\..\AMD64;C:\Program Files\Windows
C:\Program Files\Windows AIK\Tools\PETools\..\AMD64\Serviceing;C:\Program Fil
C:\Program Files\Windows AIK\Tools\PETools>_
```

**6. In the Deployment Tools Command Prompt, perform the following:**

- a. Use **mkdir** command to create a temporary directory mount point to mount the Windows Server 2008 SP2 boot WIM image.

For example:

```
mkdir C:\Mnt
```

- b. Use the **cd** command to change the directory to the folder containing the Windows Server 2008 SP2 boot WIM.

For example:

```
cd DVDDrive:\RemoteInstall\Boot\x64\images
```

- c. Use the **imagex** command to mount the Windows Server 2008 SP2 boot WIM with read/write permissions to the temporary directory mount point.

For example:

```
imagex /mountrw boot.wim 2 C:\Mnt
```

- d. Use the **cd** command to change the directory to the device driver repository containing the Windows Server 2008 SP2 device driver for the Sun Storage 6 Gb SAS RAID HBA option (SG-SAS-R-REM-Z or SG-SAS-R-EM-Z):

For example, to change to the directory containing the LSI device driver for the Sun Storage 6 Gb SAS RAID HBA option (SG-SAS-R-REM-Z or SG-SAS-R-EM-Z), type:

```
cd C:\Unattend\Drivers\W2K8\lsi\1.19.2.64
```

- e. Use the `peimg` command to add the LSI MegaRAID device driver for the Sun Storage 6 Gb SAS RAID HBA option (SG-SAS-R-REM-Z, or SGX-SAS-R-REM-Z, or SG-SAS-R-EM-Z) to the Windows Server 2008 SP2 boot WIM image.

For example, to add the LSI MegaRAID device driver for the Sun Storage 6 Gb SAS RAID HBA option (SG-SAS-R-REM-Z, SGX-SAS-R-REM-Z, or SG-SAS-R-EM-Z), type:

```
peimg /INF=* .inf C:\Mnt\Windows
```

- f. Repeat Steps 7d and 7e for each additional device driver (as described in TABLE E-2) that is required in the boot WIM image:

- Sun Storage 6 Gb SAS HBA option (SG-SAS-REM-Z or SG-SAS-EM-Z).
- Intel Network Driver

- g. Use the `imagex` command to unmount and commit the modified Windows Server 2008 SP2 boot WIM image.

For example:

```
imagex /unmount/commit C:\Mnt
```

7. To enable the Windows Server 2008 SP2 boot WIM image, do the following:

- a. Launch the Windows Deployment Services administration tool.

Click Start-->All Programs-->Windows Deployment Services.

- b. In the Windows Deployment Services (WDS) administration tool, click and expand Boot Images.

- c. Right-click Microsoft Windows Server (Setup) x64 and select Enable.

8. The modifications to include the device drivers into the `boot.wim` image are complete. Exit the Deployment Tools Command Prompt and the WDS administration tool, then proceed to “Map ImageUnattend.xml Setup Script to Windows Server 2008 (SP2 or R2) Install Image” on page 65.

## ▼ Map ImageUnattend.xml Setup Script to Windows Server 2008 (SP2 or R2) Install Image

Follow the steps in this procedure to map the `ImageUnattend.xml` Setup Script (created in an earlier procedure in this section) to the Windows Server 2008 (SP2 or R2) `install.wim`.

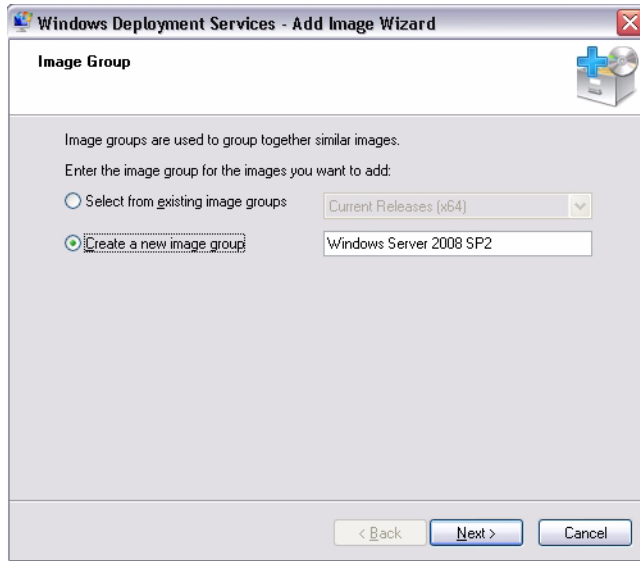
1. Insert the Windows Server 2008 SP2 DVD media into the DVD reader of the system that is hosting the Windows Deployment Services.

**2. Perform the following to launch the Windows Deployment Services administration tool and import the Windows Server 2008 SP2 install WIM.**

**a. Click** Start -->All Programs -->Windows Deployment Services.

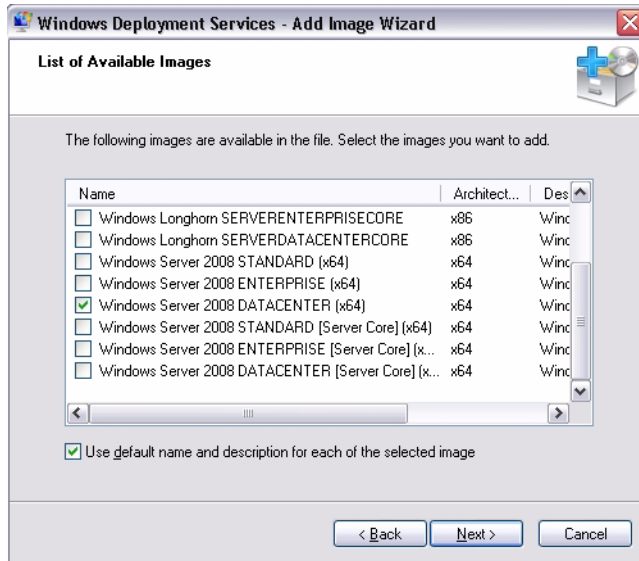
**b. Right-click** Install Images **and select** Add Install Image.

Note that if no image groups exist, create a new image group named Windows Server 2008 SP2 or Windows Server 2008 R2 and click Next.



**c. Click** Browse **to select the Windows Server 2008 SP2 Install WIM image located at:** DVDDrive:\sources\install.wim; **then proceed by clicking** Open **then** Next.

**d. Select the Windows Server 2008 (SP2 or R2) edition (Data Center, Standard, or Enterprise) to import into Windows Deployment Services, then click** Next.



e. To import the specified Windows Server 2008 (SP2 or R2) edition install image, click **Next** twice, then click **Finish**.

### 3. Launch the Deployment Tools Command Prompt as Administrator.

For example:

- Click **Start** --> **All Programs** --> **Microsoft Windows AIK**, then right-click **Deployment Tools Command Prompt**, and select **Run as Administrator**.

### 4. In the Deployment Tools Command Prompt, perform the following:

- a. Use the **cd** command to change the directory to the folder containing the **Windows Server 2008 SP2** install WIM image.

For example, the Windows Server 2008 SP2 Datacenter (x64) edition WIM image would be located at:

```
cd Drive:\RemoteInstall\images\Windows Server 2008 SP2
```

- b. Use the **mkdir** command to create a directory with the exact same spelling and case as the imported Windows Server 2008 (SP2 or R2) WIM image.

```
mkdir install
```

---

**Note** – Selecting the defaults when importing the install image for Windows Server 2008 (SP2 or R2) will create an installation WIM file called `install.wim`.

---

- c. Use the `cd` command to change the directory to the imported Windows Server 2008 (SP2 or R2) folder, then use the `mkdir` command to create an Unattend directory.

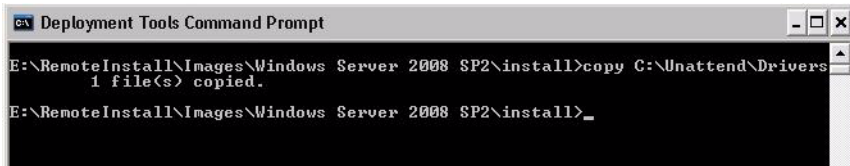
For example:

```
cd install
mkdir Unattend
```

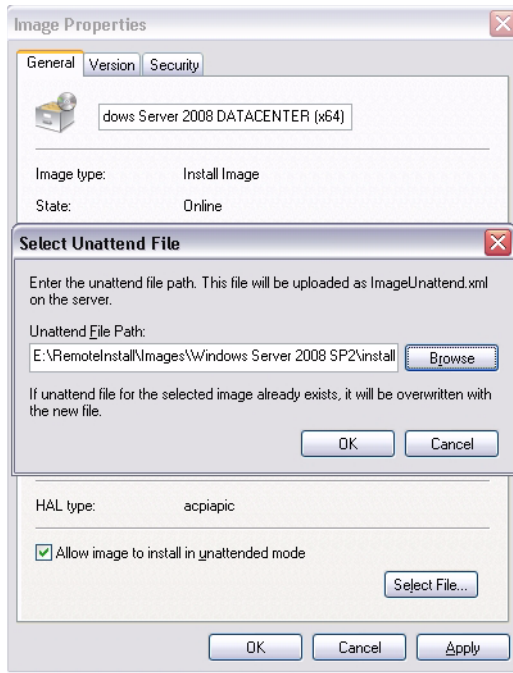
- d. Use the `cd` command to change the directory to the `unattend` directory, then use the `copy` command to copy the `ImageUnattend.xml` Setup Script (created in an earlier procedure in this appendix) to the Unattend directory.

For example:

```
cd Unattend
copy C:\Unattend\Drivers\{W2K8|W2k8R2}\Catalogs\
ImageUnattend.xml
```



5. Perform the following steps to open the Windows Server 2008 (SP2 or R2) image properties:
  - a. Launch the Windows Deployment Services administration tool.  
Click Start-->All Programs-->Windows Deployment Services.
  - b. In the Windows Deployment Services (WDS) Administration tool, click and expand the Windows Server 2008 (SP2 or R2) image group.
  - c. Right-click Microsoft Windows Server (SP2 or R2) and select Properties.
6. Perform the following steps to map the `ImageUnattend.xml` Setup Script to the Windows Server 2008 (SP2 or R2) image:
  - a. In the General Tab of the Windows Server 2008 (SP2 or R2) image properties, check Allow image to install in unattended mode and click Select File.
  - b. Browse to the following location (specified in Step 4d) then click OK.  
Drive:\RemoteInstall\images\{W2K8|W2K8R2}\install\Unattend\ImageUnattend.xml



**c. Click OK to map the ImageUnattend.xml Setup Script to the Windows Server 2008 (SP2 or R2) WIM image.**

The Windows Server 2008 (SP2 or R2) WIM image is ready to be installed via Windows Deployment Services.

**d. Exit the Deployment Tools Command Prompt and the Windows Deployment Services Administration tool.**

**7. To deploy the Windows Server 2008 (SP2 or R2), refer to the following procedure:**

[“Install Windows Server 2008 \(SP2 or R2\) Using PXE”](#) on page 25.





## Identifying Network Interfaces in Windows

---

This section includes information that can assist you when configuring Windows network settings. Specifically, it provides information for identifying Windows OS network interface settings for Oracle's Sun Netra X6270 M2 server module.

---

### Procedures for Identifying Network Interfaces

The following procedures describe how to:

- Determine which network ports are actively connected to a network. For details, see [“Determine Active Network Data Ports”](#) on page 71.
- Confirm the MAC addresses for the physical network ports and match them to the Windows friendly device names. For details, see [“Confirm Physical Port MAC Addresses and Match Them to Windows Device Names”](#) on page 72.

#### ▼ Determine Active Network Data Ports

You can determine which network data ports are actively connected to a network by using Microsoft's Network Connections folder. To access the Network Connections folder, follow this step:

- **Click** Start-->Settings-->Control Panel-->Network Connections

The Network Connections folder appears identifying the actively connected data ports.

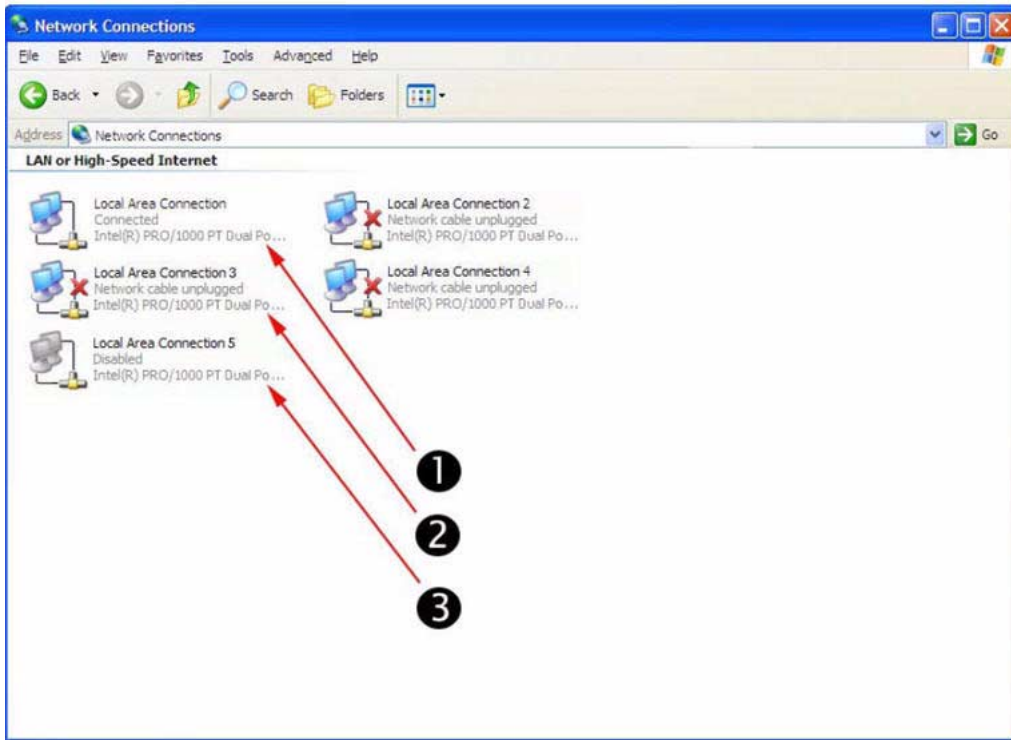


Figure Item Number	Description
1	An active port connection.
2	A red X marks the port connections that are currently inactive.
3	The port has been manually disabled (right-click to re-enable).

## ▼ Confirm Physical Port MAC Addresses and Match Them to Windows Device Names

To confirm the MAC addresses of installed network interface ports and to match them to the Windows Device Friendly Names, you need to open a command prompt and run `ipconfig /all`, as described below:

1. Click --> Start --> Run.  
The Run dialog appears.

2. In the Run dialog, type `cmd` then click `OK`.

The `cmd.exe` DOS window appears.

3. In the `cmd.exe` DOS window, enter the following command at the prompt:  
**`ipconfig /all`**

The output from the `ipconfig /all` command identifies the installed network interface ports by the connection name in the order of enumeration.

The output does not necessarily follow an alpha or numeric order. You can customize the connection name in the Network Connections folder. For details, see Microsoft's documentation. The output below illustrates how the Windows operating system, by default, assigns logical names to network interfaces.

```

C:\>ipconfig /all

Windows IP Configuration

Host Name . . . . . : SUN-9CB9SVR09H6
Primary Dns Suffix . . . . . :
Node Type . . . . . : Unknown
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : East.sun.com

① → Ethernet adapter Local Area Connection 2:

Media State . . . . . : Media disconnected
Description . . . . . : Intel(R) PRO/1000 FT Dual Port Network Connection #2
Physical Address. . . . . : 00-14-4F-9C-30-3F

② → Ethernet adapter Local Area Connection:

Connection-specific DNS Suffix . . : East.sun.com
Description . . . . . : Intel(R) PRO/1000 FT Dual Port Network Connection
Physical Address. . . . . : 00-14-4F-9C-30-3E
DHCP Enabled. . . . . : No
IP Address. . . . . : 10.8.143.181
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 10.8.143.254
DNS Servers . . . . . : 129.148.9.49
                          129.148.13.40

Ethernet adapter Local Area Connection 3:

Media State . . . . . : Media disconnected
Description . . . . . : Intel(R) PRO/1000 FT Dual Port Network Connection #5
Physical Address. . . . . : 00-03-00-C4-FC-E2

Ethernet adapter Local Area Connection 4:

Media State . . . . . : Media disconnected
Description . . . . . : Intel(R) PRO/1000 FT Dual Port Network Connection #6
Physical Address. . . . . : 00-03-00-C4-FC-E3

C:\>

```

Figure Item Number	Description
1	Second Ethernet adapter port.
2	First Ethernet adapter port.

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