



# SAN Install for Windows Server 2008 Server

Release XgBoot 2.9.7 and Host Driver Version 2.7.4 and Later

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Part number: 650-20078-02 Rev A  
Published: Oct 2012

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#### EMI Statement, United States of America (Class A)

“NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.”

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Danger of explosion if the lithium battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

#### Laser Caution for I/O Cards (CDRH-US)

USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

Complies with 21 CFR Chapter 1, Subchapter J, Part 1040.10.

IEC 60825-1: 1993, A1: 1997, A2: 2001; IEC 60825-2: 2000



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## Replacement Laser Transceiver Modules

For continued compliance with the above laser safety Standards, only approved Class 1 modules from our approved vendors should be installed in the product. Contact Xsigo Customer Support (see [Technical Support Contact Information](#)) for approved-vendor contact information.

## Power Cord Set Requirements – General

The requirements listed below are applicable to all countries:

The length of the power cord set must be at least 6.00 feet (1.8 m) and a maximum of 9.75 feet (3.0 m).

All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country where the power cord set will be used.

The power cord set must have a minimum current capacity of 13A and a nominal voltage rating of 125 or 250 V ac~, as required by each country's power system.

The appliance coupler on the power cord must meet the mechanical configuration of an EN 60320 / IEC 60320 Standard Sheet C20 connector, which is the connector on the Fabric Director. The C20 connector supports a C19 plug as the mating part on the power cord that connects to the Fabric Director.

## Power Cord Set Requirements – Specifics By Country

### United States (UL), Canada (CSA)

The flexible power cord set must be UL Listed and CSA Certified, minimum Type SVT or equivalent, minimum No. 18 AWG, with 3-conductors that includes a ground conductor. The wall plug must be a three-pin grounding type, such as a NEMA Type 5-15P (rated 15A, 120V) or Type 6-15P (rated 15A, 250V).

Europe (Austria (OVE), Belgium (CEBEC), Denmark (DEMKO), Finland (SETI), France (UTE), Germany (VDE), Italy (IMQ), Netherlands (KEMA), Norway (NEMKO), Sweden (SEMKO), Switzerland (SEV), U.K. (BSI/ASTA)

The flexible power cord set must be <HAR> Type H03VV-F, 3-conductor, minimum 0.75mm<sup>2</sup> conductor size. Power cord set fittings, particularly the wall plug, must bear the certification mark of the agency responsible for evaluation in the country where it is being used, with examples listed above.

### Australia (DFT/SAA)

Cord is as described under “Japan (PSE)” immediately below. Pins in the power plug must be with the sheathed, insulated type, in accordance with AS/NZS 3112:2000.

### Japan (PSE)

The appliance coupler, flexible cord, and wall plug must bear a “PSE” Mark in accordance with the Japanese Denan Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 0.75 mm<sup>2</sup> conductor size. The wall plug must be a grounding type with a Japanese Industrial Standard C8303 (15A, 125V) configuration.

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## Documentation Purpose and Audience

This guide provides the basic information that you need to use install Windows Server 2008 SP2 and later OS on a SAN LUN where it can be used by one or more host servers for boot up. Depositing the OS on the SAN LUN can occur either by using a remastered OS DVD and installing it onto the LUN, or through Windows Deployment Services (WDS) to contain the `install.wim` for the OS, and install the OS on the SAN LUN.

This guide is intended for data center network administrators, and it assumes that its readers have knowledge and familiarity with common configuration and management tasks related to administering Windows Sever 2008 SP2 and later with WDS. Although this guide does present some conceptual material about topics and technologies, it is not intended as a complete and exhaustive reference on those topics.

## Document Overview

This guide is divided into the following sections:

- [Overview](#) — Provides a basic example of an environment in which hosts running Xsigo virtual I/O can be updated through SCCM.
- [SAN Installing from Remastered DVD](#) — Documents the procedure for injecting the Xsigo Windows host drivers into a remastered DVD and using that DVD to deposit the SAN Boot image on the SAN LUN.
- [SAN Installing Through WDS](#) — Documents the procedure for creating Xsigo host drivers as a package in SCCM, then advertising the host driver package from SCCM to host. Also, for environments that are using a Citrix PVS deployment solution, this chapter documents the procedure for configuring SCCM and Xsigo host drivers to support the PVS environment.

## Related Documentation

This document is part of a set of documentation for the Oracle Fabric Director. [Table 1](#) shows the other documents in the Oracle Fabric Director documentation set.

Table 1 Related Documentation for the Xsigo Systems Fabric Director

Document	Part Number	Revision Level and Date
<i>Fabric Manager User Guide</i>	650-30005-02	Rev A 10/2012
<i>Fabric Director Quick Install Guide</i>	650-20022-04	Rev A 10/2012
<i>Fabric Director Hardware and Drivers Installation Guide</i>	650-30008-03	Rev A 10/2012
<i>Fabric Accelerator Quick Start Guide</i>	650-20085-03	Rev A 10/2012
<i>Fabric Performance Manager User Guide</i>	650-20082-02	Rev A 10/2012
<i>XgOS Software Upgrade Guide</i>	650-20028-06	Rev A 10/2012
<i>XgOS Remote Booting Guide</i>	650-20029-08	Rev A 10/2012
<i>XgOS Command-Line Interface User Guide</i>	650-30007-03	Rev A 10/2012



Table 1 Related Documentation for the Xsigo Systems Fabric Director

Document	Part Number	Revision Level and Date
<i>XgOS vNIC Switching Configuration Guide</i>	650-20052-02	Rev A 10/2012
<i>Installing Host Drivers on Windows 2008 Servers</i>	650-20081-02	Rev A 10/2012
<i>SAN Install for Windows 2008 Servers</i>	650-20078-03	Rev A 10/2012

Release notes are also available with each major hardware or software release for the Oracle Fabric Director and Xsigo Windows host drivers.

## Revision Trail

Table 2 shows the revision history for this document.

Table 2 Revision History

Document Title	Document Number	Revision Level	Revision Date
<i>SAN Install for Windows Server 2008 R2 Servers</i>	650-20078-03	A	10/2012
<i>SAN Install for Windows Server 2008 R2 Servers</i>	650-20078-02	A	12/2011
<i>SAN Install for Windows Server 2008 R2 Servers</i>	650-20078-01	A	08/2011

## Syntax Usage

Table 3 shows the typographical conventions used in this document.

Table 3 Syntax Usage

Syntax Marker	Means...	Example
bold text, courier font	a command	<b>help</b>
blank space	a delimiter for commands and arguments	<b>system show version</b>
- (dash)	you are specifying an argument	<b>set ethernet-card 1 -type</b>
= (equals sign)	you are specifying a parameters for an argument	<b>set ethernet-card 1 -type=nwEthernet4Port1GbCard</b>



## Technical Support Contact Information

Xsigo customers may contact support via the Xsigo website, telephone or e-mail. In order to expedite troubleshooting, all new support requests must be submitted via the Xsigo self-service portal at: <http://support.xsigo.com>. In addition to opening cases, the Xsigo Support Portal will allow you to update your support cases, download software, search for and view knowledge-base articles, and access technical documentation.

In order to access the customer support portal, you will need to have a Xsigo Support Portal login. Your account team will provide you with the necessary login information to access the support portal. If you need additional logins for your staff, please contact your account team for assistance.

For all Critical (P1) cases, please call the Xsigo support center at **866-974-4647** (toll free) or **1 408-736-3013** (international). Alternatively, you can email [supportP1@xsigo.com](mailto:supportP1@xsigo.com) and you will be responded to within 30 minutes.



## Preface

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<b>Chapter 1</b>	<b>Overview</b> .....	<b>1</b>
	SAN Install of Windows Server 2008 OS .....	2
	SAN Install from Remastered DVD .....	2
	SAN Install through Windows Deployment Service (WDS) .....	3
<b>Chapter 2</b>	<b>SAN Installing from Remastered DVD</b> .....	<b>5</b>
	Overview of Procedure .....	6
	Considerations .....	6
	Installing the OS from the DVD to the SAN LUN .....	7
	Preparing the Installer Medium (Remastering the OS DVD) .....	7
	Preparing the Chassis and the Bootable vHBA .....	10
	Installing the OS from the Remastered DVD to the SAN LUN .....	11
	Using sysprep, Cloning and Imaging of SAN-Installed Systems .....	21
	Installing Xsigo Host Drivers .....	24
	Verifying the Installation .....	29
<b>Chapter 3</b>	<b>SAN Installing Through WDS</b> .....	<b>33</b>
	Overview of Procedure .....	34
	Considerations .....	34
	Installing the OS on the SAN LUN Through WDS .....	35
	Preparing the Installer Medium (Remastering the OS DVD) .....	35
	Preparing the Windows Deployment Service Server .....	38
	Preparing the Chassis, Bootable vHBA, and Bootable PXE vNIC .....	40
	Installing the OS and Xsigo Host Drivers Using the WDS PXE Server .....	41
	Using sysprep, Cloning, and Imaging of SAN-Installed Systems .....	51
	Installing Xsigo Host Drivers .....	54
	Verifying the Installation .....	58
	<b>Index</b> .....	<b>63</b>



## Contents

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This document describes the procedure of installing a Windows Server 2008 R2, R2 SP1, or SP2 and later OS onto a SAN LUN. After the OS installed, a diskless server can be SAN Booted. Any AMD64 or x86 architecture server running these versions of the Windows OS are supported.

When this documentation mentions Windows Server 2008, be aware that Windows Server 2008 R2, R2 SP1, and Windows Server 2008 SP2 and later are also supported.

This chapter contains the following sections:

- [SAN Install from Remastered DVD](#)
- [SAN Install through Windows Deployment Service \(WDS\)](#)

## SAN Install of Windows Server 2008 OS

Diskless servers have no internal hard disk to contain the OS and other files required to boot up to runtime. They also have no hard disk to use as a boot device. To solve this problem, you can use a SAN LUN as a proxy for the server's hard disk, and use a Xsigo vHBA to connect to the SAN LUN. A special procedure is required to place on the SAN LUN all the information a diskless server needs to boot up. Placing all required information on the SAN LUN is called SAN Install.

To perform a SAN install, you will use an OS, a vHBA, and a SAN LUN. The OS is the standard Windows Server 2008 OS DVD, which has been modified by adding the Xsigo host drivers to it. When this OS is installed on a LUN in your fibre channel SAN, you use a Xsigo vHBA to connect the diskless server to the LUN where its boot information resides. The SAN LUN takes the place of the server's internal hard drive (which is not present on a diskless server) as the location for holding the OS and presenting a boot device when each Windows Server 2008 server boots.

You can install an OS on a SAN LUN by using either of the following methods:

- [SAN Install from Remastered DVD](#)
- [SAN Install through Windows Deployment Service \(WDS\)](#)



Note

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SAN Install is supported for Windows Server 2008 R2, R2 SP1, and SP2 and later.

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### SAN Install from Remastered DVD

When SAN installing the modified OS from DVD, you will create a remastered DVD (by injecting the Xsigo host drivers), then copy that remastered DVD to a LUN in the SAN. After the modified OS is installed on the SAN, you do not need the remastered DVD. Instead, you will bring up the host server by allowing it to connect to the OS available through the vHBA.

Figure 1 shows a basic configuration for performing a SAN Install from boot DVD.

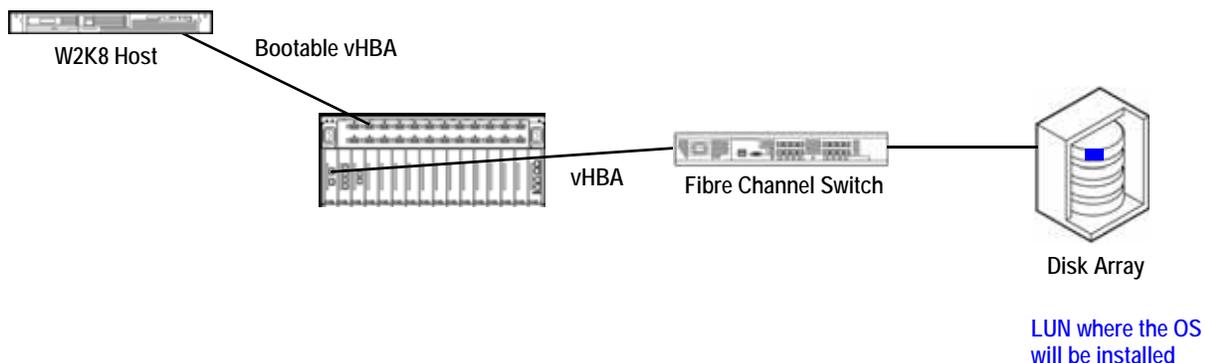


Figure 1 Example Environment

In this example, the Windows 2008 host is a diskless server that is connected to a SAN LUN through a Xsigo vHBA. The vHBA is configured as a bootable vHBA, and the XG Boot and DVD have been set to the first and second boot devices respectively in the server's BIOS boot devices list. When the server boots, the vHBA is recognized as a bootable device.

The Xsigo installer (setup.exe) runs automatically to install the host drivers. As part of the installing the host drivers, you select the OS you want to install and select the LUN attached to the vHBA as a location to install the OS. When you complete the Xsigo installer, the OS is pushed over the vHBA to the SAN LUN. By keeping the XGBoot utility as the first device in the server's BIOS boot devices list, whenever that server boots up, it will use the OS available through the vHBA (the OS on the LUN).

For additional servers, you can sysprep the first W2K8 host, clone the modified OS on the LUN, copy the modified OS to a different LUN, and connect the host to the OS through another bootable vHBA. To support multiple servers, you are essentially recreating the single-server environment multiple times. See [Figure 2](#).

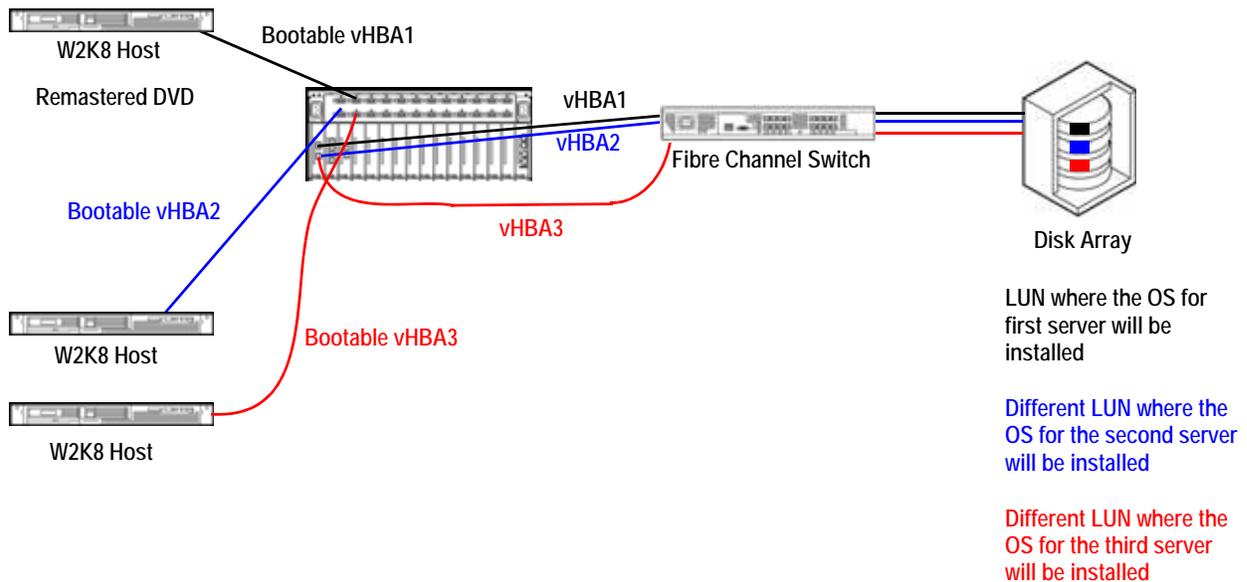


Figure 2 Example of Multiple Servers Connected for SAN Install

For additional information about SAN Installing the Windows Server 2008 OS from a modified (remastered) DVD, see [Chapter 2, "SAN Installing from Remastered DVD."](#)

## SAN Install through Windows Deployment Service (WDS)

When SAN installing the OS from the WDS server, you will create a remastered DVD on a host server by injecting the Xsigo host drivers, copy the `install.wim` from the remastered DVD to the WDS server, then install the OS to the SAN LUN. A bootable vNIC is required to connect the host server(s) to the WDS server, and a bootable vHBA is required to install the OS on the SAN LUN where the OS will be saved. After the OS is installed on the SAN, you will bring up the host server by allowing it to connect to the OS available through the vHBA.

[Figure 1](#) on page 2 shows a basic configuration for performing a SAN Install from through a WDS server.

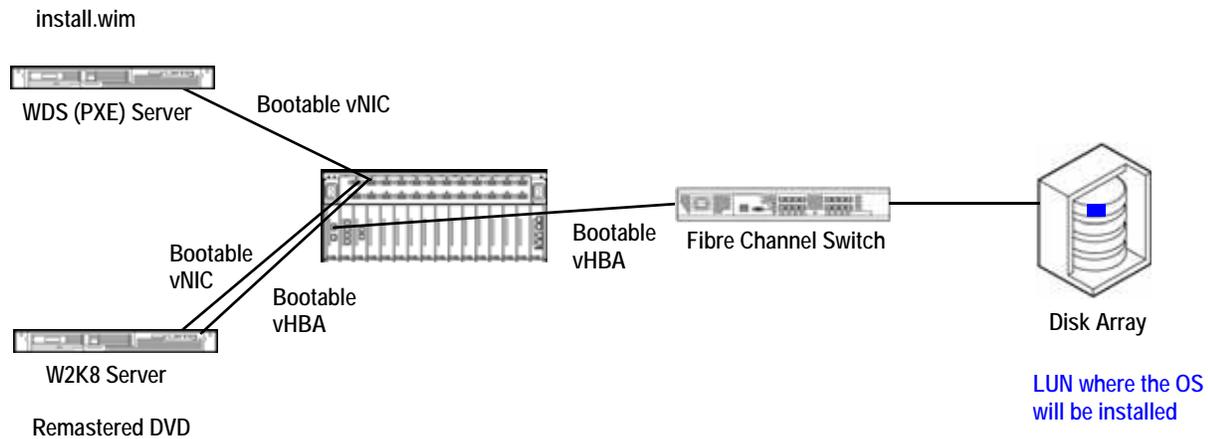


Figure 3 Example of SAN Install in WDS Environment

In this example, the Windows 2008 host is a diskless server that is connected to a SAN LUN through a Xsigo vHBA. The host is also connected to the WDS server through a bootable PXE vNIC. The vHBA is configured as a bootable vHBA, and the XG Boot has been set to the first boot device in the server's BIOS boot devices list. When the server boots up it attempts use the vHBA and vNIC to boot. The vHBA is attempted first, but with no OS available through the vHBA (the OS has not yet been installed on the vHBA's LUN), this attempt fails. The server then progresses to the vNIC, which is used to contact the WDS server. The host gets the boot image from the WDS server and boots into the PXE environment. As part of the PXE environment, you select the OS you want to install, and select the LUN where the OS will be installed. When the PXE environment's requirements are met, the server reboots. After this reboot, the host is now connected to the OS on the SAN LUN. At this point you can optionally sysprep the host server. Regardless of whether you sysprep the server or not, you will need to install the Xsigo host drivers in SAN Install mode.

For additional servers, you can sysprep the first W2K8 host, clone the LUN, and connect the host to the OS on the SAN LUN through a bootable vHBA. You do not need to connect any additional servers to the WDS server. The WDS server is typically used only once to get the `install.wim` (OS) onto the LUN. To support multiple servers, you are essentially recreating the single-server environment multiple times.

For information about how to SAN Install the Windows Server 2008 OS through WDS, see [Chapter 3, "SAN Installing Through WDS."](#)

This chapter documents using a single host in the network to create the golden boot image from the Windows Server 2008 distribution medium (DVD) that Microsoft provides, then installing that golden image to the SAN. After the image is installed on the SAN, the image can be cloned and used to boot multiple additional servers with the same configuration.



Note

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Where this document mentions Windows Server 2008, be aware that Windows Server 2008 SP2, R2, and R2 SP1 are supported.

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Using a DVD to install the Windows Server 2008 operating system (OS) to a SAN LUN is useful in smaller environment (fewer Windows Server 2008 hosts), or in environments that do not have a Windows Deployment Service (WDS). For information about using WDS, see [Chapter 3, “SAN Installing Through WDS.”](#)

This chapter contains the following topics:

- [Overview of Procedure](#)
- [Considerations](#)
- [Preparing the Installer Medium \(Remastering the OS DVD\)](#)
- [Preparing the Chassis and the Bootable vHBA](#)
- [Installing the OS from the Remastered DVD to the SAN LUN](#)
- [Using sysprep, Cloning and Imaging of SAN-Installed Systems](#) (Optional procedure)
- [Verifying the Installation](#)

## Overview of Procedure

To SAN install the OS, you will need a distribution medium (DVD) of Windows Server 2008, the Xsigo host drivers, a bootable vHBA, and some standard Windows tools.

An illustration of what you will be doing is in [Chapter 1, “Overview.”](#) You might find it helpful to review that illustration before attempting this procedure.

SAN installing the OS has the following general stages:

1. [Preparing the Installer Medium \(Remastering the OS DVD\)](#), which consists of copying the Xsigo drivers into the `install.wim` and `boot.wim` of the Windows Server 2008 DVD provided by Microsoft.
2. [Preparing the Chassis and the Bootable vHBA](#), which consists of creating a server profile and a bootable vHBA which will provide connection to the LUN where the server’s OS will be located after you install it to the LUN.
3. [Installing the OS from the Remastered DVD to the SAN LUN](#), which is done from the installer medium that contains the Xsigo host drivers.
4. [Using sysprep, Cloning and Imaging of SAN-Installed Systems](#), which is an optional procedure that consists of returning the host which was used for preparing the installer medium to a “vanilla” configuration, and creating one OS in the SAN for each server that will be booting.
5. [Installing Xsigo Host Drivers](#) by running `setup.exe` in SAN Install mode. This part of the procedure upgrades the Xsigo host drivers to the full Xsigo host driver package.
6. [Verifying the Installation](#), which consists of checking the installed versions of Xsigo software.

## Considerations

To SAN Install the Windows Server 2008 OS on a SAN LUN, be aware of the following considerations:

- The version of Windows host drivers that are supported for this procedure are:
  - 2.7.4
  - 2.7.4-PVS
  - 3.0.0 and later
- The OSes supported for this procedure are:
  - Windows Server 2008 R2 only, for 2.7.4 or 2.7.4-PVS host drivers
  - Windows Server 2008 SP2 and later for 3.0.0 host drivers
- You will use the `SysPrepBeforeShutdownXsigoScript.vbs` tool, which is a visual basic script that must be manually run after sysprep is run, but before the server is shut down. This script cleans the hardware registry and prevents any stale entries from causing problems when the server reboots.



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When setting up sysprep, make sure to specify that it quits (not restarts the server) when it completes. By doing so, you allow the `SysPrepBeforeShutdownXsigoScript.vbs` tool to run at the correct time.

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- You will need full admin rights on the Windows host where the image will be prepared.

- Make sure the folders have the correct packages and all files are unblocked by windows security. Files must be unblocked by Windows security or else they will not install.
- SAN install through DVD is supported for ConnectX and ConnectX-2 HCAs (dual-port only).
- The server's ConnectX or ConnectX-2 HCAs must have Xsigo Option ROM version 2.8.7 or later, and HCA firmware version 2.7.0 or later.
- For PVS deployments, the server's ConnectX or ConnectX-2 HCAs must have Xsigo Option ROM version 2.8.9 or later, and HCA firmware version 2.7.0 or later.
- The OS that you will be installing will be somewhat large. Allocate a 50 GB LUN to allow sufficient space for the OS.

## Installing the OS from the DVD to the SAN LUN

This section documents the procedure for creating the remastered DVD from the Windows DVD, and depositing the OS on the SAN LUN. The remastered DVD is the regular Windows OS DVD with the Xsigo host drivers injected.

### Preparing the Installer Medium (Remastering the OS DVD)

When you prepare the installer medium, you are extracting the standard Windows Server 2008 OS provided by Microsoft, injecting the Xsigo host drivers into the OS, then repackaging the DVD with the Xsigo host drivers included. Finally, you will complete this part of the procedure by creating an ISO of the remastered DVD. Preparing the installer medium is called “remastering a DVD” in other Xsigo documentation.

To prepare the installer medium, you will use the following tools:

- WAIK
- The Windows Server 2008 installation DVD that accompanied your servers.
- Xsigo host drivers version 2.7.4 and later.
- For 3.0.0 host drivers, you will need the `XsigoPkgAddToW2k8_Or_W2k8R2_DVDImage.bat` tool, which injects the Xsigo host drivers into the Windows distribution medium. This tool is included in the 3.0.0 Windows host driver package. It should be present when you download and unzip the 3.0.0 host drivers.
- For 2.7.4 or 2.7.4-PVS host drivers, you will need the `XsigoPkgAddToW2k8R2_Image.bat` tool, which injects the Xsigo host drivers into the Windows distribution medium.



Note

For Windows hosts running 2.7.4 or 2.7.4-PVS host drivers, you will need to download the `XsigoPkgAddToW2k8R2_Image.bat` file from the Xsigo FTP site. Connect to <ftp://ftp.xsigo.com/xsigo/software/current/ga/pkgadd/> and log in to obtain the file.

For hosts running a later version of host drivers, this file should be bundled into the Xsigo host driver package. However, you can always check the Xsigo FTP site for this file.

The following example assumes that the medium is a DVD, the OS is Windows Server 2008 R2, and Xsigo Windows host driver version 3.0.0 is being installed. Follow this procedure to prepare the installer medium.

**Step 1** Download the appropriate Windows® Automated Installation Kit (AIK) for Windows® 7:

- For Windows 2008 R2 servers, you will need the AIK with either PE 3.0 or PE 3.1.
- For Windows 2008 non-R2 servers, you will need the AIK with PE 2.1.

## Chapter 2: SAN Installing from Remastered DVD

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You can get the WAIK from the following Microsoft site:

<http://www.microsoft.com/download/en/details.aspx?id=5753>

This step gets the required 3.0 PE package.

- Step 2** As an option for Windows 2008 R2 and R2 SP1 installs, download The Windows Automated Installation Kit (AIK) Supplement for Windows 7 SP1 from the following Microsoft site:

<http://www.microsoft.com/download/en/details.aspx?id=5188>

This step updates the 3.0 PE to 3.1 PE. This step is optional. The procedure can be completed with 3.0 PE.

- Step 3** Install AIK and optionally apply any supplements that are offered. By default, the AIK is installed to C:\Program Files\Windows AIK
- Step 4** Create a temporary folder in C: (for example, C:\temp) which will be the workspace for injecting the host drivers into the Windows 2008 OS DVD.
- Step 5** Create a W2K8-R2S in C:\temp.
- Step 6** Create a 300 folder in C:\temp.  
For earlier host driver versions, such as 2.7.4, you would want to create a 274 folder.
- Step 7** Copy the contents of the W2K8-R2 ISO image located on the DVD into C:\temp\W2k8-R2.
- Step 8** Unzip the `hostdrivers_windows_3.0.0.26_FREE_WHQL.zip` file and copy the contents into C:\temp\300.  
For earlier host driver versions, unzip the appropriate version to the correct folder—for example, you would unzip `hostdrivers_windows_2.7.4_FREE_WHQL.zip` to the C:\temp\274 folder).
- Step 9** If you are using 2.7.4 or 2.7.4-PVS Windows host drivers, log in to the Xsigo FTP site, and download `XsigoPkgAddToW2k8R2_Image.bat` to C:\temp\274\xsigos-2.7.4\xsigo\PEdrivers.



Note

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You need to download the file only if you are performing SAN Install with 2.7.4 or 2.7.4-PVS Xsigo Windows host drivers. For 3.0.0 and later host drivers, the file is bundled with the 3.0.0 host drivers.

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- Step 10** Navigate to the appropriate `PEdrivers` directory for your version of host drivers.
- Step 11** From the `PEdrivers` directory, run the correct tool in the PE drivers folder.
- `XsigoPkgAddToW2k8R2_Image.bat` for 2.7.4 or 2.7.4-PVS host drivers
  - `XsigoPkgAddToW2k8_Or_W2k8R2_DVDImage.bat` for 3.0.0 host drivers

For 3.0.0 host drivers, the batch file has the following syntax:

```
XsigoPkgAddToW2k8_Or_W2k8R2_DVDImage.bat <win2008R2 | win2008x86 | win2008amd64> <path to DVD contents> <path to drivers> <driver folder name> <path to WAIK>
```

where:

- `<win2008R2 | win2008x86 | win2008amd64>` is a choice list for the W2k8 or w2k8R2 OS DVD folder location. This folder must have write access for current user.
- `<path to DVD contents>` is the file path to the DVD that contains the modified OS image.
- `<path to drivers>` specifies the path to the Xsigo host drivers.
- `<driver folder name>` specifies the path to the folder on the DVD where the Xsigo host drivers are.
- `<path to WAIK>` specifies the full file system path to the location of the Windows AIK.



Note

The batch file runs in pause mode, which pauses to prompt you for input at various times while the batch file is running. While the batch file is paused, you can inspect the previous set of results. You must specify all parts of the batch file syntax to allow the batch file to run to completion.

Help text is available for the batch file at runtime by either executing the batch file without any command arguments, or by supplying incomplete syntax for the batch file.

Run the batch file with the appropriate arguments. The following example assumes 3.0.0 host drivers. If you are using earlier versions of host drivers, make sure to use the appropriate inputs.

- DVD folder (C:\Temp\W2K8-R2)
- Xsigo temporary folder (C:\Temp\300\xsigos-3.0.0.26)
- Xsigo host driver folder (xsigos-3.0.0.26) which will be copied into DVD
- The WAIK ("C:\Program Files\Windows AIK")
- The image mount location (C:\temp\_mount)

For example, for 3.0.0 host drivers:

```
XsigoPkgAddToW2k8_Or_W2k8R2_DVDImage.bat win2008R2 C:\Temp\W2K8-R2
C:\Temp\300\xsigos-3.0.0.26 xsigos-3.0.0.26 "C:\Program Files\Windows
AIK" C:\temp_mount
```

This command injects the Xsigo drivers into the Windows Server 2008 OS DVD.



Note

Make sure the command runs without any errors. It will take while to complete, so please be patient.

When the tool completes, you will create an ISO image and burn it on to a DVD and to use it for installation. With this procedure, the ISO will be named `W2K8-R2_Xsigo_San_Install_3.0.0.26.iso`. (If you used an earlier version of host drivers, that version number will appear instead of 3.0.0.26).

**Step 12** To create an ISO image of the remastered DVD, run the `oscdimg -m -n yo` command with all the required arguments as shown below.

```
oscdimg -m -n -bC:\Temp\W2K8-R2-SP1\boot\etfsboot.com C:\Temp\W2K8-R2-SP1
C:\Temp\W2K8-R2_Xsigo_San_Install_3.0.0.iso
```

## Chapter 2: SAN Installing from Remastered DVD

**Step 13** When the command completes, burn the `W2K8-R2_Xsigo_San_Install_3.0.0.26.iso` onto a DVD. (If you used an earlier version of host drivers, the ISO is named with that version number).

### Preparing the Chassis and the Bootable vHBA

A boot vHBA is required to connect the server that wants to boot with the OS on the SAN. Follow this procedure to create a Server Profile with a bootable vHBA, and set SAN Boot configurations as shown below. Be aware that the disk to which the vHBA will connect must be a raw disk.

**Step 1** Create a Server Profile that will be used for SAN Booting. For example:

```
add server-profile logo5
```

**Step 2** Create a vHBA in the Server Profile. For example:

```
add vhma saninstall.logo5 8/1 -wwn-id=618
```

**Step 3** Connect the Server Profile to an InfiniBand server port by using the HCA port GUID. For example:

```
set server-profile logo5 connect 3048ffffce25e1
```



Note

---

If you do not know the HCA port GUID, you can boot the server from the live CD to get the GUID. Or, you can boot from the HCA's Option ROM (if present).

---

**Step 4** Set the Server Profile to support SAN Boot functionality. For example:

```
set server-profile logo5 san-boot saninstall 22:42:00:02:AC:00:06:24 0
```

**Step 5** Verify the SAN Boot configuration is correct. For example:

```
show server-profile logo5 san-boot
server      role          vhma          mnt-type      lvm-grp      lvm-vol      dev
mnt-opts    disks
-----
logo5       loadmount     saninstall    static         22:42:00:02:AC:00:06:24(0/LM)
1 record displayed
```

## Installing the OS from the Remastered DVD to the SAN LUN

In this section, you will load the remastered DVD onto a server. After the server boots up with the Xsigo host drivers included, you will use this image as a golden master image that is used to boot other Windows 2008 servers as needed.



Note

Before loading the remastered DVD, make sure XG Boot is selected as the first device in the server's boot order, and the DVD ROM is the second device in the boot order. You will need to enter the server's BIOS to set the boot order appropriately.

Follow this procedure:

- Step 1** Insert the modified OS DVD and startup the Windows Server 2008 DVD as you would do with a standard installation. The installer starts. [Figure 1](#) shows an example of installing the remastered DVD on an HP server.



Figure 1 Example OS Installation

When the server is coming up, watch the boot messages. Make sure that the vHBA is installed and loaded, as shown in [Figure 2](#). This vHBA is the one you specified in the Server Profile you created earlier.

```

Prodant 192.168.56.130
Attempting Boot From NIC
XgBoot (PCI 09:00:0) starting execution...ok

Connect-X Node GUID: 0x1b70ffff34fbc8, FW ver: 2.7.710, Board ID: HP_00B0000001

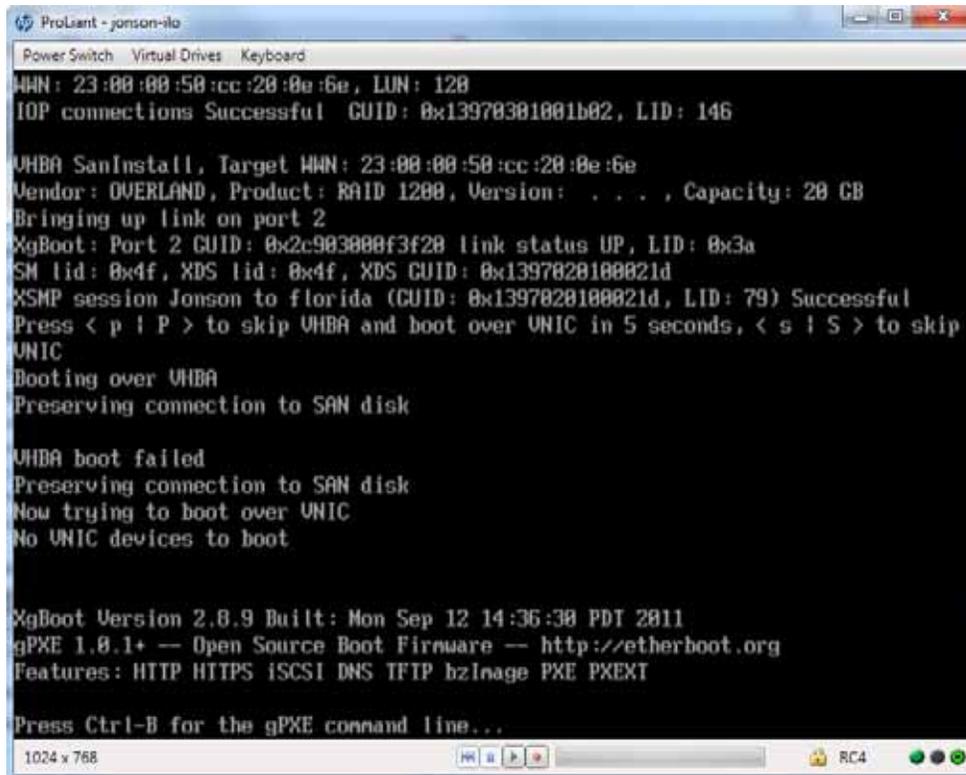
Bringing up link on port 1
XgBoot: Port 1 GUID: 0x1b70ffff34fbc9 link status UP, LID: 0x2c
SM lid: 0x1, XDS lid: 0x1, XDS GUID: 0x13970201000021
CCMP session HPBLADE to ioms (GUID: 0x139702010000a1, LID: 56) Successful

Installed vHBA 300.HPBLADE from ioms
Number of bootable targets: 1
Wwn: 22:42:00:02:ac:00:06:24, LUN: 0
IOF connections Successful GUID: 0x139703010000de, LID: 65

vHBA 300, Target Wwn: 22:42:00:02:ac:00:06:24
Vendor: 3PARdata, Product: UU, Version: 0.0.0.0, Capacity: 107 GB
Bringing up link on port 2
XgBoot: Port 2 GUID: 0x1b70ffff34fbc9 link status UP, LID: 0x19
SM lid: 0x1, XDS lid: 0x1e, XDS GUID: 0x139702010000106
Press < p | P > to skip vHBA and boot over vNIC in 5 seconds, < s | S > to skip
vNIC
  
```

Figure 2 Verifying the Bootable vHBA is Recognized

- Step 2 As the boot messages progress, verify that the vHBA sees the LUN and that the LUN is preserved in the BIOS. Specifically, look for the boot message Preserving connection to SAN disk., as shown in Figure 3.



```
ProLiant - jonson-ilo
Power Switch  Virtual Drives  Keyboard
WWN: 23:00:00:58:cc:28:0e:6e, LUN: 128
IOP connections Successful GUID: 8x13970301001b02, LID: 146

vHBA SanInstall, Target WWN: 23:00:00:58:cc:28:0e:6e
Vendor: OVERLAND, Product: RAID 1200, Version: . . . , Capacity: 20 GB
Bringing up link on port 2
XgBoot: Port 2 CUID: 0x2c903000f3f28 link status UP, LID: 0x3a
SM lid: 0x4f, XDS lid: 0x4f, XDS GUID: 0x1397020100021d
XSMP session Jonson to florida (GUID: 0x1397020100021d, LID: 79) Successful
Press < p | P > to skip vHBA and boot over UNIC in 5 seconds, < s | S > to skip
UNIC
Booting over vHBA
Preserving connection to SAN disk

vHBA boot failed
Preserving connection to SAN disk
Now trying to boot over UNIC
No UNIC devices to boot

XgBoot Version 2.8.9 Built: Mon Sep 12 14:36:38 PDT 2011
gPXE 1.8.1+ -- Open Source Boot Firmware -- http://etherboot.org
Features: HTTP HTTPS iSCSI DNS TFTP bzImage PXE PXEXT

Press Ctrl-B for the gPXE command line...
```

Figure 3 Verifying the Bootable vHBA is Persistent

At this point the server will bypass the vHBA and boot from the DVD because there is no OS available through the vHBA yet. Instead, the remastered DVD is used for booting at this point, as shown in [Figure 4](#).

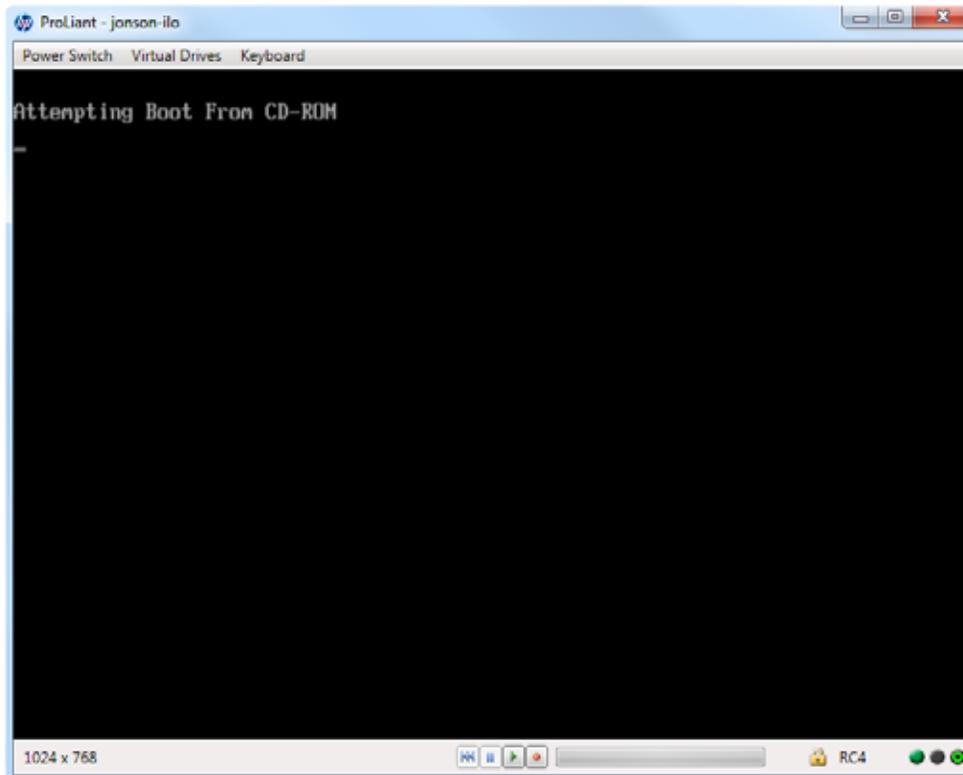


Figure 4 OS Booting from DVD

- Step 3 Windows loads from the remastered DVD, and the server begins to install Windows Server 2008.
- Step 4 When prompted with the OS pre-install options, specify them as you wish with a standard install. [Figure 5](#) shows an example of localizing the OS to your language, time zone, and keyboard input type.



Figure 5 OS Pre-Install Options

Step 5 When prompted, click **Install Now** begin OS installation. See [Figure 6](#).

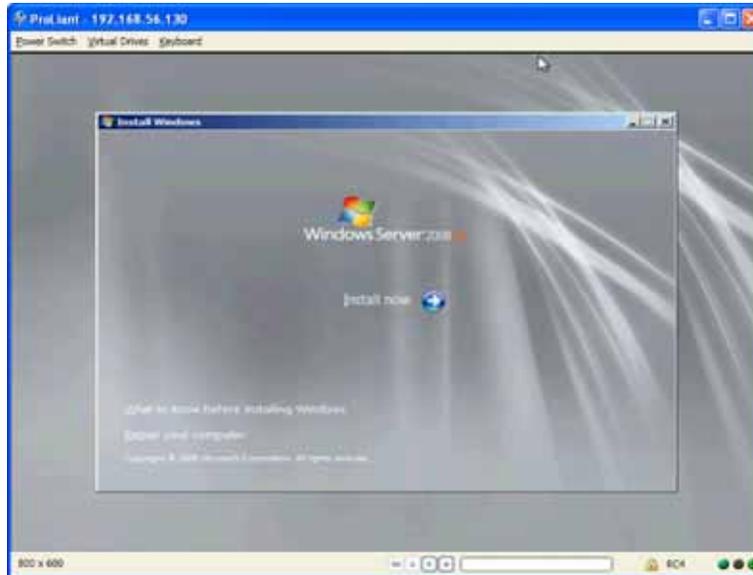


Figure 6 Begin OS Installation

Step 6 Select the OS that you want to install as shown in [Figure 7](#). This example shows installing the Enterprise version of Windows Server 2008.

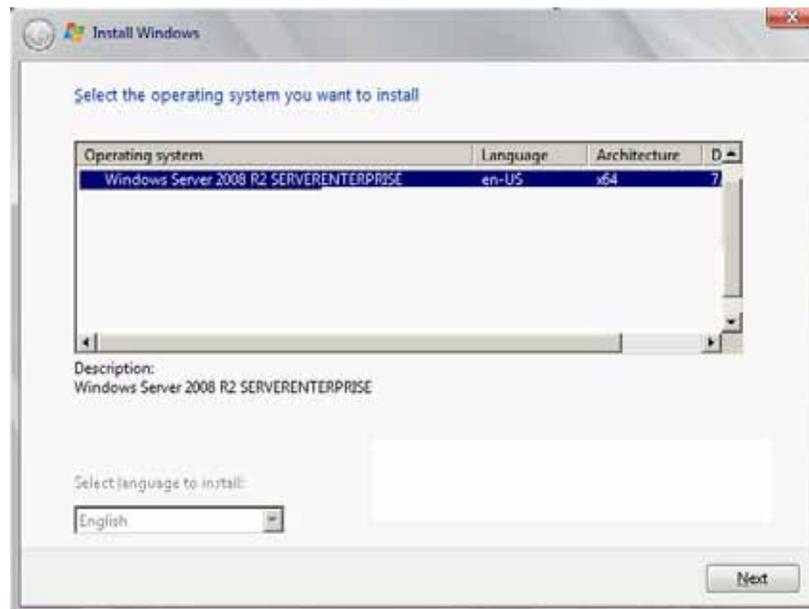


Figure 7 Selecting OS to be Installed

Step 7 Click **Next** to continue with the installation.

- Step 8 When the installer prompts you for the type of installation you want, select *Custom (advanced)* as shown in Figure 8.

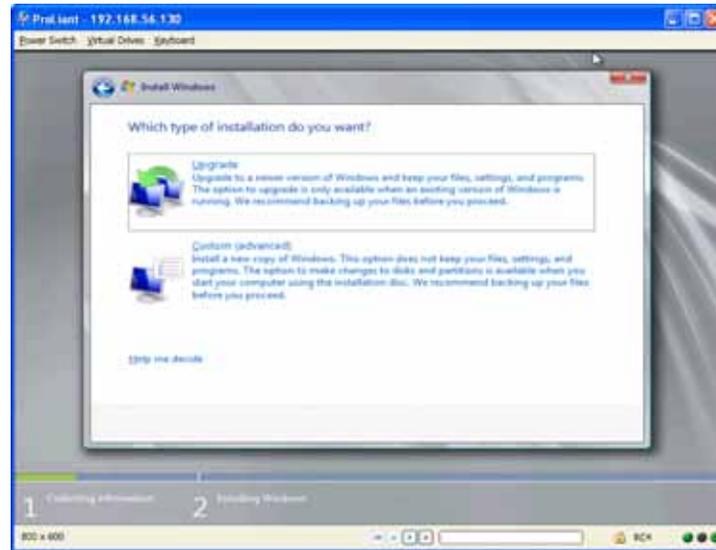


Figure 8 Selecting the Type of Install

- Step 9 When the installer prompts for where you want the OS installed, select the LUN that is presented through the vHBA. See Figure 9.

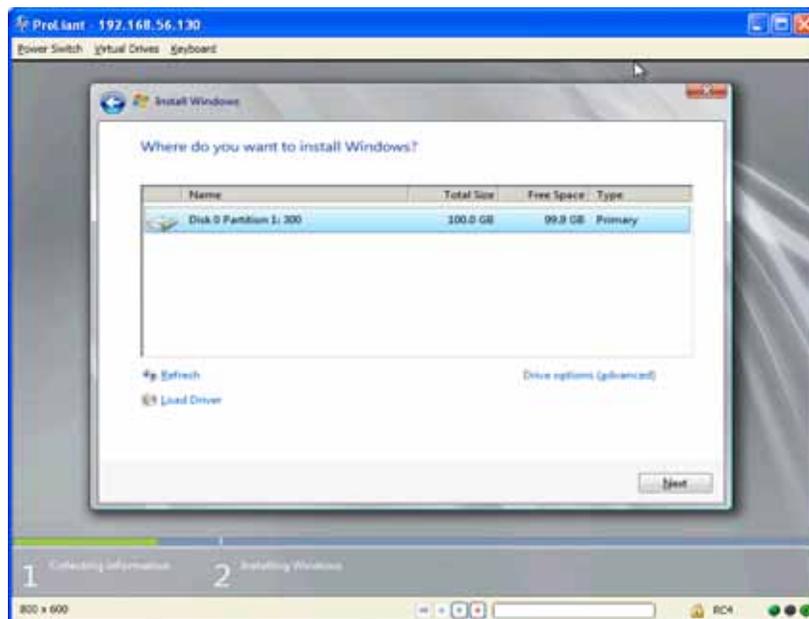


Figure 9 Installing the OS to the SAN LUN connected through the vHBA



This step is the heart of SAN Installation. With this step, you are loading the modified OS (which includes the Xsigo host drivers) onto the LUN that is connected to the vHBA.

Step 10 Click *Next* to allow the install to run to completion. See [Figure 10](#).



If you want to clone the LUN and modified OS image for deployment across multiple servers, Xsigo recommends doing so now. Cloning is not required, but if you want to do so, do it during the server's reboot cycle by halting the server's reboot that occurs during this step. For information about cloning the LUN and OS image, see [Cloning](#). Otherwise, proceed to [Completing the Install](#) on page 19.

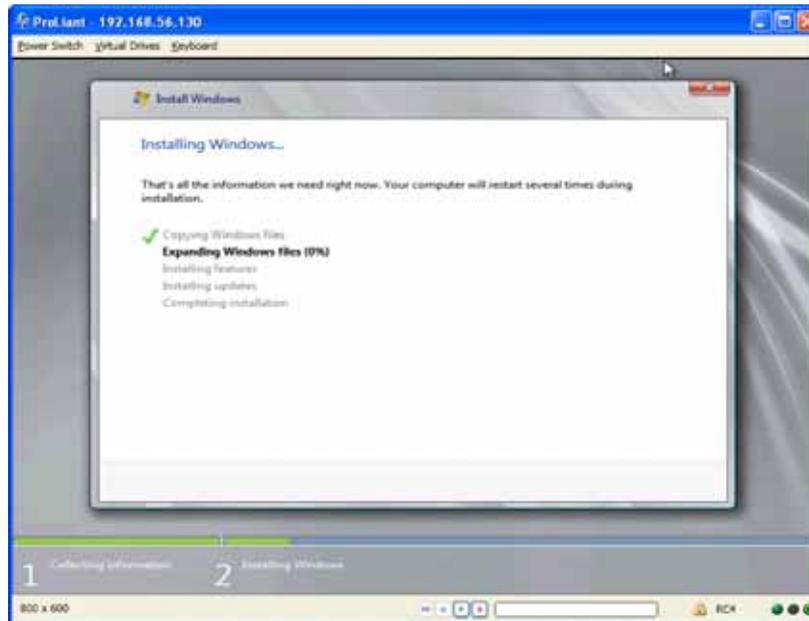


Figure 10 Installation Progress

## Cloning

Cloning can be done at different points of this procedure. Cloning at this point of the procedure is useful if you will be deploying the SAN Boot image to servers of different hardware types—for example, Dell servers and Hewlett Packard servers.

If you want to clone the LUN and OS image so that it can be applied to multiple Windows servers, you will need to do so in between the server's shutdown and reboot. The procedure in this section is useful if you are running 3.0.0 host drivers, or not running sysprep on the servers. If you will be using sysprep on 2.7.4 or 2.7.4-PVS servers, another procedure is documented. See [Using sysprep, Cloning and Imaging of SAN-Installed Systems](#) on page 21.

Follow these steps, and when they are complete, you will return to the main install procedure:

- Step 11** Stop the installation between the first and second server reboot. For example, during this boot cycle, you can shutdown the server.
- Step 12** Follow the LUN cloning procedure in your storage target's documentation, and clone the LUN as many times as needed. On the first server, you will want to clone the LUN once so that two copies of the LUN are present. Leave one copy of the LUN as a master copy which you do not use. It is a backup copy that can be used for future clones if needed. Then, use the second copy of the LUN as a cloneable LUN template which can be duplicated as needed for additional servers.
- Step 13** When you are done with cloning, proceed to [Completing the Install](#).

## Completing the Install

You will now need to complete the install:

- If you have chosen to clone the LUN and modified OS image, you will resume the install now by powering the server on. (Remember, it was shut down to perform the cloning procedure).
- If you chose not to clone the LUN and modified OS image, the server continues with the install.

In either case, the procedure resumes here. Continue with the following steps:

- Step 14** When the install is complete, the server will be rebooted to SAN and continue the installation, as shown in [Figure 11](#).

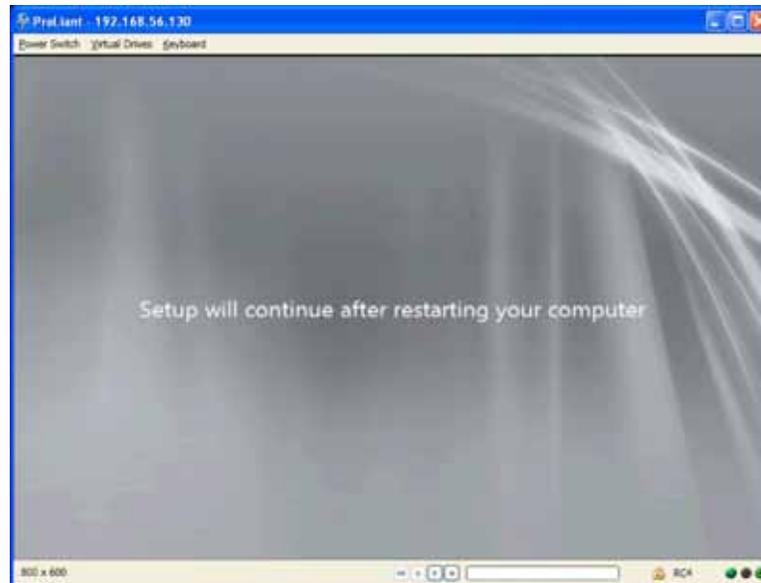


Figure 11 Server Restart

The server starts up and loads to the OS, as shown in [Figure 12](#).

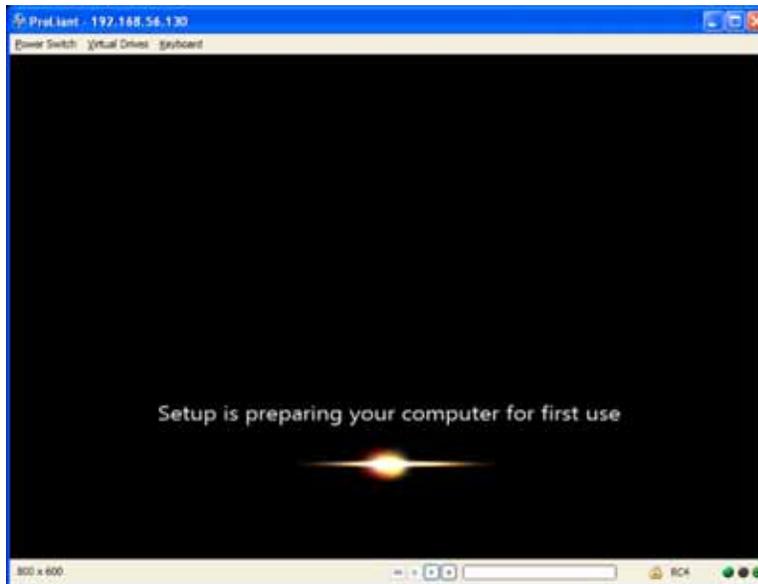


Figure 12 System Startup

Step 15 When the server reboots to the Login dialog, enter the system admin user name and password as shown in Figure 13.

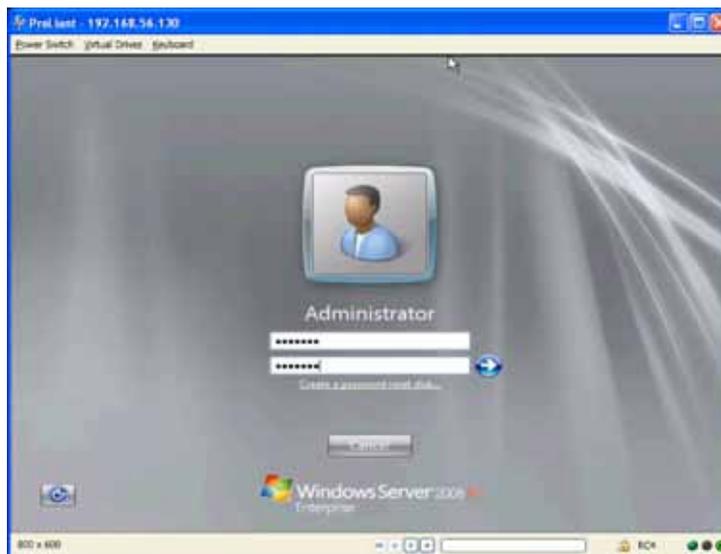


Figure 13 Login to Server

Step 16 Click the arrow to login. Allow the server to boot to the desktop as shown in Figure 14.

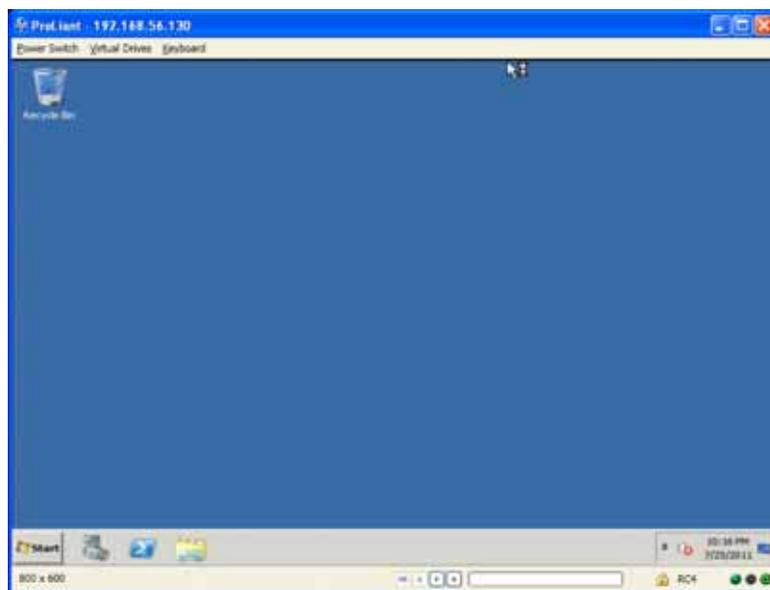


Figure 14 Server Booted to Desktop

When the desktop is displayed, the OS has completely installed from the remastered DVD, and the OS is successfully loaded.

## Using sysprep, Cloning and Imaging of SAN-Installed Systems

Another method for cloning systems is to use sysprep to maintain the critical elements of the configuration, but also remove variable parts of the configuration which are likely to change—for example, system name or system time zone. This section documents the procedure for running sysprep and cloning the LUN and modified OS image if servers are running either 2.7.4 or 2.7.4-PVS host drivers.



Note

This section is not required as part of the procedure. However, you will need this procedure if either of the following is true:

- \* You will be cloning the server configuration and did not clone it in [Cloning the Image on the LUN](#).
- \* You have installed additional software and need to replicate the setup.

At this point in the procedure, you have created the modified OS DVD, and installed that OS on a SAN LUN connected through a vHBA.



Caution

Do not attempt to run sysprep after installing the Xsigo host drivers, or you risk having the server run unpredictably, including having the sysprepped system and systems with cloned images crash to a blue screen while booting.

## Chapter 2: SAN Installing from Remastered DVD

The sysprep tool is located in `C:\Windows\System32\sysprep\sysprep.exe`. Sysprep can be run either from either Windows Explorer (`sysprep.exe`) or through the command-line depending on what you prefer.

- To run sysprep through the Explorer GUI, see [Running sysprep from the GUI](#)
- To run sysprep from the server's CLI see [Running sysprep from CLI](#)

### Running sysprep from the GUI

Follow this procedure to sysprep the system through the server's Explorer GUI:

- Step 1** In `C:\Windows\System32\sysprep\`, run **sysprep.exe** to display the System Preparation Tool dialog as shown in [Figure 15](#).

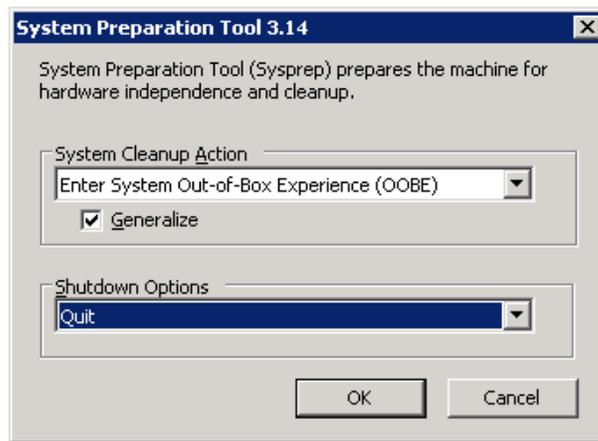


Figure 15 Running sysprep



Caution

When setting up sysprep make sure to specify that it quits (not restarts the server) when it completes. By doing so, you allow the `SysPrepBeforeShutdownXsigoScript.vbs` tool to run at the correct time and clean the hardware registry.

- Step 2** From the System Cleanup Action dropdown menu, select *Enter System Out-of-Box Experience (OOBE)*
- Step 3** Click the *Generalize* checkbox.
- Step 4** From the Shutdown Options dropdown menu, select *Quit*.
- Step 5** Click **OK** and allow sysprep to run to completion.
- Step 6** Shutdown the server.
- Step 7** Proceed to [Cloning the Image on the LUN](#).

## Running sysprep from CLI

Follow this procedure to sysprep the system from the CLI:

**Step 8** Run **sysprep.exe** and supply the required command-line options:

```
C:\Windows\System32\sysprep>sysprep.exe /generalize /oobe /quit
```

**Step 9** Allow sysprep to run to completion.

You will now run another script that prepares the sysprepped server for shutdown.  
Proceed to

## Preparing sysprepped Systems for Shutdown

If you want to clone the LUN and OS image so that it can be applied to multiple Windows servers, you will need to do so in between the server's shutdown and reboot. For sysprepped 2.7.4 or 2.7.4-PVS servers, you will need to run the **SysPrepBeforeShutdownXsigoScript.vbs** which prepares the server for a graceful shutdown. Cloning the LUN and OS image will occur after the script completes, but before the server is rebooted.

To run the script, follow this procedure:

**Step 10** Run `SysPrepBeforeShutdownXsigoScript.vbs` script from below path

```
c:\Xsigo\xsigos-2.7.4\xsigo\cscript SysPrepBeforeShutdownXsigoScript.vbs
```

**Step 11** Allow the script to run to completion.

**Step 12** Shutdown the server.

**Step 13** If you will be cloning the LUN and modified OS image, proceed to [Cloning the Image on the LUN](#). Otherwise proceed to [Step 14](#).

**Step 14** Restart the server.

**Step 15** Allow the server to completely boot up, and proceed to [Installing Xsigo Host Drivers](#) to load the host drivers.

## Cloning the Image on the LUN

**Step 16** Clone of the LUN or take an image of the LUN as usual.

**Step 17** Boot the system to complete sysprep process.

**Step 18** Allow the server to completely boot up, and proceed to [Installing Xsigo Host Drivers](#) to load the host drivers.

## Installing Xsigo Host Drivers

When you created the modified OS DVD, you injected the Xsigo host drivers into the Windows Server 2008 OS. The Xsigo host drivers can now be run from the SAN LUN to install them on the Windows host server.

At this point of the procedure, the server has booted to the OS from the SAN LUN, but the Xsigo host drivers have not yet been installed. To install the Xsigo host drivers, you will use **setup.exe** with the **/saninstall** argument to allow the host drivers to install over the SAN.



Note

---

If you need additional documentation about installing the host drivers, see the latest published *XgOS Hardware and Host Drivers Installation Guide*.

---

Follow this procedure to install the Xsigo host drivers:

- Step 1 Navigate to `c:\xsigo\xsigos-3.0.0.26` folder.
- Step 2 Install the Xsigo host drivers with the **/saninstall** option as shown in [Figure 16](#). For example through the CLI, you would issue:

```
C:\xsigo\xsigos-3.0.0.26>setup.exe /saninstall
```

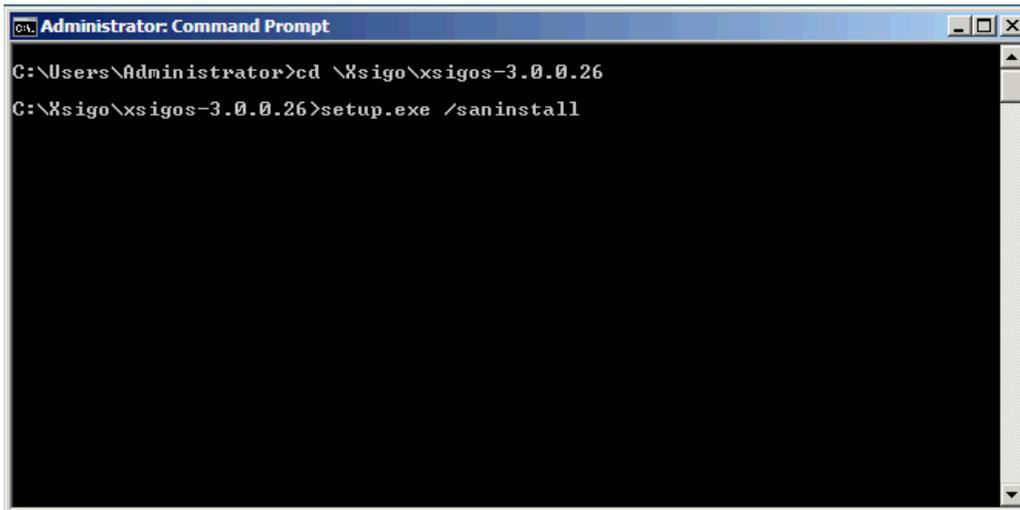


Figure 16 Installing Xsigo Host Drivers with SAN Install Option

When you enter the command, the Welcome dialog is displayed (see [Figure 17](#)), and the host driver installation begins.

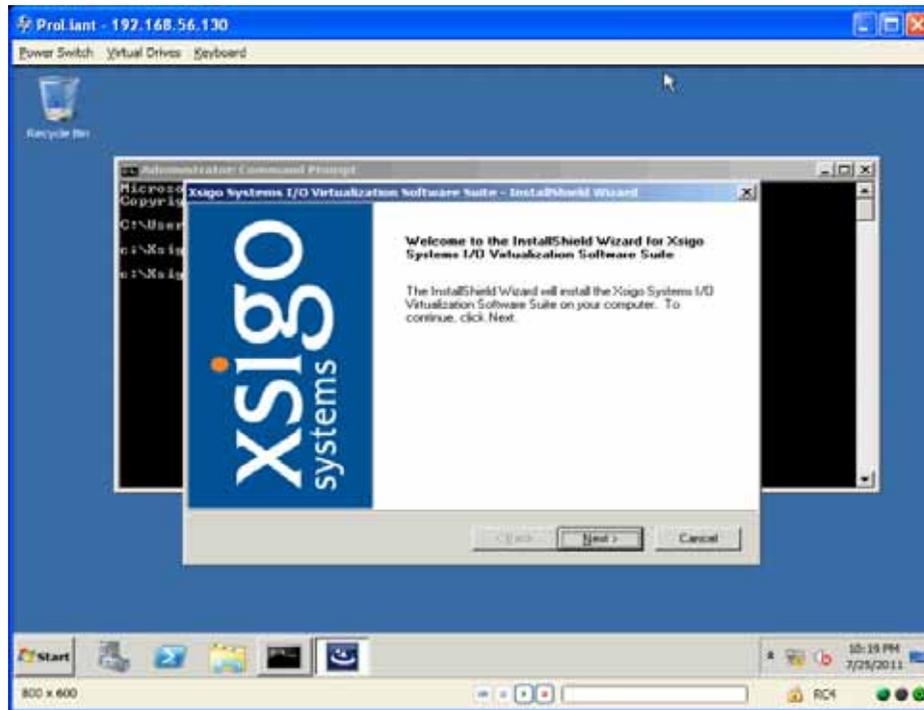


Figure 17 Xsigo Host Driver — Welcome Dialog

The host drivers will install as usual. Follow the on-screen prompts to continue the installation of the host drivers.

- Step 3 Follow the installer prompts and click *Next* until the installation is complete and you are prompted with the Reboot dialog, as shown in [Figure 18](#).

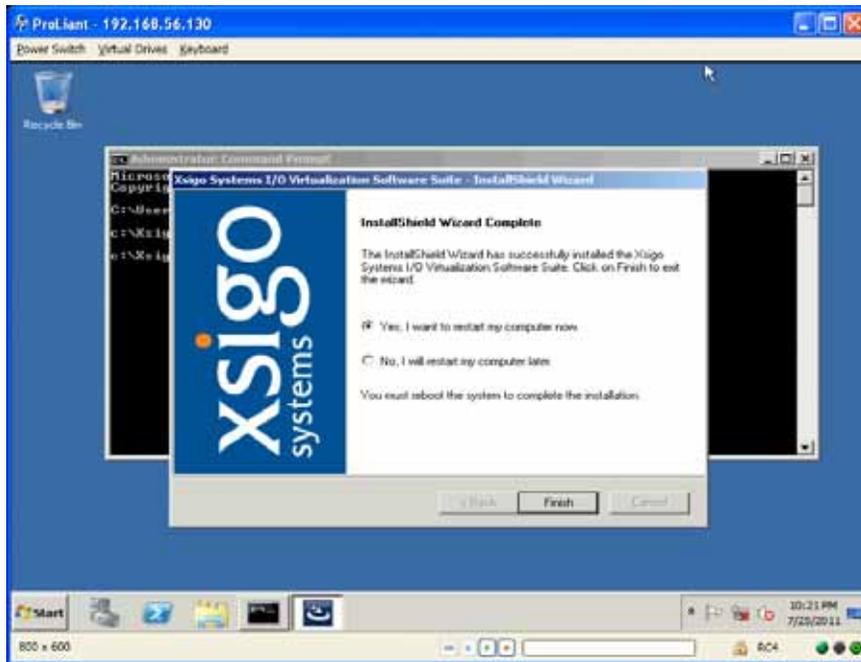


Figure 18 Xsigo Host Driver Installer — Reboot Server

- Step 4 Select *Yes, I want to restart my computer now* (if it is not selected by default).
- Step 5 Click **Finish** to reboot the server. See [Figure 19](#).

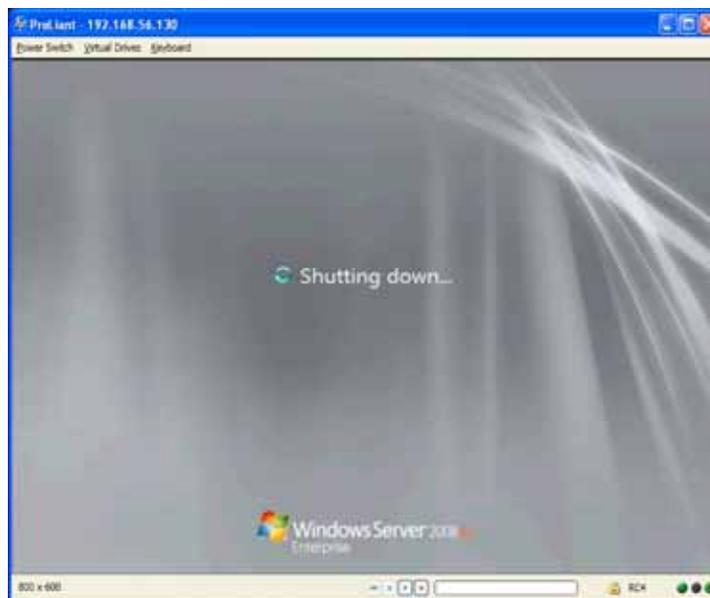


Figure 19 Server Shutdown

Step 6 When the server restarts, the Xginstdev64.exe automatically runs at the next administrator log in. (See Figure 20.) This tool updates all devices to run on the correct version of drivers, and checks the devices and drivers to verify that they are functioning predictably.



The xginstdev64.exe tool runs at least once to confirm all devices are properly installed, and a reboot might be required if problems are detected with the Xsigo devices.

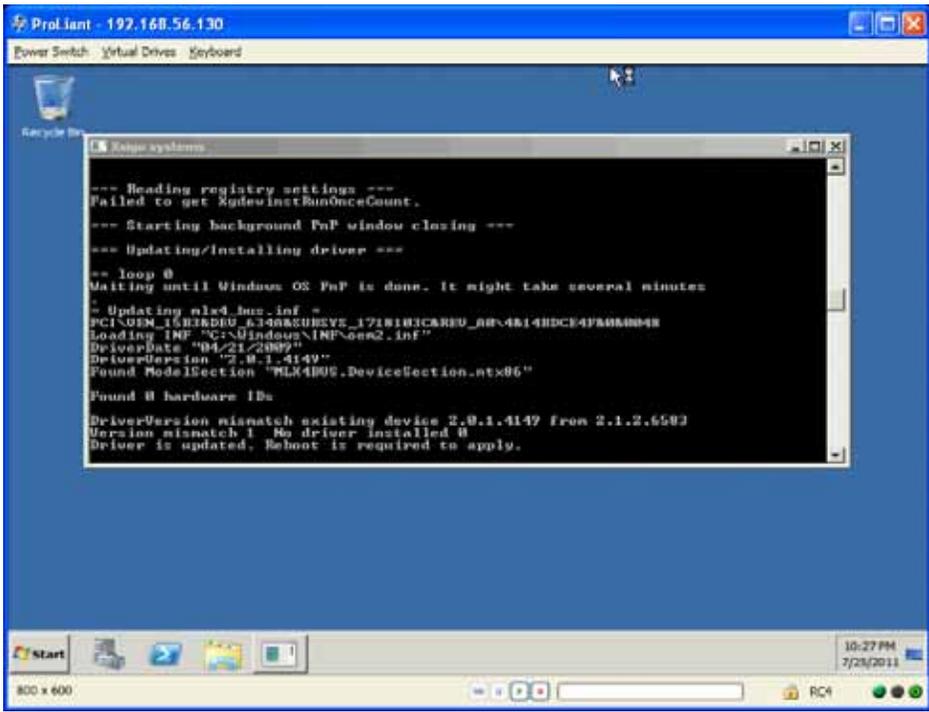


Figure 20 Xginstdev.exe Runs the First Time

For illustrative purposes, this procedure assumes that xginstdev64.exe has found a problem, as shown in Figure 20.

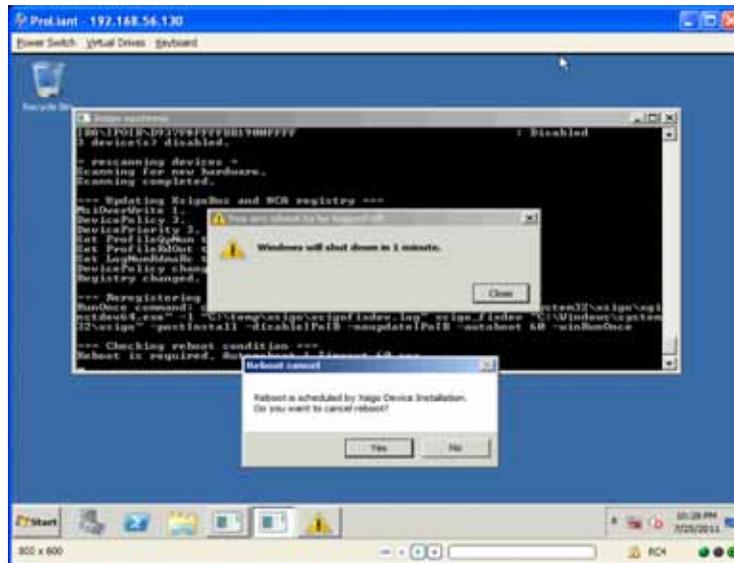


Figure 21 Required Reboot after First Xginstev.exe

If a problem is found, `xginstdev64.exe` will attempt to repair the Xsigo devices, then automatically reboot the server after 1 minute as shown in Figure 21.

After this reboot, `xginstdev64.exe` runs a second time to verify that all the Xsigo devices are functioning predictably, as shown in Figure 22.

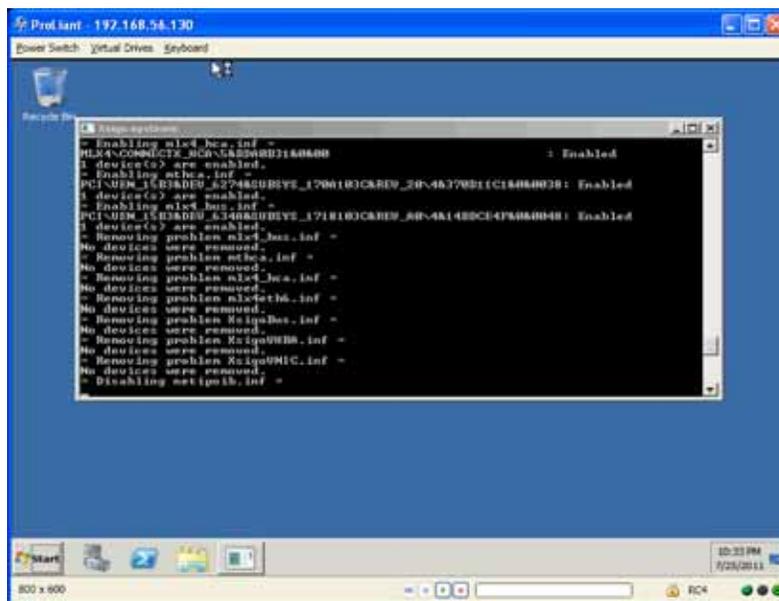


Figure 22 Xginstdev.exe Runs the Second Time

This second instance of `xginstdev64.exe` occurs at the next administrator login. When the second reboot completes, the server is running and operational.

At this point, the modified OS has been installed on the LUN and cloned as needed for other servers. Also, the server where the modified OS DVD was created has been sysprepped to return it to its generic configuration, and the Xsigo host drivers have been properly installed, so the server is online and functional.

## Verifying the Installation

With the server online and Xsigo host drivers installed, you can perform some simple steps to verify that the vNICs and vHBAs are functional and support virtual I/O to and from the server.



Note

For information about configuring vNICs and vHBAs, see the *XgOS Command-Line Interface User Guide*, or the *Fabric Manager User Guide* if you are using Oracle's Xsigo Fabric Manager.

You can do the following to verify the installation is successful and functional:

**Step 1** Add few vNICs, HA vNICs, and vHBAs and check the driver version and traffic.



Note

The vNICs and HA vNICs are not required for the OS installation, but Xsigo recommends that you add them after the host server has booted from the SAN Installed OS to verify full functionality.

**Step 2** Check the Xsigo Virtual Bus driver information, and verify that the version number is a variant of 3.0.0.x (for example, 3.0.0.26, shown) or 2.7.4.x (for example, 2.7.4.37, not shown). See [Figure 23](#).

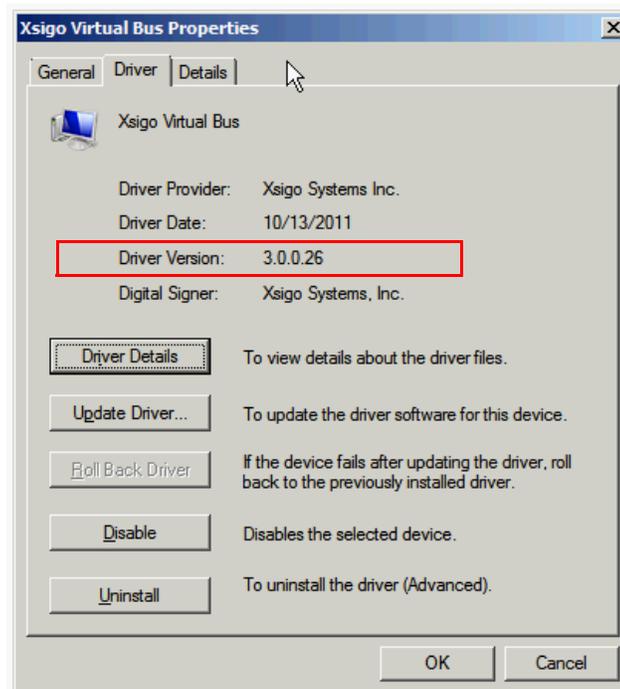


Figure 23 Verifying the Xsigo Virtual Bus Version

## Chapter 2: SAN Installing from Remastered DVD

- Step 3** Check the Xsigo vHBA driver information, and verify that the version number is a variant of 3.0.0.x (for example, 3.0.0.26, shown) or 2.7.4.x (for example, 2.7.4.37, not shown). See in [Figure 24](#).

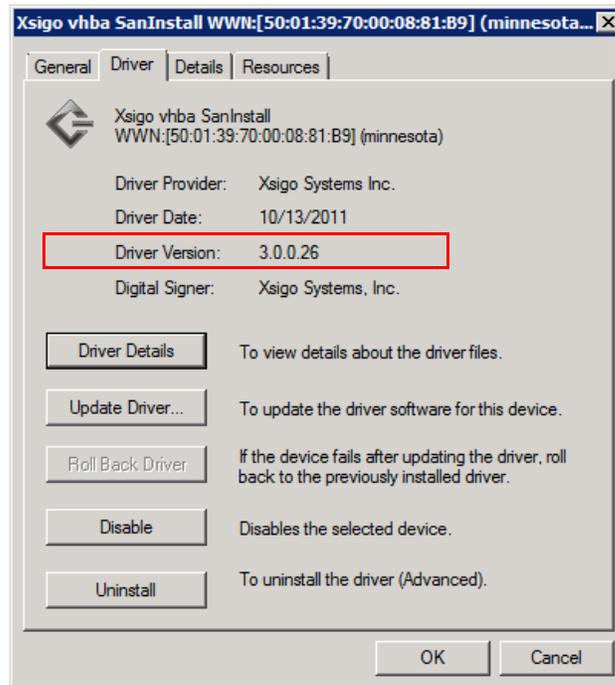


Figure 24 Verifying the Xsigo vHBA Driver Version

- Step 4** Check the Xsigo vNIC driver information and verify that the version number is a variant of 3.0.0.x (for example, 3.0.0.26), shown) or 2.7.4.x (for example, 2.7.4.37, not shown). See [Figure 25](#) on page 31.

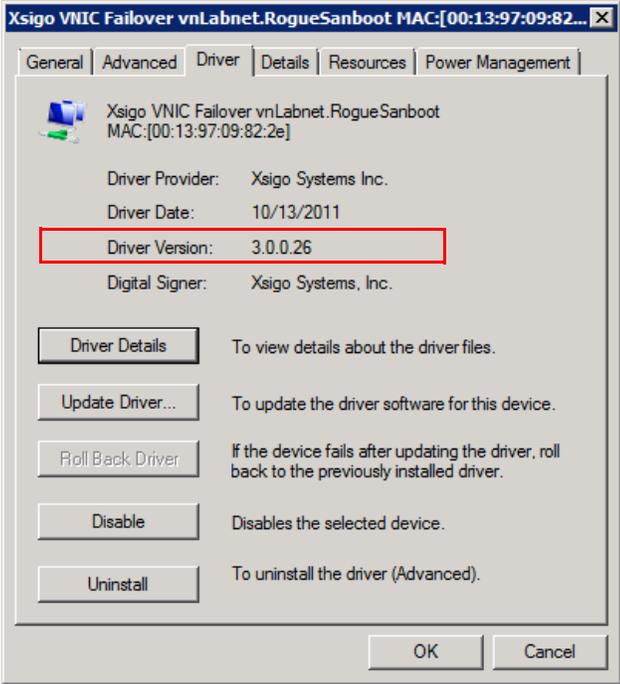


Figure 25 Verifying the Xsigo vNIC Driver Version



This chapter documents using a Windows Deployment Server in the network to install a server's OS using a vNIC and a vHBA LUN. After the image is installed on the SAN, the image can be cloned and used to boot multiple additional servers with the same configuration.



Note

---

Where this document mentions Windows Server 2008, be aware that Windows Server 2008 R2, R2 SP1, and SP2 and later are also supported.

---

Using a WDS to install the OS to a SAN LUN is useful in larger environments (fewer Windows Server 2008 hosts), or in environments that use Windows Deployment Service (WDS). For information, see [Chapter 2, "SAN Installing from Remastered DVD."](#)

This chapter contains the following topics:

- [Overview of Procedure](#)
- [Considerations](#)
- [Preparing the Installer Medium \(Remastering the OS DVD\)](#)
- [Preparing the Windows Deployment Service Server](#)
- [Installing the OS and Xsigo Host Drivers Using the WDS PXE Server](#)
- [Using sysprep, Cloning, and Imaging of SAN-Installed Systems](#) (optional procedure)
- [Verifying the Installation](#)

## Overview of Procedure

To SAN install the OS onto a SAN LUN, you will need a distribution medium (DVD) of Windows Server 2008, the Xsigo host drivers, a bootable vHBA, a bootable vNIC for the PXE connection to the WDS server, and some standard Windows tools.

An illustration of what you will be doing is in [Chapter 1, “Overview.”](#) You might find it helpful to review that illustration before attempting this procedure.

SAN installing the OS by using the WDS PXE server has the following general stages:

1. [Preparing the Installer Medium \(Remastering the OS DVD\)](#), which consists of injecting the Xsigo drivers into the `install.wim` and `boot.wim` of the Windows Server 2008 DVD provided by Microsoft to create a “remastered DVD.”
2. [Preparing the Windows Deployment Service Server](#), which consists of loading the `install.wim` and `boot.wim` onto the WDS server.
3. [Preparing the Chassis, Bootable vHBA, and Bootable PXE vNIC](#), which consists of creating a server profile and a bootable vHBA which will provide connection to the LUN where the server’s OS will be located after you install it to the LUN. Also, a bootable PXE vNIC is required to connect the host to the WDS server.
4. [Installing the OS and Xsigo Host Drivers Using the WDS PXE Server](#), which is accomplished by using the `install.wim` from the remastered DVD. The WDS server has a wizard that will assist with this part of the procedure.
5. [Using sysprep, Cloning, and Imaging of SAN-Installed Systems](#), which is an optional procedure that consists of returning the host which was used for preparing the installer medium to a “vanilla” configuration, and creating one OS in the SAN for each server that will be booting.
6. [Installing Xsigo Host Drivers](#) by running `setup.exe` in SAN Install mode. This part of the procedure officially installs the Xsigo PE host drivers to the full Xsigo host driver package.
7. [Verifying the Installation](#), which consists of checking the installed versions of Xsigo software.

## Considerations

To SAN Install the Windows Server 2008 OS on a SAN LUN, be aware of the following considerations:

- The version of Xsigo Windows host drivers that are supported for this procedure are:
  - 2.7.4
  - 2.7.4-PVS
  - 3.0.0
- The OSes supported for this procedure are:
  - Windows Server 2008 R2
  - Windows Server 2008 R2 SP1
  - Windows Server 2008 SP2 and later. These OSes are not supported with 2.7.4 or 2.7.4-PVS host drivers.

- You will use the `SysPrepBeforeShutdownXsigoScript.vbs` tool, which is a visual basic script that must be manually run after sysprep is run, but before the server is shut down. This script cleans the hardware registry and prevents any stale entries from causing problems when the server reboots.



Caution

---

When setting up sysprep, make sure to specify that it quits (not restarts the server) when it completes. By doing so, you allow the `SysPrepBeforeShutdownXsigoScript.vbs` tool to run at the correct time.

---

- You will need full admin rights on the Windows host where the image will be prepared.
- Make sure the folders have the correct packages and all files are unblocked by windows security. Files must be unblocked by Windows security or else they will not install.
- SAN install through DVD is supported for ConnectX and ConnectX-2 HCAs (dual-port only).
- The server's ConnectX or ConnectX-2 HCAs must have Xsigo Option ROM versions 2.8.7 or later, and HCA firmware version 2.7.0 or later.
- For WDS deployments, the server's ConnectX or ConnectX-2 HCAs must have Xsigo Option ROM version 2.8.9 or later, and HCA firmware version 2.7.0 or later.
- The OS that you will be installing will be somewhat large. Allocate a 50 GB LUN to allow sufficient space for the OS.
- Active Directory (AD), DHCP, Windows Deployment Service (WDS) server, and DNS must be correctly set up. The configuration and management of these systems is out of the scope of this document. If you need additional assistance, consult your Windows network admins, or the Microsoft website.

## Installing the OS on the SAN LUN Through WDS

This section documents the procedure for installing the OS from the WDS server onto the SAN LUN by using the `install.wim` and `boot.wim` from the remastered DVD.

### Preparing the Installer Medium (Remastering the OS DVD)

When you prepare the installer medium, you are extracting the standard Windows Server 2008 OS provided by Microsoft, adding the Xsigo host drivers, then repackage the OS with the Xsigo host drivers included. With the Xsigo host drivers included, the OS can be loaded onto a server (for example, through the OS that will be copied to a LUN) and the server will boot and recognize the Xsigo vNIC and vHBAs as devices in the OS.

To prepare the installer medium, you will use the following tools:

- WAIK 2.1 for Windows Server 2008 SP2 servers and WAIK 3.0 or 3.1 for Windows Server 2008 R2 and later servers
- The Windows Server 2008 installation DVD that accompanied your servers.
- Xsigo host drivers version 2.7.4 and later.
- For 3.0.0 host drivers, you will need the `XsigoPkgAddToW2k8_Or_W2k8R2_DVDImage.bat` tool, which injects the Xsigo host drivers into the Windows distribution medium. This tool is included in the 3.0.0 Windows host driver package. It should be present when you download and unzip the 3.0.0 host drivers.

## Chapter 3: SAN Installing Through WDS

---

- For 2.7.4 or 2.7.4-PVS host drivers, you will need the `XsigoPkgAddToW2k8R2_Image.bat` tool, which injects the Xsigo host drivers into the Windows distribution medium.



Note

---

For Windows hosts running 2.7.4 or 2.7.4-PVS host drivers, you will need to download the `XsigoPkgAddToW2k8R2_Image.bat` file from the Xsigo FTP site. Connect to <ftp://ftp.xsigo.com/xsigo/software/current/ga/pkgadd/> and log in to obtain the file.

For hosts running a later version of host drivers, this file should be bundled into the Xsigo host driver package. However, you can always check the Xsigo FTP site for this file.

---

Follow this procedure to prepare the installer medium. This example assumes that the medium is a DVD.

- Step 1** Download the appropriate Windows® Automated Installation Kit (AIK) for Windows® 7:
- For Windows 2008 R2 servers, you will need the AIK with at least PE 3.0, but PE 3.1 is recommended.
  - For Windows 2008 non-R2 servers, you will need the AIK with PE 2.1.

You can get the WAIK from the following Microsoft site:

<http://www.microsoft.com/download/en/details.aspx?id=5753>

This step gets the required 3.0 PE package.

- Step 2** As an option for Windows 2008 R2 and R2 SP1 installs, download The Windows Automated Installation Kit (AIK) Supplement for Windows 7 SP1 from the following Microsoft site:

<http://www.microsoft.com/download/en/details.aspx?id=5188>

This step updates the 3.0 PE to 3.1 PE. This step is optional. The procedure can be completed with 3.0 PE.

- Step 3** Install AIK and optionally apply any supplements that are offered. By default, the AIK is installed to `C:\Program Files\Windows AIK`

- Step 4** Create a temporary folder in C: (for example, `C:\temp`) which will be the workspace for injecting the Xsigo host drivers into the Windows 2008 OS DVD.

- Step 5** Create a `W2K8-R2` in `C:\temp`.

- Step 6** Create a `300` folder in `C:\temp`.

For earlier host driver versions, such as 2.7.4, you would want to create a `274` folder.

- Step 7** Copy the contents of the `W2K8-R2` ISO image located on the DVD into `C:\temp\W2k8-R2`.

- Step 8** Unzip the `hostdrivers_windows_3.0.0_FREE_WHQL.zip` file and copy the contents into `C:\temp\300`.

For earlier host driver versions, unzip the appropriate version to the correct folder—for example, you would unzip `hostdrivers_windows_3.0.0_FREE_WHQL.zip` to the `C:\temp\274` folder).

- Step 9** If you are using 2.7.4 or 2.7.4-PVS Windows host drivers, log in to the Xsigo FTP site, and download `XsigoPkgAddToW2k8R2_Image.bat` to `C:\temp\274\xsigos-2.7.4\xsigo\PEdrivers`.



Note

---

You need to download the file only if you are performing SAN Install with 2.7.4 or 2.7.4-PVS Xsigo Windows host drivers. For 3.0.0 and later host drivers, the file is bundled with the 3.0.0 host drivers.

---

- Step 10** Navigate to the appropriate `PEdrivers` directory for your version of host drivers.

- Step 11** From the `PEdrivers` directory, run the correct tool in the PE drivers folder.

- `XsigoPkgAddToW2k8R2_Image.bat` for 2.7.4 or 2.7.4-PVS host drivers
- `XsigoPkgAddToW2k8_Or_W2k8R2_DVDImage.bat` for 3.0.0 host drivers

For 3.0.0 host drivers, the batch file has the following syntax:

```
XsigoPkgAddToW2k8_Or_W2k8R2_DVDImage.bat <win2008R2 | win2008x86 | win2008amd64> <path to DVD contents> <path to drivers> <driver folder name> <path to WAIK>
```

where:

- <win2008R2 | win2008x86 | win2008amd64> is a choice list for the W2k8 or w2k8R2 OS DVD folder location. This folder must have write access for current user.
- <path to DVD contents> is the file path to the DVD
- <path to drivers> specifies the path to the Xsigo host drivers.
- <driver folder name> specifies the path to the folder on the DVD where the Xsigo host drivers are.
- <path to WAIK> specifies the full file system path to the location of the Windows AIK.



Note

---

The batch file runs in pause mode, which pauses while you are prompted for input at various times while the batch file is running. While the batch file is paused, you can inspect the previous set of results. You must specify all parts of the batch file syntax to allow the batch file to run to completion.

---

Help text is available for the batch file. Help text is available for the batch file at runtime by either executing the batch file without any command arguments, or by supplying incomplete syntax for the batch file.

---

Run the batch file with the appropriate arguments. The following example assumes 3.0.0 host drivers. If you are using earlier versions of host drivers, make sure to use the appropriate inputs.

- DVD folder (`C:\Temp\W2K8-R2`)
- Xsigo temporary folder (`C:\Temp\300\xsigos-3.0.0.26`)
- Xsigo host driver folder (`xsigos-3.0.0.26`) which will be copied into DVD
- The WAIK ("`C:\Program Files\Windows AIK`")
- The image mount location (`C:\temp_mount`)

For example, for 3.0.0 host drivers:

```
XsigoPkgAddToW2k8_Or_W2k8R2_DVDImage.bat win2008R2 C:\Temp\W2K8-R2
C:\Temp\300\xsigos-3.0.0.26 xsigos-3.0.0.26 "C:\Program Files\Windows
AIK" C:\temp_mount
```

This command injects the Xsigo drivers into the Windows Server 2008 OS DVD.



Make sure the command runs without any errors. It will take while to complete, so please be patient.

When the tool completes, you will create an ISO image and burn it on to a DVD and to use it for installation. With this procedure, the ISO will be named `W2K8-R2_Xsigo_San_Install_3.0.0.iso`. (If you used an earlier version of host drivers, that version number will appear instead of 3.0.0).

**Step 12** To create an ISO image of the remastered DVD, run the `oscdimg -m -n` command with all the required arguments as shown below.

```
oscdimg -m -n -bC:\Temp\W2K8-R2-SP1\boot\etfsboot.com C:\Temp\W2K8-R2-SP1
C:\Temp\W2K8-R2_Xsigo_San_Install_3.0.0.iso
```

**Step 13** When the command completes, burn the `W2K8-R2_Xsigo_San_Install_3.0.0.iso` onto a DVD.

## Preparing the Windows Deployment Service Server

The remastered DVD, which includes Windows Server 2008 OS and the Xsigo host drivers, will be used to install the images on the WDS server. To do so, you will add the modified `install.wim` and `boot.wim` along with the Xsigo drivers onto the WDS server. The WDS server uses the Add Image Wizard to help you specify the install image for the server.

To add the `install.wim` on the WDS server, follow this procedure:

- Step 1** On the WDS server, navigate to the Install Images directory.
- Step 2** Right-click the `Install Images` folder, and select `Add New Image`, as shown in [Figure 1](#) on page 39.

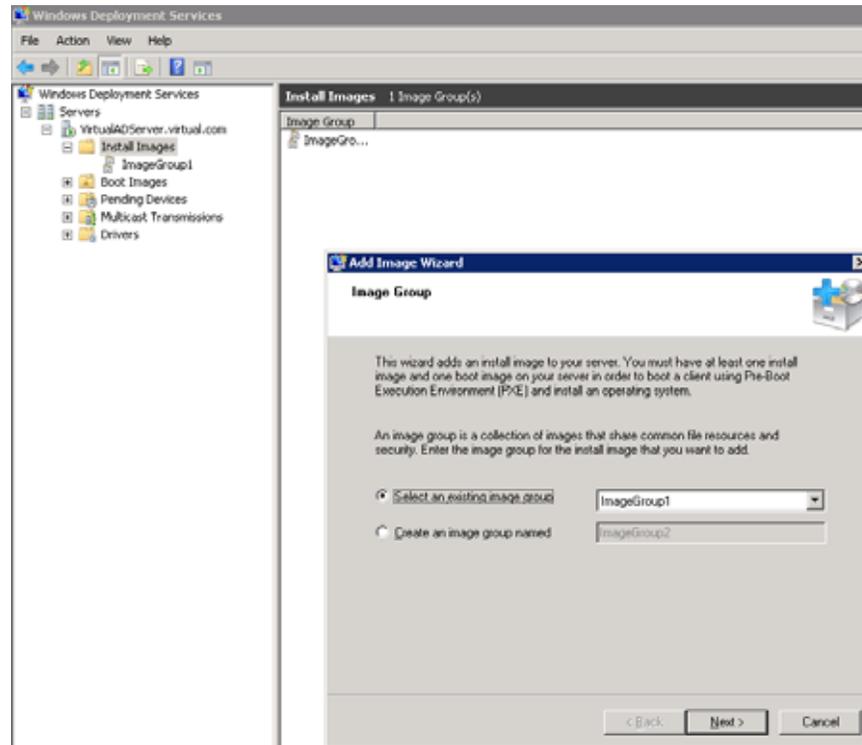


Figure 1 WDS Server — Adding an Image Group

- Step 1 Click *Select an existing image group*.
- Step 2 Click *Next* to proceed to the next dialog.
- Step 3 Click **Browse...** to display the Select Windows Image (WIM) File dialog.
- Step 4 On that dialog, navigate to the Xsigo Sources directory on the remastered DVD.
- Step 5 Select the `install.wim` file as shown in [Figure 2](#).

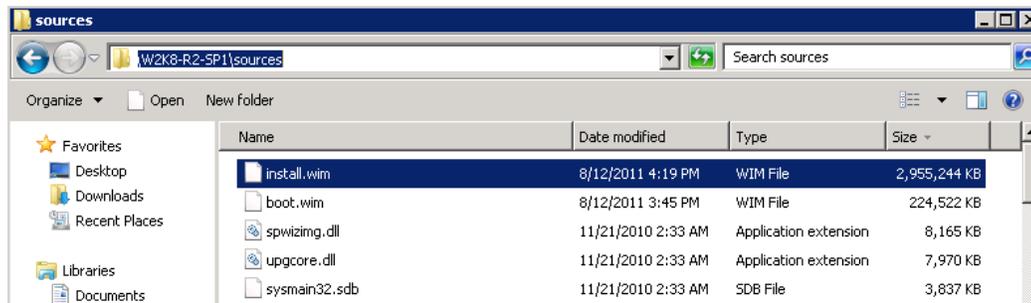


Figure 2 Selecting the install.wim

## Chapter 3: SAN Installing Through WDS

- Step 6** Proceed through the Add Install Images wizard, making sure to rename the OS to an intuitive name so that it is differentiated from any other OSes available. For example, the OS name has 274 prepended to it.
- Step 7** When you complete the wizard, check the `Install Images` directory to verify that the modified OS for 3.0.0 host drivers are installed, as shown in [Figure 3](#).

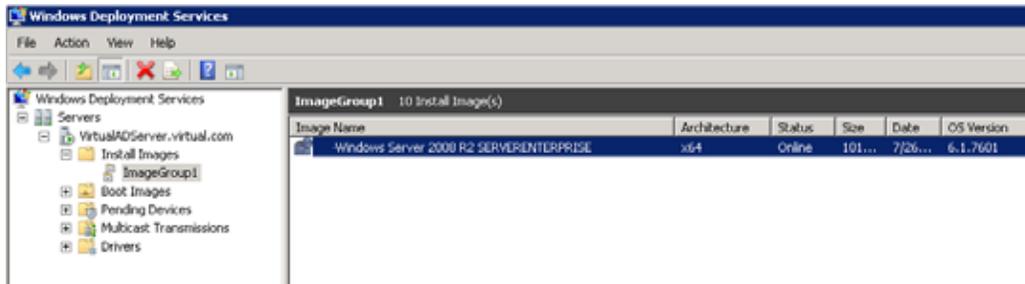


Figure 3 Modified OS installed on the WDS Server

- Step 8** Repeat this procedure to add the `boot.wim` file to the Boot Images directory. When prompted for Image name and Image description, place a comma-separated string into to the field to make it easier to tell which image to use to boot for SAN Install.
- Step 9** Proceed to the next section.

## Preparing the Chassis, Bootable vHBA, and Bootable PXE vNIC

A bootable vHBA and a bootable vNIC are required to connect the WDS server to the servers that want to boot with the OS on the SAN. In this section, you will add a bootable vNIC and bootable vHBA to a Server Profile, then connect that Server Profile to the target server's HCA GUID.



Note

Make sure XG Boot is selected as the first device in the server's boot order, and the DVD ROM is the second device in the boot order. You will need to enter the server's BIOS to set the boot order appropriately.

Make sure the bootable vNIC is connected to WDS network and boot the server, then follow this procedure to create a Server Profile with a bootable vHBA, bootable PXE vNIC, and set SAN Boot configurations:

- Step 1** Create a Server Profile. For example:
- ```
add server-profile hpblade
```
- Step 2** Add a bootable vNIC to the Server Profile. For example

```
add vnic pxe.hpblade 7/5 -bootable=true
```

**Step 3** Add a bootable vHBA to the Server Profile. For example:

```
add vhba disk2.hpblade 8/1 -wwn-id=301
```

Step 4 Connect the Server Profile to an InfiniBand server port on the Oracle Fabric Director by using the server’s GUID. For example:

```
set server-profile hpblade connect 2c9030003cdb4
```

Step 5 Set the Server Profile to support SAN Boot functionality. For example:

```
set server-profile hpblade san-boot 22:42:00:02:AC:00:06:24 0
```

Step 6 Verify the SAN Boot configuration is correct. For example:

```
admin@iowa[xsigo] show server-profile hpblade
name          state      descr      connection
def-gw        vnics     vhbases
-----
hpblade       up/up
1             1
1 record displayed
```

## Installing the OS and Xsigo Host Drivers Using the WDS PXE Server

In this section, you will boot the WDS server over the PXE bootable vNIC you created in the previous section, pull the modified `install.wim` from the WDS server, and apply it to the LUN accessible through the vHBA to complete the OS install. Be aware that the disk to which the vHBA will connect must a raw disk.

Step 1 Boot the WDS server to start the installation over the PXE vNIC into memory. See [Figure 4](#).



Figure 4 Installing Modified OS DVD

When the server is coming up, watch the boot messages. Make sure that the vHBA and vNIC are installed and loaded, as shown in [Figure 5](#) on page 42. The vHBA and vNIC are the ones you specified in the Server Profile you created earlier.

```

ProLiant - jonson-ilo
Power Switch  Virtual Drives  Keyboard
Installed UNIC vnPxeboot.Jonson from minnesota
Number of bootable targets 1
WWN: 22:43:00:82:ac:00:06:24, LUN: 89
IOP connections Successful GUID: 0x13970301001b02, LID: 146

vHBA m09, Target WWN: 22:43:00:82:ac:00:06:24
Vendor: 3PARdata, Product: UU, Version: 0.0.0.0, Capacity: 32 GB
Bringing up link on port 2
MgBoot: Port 2 GUID: 0x2c903000f3f20 link status UP, LID: 0x3a
SM lid: 0x4f, XDS lid: 0x4f, XDS GUID: 0x1397020100021d
Press < p | P > to skip vHBA and boot over UNIC in 5 seconds, < s | S > to skip
UNIC
Booting over vHBA
Preserving connection to SAN disk

vHBA boot failed
Preserving connection to SAN disk
Now trying to boot over UNIC

MgBoot Version 2.0.9 Built: Mon Sep 12 14:36:30 PDT 2011
gPXE 1.0.1+ -- Open Source Boot Firmware -- http://etherboot.org
Features: HTTP HTTPS iSCSI DNS TFTP bzImage PXE PXEXT

Press Ctrl-B for the gPXE command line...
1024 x 768

```

Figure 5 Boot Messages for Bootable vNIC and Bootable vHBA

When the server attempts to boot from the vHBA first, no OS is accessible so the server bypasses the vHBA and attempts to use the vNIC. After a DHCP handshake, the server learns about the WDS server, which then presents a list of bootable images for the server.

Step 2 Select the appropriate OS that you want to load onto the server. See [Figure 6](#).

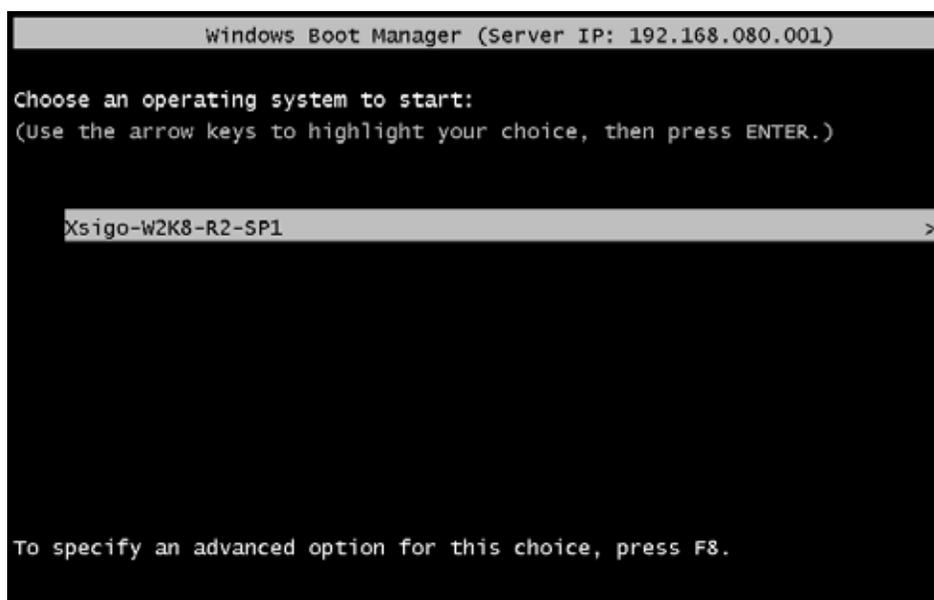


Figure 6 OS Begins to Load

After booting from the image that you select, installation of the Windows OS begins.

- Step 3** When prompted with Windows OS installation dialog, enter the pre-configuration options as shown in [Figure 7](#) on page 44. In this example, the localization options are specified.

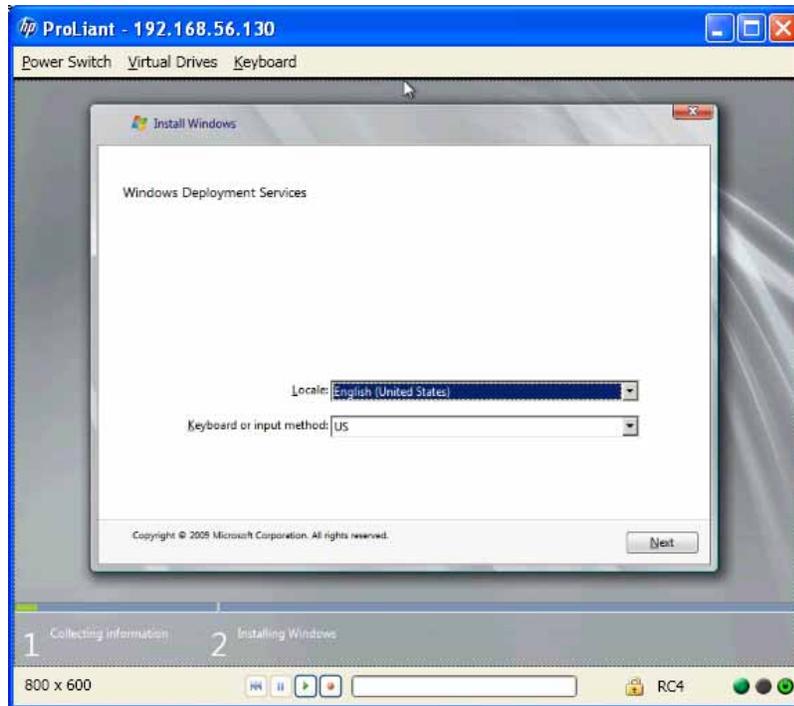


Figure 7 Windows Deployment Service Starts

- Step 4 When prompted to log in, enter the domain and administrator credentials to access WDS services as shown in Figure 8.

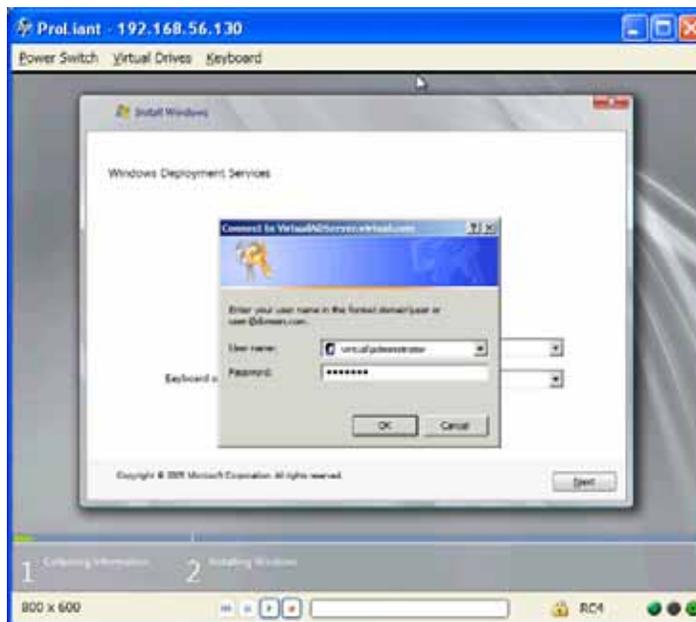


Figure 8 Login to Access WDS Services

- Step 5 Select the Windows OS that you want to install, which in this example is the modified OS with 3.0.0 host drivers. See [Figure 9](#).

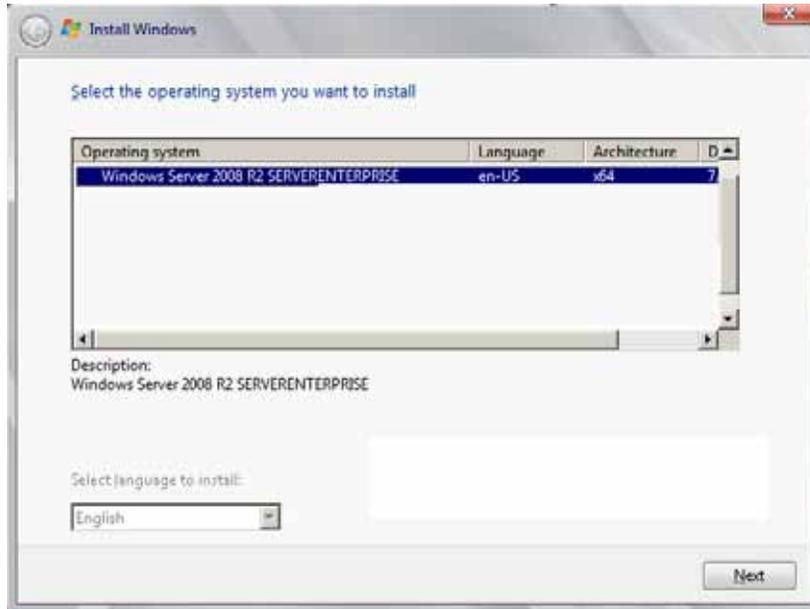


Figure 9 Select the Windows 2008 OS to Load

- Step 6 When the installer prompts for where you want the OS installed, elect the LUN that is presented through the vHBA. [Figure 10](#).

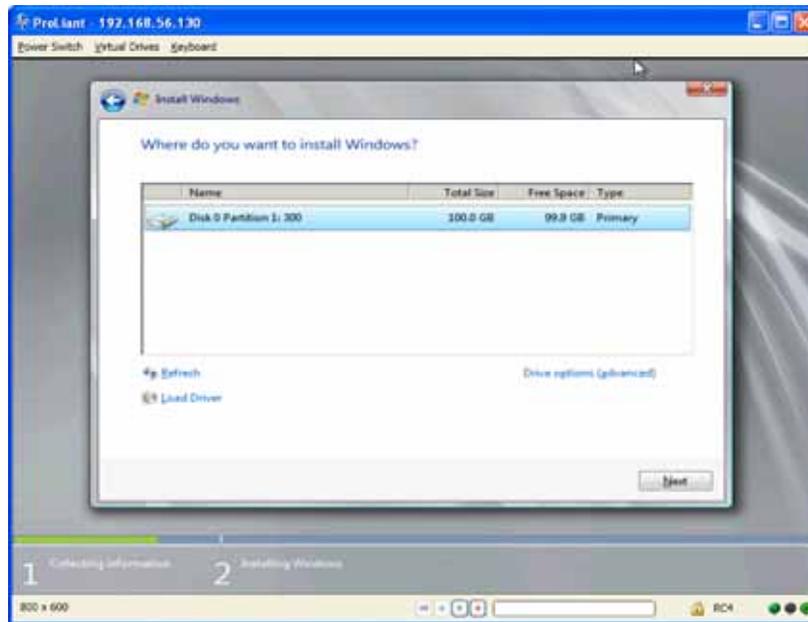


Figure 10 Installing the OS to the SAN LUN connected through the vHBA



Note

---

This step is the heart of SAN Installation. With this step, you are loading the modified OS (which includes the Xsigo host drivers) onto the LUN that is connected to the vHBA.

---

**Step 7** Click *Next* to allow the install to run to completion. See [Figure 11](#).

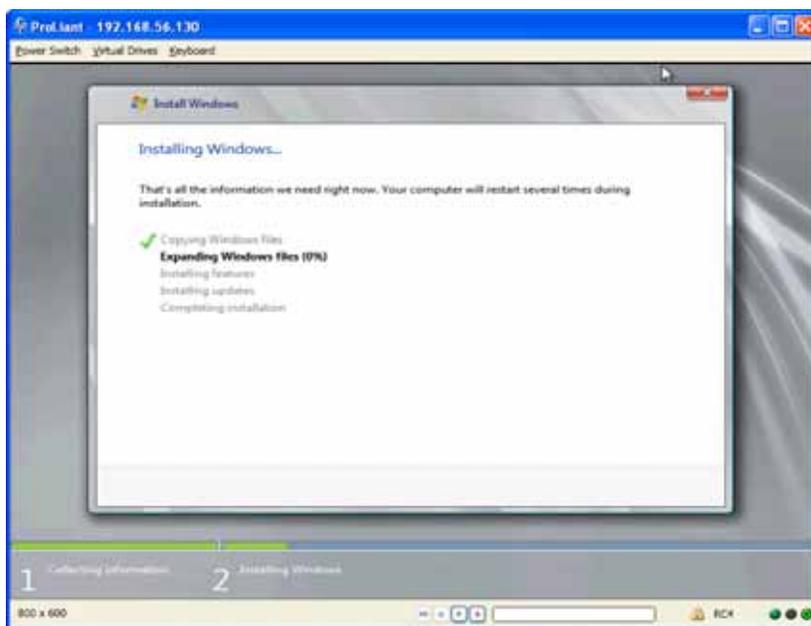


Figure 11 Installation Progress

Step 8 When the installation is complete, the server will be rebooted. On the reboot, the server will next attempt to boot from the vHBA. See [Figure 12](#).

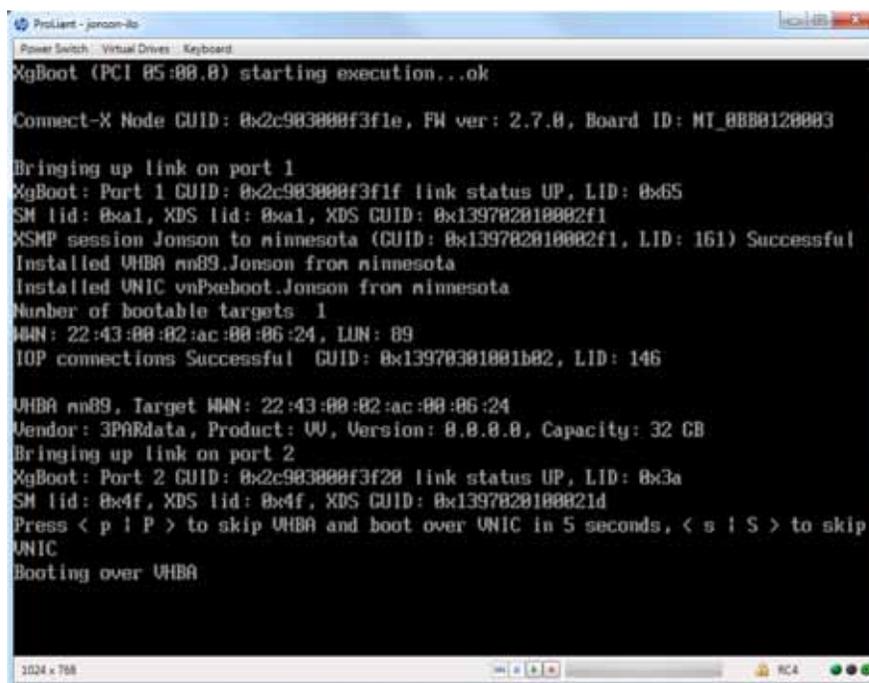


Figure 12 Booting from vHBA

Devices are installed as shown in [Figure 13](#).

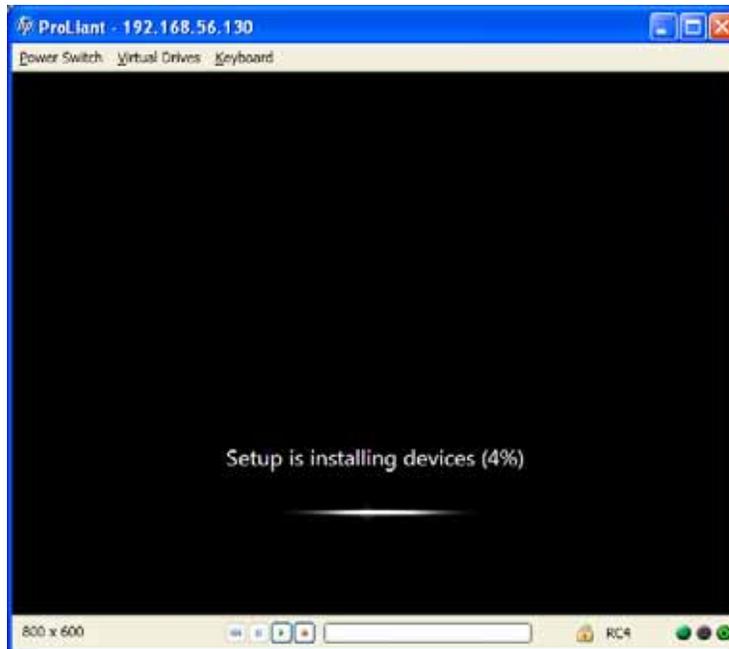


Figure 13 Loading Devices into OS

After the devices are installed, the server reboots and begins loading the OS. You will be prompted for standard pre-install information. For example, you will be required to enter the localization information as shown in [Figure 14](#).

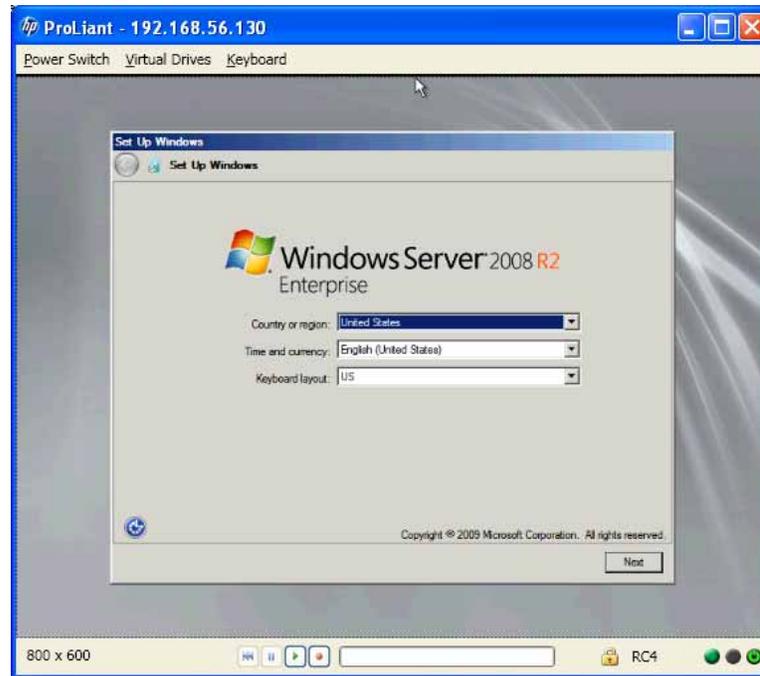


Figure 14 Pre-Install Options — Localization

Step 9 When prompted to log in, provide the AD user name and password credentials as shown in [Figure 15](#).

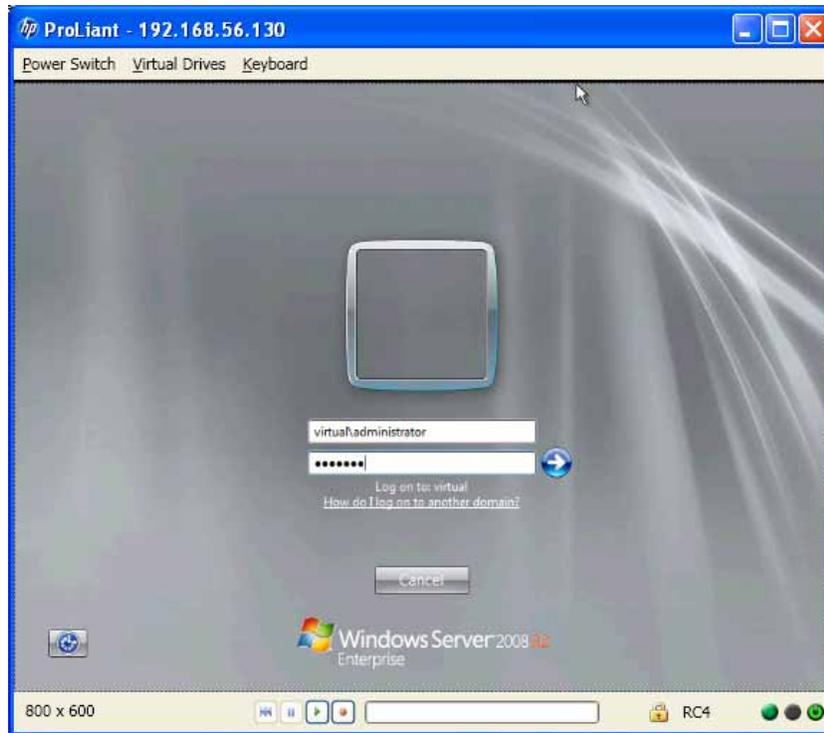


Figure 15 Login In to WDS Server

After logging in, the server is available for standard initial configuration tasks (see [Figure 16](#)). Perform these as needed for a standard server deployment.

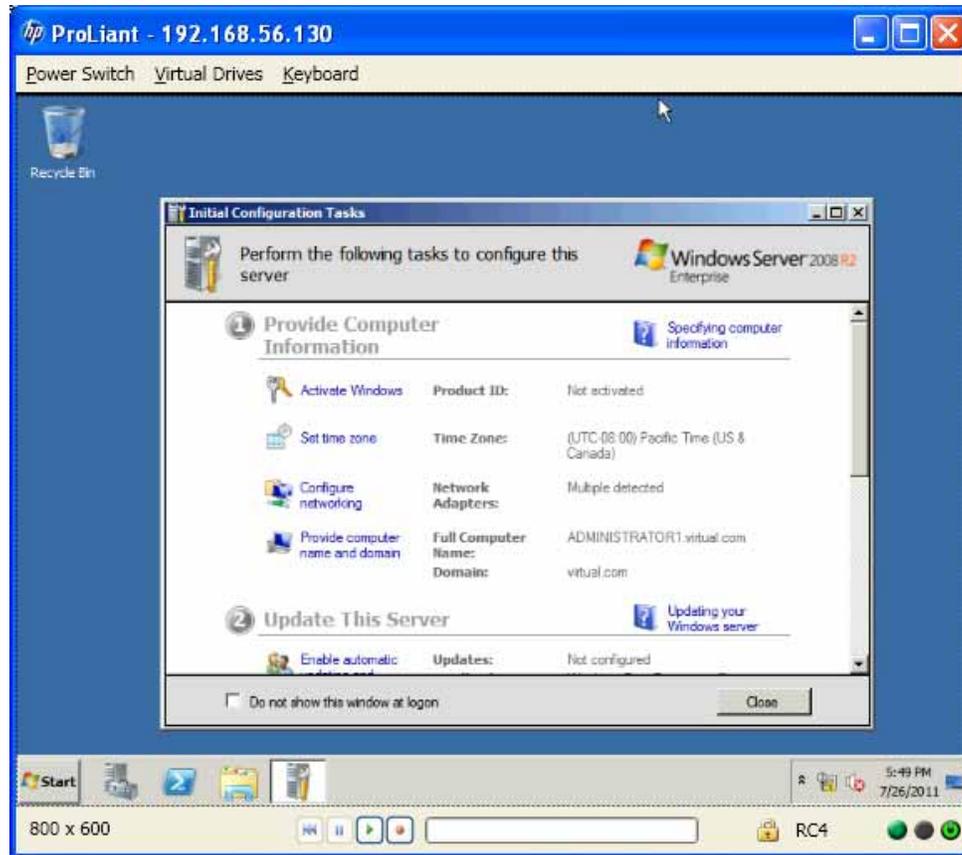


Figure 16 Boot to Windows Desktop and Initial Configuration Tasks

- Step 10 Complete the installation of the Xsigo host drivers by running `setup.exe` with the `/saninstall` option.

## Using sysprep, Cloning, and Imaging of SAN-Installed Systems



Note

This section is not required as part of the procedure. However, if you will be cloning the server configuration you can use this procedure if your hosts are running 2.7.4 or 2.7.4-PVS host drivers and you will be using sysprep.

Another method for cloning systems is to use sysprep to maintain the critical elements of the configuration, but also remove variable parts of the configuration which are likely to change—for example, system name and system time zone. This section documents the procedure for running sysprep and cloning the LUN and modified OS image if servers are running either 2.7.4 or 2.7.4-PVS host drivers.



Note

This section is not required as part of the procedure. However, you will need this procedure if either of the following is true:

- \* You will be cloning the server configuration and did not clone it in [Cloning the Image on the LUN](#).
- \* You have installed additional software and need to duplicated the setup

At this point in the procedure, you have created the modified OS DVD, and installed that OS on a SAN LUN connected through a vHBA.



Caution

Do not attempt to run sysprep after installing the Xsigo host drivers, or you risk having the server run unpredictably, including having the sysprepped system and systems with cloned images crash to a blue screen while booting.

The sysprep tool is located in `C:\Windows\System32\sysprep\sysprep.exe`. Sysprep can be run either from either Windows Explorer (`sysprep.exe`) or through the command-line depending on what you prefer.

- To run sysprep through the Explorer GUI, see [Running sysprep from the GUI](#)
- To run sysprep from the server's CLI see [Running sysprep from CLI](#)

## Running sysprep from the GUI

Follow this procedure to sysprep the system through the server's Explorer GUI:

- Step 1** Start the sysprep tool to display the System Preparation Tool dialog as shown in [Figure 17](#).

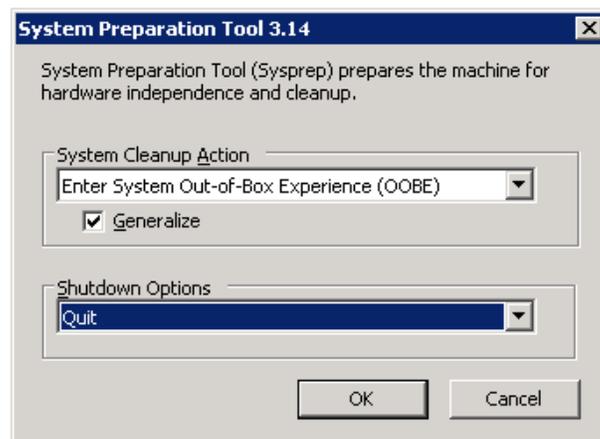


Figure 17 Running sysprep



Caution

---

When setting up sysprep make sure to specify that it quits (not restarts the server) when it completes. By doing so, you allow the `SysPrepBeforeShutdownXsigoScript.vbs` tool to run at the correct time and clean the hardware registry.

---

- Step 2 On the dialog, select Enter System Out-of-Box Experience (OOBE)
- Step 3 Click the Generalize checkbox. This option must be selected.
- Step 4 From the Shutdown Options dropdown menu, select Quit.
- Step 5 Shutdown the system
- Step 6 Proceed to [Cloning the Image on the LUN](#).

### Running sysprep from CLI

Follow this procedure to sysprep the system from the CLI:

- Step 7 Run **sysprep.exe** and supply the required command-line options:

```
C:\Windows\System32\sysprep>sysprep.exe /generalize /oobe /quit
```

- Step 8 Allow sysprep to run to completion.

You will now run another script that prepares the sysprepped server for shutdown.  
Proceed to

### Preparing sysprepped Systems for Shutdown

If you want to clone the LUN and OS image so that it can be applied to multiple Windows servers, you will need to do so in between the server's shutdown and reboot. For sysprepped 2.7.4 or 2.7.4-PVS servers, you will need to run the **SysPrepBeforeShutdownXsigoScript.vbs** which prepares the server for a graceful shutdown. Cloning the LUN and OS image will occur after the script completes, but before the server is rebooted.

To run the script, follow this procedure:

- Step 9 Run `SysPrepBeforeShutdownXsigoScript.vbs` script from below path

```
c:\Xsigo\xsigos-2.7.4\xsigo\cscrip SysPrepBeforeShutdownXsigoScript.vbs
```

- Step 10 Allow the script to run to completion.
- Step 11 Shutdown the server.
- Step 12 If you will be cloning the LUN and modified OS image, proceed to [Cloning the Image on the LUN](#). Otherwise proceed to [Step 13](#).
- Step 13 Restart the server.
- Step 14 Allow the server to completely boot up, and proceed to [Installing Xsigo Host Drivers](#) to load the host drivers.

## Cloning the Image on the LUN

- Step 15 Clone of the LUN or take an image of the LUN as usual.
- Step 16 Boot the system to complete sysprep process.
- Step 17 Allow the server to completely boot up, and proceed to [Installing Xsigo Host Drivers](#) to load the host drivers.

## Installing Xsigo Host Drivers

When you created the modified OS DVD, you injected the Xsigo host drivers into the Windows Server 2008 OS. The drivers are a minimal set of Xsigo host drivers that are used during bootup to instantiate the host and preserve it during bootup so that the full functionality Xsigo host drivers can be installed.

At this point of the procedure, the server has booted to the OS, so you now need to install the full version of Xsigo host drivers. Because the Xsigo host drivers are not installed on the server, you will use the `/saninstall` argument to allow the host drivers to install over the SAN.



Note

---

If you need additional documentation about installing the host drivers, see the latest published *XgOS Hardware and Host Drivers Installation Guide*.

---

Follow this procedure to install the Xsigo host drivers:

- Step 18 Navigate to `c:\xsigo\xsigos-3.0.0.26` folder to start Xsigo software installation (drivers).
- Step 19 Install the Xsigo host drivers with the `/saninstall` option as shown in [Figure 18](#) on page 54. For example through the CLI, you would issue:

```
C:\xsigo\xsigos-3.0.0.26>setup.exe /saninstall
```

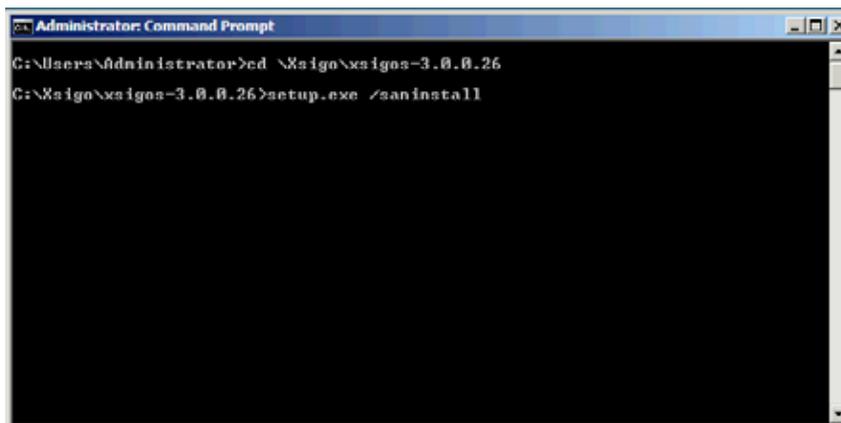


Figure 18 Installing Xsigo Host Drivers with SAN Install Option

When you enter the command, the Welcome dialog is displayed (see [Figure 19](#)), and the host driver installation begins.

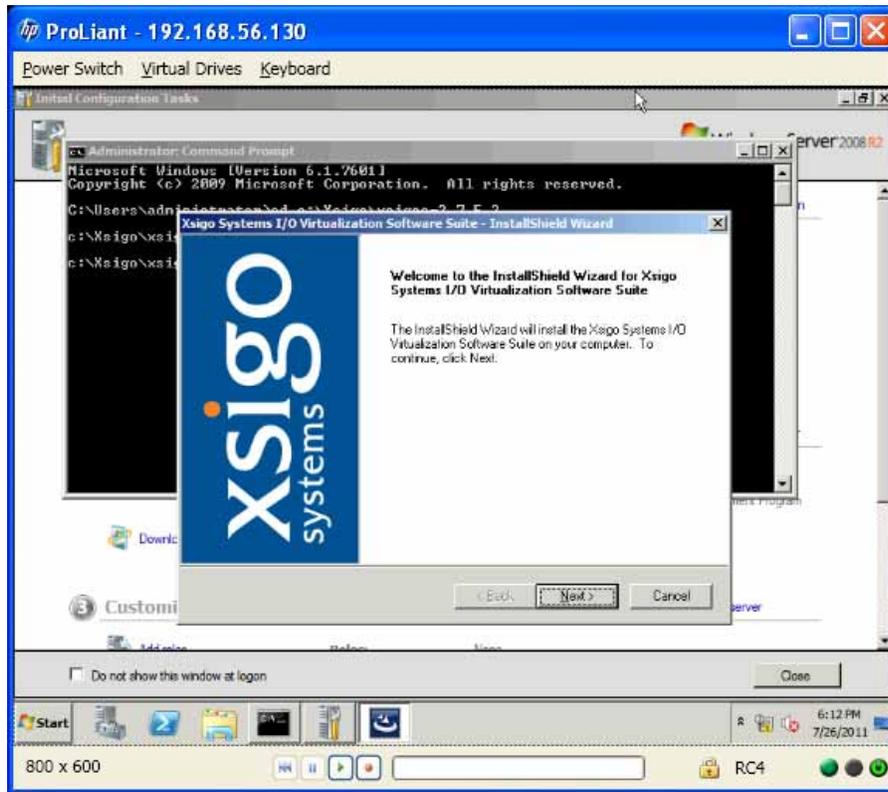


Figure 19 Xsigo Host Driver Installer — Welcome Dialog

The host drivers will install as usual. Follow the on-screen prompts to continue the installation of the host drivers until the installation is complete and you are prompted with the Reboot dialog, as shown in [Figure 20](#).



Figure 20 Xsigo Host Driver Installer — Reboot Server

- Step 20 Select *Yes, I want to restart my computer now*, and click **Finish** to reboot the server.
- Step 21 When the server restarts, the `Xginstdev64.exe` automatically runs at the next administrator log in. (See [Figure 20](#).) This tool updates all devices to run on the correct version of drivers, and checks the devices and drivers to verify that they are functioning predictably.



Note

The `xginstdev64.exe` tool runs at least once to confirm all devices are properly installed, and a reboot might be required if problems are detected with the Xsigo devices.





- Step 2** Check the Xsigo Virtual Bus driver information, and verify that the version number is a variant of 3.0.0.x (for example, 3.0.0.26, shown) or 2.7.4.x (for example, 2.7.4.37, not shown). See [Figure 25](#).

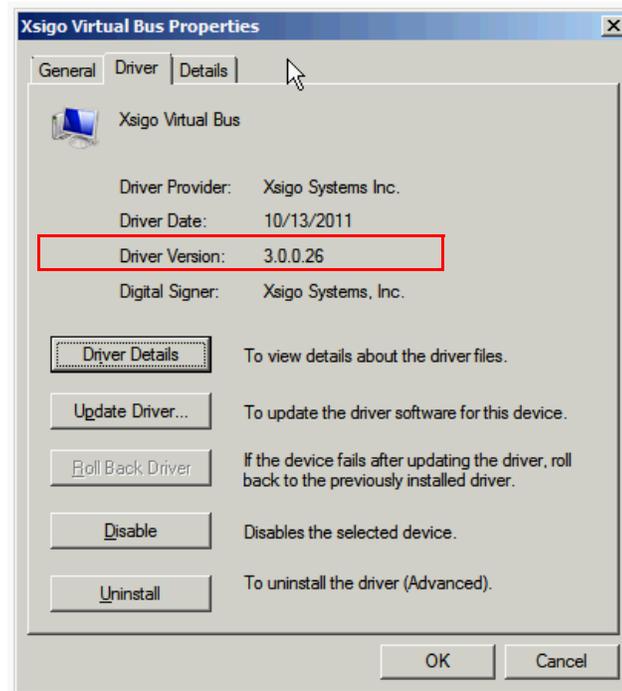


Figure 24 Verifying the Xsigo Virtual Bus Version

- Step 3** Check the Xsigo vHBA driver information, and verify that the version number is a variant of 3.0.0.x (for example, 3.0.0.26, shown) or 2.7.4.x (for example, 2.7.4.37, not shown). See [Figure 25](#).

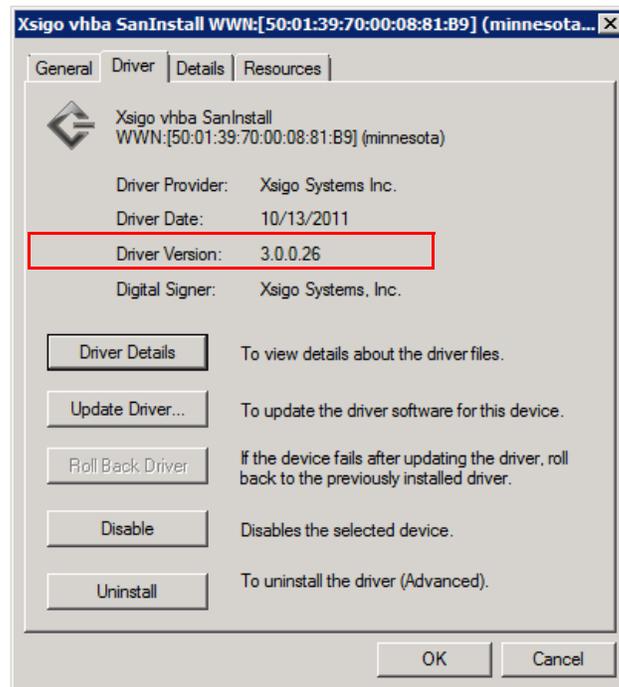


Figure 25 Verifying the Xsigo vHBA Driver Version

- Step 4** Check the Xsigo vNIC driver information and verify that the version number is a variant of 3.0.0.x (for example, 3.0.0.26), shown) or 2.7.4.x (for example, 2.7.4.37, not shown). See [Figure 26](#) on page 61.

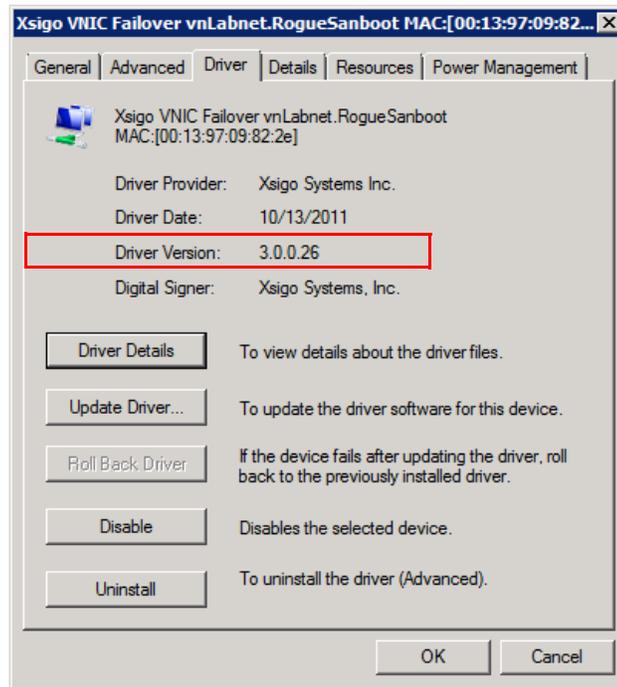


Figure 26 Verifying the Xsigo vNIC Driver Version



## C

cloning and imaging (boot DVD) 21  
cloning and imaging (WDS) 52  
copying install.wim to WDS server 38

## I

injecting host drivers (batch file) 7, 36  
install.wim 38  
installing OS to SAN LUN (boot DVD) 11  
installing OS to SAN LUN (WDS) 41  
installing Xsigo host drivers (boot DVD) 24  
installing Xsigo host drivers (WDS) 54

## P

preparing chassis and vHBA (boot DVD) 10  
preparing chassis, vNIC, and vHBA (WDS) 40  
preparing installer medium (boot DVD) 7  
preparing installer medium (WDS) 35  
preparing the WDS server 38

## R

remastering the OS DVD (boot DVD) 7  
remastering the OS DVD (WDS) 35

## S

SAN Install (boot DVD) 2  
    considerations 6  
    procedure 7  
SAN Install (WDS) 3  
    considerations 35  
    procedure 35  
SAN Install, overview 2  
SAN Install, using boot DVD 5  
SAN Install, using WDS 33  
sysprep (boot DVD) 21  
sysprep (WDS) 52

## V

verifying installation (boot DVD) 29  
verifying installation (WDS) 58

## W

Windows Deployment Service 3

## X

XsigoPkgAddToW2k8\_Or\_W2k8R2\_DVDImage.bat 7,  
35  
XsigoPkgAddToW2k8R2\_Image.bat 7, 36

