



Sun Blade™ X6220 Server Module Operating System Installation Guide

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Preface

This *Sun Blade X6220 Server Module Operating System Installation Guide* contains operating system installation and initial software configuration procedures for bringing the server module to a configurable and usable state.

Product Updates

You can navigate to and download product updates for the Sun Blade™ X6220 server module at <http://www.sun.com/download/index.jsp>.

Related Documentation

For a description of the document set for the Sun Blade X6220 server module, see the *Where To Find Documentation* sheet that is packed with your system and posted at the Sun Blade X6220 server module documentation site at <http://docs.sun.com/app/docs/doc/820-0049-11>.

Translated versions of some of these documents are available on the web site described above in French, Simplified Chinese, Traditional Chinese, Korean, and Japanese. English documentation is revised more frequently and might be more up-to-date than the translated documentation.

For all Sun hardware documentation, go to <http://www.sun.com/documentation>.

For Solaris and other software documentation, go to <http://docs.sun.com>.

For information about the pre-installed Solaris on your system, go to <http://www.sun.com/software/preinstall>.

Using UNIX Commands

This document might not contain information about basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices. Refer to the following for this information:

- The software documentation that you received with your system.
 - The Solaris Operating System documentation at <http://docs.sun.com>.
-

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Typographic Conventions

Typeface*	Meaning	Examples
AaBbCc123	The names of commands, files, and directories; on-screen computer output	Edit your <code>.login</code> file. Use <code>ls -a</code> to list all files. % You have mail.
AaBbCc123	What you type, when contrasted with on-screen computer output	% su password:
<i>AaBbCc123</i>	Book titles, new words or terms, words to be emphasized. Replace command-line variables with real names or values.	Read Chapter 6 in the <i>User's Guide</i> . These are called <i>class</i> options. You <i>must</i> be superuser to do this. To delete a file, enter <code>rm filename</code> .

* The settings on your browser might differ from these settings.

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Please include the following document title and part number with your feedback:

Sun Blade X6220 Server Module Operating System Installation Guide, 820-0045-16

Overview

About Installing an Operating System on a Sun Blade X6220 Server Module

There are several supported operating system (OS) distributions and several ways to install each. This document is intended only as a general guide that refers you to detailed procedures.

Note – This document only covers supported Solaris™, Linux, and VMware OS installation. For instructions on installing the Windows Server 2003 Operating System onto the Sun Blade X6220 server module, see the *Sun Blade X6220 Server Modules Windows Operating System Installation Guide* (820-0188).

Supported Operating Systems

Solaris 10 5/08 may be pre-installed on your Sun Blade X6220 server module. If not, you can install it. You can also install these 64-bit Linux or VMware operating systems:

- RedHat Enterprise Linux, RHEL 4.6 and 5.1
- SUSE Linux Enterprise Server, SLES 9 SP4 and SLES 10 SP1
- VMware 3.0.2 U1 and 3.5 U1

Installation Prerequisites

You must complete the following prerequisite steps before you can begin installing an OS.

- Install the server hardware.
- Configure the service processor.
- Make sure that the blade ILOM version installed on the Sun Blade X6220 is the same as the version on the Chassis Management Module (CMM). ILOM version 2.0.3.1 is recommended.
- Gather needed information, such as IP address and netmask.
- Create a driver CD

Note – If you install a Linux OS by using the Sun Installation Assistant (see [Chapter 2](#)), which is the recommended procedure, you do not need to create a driver CD.

- Create a RAID volume for your OS before you install it (see “[Configuring RAID for Any Operating System from the BIOS](#)” on page 79).

Installation Instructions

[Chapter 3](#) (RHEL), [Chapter 4](#) (SLES), [Chapter 5](#) (Solaris), and [Chapter 6](#) (VMware) provide the information you need to manually install these operating systems.

For all supported Linux operating systems, you can use the Sun Installation Assistant (SIA) described in [Chapter 2](#). The SIA simplifies installation and handles the acquisition and installation of the appropriate drivers automatically. If you choose to install a Linux OS manually, you must obtain and install the drivers yourself.

Note – If you use SIA to install Linux, you do not need to refer to [Chapter 3](#) (RHEL) or [Chapter 4](#) (SLES) except as you are instructed to do in the *Sun Installation Assistant for Windows and Linux User’s Guide* (820-3357).

Installation Options

Whether or not you use SIA, you have three basic options for installing an OS:

1. **Local CD Installation** To install the OS at the server, you will need to use a dongle cable plugged into the front slot of the Sun Blade X6220 server module. The dongle can connect a physical USB CD drive, a keyboard, a mouse, and a monitor. Depending on the equipment you have at hand, you may need a USB hub to increase the number of USB ports available (the Sun-supplied dongle only includes two).
2. **Remote Console Installation** You can use the ILOM Remote Console application to install the OS from a server on your network. ILOM 2.0 or later is required. You can download the ILOM 2.0.3.1 firmware for your X6220 server module from the product download page at <http://www.sun.com/downloads>.
3. **PXE Boot** The network ports for the X6220 server module are provided either through a network express module (NEM, NEM+) or PCI express module (PCI EM) installed on the back of the chassis.

Related Documentation

- *Red Hat Enterprise Linux System Administration Guide* at: <https://www.redhat.com/docs/manuals/enterprise/>
- *SUSE Linux Enterprise Server 10 Installation and Administration Guide* – on the first installation CD under the docu directory as the file `sles-admin.pdf`.
- *Installation and Upgrade Guide for VMware Infrastructure* at: http://www.vmware.com/support/pubs/vi_pubs.html
- *Solaris 10 Installation Guide: Network-Based Installations (817-5504)*
- *Sun Integrated Lights Out Manager 2.0 User's Guide (820-1188)*
or
Integrated Lights Out Manager (ILOM) Administration Guide for ILOM 1.1.1 (820-0280)
- *Sun Installation Assistant for Windows and Linux User's Guide (820-3357)*

The Sun documents can be found at <http://docs.sun.com>.

Using the Sun Installation Assistant (SIA)

This chapter describes operating system installation options using the Sun Installation Assistant (SIA). You can choose to install a Linux or Windows operating system on your Sun x64 architecture server using SIA.

About the Sun Installation Assistant (SIA)

The Sun Installation Assistant (SIA) is a tool that assists in the installation of supported Linux and Microsoft Windows operating systems (OS). With SIA, you can install the OS, the appropriate drivers, and if necessary, additional system software by simply booting the SIA media and following the prompts.

SIA does not automate the OS installation process. You still need to follow the vendor installation procedures for your OS, but you do not have to inventory your system hardware, search for and download the most recent supported Sun device drivers, nor do you need to create a separate driver CD. SIA does that work for you.

Features and Benefits

SIA provides the following features and benefits:

- Bootable media from either a local drive attached to the server (CD/DVD or USB flash drive), a remote redirected network drive (virtual CDRom or ISO image), or a PXE network boot.

- Identification of your platform hardware and installed option cards.
- Identification of the operating system media and the supported device drivers that are required for your system.

Note that SIA does not provide the operating system software. The operating system software must be provided by the customer during the SIA installation.

- Assisted operating system installation on platform-supported bootable media (hard disk, compact flash)
- Installation (if required) of the most recent OS-level device driver(s) supported by Sun, and system software required for your system.
- Option to upgrade server BIOS and Service Processor (SP) firmware on supported servers.
- Script-based unattended SIA installation of a supported Linux OS from a Linux-based PXE server.
- Intuitive error messages if an error or unexpected condition occurs during the installation.
- Event log file readily available, if required, at the `/root` for Linux, or `C:\` for Windows of the newly installed server.

How to Get Started Using SIA

The following information will help you get started using SIA.

- For a complete list of supported Sun server platforms, refer to the SIA information page at:

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

- The Sun Installation Assistant CD ships with most Sun servers that support the x64 processor architecture. You may also download the latest ISO CD image of the Sun Installation Assistant from the Sun Download page at:

<http://www.sun.com/download/index.jsp>

Updates to the SIA program can be obtained easily during the SIA installation by using the Remote Update option in the SIA.

- The *Sun Installation Assistant for Windows and Linux User's Guide* (820-3357) describes using SIA with your server and may be downloaded from the Sun documentation web site at:

<http://docs.sun.com>

Installing Red Hat Enterprise Linux

Note – If you want to mirror your OS, the recommended procedure is to create the RAID before you install the OS. See [“Configuring RAID for Any Operating System from the BIOS”](#) on page 79.

This chapter provides information about *manually* installing Red Hat Enterprise Linux on a Sun Blade X6220 server module. It contains the following sections:

- [“About the Red Hat Enterprise Linux Installation”](#) on page 8
- [“Preparing to Install RHEL”](#) on page 10
- [“Installing RHEL From Distribution Media”](#) on page 10
- [“Installing the RHEL OS Using the Remote Console Application”](#) on page 12
- [“Red Hat Enterprise Linux and PXE”](#) on page 13
- [“Updating the RHEL SCSI Drivers”](#) on page 26
- [“Updating the RHEL Operating System”](#) on page 26

Note – If you use the Sun Installation Assistant to install Red Hat Enterprise Linux, the *only* section of this chapter that concerns you is: [“Updating the RHEL Operating System”](#) on page 26.

About the Red Hat Enterprise Linux Installation

If you have installed Red Hat Enterprise Linux (RHEL) software on other Intel or AMD Opteron servers, you are already familiar with how to install it on a Sun Blade X6220 server module. The two most common methods to install RHEL on your server are to use:

- The RHEL distribution media
- The automatic kickstart installation from RHEL software (installation tree) stored on a Preboot Execution Environment (PXE) network server

Red Hat Installation and Administration Documentation

Before you install the RHEL software on a Sun Blade X6220 server module, consult the following RHEL documentation.

TABLE 3-1 Sources for RHEL Documentation

Document	Description	Where to Find
README file	Contains late-breaking information about system requirements and system configuration for your version of the RHEL software.	On the RHEL CD 1, and online from http://www.redhat.com/docs/
<i>Red Hat Enterprise Linux Quick Installation Guide</i>	Brief printed guide containing useful information to assist you during the installation of RHEL.	Included with the RHEL distribution media
<i>Red Hat Enterprise Linux Installation Guide</i>	Full version of the printed <i>Quick Installation Guide</i> .	Included on the Red Hat Documentation CD, and available for download from http://www.redhat.com/docs/
<i>Red Hat Enterprise Linux Introduction to System Administration</i>	Introductory information for RHEL system administrators.	Available for download from http://www.redhat.com/docs/manuals/enterprise/

TABLE 3-1 Sources for RHEL Documentation (*Continued*)

Document	Description	Where to Find
<i>Red Hat Enterprise Linux System Administration Guide</i>	Information on customizing the RHEL software.	Available for download from http://www.redhat.com/docs/manuals/enterprise/
<i>System Administration for Diskless Booting</i>	Information on configuring your server and Red Hat Linux for diskless booting.	Available for download as the <i>Red Hat Enterprise Linux Installation Guide for the x86, Itanium™, and AMD64 Architectures</i> at http://www.redhat.com/docs/manuals/enterprise/
<i>Red Hat Enterprise Linux Security Guide</i>	Guide for securing the RHEL software.	Available for download from http://www.redhat.com/docs/manuals/enterprise/

If you will need to know the logical names of your physical Internet interfaces when configuring your OS, refer to the appendix: “[Identifying Logical and Physical Network Interface Names for Linux OS Configuration](#)” on page 87

Task Map for RHEL Installation

Consult [TABLE 3-2](#) to determine which topics documented in this Guide are relevant to the installation tasks that you want to perform.

TABLE 3-2 Task Map for Installing RHEL

Installation Task)	Relevant Topic
Collect information about your system and network.	“ Preparing to Install RHEL ” on page 10
Install RHEL from distribution media using a local or network-attached CD or DVD drive.	“ Installing RHEL From Distribution Media ” on page 10
Update RHEL operating system files and drivers.	“ Updating the RHEL Operating System ” on page 26

Preparing to Install RHEL

You can install the RHEL software from a local CD/DVD, or the network. However, you will need to collect some information about your system and your network before you proceed with any of these installation methods. Before you begin installing the RHEL OS, review the procedures listed in this chapter for your installation method.

Additional Software Updates or Patches

After installing the RHEL software on the server, you might also need to update your system software with patches and packages. See “[Updating the RHEL Operating System](#)” on page 26 for details.

Obtaining Updated Media Kits

To install RHEL updates on the Sun Blade X6220 server module, you will need to obtain the RHEL 4 or RHEL 5 Update Media Kit, available at <http://rhn.redhat.com>

You will need your enterprise account information to download the updated ISO images. An enterprise account is an account that the customer creates to access Red Hat's support network after purchasing the RHEL media kit.

Installing RHEL From Distribution Media

RHEL provides both a text mode and an easy-to-use graphical interface for installing and configuring the operating system. At the boot prompt, you can select the interface that you want to use. Both options are shown later in this section.

Before You Begin

Installing RHEL software from CDs consists of the following procedures:

1. Download the updated media kit from <http://rhn.redhat.com>.
See “Obtaining Updated Media Kits” on page 10.
2. Install the RHEL software.
3. Update the RHEL software.
See “Updating the RHEL Operating System” on page 26.

Required Items

Installation from distribution media requires the following items:

- Sun Blade X6220 server module equipped with equipped the following four items:
 - USB keyboard and mouse
 - USB CD/DVD drive
 - Monitor
 - Multi-port dongle cable to plug into the front slot of the Sun Blade X6220 server module. Refer to the *Sun Blade X6220 Server Module Installation Guide*, 820-0044.
- RHEL media CD set

▼ To Install RHEL From Local Media

1. **Connect the USB CD/DVD drive into the USB port of the dongle.**
2. **Power on the system.**
3. **Insert the RHEL Distribution CD 1 into the DVD/CD drive connected to the Sun Blade X6220 server module and reboot the server.**
The server will boot from the CD and display a `boot:` prompt.
4. **At the `boot` prompt, select one of the following:**
 - For text mode, enter the following command:
`boot: linux text`
 - For graphical mode, press Enter.
5. **Refer to the *Red Hat Enterprise Linux Installation Guide* to guide you through the remainder of the installation process.**
6. **Proceed to “Updating the RHEL Operating System” on page 26.**

7. Update the SCSI drivers.

See “[To Update the RHEL SCSI Drivers](#)” on page 26.

If the installation process does not recognize the CD inserted, please refer to the *Sun Blade X6220 Modular Server Product Notes*, 820-0048 (CR 6523141).

Installing the RHEL OS Using the Remote Console Application

This section explains how to install the RHEL operating system on your server using the Integrated Lights Out Manager (ILOM) Remote Console application.

Use the following procedure to install the RHEL 4 U4 (or later) OS using the ILOM Remote Console application.

Note – Read the *Integrated Lights Out Manager (ILOM) Administration Guide* before completing the following steps. This guide provides details on using the ILOM Service Processor Web interface to redirect the console.

▼ To Install Using the ILOM Remote Console Application

1. **Locate your RHEL installation CD/DVD or the equivalent ISO images.**
2. **Connect to the ILOM Service Processor Web interface.**
3. **Click the Remote Control tab, then the Mouse Mode Settings tab.**
4. **If necessary, change the mouse mode to Relative Mouse Mode.**
See the “Remote Console Application” chapter of the *Integrated Lights Out Manager (ILOM) Administration Guide* for further instructions.
5. **Click the Redirection tab.**
6. **Click the Launch Redirection button to start the JavaRConsole application.**
7. **Log in to the JavaRConsole.**
8. **Start keyboard and mouse redirection.**

Select Keyboard and Mouse in the Devices menu.

9. Start CD/DVD redirection.

From the JavaRConsole Devices menu, you can redirect the CD in two ways:

- If you are installing a physical CD into the remote console CD ROM drive, insert the CD into the drive and select CD-ROM.
- If you are using an ISO image installed on the remote console, select CD-ROM image and provide the location of the iso file.

Note – Floppy diskette redirection is also available through the JavaRConsole. See the *Integrated Lights Out Manager (ILOM) Administration Guide* for more details.

10. Turn on the server using the ILOM Web interface.

11. Set up the BIOS as follows:

- a. Press Ctrl-E to enter BIOS Setup Utility.
- b. Select the Boot menu.
- c. Select CD/DVD Drives.
- d. Set AMI Virtual CD as the first boot device.
- e. Press F10 to save changes and exit.
- f. Reboot.
- g. Press Ctrl-P to select CD/DVD as the boot device.

12. When the boot prompt appears, enter `linux text`.

13. When prompted to test the CD media before installation, select Skip if you do not want the media test to run.

14. Refer to the *Red Hat Enterprise Linux Installation Guide* to guide you through the remainder of the installation process.

Red Hat Enterprise Linux and PXE

The on-board network interface card (NIC) in your Sun Blade X6220 server module supports the Preboot Execution Environment (PXE) network booting protocol. The system BIOS and network interface BIOS on your server automatically query the network for a DHCP server. If the DHCP server on the network has been configured

to support the PXE protocol and PXE image servers on the same network, then the BIOS on your system can be used to install a bootable Red Hat Enterprise Linux (RHEL) image on your server.

Tip – PXE is a powerful and convenient solution for setting up a number of Sun Blade X6220 server modules so their configuration is identical.

Task Map

If you don't have PXE set up on your network and you would like to take advantage of PXE to install RHEL on your network, you need to perform the following tasks.

Task	Related Sections
Obtain the updated media kit at http://rhn.redhat.com .	"Obtaining Updated Media Kits" on page 10.
Set up your Linux network and PXE server.	"Preconfiguring Your Network to Support PXE Installation of RHEL" on page 14.
Install RHEL images on that PXE server.	"Creating a PXE Install Image on the PXE Server" on page 22.
Configure your server to install from a RHEL image on a PXE server.	"Installing RHEL From a PXE Server" on page 24.

Preconfiguring Your Network to Support PXE Installation of RHEL

This section describes how to preconfigure a network running RHEL to support PXE installation of RHEL software on a server. These procedures assume that you already have a bootable server that is running a version of the RHEL operating system to use as a PXE server.

Preconfiguring your network for PXE installation involves the following procedures:

- Download the Tools and Drivers CD Image
See "[To Download the Tools and Drivers CD Image](#)" on page 15
- Copy Files From the Tools and Drivers CD
See "[To Copy Files From the Tools and Drivers CD](#)" on page 15.
- Configure a DHCP Server
See "[To Configure a DHCP Server](#)" on page 16.

- Install Portmap
See “[To Install Portmap on Your DHCP Server](#)” on page 17.
- Configure the TFTP Service
See “[To Configure the TFTP Service on Your DHCP Server](#)” on page 18.
- Install and Configure the neopxe Boot Server Daemon
See “[To Install and Configure the neopxe Boot Server Daemon](#)” on page 18.
- Configure the NFS Service
See “[To Configure the NFS Service on Your DHCP Server](#)” on page 20.
- Disable the Firewall
See “[To Disable the Firewall](#)” on page 21

Required Items

Preconfiguring your network for PXE installation requires the following items:

- RHEL server equipped with:
 - A USB CD/DVD drive connected to server module through front dongle port
 - A USB keyboard
 - A Monitor
- RHEL media set
- Tools and Drivers CD (707-0095)

▼ To Download the Tools and Drivers CD Image

- **If you do not have the Tools and Drivers CD, download the ISO image at <http://www.sun.com/servers/blades/x6200/downloads.jsp>.**

If you create your own CD from the download site, use this CD in place of the Tools and Drivers CD referenced in this procedure.

▼ To Copy Files From the Tools and Drivers CD

This section describes how to copy the PXE support files, which are required for PXE configurations, from the Tools and Drivers CD. The steps below use RHEL 4. If necessary replace `rhel4` with the file name that corresponds to your update.

1. **Insert the Tools and Drivers CD into the DHCP/PXE server.**

2. Create a temporary (/tmp) directory for the PXE support files, or use an existing /tmp directory. If a /tmp directory does not exist, enter the following command:

```
# mkdir /tmp
```

3. Enter the following commands to copy the files to the /tmp/ directory:

```
# mount /dev/cdrom /mnt/cdrom
```

```
# cp /mnt/cdrom/Linux/pxe/rhel4-pxefiles.tar.gz /tmp/
```

4. Uncompress and extract the contents of the tar file into the /tmp/ directory. Enter:

```
# cd /tmp
```

```
# tar -zxvf rhel4-pxefiles.tar.gz
```

When you extract the file, a directory with all required files is created at /tmp/rhel4-pxefiles/.

▼ To Configure a DHCP Server

Complete the following steps on the server that will be your DHCP server.

1. Turn on the server and log in as superuser.
2. Determine whether the DHCP server package is already installed on the server. Enter the following command:

```
# rpm -qa | grep dhcp-
```

3. If the DHCP server package is not listed, insert the RHEL CD 5 and install the DHCP server. Enter the following commands:

```
# mount /dev/cdrom /mnt/cdrom
```

```
# rpm -Uvh /mnt/cdrom/RedHat/RPMS/dhcp-*.rpm
```

4. Enter the following command:

```
# umount /mnt/cdrom
```

5. Remove the CD from the CD/DVD drive.

6. Set up your DHCP configuration file (for example, `/etc/dhcpd.conf`) so that only PXEClient requests receive PXEClient responses.

Enter the following entry to the DHCP configuration file (refer to the `dhcpd.conf` man page for more information):

```
class "PXE" {match if substring(option vendor-class-
identifier, 0, 9) ="PXEClient"; option vendor-class-
identifier "PXEClient"; vendor-option-space PXE;next-server
n.n.n.n;}
```

where `n.n.n.n` is the IP address of the server.

Note – If the server does not already have a `dhcpd.conf` file in its `/etc` directory, you can copy the `dhcpd.conf` file from the sample DHCP configuration file in the `/tmp/rhel4-pxefiles` directory.

7. In the DHCP configuration file, edit the `server-identifier` entry:

```
server-identifier n.n.n.n
```

Where `n.n.n.n` is the PXE/dhcp server's IP address.

8. Also in the DHCP configuration file, find the subnet entry fields:

```
subnet 1.2.3.0 netmask 255.255.255.0 {
    range dynamic-bootp 1.2.3.100 1.2.3.200;
    option routers 1.2.3.1;
    option broadcast-address 1.2.3.225;
}
```

Edit the `subnet`, `range`, `router` and `broadcast-address` entries according to the PXE/dhcp server's network configuration.

9. Start the DHCP service. Enter:

```
# service dhcpd start
```

10. Configure the server to always start DHCP. Enter:

```
# chkconfig dhcpd on
```

▼ To Install Portmap on Your DHCP Server

1. Determine whether the portmap server package is already installed on the server. Enter:

```
# rpm -qa | grep portmap
```

2. If `portmap` is not listed, insert the RHEL CD 2 and install the `portmap` service by entering the following commands:

```
# mount /dev/cdrom /mnt/cdrom
# rpm -Uvh /mnt/cdrom/RedHat/RPMS/portmap-*
```

3. Remove the CD from the server after you enter the following command:

```
# umount /mnt/cdrom
```

▼ To Configure the TFTP Service on Your DHCP Server

1. Determine whether the TFTP server package is already installed on the server. Enter:

```
# rpm -qa | grep tftp-server
```

2. If the TFTP server package is not listed, insert the RHEL CD 4 and install the TFTP service by entering the following commands:

```
# mount /dev/cdrom /mnt/cdrom
# rpm -Uvh /mnt/cdrom/RedHat/RPMS/tftp-server*
```

3. Remove the CD from the server after you enter the following command:

```
# umount /mnt/cdrom
```

4. Edit and save the `/etc/xinetd.d/tftp` file.

Make the following changes:

- Change the `-s /tftpboot` entry to `-v -s /home/pxeboot`.
- Change the `disable` attribute to `no`.

5. Restart the `xinetd` server. Enter:

```
# service xinetd restart
```

▼ To Install and Configure the neopxe Boot Server Daemon

Complete the following steps on your DHCP server. The `neopxe` server is designed for use with a DHCP server that is running on the same system.

1. Install the `neopxe` boot server daemon onto the system that is your DHCP server. Enter:
2. Append the path `/usr/local/sbin/neopxe` to the `rc.local` file by entering the following command, making sure to use two greater-than signs:

```
# cd /tmp/rhel4-pxefiles/neopxe-0.2.0
# ./configure
# make
# make install
```

3. Copy the PXE Linux image from the `/tmp/` directory. Enter:

```
# mkdir /home/pxeboot
# cp /tmp/rhel4-pxefiles/pxelinux.0 /home/pxeboot
```

4. Configure the PXE Linux image. Enter:

```
# mkdir /home/pxeboot/pxelinux.cfg/
# touch /home/pxeboot/pxelinux.cfg/default
```

5. Edit the `/usr/local/etc/neopxe.conf` configuration file, which is read by `neopxe` at startup.
 - If the `neopxe.conf` file is not in the `/usr/local/etc` directory, copy it from the `/tmp/rhel4-pxefiles/neopxe-0.2.0/` directory.
 - A valid configuration file must have entries for each of the following lines, including at least one service line.

```
ip_addr=n.n.n.n
prompt=boot-prompt-string
prompt_timeout=timeout
service=service-number,boot-server,boot-file,label
```

Where:

- *n.n.n.n* is the IP address of your PXE server.
- *boot-prompt-string* is the character string displayed during a network boot that prompts the user to press the F8 key for a boot menu.
- *timeout* is the number of seconds the prompt is displayed before the server defaults to the first service for booting.
- *service-number* is an integer in the range of 1 to 254 that identifies the boot service.
- *boot-server* is the IP address of the boot server for that boot service.

- *boot-file* is the name of the boot file that is read from your `/home/pxeboot` directory.
- *label* is the text string that is displayed when the boot menu is invoked by pressing the F8 key.

For example:

```
ip_addr=192.168.0.1
prompt=Press [F8] for menu.
prompt_timeout=10
service=1,192.168.0.1,pxelinux.0,Linux
service=2,192.169.0.1,nbp.unknown,Solaris
```

Note – Refer to the `neopxe.conf` man page for more information.

6. Start the `neopxe` daemon. Enter:

```
# /usr/local/sbin/neopxe
```

▼ To Configure the NFS Service on Your DHCP Server

1. Determine whether the NFS service package is already installed on the server. Enter:

```
# rpm -qa | grep nfs-utils
```

2. If the NFS service package is not listed, insert the RHEL CD 2 and install the NFS service with the following commands:

```
# mount /dev/cdrom /mnt/cdrom
# rpm -Uvh /mnt/cdrom/RedHat/RPMS/nfs-utils-*
```

3. Remove the CD from the server after you enter the following command:

```
# umount /mnt/cdrom
```

4. Edit and save the `/etc/exports` file to add the following line to it:

```
/home/pxeboot *(no_root_squash,no_subtree_check,insecure)
```

5. Start the NFS service. Enter:

```
# service nfs start
```

6. Configure the server to always start the NFS service. Enter:

```
# chkconfig nfs on
# chkconfig nfslock on
```

Note – If you are using a DNS server, verify that DNS entries exist for the range of addresses defined in the PXE subnet dynamic-bootp entry in the `dhcpd.conf` file. If you are not using a DNS server, edit the `/etc/hosts` file to add the range of host addresses found in the PXE subnet dynamic-bootp entry in the `dhcpd.conf` file.

▼ To Disable the Firewall



Caution – Security vulnerability. When you disable the firewall protection on the system that is your PXE server, the security of the data on that server cannot be ensured. If this server is networked outside of your local intranet, be sure to re-enable the firewall after downloading software to PXE clients.

If you enabled firewall security when you installed RHEL software on the system that will be your PXE server, complete the following steps to disable the firewall so that PXE clients can download from the server.

1. Stop the ipchains service. Enter the command:

```
# service ipchains stop
```

2. Stop the iptables service. Enter the command:

```
# service iptables stop
```

3. Stop the ipchains service from starting when you restart the server. Enter the command:

```
# chkconfig ipchains off
```

4. Stop the iptables service from starting when you restart the server. Enter the command:

```
# chkconfig iptables off
```

Note – You might encounter error messages if the ipchains service is not installed on the server. You can safely ignore these messages.

Installing RHEL From the Network

When you have completed all the previous configuration steps, do the following.

1. Reboot the PXE/DHCP server.

2. Refer to the next section, [Creating a PXE Install Image on the PXE Server](#).

Creating a PXE Install Image on the PXE Server

This procedure describes how to create a Preboot Execution Environment (PXE) install image on the same server that is your DHCP server so that it will also act as your PXE server. The PXE server provides the operating system files to your PXE client.

Before You Begin

Before you install a RHEL image on your PXE server, you must configure your Linux network to support PXE images. See [“Preconfiguring Your Network to Support PXE Installation of RHEL” on page 14](#).

Required Items

The PXE installation procedure requires the following items:

- A CD/DVD drive on the DHCP Server
- RHEL 4 U4 (or later) or RHEL 5 media CD set (see [“Obtaining Updated Media Kits” on page 10](#))
- Tools and Drivers CD (707-0095)

▼ To Create a RHEL Image on Your PXE Install Server

Note – For RHEL 5.x, please replace the appropriate filenames with the names of the RHEL5 files supplied in the resource CD.

1. **Insert the Tools and Drivers CD into the CD/DVD drive of the DHCP/PXE server.**

2. Enter the following commands to copy the Sun support files from the CD to the /tmp directory on your DHCP/PXE server:

```
# mount /dev/cdrom /mnt/cdrom
# cp -a /mnt/cdrom/Linux/pxe/rhel4-pxefiles.tar.gz /tmp
# cd /tmp
# tar -zxvf rhel4-pxefiles.tar.gz
# umount /mnt/cdrom
```

3. Set up the directory structure that will hold the RHEL software. Enter:

```
# mkdir -p /home/pxeboot/rhel4/
```

Note – You can use a different target directory than the /home/pxeboot/rhel4/ directory shown below. The examples in this procedure use this directory.

4. For each RHEL Distribution CD, enter the following commands to copy the contents of the CD to the appropriate PXE target subdirectory:

```
# mount dev/cdrom /mnt/cdrom
# cp -a /mnt/cdrom/* /home/pxeboot/rhel4/
# umount /mnt/cdrom
```

Note – If you are prompted whether to overwrite any existing files, enter **y** to overwrite the files. Eject and insert RHEL CDs only when the CD/DVD drive is unmounted.

5. Copy the kickstart file ks.cfg to your PXE server. Enter:

```
# cp /tmp/rhel4-pxefile/ks.cfg /home/pxeboot/rhel4/
```

The kickstart configuration file contains a configuration that might not be optimal for your operating environment. Modify the file as necessary to suit your environment.

6. Copy the initial ramdisk from the PXE files uncompressed in Step 2 into the base of the PXE image. Enter:

```
# cp /tmp/rhel4-pxefiles/initrd.img /home/pxeboot/rhel4/
```

7. On your PXE server, edit and save the kickstart file:

```
/home/pxeboot/rhel4/ks.cfg.
```

Edit the nfs line is as follows:

```
nfs --server n.n.n.n --dir /home/pxeboot/rhel4/
```

Where *n.n.n.n* is the IP address of your PXE server. Ensure that the location indicated after --dir is pointing to the top level of your image.

8. Create a default directory for the `pxelinux.cfg` image:

```
# mkdir /home/pxeboot/pxelinux.cfg/default
```

9. Add the following entry to the file `/home/pxeboot/pxelinux.cfg/default`:

Note – Enter the text block from `append` through `ks.cfg` as one continuous string with no returns.

```
default rhel4
label rhel4
kernel rhel4/vmlinuz
append ksdevice=eth0 console=tty0 load_ramdisk=1
initrd=rhel4/initrd.img network
ks=nfs:n.n.n.n:/home/pxeboot/
```

Where `n.n.n.n` is the IP address of your PXE server.

Note – For console-based installations, add `console=ttyS0,9600` to the `append` line.

10. Save the modified version of the `/home/pxeboot/pxelinux.cfg/default` file.

11. Insert the RHEL Distribution CD1 into the CD/DVD drive of the DHCP/PXE server.

```
# mount /dev/cdrom /mnt/cdrom
# cp /mnt/cdrom/images/pxeboot/vmlinuz /home/pxeboot/rhel4/
```

Installing RHEL From a PXE Server

This procedure describes how to configure your Sun Blade X6220 server module to initiate the request to download the boot image file from the PXE/DHCP server and how to install the RHEL boot image onto your Sun Blade X6220 server module.

Before You Begin

Before you configure your server to install RHEL from a PXE server, you need to have done the following:

- Configured your Linux network to support a PXE server. See [“Preconfiguring Your Network to Support PXE Installation of RHEL”](#) on page 14.

- Installed a RHEL image on that Linux PXE server. See [“Creating a PXE Install Image on the PXE Server”](#) on page 22.

▼ To Install a RHEL from a PXE Server

1. **Connect the PXE client to the same network as the PXE server, and power on the PXE client.**

The PXE client is the target Sun Blade X6220 server module to which you are installing RHEL software.

2. **When the PXE client prompts you for a network boot, press the F12 key.**

The PXE client connects to the PXE server and attempts to obtain an IP address from the DHCP server.

3. **When prompted, press the F8 key to begin downloading the PXE boot image.**

4. **At the `boot:` prompt, enter in the label you gave the image when you installed a RHEL image on the PXE server.**

The RHEL install image downloads onto the target Sun Blade X6220 server module.

5. **To configure the Linux operating system for your server, refer to the manual that is shipped with your RHEL media kit.**

6. **Update the SCSI drivers.**

See [“To Update the RHEL SCSI Drivers”](#) on page 26

7. **Update the operating system files.**

See [“Updating the RHEL Operating System”](#) on page 26.

Updating the RHEL SCSI Drivers

▼ To Update the RHEL SCSI Drivers

1. Insert the Tools and Drivers CD for Sun Blade X6220 and mount it onto the directory `/mnt` as explained in the previous section. Enter the following commands:

For RHEL 4.6 and older, 32 bit:

```
# cd /mnt/Linux/drivers
# rpm -ivh mptlinux-redhat4.0-3.12.27.00-2.i686.rpm
```

For RHEL 4.6 and older, 64 bit:

```
# cd /mnt/Linux/drivers
# rpm -ivh mptlinux-redhat4.0-3.12.27.00-2.x86_64.rpm
```

For RHEL 5.0 and 5.1, 64 bit:

```
# cd /mnt/Linux/drivers
# rpm -ivh mptlinux-4.00.22.00-1-rhel5.x86_64.rpm
```

2. Installation of the new drivers is now complete. Reboot the blade for the changes to take effect. Enter:

```
# reboot
```

Updating the RHEL Operating System

Since software is constantly being updated, your distribution media might not contain the most up-to-date versions of the operating system.

The following procedures assume that you have already installed the RHEL software on the Sun Blade X6220 server module. This procedure explains how to update the RHEL installation with the latest OS.

To use the RHEL 5 update program, your server must be registered with the RedHAT Network (RHN).

▼ To Update the RHEL4 Software

This procedure assumes that your system has access to the internet.

- 1. Set up the `up2date` program on the server.**

Refer to the documentation included with your RHEL media kit for details.

- 2. Run the `up2date` program.**

Select the kernel packages in the `available package updates` section.

▼ To Update the RHEL5 Software

Your system must have access to the internet and be registered with the RedHat Network.

- 1. To run the `yum` update program, enter:**

```
# yum
```

The program checks that the machine is registered with RedHat Network. If so, `yum` downloads necessary updates from the RedHat Network repository.

- 2. Answer the questions and make your choices before the packages are downloaded and installed.**

You should periodically update your system using `yum`.

For more information, refer to the man page. Enter:

```
# man yum
```


Installing SUSE Linux Enterprise Server 9 and 10

Note – If you want to mirror your OS, the recommended procedure is to create the RAID before you install the OS. See [“Configuring RAID for Any Operating System from the BIOS” on page 79](#).

This chapter contains information about *manually* installing SUSE Linux Enterprise Server (SLES) 9 and 10 operating system (OS) on a Sun Blade X6220 server. It contains the following sections:

- [“Installing SLES 9” on page 30](#). Describes installation of SLES 9 from a local or remote CD.
- [“Installing SLES 10” on page 35](#). Describes installation of SLES 10 from a local or remote CD.
- [“Preconfiguring Your Network to Support PXE Installation of SLES 9 or 10” on page 39](#). Describes the necessary pre-configuration steps for PXE installation.
- [“Installing SLES 9 Using PXE” on page 47](#). Describes installation of SLES 9 from a PXE image stored on a network-attached PXE server.
- [“Installing SLES 10 Using PXE” on page 52](#). Describes installation of SLES 10 from a PXE image stored on a network-attached PXE server.
- [“Updating the SLES 9 or 10 Operating System” on page 55](#). Describes updating the OS after it has been installed.
- [“Updating the SLES SCSI Drivers” on page 56](#) describes the procedures for updating the SCSI drivers.

Note – If you use the Sun Installation Assistant to install SLES 10, the *only* section of this chapter that concerns you is: [“Updating the SLES 9 or 10 Operating System” on page 55](#).

The most common methods to install SLES 9 or 10 on your server are to use:

- Installation from your SLES 9 or 10 distribution media from a local or remote CD (see “[Installing SLES 9 From Distribution Media](#)” on page 32 or “[Installing SLES 10 From Distribution Media](#)” on page 36).
- Installation from the network, either from a Preboot Execution Environment (PXE) image stored on a PXE server on your local network or from an image stored elsewhere on your network (see “[Preconfiguring Your Network to Support PXE Installation of SLES 9 or 10](#)” on page 39)

Installing SLES 9

Note – The minimum supported SLES version is SLES 9 Service Pack 3 (SP3).

SLES 9 Installation and Configuration Documentation

Before you install SLES 9 Linux on your server, consult the following SLES 9 documentation

- **README file**—The README file contains late-breaking information about system requirements and system configuration for your version of SLES 9. It is available on the SLES 9 Documentation CD (and SLES 9 SP3 CD1)
- *SUSE Linux Enterprise Server 9 Installation Manual*—This manual provides detailed information about installation requirements, disk partitioning, the YaST2 installation application, and other configuration options.
- *SUSE Linux Enterprise Server 9 Administration Manual*—This manual provides information about configuring your system and integrating it with your existing network services.
- **SLES 9 Support Sites**—SUSE provides considerable technical information about the Enterprise Server operating system at its product and support web sites. See the SLES 9 home page at <http://www.novell.com/products/linuxenterpriseserver>.
- If you will need to know the logical names of your physical Internet interfaces when configuring your OS, refer to the appendix: “[Identifying Logical and Physical Network Interface Names for Linux OS Configuration](#)” on page 87

Task Map for SLES 9 Installation

Consult the following table to determine which procedures are relevant to the installation task(s) that you need to perform.

Installation Task	Relevant Procedure(s) or Source(s)
Collect information about your system and network.	“Preparing to Install SLES 9” on page 31
Install SLES 9 and SLES 9 SP3 from a local or remote CD/DVD drive.	“Installing SLES 9 From Distribution Media” on page 32 or “Installing SLES 9 Using the Remote Console Application” on page 33
Install SLES 9 SP3 from an image stored on a networked system.	<i>SUSE Linux Enterprise Server 9 Installation Manual</i>
Install SLES 9 SP3 from a PXE server.	“Preconfiguring Your Network to Support PXE Installation of SLES 9 or 10” on page 39
Update SLES 9 SP3 software.	“Updating the SLES 9 or 10 Operating System” on page 55

Before you install SUSE Linux from CD, from DVD, or from the network, you need to gather information about your system and your local area network.

Preparing to Install SLES 9

You can install the SLES 9 operating system (OS) from a local CD/DVD drive, remote CD/DVD drive, or the network; however, you will need to collect some information about your system before you proceed with any one of these installation methods.

Installation Prerequisites

Before installing SLES 9 on your server, verify or collect the following information:

- DHCP server name
- MAC address on system label
- The SLES 9 SP3 set of CDs and SLES 9 CDs

Installing SLES 9 From Distribution Media

SLES 9 provides an easy-to-use graphical interface for installing and configuring the operating system. Whether you are using Distribution CDs to install SUSE Linux from a locally attached CD/DVD drive or from a remote CD/DVD drive attached via KVMs, the installation procedure is fundamentally the same.

Required Items

Installation from distribution media requires the following items:

- SLES 9 media base CD set and SP3 CD set
- Sun Blade X6220 server module equipped with the following four items:
 - USB keyboard and mouse
 - USB CD/DVD drive
 - Monitor
 - Multi-port dongle cable to plug into the front slot of the Sun Blade X6220 server module. Refer to the *Sun Blade X6220 Server Module Installation Guide*, 820-0044.

▼ To Perform a Basic Installation From Local CD/DVD Drive

1. **Connect the USB CD/DVD drive into the USB port of the dongle.**
2. **Power on the system.**
3. **Insert the SLES 9 CD 1 (or the DVD) into your local CD/DVD drive.**
SUSE Linux boots from the Distribution CD. The graphical boot loader displays several boot options.
4. **During the installation process, you will be prompted to swap Distribution CDs and to remove media before reboots. Follow the prompts.**

Note – You can change the video resolution of the installer by pressing the corresponding function key on your keyboard displayed on the selection menu.

5. **Follow the installation instructions provided with the SLES 9 installation guide to complete installation of the system software.**

Installing SLES 9 Using the Remote Console Application

This topic explains how to install the SLES 9 OS on your Sun Blade X6220 server using the ILOM Remote Console application.

▼ To Install SLES 9 Using the ILOM Remote Console Application

1. **Locate your SLES 9 installation CD/DVD or the equivalent ISO images.**

Note – The Remote Console application can redirect ISO images.

2. **Connect to the ILOM Service Processor web GUI.**

See the topic that describes how to log in to and out of the Sun ILOM web GUI in the *Integrated Lights-Out Manager (ILOM) Administration Guide* (note that there are multiple versions of ILOM, be sure to refer to the guide that matches your server's installed version of ILOM).

3. **Click the Remote Control tab, then the Mouse Mode Settings tab.**

4. **If necessary, change the mouse mode to Relative Mouse Mode.**

See the "Remote Console Application" chapter of the *Integrated Lights Out Manager (ILOM) Administration Guide* for further instructions.

5. **Click the Redirection tab.**

6. **Click the Launch Redirection button to start the JavaRConsole application.**

7. **Log in to the JavaRConsole.**

8. **Start keyboard and mouse redirection.**

Select Keyboard and Mouse in the Devices menu.

9. **Start CD/DVD redirection.**

From the JavaRConsole Devices menu, you can redirect the CD in two ways:

- If you are installing a physical CD into the remote console CD ROM drive, insert the CD into the drive and select CD-ROM.
- If you are using an ISO image installed on the remote console, select CD-ROM image and provide the location of the ISO file.

Note – Diskette redirection is also available through the JavaRConsole. See the *Integrated Lights Out Manager (ILOM) Administration Guide* for more details.

10. Turn on the server using the ILOM web GUI.
11. Set up the BIOS as follows:
 - a. Press Ctrl-E to enter BIOS Setup Utility.
 - b. Select the Boot menu.
 - c. Select CD/DVD Drives.
 - d. Set AMI Virtual CD as the first boot device.
 - e. Press F10 to save changes and exit.
 - f. Reboot and press Ctrl-P to select CD/DVD as the boot device.
12. When the SLES 9 installation menu appears, use the arrow keys to select Installation. Do not press Enter.

Note – Make this selection quickly before another value (the default) executes.

- a. (Optional) Press F2 to change the display resolution to 1024x768.

This is the default display resolution for the Remote Console application.
13. Press Enter to continue with the installation.

SLES 9 prompts you for the driver disk.
14. Switch back to the SLES 9 installation CD 1 (from the SLES 9 base media set) or ISO image 1 when the SLES 9 installation program prompts you to insert CD 1 into the drive.

Note – If SLES 9 indicates that there is not enough memory for graphical installation and that you must use text-based installation, use the Tab keys to navigate options.

15. Proceed with SLES 9 installation as usual.

Installing SLES 10

The Sun Blade X6220 supports both SLES 10 GA and SLES 10 SP1. The instructions for both are exactly the same, with one exception—the steps to update the SLES SCSI drivers differ. This is covered in “[Updating the SLES SCSI Drivers](#)” on page 56.

SLES 10 Installation and Configuration Documentation

You can find help in installing SUSE Linux on your server from the following locations:

- README file—the README file on your SLES 10 CD 1 contains late-breaking information about system requirements and system configuration.
- The Release Notes for SLES 10 are available on the first installation CD, under the `docu` directory.
- *SUSE Linux Enterprise Server 10 Start-Up Guide*—This short manual provides a quick introduction to the installation. It is available on the first installation CD under the `docu` directory, as the file `startup.pdf` under the appropriate language directory.
- *SUSE Linux Enterprise Server 10 Installation and Administration Guide*—This manual provides detailed information about planning, deployment, configuration and administration of SLES 10. It is available on the first installation CD under the `docu` directory as the file `sles-admin.pdf` under the appropriate language directory.
- SLES 10 Support Sites - SUSE provides considerable technical information about the Enterprise Server operating system at its product and support web sites. See the SLES 10 home page at <http://www.novell.com/products/server/> for additional support information.

Task Map for SLES 10 Installation

Consult the following table to determine which procedures documented in this help system are relevant to the installation task(s) that you need to perform.

Installation Task (Goal)	Relevant Procedure(s) or Source(s)
Install SLES 10 from local or remote CD/DVD drive.	“Installing SLES 10 From Distribution Media” on page 36 or “Installing the SLES 10 Using the Remote Console Application” on page 37
Install SLES 10 from local or remote CD/DVD drive or PXE server.	<i>SUSE Linux Enterprise Server 10 Installation Manual</i>
Install SLES 10 from an image stored on a networked system.	“Preconfiguring Your Network to Support PXE Installation of SLES 9 or 10” on page 39
Install SLES 10 from a PXE server.	“Preconfiguring Your Network to Support PXE Installation of SLES 9 or 10” on page 39
Update SLES 10 software.	“Updating the SLES 9 or 10 Operating System” on page 55

Installing SLES 10 From Distribution Media

SLES 10 provides an easy-to-use graphical interface for installing and configuring the operating system. Whether you are using Distribution CDs to install SLES from a locally attached CD/DVD drive or from a remote CD/DVD drive attached via KVMs, the installation procedure is fundamentally the same.

Required Items

- SLES 10 media base CD or DVD set
- SLES 10 installation guide, *SUSE Linux Enterprise Server 10 Installation and Administration Guide* (see [“SLES 9 Installation and Configuration Documentation” on page 30](#))
- Sun Blade X6220 server module equipped with the following four items:
 - USB keyboard and mouse
 - USB CD/DVD drive
 - Monitor
 - Multi-port dongle cable to plug into the front slot of the Sun Blade X6220 server module. Refer to the *Sun Blade X6220 Server Module Installation Guide*, 820-0044.

▼ To Install SLES 10 from Distribution Media

1. Connect the USB CD/DVD drive into the USB port of the dongle.
2. Power on the system.
3. Press F8 and select CDROM when prompted.
4. Insert the SLES 10 CD 1 into your local CD/DVD drive.
5. Follow the installation instructions provided with the SLES 10 Installation Guide to complete the installation of the system software.

Installing the SLES 10 Using the Remote Console Application

This topic explains how to install the SLES 10 OS on your Sun Blade X6220 server using the ILOM Remote Console application.

▼ To Install SLES 10 from the Remote Console

1. Locate your SLES 10 installation CD/DVD or the equivalent ISO images.
2. Connect to the ILOM Service Processor web GUI.
3. Click the Remote Control tab, then the Mouse Mode Settings tab.
4. If necessary, change the mouse mode to Relative Mouse Mode.
See the “Remote Console Application” chapter of the *Integrated Lights Out Manager (ILOM) Administration Guide* for more information (note that there are multiple versions of ILOM, be sure to refer to the guide that matches your server’s installed version of ILOM).
5. Click the Redirection tab.
6. Click the Launch Redirection button to start the JavaRConsole application.
7. Log in to the JavaRConsole.
8. Start keyboard and mouse redirection.
Select Keyboard and Mouse in the Devices menu.
9. Start CD/DVD redirection.
From the JavaRConsole Devices menu, you can redirect the CD in two ways:

- If you are installing a physical CD into the remote console CD ROM drive, insert the CD into the drive and select CD-ROM.
- If you are using an ISO image installed on the remote console, select CD-ROM image and provide the location of the ISO file.

Note – Floppy diskette redirection is also available through the JavaRConsole. See the *Integrated Lights Out Manager (ILOM) Administration Guide* for more information (note that there are multiple versions of ILOM, be sure to refer to the guide that matches your server's installed version of ILOM).

10. Turn on the server using the ILOM web GUI.
11. Set up the BIOS as follows:
 - a. Press Ctrl-E to enter BIOS Setup Utility.
 - b. Select the Boot menu.
 - c. Select CD/DVD Drives.
 - d. Set AMI Virtual CD as the first boot device.
 - e. Press F10 to save changes and exit.
 - f. Reboot and press Ctrl-P to select CD/DVD as the boot device.
12. When the SLES 10 installation menu appears, use arrow keys to select Installation and press Enter.
13. Proceed with SLES 10 installation as usual.

Preconfiguring Your Network to Support PXE Installation of SLES 9 or 10

These procedures describe how to preconfigure your network running SLES 9 or 10 software to support PXE installation of SUSE Linux software on your Sun Blade X6220 server. These procedures assume that you already have a bootable server that is running a version of the SLES 9 operating system.

Preconfiguring your network for PXE installation involves the following procedures:

- “Copying Files From the Tools and Drivers CD” on page 39
- “Configuring a DHCP Server” on page 40
- “Installing Portmap” on page 42
- “Configuring the TFTP Service” on page 42
- “Installing and Configuring the neopxe Boot Server Daemon” on page 43
- “Configuring the NFS Service” on page 45
- “Disabling the Firewall” on page 46

Required Items

Preconfiguring your network for PXE installation requires the following items:

- SLES 9 or 10 server equipped with:
 - CD/DVD drive
 - USB keyboard
 - Monitor (optional)
- SLES 9 or 10 media set
- Sun Blade X6220 server Tools and Drivers CD

Copying Files From the Tools and Drivers CD

This section describes how to copy the required PXE configuration support files, from the Sun Blade X6220 Tools and Drivers CD to the DHCP/PXE server. You can also download the driver RPMs from the Sun Blade X6220 server module web site. The download links are at

<http://www.sun.com/servers/blades/x6200/downloads.jsp>.

▼ To Copy Files From the Tools and Drivers CD

1. Insert the Tools and Drivers CD into the DHCP/PXE server.
2. Create a temporary directory to copy the PXE support files to. Enter the following command:

```
# mkdir /tmp
```
3. Mount the CD-ROM drive. Enter the command:

```
# mount /dev/cdrom /mnt/cdrom
```
4. Depending on your OS version, enter the following commands to copy the files to the `/tmp/` directory:
For SLES 9:

```
# cp /mnt/cdrom/support/pxeboot/sles9-pxefiles.tar.gz /tmp/
```


For SLES 10:

```
# cp /mnt/cdrom/support/pxeboot/sles10-pxefiles.tar.gz /tmp/
```
5. Depending on your OS version, uncompress and extract the contents of the tar file into the `/tmp/` directory. Enter the following command:
For SLES 9:

```
# tar -zxvf /tmp/sles9-pxefiles.tar.gz
```


For SLES 10:

```
# tar -zxvf /tmp/sles10-pxefiles.tar.gz
```


When you extract the file, a directory with all required files is created at `/tmp/slesX-pxefiles/`. Where X is your OS version (9 or 10).
6. Unmount the CD/DVD by entering the following command:

```
# umount /mnt/cdrom
```
7. Remove the Tools and Drivers CD from the server.

Configuring a DHCP Server

Complete the following steps on the server that will be your DHCP server.

▼ To Configure a DHCP Server

1. Power on the server and log in as superuser.

2. Determine whether the DHCP server package is already installed on the server. Enter the following command:

```
# rpm -qa | grep dhcp-server
```

3. If the DHCP server package is not listed, install the package using YaST. Enter the following command:

```
# yast -i dhcp-server
```

4. Set up your DHCP configuration file (for example, `/etc/dhcpd.conf`) so that only PXEClient requests receive PXEClient responses.

Add the following entry to the DHCP configuration file (refer to the `dhcpd.conf` man page for more information):

```
class "PXE" {match if substring(option vendor-class-
identifier, 0,9) = "PXEClient"; option vendor-class-
identifier "PXEClient"; vendor-option-space PXE; next-server
n.n.n.n;}
```

where `n.n.n.n` is the IP address of the server.

Note – You can start with a sample DHCP configuration file in the `/tmp/sles9-pxefiles` or `/tmp/sles10-pxefiles` directory.

5. In the DHCP configuration file, edit the `server-identifier` entry:

```
server-identifier n.n.n.n
```

Where `n.n.n.n` is the PXE/dhcp server's IP address.

6. Also in the DHCP configuration file, find the subnet entry fields:

```
subnet 1.2.3.0 netmask 255.255.255.0 {
    range dynamic-bootp 1.2.3.100 1.2.3.200;
    option routers 1.2.3.1;
    option broadcast-address 1.2.3.225;
}
```

Edit the `subnet`, `range`, `router` and `broadcast-address` entries according to the PXE/dhcp server's network configuration.

7. Edit the `/etc/sysconfig/dhcpd` file and verify that the `DHCPD_INTERFACE` is set to the interface that is connected to the network you are planning to run the PXE server.

For example, if you are using Ethernet interface 0, the `DHCPD_INTERFACE` variable would be set as follows:

```
DHCPD_INTERFACE="eth0"
```

8. Start the DHCP service. Enter the following command:

```
# /etc/init.d/dhcpd start
```

9. Configure the server to always start DHCP. Enter the following command:

```
# chkconfig dhcpd on
```

Installing Portmap

Complete the following steps on your DHCP server.

▼ To Install Portmap

1. Determine whether the portmap server package is already installed on the server. Enter the following command:

```
# rpm -qa | grep portmap
```

2. If portmap is not listed, install the package using YaST. Enter the following command:

```
# yast -i portmap
```

Configuring the TFTP Service

Complete the following steps on your DHCP server.

▼ To Configure the TFTP Service

1. Determine whether the TFTP server package is already installed on the server. Enter the following command:

```
# rpm -qa | grep tftp
```

2. If the TFTP server package is not listed, install the package using YaST. Enter the following command:

```
# yast -i tftp
```

3. Edit and save the `/etc/xinetd.d/tftp` file.

Make the following changes:

- Change the `-s /tftpboot` entry to `-v -s /home/pxeboot`
- Change the `disable` attribute to `no`

4. Restart the `inetd` server. Enter the following command:

```
# /etc/init.d/xinetd restart
```

Installing and Configuring the neopxe Boot Server Daemon

Complete the following steps on your DHCP server. The neopxe server is designed for use with a DHCP server that is running on the same system.

▼ To Install and Configure the neopxe Boot Server Daemon

1. If a compiler is not installed on the server, use YaST to install `gcc` with the following commands:

```
# yast -i gcc
# yast -i make
```

2. Install the neopxe boot server daemon onto your system that is your DHCP server. Depending on your OS version, enter the following command:

For SLES 9:

```
# cd /tmp/sles9-pxefiles/neopxe-0.2.0
```

For SLES 10:

```
# cd /tmp/sles10-pxefiles/neopxe-0.2.0
```

3. Next, enter the following commands:

```
# ./configure
# make
# make install
```

4. Append the path `/usr/local/sbin/neopxe` to the `rc.local` file by typing the following command, making sure to use two greater-than signs:

```
# echo "/usr/local/sbin/neopxe" >> /etc/rc.d/boot.local
```

5. Copy the PXE Linux image from the `/tmp/` directory. Enter the following commands:

```
# mkdir /home/pxeboot
```

6. Depending on your OS version, enter the following command:

For SLES 9:

```
# cp /tmp/sles9-pxefiles/pxelinux.0 /home/pxeboot
```

For SLES 10:

```
# cp /tmp/sles10-pxefiles/pxelinux.0 /home/pxeboot
```

7. Configure the PXE Linux image. Enter the following commands:

```
# mkdir /home/pxeboot/pxelinux.cfg/
```

```
# touch /home/pxeboot/pxelinux.cfg/default
```

8. Edit the `/usr/local/etc/neopxe.conf` configuration file, which is read by `neopxe` at startup.

If the `/usr/local/etc/` directory does not exist, create it with the following command:

```
# mkdir /usr/local/etc
```

If you need to create the `neopxe.conf` file, you can copy it from the `/tmp/slesX-pxefiles/neopxe-0.2.0/` directory. Where X is the OS version (9 or 10).

A valid configuration file must have entries for each of the following lines, including at least one service line.

```
ip_addr=n.n.n.n
```

```
prompt=boot-prompt-string
```

```
prompt_timeout=timeout
```

```
service=service-number, boot-server, boot-file, label
```

Where:

- *n.n.n.n* is the IP address of your PXE server.
- *boot-prompt-string* is the character string displayed during a network boot that prompts the user to press the F8 key for a boot menu.
- *timeout* is the number of seconds the prompt is displayed before the server defaults to the first service for booting.
- *service-number* is an integer in the range of 1 to 254 that identifies the boot service.
- *boot-server* is the IP address of the boot server for that boot service.
- *boot-file* is the name of the boot file that is read from your `/home/pxeboot` directory.

- *label* is the text string that is displayed when the boot menu is invoked by pressing the F8 key.

For example:

```
ip_addr=192.168.0.1
prompt=Press [F8] for menu...
prompt_timeout=10
service=1,192.168.0.1,pxelinux.0,Linux
service=2,192.169.0.1,nbp.unknown,Solaris
```

Note – Refer to the `neopxe.conf` man page for more information.

9. Start the `neopxe` daemon. Enter the following command:

```
# /usr/local/sbin/neopxe
```

Configuring the NFS Service

Complete the following steps on your DHCP server.

▼ To Configure the NFS Service

1. Determine whether the NFS service package is already installed on the server. Enter the following command:

```
# rpm -qa | grep nfs-utils
```

2. If the NFS service package is not listed, install the package using YaST. Enter the following command:

```
# yast -i nfs-utils
```

3. Edit and save the `/etc/exports` file to add the following line to it:

```
/home/pxeboot *(sync,no_root_squash,no_subtree_check,insecure)
```

4. Start the NFS service. Enter the following command:

```
# /etc/init.d/nfsserver start
```

5. Configure the server to always start the NFS service. Enter the following commands:

```
# chkconfig nfslock on
```

```
# chkconfig nfsserver on
```

Note – If you are using a DNS server, verify that DNS entries exist for the range of addresses defined in the PXE subnet `dynamic-bootp` entry in the `dhcpd.conf` file. If you are not using a DNS server, edit the `/etc/hosts` file to add the range of host addresses found in the PXE subnet `dynamic-bootp` entry in the `dhcpd.conf` file.

Disabling the Firewall

If a firewall is enabled on your PXE/DHCP server, you must disable it before attempting to install a PXE image onto the client system.



Caution – Network security vulnerability. When you disable the firewall protection on the system that is your PXE server, the security of the data on that server cannot be ensured. If this server is networked outside of your local intranet, be sure to re-enable the firewall after downloading software to PXE clients.

▼ To Disable the Firewall

1. Execute the YaST command. Enter the following command:

```
yast
```

2. Select Security & Users.

3. Select Firewall.

- Select none to disable the firewall for all network interfaces.
- Select specific interfaces to enable the firewall on those only.

Installing SLES 9 Using PXE

PXE is a powerful and convenient solution for setting up a number of Sun Blade X6220 servers so their configuration is identical.

Before You Begin

The network interface card (NIC) in your Sun Blade X6220 server supports the Preboot Execution Environment (PXE) network booting protocol. The system BIOS and network interface BIOS on your server automatically query the network for a DHCP server.

Task Map

To take advantage of PXE installations on your network, you need to perform the following tasks.

Task	Related Topic
Set up your Linux network and PXE server.	“Preconfiguring Your Network to Support PXE Installation of SLES 9 or 10” on page 39
Install SUSE Linux images on that PXE server.	“Creating a SLES 9 Service Pack PXE Install Image on the PXE Server” on page 47
Configure your server to boot from or to install from a SLES 9 or SLES 9 Service Pack image on a PXE server.	“Installing SLES 9, SP3 From a PXE Server” on page 51

Creating a SLES 9 Service Pack PXE Install Image on the PXE Server

This procedure describes how to create a Preboot Execution Environment (PXE) install image on the same server that is your DHCP server so that it will also act as your PXE server. The PXE server provides the operating system files to your PXE client.

Before You Begin

Before you install a SLES 9 image on your PXE server, you must configure your Linux network to support PXE images. See [“Preconfiguring Your Network to Support PXE Installation of SLES 9 or 10” on page 39](#) for instructions on how to preconfigure your network to support PXE installations of SLES 9, SP3.

Required Items

The PXE installation procedure requires the following items:

- The DHCP server that you set up when you preconfigured your network to support PXE installation equipped with a CD/DVD drive
- SLES 9 media CD set
- SLES 9 SP3 media CD set
- Sun Fire server Tools and Drivers CD

▼ To Create a SLES 9 SP3 PXE Install Image on the PXE Server

This section covers creating the PXE installation image, setting up and copying the SLES 9 software to a directory, and creating links to the PXE files.

Create a PXE Install Image

Follow these steps to create a PXE install image on the PXE server.

Note – Before you start this procedure, verify that your network has been preconfigured to support PXE installation. Refer to [“Preconfiguring Your Network to Support PXE Installation of SLES 9 or 10” on page 39](#).

1. **Reboot the PXE/DHCP server.**
2. **Follow the steps in “To Copy Files From the Tools and Drivers CD” on page 40.**

Note – For installing SLES 9 SP3, you require both the SLES 9 base media set and the SLES 9 SP3 media set.

Setting Up and Copying SLES 9 Software to a Directory

The following steps explain how to create the directory setup containing both the SLES 9 base and the SLES 9, SP3 files for PXE installation.

Note – You can use a different target directory than the `/home/pxeboot/sles9/` directory shown. The examples in this procedure use this directory.

1. Set up the directory structure that will hold the SLES 9 software. Enter the following commands:

```
# mkdir -p /home/pxeboot/sles9/sles9/CD1
# mkdir -p /home/pxeboot/sles9/core9/CD1
# mkdir -p /home/pxeboot/sles9/core9/CD2
# mkdir -p /home/pxeboot/sles9/core9/CD3
# mkdir -p /home/pxeboot/sles9/core9/CD4
# mkdir -p /home/pxeboot/sles9/core9/CD4
```

2. Insert the SLES 9 CD 1 into the server's CD/DVD drive.

3. Mount and copy the contents of the CD to the PXE server directory `/home/pxeboot/sles9/sles9/CD1` by entering the following commands:

```
# mount /dev/cdrom /mnt/cdrom
# cp -r /mnt/cdrom/* /home/pxeboot/sles9/sles9/CD1
```

4. Unmount the SLES 9 CD 1 by entering:

```
# umount /mnt/cdrom
```

5. Remove the SLES 9 CD 1.

6. Repeat the above steps for mounting and copying CD media contents to corresponding directories in `/home/pxeboot/sles9/core9` as given below.

```
# cp -r /mnt/cdrom/* /home/pxeboot/sles9/core9/CD1
# cp -r /mnt/cdrom/* /home/pxeboot/sles9/core9/CD2
# cp -r /mnt/cdrom/* /home/pxeboot/sles9/core9/CD3
# cp -r /mnt/cdrom/* /home/pxeboot/sles9/core9/CD4
i. # cp -r /mnt/cdrom/* /home/pxeboot/sles9/core9/CD5
```

7. Create directories for SLES 9 SP3 CDs by typing the following commands:

```
# mkdir /home/pxeboot/sles9/sles9-sp3/CD1
# mkdir /home/pxeboot/sles9/sles9-sp3/CD2
# mkdir /home/pxeboot/sles9/sles9-sp3/CD3
```

8. Insert the SLES 9 SP3 CD 1 into the CD/DVD drive
9. Mount and copy the contents of the CD to the PXE server by entering the following commands:


```
# mount /dev/cdrom /mnt/cdrom
# cp -r /mnt/cdrom/* /home/pxeboot/sles9/sles9-sp3/CD1
```
10. Unmount the CD.


```
# umount /mnt/cdrom
```
11. Remove the SLES 9, SP3 CD 1 from the CD/DVD drive.
12. Repeat the above steps to mount, copy, and unmount the SLES 9, SP3 CD 2 and CD 3. Substitute the following copy commands for CD2 and CD3.


```
# cp -r /mnt/cdrom/* /home/pxeboot/sles9/sles9-sp3/CD2
# cp -r /mnt/cdrom/* /home/pxeboot/sles9/sles9-sp3/CD3
```

Creating Links to PXE Files

1. Create symbol links by executing the following commands. Enter the following commands:


```
# cd /home/pxeboot/sles9
# ln -s ./sles9/CD1/boot/ .
# ln -s ./sles9-sp3/CD1/boot ./boot.sp3
# ln -s ./sles9/CD1/content .
# ln -s ./sles9/CD1/control.xml .
# ln -s ./sles9-sp3/CD1/driverupdate .
# ln -s ./sles9-sp3/CD1/boot/loader/initrd .
# ln -s ./sles9-sp3/CD1/boot/loader/linux .
# ln -s ./sles9/CD1/media.1 .
```
2. Set up the appropriate `content` and `instorder` files. Enter the following command:


```
# mkdir yast
# cp /tmp/sles9sp3-pxefiles/order yast/
# cp /tmp/sles9sp3-pxefiles/instorder yast/
```
3. Copy the `autoyast.xml` file from the `/tmp/sles9sp3-pxefiles/` directory to the root of the PXE image. Enter the following command:


```
# cp /tmp/sles9sp3-pxefiles/autoyast.xml /home/pxeboot/sles9/
```


4. On your PXE server, modify and save the file

/home/pxeboot/pxelinux.cfg/default to add the following entries:

Note – Enter the text block from append through autoyast.xml as one continuous line with no returns.

```
default sles9
label sles9
kernel sles9/linux
append textmode=1 initrd=sles9/initrd install=
nfs://n.n.n.n/home/pxeboot/sles9
autoyast=nfs://n.n.n.n/home/pxeboot/sles9/autoyast.xml
```

Where *n.n.n.n* is the IP address of your PXE server.

Note – For console-based installations, add `console=ttyS0,9600` to the append line.

Installing SLES 9, SP3 From a PXE Server

This procedure describes how to configure your Sun Blade X6220 server to initiate the request to download the boot image file from the PXE/DHCP server and how to install the SLES 9 SP3 boot image onto your Sun Blade X6220 server.

Before You Begin

Before you configure your server to install SUSE Linux from a PXE server, you need to have done the following:

- Configured your Linux network to support a PXE server. See [“Preconfiguring Your Network to Support PXE Installation of SLES 9 or 10”](#) on page 39.
- Installed a SLES 9 image on that Linux PXE server. See [“Creating a SLES 9 Service Pack PXE Install Image on the PXE Server”](#) on page 47.

▼ To Install a SLES 9 SP3 Image From a PXE Server

1. **Connect the PXE client to the same network as the PXE server, and power on the PXE client.**

The PXE client is the target Sun Blade X6220 server to which you are installing the SLES 9 software.

2. **When the PXE client prompts you for a network boot, press the F12 key.**

The PXE client connects to the PXE server and attempts to obtain an IP address from the DHCP server.

3. **Press the F8 key to begin the downloading of the PXE boot image.**

4. **At the `boot:` prompt, enter in the label you gave the image when you installed a SUSE image on the PXE server.**

The SLES 9 SP3 install image downloads onto the target Sun Blade X6220 server.

5. **To configure the Linux operating system for your server, refer to the manual that is shipped with your SLES 9 media kit.**

6. **Update the operating system files.**

See [“Updating the SLES 9 or 10 Operating System”](#) on page 55.

Installing SLES 10 Using PXE

Before you perform the procedures in this section, you must have configured your Linux network to support a PXE server (see [“Preconfiguring Your Network to Support PXE Installation of SLES 9 or 10”](#) on page 39).

The two procedures in this section are:

- [“Creating a SLES 10 PXE Install Image on the PXE Server”](#) on page 53
- [“Installing SLES 10 From a PXE Server”](#) on page 55

Required Items

The PXE installation procedure requires the following items:

- The DHCP server that you set up when you preconfigured your network to support PXE installation equipped with a CD/DVD drive

- SLES 10 media CD set
- Sun Fire server Tools and Drivers CD

Creating a SLES 10 PXE Install Image on the PXE Server

To transfer the SLES 10 PXE files for installation you must:

- Create a SLES 10 image on your PXE server.
- Set up and copy SLES 10 software to a directory.
- Set up the PXE files.

▼ To Create a SLES 10 Image on Your PXE Server

1. Insert the Tools and Drivers CD into the DVD-ROM drive.
2. Copy the PXE support files from the Tools and Drivers CD into the `/tmp` directory by typing the following commands:

```
# mount /dev/cdrom /mnt/cdrom
# cp -a /mnt/cdrom/support/pxeboot/sles10-pxefiles.tar.gz /tmp
# cd /tmp
# tar xzf sles10-pxefiles.tar
# umount /mnt/cdrom
```

Set Up and Copy SLES 10 Software to a Directory

The following steps explain how to create the directory setup containing SLES 10 files for PXE installation.

Note – You can use a different target directory than the `/home/pxeboot/sles10/` directory shown. The examples in this procedure use this directory.

1. Set up the directory structure that will hold the SLES 10. Enter the following commands:

```
# mkdir -p /home/pxeboot/sles10/CD1
# mkdir -p /home/pxeboot/sles10/CD2
# mkdir -p /home/pxeboot/sles10/CD3
# mkdir -p /home/pxeboot/sles10/CD4
```

2. Insert SLES 10 CD 1 into your server and copy its content to your PXE server. Enter the following command:

```
# mount /dev/cdrom /mnt/cdrom
# cp -r /mnt/cdrom/* /home/pxeboot/sles10/CD1/
# umount /mnt/cdrom
```

3. Remove SLE S10 CD 1 from the server.

4. Repeat the above procedure for copying CD 2, 3 and 4 to their corresponding directories in /home/pxeboot/sles10/ as given below:

```
# cp -r /mnt/cdrom/* /home/pxeboot/sles10/CD2/
# cp -r /mnt/cdrom/* /home/pxeboot/sles10/CD3/
# cp -r /mnt/cdrom/* /home/pxeboot/sles10/CD4/
```

Setup PXE Files

1. Copy the `autoinst.xml` file from the `/tmp/sles10/` directory to the root of the PXE image. Enter the following command:

```
# cp /tmp/sles10/autoinst.xml /home/pxeboot/sles10/
```

2. On your PXE server, modify the file `home/pxeboot/pxelinux.cfg/default` adding the following entry to it:

Note – Enter the text block from “append” through “autoinst.xml” below as one continuous line with no returns.

```
default sles10
label sles10
kernel sles10/CD1/boot/x86_64/loader/linux
append textmode=1 initrd=sles10/CD1/boot/x86_64/loader/initrd
install=nfs://n.n.n.n/home/pxeboot/sles10/CD1
autoyast=nfs://n.n.n.n/home/pxeboot/sles10/autoinst.xml
```

Where *n.n.n.n* is the IP address of your PXE server.

3. Save and exit the file.

Installing SLES 10 From a PXE Server

This procedure describes the final step of installing the SLES 10 boot image onto your Sun Blade X6220 server. Before proceeding with this procedure you must have done the following:

- Configured your Linux network to support a PXE server. See [“Preconfiguring Your Network to Support PXE Installation of SLES 9 or 10”](#) on page 39.
- Installed a SLES 10 image on that Linux PXE server. See [“Creating a SLES 10 PXE Install Image on the PXE Server”](#) on page 53.

▼ To Install SLES 10 From a PXE Server

1. Connect the PXE client to the same network as the PXE server.
2. Power on the PXE client and press F12 to select network boot.
3. When you are prompted at the boot: prompt, enter in the label you gave the image when you install the SLES 10 image on the PXE server (`sles10` in the example above).
4. To configure your SLES 10 Linux server, refer to the Installation and Administration guide on SLES 10 CD 1.
5. Perform an Online Software Update to update the operating system files (see [“Updating the SLES 9 or 10 Operating System”](#) on page 55).

Updating the SLES 9 or 10 Operating System

The SLES operating system installation media might not contain the most up-to-date versions of the SUSE software. This procedure describes how to update the SLES OS on your server after you have installed it from a PXE server or distribution CDs.

▼ To Update Your SLES Operating System

1. **Log in as the superuser.**
2. **Enter the following command to run the YaST Online Update:**

```
# you
```

Note that YaST can operate in both text and graphical modes. These directions apply to both.
3. **If you are behind a network firewall and need to use a Proxy server in order to access the internet, you must first configure YaST with the correct Proxy information.**
 - a. **Select the 'Network Services' tab on the left, then the 'Proxy' screen on the right. Enter the correct proxy URLs in both the HTTP and HTTPS fields.**

Note – In order for the on-line update service to function correctly through a network HTTP proxy, the following additional configuration step must be performed.

- b. **Exit the YaST utility and run the following command:**

```
rug set-prefs proxy-url Proxy URL
```

where *Proxy URL* is the fully qualified URL of your proxy server (for example: <http://proxy.yourdomain:3128/>).
 - c. **After successfully running the command, launch YaST again.**
4. **Register with the Novell Customer Center. Select the 'Software' tab on the left, then select 'Novell Customer Center Configuration' and follow the directions.**

You will need your Novell Customer Center username and password, as well as a SLES product activation code.
 5. **Once registered, select the 'Online Update' tab to perform the software update**

Updating the SLES SCSI Drivers

To Update the SLES SCSI Drivers:

1. **Insert the Tools and Drivers CD for Sun Blade X6220 module.**
2. **Mount it onto the directory /mnt**

```
# mount /dev/cdrom /mnt
```
3. **Enter the following commands:**

a. For SLES9 SP4 and older

```
# cd /mnt/Linux/drivers  
# rpm -ivh mptlinux-sles9.0-3.12.27.00-2.x86_64.rpm
```

b. For SLES 10 and SLES 10 SP1, 64 bit

```
# cd /mnt/Linux/drivers  
# rpm -ivh mptlinux-4.00.22.00-1-sles10.x86_64.rpm
```

4. Installation of the new drivers is now complete. Reboot the server for the changes to take effect. Enter:

```
# reboot
```

Installing Solaris 10

This chapter provides information about installing the Solaris 10 operating system on a Sun Blade X6220. It includes the following sections:

- [“About Solaris OS Installation”](#) on page 59
- [“Preparing to Install the Solaris OS”](#) on page 64
- [“Booting a Server in a GRUB-Based Environment”](#) on page 66
- [“Booting a Server Over the Network Using PXE”](#) on page 66
- [“Installing the Solaris OS From Distribution Media”](#) on page 67
- [“Using a Serial Console to Install the Solaris OS”](#) on page 68

Note – If you want to mirror your OS, the recommended procedure is to create the RAID before you install the OS. See [“Configuring RAID for Any Operating System from the BIOS”](#) on page 79.

About Solaris OS Installation

Note – This chapter contains information about installing the Solaris 10 from network or media. If you are configuring the preinstalled Solaris 10 OS that is shipped with the server, refer to the *Sun Blade X6220 Server Module Installation Guide*.

The sections in this chapter describe what you need to know to install Solaris OS on a Sun Blade X6220 server module. However, to complete the installation you will need to frequently reference procedures in other Solaris OS documentation. A list of the necessary additional documentation is provided below (see [“Where to Find Solaris 10 Information”](#) on page 63).

Before You Begin

Before you begin to install the Solaris OS, review the information in this section:

- “System Requirements” on page 60
- “Software Availability” on page 60
- “Installation Methods” on page 61
- “Installation Task Map” on page 62
- “Where to Find Solaris 10 Information” on page 63

Note – In this chapter the term “x86” refers to the Intel 32-bit family of microprocessors and compatible 64-bit and 32-bit microprocessors made by AMD. For supported systems, see the Solaris Hardware Compatibility List at <http://www.sun.com/bigadmin/hcl>.

System Requirements

TABLE 5-1 summarizes the system requirements for installing Solaris 10 on a Sun Blade X6220.

TABLE 5-1 System Requirements

Requirement	Description
Hardware requirements	The server hardware and the initial service processor configuration must be installed before you install the Solaris OS.
Minimum Solaris OS	Solaris 10 for Sun Blade X6220 server module.
Memory to install	Memory size is between 4 GB and 64 GB.
Disk space	12 GB or greater.
Swap area	512 MB is the default size.
x86/x64 processor requirements	x86/x64 120 MHz or faster processor is recommended. Hardware floating point support is required.
BIOS	Industry standard x86/x64 BIOS (resident in FLASH). The BIOS must be able to boot from CD or DVD media.

Software Availability

- You can download or order the media for Solaris 10 at <http://www.sun.com/servers/blades/x6220/downloads.jsp>.

- Additional software is shipped separately on a Tools and Drivers CD. Contact your Sun service provider if you need to order the Solaris OS or if you are missing the Tools and Drivers CD.
- For updates on Solaris 10 versions and hardware compatibility, go to <http://www.sunsolve.sun.com>.

Note – The Solaris 10 OS box contains the CD and DVD media and documentation that you will need to install the Solaris OS software for both SPARC and x86 platforms. For a Sun Blade X6220 server module, use the media for x86 platforms.

Installation Methods

The Sun Blade X6220 server module supports the following Solaris OS installation methods:

- Install one server from DVD or CD-ROM media interactively with the Solaris Installation Program. The Solaris Installation Program is available on the Solaris 10 media and includes the Solaris Device Configuration Assistant. You can run the Solaris Installation Program with either a graphical user interface (GUI) or as an interactive text installer in a console session.
- Install one or several servers over the network with Preboot Execution Environment (PXE) technology and the following installation methods:
 - Solaris installation program over the network from remote DVD or CD images
 - JumpStart™ installation
 - Diskless boot
 - Install using a serial console
- Boot from the preinstalled Solaris 10 OS image on the hard drive.

TABLE 5-2 summarizes the installation methods described in this chapter, and provides pointers to the installation instructions.

TABLE 5-2 Installation Methods

Method	Description	Instructions
Install from DVD or CD-ROM media.	Use the Solaris Installation Program on the CD or DVD media to install one server interactively.	“Installing the Solaris OS From Distribution Media” on page 67
Install from the network by using PXE.	You need a PXE installation to install the Solaris OS over the network from remote DVD or CD images or to automate the installation process and install several systems with a JumpStart installation. To boot over the network by using PXE, you need to set up an install server and a DHCP server, and configure the BIOS on each server to boot from the network.	To set up for a PXE installation, see “x86: Guidelines for Booting with PXE,” in the <i>Solaris 10 Installation Guide: Network-Based Installations</i> To boot by using PXE, see “Booting a Server Over the Network Using PXE” on page 66
Boot from the preinstalled image.	Depending on your configuration, a Solaris OS image may be preinstalled on a hard drive.	<i>Solaris 10 Installation Guide: Basic Installations</i>
Install from a serial console.	Use a serial console to install the Solaris OS in a PXE-based network installation.	“Using a Serial Console to Install the Solaris OS” on page 68
Perform a diskless boot.	Boot the Solaris OS on a Sun Blade X6220 Server Module without a hard drive. Use this method with a PXE-based network installation.	“x86: Booting and Installing Over the Network PXE,” in the <i>Solaris10 Installation Guide: Network-Based Installations</i>

Installation Task Map

Use [TABLE 5-3](#) to preview the installation process defined as a series of tasks. The table defines each task, describes it, and provides pointers to the instructions for that task.

TABLE 5-3 Task Map for Initial Solaris OS Installation

Task	Description	Instructions
Set up your server.	Install your server hardware and configure the service processor.	<i>Sun Blade X6220 Server Module Installation Guide (820-0044)</i>
Review the Sun Blade X6220 Server Module Product Notes.	The product notes contain late-breaking news about the Solaris OS software and patches.	<i>Sun Blade X6220 Server Module Product Notes (820-0048)</i>
Review the system requirements.	Verify that your server meets the minimum system requirements.	TABLE 5-1

TABLE 5-3 Task Map for Initial Solaris OS Installation (*Continued*)

Task	Description	Instructions
Gather the information you need to install the Solaris OS.	The type of information you need to collect depends on your environment and the method you choose to install the Solaris OS.	“About Solaris OS Installation” on page 59
Locate the Solaris OS documentation.	The Solaris OS documentation included with your software contains most of what you need to know about installation.	“Where to Find Solaris 10 Information” on page 63
Install the Solaris OS.	Choose an installation method and locate the installation instructions.	TABLE 5-2
Install additional software, if necessary.	The Solaris OS drivers for the server are bundled in the Solaris OS. However, you may need to install additional software from the Tools and Drivers CD.	<i>Sun Blade X6220 Server Module Product Notes (820-0048)</i>
Install patches, if necessary.	Patches are available from the SunSolve Patch Portal at http://www.sunsolve.sun.com .	<i>Sun Blade X6220 Server Module Product Notes</i>

Note – The Solaris OS provides additional programs for installation, such as booting over a wide area network (WAN), but all Sun Blade X6220 server modules support only those methods listed in this topic.

Where to Find Solaris 10 Information

Solaris OS documentation is available from the web at <http://docs.sun.com/>.

- For the Solaris 10 installation guides, see <http://docs.sun.com/app/docs/coll/1236.1>
- For the Solaris 10 administration guides, see <http://docs.sun.com/app/docs/coll/47.16>
- For information about upgrading your system, see <http://docs.sun.com/app/docs/doc/817-5505>
- For troubleshooting information, see Appendix A at <http://docs.sun.com/app/docs/doc/817-5504>

Solaris 10 documentation is also available on the Solaris Documentation DVD included with your Solaris OS software.

Preparing to Install the Solaris OS

You need to gather information about your system before you install the Solaris OS.

If you will need to know the logical names of your physical Internet interfaces when configuring your OS, refer to the appendix: [“Identifying Logical and Physical Network Interface Names for Solaris OS Installation”](#) on page 99

The amount of planning and initial set up that you need to perform varies and depends on whether you are preparing for a local installation from CD/DVD, or you are preparing for a PXE-based network installation.

You also need to obtain the appropriate media for your installation.

Media	Title
DVD	Solaris 10 OS <i>version</i> * DVD
CD-ROM	Solaris 10 OS <i>version</i> Software CDs Solaris 10 <i>version</i> Languages for x86 Platforms CD Sun Blade X6220 Server Module Tools and Drivers CD
Patches	See the <i>Sun Blade X6220 Server Module Product Notes</i> for information about patches.

* Replace *version* with the version of the Solaris Operating System you want to install.

Installation Prerequisites

You must complete the following tasks before you install the Solaris OS.

- Verify that your system meets the minimum system requirements (see [“System Requirements”](#) on page 60).
- If you are using the Solaris Installation Program GUI or text installer, you need a local CD/DVD drive or a network connection, a keyboard, and a monitor. You will also need the multi-port dongle cable to plug in to the front of the server module. For more information, see the *Solaris 10 Installation Guide: Basic Installations*.

- Gather the information you need to install the Solaris OS.

See the “Checklist for Installation,” in Chapter 1, at <http://docs.sun.com/app/docs/doc/817-0544>.

For Solaris 10 5/08 installations, go to

<http://docs.sun.com/app/docs/doc/820-4039/>.

For a non-networked system, you need to know the host name of the system you are installing and the language and the locales that you intend to use on the system.

For a networked system, use the checklist to gather the following information:

- Host name of the system that you are installing
 - Language and locales that you intend to use on the system
 - IP address of the name server
 - Subnet mask
 - Type of name service (for example, DNS, NIS, or NIS+)
 - IP address of gateway
 - Domain name
 - Host name of the name server
 - IP address of the name server
 - Root password
- If you are installing the Solaris OS over the network, you need to set up a PXE-based network installation before you install the Solaris OS.

For information about setting up a PXE-based network installation, see *Solaris 10 Installation Guide: Network-Based Installations* at

<http://docs.sun.com/app/docs/doc/817-5504> for Solaris 10.

For Solaris 10 5/08 installations, go to

<http://docs.sun.com/app/docs/doc/820-4039/>.

Note – Consult the appropriate platform guide that ships with Solaris 10 for detailed information about remote installation via USB. If USB-based installation is not supported, use PXE.

Booting a Server in a GRUB-Based Environment

Starting with the Solaris 10 1/06 (Solaris 10 version 1/06) release, x86-based systems use the open-source GNU Grand Unified Bootloader (GRUB). GRUB is the boot loader that is responsible for loading a boot archive into a system's memory. The boot archive contains the kernel modules and configuration files that are required to boot the system. For more information on GRUB, you can see the `grub(5)` man page.

For information on how to boot a Sun Blade X6220 server module that is running Solaris 10 in a GRUB-based environment, refer to the *Solaris 10 System Administration Guide: Basic Administration* at <http://docs.sun.com/app/docs/doc/819-2379>.

Booting a Server Over the Network Using PXE

Use this procedure along with the instructions in *Solaris 10 Installation Guide: Networked-Based Installations*.

The Sun Blade X6220 server module implements the PXE specification required for a PXE network boot. PXE technology provides your server with the capability to boot the Solaris OS over the network using the Dynamic Host Configuration Protocol (DHCP). Using a PXE-based network installation, you can install the Solaris OS onto a server from the network with remote CD or DVD images. You can also automate the installation process and install the Solaris OS on several Sun Blade X6220 server modules using a JumpStart scenario.

A PXE network boot is a direct network boot. No boot media is required on the Sun Blade X6220 server module client system.

Before You Begin

To boot over the network by using PXE, you first need to do the following:

1. Set up an install server.
2. Add the Sun Blade X6220 server module clients to be installed.
3. Set up a DHCP server.

For instructions, see Step 1 below.

▼ To Boot a Server Over the Network Using PXE

1. **Perform the tasks in “Guidelines for Booting with PXE,”** located in *Solaris 10 Installation Guide: Network-Based Installations*, located at <http://docs.sun.com/app/docs/doc/817-5504>.

If you have already set up the systems you need for a PXE boot, review the Task Map (TABLE 5-3) to verify that you have performed all the steps.

2. **Boot the server over the network by using PXE.**

Complete the steps in *Solaris 10 Installation Guide: Network-Based Installations* at <http://docs.sun.com/app/docs/doc/817-5504>. Follow the instructions on the screen.

When the BIOS comes up, press F12 to tell the BIOS to perform a network boot from the PXE server.

Installing the Solaris OS From Distribution Media

Use this procedure to install the Solaris OS onto a Sun Blade X6220 server module from CD/DVD media. This procedure describes an interactive installation using the Solaris Installation Program.

The Solaris Installation Program on the Solaris 10 OS media can be run with a graphical user interface (GUI) or as an interactive text installer in a console session. The GUI or command-line interface (CLI) uses screens to guide you step-by-step through installing the OS.

Note – Solaris 10 is preinstalled on the Sun Blade X6220 server module. You do not need to follow this procedure unless you are installing a new OS version.

▼ To Install the Solaris OS From Distribution Media

Note – Before starting this procedure perform the tasks described in “Preparing to Install the Solaris OS” on page 64.

1. **Power down the server.**
2. **Connect the multi-port dongle cable to the connector on the front of the server.**
3. **Connect a USB CD/DVD drive to the USB connector on the multi-port dongle cable.**
4. **Power on to boot the system.**
The server BIOS supports booting from a CD/DVD.
5. **Insert the Solaris 10 OS CD/DVD into your Sun Blade X6220 server module.**
6. **Continue the installation procedure by performing the steps in the procedure: “x86: To Install or Upgrade with the Solaris Installation Program,” in Chapter 2 at <http://docs.sun.com/app/docs/doc/817-0544>.**

Start the procedure at Step 4. When prompted, answer the configuration questions to complete the installation.

You can accept the default values on the screens to format the entire hard disk, use auto-layout file systems, and install a preselected set of software. Or, you can customize the installation to modify the hard disk layout, modify a Solaris `fdisk` partition, and select the software that you want to install.

Using a Serial Console to Install the Solaris OS

The Solaris text installer enables you to type information in a terminal or a console window to interact with the Solaris OS Installation Program. Use this procedure to use a serial console to install the Solaris 10 OS on a Sun Blade X6220 server module with a PXE-based network installation.

Before You Begin

Before you set up the serial console, you need to set up the following systems for a PXE-based network installation:

- An install server
- A DHCP server

To set up these systems, see *Solaris 10 Installation Guide: Network-Based Installations* at <http://docs.sun.com/app/docs/doc/817-5504>.

▼ To Use a Serial Console to Install the Solaris OS

Note – For Steps 1 through 3, see *Solaris 10 Installation Guide: Network-Based Installations* at <http://docs.sun.com/app/docs/doc/817-5504>.

1. Connect a terminal to the serial port on the service processor.

A terminal can be a VT100, a PC running terminal emulation, or a terminal server.

2. Set the terminal to receive at 9600 baud.

3. Add an x86 install client to an install server and specify a boot device to use during the installation.

If you specify the boot device when you set up the install client, you are not prompted for this information by the Device Configuration Assistant during the installation.

The examples below use the following values:

- Client MAC address: 00:07:e9:04:4a:bf
- Server IP address (GRUB only): 192.168.0.123
- Client macro name (GRUB only): 01000039FCF2EF

Enter the commands specified in the examples below for the OS version that you are using:

Tip – See the man pages for these commands for more information on usage.

- For Solaris 10 1/06 or later system with GRUB booting:

```
# cd /export/boot/Solaris_10/Tools
# ./add_install_client -d -e "00:07:e9:04:4a:bf" \
-b "consolatory" i86pc
# datum -A -m 01000039FCF2EF \
-d ":BootSrvA=192.168.0.123:BootFile=01000039FCF2EF:"
# pntadm -f 01 -A $CLIENT_IP -i 01000039FCF2EF \
-m 01000039FCF2EF $CLIENT_NET
```

4. Log in to the service processor as an Administrator.

5. Enter the following command to use the serial console:

```
start /SP/console
```

6. Boot the Sun Blade X6220 server module.

Refer to the instructions in *Solaris 10 Installation Guide: Network-Based Installations* at <http://docs.sun.com/app/docs/doc/817-5504>. When prompted, do the following setting:

7. Press F12 at the BIOS menu.

8. After the OS is installed, log in to the system and use the `eeeprom` command to change `bootenv.rc`:

```
eeeprom input-console=ttya
```

Installing VMware

This chapter explains the procedure for installing VMware ESX Server 3 on the Sun Blade X6220 Server Module.

Note – If you want to mirror your OS, the recommended procedure is to create the RAID before you install the OS. See [“Configuring RAID for Any Operating System from the BIOS” on page 79](#).

Before You Begin

Review the following sections:

- [“Task Map for VMware ESX Server 3 Installation” on page 71](#)
- [“VMware Installation and Administration Documentation” on page 72](#)

Task Map for VMware ESX Server 3 Installation

The following table maps out the installation task order and points to the relevant section where you can find more information.

Installation Task	Relevant Section
Collect information about your system.	“VMware Installation and Administration Documentation” on page 72 .
Plan your network interface.	“Planning Network Interfaces” on page 72
Choose an installation method.	“Select an Installation Method” on page 73

Installation Task	Relevant Section
Download ISO image.	“Downloading the VMWare ESX Server ISO Image” on page 74.
Download ISO image and burn to CD.	“Downloading the VMWare ESX Server ISO Image” on page 74.
Identify a specific network interface.	“Planning Network Interfaces” on page 72
Complete the VMware ESX Server 3 software installation.	Refer to http://www.vmware.com/support/pubs/vi_pubs.html .
Update the ESX Server 3 software if necessary.	“VMware Updates and Patches” on page 77

VMware Installation and Administration Documentation

Before you begin installing VMware ESX Server 3 software on a Sun Blade X6220 server module, collect the necessary information pertinent to your situation by consulting the following required documents at http://www.vmware.com/support/pubs/vi_pubs.html.

- Introduction to VMWare Infrastructure
- Quick Start Guide
- Installation and Upgrade Guide
- Basic System Administration
- Virtual Infrastructure Web Access Administrator’s Guide
- Server Configuration Guide

Planning Network Interfaces

- The Virtual Infrastructure 3 service console and management interface is dependent on a network interface. The service console does not automatically use the first interface with a live connection. A live interface must be associated with the service console for host management.
- To install and use ESX Server 3.0.2, the chassis does not need to contain a PCI Express Module (PEM). ESX Server 3.0.2 supports the built-in NICs that are used through the chassis NEM.

Refer to the *Sun Blade X6220 Server Module Service Manual* for detailed information concerning network interface cabling and the BIOS considerations of these interfaces.

- By default, `vmnic0` is assigned for service console communications.

Select an Installation Method

The most common methods to install VMware on your server are to use:

- A remote ISO image downloaded from the VMware website, redirected through Java remote console.
- A remote CD/DVD drive (burned from the ISO image downloaded from the VMware website) redirected through Java remote console.
- A local CD/DVD drive burned from the ISO image downloaded from the VMware website.
- Automatic kickstart installation from VMware software (installation tree) stored on a Preboot Execution Environment (PXE) network server.

This chapter contains the procedures for the first three methods. For information about preparing for PXE install, see the VMware *Installation and Upgrade Guide for VESX Server 3 and Virtual Center 2.0*, Chapter 6, “Remote and Scripted Installations” at http://www.vmware.com/support/pubs/vi_pubs.html.

VMware ESX Server 3 Installation Overview

- Read the required documents for VMware ESX Server 3, available at http://www.vmware.com/support/pubs/vi_pubs.html.
- Decide which of the installation methods you will use:
 - From a remote ISO image or from a remote CD/DVD (burned from an ISO image) drive (see “Installing the VMware ESX Server OS Using the Remote Console Application” on page 74)
 - or-
 - From a local USB CD/DVD (burned from an ISO image) drive connected to the Sun Blade X6220 server module (see “To Install VMware ESX Server 3 From a Local CD/DVD Drive” on page 76)

Downloading the VMWare ESX Server ISO Image

No matter what method you choose to install VMWare ESX Server, you must first download an ISO image of the software installation CD.

▼ To Download the VMware ESX Server ISO Image

From:

1. Download the ISO image using a network-connected system with CD-burning capabilities from:

<http://www.vmware.com/download/vi/eval.html>

2. Optionally, burn the image to a CD.

Installing the VMware ESX Server OS Using the Remote Console Application

This section explains how to install the VMWare ESX operating system on your server using the Integrated Lights Out Manager (ILOM) Remote Console application.

Note – Read the *Integrated Lights Out Manager (ILOM) Administration Guide* before completing the following steps. This guide provides details on using the ILOM Service Processor Web interface to redirect the console.

▼ To Install Using the ILOM Remote Console Application

1. **Locate your VMWare ESX Server installation CD/DVD or the equivalent ISO image.**
 2. **Connect to the ILOM Service Processor Web interface.**
 3. **Click the Remote Control tab, then the Mouse Mode Settings tab.**
 4. **If necessary, change the mouse mode to Relative Mouse Mode.**

See the “Remote Console Application” chapter of the *Integrated Lights Out Manager (ILOM) Administration Guide* for further instructions.
 5. **Click the Redirection tab.**
 6. **Click the Launch Redirection button to start the JavaRConsole application.**
 7. **Log in to the JavaRConsole.**
 8. **Start keyboard and mouse redirection.**

Select Keyboard and Mouse in the Devices menu.
 9. **Start CD/DVD redirection.**

From the JavaRConsole Devices menu, you can redirect the CD in two ways:

 - If you are installing a physical CD into the remote console CD ROM drive, insert the CD into the drive and select CD-ROM.
 - If you are using an ISO image installed on the remote console, select CD-ROM Image and provide the location.
-
- Note** – Depending on the number of USB devices in use, you *may* be prompted for the install location or device. This deviates from the normal installation. To continue installation under these circumstances, select CD-ROM Image. Then, when prompted to select a device driver, select Linux USB Driver.
-
10. **Refer to the *Installation and Upgrade Guide for VMware Infrastructure* to guide you through the installation process.**

From your network-connected system go to http://www.vmware.com/support/pubs/vi_pubs.html.
 11. **Identify the Sun Blade-specific network interface.**

In the service console window on the Sun Blade X6220 server module, identify the available network configuration alternatives (see [FIGURE 6-1](#)).

▼ To Install VMware ESX Server 3 From a Local CD/DVD Drive

To perform this procedure you must have The Sun Blade X6220 server module multi-port dongle cable.

1. **Attach the multi-port dongle cable to the front of the Sun Blade X6220 server module.**
2. **Connect the following to the USB ports on the dongle:**
 - A CD/DVD drive
 - A USB Keyboard and Mouse
3. **Connect a monitor connected to the server module.**
4. **Power on the server module.**
5. **Insert the media into CD/DVD drive. The server will boot from the CD/DVD and display a boot prompt.**

boot:
6. **To access graphical mode, press ENTER.**
7. **To work in text mode, enter the following:**

esx text
8. **Refer to the *Installation and Upgrade Guide for VMware Infrastructure* to guide you through the installation process.**

From your network-connected system go to http://www.vmware.com/support/pubs/vi_pubs.html.
9. **Identify the Sun Blade-specific network interface.**

In the service console window on the Sun Blade X6220 server module, identify the available network configuration alternatives (see [FIGURE 6-1](#)).

FIGURE 6-1 ESX Server 3.x Network Configuration Dialog Box

ESX Server 3

Network Configuration
Select and configure the network interface card that is used for console communication.

Network Interface Card

Device: 0:a:0 - forcedeth - nVidia NForce Network Controller
80:a:0 - forcedeth - nVidia NForce Network Controller

Network Addressing and Host Name

Set automatically using DHCP

Use the following network information:

IP Address: [][][][]

Subnet mask: [][][][]

Gateway: [][][][]

Primary DNS: [][][][]

Secondary DNS: [][][][]

Host name: localhost.localdomain Enter a fully qualified host name (e.g. host.vmware.com)

VLAN Settings

VLAN ID: [] (Leave blank if you are unsure whether your network requires a VLAN ID)

Create a default network for virtual machines

Back Next Cancel

10. Complete the VMware installation.

This is detailed in the *Installation and Upgrade Guide for VMware Infrastructure* at http://www.vmware.com/support/pubs/vi_pubs.html.

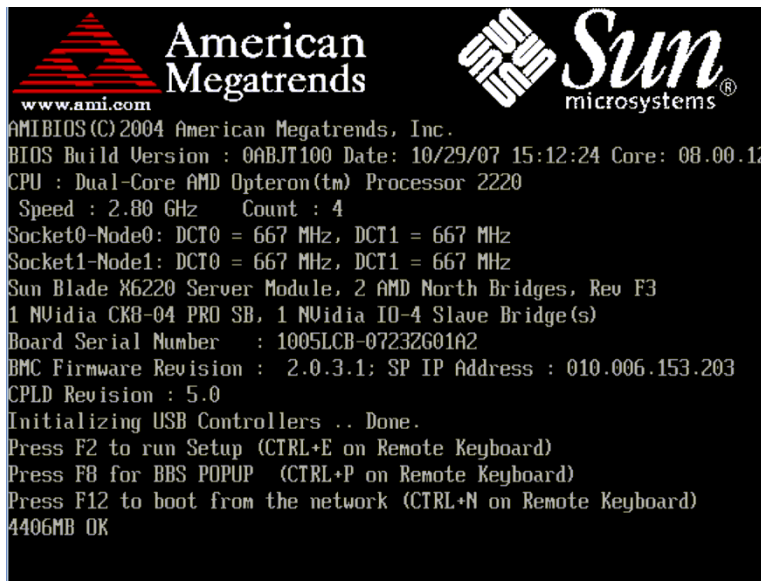
VMware Updates and Patches

VMware ESX Server 3 update images are available for download at <http://www.vmware.com/selfsupport/download>

Configuring RAID for Any Operating System from the BIOS

If you want to install your OS on disks that are part of a RAID, there is an LSI RAID configuration utility that is entered from the server's BIOS and can be used for any operating system.

1. Power off your server module and then power it back on. The BIOS screen appears. Watch for the LSI Logic Corp. screen.

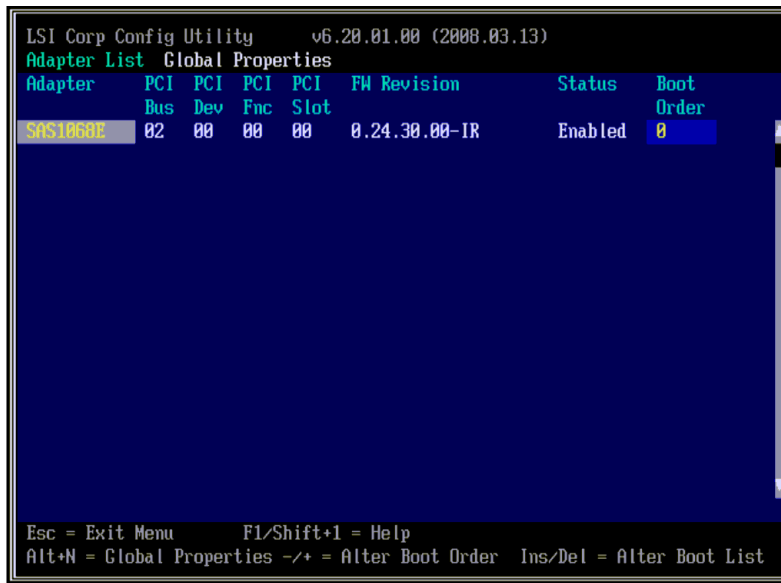


Watch for the LSI Logic prompt and press Ctrl-C.

2. When the BIOS screen shows the LSI Logic Corp. message, press Ctrl-C to start the LSI Logic Configuration Utility.



The first screen of the utility appears after a short delay.



3. With the LSI 1068E adapter highlighted in the first screen, press Enter.
The main screen of the utility opens.

```

LSI Corp Config Utility      v6.20.01.00 (2008.03.13)
Adapter Properties -- SAS1068E

Adapter                      SAS1068E
PCI Slot                     00
PCI Address(Bus/Dev/Func)    02:00:00
MPT Firmware Revision       0.24.30.00-IR
SAS Address                  50000200:00422470
NUDATA Version              20.03
Status                       Enabled
Boot Order                   0
Boot Support                 Enabled BIOS & UEFI

RAID Properties
SAS Topology
Advanced Adapter Properties

Esc = Exit Menu      F1/Shift+1 = Help
Enter = Select Item  +/-/Enter = Change Item

```

4. Use the arrow keys to select RAID Properties and press Enter.

The next screen allows you to choose the type of RAID. You can choose between RAID 1 (two mirrored disks with an optional hot spare) or RAID 1E (three or more mirrored disks with one or two hot spares).

```

LSI Corp Config Utility      v6.20.01.00 (2008.03.13)
Select New Array Type -- SAS1068E

Create IM Volume             Create Integrated Mirror Array of 2
                             disks plus up to 2 optional hot spares.
                             Data on the primary disk may be migrated.

Create 1M6 Volume           Create Integrated Mirrored Enhanced
                             Array of 3 to 10 disks including up
                             to 2 optional hot spares.
                             ALL DATA on array disks will be DELETED!

Create IS Volume             Create Integrated Striping array of
                             2 to 10 disks.
                             ALL DATA on array disks will be DELETED!

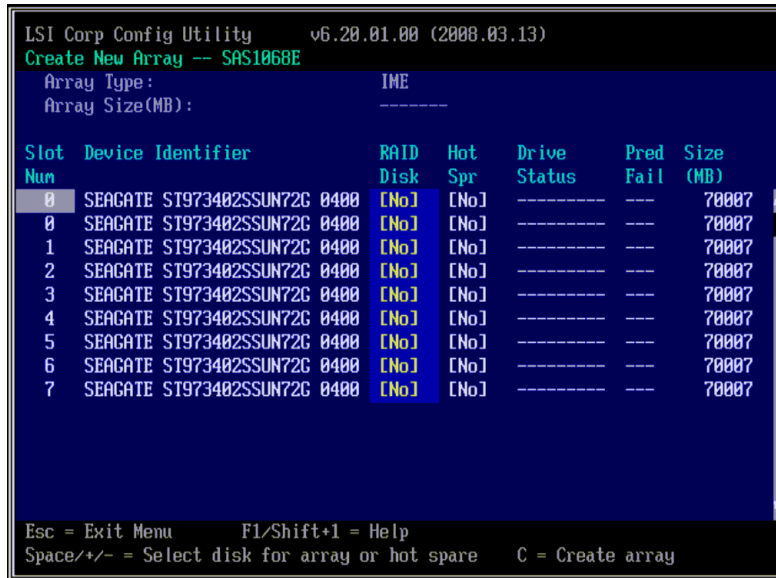
Esc = Exit Menu      F1/Shift+1 = Help
Enter = Choose array type to create

```

5. Select the type of volume you want to create, in this case an IME volume.

The next screen lists the disks you can choose to include in the volume and also disks you can choose as hot-spares.

Note – Despite the fact that there are dual paths to disks 1 - 7, they are not shown in the BIOS configuration utility. The utility hides them so that you cannot include the same disk twice in a volume. That is, you cannot mirror a disk with itself.



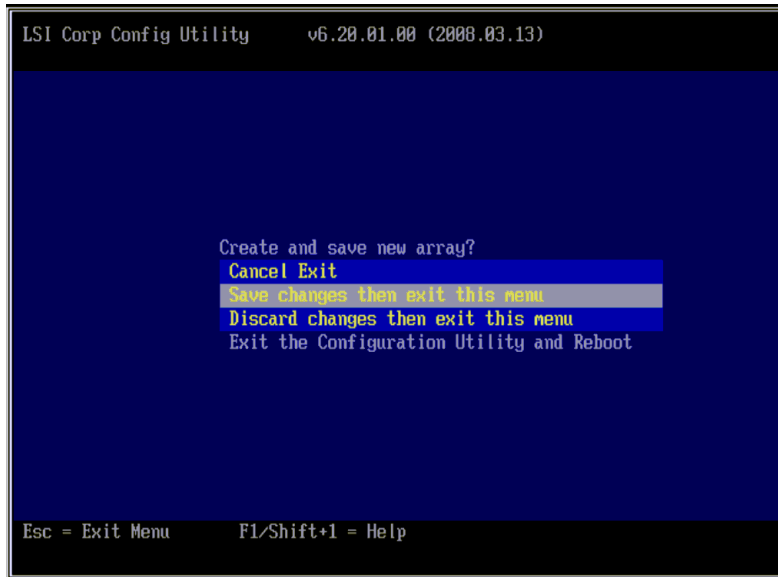
6. Use the arrow keys to highlight the [No] item in the RAID Disk column for the disks you want to include in the volume. For each such disk, press the spacebar or type the + or - key to change the [No] to [Yes].

7. Use the arrow keys to highlight the [No] item in the Hot Spr column for the disks you want to use as hot-spares. For each such disk, press the spacebar or type the + or - key to change the [No] to [Yes].

Your selections might look like this:

Slot Num	Device Identifier	RAID Disk	Hot Spr	Drive Status	Pred Fail	Size (MB)
0	SEAGATE ST973402SSUN72G 0400	[No]	[No]	-----	---	70007
0	SEAGATE ST973402SSUN72G 0400	[No]	[No]	-----	---	70007
1	SEAGATE ST973402SSUN72G 0400	[Yes]	[No]	-----	---	70007
2	SEAGATE ST973402SSUN72G 0400	[Yes]	[No]	-----	---	70007
3	SEAGATE ST973402SSUN72G 0400	[Yes]	[No]	-----	---	70007
4	SEAGATE ST973402SSUN72G 0400	[Yes]	[No]	-----	---	70007
5	SEAGATE ST973402SSUN72G 0400	[No]	[No]	-----	---	70007
6	SEAGATE ST973402SSUN72G 0400	[No]	[Yes]	Hot Spare	---	70007
7	SEAGATE ST973402SSUN72G 0400	[No]	[No]	-----	---	70007

8. When you are satisfied with your choices, type **c** to create the array.
You are asked for confirmation.



9. Select **Save changes then exit this menu**, and then press **Enter**.
The volume is created. When the utility finishes creating the volume, the main screen reappears.

```

LSI Corp Config Utility      v6.20.01.00 (2008.03.13)
Adapter Properties -- SAS1068E

Adapter                      SAS1068E
PCI Slot                     00
PCI Address(Bus/Dev/Func)    02:00:00
MPT Firmware Revision        0.24.30.00-IR
SAS Address                   50000200:00422470
NUDATA Version                2D.03
Status                       Enabled
Boot Order                   0
Boot Support                  [Enabled BIOS & OS]

RAID Properties

SAS Topology

Advanced Adapter Properties

Esc = Exit Menu      F1/Shift+1 = Help
Enter = Select Item  -/+Enter = Change Item

```

10. Highlight RAID Properties and press Enter.

11. When the next screen appears, select View Existing Array and press Enter.

You see the volume you have created.

```

LSI Corp Config Utility      v6.20.01.00 (2008.03.13)
View Array -- SAS1068E

Array                        1 of 1
Identifier                   LSILOGICLogical Volume 3000
Type                         IME
Scan Order                   7
Size(MB)                     139236
Status                       Optimal

Manage Array

Slot  Device Identifier      RAID  Hot  Drive  Pred  Size
Num   ID                    Disk  Spr  Status  Fail  (MB)
1     SEAGATE ST973402SSUN72G 0400 Yes  No    Ok    No    69617
2     SEAGATE ST973402SSUN72G 0400 Yes  No    Ok    No    69617
3     SEAGATE ST973402SSUN72G 0400 Yes  No    Ok    No    69617
4     SEAGATE ST973402SSUN72G 0400 Yes  No    Ok    No    69617
6     SEAGATE ST973402SSUN72G 0400 No   Yes   Hot Spare No    70007

Esc = Exit Menu      F1/Shift+1 = Help
Enter=Select Item  Alt+N=Next Array  C=Create an array  R=Refresh Display

```

12. Exit the LSI RAID configuration utility.
13. Install your OS on this RAID volume.

Note – The LSI RAID configuration utility is described in detail in the *Sun LSI 106x RAID User's Guide* (820-4933), which is in the collection of documents for the X6220 server.

Identifying Logical and Physical Network Interface Names for Linux OS Configuration

The Sun Blade X6220 server module can connect to a network through PCI EM or NEM modules. While configuring an operating system for a networked server, it is necessary to provide the logical names (assigned by the OS) and the physical name (MAC address) of each network interface.

You should begin by finding and recording the MAC addresses of all your physical ports from their labels.

This appendix explains how to obtain the needed logical information in these situations:

- While configuring a SUSE Linux Enterprise Server OS during installation (see [“Identifying Logical and Physical Network Interface Names While Installing a SUSE Linux OS”](#) on page 88).
- While configuring a Red hat Enterprise Linux OS during installation (see [“Identifying Logical and Physical Network Interface Names While Installing a RHEL Linux OS”](#) on page 93).

Identifying Logical and Physical Network Interface Names While Installing a SUSE Linux OS

When you are configuring the SUSE Linux OS while installing it, you reach a point where you must enter the logical and physical names (MAC addresses) of the network interfaces.

This section explains how to launch a user shell during the SUSE Linux OS configuration to obtain the logical and physical network interface names that you need to continue with the configuration.

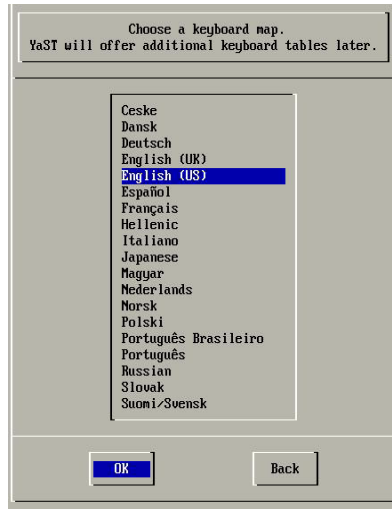
▼ Launch User Shell and Identify Network Interfaces

1. If you have not already done so, select `Rescue System` and press `Enter`.



The message `Loading Linux Kernel` appears followed by the SUSE splash screen, then the `Choose a Keyboard Map` screen appears.

2. In the Choose a Keyboard Map screen, select the appropriate keyboard configuration and click OK.



The user shell launches and the Rescue Login prompt appears.

3. At the Rescue Login prompt, type `root` to log in, then press Enter.

```
INIT: Entering runlevel: 3
Boot logging started on /dev/tty1(/dev/console) at Wed May 17 19:49:24 2006
Master Resource Control: previous runlevel: N, switching to runlevel: 3
Initializing random number generator done
Starting syslog services done
Starting RPC portmap daemon done
Importing Net File System (NFS) unused
Master Resource Control: runlevel 3 has been reached
Skipped services in runlevel 3: nfsboot nfs

Rescue login: root
```

The Rescue prompt appears.

4. At the Rescue prompt (**#**), type the following command then press Enter to display all network interfaces.

```
# ifconfig -a
```

```
INIT: Entering runlevel: 3 done  
Boot logging started on /dev/tty1(/dev/console) at Wed May 17 19:49:24 2006  
Master Resource Control: previous runlevel: N, switching to runlevel: 3  
Initializing random number generator done  
Starting syslog services done  
Starting RPC portmap daemon done  
Importing Net File System (NFS) unused  
Master Resource Control: runlevel 3 has been reached  
Skipped services in runlevel 3: nfsboot nfs  
  
Rescue login: root  
Rescue:~ # ifconfig -a_
```


The output of the Linux SUSE named and physical named network interfaces appear. See the following sample output as an example.

```
eth4  Link encap:Ethernet  HWaddr 00:14:4F:0C:A1:52
      BROADCAST MULTICAST  MTU:1500  Metric:1
      RX packets:0 errors:0 dropped:0 overruns:0 frame:0
      TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
      collisions:0 txqueuelen:1000
      RX bytes:0 (0.0 b)  TX bytes:0 (0.0 b)
      Base address:0xc800  Memory:b5d80000-b5da0000

eth5  Link encap:Ethernet  HWaddr 00:14:4F:0C:A1:53
      BROADCAST MULTICAST  MTU:1500  Metric:1
      RX packets:0 errors:0 dropped:0 overruns:0 frame:0
      TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
      collisions:0 txqueuelen:1000
      RX bytes:0 (0.0 b)  TX bytes:0 (0.0 b)
      Base address:0xcc00  Memory:b5de0000-b5e00000

eth6  Link encap:Ethernet  HWaddr 00:14:4F:0C:A4:72
      BROADCAST MULTICAST  MTU:1500  Metric:1
      RX packets:0 errors:0 dropped:0 overruns:0 frame:0
      TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
      collisions:0 txqueuelen:1000
      RX bytes:0 (0.0 b)  TX bytes:0 (0.0 b)
      Base address:0xf800  Memory:bbd00000-bbda0000

eth7  Link encap:Ethernet  HWaddr 00:14:4F:0C:A4:73
      BROADCAST MULTICAST  MTU:1500  Metric:1
      RX packets:0 errors:0 dropped:0 overruns:0 frame:0
      TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
      collisions:0 txqueuelen:1000
      RX bytes:0 (0.0 b)  TX bytes:0 (0.0 b)
      Base address:0xfc00  Memory:bbde0000-bbe00000

lo    Link encap:Local Loopback
      inet addr:127.0.0.1  Mask:255.0.0.0
      UP LOOPBACK RUNNING  MTU:16436  Metric:1
      RX packets:8 errors:0 dropped:0 overruns:0 frame:0
      TX packets:8 errors:0 dropped:0 overruns:0 carrier:0
      collisions:0 txqueuelen:0
      RX bytes:528 (528.0 b)  TX bytes:528 (528.0 b)

Rescue:~ #
```

If you have multiple network interfaces and the output of interfaces scrolls off the top of the screen, you can display the output per interface.

5. To view the output per network interface, type the following command at the prompt, then press Enter:

```
# ifconfig eth#
```

where # = the interface number. For example, if you type:

```
# ifconfig eth0
```

The output for **eth0** appears:

```
eth0      Link encap:Ethernet  HWaddr 00:14:4F:0C:A1:53
          BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 b)  TX bytes:0 (0.0 b)
          Base address:0xcc00  Memory:b5de0000-b5e00000
```

In the sample output above:

- **eth0** entry in the first column refers to the Linux SUSE logical named interface. This first column in the output identifies the logical names SUSE assigned to the network interface.
 - **HWaddr 00.14.4F.0C:A1:53** entry in second column (first row) refers to the physical MAC address of the network port.
 - a. **Record the SUSE logical network interface name with the physical port MAC address for future reference.**

You will need to refer to this record when configuring the network interfaces during the Linux SUSE OS installation.
6. When you are done, do one of the following to exit the Rescue shell.
 - a. From the ILOM web interface, select Remote Control ->Remote Power Control->Reset.
 - b. From other consoles, type `reboot` at the Rescue prompt (#), then press Enter.
 7. Restart the Linux SUSE installation program.

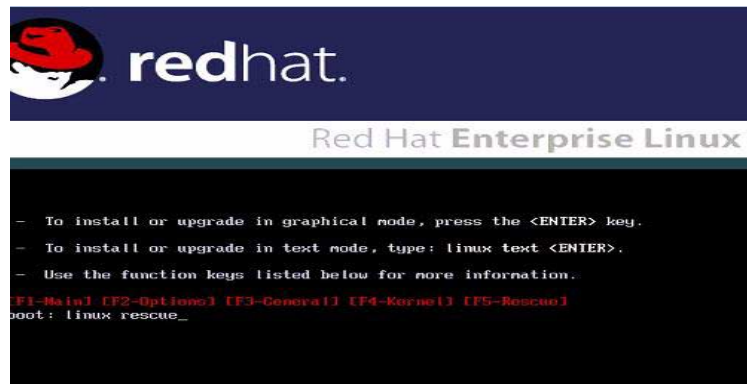
Identifying Logical and Physical Network Interface Names While Installing a RHEL Linux OS

When you are configuring the RHEL Linux OS while installing it, you reach a point where you must enter the logical and physical names (MAC addresses) of the network interfaces.

This section explains how to launch a user shell during the Red Hat Linux configuration to obtain the logical and physical network interface names that you need to continue with the configuration.

▼ Launch User Shell and Identify Network Interfaces

1. If you have not already done so, type: **linux rescue** at the boot prompt, then press Enter.



The Choose a Language screen appears.

2. In the Choose a Language screen, select the appropriate language and click OK.



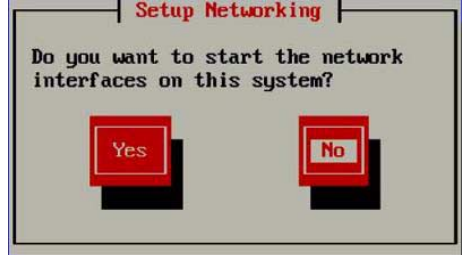
The Keyboard Type screen appears.

3. In the Keyboard Type screen, select the appropriate configuration then click OK.



The Setup Network screen appears.

4. In the Setup Network screen, click No.



The Rescue screen appears.

5. In the Rescue screen, click Skip.



The user shell appears.

6. At the command prompt (#) in the user shell, type the following command to display all network interfaces, then press Enter.

```
# ifconfig -a
```

The output of the Linux Red Hat named network interfaces appear. See the following sample output as an example.

```
collisions:0 txqueuelen:1000
RX bytes:0 (0.0 B) TX bytes:0 (0.0 B)
Base address:0xcc00 Memory:b5de0000-b5e00000

eth6   Link encap:Ethernet  HWaddr 08:14:4F:8C:A4:72
       BROADCAST MULTICAST  MTU:1500 Metric:1
       RX packets:0 errors:0 dropped:0 overruns:0 frame:0
       TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
       collisions:0 txqueuelen:1000
       RX bytes:0 (0.0 B) TX bytes:0 (0.0 B)
       Base address:0xf800 Memory:bbd00000-bbda0000

eth7   Link encap:Ethernet  HWaddr 08:14:4F:8C:A4:73
       BROADCAST MULTICAST  MTU:1500 Metric:1
       RX packets:0 errors:0 dropped:0 overruns:0 frame:0
       TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
       collisions:0 txqueuelen:1000
       RX bytes:0 (0.0 B) TX bytes:0 (0.0 B)
       Base address:0xfc00 Memory:bbde0000-bbe00000

lo     Link encap:Local Loopback
       LOOPBACK MTU:16436 Metric:1
       RX packets:0 errors:0 dropped:0 overruns:0 frame:0
       TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
       collisions:0 txqueuelen:0
       RX bytes:0 (0.0 B) TX bytes:0 (0.0 B)

~/bin/sh-3.00#
```

If you have multiple network interfaces and the output of interfaces scrolls off the top of the screen, you can display the output per interface.

7. To view the output per network interface, type the following at the command prompt, then press Enter:

```
# ifconfig eth#
```

where # = the interface number. For example, if you type:

```
# ifconfig eth0
```

The output for **eth0** appears,:

```
-/bin/sh-3.00# ifconfig eth0
eth0      Link encap:Ethernet  HWaddr 00:14:4F:0C:A1:F2
          BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)
          Base address:0x8800  Memory:89b80000-89ba0000

-/bin/sh-3.00#
```

In the sample output above:

- **eth0** entry in the first column refers to the Linux Red Hat logical named interface. This first column in the output identifies the logical names Red Hat assigned to the network interface.
 - **HWaddr 00.14.4F.0C:A1:F2** entry in second column (first row) refers to the physical MAC address of the network port.
 - c. **Record the Red Hat logical network interface name with the physical port MAC address for future reference. You will need to refer to this record when configuring the network interfaces during the Red Hat OS installation.**
8. **When you are done, do one of the following to exit the user shell.**
 - From the ILOM, select Remote Control ->Remote Power Control->Reset.
 - From the ILOM Remote Console, select **Ctrl Alt Delete** in the Keyboard menu.
 - From other consoles, press **Ctrl->Alt->Delete**.
 9. **Restart the Linux Red Hat installation program.**

Identifying Logical and Physical Network Interface Names for Solaris OS Installation

The Sun Blade X6220 server module can connect to a network through PCI EM or NEM modules. While configuring an operating system for a networked server, it is necessary to provide the logical names (assigned by the OS) and the physical name (MAC address) of each network interface.

You should begin by finding and recording the MAC addresses of all your physical ports from their labels.

This appendix explains how to obtain the needed logical information in these situations:

- *Before* configuring a pre-installed Solaris OS (see [“Identifying Logical and Physical Network Interface Names for a Pre-installed Solaris OS”](#) on page 99).
- *While* configuring a Solaris OS during installation (see [“Identifying Logical and Physical Network Interface Names While Installing a Solaris OS”](#) on page 101).

Identifying Logical and Physical Network Interface Names for a Pre-installed Solaris OS

Pre-installed Solaris OS are unconfigured.

Prior to configuring the OS, you use the procedure below to identify the network interfaces by their logical and physical names (MAC addresses). You record this information, which you need during configuration, and then return the OS to its unconfigured state before proceeding with the configuration.

1. Log in to the system as root and run `ifconfig -a` in a command shell.

The command discovers all installed network interfaces. The shell prompt (#) appears when the discovery completes.

2. To output a list of all Solaris named interfaces along with their physical MAC addresses, type this command at the prompt (#):

```
#s ifconfig -a
```

A sample `ifconfig-a` output is as follows:

```
# ifconfig -a
```

```
lo0: flags=2001000849<UP,LOOPBACK,RUNNING,MULTICAST,IPv4,VIRTUAL>  
mtu 8232 index 1
```

```
inet 127.0.0.1 netmask ff000000
```

```
e1000g0: flags=1000802<BROADCAST,MULTICAST,IPv4> mtu 1500 index 2
```

```
inet 0.0.0.0 netmask 0
```

```
ether 0:14:4f:c:a1:ee
```

```
e1000g1: flags=1000802<BROADCAST,MULTICAST,IPv4> mtu 1500 index 3
```

```
inet 0.0.0.0 netmask 0
```

```
ether 0:14:4f:c:a1:ef
```

```
e1000g2: flags=1000802<BROADCAST,MULTICAST,IPv4> mtu 1500 index 4
```

```
inet 0.0.0.0 netmask 0
```

```
ether 0:14:4f:c:a5:d6
```

```
e1000g3: flags=1000802<BROADCAST,MULTICAST,IPv4> mtu 1500 index 5
```

```
inet 0.0.0.0 netmask 0
```

```
ether 0:14:4f:c:a5:d7
```

```
e1000g4: flags=1000802<BROADCAST,MULTICAST,IPv4> mtu 1500 index 6
```

```
inet 0.0.0.0 netmask 0
```

```
ether 0:14:4f:c:a1:4e
```

In the sample above, the Solaris named network interfaces appear as `e1000g0`, `e1000g1`, and so on. The MAC address for each network interface appears after the word `ether`. For example, the MAC address associated to the Solaris named network interface `e1000g0` is `0:14:4f:c:a1:ee`.

3. Record the Solaris network interface name for each MAC address previously recorded in the Configuration Worksheet list.

4. When you are done, type `sys-unconfig(1M)` at the command line.

This command restores the system configuration to the "as-manufactured" state.

Caution – The `sys-unconfig(1M)` command will halt the system

For example,

```
# sys-unconfig
WARNING
```

```
This program will unconfigure your system.  It will cause
it
```

```
to revert to a "blank" system - it will not have a name or
know about other systems or networks.
```

```
This program will also halt the system.
```

```
Do you want to continue (y/n) ?
```

5. Reboot the system.

You will be prompted with a series of configuration questions.

6. In the Network Connection screen, select Yes.

The Configure Multiple Network Interfaces screen appears.

7. In the Configure Multiple Network Interfaces screen, consult the list of network interface names recorded in Step 3, then select the appropriate network interfaces.

8. Continue the normal Solaris configuration.

Identifying Logical and Physical Network Interface Names While Installing a Solaris OS

When you are configuring the Solaris OS while installing it, you reach a point where you must enter the logical and physical names (MAC addresses) of the network interfaces.

This section explains how to launch a user shell during the Solaris OS configuration to obtain the logical and physical network interface names that you need to continue with the configuration.

▼ Launch User Shell and Identify Network Interfaces

1. In the Install Type menu, select Option (6) Single User Shell and press Enter.

If a message appears about mounting an OS instance, select **q**. You should not mount any OS instance.

The message "Starting Shell" appears, see the following figure.

```
1. Solaris Interactive (default)
2. Custom JumpStart
3. Solaris Interactive Text (Desktop session)
4. Solaris Interactive Text (Console session)
5. Apply driver updates
6. Single user shell

Enter the number of your choice.
Selected: 6

Single user shell

Searching for installed OS instances...

Multiple OS instances were found. To check and mount one of them
read-write under /a, select it from the following list. To not mount
any, select 'q'.

  1 /dev/dsk/c2t0d0s0    Solaris 10 6/06 s10x_u2wos_08 X86
  2 /dev/dsk/c2t1d0s0    Solaris 10 6/06 s10u2_08-0N-WOS X86

Please select a device to be mounted (q for none) [?,??,q]: q

Starting shell.
#
```

2. At the command prompt (#), type the following command to plumb all network interfaces.

```
# ifconfig -a plumb
```

Note – The plumb process may take some time.

3. At the command prompt, type the following command to output a list of all network interfaces by their Solaris logical name and physical MAC address name.

```
# ifconfig -a
```

The output of Solaris named interfaces and MAC addresses appears. For an example, see the following sample output.

```
# ifconfig -a | more
e1000g0: flags=1000802<BROADCAST,MULTICAST,IPv4> mtu 1500 index 2
    inet 0.0.0.0 netmask 0
    ether 0:14:4f:c:a1:ee
e1000g1: flags=1000802<BROADCAST,MULTICAST,IPv4> mtu 1500 index 3
    inet 0.0.0.0 netmask 0
    ether 0:14:4f:c:a1:ef
e1000g2: flags=1000802<BROADCAST,MULTICAST,IPv4> mtu 1500 index 4
    inet 0.0.0.0 netmask 0
    ether 0:14:4f:c:a5:d6
e1000g3: flags=1000802<BROADCAST,MULTICAST,IPv4> mtu 1500 index 5
    inet 0.0.0.0 netmask 0
    ether 0:14:4f:c:a5:d7
e1000g4: flags=1000802<BROADCAST,MULTICAST,IPv4> mtu 1500 index 6
    inet 0.0.0.0 netmask 0
    ether 0:14:4f:c:a1:4e
e1000g5: flags=1000842<BROADCAST,RUNNING,MULTICAST,IPv4> mtu 1500 index 1
    inet 0.0.0.0 netmask 0
    ether 0:14:4f:c:a1:4f
e1000g6: flags=1000802<BROADCAST,MULTICAST,IPv4> mtu 1500 index 7
    inet 0.0.0.0 netmask 0
    ether 8:0:20:b6:ce:94
e1000g7: flags=1000802<BROADCAST,MULTICAST,IPv4> mtu 1500 index 8
    inet 0.0.0.0 netmask 0
#
```

In the sample output above, the:

- e1000g# entry in the first column refers to the Solaris logical named interface. This first column in the output identifies the logical names assigned by Solaris to the network interfaces.
- ether #:#: #: #: #: # entry in second column (third row) refers to the physical MAC address name of the network port.

For example:

The physical MAC address for the Solaris named network interface e1000g0 is 0:14:4f:c:a1:ee.

4. Record the Solaris network interface name next to the physical port MAC address previously recorded (per the Configuration Worksheet).
5. When you are done, type **exit** at the command prompt.

The Solaris Installation program will resume where you last left off.

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