Sun Fire X4500 Server Linux and Solaris OS Installation Guide

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Contents

Preface

The *Sun Fire X4500 Server Linux and Solaris OS Installation Guide* contains instructions for installing supported versions of Linux and Solaris™ operating systems on the Sun™ Fire X4500 server, using the Sun Installation Assistant and PXE.

For information about installing Windows OS, refer to the *Sun Fire™ X4500/X4540 Server Windows Operating System Installation Guide*.

Product Updates

For firmware and driver updates, as well as CD/DVD ISO images that you can download for the Sun Fire X4500 Server, go to http://www.sun.com/servers/x64/x4500/support.xml.

Related Documentation

For a description of the document set for the Sun Fire X4500 server, see the *Where To Find Documentation* sheet that is packed with your system and also posted at the product's documentation site. To navigate to your product go to http://www.sun.com/documentation.

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.

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Sun Fire X4500 Server Linux and Solaris OS Installation Guide, part number 819-4362.

Operating System Installation Overview

This chapter gives an overview of the operating system (OS) installation process for Linux and the Solaris OS.

Note – Installation for Windows is covered in the *Sun Fire X4500/X4540 Server Windows Operating System Installation Guide*(820-0407).

For additional information about disk management and monitoring utilities, refer to *Sun Fire™ X4500/X4540 Server Administration Guide (819-6562)*.

Preparing to Install an OS on a Sun Fire X4500 Server

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

Prerequisites

You must complete the following before you can begin the installation:

■ Install the server hardware.

■ (Optional) Configure the service processor (you can do this after installation if you prefer).

■ (Solaris OS only) Install and set up the software on the preinstall image and the Bootable Diagnostics CD.

■ Gather needed information, such as the IP address and netmask.

Things You Must Decide

Before you begin installing the OS, answer the following questions.

■ Which OS must I install?

A list of supported operating systems for the Sun Fire X4500 series servers is available at http://www.sun.com/servers/x64/x4500/os.jsp.

■ Must I configure the server for diskless booting?

Operating System	Relevant Documentation on Diskless Configurations
Solaris 10	See "About Solaris OS Installation" on page 7 or *Solaris 10 Installation Guide: Network-Based Installations* at http://docs.sun.com/app/docs/doc/817-5504.
Red Hat Linux	See "About RHEL Installation" on page 14 or *Red Hat Enterprise Linux System Administration Guide* at https://www.redhat.com/docs/manuals/enterprise/.
SUSE Linux Enterprise Server 10	See "About SUSE Linux Enterprise Server 10 Installation" on page 36, or go to http://www.novell.com/documentation/sles10/index.html .

■ Which installation method must I use?

Method	Solaris	Red Hat	SUSE
Preinstalled on disk	YES	NO	NO
Install from distribution media (CD/DVD) on the server	YES	YES	YES
Install from distribution media (CD/DVD) via KVMS	YES	YES	YES
Install from network using PXE	YES	YES	YES
Sun Installation Assistant (Linux only)	NO	YES	YES

Note – The Sun Fire X4500 server supports industry-standard remote KVMS (keyboard, video, mouse, and storage) operation with the Integrated Lights Out Manager (ILOM) Remote Console application. For more information on setting up a remote KVMS connection to your server using the ILOM Remote Console application, see the *Integrated Lights Out Manager Administration Guide*.

- Must I update the OS?

  In general, you might need to perform updates once the OS has been installed. For details, see the appropriate chapter for your particular OS.

Next Steps

- See the appropriate chapter for your OS.
- Gather the installation, administration, and configuration documentation. See the chapters in this guide for pointers to relevant documentation.

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 Solaris 10 Operating System

This chapter describes the installation process for the Solaris 10 operating system.

About Solaris OS Installation

This chapter describes some of what you need to know to install the Solaris Operating System (Solaris OS) on a Sun Fire X4500 server and points you to the Solaris OS documentation for more detailed information you need to complete the installation.

This chapter contains instructions for installing the Solaris 10 OS from network or media. If you are configuring the preinstalled Solaris 10 OS that is shipped with the server, refer to the *Sun Fire X4500 Server Guide for Preinstalled Solaris 10 Operating System*.

Note – This chapter is intended for experienced system administrators who are familiar with using the Solaris OS on an x86/x64 platform.

Overview

In this document the term "x86" refers to the Intel 32-bit family of microprocessors and compatible 64-bit and 32-bit microprocessors made by AMD. The supported x86 based systems appear in the Solaris Hardware Compatibility List at http://www.sun.com/bigadmin/hcl.

The minimum Solaris OS for a Sun Fire X4500 server is Solaris 10. The Solaris 10 OS box contains the DVD media and documentation that you need to install the Solaris OS software for both SPARC and x86 platforms. For a Sun Fire X4500 server, use the media for x86 platforms.

The Sun Fire X4500 server supports the following Solaris OS installation methods:

- Boot from the preinstalled Solaris 10 OS image on the hard drive.
- Install Solaris on one server from CD/DVD media interactively using the Solaris installation program.
- Install Solaris on one or several servers over the network using Preboot Execution Environment (PXE) technology and the following installation methods:
  - Solaris installation program over the network from remote CD/DVD images
  - JumpStart™ installation
  - Diskless boot
  - Install using a serial console

Note – On the Sun X4500 Server, there are two possible boot locations: c5t0 (physical drive slot 0) and c5t4 (physical drive slot 1). These device identifiers are the default with the server configured to boot off of the factory installed SATA storage. If you add additional storage devices (such as a USB storage device), the device identifiers may change depending on which device the operating system looks at first during boot. See TABLE 3-4 for default drive mapping.

Use TABLE 3-1 to identify the steps you need to perform to install the Solaris OS.

TABLE 3-1   Task Map for Initial Solaris OS Installation

Task	Description	Instructions
Set up your server.	Install your server hardware and configure the service processor.	*Sun Fire X4500 Server Installation Guide*
Review requirements specific to the Sun Fire X4500 server.	Verify that your server meets the minimum system requirements.	See "Minimum System Requirements for a Solaris OS Installation" on page 9 and the *Sun Fire X4500 Server Guide for Preinstalled Solaris OS*
Review the Sun Fire X4500 Server Product Notes.	The product notes contain late-breaking news about the Solaris OS software and patches.	*Sun Fire X4500 Server Product Notes*

TABLE 3-1   *(Continued)*Task Map for Initial Solaris OS Installation

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 7
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 12
Install the Solaris OS.	Choose an installation method and locate the installation instructions.	See "Installation Methods" on page 10.
Install patches, if necessary.	Patches are available from the SunSolve Patch Portal at http://www.sunsolve.sun.com.	*Sun Fire X4500 Server Product Notes*

TABLE 3-2   Minimum System Requirements for a Solaris OS Installation

Requirement	Description
Hardware requirements	The server hardware and the initial service processor configuration (if used) must be installed before you install the Solaris OS.
Minimum Solaris OS	Solaris 10 for x86 and x64 platforms or later compatible versions.
Memory to install	256 Mbytes is the recommended size. 64 Mbytes is the minimum size.
Disk space	12 Gbytes or greater.
Swap area	512 Mbytes 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/DVD media.

TABLE 3-3 Installation Methods

Method	Description	Instructions
Install from CD/DVD media.	Use the Solaris Installation Program on the CD/DVD media to install one server interactively.	Follow the instructions for x86 installation in *Solaris 10 Installation Guide: Basic Installations* at `http://docs.sun.com/app/docs/doc/817-0544`.
Install from the network by using PXE.	You need to use PXE to install the Solaris OS over the network from remote CD/DVD 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, a DHCP server, and configure the BIOS on each server to boot from the network.	Follow the instructions for an x86 PXE installation, in *Solaris 10 Installation Guide: Network-Based Installations* at `http://docs.sun.com/app/docs/doc/817-5504`.
Boot from the preinstalled image.	Depending on your configuration, a Solaris OS image might be preinstalled on a hard drive.	*Sun Fire X4500 Server Guide for Preinstalled Solaris OS*
Install from a serial console.	Use a serial console to install the Solaris OS in a PXE-based network installation.	Follow the instructions for an x86 PXE installation in *Solaris 10 Installation Guide: Network-Based Installations* at `http://docs.sun.com/app/docs/doc/817-5504`.
Perform a diskless boot.	Boot the Solaris OS on a Sun Fire X4500 server without a hard drive. Use this method with a PXE-based network installation.	Follow the instructions for an x86 PXE installation in *Solaris 10 Installation Guide: Network-Based Installations* at `http://docs.sun.com/app/docs/doc/817-5504`.

Note – The Solaris OS provides additional programs for installation, such as booting over a wide area network (WAN), but the Sun Fire X4500 server supports only those methods listed in this document.

Use TABLE 3-4 to see the default disk mapping and boot disk locations for the Sun Fire X4500 server with ILOM 2.0.2.5 or later:

TABLE 3-4   Sun Fire X4500 Disk Mapping

Device	Slot Number	Device Node	Device	Slot Number	Device Node
sata3/0	0 *	c5t0	sata3/2	24	c5t2
sata3/4	1 *	c5t4	sata3/6	25	c5t6
sata2/0	2	c4t0	sata2/2	26	c4t2
sata2/4	3	c4t4	sata2/6	27	c4t6
sata5/0	4	c7t0	sata5/2	28	c7t2
sata5/4	5	c7t4	sata5/6	29	c7t6
sata4/0	6	c6t0	sata4/2	30	c6t2
sata4/4	7	c6t4	sata4/6	31	c6t6
sata1/0	8	c1t0	sata1/2	32	c1t2
sata1/4	9	c1t4	sata1/6	33	c1t6
sata0/0	10	c0t0	sata0/2	34	c0t2
sata0/4	11	c0t4	sata0/6	35	c0t6
sata3/1	12	c5t1	sata3/3	36	c5t3
sata3/5	13	c5t5	sata3/7	37	c5t7
sata2/1	14	c4t1	sata2/3	38	c4t3
sata2/5	15	c4t5	sata2/7	39	c4t7
sata5/1	16	c7t1	sata5/3	40	c7t3
sata5/5	17	c7t5	sata5/7	41	c7t7
sata4/1	18	c6t1	sata4/3	42	c6t3
sata4/5	19	c6t5	sata4/7	43	c6t7
sata1/1	20	c1t1	sata1/3	44	c1t3
sata1/5	21	c1t5	sata1/7	45	c1t7
sata0/1	22	c0t1	sata0/3	46	c0t3
sata0/5	23	c0t5	sata0/7	47	c0t7

* Possible boot disk location.

Note – If you add additional storage devices (such as a USB storage device), the device identifiers may change depending on which device the operating system looks at first during boot.

Where to Find Solaris 10 Information

Solaris 10 OS documentation is available at http://docs.sun.com/.

Select Solaris 10 to display the list of documents in the Solaris 10 Documentation Collection. Make sure to follow instructions specific to x86 systems, where specified.

- For the Solaris 10 installation guides, go to http://docs.sun.com/app/docs/coll/1236.4.
- For the Solaris 10 administration guides, go to http://docs.sun.com/app/docs/coll/47.16.
- For information about upgrading your system, go to 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.

Red Hat Enterprise Linux

This chapter includes information on installing the Red Hat Enterprise Linux (RHEL) operating systems and system specific drivers onto your Sun Fire X4500 server.

This chapter includes the following sections:

About RHEL Installation

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

■ The Sun™ Installation Assistant (SIA) CD

■ Automatic kickstart installation from RHEL software (installation tree) stored on a Preboot Execution Environment (PXE) network server.

Task Map for RHEL Installation

Consult the following table to determine which sections in this document are relevant to the installation tasks that you want to perform.

Installation Task	Relevant Section
Collect information about your system and network.	"Red Hat Installation and Administration Documentation" on page 15
Meet the requirements for Installing RHEL from distribution media.	"Requirements for Installing RHEL From Distribution Media" on page 18
Install from local media using SIA.	."How to Get Started Using SIA" on page 6
Install from local media using PXE.	"Installing RHEL Using PXE" on page 20
Update RHEL OS files.	"Updating the RHEL OS" on page 33

Red Hat Installation and Administration Documentation

Before you install the RHEL software on a Sun Fire X4500 server, consult the following 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 at `http://www.redhat.com/docs/`
Red Hat Enterprise Linux Quick Installation Guide	A printed guide containing useful information to assist you during the installation of RHEL.	Included with the RHEL distribution media
Red Hat Enterprise Linux Installation Guide	The expanded version of the printed *Quick Installation Guide*.	Included on the Red Hat Documentation CD, and available for download at `http://www.redhat.com/docs/`
Red Hat Enterprise Linux Introduction to System Administration	Introductory information for RHEL system administrators.	Available for download at `http://www.redhat.com/docs/manuals/enterprise/`
Red Hat Enterprise Linux System Administration Guide	Information on customizing the RHEL software.	Available for download at `http://www.redhat.com/docs/manuals/enterprise/`
System Administration for Diskless Booting	Information on configuring your server and Red Hat Linux for diskless booting.	Available for download as the *Red Hat Enterprise Linux Installation Guide for the x86, Itanium™, and AMD64 Architectures* at `http://www.redhat.com/docs/manuals/enterprise/`
Red Hat Enterprise Linux Security Guide	Guide for securing the RHEL software.	Available for download at `http://www.redhat.com/docs/manuals/enterprise/`

Sun Fire X4500 Disk Map

Use TABLE 4-1 to see the default disk mapping and boot disk locations for the Sun
Fire X4500 server:

TABLE 4-1   Sun Fire X4500 Disk Mapping

Device	Slot Number	Device Node
sata3/0	0 *	/dev/sdy
sata3/4	1 *	/dev/sdac
sata2/0	2	/dev/sdq
sata2/4	3	/dev/sdu
sata5/0	4	/dev/sdao
sata5/4	5	/dev/sdas
sata4/0	6	/dev/sdag
sata4/4	7	/dev/sdak
sata1/0	8	/dev/sdi
sata1/4	9	/dev/sdm
sata0/0	10	/dev/sda
sata0/4	11	/dev/sde
sata3/1	12	/dev/sdz
sata3/5	13	/dev/sdad
sata2/1	14	/dev/sdr
sata2/5	15	/dev/sdv
sata5/1	16	/dev/sdap
sata5/5	17	/dev/sdat
sata4/1	18	/dev/sdah
sata4/5	19	/dev/sdal
sata1/1	20	/dev/sdj
sata1/5	21	/dev/sdn
sata0/1	22	/dev/sdb
sata0/5	23	/dev/sdf
sata3/2	24	/dev/sdaa
sata3/6	25	/dev/sdae

TABLE 4-1   Sun Fire X4500 Disk Mapping

Device	Slot Number	Device Node
sata2/2	26	/dev/sds
sata2/6	27	/dev/sdw
sata5/2	28	/dev/sdaq
sata5/6	29	/dev/sdau
sata4/2	30	/dev/sdai
sata4/6	31	/dev/sdam
sata1/2	32	/dev/sdk
sata1/6	33	/dev/sdo
sata0/2	34	/dev/sdc
sata0/6	35	/dev/sdg
sata3/3	36	/dev/sdab
sata3/7	37	/dev/sdaf
sata2/3	38	/dev/sdt
sata2/7	39	/dev/sdx
sata5/3	40	/dev/sdar
sata5/7	41	/dev/sdav
sata4/3	42	/dev/sdaj
sata4/7	43	/dev/sdan
sata1/3	44	/dev/sdl
sata1/7	45	/dev/sdp
sata0/3	46	/dev/sdd
sata0/7	47	/dev/sdh

* Possible boot disk location.

Note – If you add additional storage devices (such as a USB storage device), the device identifiers may change depending on which device the operating system looks at first during boot.

Requirements for Installing RHEL From Distribution Media

To install the RHEL from local media, you must use either PXE network installation or the Sun Installation Assistant CD.

Required Items

Installation from distribution media requires the following items:

- Sun Fire X4500 server equipped with:
    - External USB CD/DVD drive
    - USB keyboard and mouse
    - Monitor
- RHEL media CD set
- Sun Installation Assistant (SIA) CD, if you choose this installation option

Obtaining Updated Media Kits

To install RHEL 4 on the Sun Fire X4500 server, you need to obtain the RHEL 4 Update Media Kit.

To obtain this kit, log in at http://rhn.redhat.com.

You 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.

After you obtain the updated ISO images, write them to CDs and use them in place of the media you obtained with your RHEL 4 box. This updated media kit contains important drivers that are required by the Sun Fire X4500 server.

Boot Disk ID On Linux Changes If Virtual Floppy Or CD-ROM Is Mounted At Installation

For the Sun Fire X4500 server, typically, the boot device nodes are `/dev/sdy` which is located at Slot 0, and `/dev/sdac` located at Slot 1.

Note – The device ID of the boot disk on Linux changes if a virtual floppy or a CD-ROM is mounted at installation. If this is the case with your system, issue the `hd` command to determine the boot disk. Use this disk as the target disk for the OS installation.

Installing Integrated Lights Out Manager (ILOM) 2.0.2.5 changes the controller IDs and the names of the system drives. For more information see "Upgrading to ILOM 2.0.2.5 Changes Controller IDs" in the *Sun Fire™ X4500/X4540 Server Installation Guide*.

The OS must be installed on one of these device nodes. You must also ensure that the GRand Unified Bootloader (GRUB) is installed on the boot device.

TABLE 4-2   Boot Drives With Virtual Devices

Firmware	Virtual Floppy	Virtual CD-ROM	Boot Device Name(s)
Before 2.0.2.5	Not Mounted	Not Mounted	`/dev/sdy`, `/dev/sdac`
Before 2.0.2.5	Not Mounted	Mounted	`/dev/sdy`, `/dev/sdac`
Before 2.0.2.5	Mounted	Not Mounted	`/dev/sdy`, `/dev/sdac`
Before 2.0.2.5	Mounted	Mounted	`/dev/sdy`, `/dev/sdac`
2.0.2.5 or later	Not Mounted	Not Mounted	`/dev/sdx`, `/dev/sdab`
2.0.2.5 or later	Not Mounted	Mounted	`/dev/sdx`, `/dev/sdab`
2.0.2.5 or later	Mounted	Not Mounted	`/dev/sdy`, `/dev/sdac`
2.0.2.5 or later	Mounted	Mounted	`/dev/sdy`, `/dev/sdac`

To ensure that GRUB gets installed on the boot device, you should perform the following step(s):

1. **During RHEL installation (using the graphical user interface), in the Advanced GRUB menu, select the device** `/dev/disk_name`**.**

2. **Click the up-arrow until** `/dev/disk_name` **is at the top of the list. This process could require approximately 90 clicks.**

Once the installation is complete, GRUB resides on `/dev/disk_name`.

Note – RHEL 4.5 and 4.7 loads the USB storage device first when installing the system and RHEL 4.6 loads the USB storage device after the SCSI devices.

Installing RHEL Using Sun Installation Assistant (SIA)

The Sun Installation Assistant is a convenient, front-end application designed to assist you in installing SUSE or Red Hat Linux on your server. The Sun Installation Assistant supplements the standard installation utilities and procedures that ship with SUSE or Red Hat Linux; it does not replace them. Refer to Chapter 2 for more information.

Installing RHEL Using PXE

PXE is a powerful and convenient solution for setting up a number of Sun Fire X4500 servers so their configuration is identical. The onboard network interface card (NIC) in your Sun Fire X4500 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. If that 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 RHEL image on your server.

Note – During RHEL installation, you need to take special steps to identify the boot device, see "Boot Disk ID On Linux Changes If Virtual Floppy Or CD-ROM Is Mounted At Installation" on page 19 for more information.

Task Map

To take advantage of RHEL and PXE 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 18
Set up your Linux network and PXE server.	"Preconfiguring Your Network to Support PXE Installation of RHEL" on page 22
Install RHEL images on that PXE server.	"Creating a PXE Install Image on the PXE Server" on page 29
Configure your server to install from a RHEL image on a PXE server.	"Installing RHEL From a PXE Server" on page 32
Update the OS.	"Updating the RHEL OS" on page 33

Preconfiguring Your Network to Support PXE Installation of RHEL

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

Preconfiguring your network for PXE installation involves the following procedures:

- Copying files from the Tools and Drivers CD
- Configuring a DHCP Server
- Installing Portmap
- Configuring the TFTP Service
- Installing and configuring the neopxe boot server daemon
- Configuring the NFS Service
- Disabling the firewall
- Completing the PXE preconfiguration

Before You Begin

If you do not have access to the Tools and Drivers CD, you can download the latest ISO image at http://www.sun.com/servers/x64/x4500/support.xml.

Required Items

Preconfiguring your network for PXE installation requires the following items:

- RHEL server equipped with:
    - DVD drive
    - USB keyboard
    - Monitor
- RHEL media set
- Tools and Drivers CD for your Sun Fire server

▼ To Copy PXE 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. This example uses RHEL 4 Update 4. Replace `rhel4_64` 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 directory to copy the PXE support files if** `/tmp` **does not exist:**

   ```
   # mkdir /tmp
   ```

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

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

   ```
   # cp /mnt/cdrom/support/pxeboot/rhel4_64-pxefiles.tar.gz /tmp/
   ```

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

   ```
   # cd /tmp
   ```

   ```
   # tar -zxvf rhel4_64-pxefiles.tar.gz
   ```

   When you extract the file, a directory with all required files is created at `/tmp/rhel4_64-pxefiles/`.

▼ To Configure a DHCP Server

Complete the following steps on the server that will become your 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:**

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

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

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

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

4. **Unmount the CD, by entering the following command:**

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

5. **Remove the CD from the server.**

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

> **Note** – Refer to the `dhcpd.conf` man page for more information.

Enter the following in the DHCP configuration file:

**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 PXE server's IP address.

> **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:**

   # **service dhcpd start**

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

    # **chkconfig dhcpd on**

▼ To Install Portmap

Complete the following steps on your DHCP server.

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

   # **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. Unmount the CD, by entering the following command:

   # **umount /mnt/cdrom**

4. Remove the CD from the server.

▼ To Configure the TFTP Service

Complete the following steps on your DHCP server.

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

   # **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. Unmount the CD, by entering the following command:

   # **umount /mnt/cdrom**

4. Remove the CD from the server.

5. **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**.

6. **Restart the inetd server:**

   # **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:

```
# cd /tmp/rhel4_64-pxefiles/neopxe-0.2.0
# ./configure
# make
# make install
```

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:**

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

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

```
# mkdir /home/pxeboot
# cp /tmp/rhel4_64-pxefiles/pxelinux.0 /home/pxeboot
```

4. Configure the PXE Linux image:

```
# 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.**

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

If the `neopxe.conf` file is not in the `/usr/local/etc` directory, you can copy it from the `/tmp/rhel4_64-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
```

6. **Start the** `neopxe` **daemon:**

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

▼ To Configure the NFS Service

Complete the following steps on your DHCP server.

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

   # **`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:**

   # **`service nfs start`**

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

   # **`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

If you enabled firewall security when you installed RHEL software on the system that will become 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:**

   # **service ipchains stop**

2. **Stop the iptables service:**

   # **service iptables stop**

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

   # **chkconfig ipchains off**

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

   # **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.

Note – 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 enable the firewall after downloading software to PXE clients.

▼ To Complete the PXE Preconfiguration

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 also acts as your PXE server. The PXE server provides the OS 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 22.

Required Items

The PXE installation procedure requires the following items:

- A CD/DVD drive on the DHCP Server
- RHEL 4 Update 4 (or later) media CD set (see "Obtaining Updated Media Kits" on page 18)
- Tools and Drivers CD for your Sun Fire server

▼ To Create a RHEL Image on Your PXE Install Server

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

   The following examples refer to RHEL 4, Update 4; replace rhel4 with the file name that corresponds to your update.

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/support/pxeboot/rhel4_64-pxefiles.tar.gz /tmp**

   # **cd /tmp**

   # **tar -zxvf rhel4_64-pxefiles.tar.gz**

   # **umount /mnt/cdrom**

3. **Create a directory to hold the RHEL software:**

   # **mkdir -p /home/pxeboot/rhel4_64/**

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

```
# mount /dev/cdrom /mnt/cdrom
# cp -a /mnt/cdrom/* /home/pxeboot/rhel4_64/
# umount /mnt/cdrom
```

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

```
# cp /tmp/rhel4_64-pxefiles/ks.cfg /home/pxeboot/rhel4_64/
```

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 image from the PXE files that you uncompressed in Step 2 into the PXE image by entering the following command:**

```
# cp /tmp/rhel4_64-pxefiles/initrd.img /home/pxeboot/rhel4_64/
```

7. **Copy the updated SATA driver rpm file found on the Tools and Drivers CD to the PXE target directory.**

   a. **Mount the Tools and Drivers CD by entering the command:**

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

   b. **Copy over the SATA driver rpm file that matches your version of the kernel**

```
# cp /mnt/cdrom/linux/drivers/mvSatalinux-3.6.3_2-
2.6.9_42.ELsmp_1.x86_64.rpm /home/pxeboot/rhel4_64/
```

   -or-

```
# cp /mnt/cdrom/linux/drivers/mvSatalinux-3.6.3_2-
2.6.9_55.ELsmp_1.x86_64.rpm /home/pxeboot/rhel4_64/
```

c. **Unmount the Tools and Drivers CD by entering the command:**

   # **umount /mnt/cdrom**

8. **On your PXE server, edit and save the kickstart file,**
   /home/pxeboot/rhel4_64/ks.cfg.

   Edit the nfs line is as follows:

   nfs --server *n.n.n.n* **--dir /home/pxeboot/rhel4_64/**

   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.

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_64
label rhel4_64
kernel rhel4_64/vmlinuz
append ksdevice=eth0 console=tty0 load_ramdisk=1
initrd=rhel4_64/initrd.img network
ks=nfs:n.n.n.n:/home/pxeboot/rhel4_64/ks.cfg
```

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_64/**

Installing RHEL From a PXE Server

This procedure describes how to configure your Sun Fire X4500 server 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 Fire X4500 server.

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 22.

■ Installed a RHEL image on that Linux PXE server. See "Creating a PXE Install Image on the PXE Server" on page 29.

▼ To Install a RHEL from a PXE Server

To configure your server to install a RHEL image from a PXE server, do the following.

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 Fire X4500 server 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 Fire X4500 server.

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

6. **Update the OS files.**

   See "Updating the RHEL OS" on page 33.

Updating the RHEL OS

This procedure describes how to update the RHEL OS.

Before You Begin

Since software is constantly being updated, it is possible that your distribution media might not contain the most up-to-date versions of the OS. This procedure explains how to update a RHEL installation to the latest OS. The following procedure assumes that you have already installed the RHEL software on the Sun Fire X4500 server.

▼ To Update the RHEL OS

Follow these steps to update the OS software. These procedures assume 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.

Updating the RHEL SCSI Drivers

You may need to update the RHEL SCSI drivers. You can find a list of the most recent drivers, and instructions for installing them, in the `linux/drivers` directory of your Tools and Drivers CD.

Note – If you use SIA to install your OS, it installs the correct drivers automatically.

Installing SUSE Linux Enterprise Server 10

This chapter contains information about installing SUSE Linux Enterprise Server 10 (SLES 10).

This chapter contains the following sections:

About SUSE Linux Enterprise Server 10 Installation

The most common methods to install SUSE Linux Enterprise Server 10 (SLES 10) on your server are to use:

■ The Sun Installation Assistant (SIA) CD (no additional drivers CD is needed since SIA contains all the required drivers for your server)

■ The SLES 10 distribution CD (local or remote).

■ A Preboot Execution Environment (PXE) image stored on a PXE server on your local network or from an image stored elsewhere on your network.

Note – The Sun Installation Assistant is a convenient, front-end application designed to assist you in installing SUSE Linux on your server. The Sun Installation Assistant supplements the standard installation utilities and procedures that ship with SLES 10; it does not replace them. Refer to Chapter 2 for more information.

SUSE Linux Installation and Configuration Documentation

You can find information about 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 OS at its product and support web sites. For support information, see the SLES 10 Home Page at http://www.novell.com/products/server/

Sun Fire X4500 Disk Map

Use TABLE 5-1 to see the default disk mapping and boot disk locations for the Sun Fire X4500 server:

TABLE 5-1 Sun Fire X4500 Disk Mapping

Device	Slot Number	Device Node
sata3/0	0 *	/dev/sdy
sata3/4	1 *	/dev/sdac
sata2/0	2	/dev/sdq
sata2/4	3	/dev/sdu
sata5/0	4	/dev/sdao
sata5/4	5	/dev/sdas
sata4/0	6	/dev/sdag
sata4/4	7	/dev/sdak
sata1/0	8	/dev/sdi
sata1/4	9	/dev/sdm
sata0/0	10	/dev/sda
sata0/4	11	/dev/sde
sata3/1	12	/dev/sdz
sata3/5	13	/dev/sdad
sata2/1	14	/dev/sdr
sata2/5	15	/dev/sdv
sata5/1	16	/dev/sdap
sata5/5	17	/dev/sdat
sata4/1	18	/dev/sdah
sata4/5	19	/dev/sdal
sata1/1	20	/dev/sdj
sata1/5	21	/dev/sdn

TABLE 5-1   Sun Fire X4500 Disk Mapping

Device	Slot Number	Device Node
sata0/1	22	/dev/sdb
sata0/5	23	/dev/sdf
sata3/2	24	/dev/sdaa
sata3/6	25	/dev/sdae
sata2/2	26	/dev/sds
sata2/6	27	/dev/sdw
sata5/2	28	/dev/sdaq
sata5/6	29	/dev/sdau
sata4/2	30	/dev/sdai
sata4/6	31	/dev/sdam
sata1/2	32	/dev/sdk
sata1/6	33	/dev/sdo
sata0/2	34	/dev/sdc
sata0/6	35	/dev/sdg
sata3/3	36	/dev/sdab
sata3/7	37	/dev/sdaf
sata2/3	38	/dev/sdt
sata2/7	39	/dev/sdx
sata5/3	40	/dev/sdar
sata5/7	41	/dev/sdav
sata4/3	42	/dev/sdaj
sata4/7	43	/dev/sdy
sata1/3	44	/dev/sdl
sata1/7	45	/dev/sdp
sata0/3	46	/dev/sdd
sata0/7	47	/dev/sdh

* Possible boot disk location.

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)
Run the Sun Installation Assistant.	"How to Get Started Using SIA" on page 6.
Install SLES 10 from local or remote CD/DVD drive.	"Installing SLES 10 From Distribution Media" on page 39.
Install SLES 10 from local or remote CD/DVD drive or PXE server.	*SUSE Linux Enterprise Server 10 Installation Manual*
Install SLES 10 from using PXE.	"Installing SLES 10 Using PXE" on page 44
Update SLE10 software.	"Updating the SLES 10 OS" on page 54

Installing SLES 10 From Distribution Media

SLES 10 provides an easy-to-use graphical interface for installing and configuring the OS. 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

- Sun Fire X4500 server equipped with internal DVD-ROM drive. An external CD/DVD drive can also be used.
  - USB keyboard and mouse
  - Monitor
- SLES 10 media base CD/DVD set.

■ A "Driver Update CD" for the Marvell SATA Controller is required in order to install SLES 10 from Distribution Media. A CD image is provided on the Tools and Drivers CD at the location "linux/drivers/sles10/driverupdate.iso". This image should be burned onto a CD in order to install from Distribution Media, or be present on the system if installing using the Remote Console Application.

▼ To Install SLES 10 From Distribution Media

1. **Power on the system.**

2. **Press F8 and select CD-ROM when prompted.**

3. **Insert the SLES 10 CD 1 (or DVD) into your local CD/DVD drive. Then do the following:**

   a. **When the Installation Media boot screen appears, press the "Down" arrow to select "Installation", but before pressing RETURN first type the string "driverupdate=1". After booting the installer displays a dialog "Please choose the Driver Update medium".**

   b. **Remove the SLES 10 Distribution Media from your CD-ROM and replace it with the Driver Update CD.**

   c. **Select the corresponding CD-ROM device on screen and press OK. The installer displays the message "Driver Updates added" to confirm the installation of the Marvell SATA Controller driver. Press OK.**

   d. **The installer again displays the dialog "Please choose the Driver Update medium". Remove the Driver Update CD from the CD-ROM and insert back the SLES 10 Distribution Media.**

   e. **Select "Back" and press Enter. The installation then proceeds normally.**

4. **Follow the installation instructions provided with the SLES 10 Installation Guide until you reach the main SLES10 installer configuration screen. Then proceed to the next step.**

5. **The boot device nodes are /dev/sdy which is located at slot 0 and /dev/sdac, located at slot 1. The OS must be installed on one of these two device nodes:**

   a. **At the SLES10 installer configuration screen, select the Change Partitioning option.**

   b. **Select "Create Custom Partition Setup", then "Custom Partitioning (for experts)".**

c. Edit the partition table to ensure that you are installing on one of the two possible boot device nodes. By default, SLES10 does NOT choose one of the correct devices for you.

6. You must also ensure that the GRand Unified Bootloader (GRUB) is installed correctly on the boot device by performing the following steps:

   a. At the SLES10 installer configuration screen, select the "Expert" tab. This tab must be selected.

   b. Navigate to Booting options.

   c. Select the Boot Loader Installation tab.

   d. Change the Boot Loader Location to /dev/sdy (or /dev/sdac)

   e. Click the Boot Loader Installation Details button.

   f. Move /dev/sdy (or /dev/sdac) to the top of the order by selecting it and pressing the up key until it is located at the top. SLES10 does not install the bootloader if this step is not performed correctly.

Installing the SLES 10 Using the Remote Console Application

This section explains how to install the SLES 10 OS on your Sun Fire X4500 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 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/DVD 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 Installation Media boot screen appears, press the "Down" arrow to select "Installation", but before pressing RETURN first type the string "driverupdate=1". After booting the installer displays a dialog "Please choose the Driver Update medium".**

    a. **Go into the Remote Console menu and setup CD-ROM image to point to the "driverupdate.iso" Driver Update image.**

    b. **Select the Virtual CD-ROM device on screen and press OK. The installer displays the message "Driver Updates added" to confirm the installation of the Marvell SATA Controller driver. Press OK.**

    c. **The installer again displays the dialog "Please choose the Driver Update medium". Go into the Remote Console menu and change the CD-ROM redirection to point back to the SLES 10 Installation Media as explained in step 9.**

13. Follow the installation instructions provided with the SLES 10 Installation Guide until you reach the main SLES10 installer configuration screen. Then proceed to the next step.

14. The boot device nodes are /dev/sdy which is located at slot 0 and /dev/sdac, located at slot 1. The OS must be installed on one of these two device nodes:

   a. At the SLES10 installer configuration screen, select the Change Partitioning option.

   b. Select "Create Custom Partition Setup", then "Custom Partitioning (for experts)".

   c. Edit the partition table to ensure that you are installing on one of the two possible boot device nodes. By default, SLES10 does NOT choose one of the correct devices for you.

15. You must also ensure that the GRand Unified Bootloader (GRUB) is installed correctly on the boot device by performing the following steps:

   a. At the SLES10 installer configuration screen, select the "Expert" tab. This tab must be selected.

   b. Navigate to Booting options.

   c. Select the Boot Loader Installation tab.

   d. Change the Boot Loader Location to /dev/sdy (or /dev/sdac)

   e. Click the Boot Loader Installation Details button.

   f. Move /dev/sdy (or /dev/sdac) to the top of the order by selecting it and pressing the up key until it is located at the top. SLES10 does not install the bootloader if this step is not performed correctly.

16. Proceed with SLES 10 installation by following the prompts.

Installing SLES 10 Using PXE

The on-board network interface card (NIC) in your Sun Fire X4500 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. If that 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 SUSE image on your server.

Note – PXE is a powerful and convenient solution for setting up a number of Sun Fire X4500 servers so their configuration is identical.

Task Map

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

Task	Related Sections
Set up your Linux network and PXE server.	"Preconfiguring Your Network to Support PXE Installation of SLES" on page 44
Install RHEL images on that PXE server.	"Creating a SLES 10 PXE Install Image on the PXE Server" on page 51
Configure your server to install from a RHEL image on a PXE server.	"Installing SLES 10 From a PXE Server" on page 53
Update the OS.	"Updating the SLES 10 OS" on page 54

Preconfiguring Your Network to Support PXE Installation of SLES

These procedures describe how to preconfigure your network running SLES 10 software to support PXE installation of SUSE Linux software on your Sun Fire X4500 server. These procedures assume that you already have a bootable server that is running a version of the SLES 10 operating system.

Preconfiguring your network for PXE installation involves the following procedures:

Required Items

Preconfiguring your network for PXE installation requires the following items:

- SLES 10 server equipped with:
  - CD/DVD drive
  - USB keyboard
  - Monitor (optional)
- SLES 10 media set
- Sun Fire X4500 Tools and Drivers CD

▼ To Copy Files From the Tools and Drivers CD

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

   You can also download the driver RPMs from the Sun Fire X4500 web site. The downloads links are at
   http://www.sun.com/servers/x64/x4500/support.xml

2. **Create a temporary directory to copy the PXE support files to. 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/sles10/sles10-pxefiles.tar.gz /tmp/
   ```

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

   # **tar -zxf /tmp/sles10-pxefiles.tar.gz**

   When you extract the file, a directory with all required files is created at /tmp/sles10-pxefiles/.

5. **Unmount the CD/DVD by entering the following command:**

   # **umount /mnt/cdrom**

6. **Remove the Tools and Drivers CD from the 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 "PXEClinet"; 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/sles10-pxefiles directory.Edit the /etc/dhcpd.conf file

---

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`

▼ To Install Portmap

1. Determine whether the portmap server package is already installed on the DHCP 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`

▼ To Configure the TFTP Service

1. Determine whether the TFTP server package is already installed on the DHCP 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**

▼ 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. **If a compiler is not installed on the DHCP 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. Enter the following commands:**

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

   # **./configure**

   # **make**

   # **make install**

3. **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**

4. **Copy the PXE Linux image from the** /tmp/ **directory. Enter the following commands:**

   # **mkdir /home/pxeboot**

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

5. **Configure the PXE Linux image. Enter the following commands:**

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

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

6. **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/sles10-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.

---

7. **Start the neopxe daemon. Enter the following command:**

   # **/usr/local/sbin/neopxe**

▼ To Configure the NFS Service

1. Determine whether the NFS service package is already installed on the DHCP 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.

▼ To Disable 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.

---

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.

▼ To Complete the PXE Pre-Configuration

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

1. **Reboot the PXE/DHCP server.**

   Proceed to the next section, Creating a SLES 10 PXE Install Image on the PXE Server**.**

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

You are then ready to install SLES 10 from your PXE server.

▼ To Create a SLES 10 Image on Your PXE Server

1. **Insert the Tools and Drivers CD into the CD/DVD drive.**

2. **Copy the PXE support files from the Tools and Drivers CD into the** /tmp **directory by entering the following commands:**

   ```
   # mount /dev/cdrom /mnt/cdrom
   # cp -a /mnt/cdrom/linux/pxe/sles10/sles10-pxefiles.tar.gz
   /tmp
   # cp /mnt/cdrom/linux/drivers/sles10/driverupdate.iso /tmp
   # cd /tmp
   # tar xfz sles10-pxefiles.tar.gz
   # 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. **Create the directory to hold the SLES 10:**

   # `mkdir -p /home/pxeboot/sles10/CD{1,2,3,4}`

2. **Insert SLES 10 CD 1 into your server and copy its content to your PXE server:**

   # `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/`

5. **Copy the Driver Update image containing the Marvell SATA Controller driver to the target directory. Note that the file must be named "driverupdate", without the '.iso' extension. Enter the command:**

   # `cp /tmp/driverupdate.iso`
   `/home/pxeboot/sles10/CD1/driverupdate`

Set Up PXE Files

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

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

2. **On your PXE server, modify and save the file** `home/pxeboot/pxelinux.cfg/default` **to add 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 the server.

Installing SLES 10 From a PXE Server

This procedure describes the final step of installing the SLES 10 boot image onto your Sun Fire X4500 server.

Before You Begin

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

- Configured your Linux network to support a PXE server. See "Preconfiguring Your Network to Support PXE Installation of SLES" on page 44.
- Installed a SLES 10 image on that Linux PXE server. See "Creating a SLES 10 PXE Install Image on the PXE Server" on page 51.

▼ 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 OS files as described in

Updating the SLES 10 OS

The OS installation media shipped with your distribution of SLES 10 software might not contain the most up-to-date versions of the SUSE software. It is possible that there have been updates to the SLES 10 software. This procedure describes how to update the SUSE OS software on your Sun Fire server after you have installed it from a PXE server or from distribution CDs.

▼ To Update the SLES 10 OS

1. Log in as the superuser.

2. Enter the following command to run the YaST Online Update:

   # **you**

Note – 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 online 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 need your Novell Customer Center username and password, and a SLES 10 product activation code.

5. **Once registered, select the 'Online Update' tab to perform the software update.**

Updating the SLES SCSI Drivers

You may need to update the SLES SCSI drivers. You can find a list of the most recent drivers, and instructions for installing them, in the `linux/drivers` directory of your Tools and Drivers CD.

Note – If you use SIA to install your OS, it installs the correct drivers automatically.

Disk Control and Monitor Utility (DCMU) for RHEL

This chapter describes how to use the Disk Control and Monitor Utility (DCMU) on a Red Hat Enterprise Linux U4 (RHEL4 U4 or 4.5) 64-bit operating system. It includes the following sections:

Overview of the Disk Control and Monitor Utility for RHEL4 U4

The Disk Control and Monitor Utility (DCMU) controls and monitors all 48-disk drives on the Sun Fire X4500 server and provides the following features:

- Monitors disk drive status and hotplug events.

- Reports disk drive failures, Field Replaceable Units (FRU) information, and hotplug events to the host's service processor (SP).

The Disk Control and Monitor Utility (DCMU) consist of three components. Each component updates the FRU, SDR (Sensor Data Record), SEL (System Event Log) and service processor logs:

- `cfgdisk`
- `hotplugmon`
- `faultmond`

DCMU Installation Procedure

To use Disk Control and Monitor Utility (DCMU), you must install the application. To install the application, you must perform the following steps:

Installing DCMU

The installation of DCMU consists of one step because the package is in `rpm` format. The DCMU package comes with two `rpm` files. One is the source rpm and other is the binary `rpm`:

▼ To Install DCMU

● **Enter the following command:**

`# ` **`rpm -ivh dcmu-1.3-5.x86_64.rpm`**

The following files are installed as components of the DCMU installation:

- `faultmond`, `cfgdisk`, and `hotplugmon` binary files to `/usr/bin` directory.
- `faultmond` startup script file to `/etc/rc.d/init.d`
- `cfgdisk.1.gz`, `faultmond.1.gz`, and `hotplugmon.1.gz` man page files to `/usr/share/man/man1`.

IPMI Service Must be Running to Use DCMU Utilities

The initial installation of the DCMU components prepares the system for running the DCMU utilities described in this chapter. However, since the DCMU utilities also require that the IPMI service is running, you have two options before you can start using the DCMU utilities: Manually start the IPMI service, or reboot the server (which automatically starts faultmond and IPMI).

If rebooting the server after the initial DCMU installation is not possible, and you wish to run DCMU utilities, you must manually start the IPMI service by entering the following command:

```
# service ipmi start
```

Note – After the initial installation of DCMU, rebooting the server starts both IPMI and faultmond.

Uninstalling DCMU

If you need to uninstall DCMU, perform the following procedure.

▼ To Uninstall DCMU

● **Enter the following command:**

```
# rpm -e dcmu-1.3-5
```

cfgdisk Command

The cfgdisk command is a command-line utility and that queries and provides status of all 48-disk drives located in the Sun Fire X4500 server. cfgdisk also allows you to connect and disconnect disk drives from the OS and also allows you to monitor disks connected to the server.

cfgdisk Command Options

Use the cfgdisk command to connect, disconnect, and determine disk drive status by using the parameters shown in TABLE 6-1. The following options are supported for the functions shown:

TABLE 6-1   cfgdisk Command Options

Option	Description
-h	Displays help information
-V	Displays utility version information
-o	Connects and disconnects disk drive(s)
-d	Displays disk drive information

Examples Using the cfgdisk Command

This section contains examples of common cfgdisk commands. For more information and options, refer to the cfgdisk man page.

Displaying Disk, Device Nodes, Slots and Status

The following command displays a map of all disk drives:

cfgdisk

Here is an example of cfgdisk command output listing physical slot number, logical name, and status information:

CODE EXAMPLE 6-1 cfgdisk Command Output

Device	Slot Number	Device Node	Status
sata0/0	10	/dev/sda	Connected
sata0/1	22	/dev/sdl	Connected
sata0/2	34	/dev/sdx	Connected
sata0/3	46	/dev/sdam	Connected
sata0/4	11	/dev/sde	Connected
sata0/7	47	/dev/sdan	Connected
sata1/0	8	/dev/sdi	Connected
sata1/1	20	/dev/sdj	Connected
sata1/2	32	/dev/sdv	Connected
sata1/3	44	/dev/sdak	Connected
sata1/4	9	/dev/sdm	Connected
sata1/5	21	/dev/sdk	Connected
sata1/6	33	/dev/sdw	Connected
sata1/7	45	/dev/sdal	Connected
sata2	2	/dev/sdq	Connected
sata2/1	14	/dev/sdd	Connected
sata2/2	26	/dev/sdr	Connected
sata2/3	38	/dev/sdad	Connected
sata2/4	3	/dev/sdu	Connected
sata2/5	15	/dev/sdf	Connected
sata3/0	0	/dev/sdy	Connected
sata3/1	12	/dev/sdb	Connected
sata3/2	24	/dev/sdo	Connected
sata3/3	36	/dev/sdaa	Connected
sata3/4	1	/dev/sdac	Connected
sata3/5	13	/dev/sdc	Connected
sata3/6	25	/dev/sdp	Connected
sata3/7	37	/dev/sdab	Connected
sata4/0	6		Disconnected or not present
sata4/1	18		Disconnected or not present
sata4/2	30		Disconnected or not present
sata4/3	42	/dev/sdaf	Connected
sata4/4	7		Disconnected or not present
sata4/5	19	/dev/sdg	Connected
sata4/6	31		Disconnected or not present
sata4/7	43	/dev/sdag	Connected
sata5/0	4	/dev/sdaj	Connected
sata5/1	16	/dev/sdh	Connected
sata5/2	28	/dev/sdt	Connected
sata5/4	5		Disconnected or not present
sata5/5	17		Disconnected or not present
sata5/6	29		Disconnected or not present
sata5/7	41	/dev/sdai	Connected

Disconnecting a Disk Using `cfgdisk`

Use the cfgdisk command to disconnect a disk before performing the hot plug event of physically removing it. The following command shows an example of how to use `cfgdisk` to **disconnect** a disk drive.

`cfgdisk -o disconnect -d sata5/1`

The command returns the following prompts; enter Y at both to disconnect the disk:

```
Are you sure (y/n)? y
Are you sure sata5/1 device is not in use(y/n)? y
Device sata5/1 has been successfully disconnected.
```

Connecting a Disk Using `cfgdisk`

After performing the hot plug event of physically adding a disk into the system, use the cfgdisk command to connect it. The following command shows an example of how to use `cfgdisk` to **connect** a disk drive.

`cfgdisk -o connect -d sata5/1`

The command returns the following:

```
Command has been issued to connect sata5/1 device, it may take a few
seconds to connect sata5/1, check status by re-running cfgdisk
command.
```

Displaying `cfgdisk` Help Information

The following command show how to use the `cfgdisk` command to display help information:

`cfgdisk - h`

faultmond

`Faultmond` is a component of the Disk Control and Monitor Utility (DCMU). `Faultmond` is a daemon which is started at boot time. It scans all disk at polling intervals, and then reports FRU, SDR, and SEL information to the service processor.

faultmond Command Options

`faultmond` uses the parameters shown in TABLE 6-2. The following options are supported for the functions shown

TABLE 6-2   `faultmond` Command Options

Option	Description
-h	Displays help information
-t	Displays polling interval information (in minutes)
-V	Displays version information
-D	Runs as a non-daemon process

Examples Using the faultmond Command

This section contains examples of common `faultmond` commands. For more information, refer to the `faultmond` man page.

The following command shows the use of `faultmond`.

faultmond -h

The command returns the following:

```
faultmond version 1.0:
```

Starting `faultmond` From the Command-line

To start `faultmond`, enter the following command:

service faultmond start

Stopping `faultmond` From the Command-line

To stop `faultmond`, enter the following command:

service faultmond stop

Setting the Polling Interval From the Command Line

To set the polling interval with `faultmond`, do the following:

1. Stop faultmond from the command line.

   # service faultmond stop

2. Set the polling interval. For example, to set the polling interval to be 1 minute, you would enter:

   # faultmond -t 1

3. Check the polling interval.

   # ps -ef | grep faultmond

The output looks like the following:

```
# ps -ef |grep faultmond
root     15357     1  5 15:49 ?        00:00:00 faultmond -t 1
root     15364 15307  0 15:50 pts/4    00:00:00 grep faultmond
```


hotplugmon

`hotplugmon` is not a command line utility. It monitors hotplug events and then reports them to service processor.

> **Note –** `hotplugmon` is only activated with `faultmond` from the command-line or during boot time. To stop or start `faultmond` and `hotplugmon` manually, you should use the `faultmond service` commands.

Viewing System and Service Processor Logs

As described above, DCMU monitors hotplug events and pending drive failures, controlled connect/disconnect events and logs these events in syslog and, more importantly, in the service processor logs (SDR, FRU, SEL). You may access these logs individually for specific information to aid in the administration or troubleshooting of the disk array. This section describes how to view individual log file information from the command line.

Viewing the SDR log

The following commands show how view the SDR log file, either at the server:

ipmitool -I open sdr elist

or over the network:

ipmitool -I lan -H *SP-IP* **-U root -P** *SP-password* **sdr elist**

Where *SP-IP* represents the IP address of the service processor and *SP-password* represents the password for the service processor.

Viewing the FRU log

The following commands show how view the FRU log file, either at the server:

ipmitool -I open fru

or over the network:

ipmitool -I lan -H *SP-IP* **-U root -P** *SP-password* **fru**

Where *SP-IP* represents the IP address of the service processor and *SP-password* represents the password for the service processor.

Note – When viewing the FRU log of a server running Linux, hard disk drive FRU information stored in the Service Processor FRU log may display a `Product Name` attribute. This attribute is meaningless, and should be ignored. Here's an example of what you might see when viewing logged FRU data (via the ipmitool command or the server's management tool) if this erroneous attribute were present:

```
FRU Device Description : hdd40.fru (ID 58)
Product Manufacturer : HITACHI
Product Name : 232VDDF12872G-40 <-- Ignore this line
Product Part Number : HDS7225SBSUN250G
Product Version : V44OA81A
Product Serial : VDK41BT4CAD0GE
```

Viewing the SEL log

The following commands show how view the SEL log file, either at the server:

ipmitool -I open sel elist

or over the network:

ipmitool -I lan -H *SP-IP* **-U root -P** *SP-password* **sel elist**

Where *SP-IP* represents the IP address of the service processor and *SP-password* represents the password for the service processor.

Viewing the System log

All events and error information from DCMU are logged in syslog (*default:* /var/log/messages). These include hard drive hotplug events, drive disconnect and connect events, and drive fault polling events.

Disk Control and Monitor Utility (DCMU) for SLES 10

This chapter describes how to use the Disk Control and Monitor Utility (DCMU) on a SUSE Linux Enterprise Server 10 (SLES 10) 64-bit operating system. It includes the following sections:

Overview of the Disk Control and Monitor Utility for SLES 10

The Disk Control and Monitor Utility (DCMU) controls and monitors all 48-disk drives on the Sun Fire X4500 server and provides the following features:

- Monitors disk drive status, hotplug events, and disk drive faults.
- Reports disk drive failures, Field Replaceable Units (FRU) information, and hotplug events to the service processor (SP).

DCMU Installation Procedure

To use Disk Control and Monitor Utility (DCMU), you must install the application. To install the application, you should perform the following steps:

Installing DCMU

The installation of DCMU consists of one step because the package is in `rpm` format. The DCMU package comes with two `rpm` files. One is the source rpm and other is the binary `rpm`.

- dcmu-1.3-7.src.rpm
- dcmu-1.3-7.x86_64.rpm

▼ To Install DCMU

Enter the following command:

```
# rpm -ivh dcmu-1.3-7.x86_64.rpm
```

The following files are installed as components of the DCMU installation:

- `diskmond` and `cfgdisk` binary files to `/usr/bin` directory.
- `diskmond` startup script file to `/etc/rc.d/init.d`
- `cfgdisk.1.gz` and `diskmond.1.gz` man page files to `/usr/share/man/man1`.

IPMI Service Must be Running to Use DCMU Utilities

The initial installation of the DCMU components prepares the system for running the DCMU utilities described in this chapter. However, since the DCMU utilities also require that the IPMI service is running, you have two options before you can start using the DCMU utilities: manually start the IPMI service, or reboot the server (which automatically starts diskmond and IPMI).

If rebooting the server after the initial DCMU installation is not possible, and you wish to run DCMU utilities, you must first start the IPMI service by entering the following command:

```
# service ipmi start
```

Note – After the initial installation of DCMU, rebooting the server starts both IPMI and diskmond.

Uninstalling DCMU

To uninstall DCMU, perform the following procedure.

▼ To uninstall DCMU

Enter the following command:

```
# rpm -e dcmu-1.3-7
```

diskmond Command

The Disk Control and Monitor Utility (DCMU) for SLES 10 has one primary utility called diskmond. diskmond is started at boot time with default polling interval of 60 minutes. It updates the FRU (Field Replaceable Units), SDR (Sensor Data Record), SEL (System Event Log) and service processor logs.

diskmond spawns one thread to monitor hotplug event, another thread to monitor pending drive failure and reports both of these events to the service processor (SP). Diskmond performs the following functions:

- Scans all disk at polling intervals, and then reports FRU, SDR, and SEL information to the service processor.
- Monitors hotplug events and then reports them to service processor.

diskmond Command Options

Use the diskmond command to connect, disconnect, and determine disk drive status by using the parameters shown in TABLE 7-1. The following options are supported for the functions shown:

Option	Description
-h	Displays help information
-V	Displays utility version information
-D	Displays disk drive information
-t *minutes*	Displays polling interval information (in minutes) in the syslog.

Examples Using the `diskmond` Command

This section contains examples of common `diskmond` commands issued from the command line. For more information and options, refer to the `diskmon` man page.

Starting `diskmond` From the Command-line

To start `diskmon`, enter the following command:

```
# service diskmond start
```

Stopping `diskmond` From the Command-line

To stop `diskmon`, enter the following command:

```
# service diskmond stop
```

Finding the status of `diskmond` From the Command-line

To obtain status from `diskmon`, enter the following command:

```
# service diskmond status
```

`cfgdisk` Command

`cfgdisk` queries and provides status of all 48-disk drives located in the Sun Fire X4500 server. `cfgdisk` also allows you to connect and disconnect disk drives from the OS while also allowing you to monitor disks connected to the server.

Use the `cfgdisk` command to connect, disconnect, and determine disk drive status by using the parameters shown in TABLE 7-2. The following options are supported for the functions shown:

TABLE 7-2   `cfgdisk` Command Options

Option	Description
-h	Displays help information
-V	Displays utility version information
-o	Connects and disconnects disk drive(s)
-d	Displays disk drive information

Examples Using the `cfgdisk` Command

This section contains examples of common `cfgdisk` commands issued from the command line. For more information and options, refer to the `cfgdisk` man page.

Displaying Disk, Device Nodes, Slots and Status

The following command displays a map of all disk drives:

```
# cfgdisk
```

Here is an example of `cfgdisk` command output listing physical slot number, logical name, and status information:

CODE EXAMPLE 7-1 `cfgdisk` Command Output

```
Device            Slot Number          Device Node
Status
sata0/0       10           /dev/sda                          Connected
sata0/1       22           /dev/sdl                          Connected
sata0/2       34           /dev/sdx                          Connected
sata0/3       46           /dev/sdam                         Connected
sata0/4       11           /dev/sde                          Connected
sata0/5       23           /dev/sdn                          Connected
sata1/0        8           /dev/sdi                          Connected
sata1/1       20           /dev/sdj                          Connected
sata1/2       32           /dev/sdv                          Connected
sata1/3       44           /dev/sdak                         Connected
sata1/4        9           /dev/sdm                          Connected
sata1/5       21           /dev/sdk                          Connected
sata1/7       45           /dev/sdal                         Connected
sata2/1       14           /dev/sdd                          Connected
sata2/2       26           /dev/sdr                          Connected
sata2/6       27           /dev/sds                          Connected
sata2/7       39           /dev/sdae                         Connected
sata3/0        0           /dev/sdy                          Connected
sata3/1       12           /dev/sdb                          Connected
sata3/2       24           /dev/sdo                          Connected
sata3/3       36           /dev/sdaa                         Connected
sata3/4        1           /dev/sdac                         Connected
sata3/5       13           /dev/sdc                          Connected
sata4/0        6                        Disconnected or not present
sata4/1       18                        Disconnected or not present
sata4/3       42           /dev/sdaf                         Connected
sata4/4        7                        Disconnected or not present
sata4/5       19           /dev/sdg                          Connected
sata4/6       31                        Disconnected or not present
sata4/7       43           /dev/sdag                         Connected
sata5/0        4           /dev/sdaj                         Connected
sata5/1       16           /dev/sdh                          Connected
sata5/2       28           /dev/sdt                          Connected
sata5/4        5                        Disconnected or not present
```

Disconnecting a Disk Using `cfgdisk`

Use the cfgdisk command to disconnect a disk before performing the hot plug event of physically removing it. The following command shows an example of how to use `cfgdisk` to **disconnect** a disk drive.

> # **cfgdisk -o disconnect -d sata5/1**

The command returns the following prompts; enter **Y** at both:

```
Are you sure (y/n)? y
Are you sure sata5/1 device is not in use(y/n)? y
Device sata5/1 has been successfully disconnected
```

Connecting a Disk Using `cfgdisk`

After performing the hot plug event of physically adding a disk into the system, use the cfgdisk command to connect it. The following command shows an example of how to use `cfgdisk` to **connect** a disk drive.

> # **cfgdisk -o connect -d sata5/1**

The command returns the following:

```
Command has been issued to connect sata5/1 device, it may take few
seconds to connect sata5/1,check status by re-running 'cfgdisk'
command.
```

Displaying `cfgdisk` Help Information

The following command shows how to use the `cfgdisk` command to display help information:

> # **cfgdisk -h**

For additional information about `cfgdisk` or `diskmond`, refer to the man pages.

Viewing System and Service Processor Logs

As described above, dcmu monitors hotplug events and pending drive failures, controlled connect/disconnect events and logs these events in syslog and, more importantly, in the service processor logs (SDR, FRU, SEL). You may access these logs individually for specific information to aid in the administration or troubleshooting of the disk array. This section describes how to view individual log file information from the command line.

Viewing the SDR Log

The following commands show how view the SDR log file, either at the server:

> # **ipmitool -I open sdr elist**

or over the network:

> # **ipmitool -I lan -H** *SP-IP* **-U root -P** *SP-password* **sdr elist**

Where *SP-IP* represents the IP address of the service processor and *SP-password* represents the password for the service processor.

Viewing the FRU Log

The following commands show how view the FRU log file, either at the server:

> # **ipmitool -I open fru**

or over the network:

> # **ipmitool -I lan -H** *SP-IP* **-U root -P** *SP-password* **fru**

Where *SP-IP* represents the IP address of the service processor and *SP-password* represents the password for the service processor.

Note – When viewing the FRU log of a server running Linux, hard disk drive FRU information stored in the Service Processor FRU log may display a `Product Name` attribute. This attribute is meaningless, and should be ignored. Here's an example of what you might see when viewing logged FRU data (via the ipmitool command or the server's management tool) if this erroneous attribute were present:

```
FRU Device Description : hdd40.fru (ID 58)
Product Manufacturer : HITACHI
Product Name : 232VDDF12872G-40 <-- Ignore this line
Product Part Number : HDS7225SBSUN250G
Product Version : V44OA81A
Product Serial : VDK41BT4CAD0GE
```

Viewing the SEL log

The following commands show how view the SEL log file, either at the server:

> # **ipmitool -I open sel elist**

or over the network:

> # **ipmitool -I lan -H** *SP-IP* **-U root -P** *SP-password* **sel elist**

Where *SP-IP* represents the IP address of the service processor and *SP-password* represents the password for the service processor.

Viewing the System log

All events and error information from DCMU are logged in syslog (*default:* /var/log/messages). These include hard drive hotplug events, drive disconnect and connect events, and drive fault polling events.

Identifying Logical and Physical Network Interface Names for Linux OS Configuration

The Sun Fire X4500 server can connect to a network. 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 77).
- 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 83).

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.**

```
Boot from Hard Disk
Installation
Installation - ACPI Disabled
Installation - Safe Settings
Manual Installation
Rescue System
Memory Test
```
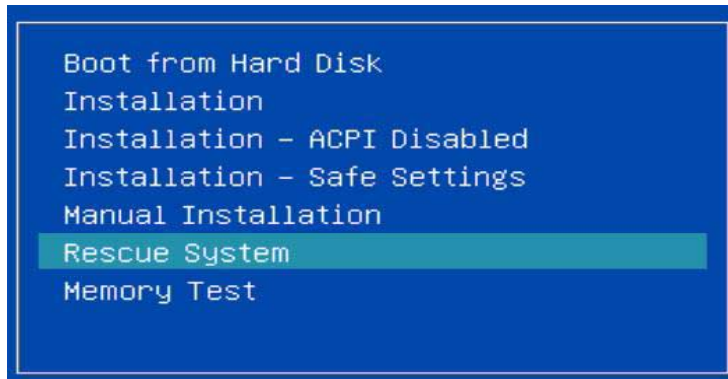
The message `Loading Linux Kernel` appears followed by the SUSE splash screen, then the Choose a Keyboard Map screen appears.

2. **In the Choose a Keyboard Map screen, select the appropriate keyboard configuration and click OK.**
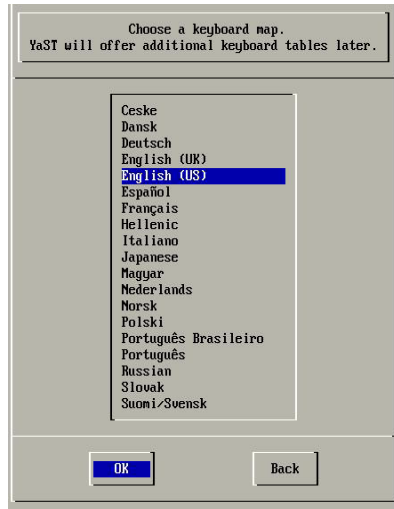
The user shell launches and the Rescue Login prompt appears.

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

The Rescue prompt appears.

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

ifconfig -a


```
                                                                        done
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
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:bbd80000-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.

   d. **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.**
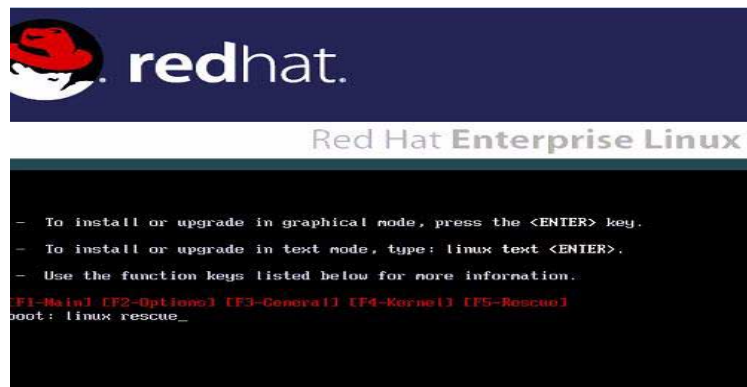
The Choose a Language screen appears.

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.**
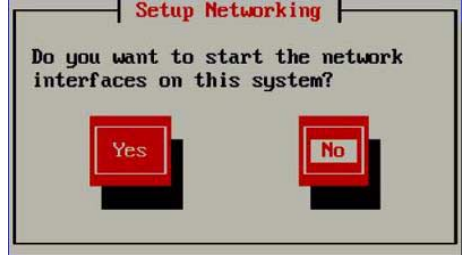
The Rescue screen appears.

5. **In the Rescue screen, click Skip.**
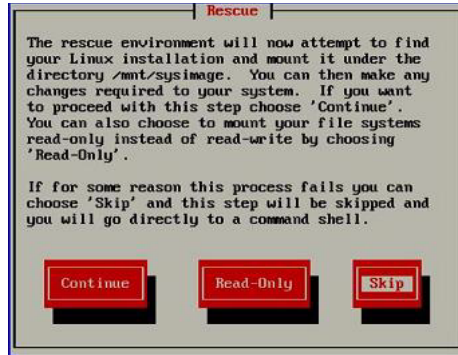
The user shell appears.

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 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:bbd80000-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
                 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 Fire X4500 server module can connect to a network. 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 89).
- *While* configuring a Solaris OS during installation (see "Identifying Logical and Physical Network Interface Names While Installing a Solaris OS" on page 91).

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 plumb` **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-ON-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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