

Sun Fire X4800 Server Installation Guide for Linux Operating Systems



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Using This Documentation

This section describes related documentation, submitting feedback, and a document change history.

- “Product Information Web Site” on page 5
- “Documentation and Feedback” on page 5
- “About This Documentation (PDF and HTML)” on page 6
- “Contributors” on page 6
- “Change History” on page 6

Product Information Web Site

For information about the Sun x86 servers, go to <http://www.oracle.com/technetwork/server-storage/sun-x86/overview/index.html>.

For software and firmware downloads for your x86 server product, go to <http://www.oracle.com/technetwork/server-storage/sun-x86/downloads/index.html> page and click on your server model.

Documentation and Feedback

Documentation	Link
All Oracle products	http://www.oracle.com/documentation
Sun Fire X4800 server	http://download.oracle.com/docs/cd/E19140-01/index.html
Oracle ILOM 3.0	http://www.oracle.com/technetwork/documentation/sys-mgmt-networking-190072.html#ilom

Provide feedback on this documentation at: <http://www.oracle-surveys.com/se.ashx?s=25113745587BE578>.

About This Documentation (PDF and HTML)

This documentation set is available in both PDF and HTML. The information is presented in topic-based format (similar to online help) and therefore does not include chapters, appendixes, or section numbering.

A PDF that includes all information on a particular topic subject (such as hardware installation or product notes) can be downloaded by clicking on the PDF button in the upper left corner of the page.

Contributors

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Change History

The following changes have been made to the documentation set.

- April 2010 – Installation Guide released.
- June 2010 – Installation Guide and Getting Started Guide re-released.
- July 2010 – Initial release of other documents.
- August 2010 – Product Notes and Service Manual re-released. ESX Installation Guide added.
- October 2010 – Product Notes re-released.
- December 2010 – Product Notes re-released.
- March 2011 – Documents re-released for SW1.2 including the Installation Guide, the Product Notes, the Linux Installation Guide, the Oracle Solaris Installation Guide, the Windows Installation Guide, and the Service Manual.

Introduction to Linux Installation

This document provides instructions for installing Oracle Linux, Red Hat Enterprise Linux (RHEL) and SUSE Linux Enterprise Server (SLES) on your server. The following topics are included:

Description	Link
Describes how to use the Oracle Hardware Installation Assistant, a tool that helps you perform a variety of deployment and recovery tasks on your Sun x64 server.	“Oracle Hardware Installation Assistant” on page 9
Describes how to erase an existing hard disk partition and create a virtual disk on which to install an operating system.	“Preliminary Tasks Before Installing An OS” on page 11
Describes how to install Oracle Linux on your server.	“Installing Oracle Linux” on page 37
Describes how to install Red Hat Enterprise Linux on your server.	“Installing Red Hat Enterprise Linux” on page 41
Describes how to install SUSE Linux on your server.	“Installing SUSE Linux Enterprise Server” on page 47
Describes how to configure a Preboot Execution Environment (PXE) server on a Linux system and use it to install Linux on your servers.	“Configuring a Linux Server to Support PXE Installation” on page 53
Describes how to find the logical name (assigned by the OS) and the physical name (MAC address) of each network interface.	“Identifying Logical and Physical Network Interface Names for Linux OS Configuration” on page 69

Oracle Hardware Installation Assistant

The Oracle Hardware Installation Assistant is a tool that helps you perform a variety of deployment and recovery tasks on your Sun x64 server. It can be launched from a bootable CD, a USB flash drive prepared with Oracle Hardware Installation Assistant software, or from a customized image available on a PXE installation server.

- [“Oracle Hardware Installation Assistant Task Overview” on page 9](#)
- [“Obtaining Oracle Hardware Installation Assistant” on page 10](#)

Oracle Hardware Installation Assistant Task Overview

The following tasks can be performed using Oracle Hardware Installation Assistant:

Note – The available tasks are server-dependent and may vary.

- Upgrade your system BIOS, ILOM service processor firmware to the latest version (regardless of the OS on your server).
- Upgrade your HBA firmware to the latest version (regardless of the OS on your server).
- Configure RAID-1 volumes if you have an LSI-based disk controller (1068e for SAS-1, or 2926x and 9280 for SAS-2).
- Perform an assisted installation of a supported Windows or Linux operating system on your server. Oracle Hardware Installation Assistant installs appropriate drivers and platform-specific software, eliminating the need to create a separate driver disk. You provide the licensed OS distribution media (from CD or network image file) and the wizard guides you through the installation.
- Update your Oracle Hardware Installation Assistant session with the latest firmware and drivers from Oracle.

Obtaining Oracle Hardware Installation Assistant

The Oracle Hardware Installation Assistant is available as an option with your server. In addition, an ISO CD image of it can be downloaded from:

<http://www.oracle.com/technetwork/server-storage/sun-x86/downloads/index.html>

For information about the Oracle Hardware Installation Assistant, see the *Oracle Hardware Installation Assistant 2.5 User's Guide for X86 Servers* in the [Oracle Hardware Installation Assistant documentation library](#).

Preliminary Tasks Before Installing An OS

Certain tasks must be done before you can install an operating system, depending on whether there is an OS already on your boot drive, or your drives are new with no previous partitions.

These tasks include:

- [“How to Erase Your Boot Hard Disk” on page 11](#)
- [“Creating a Virtual Disk” on page 12](#)

▼ How to Erase Your Boot Hard Disk

Your server might have the Solaris OS preinstalled on the hard drive. If so, you must erase it before installing Linux.

Before You Begin Obtain a copy of the Tools and Drivers CD before starting this procedure.



Caution – This procedure erases all data from the hard drive. Back up any data you wish to save before starting this procedure.

1 Back up any data on the hard drive that you want to save.

2 Insert the Tools and Drivers CD into the server's CD/DVD drive.

If your server does not have a CD/DVD drive, use the remote console (JavaRConsole). See [“Remote Installation By Accessing the Console Using ILOM” on page 30](#).

3 Boot the system from the Tools and Drivers CD.

The tools and drivers main menu appears.

4 Select Erase Primary Boot Hard Disk from the main menu.

This erases all partitions currently on the primary hard drive except for the diagnostic partition. If the diagnostic partition is present, it is not erased.

Next Steps

- [“Creating a Virtual Disk” on page 12](#).
- [“How to Set the Boot Drive” on page 25](#).

Creating a Virtual Disk

Before attempting to install the operating system, you must create a virtual disk on your server to make available space accessible for the image download. The download erases the contents of the disk.

Virtual disks can be created from the LSI firmware for downloading the operating system. The LSI firmware can only be reached during boot-up of the server. Before Windows is launched and when the LSI banner is shown, you can enter the Control-H key combination to access the LSI interface.

Note – Virtual disks can also be created from the MegaRAID software (which is installed through the supplemental drivers on the Tools and Drivers DVD), but should not be used for installing the operating system.

See [“How to Create a Virtual Disk”](#) on page 12.

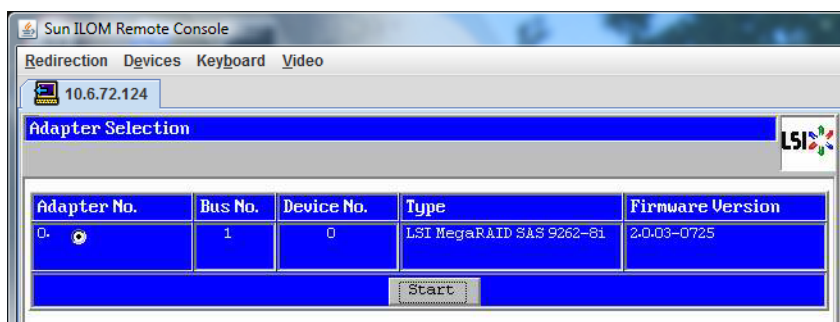
▼ How to Create a Virtual Disk

- 1 **Log in to the server using the IP address of the service processor (SP) module.**
- 2 **In the GUI window, click the Remote Control tab to launch ILOM Remote Control.**
- 3 **Select the KVMS tab.**
- 4 **Under Mouse Mode, select Relative, then click Save.**

Note – The Relative option enables the mouse to move from window to window while you are in Remote Console. At the end of this procedure, you are asked to change this mouse setting to Absolute.

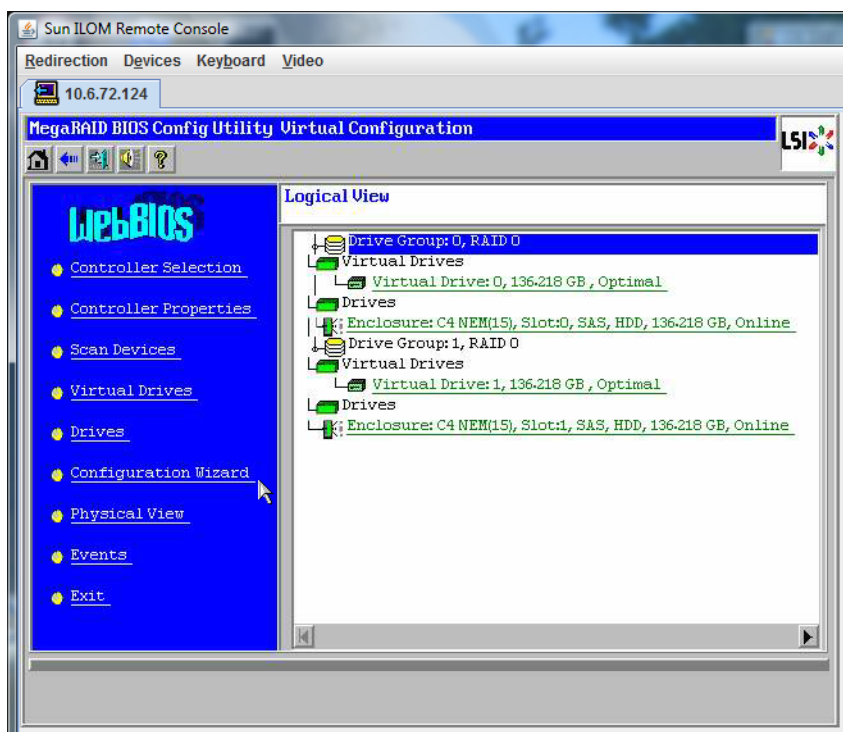
- 5 **Click the Redirection tab. In the Redirection screen, click on Launch Remote Console.**
This launches the ILOM 3.0 remote console window.
- 6 **From the Devices menu, select Mouse to enable the mouse.**
- 7 **Reboot your system and wait for the LSI banner. When the devices appear in the banner page, use the Control-H key combination.**

- 8 In the Adapter Selection screen, click Start.

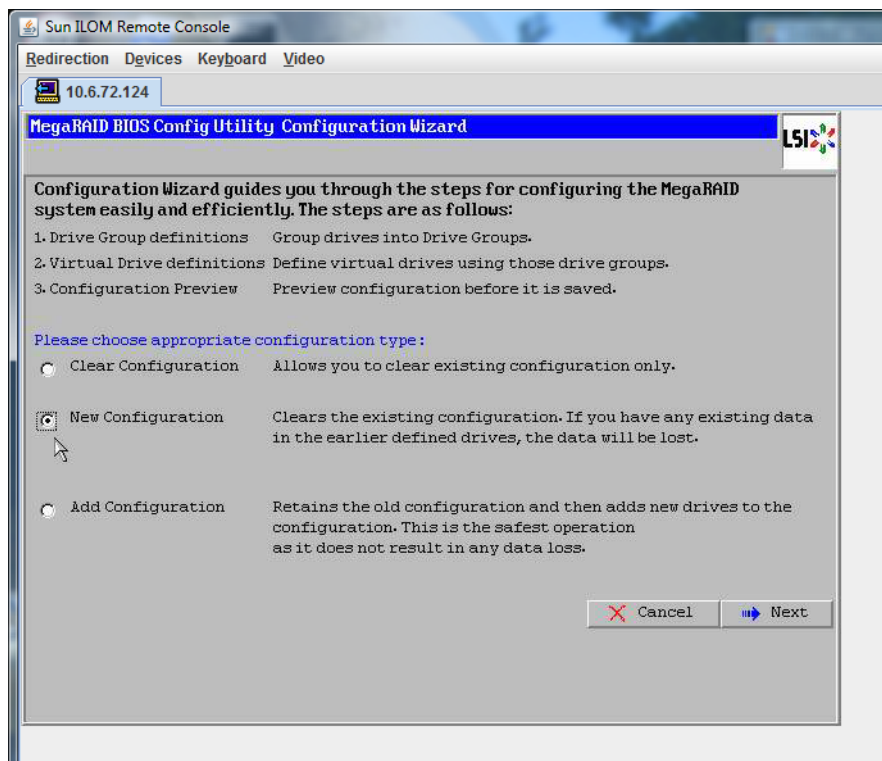


The MegaRaid BIOS Config Utility Virtual Configuration screen opens.

- 9 In the MegaRaid BIOS Config Utility Virtual Configuration screen, select Configuration Wizard.

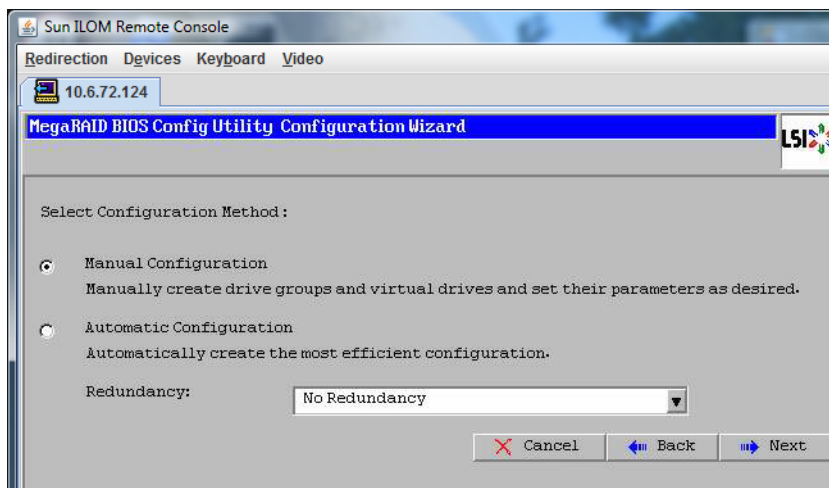


- 10 In the Configuration Wizard screen, select New Configuration, then click Next.

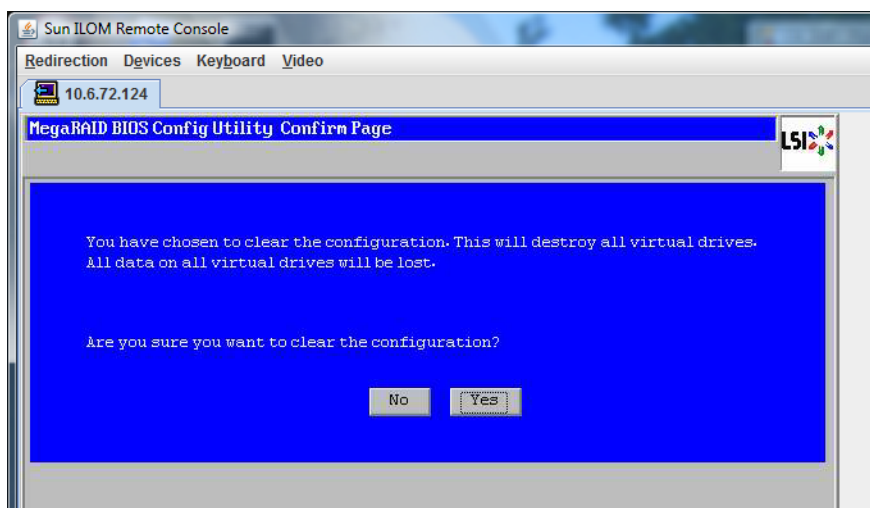


11 Select Manual Configuration.

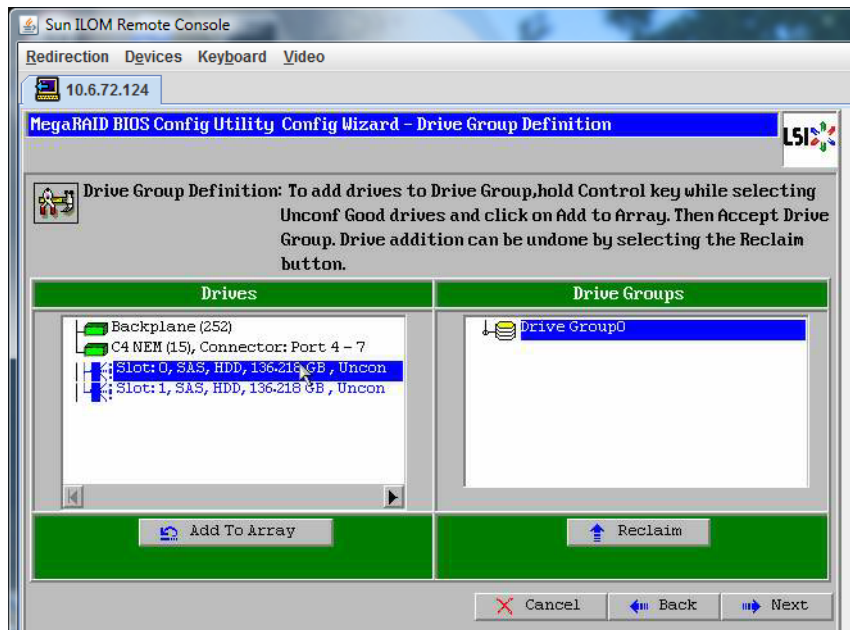
Automatic Configuration creates a single virtual drive that includes all the hard drives on your system. More than one drive is configured as a striped set (RAID0) and appears as a single virtual drive of combined storage space. This might not be desirable as there can be multiple points of failure. That is, if one drive fails, then the system does not boot. You must remove all the drives except one. Alternatively, you can use Manual Configuration to create the virtual drive using only one hard drive.



12 If a confirmation window appears, click Yes.

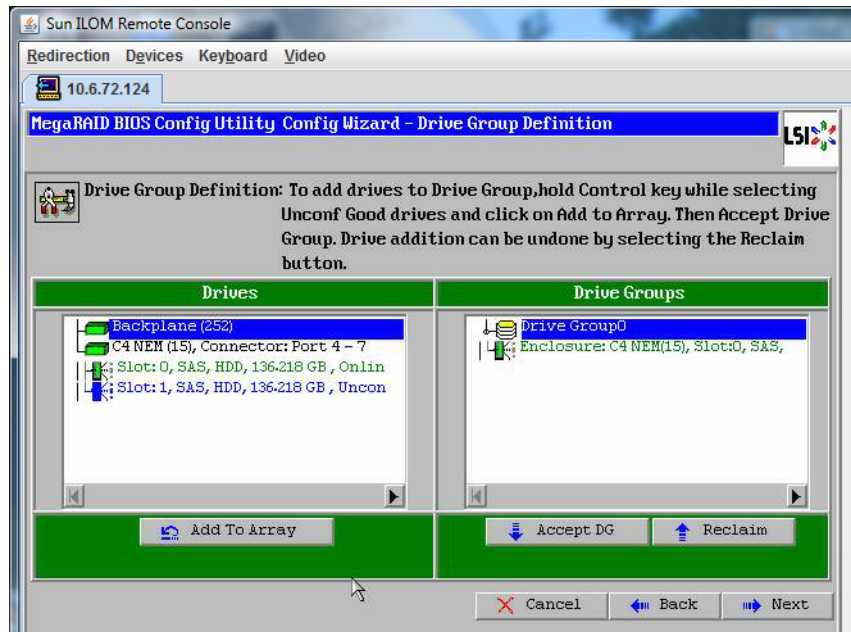


- 13 When the MegaRAID BIOS Config Utility Config Wizard – Drive Group Definition screen appears, you see the drives in the system and the drive groups. Select the drive you want and click Add To Array.



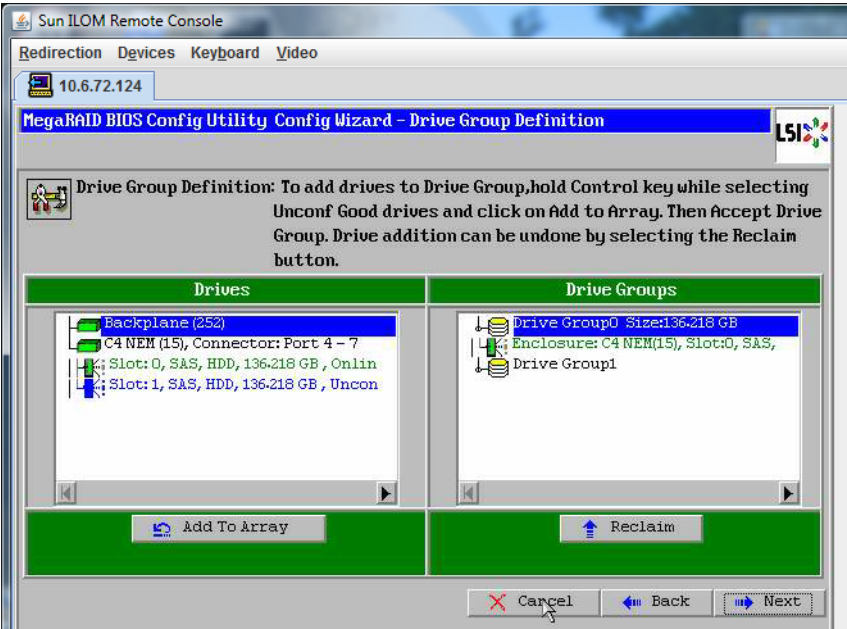
14 Click Accept DG to create the drive group.

You can now view Drive Group0.

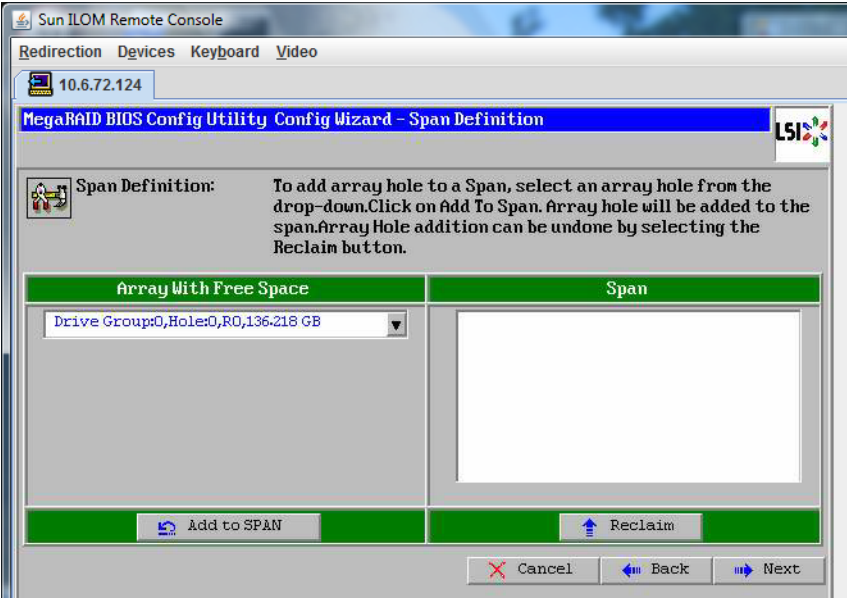


15 Click Next.

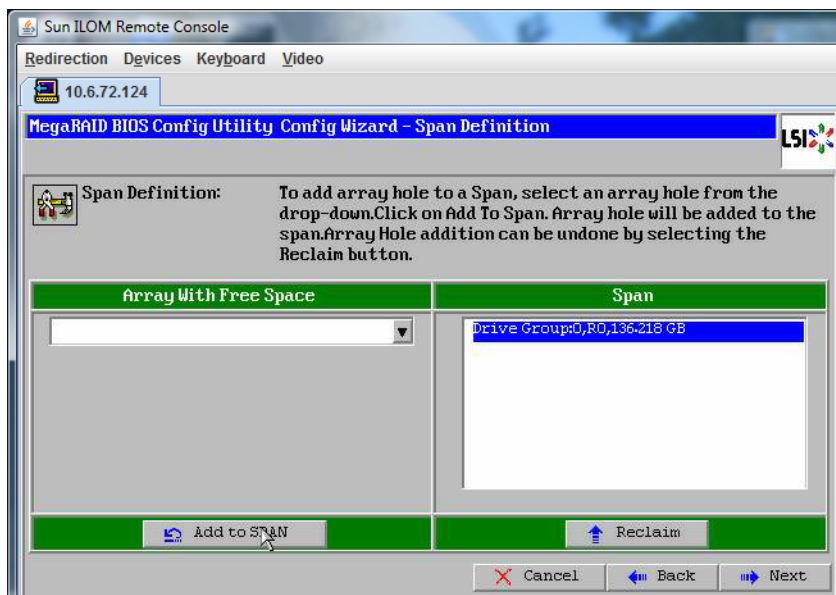
Note – You can undo the drive group selection by clicking the Reclaim button.



16 The drive group appears in the Span Definition window. Click Add to SPAN.

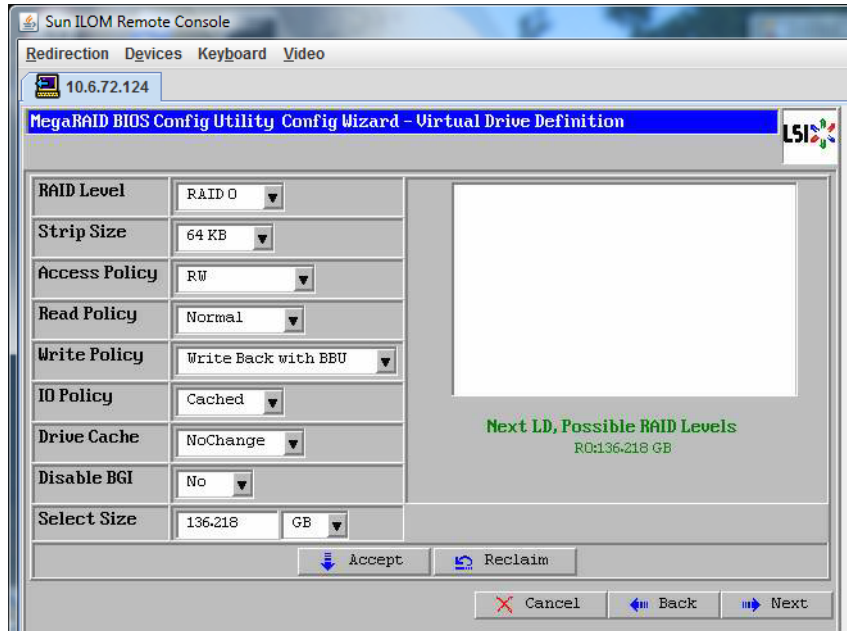


- 17 The drive group appears in the span. Click Next.

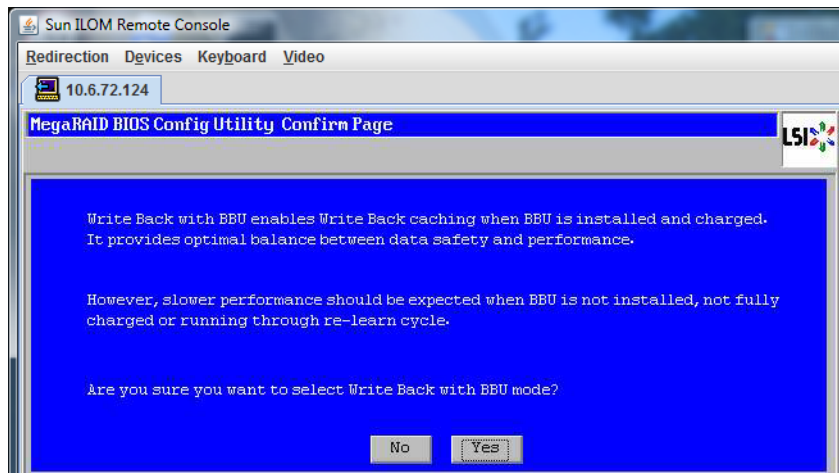


- 18 The Virtual Drive Definition screen appears. Set the RAID level and configurations you want for your virtual drive and click Accept.

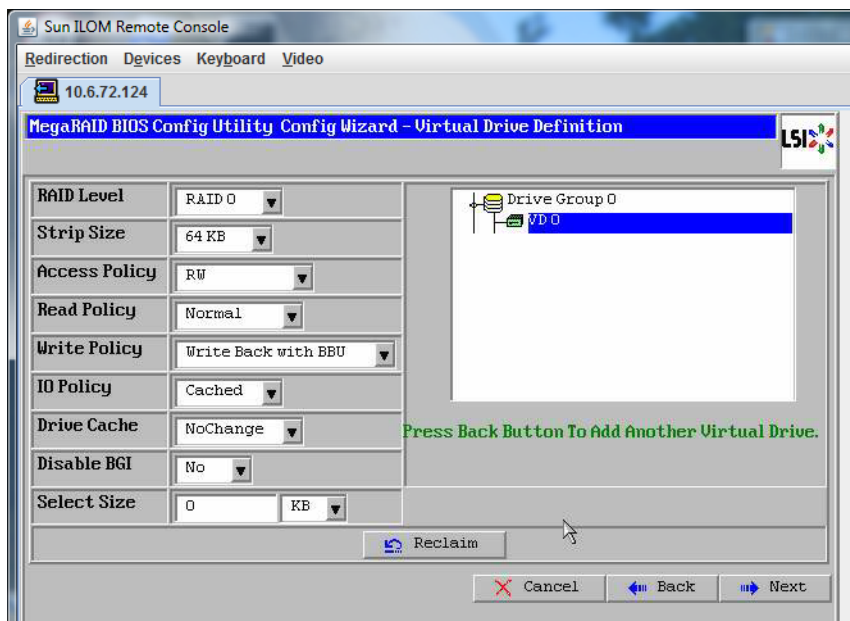
For more information about configuring RAID, refer to your server's Disk Management documentation.



- 19 When system prompts you to confirm Write Back with BBU mode, click Yes.

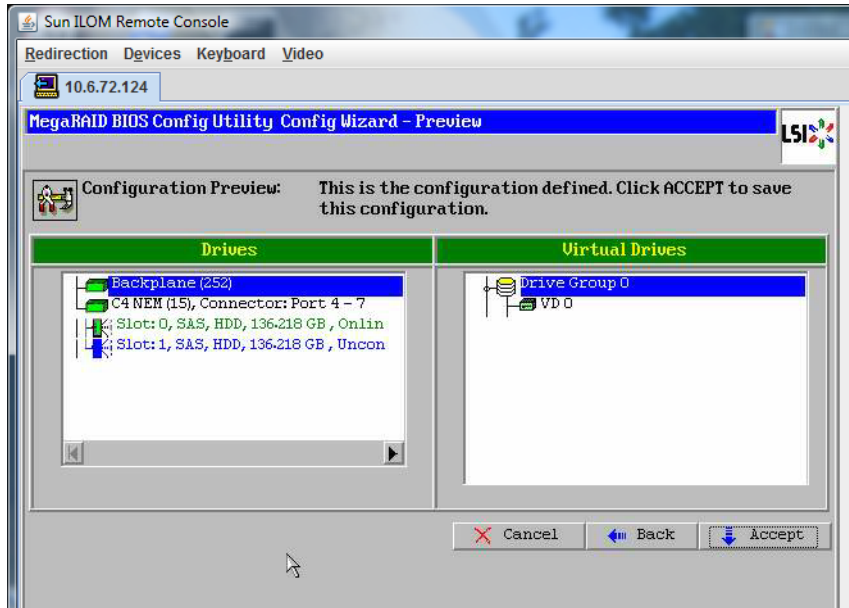


20 At the Config Wizard window, click Next.

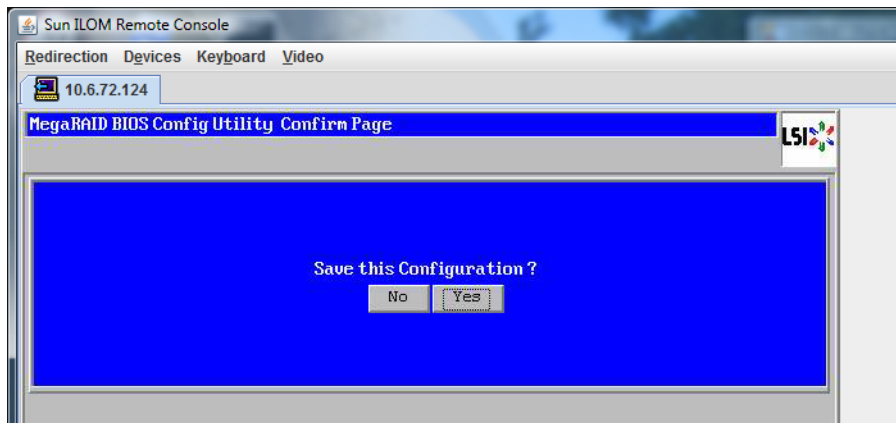


21 The Preview screen appears. Note that the virtual drive includes Drive Group 0.

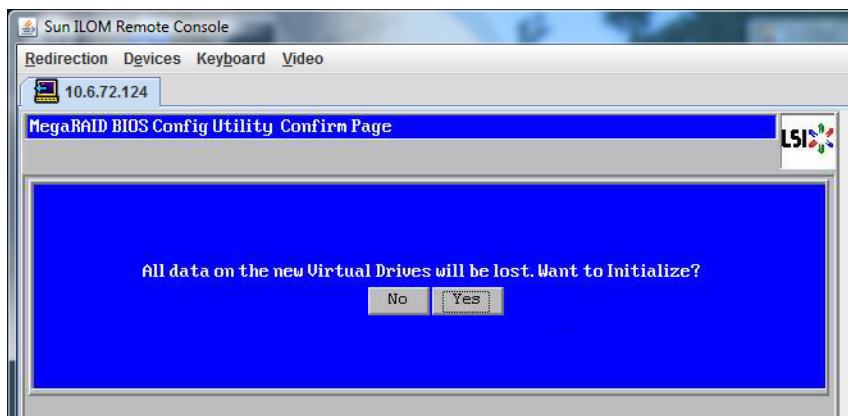
This graphic shows a single virtual drive using the Manual Configuration option:



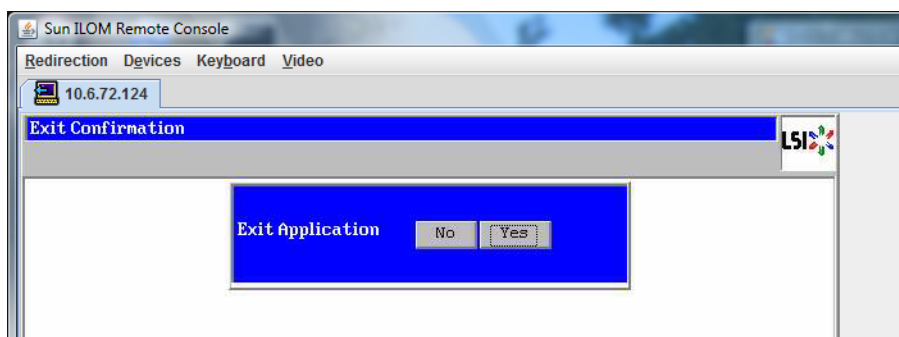
22 Save the Configuration.



- 23 Select Yes to the prompt: All data on Virtual Drives will be lost. Want to Initialize?



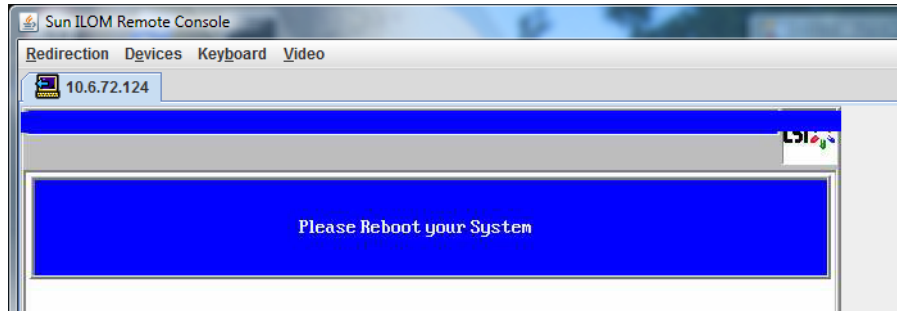
- 24 Click Yes to exit.



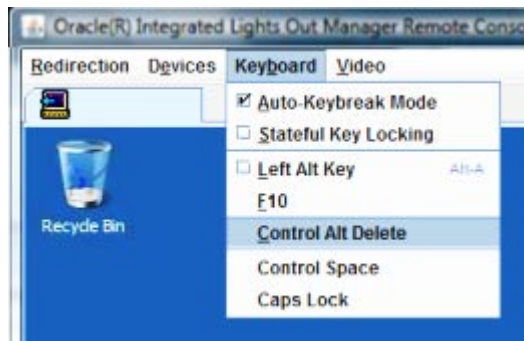
- 25 When you see Please Reboot Your System, use the Alt-B key combination to view the keyboard pull-down menu.



Caution – You must do this step; otherwise, the next step using Control Alt Delete reboots your local machine.



- 26 Use the arrow keys to select Control Alt Delete in the menu to reboot the remote system. Press Enter.

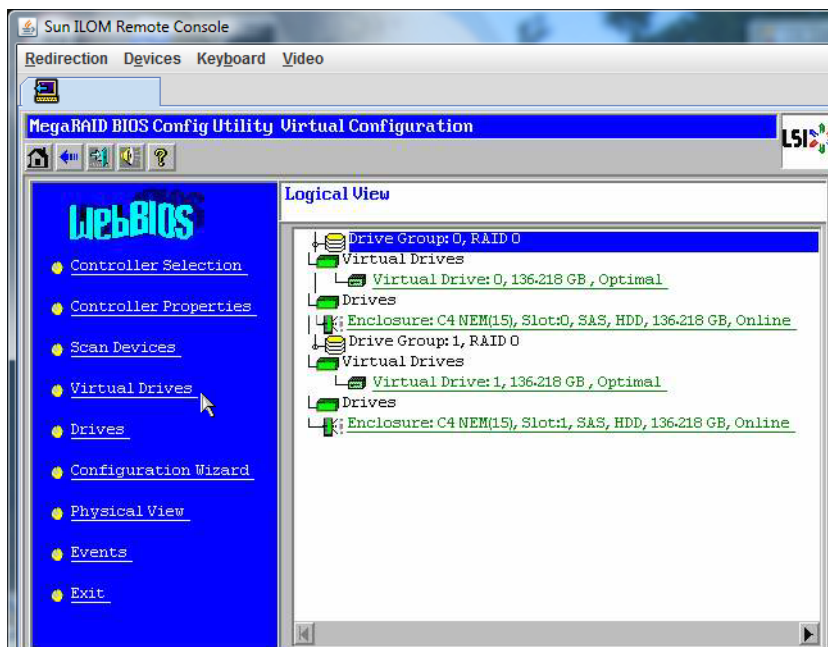


- 27 Go back and set the mouse mode to Absolute:
- In the Remote Control screen, select the KVMS tab.
 - Under Mouse Mode, select the Absolute.
 - Click Save.

▼ How to Set the Boot Drive

After creating a virtual drive you need to set the drive to be the boot drive if you are going to install your operating system on it.

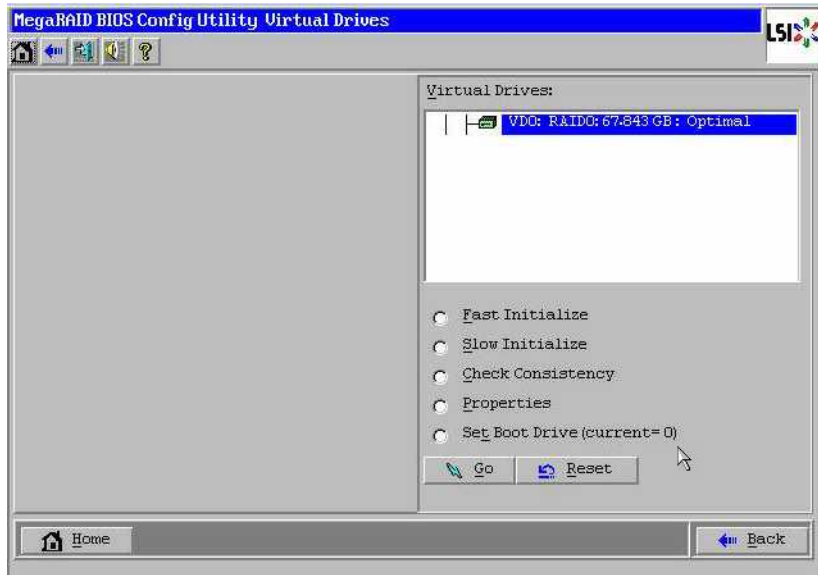
- 1 Go to the Configuration Wizard screen and select Virtual Drives.



The MegaRAID BIOS Config Utility Virtual Drives Configuration screen appears.

2 Check to see if the Set_Boot Drive (current=none) is listed as one of the options:

If the Set_Boot Drive (current=none) option is listed, then the boot drive has not been set.



3 Click Set_Boot Drive (current=none), then click Go.

Selecting a Media Delivery Method

In this section, you need to select a method for providing the Linux installation media. The procedures for installing Linux differ depending on your media delivery method.

Media Delivery Method	Additional Requirements
Using the Serial or Video Ports and a Local DVD: Uses a physical CD/DVD drive connected to the server and a terminal connected to the server's serial or video port.	Uses a USB CD/DVD drive directly connected to the server's USB dongle port, and access to the server console through the serial or video port. To install Linux, refer to “Local Installation By Accessing the Console Using the Serial or Video Port” on page 27.
Using ILOM and a Remote DVD or ISO image: Uses a redirected physical CD/DVD drive or ISO image file on a remote system running JavaRConsole.	A remote system with a browser, an attached physical CD/DVD drive, a Linux distribution DVD, and network access to the server's management port. To set up this method, refer to “Remote Installation By Accessing the Console Using ILOM” on page 30.
Using a PXE image: Uses a customized image available through the PXE environment.	A server setup and running PXE and a image customized for your server, refer to “Configuring a Linux Server to Support PXE Installation” on page 53.

Local Installation By Accessing the Console Using the Serial or Video Port

Installing the OS requires you to view the system console output. This can appear on both the serial port and the video port.

Note – This topic describes the default video and serial port outputs. Other settings, including console commands and GRUB menu selections, can change this behavior.

If you are using a terminal or laptop, you can connect to the server's serial port or video port using the multiport cable (also called a 'dongle') to access the console. See [“Attaching Administration \(SP\) Cables” in Sun Fire X4800 Server Installation Guide.](#)

- **Serial Port** – Connect a serial cable between the serial connector of the multiport cable and a terminal or laptop. From the moment you start the SP until the OS assumes control of the display, all output appears on the serial port. See [“How to Configure the Serial Port” on page 28](#).
- **Video Port** – Connect a VGA monitor cable from a KVM to the video port on the server's multiport cable. After the SP startup is complete, the system begins POST/BIOS, and displays all output on the video port. This continues until the OS assumes control of the display. Most OS configurations continue to display information on the video port. See *Sun Fire X4800 Server Installation Guide* for information on setting up the hardware.

▼ **How to Configure the Serial Port**

- 1 Connect either a terminal or a laptop running terminal emulation software directly to the serial port using the server's multiport cable.**

Use the following terminal settings:

8,n,1: eight data bits, no parity, one stop bit

9600 baud rate

Disable software flow control (XON/XOFF)

- 2 Power on the server.**

Console output appears on the serial port.

If the output does not appear, it might be necessary to configure the output in the BIOS. Use the following step to configure the output in the BIOS.

- 3 If necessary, check the BIOS settings.**

- a. During POST, press F2 (F4 on a remote keyboard) during the boot process to enter the BIOS.**

- b. Use the Right Arrow key to navigate to the Advanced tab.**

The left and right arrow keys allow you to access the BIOS Setup Utility menu tabs.

- c. Use the Down Arrow key to highlight the Remote Access Configuration option, and press Enter.**

The Configure Remote Access type and parameters submenu screen appears.

- d. Confirm that Remote Access is set to Enabled.**

- e. Confirm that Redirection after POST is set to Always.**

- f. To save the change and exit BIOS, press the F10 key.**

4 If the OS includes GRUB, it might be necessary to configure it as well. Do the following:

a. When the GRUB menu appears, press “e” to edit it.

b. Change `/boot/grub/menu.lst` as follows (the example below is for Oracle Linux):

Change from:

```
# grub.conf generated by anaconda
#
# Note that you do not have to rerun grub after making changes to this file
# NOTICE: You have a /boot partition. This means that
#          all kernel and initrd paths are relative to /boot/, eg.
#          root (hd0,0)
#          kernel /vmlinuz-version ro root=/dev/sda3
#          initrd /initrd-version.img
#boot=/dev/sda
default=1
timeout=5
title Oracle Linux Server (2.6.18-164.el5xen)
    root (hd0,0)
    kernel /xen.gz-2.6.18-164.el5
    module /vmlinuz-2.6.18-164.el5xen ro root=LABEL=/
    module /initrd-2.6.18-164.el5xen.img
title Oracle Linux Server-base (2.6.18-164.el5)
    root (hd0,0)
    kernel /vmlinuz-2.6.18-164.el5 ro root=LABEL=/
    initrd /initrd-2.6.18-164.el5.img
```

Change to:

```
# grub.conf generated by anaconda
#
# Note that you do not have to rerun grub after making changes to this file
# NOTICE: You have a /boot partition. This means that
#          all kernel and initrd paths are relative to /boot/, eg.
#          root (hd0,0)
#          kernel /vmlinuz-version ro root=/dev/sda3
#          initrd /initrd-version.img
#boot=/dev/sda
default=1
timeout=5
serial --unit=0 --speed=9600
terminal --timeout=5 serial console
title Oracle Linux Server (2.6.18-164.el5xen)
    root (hd0,0)
    kernel /xen.gz-2.6.18-164.el5 com1=9600 console=com1
    module /vmlinuz-2.6.18-164.el5xen ro root=LABEL=/ console=ttyS0,9600
    module /initrd-2.6.18-164.el5xen.img
title Oracle Linux Server-base (2.6.18-164.el5)
    root (hd0,0)
    kernel /vmlinuz-2.6.18-164.el5 ro root=LABEL=/ earlyprintk=ttyS0,9600
    console=ttyS0,9600
    initrd /initrd-2.6.18-164.el5.img
```

Next Steps ■ [“Installing Oracle Linux” on page 37](#)

—Or—

- [“Installing Red Hat Enterprise Linux” on page 41](#)
- Or—
- [“Installing SUSE Linux Enterprise Server” on page 47](#)

Remote Installation By Accessing the Console Using ILOM

Your server's *Integrated Lights Out Manager* (ILOM) provides a method of installing an operating system using either a CD/ DVD or an ISO image mounted on a remote system. The remote console feature allows you to use the keyboard, mouse, video, and storage of the remote system as if it were connected to the server where you are installing the operating system. Once the remote console session is configured, the server can boot from the remotely mounted distribution media (either a CD/DVD or equivalent ISO file).

This section describes how to set up a remote console system using JavaRConsole to deliver the Linux media over the network for operating system installation on your Sun server. Choose one of the following methods:

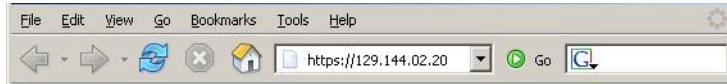
- [“How to Access the Server Console Using the Server's ILOM Web Interface” on page 30](#)
- [“How to Access the Server Console Using the Server's ILOM CLI Interface” on page 34](#)

▼ How to Access the Server Console Using the Server's ILOM Web Interface

Before You Begin The following requirements must be met:

- The JavaRConsole system must be running Solaris, Linux, or Windows.
- The JavaRConsole system must be connected to a network that has access to the Sun server Ethernet management port.
- Java Runtime Environment (JRE) 1.5 or later must be installed. For CD-ROM redirection, 32-bit Java must be used.
- If the JavaRConsole system is running Solaris, volume management must be disabled for JavaRConsole to access the CD/DVD-ROM drive.
- If the JavaRConsole system is running Windows, Internet Explorer Enhanced Security must be disabled.
- You must have network access to the server's ILOM service processor (see [“Attaching Administration \(SP\) Cables” in *Sun Fire X4800 Server Installation Guide*](#)). You must have also configured ILOM according to the instructions in the *Integrated Lights Out Manager (ILOM)* documentation for your server.

- 1 Start the remote console application by typing the IP address of the Integrated Lights Out Manager (ILOM) service processor into a browser on the JavaRConsole system.

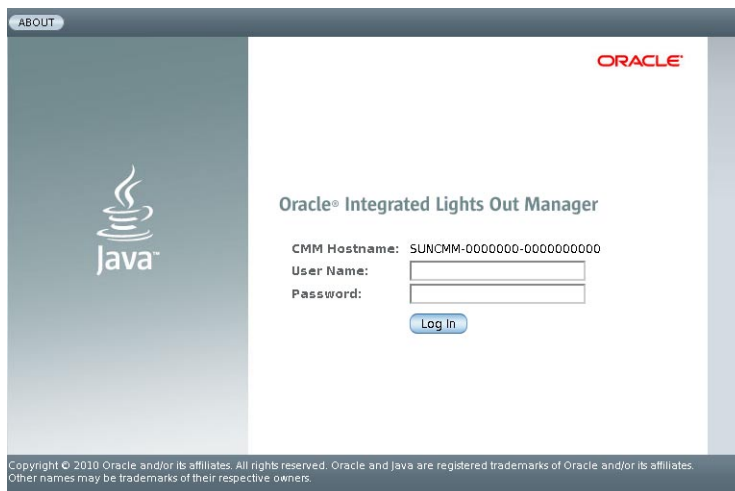


The Security Alert dialog box appears.



- 2 Click Yes.

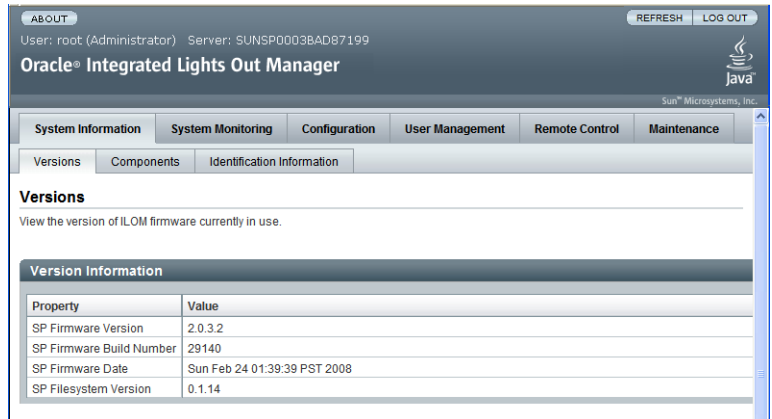
The ILOM login screen appears.



- 3 Enter the user name and password and click Log In.

The default user name is **root** and default password is **changeme**.

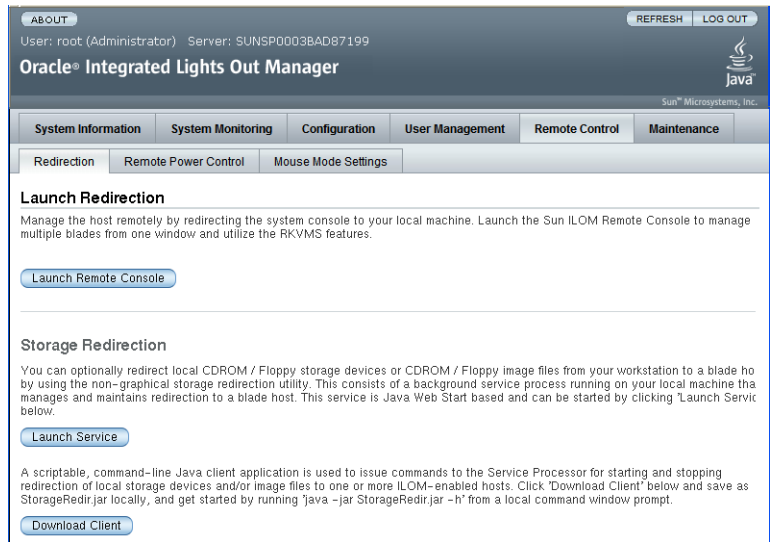
The ILOM Version Information screen appears.



4 Click the Remote Control tab in the ILOM web interface.

The Launch Redirection screen appears.

Note – Make sure that the mouse mode is set to Absolute mode in the Mouse Mode Settings tab.

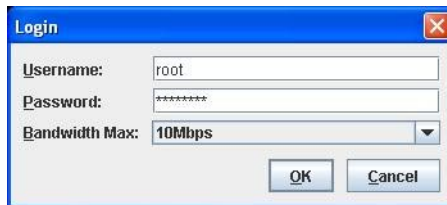


5 Click Launch Remote Console.

Note – When using a Windows system for JavaRConsole System redirection, an additional warning appears after clicking Launch Redirection. If the Hostname Mismatch dialog box is displayed, click the Yes button.



A Remote Control dialog box might appear appear.

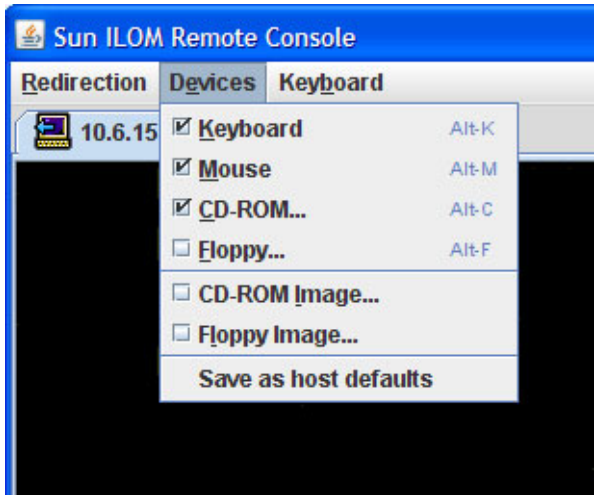


- 6 If you are prompted to login again using the Remote Control Login dialog box, enter your user name and password and click OK.

The default user name is **root** and password is **changeme**.

After the login is successful, the JavaRConsole screen appears.

- 7 From the Devices menu, select one CD item according to the delivery method you have chosen.



- **CD-ROM Remote:** Select CD-ROM to redirect the server to the operating system software CD/DVD contents from the CD/DVD-ROM drive attached to the JavaRConsole system.
- **CD-ROM Image:** Select CD-ROM Image to redirect the server to the operating system software .iso image file located on the JavaRConsole system.



Caution – Using the CD-ROM Remote or CD-ROM Image options to install the Linux OS significantly increases the time necessary to perform the installation as the content of the CD-ROM is accessed over the network. The installation duration depends on the network connectivity and traffic.

- Next Steps**
- “Installing Oracle Linux” on page 37
 - Or—
 - “Installing Red Hat Enterprise Linux” on page 41
 - Or—
 - “Installing SUSE Linux Enterprise Server” on page 47

▼ How to Access the Server Console Using the Server's ILOM CLI Interface

- 1 Open a terminal window and establish an ssh connection to the CMM by entering the following command:

```
# ssh root@sp_ip
```

Where *sp_ip* is the IP address of the server's Service Processor.

The login prompt is displayed.

2 Log in as root and enter the root password:

`/hostname/login: root`

`password:xxxxxxxx`

After you have successfully logged in, the prompt will be displayed:

`->`

3 To redirect the console, enter the command:

`-> start /SP/console`

- Next Steps**
- [“Installing Oracle Linux” on page 37](#)
—Or—
 - [“Installing Red Hat Enterprise Linux” on page 41](#)
—Or—
 - [“Installing SUSE Linux Enterprise Server” on page 47](#)

Installing Oracle Linux

Your server is compatible for use with Oracle Linux 5.5 64-bit. The following topics describing the installation of Oracle Linux on your server are included in this section:

- [“Installing Oracle Linux from Distribution Media” on page 37](#)
- [“Updating Oracle Linux” on page 40](#)

Note – You can also install Oracle Linux using a PXE installation, as described in [“Configuring a Linux Server to Support PXE Installation” on page 53](#)

Installing Oracle Linux from Distribution Media

Before installing Oracle Linux on your server, you must obtain the following items:

- Oracle Linux media set (CD or DVD) or an equivalent ISO image. The ISO image can be used for remote installation or for creating an installation DVD. See [“How to Download Oracle Linux Media” on page 38](#).
- DVD-ROM drive.

Note – If you are installing remotely, the DVD-ROM drive, keyboard, mouse, and monitor are connected to the local system instead of the server. Also, you can use an ISO image instead of an actual DVD/CD-ROM.

- USB keyboard and mouse.
- Monitor.
- Obtain the following Oracle documentation.

Document	Description	Where to Find
Release Notes	Contains late-breaking information about system requirements and system configuration for your version of the Oracle Linux software.	Online from http://oss.oracle.com/e15/docs/
<i>Oracle Linux Installation Guide</i>	An online article with step-by-step instructions for installing Oracle Linux.	Available for download from http://www.oracle-base.com/articles/linux/OracleEnterpriseLinux5Installation.php

Also see:

- “How to Download Oracle Linux Media” on page 38
- “How to Install Oracle Linux From Distribution Media” on page 38

▼ **How to Download Oracle Linux Media**

- 1 Go to the Oracle e–delivery site: <http://edelivery.oracle.com/linux>
- 2 Create an account (if you do not already have one).
You need an account to download the updated ISO images.
- 3 Find and download Oracle Linux.

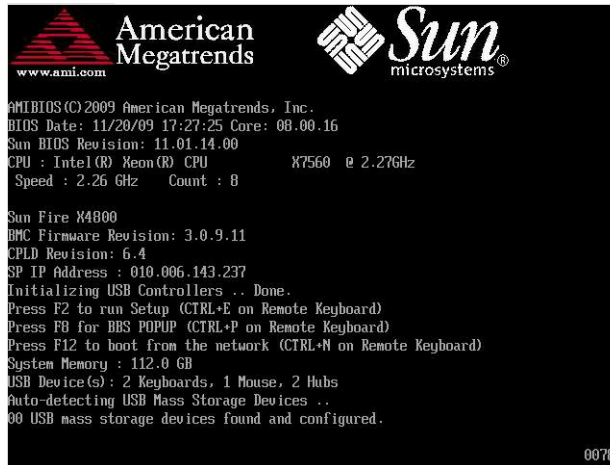
Next Steps Proceed to “How to Install Oracle Linux From Distribution Media” on page 38.

▼ **How to Install Oracle Linux From Distribution Media**

- Before You Begin**
- Before installing your OS, you must create a virtual disk volume on the target disk. See “Creating a Virtual Disk” on page 12.
 - 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. See “Identifying Logical and Physical Network Interface Names for Linux OS Configuration” on page 69 for details.
- 1 Connect to your server console using one of the following methods:
 - “Local Installation By Accessing the Console Using the Serial or Video Port” on page 27
 - “Remote Installation By Accessing the Console Using ILOM” on page 30
 - 2 If not done already, insert your Linux distribution DVD or access the ISO image distribution media for the method you chose in step 1.

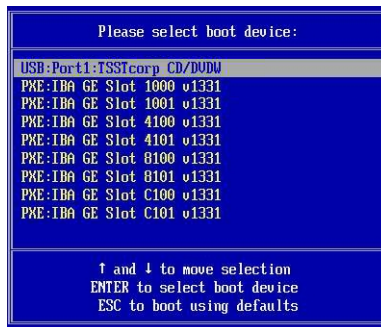
3 Power on or reset the server.

BIOS messages appear on the console.



4 When you see a message offering a series of selections, press F8.

After a delay, a menu offers a selection of boot devices (see the following example).



5 Select a boot device from the list.

To boot from a physical CD/DVD or from an ISO image, select CD/DVD.

Control passes to the OS installation program on the media.

6 Do one of the following at the boot prompt, depending on which type of interface you want to use:

- For text mode, type the following command: `boot: linux text.`
- For graphical mode, press Enter at the boot prompt.

7 Refer to the Oracle Linux 5 installation article on the web at:

<http://www.oracle-base.com/articles/linux/OracleEnterpriseLinux5Installation.php>

Note – If you already have an operating system besides Linux installed (for example, the Solaris OS), it will appear as a partition during the installation process. If you choose to install Oracle Linux on that partition, it will overwrite the OS. If you wish to preserve the partition, you must install Oracle Linux on a different partition.

Next Steps ■ Proceed to “Updating Oracle Linux” on page 40.

Updating Oracle Linux

Use this procedure to update Oracle Linux to the latest OS.

Note – If your system is on a publicly accessible network, updating your system can help to improve security.

▼ How to Update the Oracle Linux Operating System

Before You Begin You must already have Oracle Linux installed on your server.

- **Choose a method for updating your Oracle Linux operating system:**
 - **For Oracle Unbreakable Linux Network (ULN) installations, create local yum repositories and configure yum and up2date to install update packages from them.**

See <http://www.oracle.com/technology/tech/linux/htdocs/yum-repository-setup.html>.
 - **For Oracle Linux installations without Unbreakable Linux Network support, use the Oracle Public yum server and a yum client to install updates.**

See <http://public-yum.oracle.com/>.

Note – This yum server is offered without support of any kind. If you require errata, security patches and other updates, you should use Oracle [Unbreakable Linux Network \(ULN\)](#) available from the [online store](#), or your sales representative.

Installing Red Hat Enterprise Linux

Your server supports Red Hat Enterprise Linux (RHEL) 5.5 64-bit. The related topics include.

- “Installing RHEL From Distribution Media” on page 41
- “Updating RHEL” on page 44

Note – You can also install RHEL using a PXE installation, as described in “Configuring a Linux Server to Support PXE Installation” on page 53

Installing RHEL From Distribution Media

Before installing RHEL on your server, you must obtain the following items:

- RHEL media set (CD or DVD) or an equivalent ISO image. The ISO image can be used for remote installation or for creating an installation DVD. See “How to Download RHEL Media Kits” on page 41.
- DVD-ROM drive.

Note – If you are installing remotely, the DVD-ROM drive, keyboard, mouse, and monitor are connected to the local system instead of the server. Also, you can use an ISO image instead of an actual DVD/CD-ROM.

- USB keyboard and mouse.
- Monitor.
- Obtain the RHEL documentation at: <http://www.redhat.com/docs>

▼ How to Download RHEL Media Kits

1 Obtain your enterprise account information.

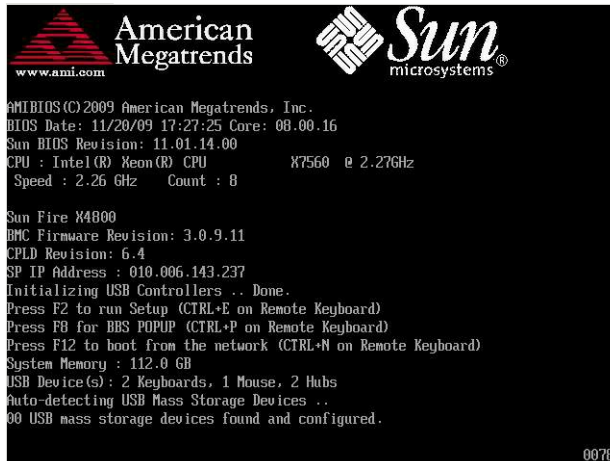
You need an enterprise account to download the updated ISO images.

2 Download the Red Hat Enterprise Linux Update Media Kit from <http://rhn.redhat.com>.

- See Also**
- [“How to Install RHEL From Distribution Media” on page 42](#)
 - [“How to Update the RHEL Operating System” on page 44](#)
 - [“How to Update the RHEL Drivers” on page 44](#)

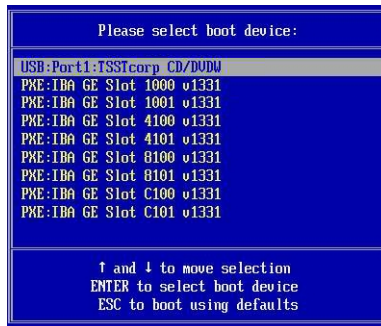
▼ How to Install RHEL From Distribution Media

- Before You Begin**
- Before installing your OS, you must create a virtual disk volume on the target disk. See [“Creating a Virtual Disk” on page 12](#).
 - 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. See [“Identifying Logical and Physical Network Interface Names for Linux OS Configuration” on page 69](#) for details.
- 1 **Connect to your server console using one of the following methods:**
 - [“Local Installation By Accessing the Console Using the Serial or Video Port” on page 27](#)
 - [“Remote Installation By Accessing the Console Using ILOM” on page 30](#)
 - 2 **If not done already, insert your Linux distribution DVD or access the ISO image distribution media for the method you chose in step 1.**
 - 3 **Power on or reset the server.**
- BIOS messages appear on the console.



4 When you see a message offering a series of selections, press F8.

After a delay, a menu offers a selection of boot devices (see the following example).

**5 Select a boot device from the list.**

To boot from a physical CD/DVD or from an ISO image, select CD/DVD.

Control passes to the OS installation program on the media.

6 Do one of the following at the boot prompt, depending on which type of interface you want to use:

- For text mode, type the following command: `boot: linux text`.
- For graphical mode, press Enter at the boot prompt.

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

Note – If you already have an operating system besides Linux installed (for example, the Solaris OS), it will appear as a partition during the installation process. If you choose to install RHEL on that partition, it will overwrite the OS. If you wish to preserve the partition, you must install RHEL on a different partition.

8 Proceed to [“How to Update the RHEL Operating System” on page 44](#).

- See Also**
- [“How to Update the RHEL Operating System” on page 44](#)
 - [“How to Update the RHEL Drivers” on page 44](#)

Updating RHEL

Use this procedure to update RHEL to the latest OS.

Note – If your system is on a publicly accessible network, updating your system can help to improve security.

Updating RHEL consists of the following procedures:

- [“How to Update the RHEL Operating System” on page 44](#)
- [“How to Update the RHEL Drivers” on page 44](#)

▼ How to Update the RHEL Operating System

Before You Begin You must already have RHEL installed on your server.

Your server must have access to the Internet.

1 Run the yum update program.

```
# yum
```

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

You should periodically update your system using yum.

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

```
# man yum
```

See Also [“How to Update the RHEL Drivers” on page 44](#)

▼ How to Update the RHEL Drivers

Check the Tools and Drivers CD shipped with your server for the latest drivers for installed components.

1 Insert the Tools and Drivers CD for your server and mount it onto the directory /mnt.

2 Type the following commands:

```
# cd /mnt/Linux/drivers  
# rpm -ivh driver-filename
```

For example, if you are using an Intel 82599 (Niantic) 10GbE network PCIe ExpressModule, you would enter the following commands:

```
# cd /mnt/Linux/drivers  
# rpm -ivh ixgbe-2.0.44.14-1-rhel5.5.x86_64.rpm
```

Note – Check the `/linux/drivers` directory on your Tools and Drivers CD for the correct driver file name for your operating system.

Installation of the new drivers is now complete.

- 3 Reboot the server for the changes to take effect.**

Installing SUSE Linux Enterprise Server

Your server supports SUSE Linux Enterprise Server (SLES) 11 64-bit. This section provides instructions for installing SUSE on your server.

The related topics include.

- “Installing SLES From Distribution Media” on page 47
- “Updating SLES” on page 50

Installing SLES From Distribution Media

Before installing SLES on your server, you must obtain the following items:

- SLES media set (CD or DVD) or an equivalent ISO image. The ISO image can be used for remote installation or for creating an installation DVD. See “[How to Download SLES Media Kits](#)” on page 48.
- DVD-ROM drive.

Note – If you are installing remotely, the DVD-ROM drive, keyboard, mouse, and monitor are connected to the remote system instead of the server. Also, you can use an ISO image instead of an actual DVD/CD-ROM.

- USB keyboard and mouse.
- Monitor.
- Obtain the SLES documentation at: <http://www.novell.com/documentation/sles11>

See also:

- “[How to Download SLES Media Kits](#)” on page 48
- “[How to Install SLES From Distribution Media](#)” on page 48

▼ How to Download SLES Media Kits

1 Obtain your Novell account information.

You need a Novell account to download the ISO images.

2 Download the SUSE Linux Enterprise Server media kit from <http://download.novell.com>.

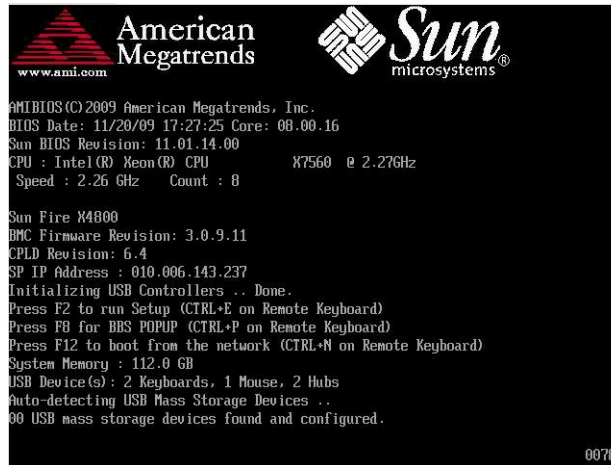
- See Also**
- “How to Install SLES From Distribution Media” on page 48
 - “How to Update the SLES Operating System” on page 50
 - “How to Update the SLES Drivers” on page 51

▼ How to Install SLES From Distribution Media

- Before You Begin**
- Before installing your OS, you must create a virtual disk volume on the target disk. See “Creating a Virtual Disk” on page 12.
 - 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. See “Identifying Logical and Physical Network Interface Names for Linux OS Configuration” on page 69 for details.
- 1 **Connect to your server console using one of the following methods:**
 - “Local Installation By Accessing the Console Using the Serial or Video Port” on page 27
 - “Remote Installation By Accessing the Console Using ILOM” on page 30
 - 2 **If not done already, insert your Linux distribution DVD or access the ISO image distribution media for the method you chose in step 1.**

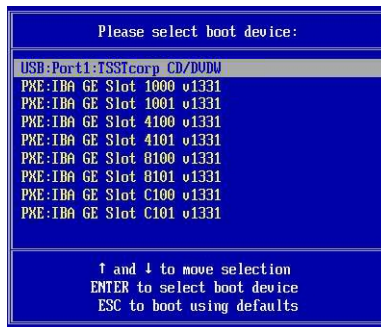
3 Power on or reset the server.

BIOS messages appear on the console.



4 When you see a message offering a series of selections, press F8.

After a delay, a menu offers a selection of boot devices (see the following example).



5 Select a boot device from the list.

To boot from a physical CD/DVD or from an ISO image, select CD/DVD.

Control passes to the OS installation program on the media.

6 Follow the installation instructions provided with the Installation Guide to complete the installation of the system software.

Note – If you already have an operating system besides Linux installed (for example, the Solaris OS), it will appear as a partition during the installation process. If you choose to install SLES on that partition, it will overwrite the OS. If you wish to preserve the partition, you must install SLES on a different partition.

See Also [“Updating SLES” on page 50](#)

Updating SLES

Use this procedure to update SLES to the latest OS.

Note – If your system is on a publicly accessible network, updating your system can help to improve security.

Updating SLES consists of the following procedures:

- [“How to Update the SLES Operating System” on page 50](#)
- [“How to Update the SLES Drivers” on page 51](#)

▼ **How to Update the SLES Operating System**

This task uses YaST to update SLES.

YaST can operate in both text and graphical modes. These directions apply to both.

Before You Begin Obtain a Novell Customer Center username and password, and a SLES product activation code.

- 1 Log in as superuser.**
- 2 Open the YaST Online Update service.**
`# you`
The YaST user window appears.
- 3 If you are behind a network firewall and need to use a proxy server to access the Internet, configure YaST with the correct proxy information.**
 - a. Select the Network Services tab.**
 - b. Select the Proxy screen on the right of the display.**
 - c. Enter the correct proxy URLs in both the HTTP and HTTPS fields.**

d. Exit YaST.

e. Enter 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/
```

f. Restart YaST.

4 To register with the Novell Customer center:

a. Select the Software tab.

b. Select Novell Customer Center Configuration and follow the directions.

This requires your Novell Customer Center username and password, and a SLES product activation code.

5 Select the Online Update tab to perform the software update.

See Also [“How to Update the SLES Drivers” on page 51](#)

▼ How to Update the SLES Drivers

Check the Tools and Drivers CD shipped with your server for the latest drivers for installed components.

1 Insert the Tools and Drivers CD for your server and mount it onto the directory /mnt.

2 Type the following commands:

```
# cd /mnt/Linux/drivers
# rpm -ivh driver-filename
```

For example, if you are using an Intel 82599 (Niantic) 10GbE network PCIe ExpressModule, you would enter the following commands:

```
# cd /mnt/Linux/drivers
# rpm -ivh ixgbe-2.0.44.14-1-sles11.x86_64.rpm
```

Note – Check the /linux/drivers directory on your Tools and Drivers CD for the correct driver file name for your operating system.

Installation of the new drivers is now complete.

3 Reboot the server for the changes to take effect.

Configuring a Linux Server to Support PXE Installation

This section describes how to configure a PXE server on a Linux system and use it to install Linux on your server.

You can configure PXE to support a network installation of a supported OS for your server, such as Oracle Linux 5.5 (64-bit), RHEL 5.5 (64-bit), and SLES 11 (64-bit).

PXE is a powerful and convenient solution for setting up a number of servers so their configuration is identical. It allows you to configure a server, which you can then use to install identical versions of the OS on any number of network systems.

Configuring a PXE server consists of the following procedures.

Step	Description	Link
1	Get an overview of PXE setup.	“Overview of PXE” on page 54
2	Verify the presence of, or install, the following servers and services:	<ul style="list-style-type: none">■ DHCP – See “How to Install and Configure a DHCP Server for PXE” on page 55.■ Portmap – See “How to Install Portmap on Your PXE Server” on page 56.■ TFTP – See “How to Configure the TFTP Service on Your PXE Server” on page 56.■ PXELINUX – See “How to Configure PXELINUX on Your PXE Server” on page 57.■ NFS – See “How to Configure the NFS Service on Your PXE Server” on page 57.
3	Disable the firewall.	“Disabling the Firewall” on page 58

Step	Description	Link
4	Create a PXE installation image.	“How to Create a PXE Installation Image for Oracle Linux” on page 59 “How to Create a PXE Installation Image for RHEL” on page 61 “How to Create a PXE Installation Image for SLES” on page 63 “How to Create a PXE Installation Image for Oracle VM” on page 64
5	Install Linux from a PXE server.	“How to Install Linux From a PXE Server” on page 66

Overview of PXE

The Linux preboot execution environment (PXE) can be used to boot your server from a network interface instead of local storage. For OS installation, booting the target server from a PXE-based OS distribution image is like booting from a DVD except that the media is on the network. To use PXE, you need to setup the necessary network infrastructure:

- DHCP server running Linux and configured for PXE booting. In the example listed in this section, the DHCP server will also be the PXE server.
- TFTP server that supports PXE boot. The PXE boot images will be located on the TFTP server. In the example listed in this section, the DHCP server will act as the PXE server with TFTP running on it as a service.
- PXELINUX installed on the PXE server
- PXE image on the PXE server. In the example listed in this section, the image will be Linux OS distribution installation media which will be used to do a remote OS installation on the PXE client.
- PXE client (also called the “target system”) with a network interface card that supports network booting. The client will boot over the network using a PXE image.

Note – Your PXE network must be running IPv4 networking (IPv6 is not support PXE network booting).

The onboard network interface card (NIC) in your 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 you can use PXE to boot and install a supported version of Linux (Oracle Linux or SLES) on your server.

Proceed to [“How to Install and Configure a DHCP Server for PXE”](#) on page 55.

▼ How to Install and Configure a DHCP Server for PXE

Although you can configure a separate server for PXE images, the following example will use a Linux DHCP server as the PXE server. Complete the following steps to set up the DHCP server.



Caution – Do not set up a new DHCP server if your network already has one because this can cause conflicts and prevent PXE booting.

- 1 Turn 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 is not listed, install it from the Linux distribution media (you can use `grep` to find the rpm).
- 4 Set up your DHCP configuration file (for example, `/etc/dhcpd.conf`) so that only PXEClient requests receive PXEClient responses.

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

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

where *n.n.n.n* is the IP address of the DHCP/PXE server.

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

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

where *n.n.n.n* is the IP address of the DHCP/PXE server.

- 6 Also in the DHCP configuration file, find the following 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 DHCP/PXE server's network configuration.

7 Start the DHCP service.

- For Oracle Linux or RHEL, type the `service dhcp start` command.
`# service dhcpd start`
- For SLES, use YaST to start the services.

8 Configure the server to always start DHCP.

- For Oracle Linux or RHEL, type:
`# chkconfig dhcpd on`
- For SLES, use YaST to configure the services to start at bootup. For example:
`# yast > system > Runlevel Editor`

▼ How to Install Portmap on Your PXE Server

If your server does not include a portmap server, you need to install it.

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

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

2 If portmap is not listed, install it from the Linux distribution media (you can use `grep` to find the rpm).

▼ How to Configure the TFTP Service on Your PXE Server

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

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

2 If TFTP is not listed, install it from the Linux distribution media (you can use `grep` to find the `tftp-server` rpm for Oracle Linux or RHEL, and `yast2-tftp-server` rpm for SLES).**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 `xinetd` server.

```
# service xinetd restart
```


▼ How to Configure PXELINUX on Your PXE Server

The PXELINUX environment can be used for the target system to boot the OS installer. PXELINUX is part of SYSLINUX. Some versions of Linux might include an older version of PXELINUX.

You can obtain SYSLINUX at:

<http://www.kernel.org/pub/linux/utils/boot/syslinux/>

- 1 On your PXE server, create the following directory

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

- 2 Obtain, download, and extract the SYSLINUX package to a directory accessible to your PXE server.

- 3 Copy the `pxelinux.0` file from the extracted SYSLINUX package to the appropriate directory on the PXE server

```
# cp /syslinux-directory/core/pxelinux.0 /home/pxeboot
```

Where `syslinux-directory` is where SYSLINUX has been extracted.

- 4 Create the `pxelinux.cfg` directory.

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

Under this directory you will create a default PXE configuration file. This procedure is described later in the process.

▼ How to Configure the NFS Service on Your PXE 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, install it from the Linux distribution media (you can use `grep` to find the `nfs-utils` rpm for Oracle Linux or RHEL, and `nfs-kernel-server` rpm for SLES).

- 3 Add the following line to the `/etc/exports` file and save it.

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

- 4 Start the NFS service.

```
# service nfs start
```

5 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.

Disabling the Firewall

This topic describes how to disable the firewall so that PXE clients can download from the server. It includes separate procedures for SUSE Linux and Oracle or Red Hat Enterprise Linux.

- [“How to Disable the Firewall for SUSE Linux” on page 58](#)
- [“How to Disable the Firewall for Oracle or Red Hat Enterprise Linux” on page 58](#)



Caution – Network security vulnerability. When you disable the firewall protection on 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.

▼ How to Disable the Firewall for SUSE Linux

- Use YaST to edit services for run levels. For example:

```
yast > system>Runlevel Editor
```

Next Steps [“How to Create a PXE Installation Image for SLES” on page 63](#)

▼ How to Disable the Firewall for Oracle or Red Hat Enterprise Linux

- 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.

5 Reboot the PXE server.

- Next Steps**
- “How to Create a PXE Installation Image for Oracle Linux” on page 59
 - “How to Create a PXE Installation Image for RHEL” on page 61
 - “How to Create a PXE Installation Image for SLES” on page 63
 - “How to Create a PXE Installation Image for Oracle VM” on page 64

▼ How to Create a PXE Installation Image for Oracle Linux

This procedure creates a supported Oracle Linux OS installation image on the PXE server. The PXE server allows the target server to do a network boot and install the operating system files over the network.

Before You Begin The PXE installation procedure requires the following items:

- You must have already completed the network infrastructure setup to support PXE. See “Configuring a Linux Server to Support PXE Installation” on page 53.
- A CD/DVD drive accessible to the PXE Server.
- Oracle Linux 5.5 distribution media set. This can be a set of CDs or a DVD.

1 Set up the directory structure that will hold the Linux OS software. For example:

```
# mkdir -p /home/pxeboot/oe15.5as_64/
```

Note – The examples in this procedure use Oracle Linux 5.5 and the image source directory /home/pxeboot/oe15.5as64 as an example. You can also choose to use a different source directory structure.

2 Enter the following commands to copy the contents of each Linux OS distribution CD to the appropriate PXE subdirectory. For example:

Note – Eject and insert CDs only when the CD/DVD drive is unmounted.

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

# cp -r /mnt/cdrom/* /home/pxeboot/oe15.5as_64/

# umount /mnt/cdrom
```

If you are installing from a DVD, you only have to do this once. When the copy is done, proceed to the next step.

3 Copy the `mlinuz` and `initrd.img` files to the appropriate PXE subdirectory. For example:

```
# cp /home/pxeboot/oe15.5as_64/images/pxeboot/mlinuz /home/pxeboot/oe15.5as_64

# cp /home/pxeboot/oe15.5as_64/images/pxeboot/initrd.img
/home/pxeboot/oe15.5as_64
```

4 Using a text editor, create a kickstart file (`ks.cfg`) in the following location on your PXE server:

`/home/pxeboot/oe15.5as_64/ks.cfg`

5 Add the necessary kickstart commands.

If you are creating a Oracle Linux image, for example, copy and insert the following content:

```
lang en_US
keyboard us
timezone --utc America/Los_Angeles
rootpw xxxx
reboot
bootloader --location=mbr
install
nfs --server n.n.n.n --dir /home/pxeboot/oe15.4as_64
clearpart --all
part /boot --fstype ext3 --size 512 --ondisk sda
part swap --size 65536 --ondisk sda
part / --fstype ext3 --size 1 --grow --ondisk sda
network --bootproto dhcp
auth --useshadow --enablemd5
firewall --disabled
#Do not configure the X Window System
skipx
text
```

```
%packages
@Everything
```

```
%pre
```

```
%post --nochroot
```

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.

6 Save the kickstart file.

7 Using a text editor, create the PXE configuration file (to be named `default`).

This file defines the menu shown to the target host during network boot. The following is an example of what should be in the file for a Oracle Linux 5.5 menu label:

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

```
default oel5.5as_64
label oel5.5as_64
kernel oel5.5as_64/vmlinuz
append ksdevice=eth0 console=tty0 load_ramdisk=1 initrd=oel5.5as_64/initrd.img
network ks=nfs:n.n.n.n :/home/pxeboot/oel5.5as_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.

8 Save the file as `default` in the `pxelinux.cfg` directory on the PXE server. For example:

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

▼ How to Create a PXE Installation Image for RHEL

This procedure creates a supported Red Hat Enterprise Linux OS installation image on the PXE server. The PXE server allows the target server to do a network boot and install the operating system files over the network.

Before You Begin The PXE installation procedure requires the following items:

- You must have already completed the network infrastructure setup to support PXE. See [“Configuring a Linux Server to Support PXE Installation” on page 53](#).
- A CD/DVD drive accessible to the PXE Server.
- RHEL 5.5 distribution media set. This can be a set of CDs or a DVD.

1 Set up the directory structure that will hold the Linux OS software. For example:

```
# mkdir -p /home/pxeboot/rhel5.5as_64/
```

Note – The examples in this procedure use RHEL 5.5 and the image source directory `/home/pxeboot/rhel5.5as64` as an example. You can also choose to use a different source directory structure.

2 Enter the following commands to copy the contents of each Linux OS distribution CD to the appropriate PXE subdirectory. For example:

Note – Eject and insert CDs only when the CD/DVD drive is unmounted.

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

```
# cp -r /mnt/cdrom/* /home/pxeboot/rhel5.5as_64/
```

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

If you are installing from a DVD, you only have to do this once. When the copy is done, proceed to the next step.

3 Copy the `vmlinuz` and `initrd.img` files to the appropriate PXE subdirectory. For example:

```
# cp /home/pxeboot/rhel5.5as_64/images/pxeboot/vmlinuz  
/home/pxeboot/rhel5.5as_64
```

```
# cp /home/pxeboot/rhel5.5as_64/images/pxeboot/initrd.img  
/home/pxeboot/rhel5.5as_64
```

4 Using a text editor, create a kickstart file (`ks.cfg`) in the following location on your PXE server:

```
/home/pxeboot/rhel5.5as_64/ks.cfg
```

5 Add the necessary kickstart commands.

If you are creating a RHEL image, for example, copy and insert the following content:

```
lang en_US  
keyboard us  
timezone --utc America/Los_Angeles  
rootpw xxxx  
reboot  
bootloader --location=mbr  
install  
nfs --server n.n.n.n --dir /home/pxeboot/rhel5.5as_64  
clearpart --all  
part /boot --fstype ext3 --size 512 --ondisk sda  
part swap --size 65536 --ondisk sda  
part / --fstype ext3 --size 1 --grow --ondisk sda  
network --bootproto dhcp  
auth --useshadow --enablemd5  
firewall --disabled  
#Do not configure the X Window System  
skipx  
text  
  
%packages  
@Everything  
  
%pre  
  
%post --nochroot
```

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.

6 Save the kickstart file.

7 Using a text editor, create the PXE configuration file (to be named `default`).

This file defines the menu shown to the target host during network boot. The following is an example of what should be in the file for a RHEL 5.5 menu label:

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

```
default rhel5.5as_64
label rhel5.5as_64
kernel rhel5.5as_64/vmlinuz
append ksdevice=eth0 console=tty0 load_ramdisk=1 initrd=oe15.5as_64/initrd.img
network ks=nfs:n.n.n.n :/home/pxeboot/rhel5.5as_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.

8 Save the file as `default` in the `pxelinux.cfg` directory on the PXE server. For example:

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

▼ How to Create a PXE Installation Image for SLES

The following steps explain how to create the directory setup containing SLES 11 files for PXE installation.

Before You Begin The PXE installation procedure requires the following items:

- You must have already completed the network infrastructure setup to support PXE. See [“Configuring a Linux Server to Support PXE Installation” on page 53](#).
- A CD/DVD drive accessible to the PXE Server.
- SLES 11 distribution media set. This can be a set of CDs or a DVD.

1 Set up the directory structure that will hold the SLES 11. Type:

```
# mkdir -p /home/pxeboot/sles11
```

You can use a different target directory than the `/home/pxeboot/sles11/` directory shown. The examples in this procedure use this directory.

- 2 Enter the following commands to copy the contents of each SLES distribution CD to the appropriate PXE subdirectory:

```
# mount /dev/cdrom /mnt/cdrom
# cp -r /mnt/cdrom/* /home/pxeboot/sles11/
# umount /mnt/cdrom
```

Note – You must place the entire contents of SLES 11 in a single directory.

- 3 Remove the media from the server.

▼ How to Create a PXE Installation Image for Oracle VM

At the release of this document, Oracle VM 2.2.1 is the minimum supported version of Oracle VM. These instructions are for creating a PXE installation image of Oracle VM Server.

Before You Begin The PXE installation procedure requires the following items:

- You must have already completed the network infrastructure setup to support PXE. See [“Configuring a Linux Server to Support PXE Installation” on page 53](#).
- A CD/DVD drive accessible to the PXE Server.
- Oracle VM Server distribution media set. This can be a set of CDs or a DVD.

- 1 Set up the directory structure that will hold the Oracle VM Server software.

```
# mkdir -p /home/pxeboot/ovm_svr_2.2/
```

- 2 Enter the following commands to copy the contents of each OVM distribution CD to the appropriate PXE subdirectory:

Note – Eject and insert CDs only when the CD/DVD drive is unmounted.

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

# cp -r /mnt/cdrom/* /home/pxeboot/ovm_svr_2.2/

# umount /mnt/cdrom
```

If you are installing from a DVD, you only have to do this once. When the copy is done, proceed to the next step.

- 3 Copy the `mlinuz` and `initrd.img` files to the appropriate PXE target subdirectory:

```
# cp /home/pxeboot/ovm_svr_2.2/images/pxeboot/mlinuz /home/pxeboot/ovm_svr_2.2
```



```
# cp /home/pxeboot/ovm_svr_2.2/images/pxeboot/initrd.img
/home/pxeboot/ovm_svr_2.2
```

4 Using a text editor, create a kickstart file (ks.cfg) in the following location on your PXE server:

```
/home/pxeboot/ovm_svr_2.2/ks.cfg
```

5 Add the necessary kickstart commands.

If you know the required commands, type them in. Or, you can copy and insert the following content:

```
lang en_US
#langsupport en_US
keyboard us
#mouse genericusb
timezone --utc America/Los_Angeles
rootpw xxxx
reboot
bootloader --location=mbr
install
nfs --server n.n.n.n --dir /home/pxeboot/ovm_svr_2.2
clearpart --all
part /boot --fstype ext3 --size 512 --ondisk sda
part swap --size 4096 --ondisk sda
part / --fstype ext3 --size 1 --grow --ondisk sda
network --bootproto dhcp
# password : abc123
ovsagent --iscrypted Y2fEjdGT1W6nsLqtJbGUVeUp9e4=
#ovsmgmtif eth0
auth --useshadow --enablemd5
firewall --disabled
#Do not configure the X Window System
skipx
text

%packages
@Everything

%pre

%post --nochroot

%post
```

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.

6 Save the kickstart file.

7 Using a text editor, create the PXE configuration file (to be named `default`). This file defines the menu shown to the target system during network boot.

The following shows two examples labels for an Oracle VM menu:

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

```
label ovm_svr_2.2 sda eth select
kernel ovm_svr_2.2/images/pxeboot/vmlinuz
append initrd=ovm_svr_2.2/images/pxeboot/initrd.img load_ramdisk=1 network
ks=nfs:n.n.n.n:/home/pxeboot/ovm_svr_2.2/ks.cfg mem=32g
```

```
label ovm_svr_2.2 sda eth select serial console
kernel ovm_svr_2.2/images/pxeboot/vmlinuz
append initrd=ovm_svr_2.2/images/pxeboot/initrd.img load_ramdisk=1 network
ks=nfs:n.n.n.n:/home/pxeboot/ovm_svr_2.2/ks.cfg mem=32g
console=ttyS0,115200
```

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

8 Save the file as default in the following location on the PXE server:

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

▼ How to Install Linux From a PXE Server

Before You Begin

- You must have already completed the network infrastructure setup to support PXE. See [“Configuring a Linux Server to Support PXE Installation” on page 53](#).
- You must have already created a supported Linux image on your PXE server. Refer to the appropriate section:
 - [“How to Create a PXE Installation Image for Oracle Linux” on page 59](#)
 - [“How to Create a PXE Installation Image for RHEL” on page 61](#)
 - [“How to Create a PXE Installation Image for SLES” on page 63](#)
 - [“How to Create a PXE Installation Image for Oracle VM” on page 64](#)
- Connect your target server (to be called the “PXE client”) to the same network as your PXE server.

1 Power on the PXE client.

The PXE client is the target where you are installing Linux from a PXE image on a PXE server.

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

The PXE client attempts to obtain an IP address from the DHCP server (in this example, the DHCP server is also configured as the PXE server) which then displays a menu of available PXE images.

3 Select an image from the list.

The corresponding Linux installation image downloads onto the over the network PXE client.

The OS installation process will start and you will proceed through the installation just as you would if the OS distribution media were booted from a local CD/DVD drive.

4 Install and configure the Linux operating system for your PXE client.

Refer to the manual that is shipped with your Linux media kit.

5 Update the operating system.

- For Oracle Linux, see [“Updating Oracle Linux” on page 40](#).
- For Red Hat Enterprise Linux, see [“Updating RHEL” on page 44](#)
- For SUSE Linux Enterprise Server, perform an Online Software Update to update the operating system files.

Identifying Logical and Physical Network Interface Names for Linux OS Configuration

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.

This topic explains how to obtain the needed logical information in these situations. It provides the following topics.

- [“How to Identify Installed Network Ports” on page 69](#)
- [“How to Identify Logical and Physical Network Interface Names While Installing Oracle Linux or RHEL” on page 72](#)
- [“How to Identify Logical and Physical Network Interface Names While Installing SLES” on page 73](#)

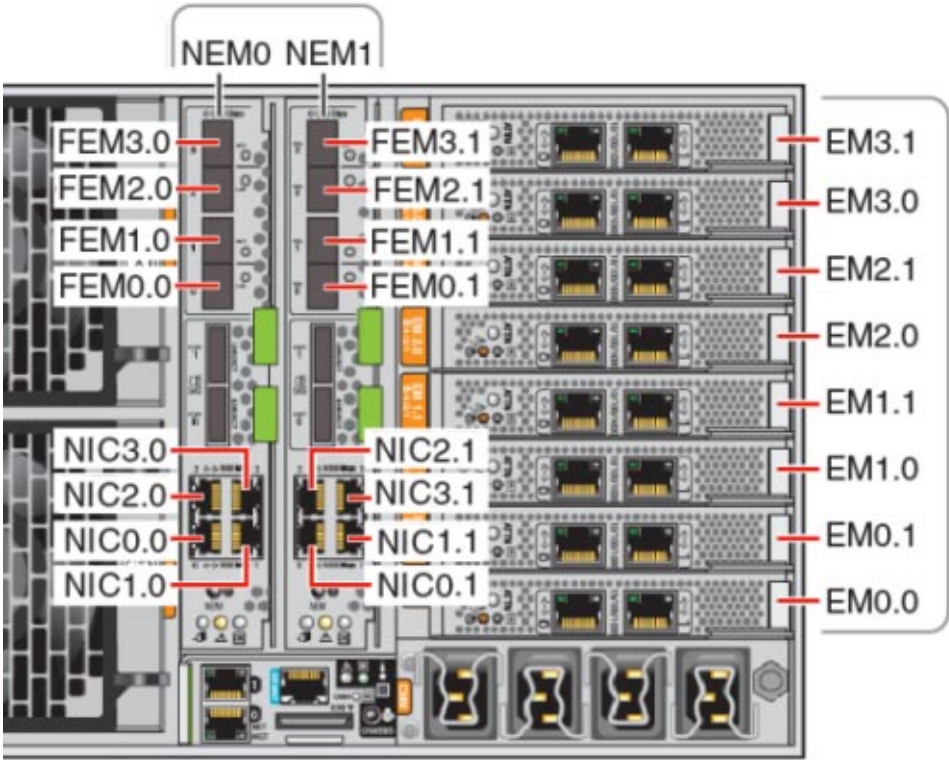
▼ How to Identify Installed Network Ports

Use these steps to help you identify the logical names of your physical network ports. This information will be necessary during the installation and configuration of the operating system.

1 Identify your installed network ports.

A fully loaded Sun Fire X4800 server could have the following ports:

- **FEM:** This is a Broadcom 10GbE port. These ports require a Fabric Expansion Module (FEM) installed on each CPU module for each NEM (for a total of two per CPU module).
- **PCIe EM:** This is a PCIe ExpressModule (EM) slot. There are two assigned per CPU module. If a network interface card is installed, it can have more than one port.
- **NIC:** This is an Intel 1GbE port. There are two assigned per CPU module.



2 Run the Oracle Hardware Assistant and proceed to the System Information screen to view logical name assignment of your installed network ports.

Even if you do not plan on using the Oracle Hardware Assistant to assist in the operating system installation, it will provide important information in identifying installed components. For information on using Oracle Hardware Assistant, see [“Oracle Hardware Installation Assistant” on page 9](#).

- Installed FEM devices are labeled as 10 Gigabit Ethernet PCI-E (GigaSwift).
- Installed NIC devices labeled as Intel 82576 Gigabit Network connection.
- Installed PCIe EM devices have vendor: as the label prefix. An example might be: vendor: Intel Corporation product: 82571EB Gigabit Ethernet Controller.

3 In the table below, make a note of the actual ports installed in the system and their logical names as shown in the Oracle Hardware Assistant System Information screen.

During system boot, ports are enumerated and assigned logical names based on the system PCIe scan order. Note that although Oracle Hardware Assistant lists the correct logical name (eth0, eth1, eth2, etc.), it does not necessarily list ports by logical name order.

PCIe Scan Order	Port Identifier	Does a Network Port at this Location Physically Exist in the System?	Is This Port Active (listed as Configured in Oracle Hardware Assistant)?	Logical Name Assigned in Oracle Hardware Assistant (eth0, eth1, etc.)
1	EM0.1			
2	EM0.0			
3	FEM0.0			
4	FEM0.1			
5	NIC0.0			
6	NIC0.1			
7	NIC3.0			
8	NIC3.1			
9	EM3.1			
10	EM3.0			
11	FEM3.0			
12	FEM3.1			
13	NIC1.0			
14	NIC1.1			
15	EM1.1			
16	EM1.0			
17	FEM1.0			
18	FEM1.1			
19	NIC2.0			
20	NIC2.1			
21	EM2.1			
22	EM2.0			
23	FEM2.0			
24	FEM2.1			

Use this information during software installation to ensure network ports are configured correctly.

▼ How to Identify Logical and Physical Network Interface Names While Installing Oracle Linux or RHEL

During installation and configuration of the Oracle or Red Hat Enterprise Linux OS, 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 Linux configuration to obtain the logical and physical network interface names that you need to continue with the configuration.

- 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 named network interfaces appear. See the following sample output as an example.

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 *eth#* is the interface number. For example, if you type:

```
# ifconfig eth0
```

The output for **eth0** appears:

In the sample output above:

```
Link encap:Ethernet HWaddr 00:14:4F:0C:A1:F2
inet addr:192.168.2.103 Bcast:192.168.2.255
```

- The **eth0** entry in the first column refers to the Oracle Linux logical named interface. This first column in the output identifies the logical names Oracle Linux or RHEL assigned to the network interface.
 - The **HWaddr 00:14:4F:0C:A1:F2** entry in second column (first row) refers to the physical MAC address of the network port.
- 8 Record the 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 Oracle Linux or RHEL OS installation.
 - 9 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.
 - 10 Restart the OS installation program.

▼ How to Identify Logical and Physical Network Interface Names While Installing SLES

During installation and configuration of the SUSE Linux Enterprise Server OS, 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.

Before You Begin Find and record the MAC addresses of all your physical ports from their labels.

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

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

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

The user shell launches and the Rescue Login prompt appears.

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

The Rescue prompt appears.

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

`ifconfig -a`

The output of the Linux SUSE named and physical named network interfaces appear. Each interface found will list output similar to the following example:

```
eth0 Link encap:Ethernet  HWaddr 00:14:4F:0C:A1:53
      inet addr:192.168.2.103  Bcast:192.168.2.255  Mask:255.255.0.0
      UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
      RX packets:23363 errors:0 dropped:0 overruns:0 frame:0
      TX packets:21798 errors:0 dropped:0 overruns:0 carrier:0
      collisions:0 txqueuelen:100
      RX bytes:13479541 (12.8 MiB)  TX bytes:20262643 (19.3 MiB)
      Interrupt:9

lo    Link encap:Local Loopback
      inet addr:127.0.0.1  Mask:255.0.0.0
      inet6 addr: ::1/128 Scope:Host
      UP LOOPBACK RUNNING  MTU:16436  Metric:1
      RX packets:9814 errors:0 dropped:0 overruns:0 frame:0
      TX packets:9814 errors:0 dropped:0 overruns:0 carrier:0
      collisions:0 txqueuelen:0
      RX bytes:3655065 (3.4 MiB)  TX bytes:3655065 (3.4 MiB)
```

- The `eth0` entry in the first column refers to the logical name of the Ethernet interface assigned by the operating system. The `lo` entry in the first column refers to the loopback interface.
- The `HWaddr 00:14:4F:0C:A1:53` entry in second column (first row) refers to the physical MAC address of the network port.

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.

`ifconfig eth#`

where `eth#` is the interface number.

- 5 **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.
 - From the ILOM web interface, select Remote Control ->Remote Power Control->Reset.
 - From other consoles, type reboot at the Rescue prompt (#), then press Enter.
- 7 Restart the SLES installation program.

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