Sun Netra™ X4450 Server Installation Guide

Sun Microsystems, Inc.
www.sun.com

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Contents

Preface vii

1. Sun Netra X4450 Features Overview 1

Sun Netra X4450 Server 1

Chassis Identification 1

Features at a Glance 5

Preinstalled Solaris Operating System 6

Remote Manageability With ILOM 7

High Levels of System Reliability, Availability, and Serviceability 7

Hot-Pluggable and Hot-Swappable Components 8

Power Supply Redundancy 8

Environmental Monitoring 9

Support for RAID Storage Configurations 9

Fault Management and Predictive Self Healing 9

Rackmountable Enclosure 10

2. Preparing for Installation 11

Tools and Equipment Needed 11

Shipping Kit Inventory List 12

ESD Precautions 12

Power Information 12

Changing the Power Input 13

Power Specifications 13

Installation Overview 13

3. Mounting the Server Into a Rack 17

Hardmounting the Server in a 19-Inch 4-Post Rack 17

▼ Install a Server With a Hardmount 19-Inch 4-Post Rack 18

Mounting the Server in a 19-Inch 4-Post Sliding Rail Mount Rack 22

▼ Install a Server With a Sliding Rail Mount in a 19-Inch 4-Post Rack 24

▼ Install Bracket Extenders 31

Hardmounting the Server in a 600-mm 4-Post Rack 33

▼ Install a Server With a Hardmount in a 600-mm 4-Post Rack 34

Hardmounting the Server in a 23-Inch 2-Post Rack 39

▼ Hardmount the Server in a 23-Inch 2-Post Rack 40

Hardmounting the Server in a 19-Inch 2-Post Rack 42

▼ Hardmount the Server in a 19-Inch 2-Post Rack 43

4. Cabling the Server 47

Attaching the Data Cables 47

Cable Connections and Ports 47

▼ Attach the Data Cables to the Server 49

Preparing the DC Power Source 50

DC Power Source Requirements 51

DC Supply and Ground Conductor Requirements 51

Overcurrent Protection Requirements 52

▼ Assemble the DC Input Power Cable 53

▼ Install the Strain Relief Housings 58

Managing Cables With the CMA 60

▼ Secure the Server Cables in the CMA 60

5. Powering On the System 63

Powering On the Server for the First Time 63

▼ Power On the Server 63

Connecting to the ILOM Service Processor for the First Time 65

ILOM Service Processor Software Overview 66

Service Processor Interfaces 67

ILOM IP Addresses 67

Determining the ILOM Service Processor IP Address 67

▼ View the Service Processor IP Address Using the BIOS 68

▼ View the Service Processor IP Address Using a Serial Connection 68

Modifying the Service Processor IP Address 69

▼ Change the SP DHCP IP Address to a Static IP Address Using the Serial Connection 69

▼ Change the SP Static IP address to a DHCP IP Address Using the Serial Connection 70

▼ Change a Static IP Address Using the SP ILOM Web Browser Interface 71

6. Configuring the Preinstalled Solaris 10 Operating System 73

Solaris Preinstallation Overview 73

Delivery Methods 73

GRUB Menu 74

Before You Begin 74

Installation Worksheet 74

Configuring the Solaris OS 78

▼ Configure the Preinstalled Solaris OS 78

▼ (Optional) Redirect the Console Output to the Video Port 78

Using the GRUB Menu 79

▼ Set the Video Port as the Default Output 79

Configuring RAID Drives 79

RAID Drive Overview 80

Mirroring the Preinstalled Solaris OS With LSI RAID 80

▼ Create a Mirror Image of the Solaris OS on HDD1 81

Creating a RAID Set to Incorporate a Preinstalled OS Using the Sun StorageTek Card 81

▼ Mirror Your Configured Solaris OS 81

Solaris 10 OS User Information 83

Accessing Solaris 10 User Documentation 83

Downloading Solaris 10 OS Software 83

Solaris 10 OS Training 83

7. Troubleshooting 85

Powering On and Off the Server 85

▼ Apply Main Power for All Server Components 85

Power Off From Main Power Mode 86

Setup Troubleshooting 87

Contacting Support 89

A. Updating the Firmware 91

Updating the Firmware 91

▼ Update the Firmware 91

Preface

This guide provides instructions, background information, and reference material to help you install the Sun Netra™ X4450 server. The installation instructions in this document assume that a system administrator is experienced with the Solaris™ Operating System (Solaris OS).

Note – All internal components except hard drives must be installed by qualified service technicians only.

Related Documentation

The following table lists the documentation for this product. The online documentation is available at:

`http://docs.sun.com/app/docs/prod/server.nebs`

Application	Title	Part Number	Format	Location
Service	*Sun Netra X4450 Server Service Manual*	820-4017	PDF and HTML	Online
Issues and updates	*Sun Netra X4450 Server Product Notes*	820-4018	PDF and HTML	Online
ILOM Reference	*Sun Integrated Lights Out Management 2.0 Supplement for the Sun Netra X4450 Server*	820-5244	PDF and HTML	Online

Application	Title	Part Number	Format	Location
Platform safety and compliance	*Sun Netra X4450 Server Safety and Compliance Guide*	820-4183	PDF and HTML	Online
Generic safety	*Important Safety Information for Sun Hardware Systems*	816-7190	PDF	Online
Getting started	*Sun Netra Server Getting Started Guide*	820-3016	Printed PDF	Shipping kit Online

1

Sun Netra X4450 Features Overview

This chapter describes the features of the Sun Netra X4450 server. Topics include:

- "Sun Netra X4450 Server" on page 1
- "Features at a Glance" on page 5
- "High Levels of System Reliability, Availability, and Serviceability" on page 7
- "Fault Management and Predictive Self Healing" on page 9

Sun Netra X4450 Server

The Sun Netra X4450 server is a 4-rack unit (4U) server that is a scalable, reliable, high-performance, entry-level server, optimized for enterprise data centers.

The server offers the following key features:

- High levels of system uptime through the processor and memory reliability-availability-serviceability (RAS) features, coupled with redundancy of some system components, support for hardware RAID (0+1), and the predictive self-healing features of the Solaris™ 10 Operating System (Solaris OS).
- Unified server management though the use of the Integrated Lights Out Manager (ILOM) system controller interface. ILOM integrates and manages CoolThreads™ and x64 platforms with the same tool set, and in heterogeneous environments, using industry standard element management tools and enterprise frameworks.

Chassis Identification

The following figures show the physical characteristics of the front and rear panels of the Sun Netra X4450 server (FIGURE 1-1, FIGURE 1-2, and FIGURE 1-3).

FIGURE 1-1 Front Panel of the Sun Netra X4450 Server

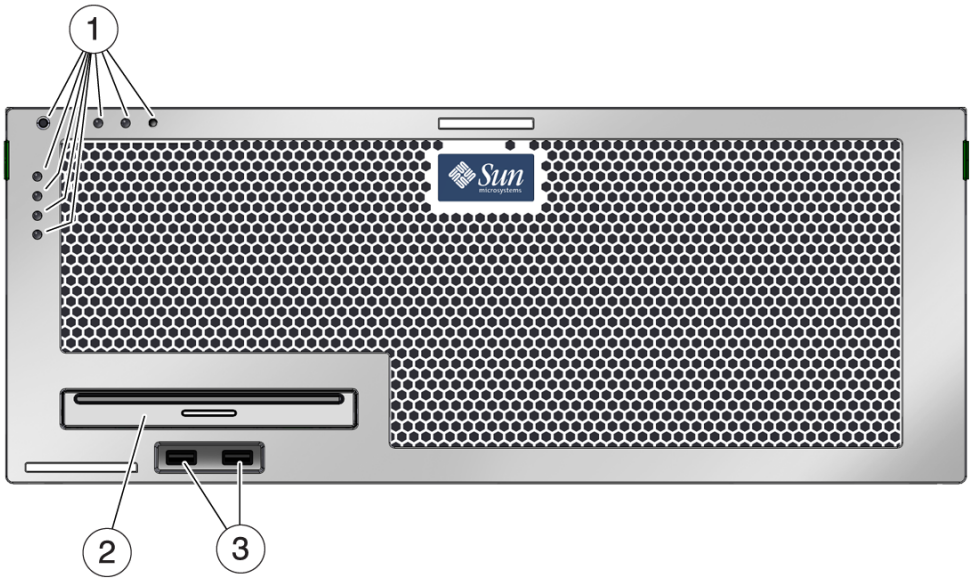


Figure Legend

1	Alarm and system status indicators
2	DVD drive
3	USB ports

FIGURE 1-2 Front Panel of the Sun Netra X4450 Server With the Bezel Removed

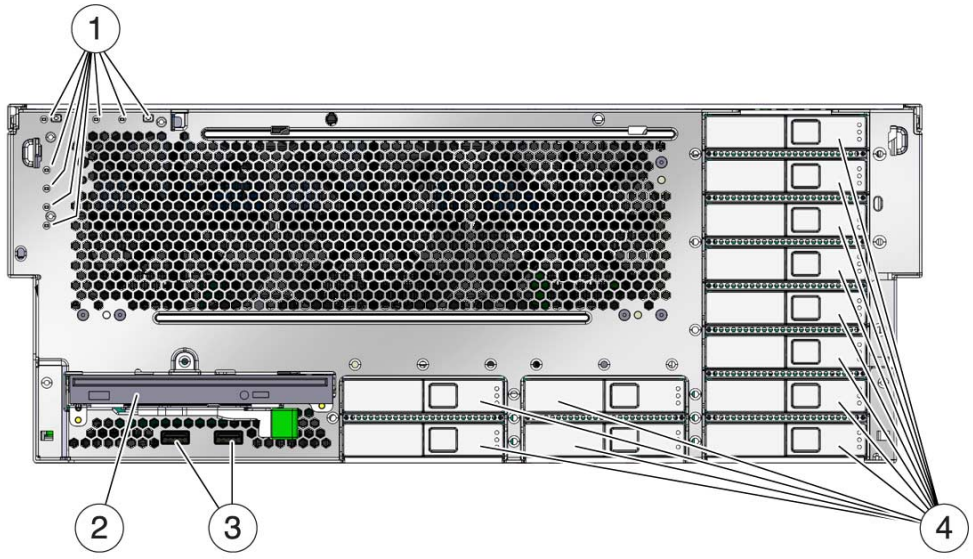


Figure Legend

1	Alarm and system status indicators
2	DVD drive
3	USB ports
4	Hard drives 0-11

FIGURE 1-3 Rear Panel Cable Connectors and LEDs on the Sun Netra X4450 Server

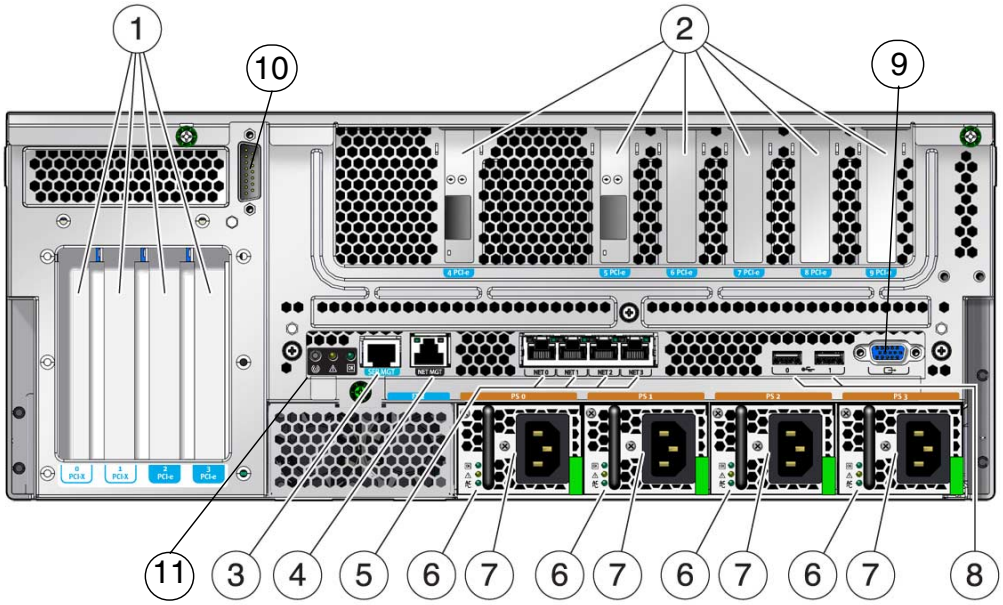


Figure Legend

1	PCI-E and PCI-X slots	**7**	Power supplies
2	PCI-E slots	**8**	USB ports
3	Serial management port	**9**	Video port
4	Network management port	**10**	Alarm port
5	Network ports	**11**	System status indicators
6	Power supply status indicators	**12**	

Features at a Glance

TABLE 1-1 lists the features of the Sun Netra X4450 server.

TABLE 1-1 Feature Specifications

Feature	Description
Processor	Two or four Intel processors running at 2.4 Ghz
Memory Slots/Capacity	32 slots that can be populated with one of the following types of fully buffered (FB) DIMMS: • 2 GB (64-GB maximum) • 4 GB (128-GB maximum)
Internal Hard Drives	Twelve hot-pluggable 146-GB SAS drives Integrated hard drive controller supports RAID 0 and RAID 1.
Optical Media Drive	One, slot-loading, slimline DVD drive, supporting CD-R/W, CD+R/W, DVD-R/W, DVD+R/W
Power Supplies	Four hot-swappable 660W DC or AC power supply units (PSUs) providing N+1 redundancy
Alarm	One Telco alarm
Ethernet Ports	Four 10/100/1000 Mbps Ethernet, RJ-45-based, autonegotiating ports (on two separate controllers)
PCI Express Interfaces*	• Five eight-lane PCIe slots • Three four-lane PCIe slots • Two eight-lane PCI-X slots • PCIe slot 4 is dedicated to the SAS controller card. Note – In a fully loaded system, PCI slots 0-3 have a maximum load of 25W, and PCI slots 5-9 have a maximum load of 15W.
USB Ports	Four USB 2.0 ports (two on front panel and two on rear panel)
Additional Ports	The following ports are located on the rear panel of the server: • One RJ-45 serial management port • One 10/100 Mbps Ethernet network management port • One DB-15 Telco alarm port • One video port
Remote Management	On-board Integrated Lights Out ManagerI

TABLE 1-1 Feature Specifications *(Continued)*

Feature	Description
Firmware	ILOM for remote management
Operating System	Solaris 10 8/07 Operating System preinstalled on disk 0 Refer to the server product notes for information on the minimum version of supported OS and required patches
Other Software (refer to the *Sun Netra X4450 Server Product Notes* for details)	• Java Enterprise System with a 90-day trial licence • Sun Studio 12 • SunUpdate Connection

* PCIe and PCI-X specifications described in this table list the physical requirements for PCI cards. Additional support capabilities must also be provided (such as device drivers) for a PCI card to function in the server. Refer to the specifications and documentation for a given PCI card to determine if the required drivers are provided that enable the card to function in this server.

Preinstalled Solaris Operating System

The Sun Netra X4450 is preinstalled with the Solaris 10 OS, and offers the following Solaris OS features:

- Stability, high performance, scalability, and precision of a mature 64-bit operating system
- Support for over 12,000 leading technical and business applications
- Solaris Containers – Isolate software applications and services using flexible, software-defined boundaries.
- DTrace – A comprehensive dynamic tracing framework for tuning applications and troubleshooting systemic problems in real time.
- Predictive Self-Healing – Capability that automatically diagnoses, isolates, and recovers from many hardware and application faults.
- Security – Advanced security features designed to protect the enterprise at multiple levels.
- Network Performance – Completely rewritten TCP/IP stack dramatically improves the performance and scalability of your networked services.

You can use the preinstalled Solaris 10 OS, or reinstall a supported version of the Solaris 10 OS from your network, CD, or downloaded copy. Refer to the *Sun Netra X4450 Server Product Notes* for information on the supported OS releases for your server.

Remote Manageability With ILOM

The Integrated Lights Out Manager (ILOM) feature is a service processor, built into the server, that enables you to remotely manage and administer the server. The ILOM software is preinstalled as firmware, and initializes as soon as you apply power to the system.

ILOM enables you to monitor and control your server over an Ethernet connection (supports SSH), or by using a dedicated serial port for connection to a terminal or terminal server. ILOM provides a command-line interface and a browser-based interface that you can use to remotely administer geographically distributed or physically inaccessible machines. In addition, ILOM enables you to run diagnostics (such as POST) remotely that would otherwise require physical proximity to the server's serial port.

You can configure ILOM to send email alerts of hardware failures and warnings, and other events related to the server. The ILOM circuitry runs independently of the server, using the server's standby power. Therefore, ILOM firmware and software continue to function when the server operating system goes offline or when the server is powered off. ILOM monitors the following Sun Netra X4450 conditions:

- CPU temperature conditions
- Hard drive status
- Enclosure thermal conditions
- Fan speed and status
- Power supply status
- Voltage conditions
- Faults detected by POST (power-on self-test)
- Solaris Predictive Self-Healing (PSH) diagnostic facilities

For information about configuring and using the ILOM service processor, refer to the latest *Integrated Lights Out Management (ILOM) User's Guide* and the *Sun Integrated Lights Out Managment 2.0 (ILOM 2.0) Supplement for the Sun Netra X4450 Server*.

High Levels of System Reliability, Availability, and Serviceability

Reliability, availability, and serviceability (RAS) are aspects of a system's design that affect its ability to operate continuously and to minimize the time necessary to service the system. Reliability refers to a system's ability to operate continuously without failures and to maintain data integrity. System availability refers to the ability of a system to recover to an operational state after a failure, with minimal

impact. Serviceability relates to the time it takes to restore a system to service following a system failure. Together, reliability, availability, and serviceability provide for near continuous system operation.

To deliver high levels of reliability, availability, and serviceability, the Sun Netra X4450 offers the following features:

- Ability to disable individual threads and cores without rebooting
- Lower heat generation reduces hardware failures
- Hot-pluggable hard drives
- Redundant, hot-swappable power supplies
- Redundant fan units
- Environmental monitoring
- Internal hardware drive mirroring (RAID 1)
- Error detection and correction for improved data integrity
- Easy access for most component replacements

Hot-Pluggable and Hot-Swappable Components

Sun Netra X4450 hardware is designed to support hot-plugging of the chassis-mounted hard drives and power supplies. By using the proper software commands, you can install or remove these components while the system is running. Hot-swap and hot-plug technology significantly increases the system's serviceability and availability by providing the ability to replace hard drives, fan units, and power supplies without service disruption.

Power Supply Redundancy

The Sun Netra X4450 provides four hot-swappable power supplies in a redundant configuration. The system will continue to operate under the following conditions:

- Power source fails to provide power to one or two of the power supplies
- Failure of one or two power supplies
- Service action that requires the removal of one or two power supplies

Caution – If one or two of the power supplies fail, the server should be operated for *only* a short period of time to avoid a hazard. Refer to the *Sun Netra X4450 Server Service Manual* for instructions on how to replace the power supplies, or call your Sun Service representative to get the power supplies replaced.

Environmental Monitoring

The Sun Netra X4450 server features an environmental monitoring subsystem that protects the server and its components against:

- Extreme temperatures
- Lack of adequate airflow through the system
- Power supply failures
- Hardware faults

Temperature sensors are located throughout the system to monitor the ambient temperature of the system and internal components. The software and hardware ensure that the temperatures within the enclosure do not exceed predetermined safe operation ranges. If the temperature observed by a sensor falls below a low-temperature threshold or rises above a high-temperature threshold, the monitoring subsystem software lights the amber Service Required LEDs on the front and back panel. If the temperature condition persists and reaches a critical threshold, the system initiates a graceful system shutdown. In the event of a failure of the system controller, backup sensors protect the system from serious damage, by initiating a forced hardware shutdown. Required LEDs remain lit after an automatic system shutdown to aid in problem diagnosis.

The power subsystem is monitored in a similar fashion by monitoring power supplies and reporting any fault in the front and rear panel LEDs.

Support for RAID Storage Configurations

You can set up hardware RAID 1 (mirroring) and hardware RAID 0 (striping) configurations for any pair of internal hard drives, providing a high-performance solution for hard drive mirroring.

By attaching one or more external storage devices to the Sun Netra X4450, you can use a redundant array of independent drives (RAID) software application such as Solstice DiskSuite™[1] or VERITAS Volume Manager to configure system drive storage in a variety of different RAID levels.

Fault Management and Predictive Self Healing

The Sun Netra X4450 server provides the latest fault management technologies. The Solaris 10 OS architecture provides a means for building and deploying systems and services capable of *predictive self-healing*. Self-healing technology enables systems to

1. Software RAID applications such as VERITAS Volume Manager are not included with this server. You must obtain and license them separately.

accurately predict component failures and mitigate many serious problems before they actually occur. This technology is incorporated into both the hardware and software of the Sun Netra X4450 server.

At the heart of the predictive self-healing capabilities is the Solaris™ Fault Manager, a new service that receives data relating to hardware and software errors, and automatically and silently diagnoses the underlying problem. After a problem is diagnosed, a set of agents automatically responds by logging the event, and if necessary, takes the faulty component offline. By automatically diagnosing problems, business-critical applications and essential system services can continue uninterrupted in the event of software failures, or major hardware component failures.

Rackmountable Enclosure

The Sun Netra X4450 uses a space-saving 4U-high rackmountable enclosure that can be installed into a variety of industry standard racks.

2

Preparing for Installation

This chapter provides background information about the server installation procedures.

This chapter contains these topics:

- "Tools and Equipment Needed" on page 11
- "Shipping Kit Inventory List" on page 12
- "ESD Precautions" on page 12
- "Installation Overview" on page 13

Tools and Equipment Needed

To install the system, you must have the following tools:

- No. 2 Phillips screwdriver
- ESD mat and grounding strap

In addition, you must provide a system console device, such as one of the following:

- ASCII terminal
- Workstation
- Terminal server
- Patch panel connected to a terminal server

Shipping Kit Inventory List

Inspect the shipping cartons for evidence of physical damage. If a shipping carton appears damaged, request that the carrier's agent be present when the carton is opened. Keep all contents and packing material for the agent's inspection.

Verify that you have received all of the parts of your server:

- Server chassis
- Rackmount kit
- Miscellaneous hardware, cables, and connectors
- Optional cable management arm with six preinstalled cable clips and installation instructions

ESD Precautions

Electronic equipment is susceptible to damage by static electricity. Use a grounded antistatic wriststrap, footstrap, or equivalent safety equipment to prevent electrostatic damage (ESD) when you install or service the servers.

Caution – To protect electronic components from electrostatic damage, which can permanently disable the system or require repair by service technicians, place components on an antistatic surface, such as an antistatic discharge mat, an antistatic bag, or a disposable antistatic mat. Wear an antistatic grounding strap connected to a metal surface on the chassis when you work on system components.

Power Information

Reversing the positive and negative inputs to the power supplies of a DC input system will not cause damage, but the power supplies with reversed inputs will not operate.

The inputs to a power supply are isolated from the system chassis and from the other power supply inputs. The AC or DC power inputs might have different voltage values within the acceptable range, and the inputs might have different offset voltage values relative to the system chassis.

Note – The DC power source must be grounded reliably.

Changing the Power Input

Safety agency requirements prohibit Sun Microsystem, Inc., from changing the power input on a product from AC to DC or DC to AC after the product has been removed from the agency-approved manufacturing site.

Power Specifications

TABLE 2-1 shows the power specifications for the Sun Netra X4450 server.

TABLE 2-1 Electrical Specifications

Parameter	AC	DC
Voltage (nominal)	100-120/200-240 VAC	-48 VDC or -60 VDC
Input current (maximum)	14 A	27 A
Frequency	50/60 Hz	N/A
DC input treatment	N/A	Isolated DC return (DC-1)

Note – The total input power for the system is divided equally among the power supplies in operation.

Installation Overview

This installation guide provides procedures that are to be performed in the following order.

1. Verify that you have received all of the components that shipped with your server.
2. Gather configuration information for your system.

   See your system administrator for specific details, including these parameters:

   - Netmask

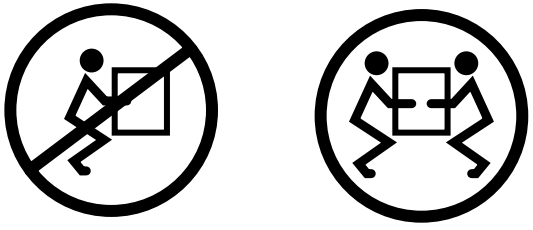
- IP address for the service processor
- Gateway IP address

3. Install any additional components.

   If you have additional components such as additional memory or PCI cards, install them prior to mounting the server in a rack.

4. Mount the server into the rack.

Caution – The Sun Netra X4450 server weighs approximately 64 lbs (32 kg). Two people are required to lift and mount this 4U server into a rack enclosure.



Caution – When completing a two-person procedure, always communicate your intentions clearly before, during, and after each step to minimize confusion.

5. Connect the server to a serial terminal or a terminal emulator (PC or workstation) to display system messages.

Caution – The serial terminal or a terminal emulator should be connected before you connect the power cables. As soon as power is connected to the system, the service processor immediately powers on and runs diagnostics. Diagnostic test failures will be printed on the serial terminal. For more information, refer to the *Integrated Lights Out Management 2.0 (ILOM 2.0) Supplement for the Sun Netra X4450 Server*.

6. Connect the data cables to the server, but do not connect the power cable yet.
7. Connect the power cable to the server and examine the display for any error messages.

Caution – There is a potential for electric shock if the server and related equipment are not properly grounded.

Note – The service processor runs on the 3.3V standby voltage. As soon as power is connected to the system, the service processor immediately powers on, runs diagnostics, and initializes the ILOM firmware.

8. After the service processor boots, access the ILOM command-line interface (CLI) through the serial management port
9. Configure the service processor network addresses.

Note – The service processor network management port is not operational until you configure network settings for the service processor (through the service processor serial management port).

10. Commit the changes to the service processor network parameters.
11. Power on the server from a keyboard using the ILOM software.
12. Configure the Solaris OS.

    The Solaris OS is preinstalled on the server. When you power on, you are automatically guided through the Solaris OS configuration procedure.
13. Install any required patches.

    Refer to the *Sun Netra X4450 Server Product Notes* for a list of required patches.
14. Load additional software from the Solaris media kit (optional).

    The Solaris media kit (sold separately) includes several CDs containing software to help you operate, configure, and administer your server. Refer to the documentation provided with the media kit for a complete listing of included software and detailed installation instructions.

3

Mounting the Server Into a Rack

This chapter provides instructions for installing the server in an open 4-post rack or 2-post rack.

This chapter contains the following sections:

- "Hardmounting the Server in a 19-Inch 4-Post Rack" on page 17
- "Mounting the Server in a 19-Inch 4-Post Sliding Rail Mount Rack" on page 22
- "Hardmounting the Server in a 600-mm 4-Post Rack" on page 33
- "Hardmounting the Server in a 23-Inch 2-Post Rack" on page 39
- "Hardmounting the Server in a 19-Inch 2-Post Rack" on page 42

Note – References to *left* and *right* are from your viewpoint as you face either the front or rear of the equipment.

Caution – The Sun Netra X4450 server weighs approximately 64 lbs (32 kg). Two people are required to lift and mount this 4U server into a rack enclosure.

Hardmounting the Server in a 19-Inch 4-Post Rack

The hardmount kit for a 19-inch 4-post rack (order number: X4061A-Z) consists of:

- Two front hardmount brackets
- Two side support brackets
- Two rear hardmount flanges

- Bag of screws

FIGURE 3-1 Contents of the Hardmount 19-Inch 4-Post Kit

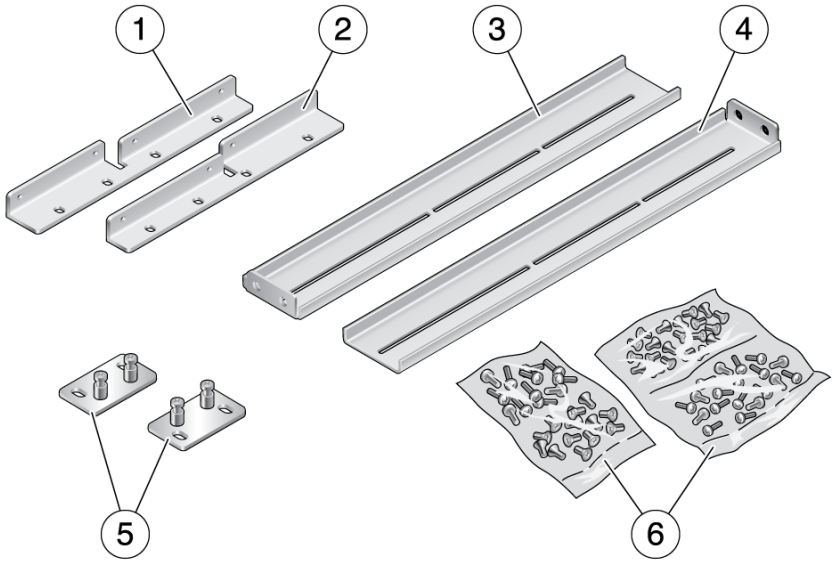


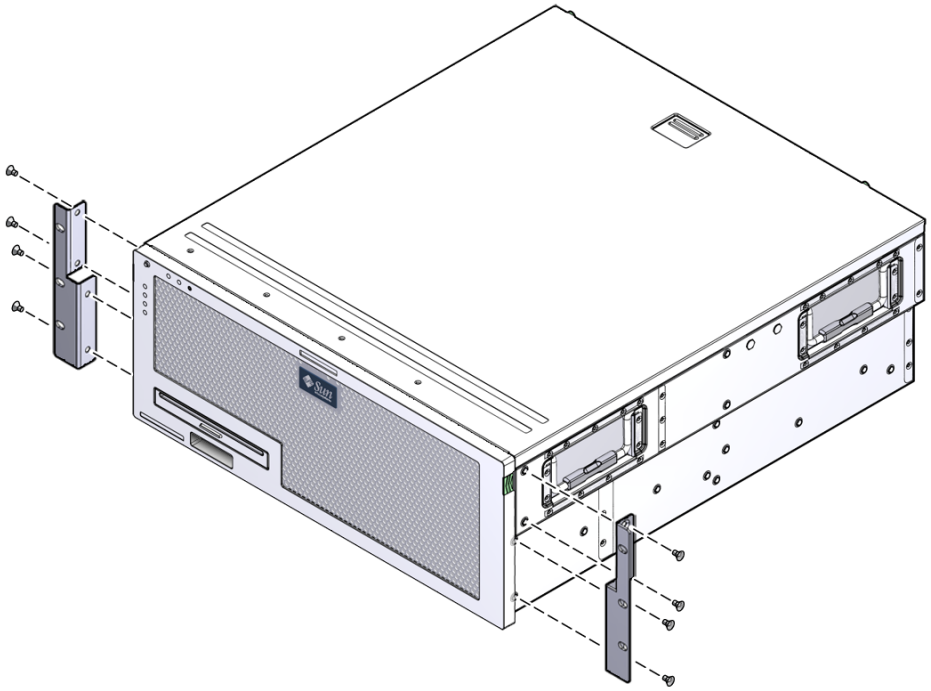
Figure Legend

1	Left front hardmount bracket	**4**	Right side bracket
2	Right front hardmount bracket	**5**	Rear hardmount brackets
3	Left side bracket	**6**	Screws

▼ Install a Server With a Hardmount 19-Inch 4-Post Rack

1. **Get the front hardmount brackets from the rack kit (**FIGURE 3-1**).**
2. **Use eight M5 x 8 mm flathead Phillips screws to secure each of the brackets to the sides of the server (**FIGURE 3-2**).**

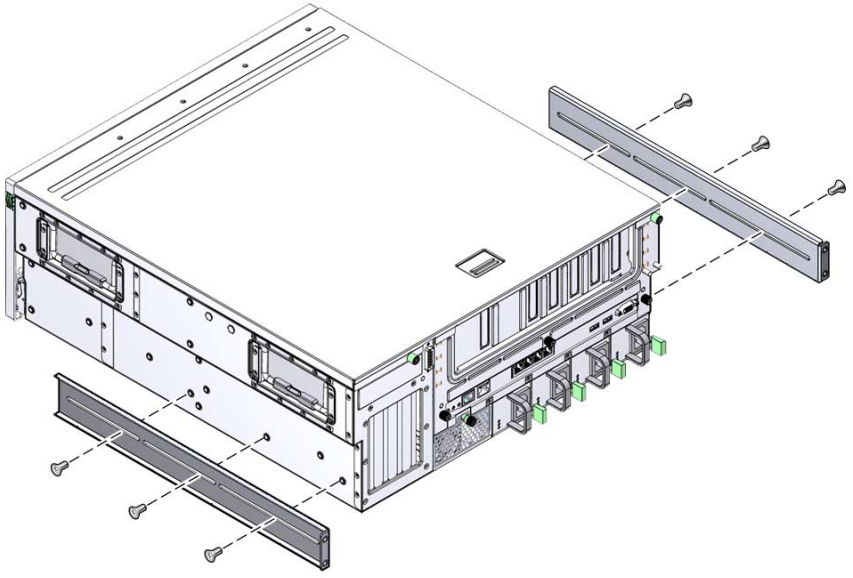
FIGURE 3-2 Securing the Front Hardmount Brackets to the Server



3. **Measure the depth of the rack.**
4. **Get the two side brackets from the rack kit.**
5. **Install the side brackets on to the sides of the server, extending the brackets to the measured depth of the rack (**FIGURE 3-3**).**

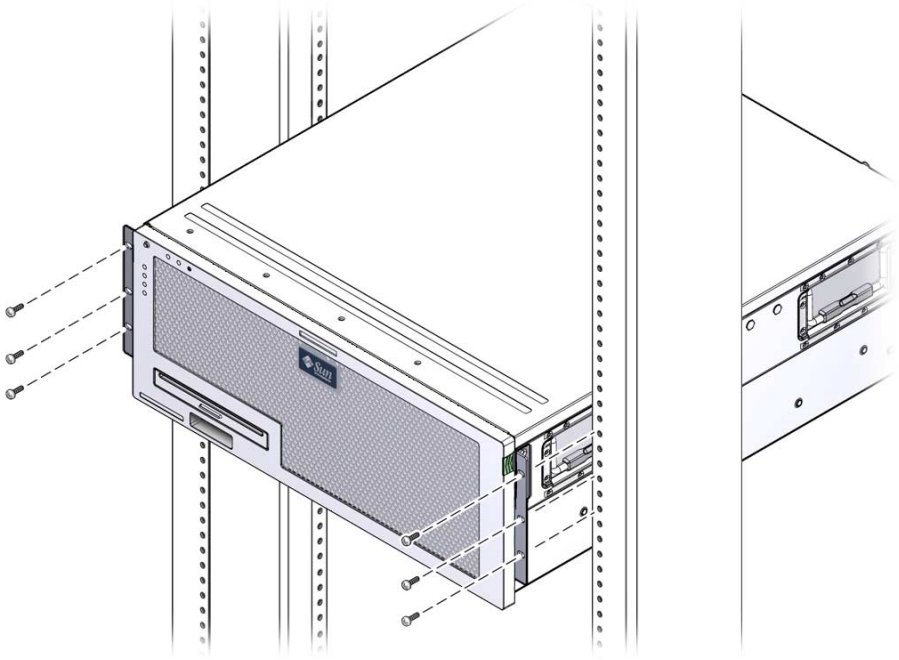
   Use two to three of the supplied M5 x 8 mm panhead Phillips screws for each bracket, depending on the rack depth.

FIGURE 3-3 Attaching the Side Brackets

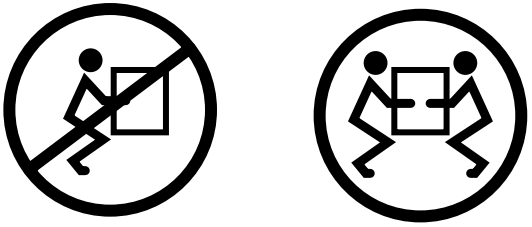


6. **Lift the server to the desired location in the rack.**
7. **Using three screws per side, secure the front of the hardmount brackets to the front of the rack (**FIGURE 3-4**).**

FIGURE 3-4 Securing the Front of the Server to the Rack

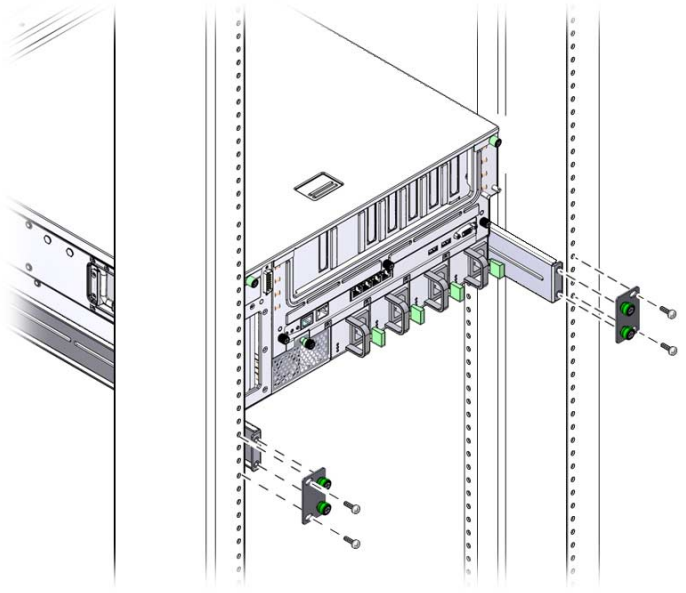


Caution – The Sun Netra X4450 server weighs approximately 64 lbs (32 kg). Two people are required to lift and mount this 4U server into a rack enclosure.



8. **Get the two rear hardmount flanges from the rack kit.**
9. **Using two screws for each flange, secure the rear of the server to the rack (**FIGURE 3-5**).**

FIGURE 3-5 Securing the Rear of the Server to the Rack



The size of the screws vary, depending on the rack.

Mounting the Server in a 19-Inch 4-Post Sliding Rail Mount Rack

The sliding rail mount kit for a 19-inch 4-post rack consists of:

- Two slide assemblies
- Two short brackets
- Two long brackets
- Two long bracket extenders
- Two front hardmount brackets
- Bag of screws

FIGURE 3-6 Contents of the Sliding Rail 19-Inch 4-Post Kit

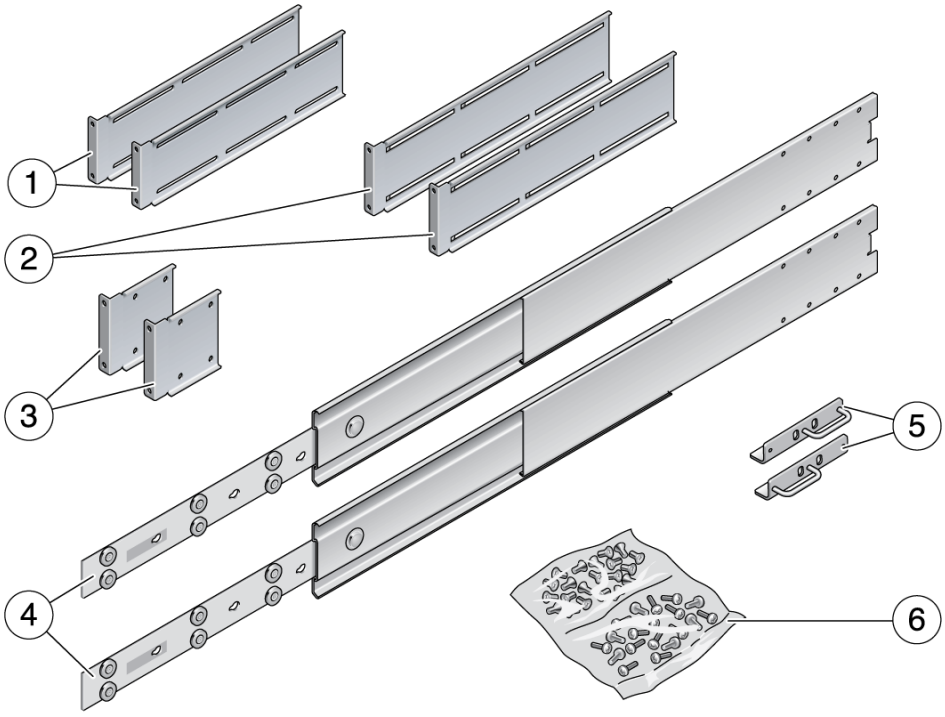


Figure Legend

1	Extender brackets	**4**	Slide assemblies
2	Long brackets	**5**	Two front hardmount brackets
3	Short brackets	**6**	Screws

Note – The front-to-back rail spacing must be at least 755.7 mm (29.75 inches) and not more than 755.7 mm from the outside face of the front rail to the outside face of the back rail. If the spacing exceeds the maximum measurement, you must install the rail extenders.

▼ Install a Server With a Sliding Rail Mount in a 19-Inch 4-Post Rack

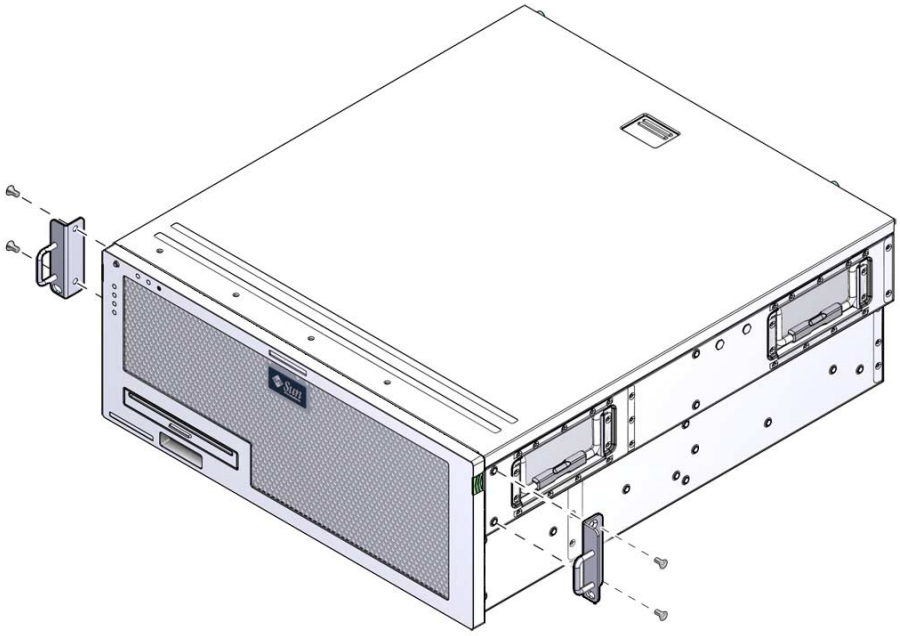
1. **Get the hardmount brackets and M5 × 8 mm flathead Phillips screws from the standard rack kit.**

   These hardmount brackets and screws are shipped with the standard server ship kit, not as part of the sliding rail 19-inch 4-post rackmount ship kit.

2. **Use four of the supplied M5 x 8 mm flathead Phillips screws to secure each of the hardmount brackets to the sides of the server (**FIGURE 3-7**).**

Note – The hardmount brackets are attached to the top portion of the server, with the brackets oriented so that the handles are at the lower part of the brackets.

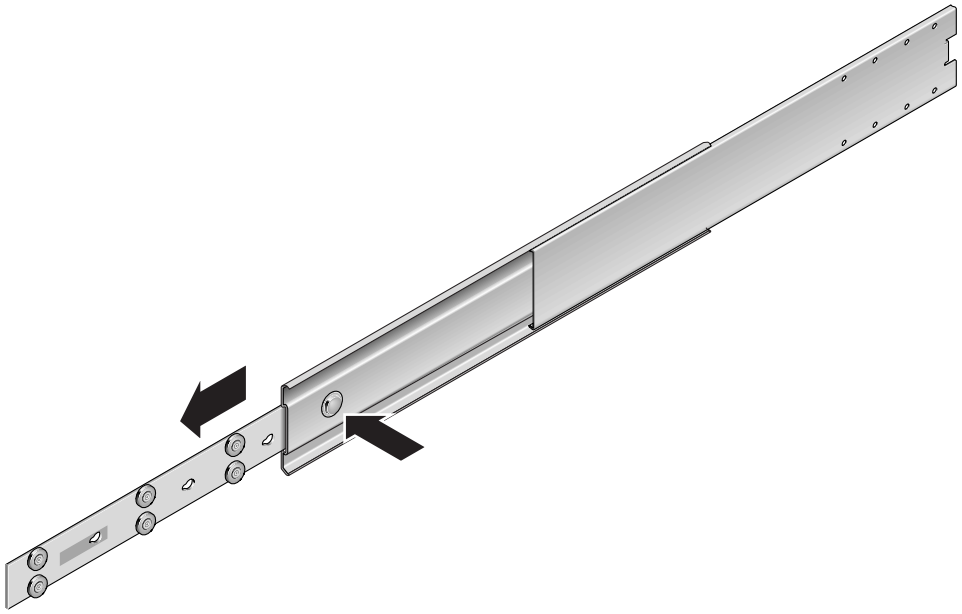
FIGURE 3-7 Securing the Hardmount Bracket to the Server



3. **Get the slide assemblies from the rack kit (**FIGURE 3-6**).**

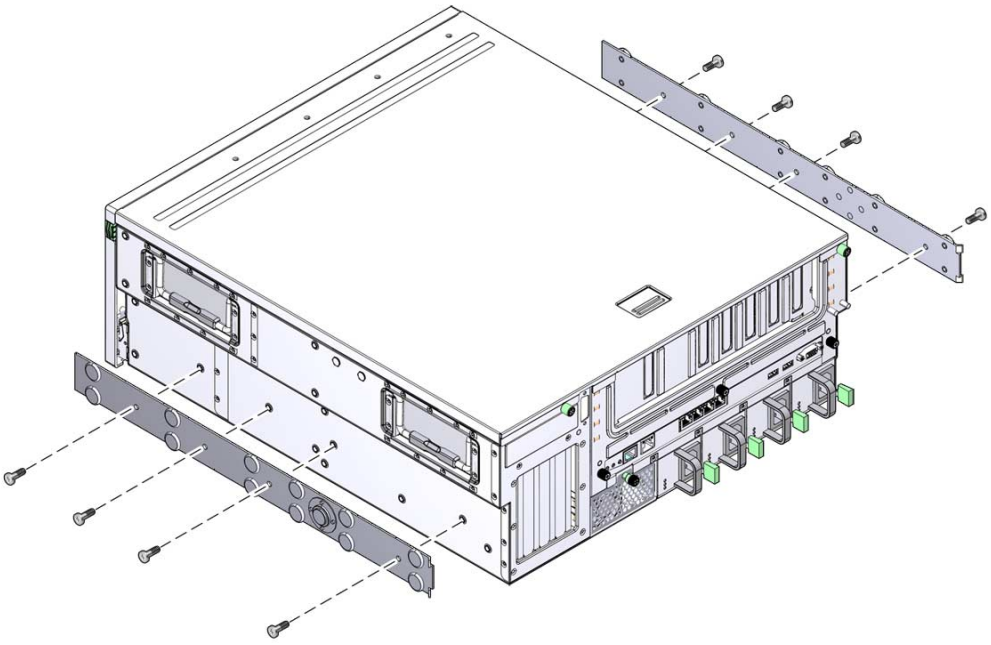
4. **Press in the button on each slide and pull the glide completely out of the slide (**FIGURE 3-8**).**

FIGURE 3-8 Dismantling the Slide



5. **Using eight panhead Phillips screws (four for each side), secure the glides to the side of the server (**FIGURE 3-9**).**

FIGURE 3-9 Fixing the Glides to the Server Chassis

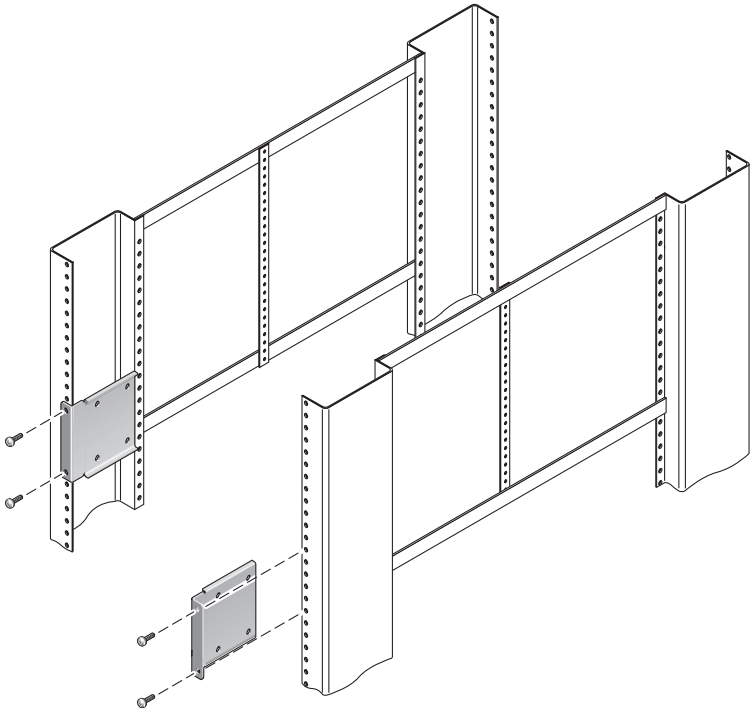


6. **Get the short brackets and long brackets from the rackmount kit.**

7. **Attach a short bracket to each of the front rack uprights (**FIGURE 3-10**).**

   Use two brass M6 collar screws and M6 cage nuts (if required) to secure each bracket.

FIGURE 3-10 Securing the Brackets to the Rack

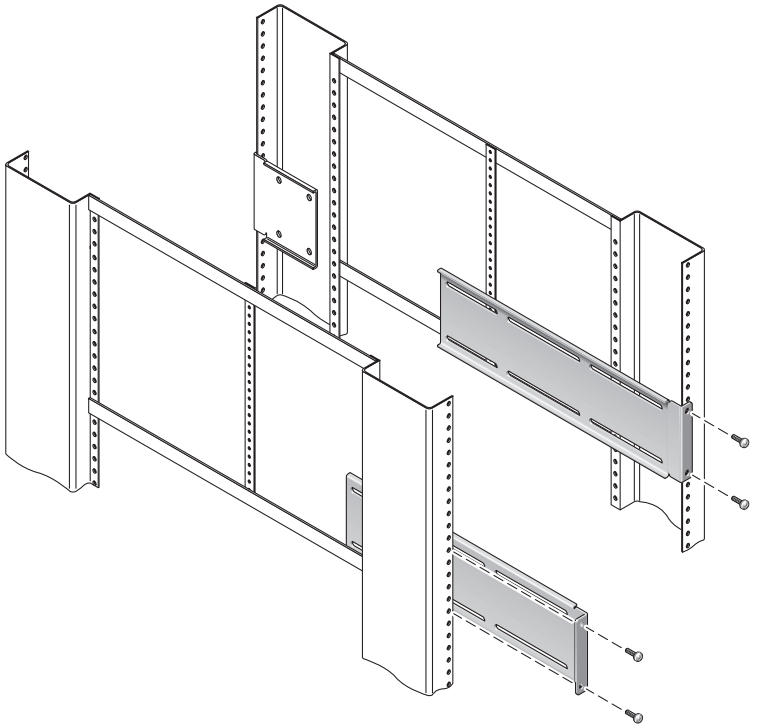


8. **Attach a long bracket to each of the rear rack uprights (**FIGURE 3-11**).**

   To secure each bracket, use two of the brass M6 collar screws and M6 cage nuts (if required).

Note – If the depth of the rack is more than 755.7 mm (29.75 inches), attach the rail extenders as described in "Install Bracket Extenders" on page 31.

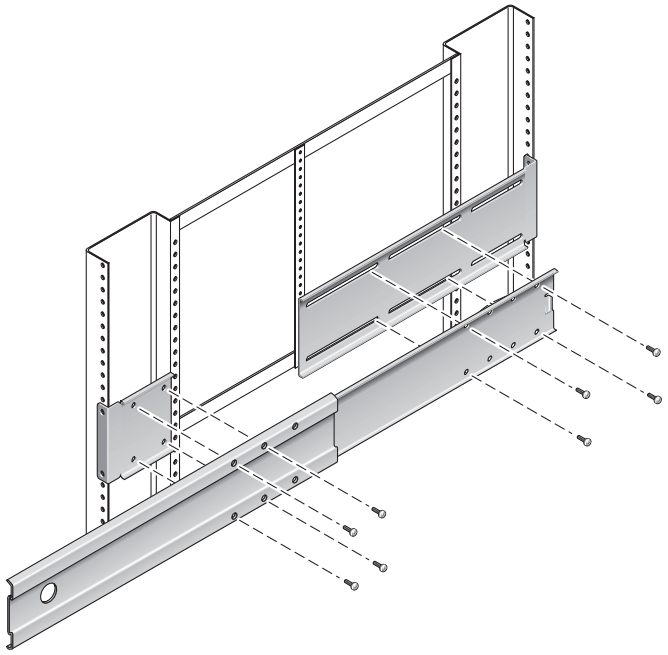
FIGURE 3-11 Securing the Long Brackets to the Rear of the Rack



9. **Extend a slide to line up the access holes with the front screw holes.**
10. **Secure the slide onto the short and long brackets at the front and rear of the rack.**

    Use the M5 panhead screws from the inside. Use the M5 nuts, plain washers, and star washers from the outside.

FIGURE 3-12 Securing the Slide to the Brackets



11. **Repeat** Step 9 **and** Step 10 **for the slide on the other side of the rack.**
12. **Push the slides completely into the assembly on each side of the rack and release the stop catches.**
13. **Align the glides attached to the server with the slide assemblies in the rack.**

    You might find that there is too much or too little room between the two slides mounted in the rack. Consequently the glides attached to the server might not align correctly with the slides in the rack. If either situation occurs, loosen the M6 collar screws and cage nuts on the long and short brackets (Step 7 and Step 8), move them inward or outward to the appropriate points, then tighten them again.
14. **Push in the slide buttons and slide the server all the way into the rack enclosure (**FIGURE 3-13**).**

Caution – The Sun Netra X4450 server weighs approximately 64 lbs (32 kg). Two people are required to lift and mount this 4U server into a rack enclosure.

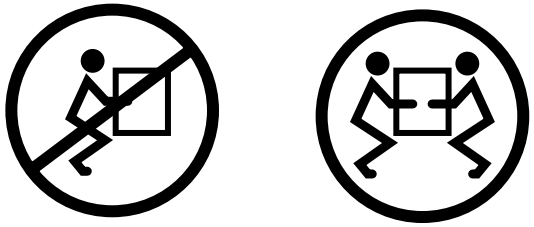
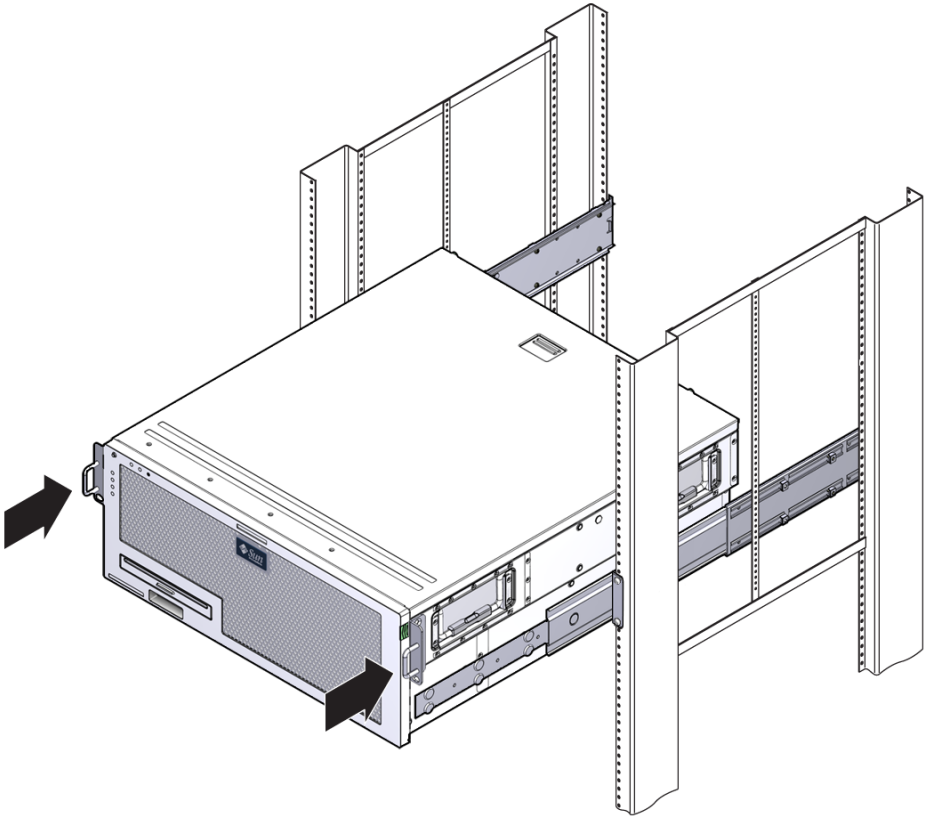


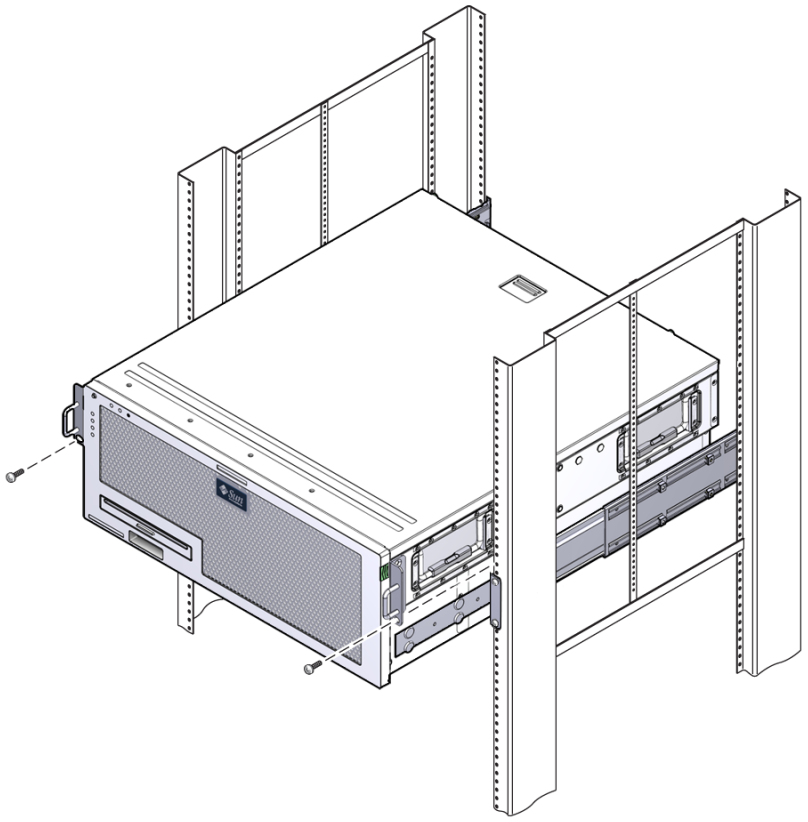
FIGURE 3-13 Sliding the Server Into the Rack



15. **Using one screw per side, secure the front of the hardmount brackets to the front of the rack (**FIGURE 3-14**).**

    The size of the screws varies, depending on your particular rack.

FIGURE 3-14 Securing the Front of the Server to the Rack



▼ Install Bracket Extenders

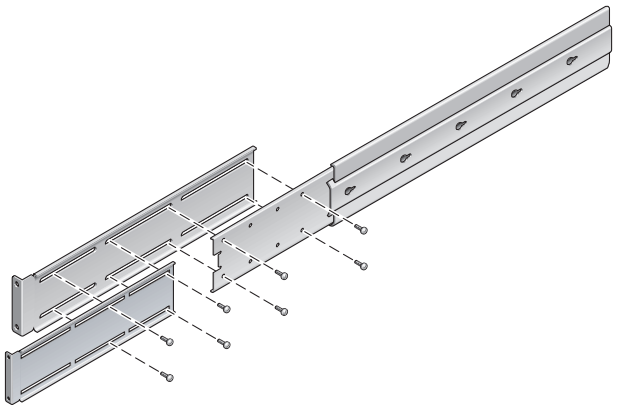
If the long brackets are already attached to the slide assembly, you might have to remove the long brackets and reinstall them using this procedure.

1. **Locate the long bracket extenders.**
2. **Place an extender and slide assembly inside of a long bracket.**
3. **Install two M5 panhead screws through the rear set of holes in the slide assembly and into the front clip nuts in the center slots of the long bracket, then tighten the screws.**
4. **Install two M5 panhead screws through one of the front set of holes in the slide assembly and into the matching clip nuts in the long bracket, then hand tighten the screws.**

5. **Install two M5 panhead screws through the front slots of the bracket extender and into the rear clip nuts in the center slots of the long bracket, then hand tighten the screws.**

6. **Install two M5 panhead screws through the center slot of the bracket extender and into the matching clip nuts on the long bracket, then hand tighten the scews.**

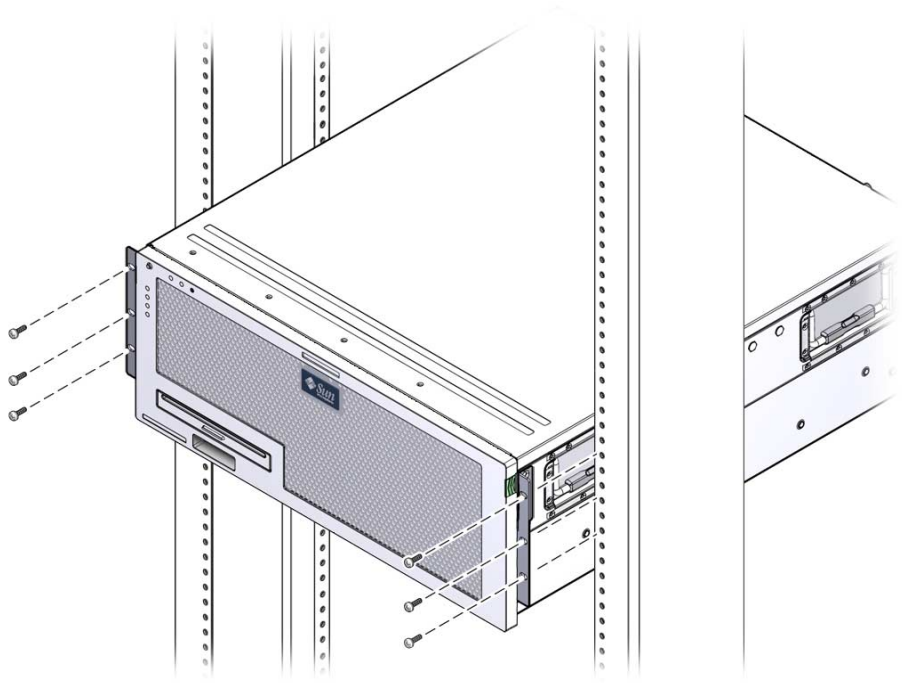
FIGURE 3-15 Installing the Extender and Slide Assembly on the Long Bracket



7. **Secure the extender brackets and slide assemblies in the rack, as shown in** FIGURE 3-12**.**

   Adjust the rails to the proper length, then tighten the screws on the extenders, and install four M6 collar screws (two in the front bracket and two in the rear bracket) for each sliding rail assembly.

FIGURE 3-16 Securing the Extenders and Slide Assembly to the Rack



Hardmounting the Server in a 600-mm 4-Post Rack

The hardmount kit for a 600 mm 4-post rack consists of:

- Two adjustable rails
- Two side rails
- Two rear flanges
- Bag of screws

Note – The front-to-back rail spacing must be at least 392 mm (15.43 in.) and not more than 504 mm (19.84 in.) from the outside face of the front rail to the outside face of the back rail.

FIGURE 3-17 Contents of the Hardmount 600-mm 4-Post Kit

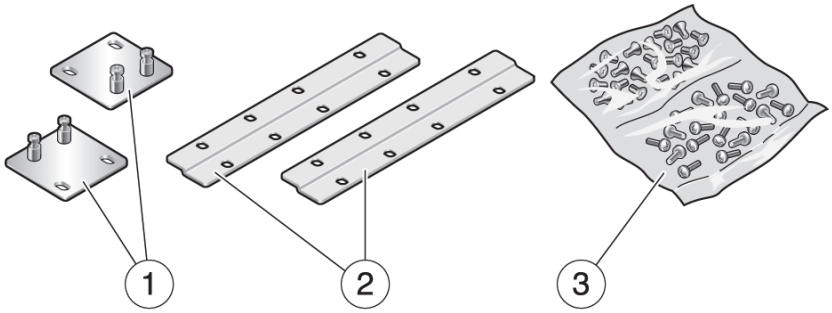


Figure Legend

1	Rear flanges	**3**	Screws
2	Side rails	**4**	

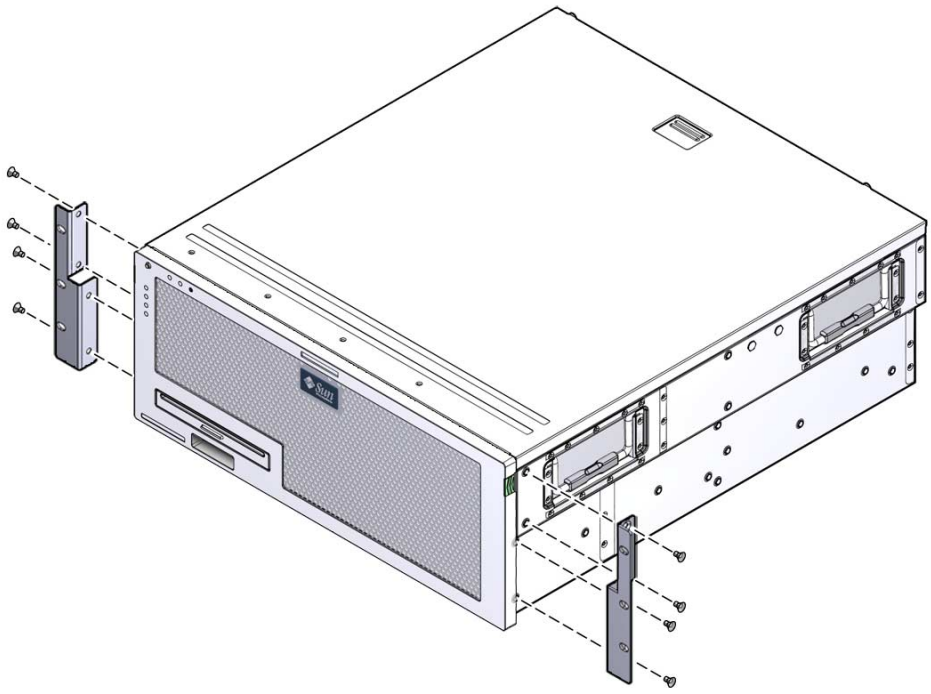
▼ Install a Server With a Hardmount in a 600-mm 4-Post Rack

1. **Get the two front hardmount brackets from the standard rack kit.**

   The front hardmount brackets come as part of the standard server ship kit, not as part of the 600 mm 4-post rackmount ship kit.

2. **Use eight M5 x 8 mm flathead Phillips screws to secure the front hardmount brackets to the sides of the server (**FIGURE 3-18**).**

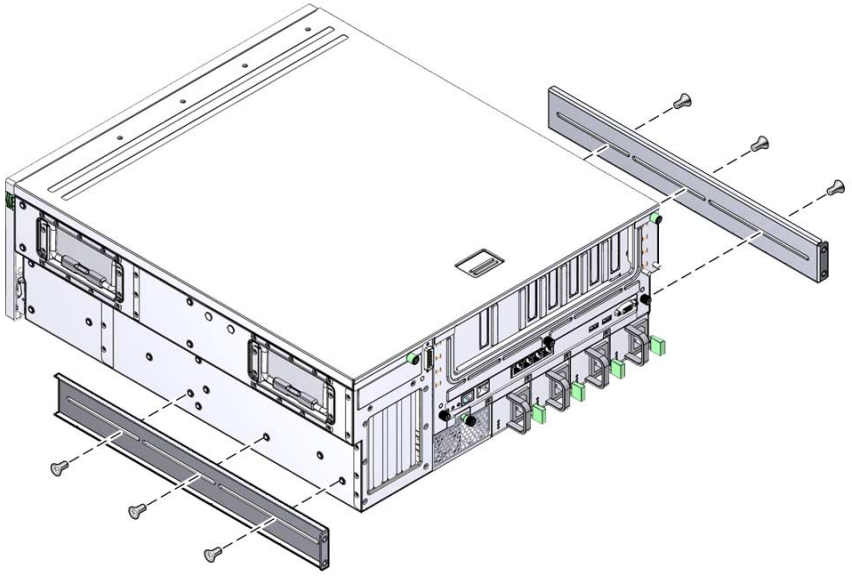
FIGURE 3-18 Securing the Hardmount Brackets to the Server



3. **Measure the depth of the rack.**

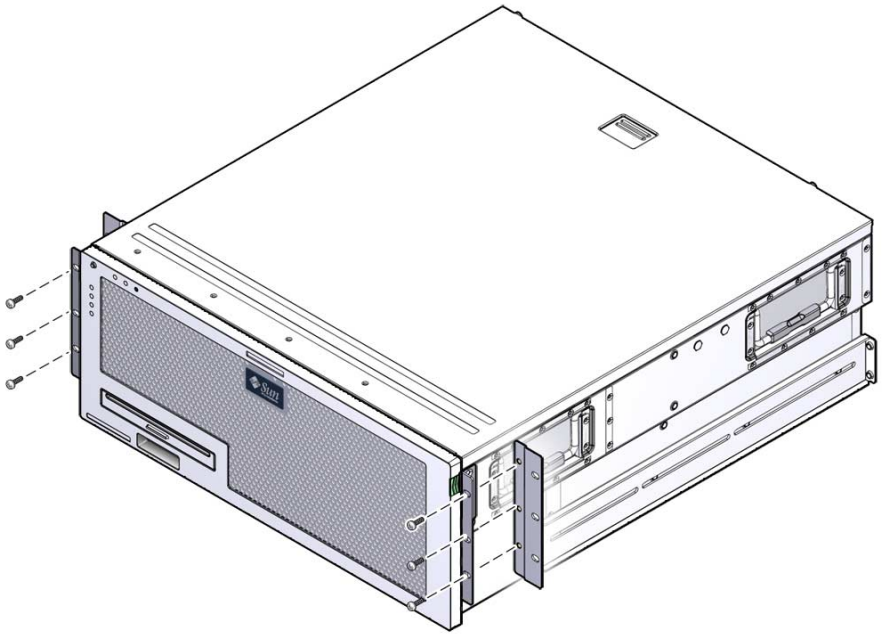
4. **Extend the rear mount support brackets to the depth of the rack, and install the brackets using two or three M4 x 8 mm panhead Phillips screws (**FIGURE 3-19**).**

FIGURE 3-19 Attaching the Rear Mount Support Brackets



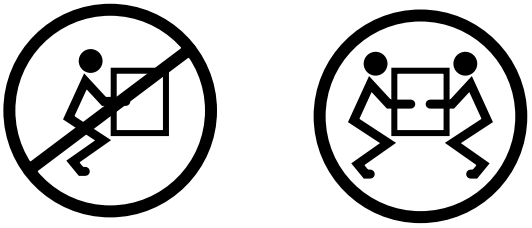
5. **Attach the front adjuster brackets to the front hardmount brackets using eight M5 x 8 mm panhead Phillips screws (**FIGURE 3-20**).**

FIGURE 3-20 Attaching the Front Adjuster Brackets



6. **Lift the server to the desired location in the rack.**

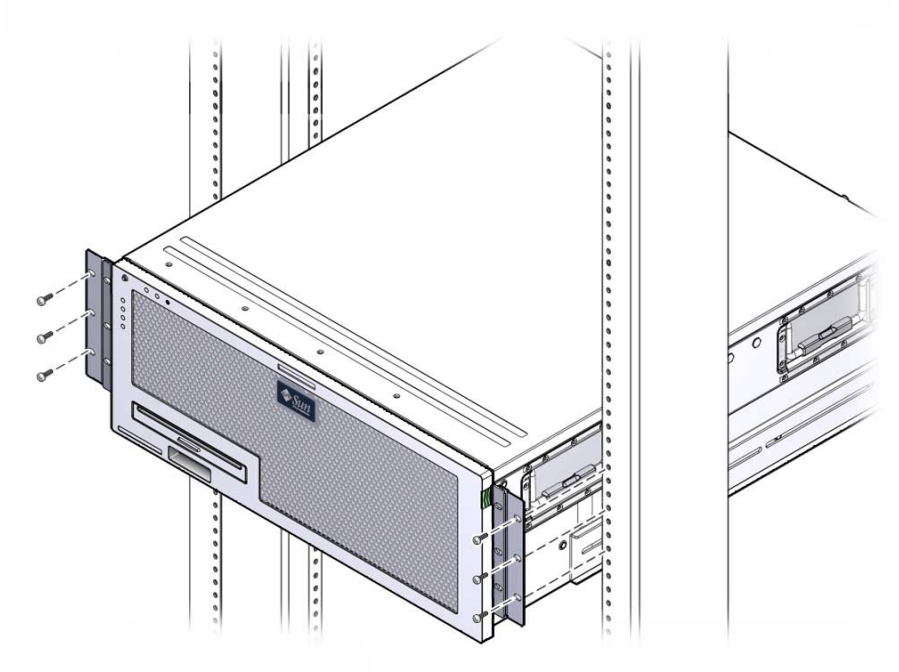
Caution – The Sun Netra X4450 server weighs approximately 64 lbs (32 kg). Two people are required to lift and mount this 4U server into a rack enclosure.



7. **Use three screws per side to secure the front adjuster brackets to the front of the rack (**FIGURE 3-21**).**

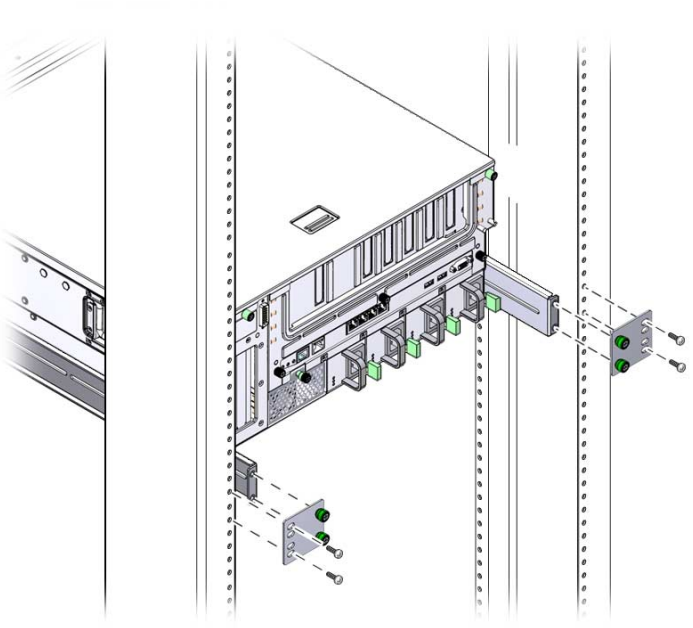
   The size of the screws varies depending on the rack.

FIGURE 3-21 Attaching the Front Brackets to the Rack



8. **Secure the four captive screws on the two rear mount flanges to the support brackets on the server (**FIGURE 3-22**).**

FIGURE 3-22 Securing the Rear Mount Flange



9. **Use four screws to secure the rear brackets to the rack.**
   The size of the screws varies depending on the rack.

Hardmounting the Server in a 23-Inch 2-Post Rack

The hardmount kit for a 23-inch 2-post rack consists of:

- Two side brackets
- Bag of screws

FIGURE 3-23 shows the contents of the hardmount, 23-inch, 2-post rackmount kit.

FIGURE 3-23 Contents of the Hardmount 23-Inch 2-Post Kit

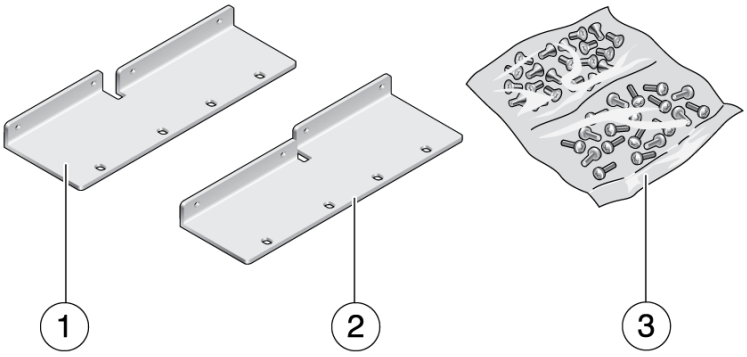


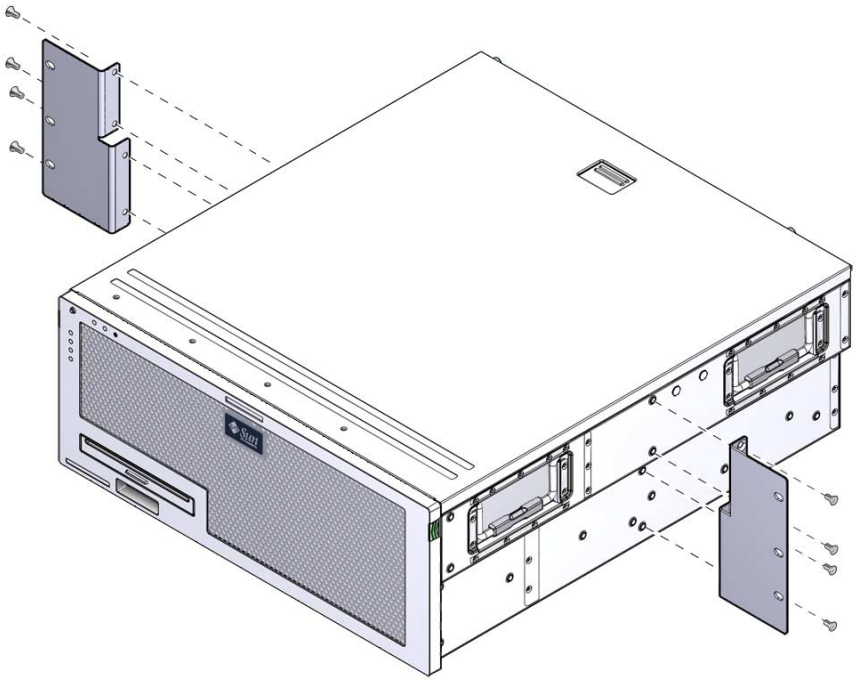
Figure Legend

1	Left side bracket	**3**	Screws
2	Right side bracket	**4**	

▼ Hardmount the Server in a 23-Inch 2-Post Rack

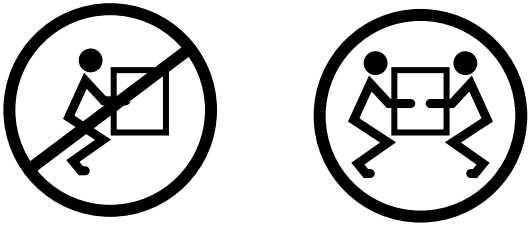
1. **Use eight M5 x 10 SEM screws to secure the side brackets to the server (**FIGURE 3-24**).**

FIGURE 3-24 Securing the Side Brackets to the Side of the Server



2. Lift the server to the desired location in the rack.

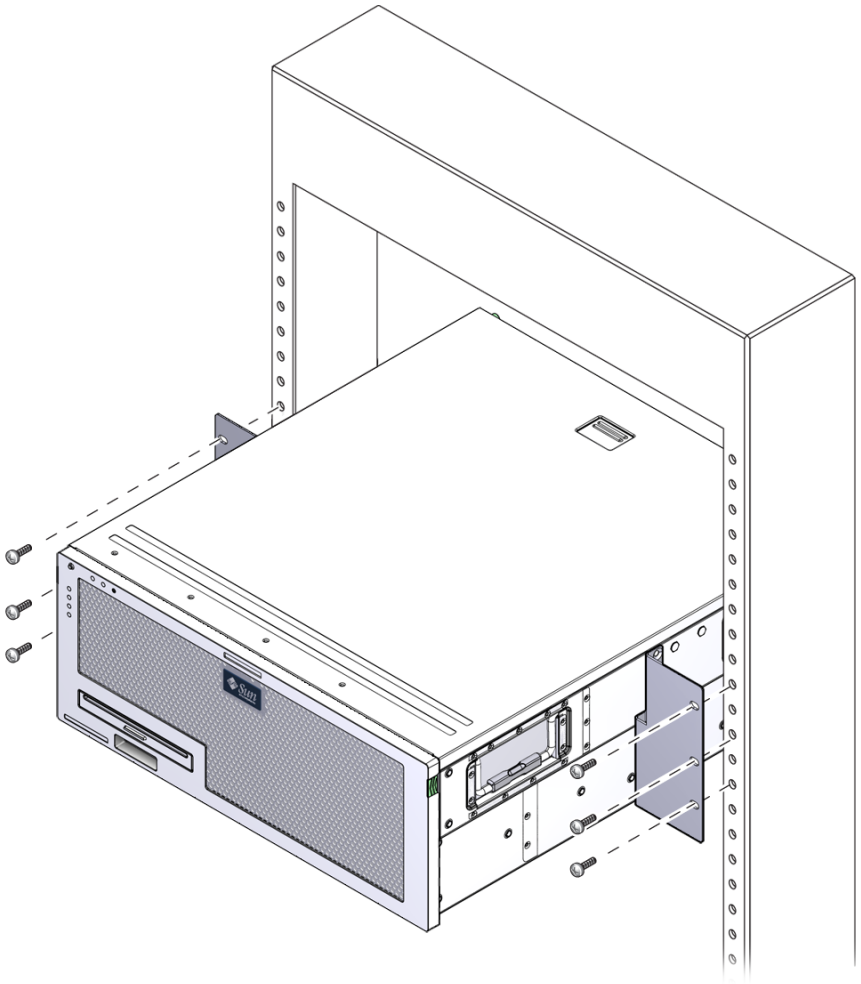
Caution – The Sun Netra X4450 server weighs approximately 64 lbs (32 kg). Two people are required to lift and mount this 4U server into a rack enclosure.



3. Use six screws to secure the front hardmount brackets to the front of the rack (FIGURE 3-25**).**

The size of the screws varies depending on the rack.

FIGURE 3-25 Securing the Hardmount Brackets to the Front of the Rack



Hardmounting the Server in a 19-Inch 2-Post Rack

The hardmount kit for a 19-inch 2-post rack consists of:

- Two hardmount brackets
- Two rear mount support brackets (not used)

- Two rear mount flanges (not used)
- Two bags of screws

FIGURE 3-26 shows the contents of the hardmount 19-inch 2-post rackmount kit.

FIGURE 3-26 Contents of the Hardmount 19-Inch 2-Post Kit

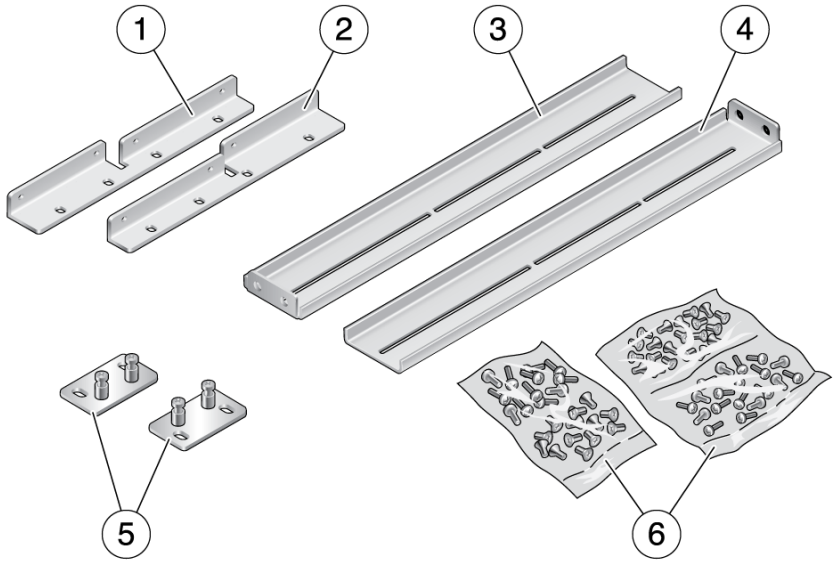


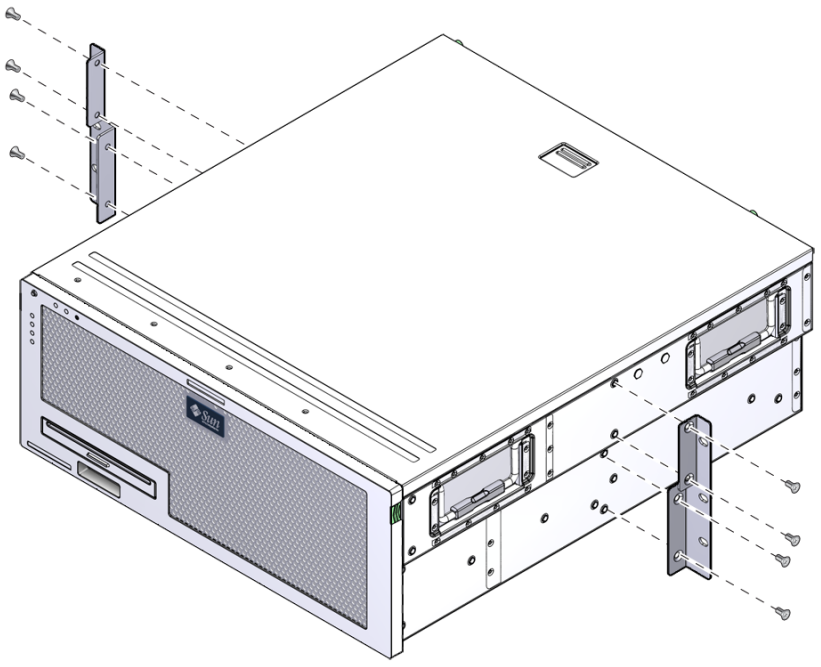
Figure Legend

1	Left front hardmount bracket	**4**	Right side bracket
2	Right front hardmount bracket	**5**	Rear hardmount brackets
3	Left side bracket	**6**	Screws

▼ Hardmount the Server in a 19-Inch 2-Post Rack

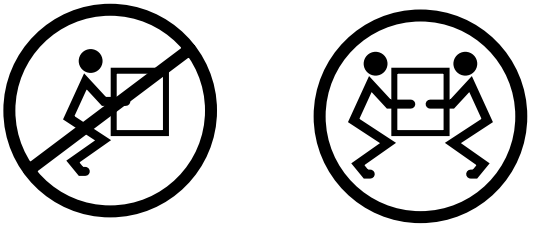
1. **Use eight M5 x 10 SEM screws to secure the side brackets to the sides of the server (FIGURE 3-27).**

FIGURE 3-27 Securing the Side Brackets to the Side of the Server



2. **Lift the server into the rack.**

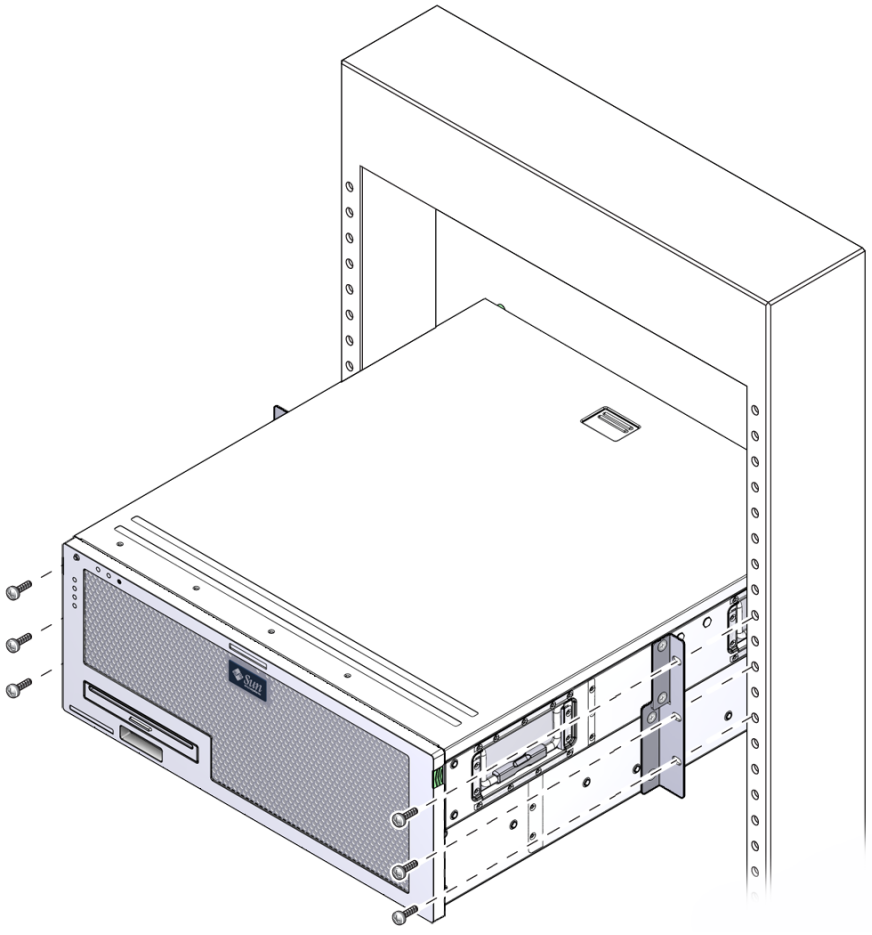
Caution – The Sun Netra X4450 server weighs approximately 64 lbs (32 kg). Two people are required to lift and mount this 4U server into a rack enclosure.



3. **Use six screws to secure the front of the server to the front of the rack (**FIGURE 3-28**).**

   The size of the screws varies depending on the rack.

FIGURE 3-28 Securing the Server in the 2-Post Rack



CHAPTER 4

Cabling the Server

This chapter provides instructions for cabling the server.

Topics include:

- "Attaching the Data Cables" on page 47
- "Preparing the DC Power Source" on page 50
- "Managing Cables With the CMA" on page 60

Attaching the Data Cables

Use the information and instructions in this section to attach the data cables to the server.

Cable Connections and Ports

The following list describes the server's cable connections and ports:

- Minimum cable connections for the server
  - At least one system on-board Ethernet network connection (NET port)
  - The service processor serial management port (SER MGT port)
  - The service processor network management port (NET MGT port)
  - DC power cables for the system power supplies
- Service processor management ports
  - Serial management port

The serial management port is labeled SER MGT) and uses an RJ-45 cable. This port is always available and is the default connection to the ILOM system controller.

- Network management port

  The network management port is labeled NET MGT and is the optional connection to the ILOM system controller. This port is not available until you have configured network settings for the system controller (through the service processor serial management port). The network management port uses an RJ-45 cable for a 10/100BASE-T connection. This port does not support connections to Gigabit networks.

  The service processor network management port is configured by default to retrieve network settings with Dynamic Host Configuration Protocol (DHCP) and allow connections using Solaris Secure Shell (SSH). You might need to modify these settings for your network.

Caution – Do not attach a modem to this port.

- Ethernet ports

  The Ethernet ports are labeled NET0, NET1, NET2, and NET3. The transfer rates for the Ethernet ports are given in TABLE 4-1.

TABLE 4-1 Ethernet Connection Transfer Rates

Connection Type	IEEE Terminology	Transfer Rate
Ethernet	10BASE-T	10 Mbit/sec
Fast Ethernet	100BASE-TX	100 Mbits/sec
Gigabit Ethernet	1000BASE-T	1000 Mbit/sec

- USB ports

  Two Universal Serial Bus (USB) ports labeled USB 0 and USB 1 are provided on the rear panel. USB ports support hot-plugging. You can connect and disconnect USB cables and peripheral devices while the server is running, without affecting system operations.

  You can only perform USB hot-plug operations while the OS is running. USB hot-plug operations are not supported when the system prompt is displayed or before the system has completed booting.

  You can connect up to 126 devices to each of the two USB controllers, for a total of 252 USB devices.

- Input power cables:

Do not attach power cables to the power supplies until you have finished connecting the data cables and have connected the server to a serial terminal or a terminal emulator (PC or workstation). After you attach the power cables, server goes into Standby mode and the ILOM system controller initializes. System messages might be lost if the server is not connected to a terminal, PC, or workstation.

▼ Attach the Data Cables to the Server

1. **Connect a Category 5 cable from the SER MGT serial management port to the terminal device.**

FIGURE 4-1 Service Processor Serial Management Port

When connecting either a DB-9 or a DB-25 cable, use an adapter to perform the crossovers given for each connector.

2. **Connect a Category 5 cable from the NET MGT network management port to your network switch or hub.**

FIGURE 4-2 Service Processor Network Management Port

3. **Connect a Category 5 cable from your network switch or hub to Ethernet Port 0 (NET0) on the rear of the chassis (**FIGURE 4-3**).**

FIGURE 4-3 Ethernet Network Ports on Rear Panel

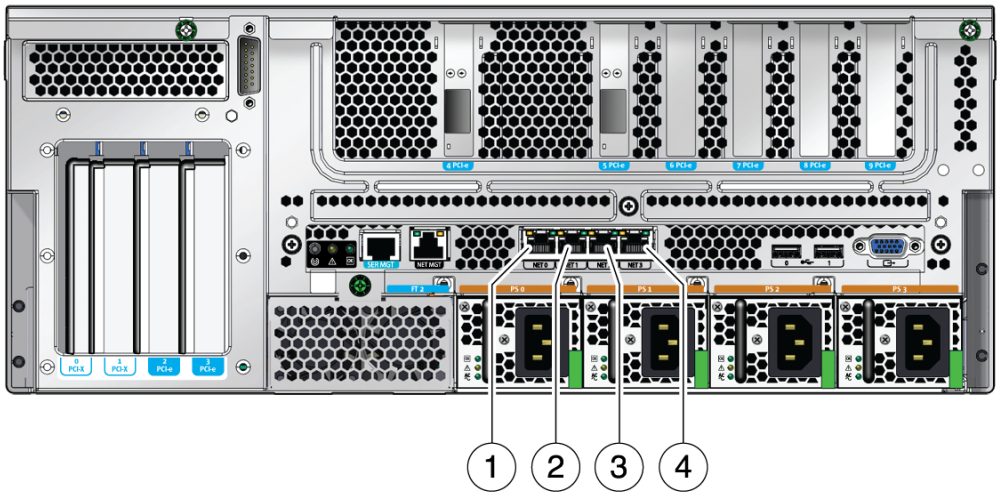


Figure Legend

1	NET0 port	**3**	NET2 port
2	NET1 port	**4**	NET3 port

4. **Connect Category 5 cables from your network switch or hub to the remaining Ethernet ports (NET1, NET2, NET3), as needed.**

Note – The LEDs located above each NET port are Link/Activity (left) and Speed (right) indicators for each port.

Preparing the DC Power Source

Powering on the system for the first time requires special preparation and procedures. For example, if you have not prepared a display before connecting the power cables, system messages might be lost.

Caution – Finish the hardware procedures in this chapter, but do not attach the power cables yet.

DC Power Source Requirements

TABLE 4-2 lists DC power source requirements for each power supply in the Sun Netra X4450 server, and TABLE 4-3 lists DC power source requirements for the server as a whole.

TABLE 4-2 DC Operating Power Limits and Ranges for Each Power Supply in the Server

Description	Limit or Range
Operating input voltage range	-48 VDC to -60 VDC nominal
Maximum operating input current	16 A
Maximum operating input power	640 W

TABLE 4-3 DC Operating Power Limits and Ranges for the Server

Description	Limit or Range
Operating input voltage range	-48 VDC to -60 VDC
Maximum operating input current	27 A
Maximum operating input power	1280 W

The server must meet the following:

- Reliably connected to protected earth ground
- Supplied by one or four power sources, isolated from each other
- Capable of providing up to 640 W of continuous power per power supply
- Limited to TNV-2 as defined by UL 60950 and IEC 60950

Note – The DC version of the server must be installed in a restricted-access location. According to the intent of the National Electrical Code, a restricted-access location is an area intended for qualified or trained personnel only and has access controlled by a locking mechanism, such as a key lock or an access card system.

DC Supply and Ground Conductor Requirements

The DC supply and ground conductor must meet the following requirements:

- Suitable conductor material are used (use copper conductors only).
- Power supply connections through the input connector are 12 AWG (between the Sun Netra X4450 server and the source).

There are three conductors:

- -48V (negative terminal)
- -48V Return (positive terminal)
- Chassis ground connection

- System ground conductor is 12 AWG.

  The ground can be connected through the DC power input connectors and/or directly to the grounding studs on the system chassis. If a local ground is available, only the local ground should be connected to the chassis grounding studs to prevent ground loop currents through the system chassis.
- Cable insulation should be a minimum rating of 75˚C (167˚F), low smoke fume (LSF), and flame retardant.
- Cable type should be one of the following:
  - UL style 1028 or other UL 1581 (VW-1) compliant equivalent
  - IEEE 383 compliant
  - IEEE 1202-1991 compliant
- Branch circuit cable insulation color should be applicable to National Electrical Codes.
- Grounding cable insulation color should be green or yellow.

Note – Depending on the DC power source, the -48V (negative terminal) might be marked with a minus (-) symbol, and the -48V return (positive terminal) might be marked with a positive (+) symbol.

Caution – You must restrict the connection of the Sun Netra X4450 server to the DC power source to minimize the possibility that transient energy will appear on the main input to the equipment. The DC battery power source must be in the same premises as the server. The server cannot be in one building with the power source in another building.

Overcurrent Protection Requirements

Overcurrent protection must meet the following requirements:

- Overcurrent protection devices must be provided as part of each equipment rack.
- Circuit breakers must be located between the DC power source and the Sun Netra X4450 server. Use one 20 A double-pole, fast trip DC-rated circuit breaker for each power supply unit.

Note – Overcurrent protection devices must meet applicable national and local electrical safety codes and be approved for the intended application.

▼ Assemble the DC Input Power Cable

1. **Identify the parts that you will use to assemble the DC input power cable (**FIGURE 4-4**).**

   The following DC connection parts are required to assemble one or more DC power input cables. These cables connect the -48V DC input source(s) to the power supply units.

   - DC input plugs
   - Strain relief housings
   - Cage clamp operating lever
   - Tie wraps

FIGURE 4-4 DC Connection Parts

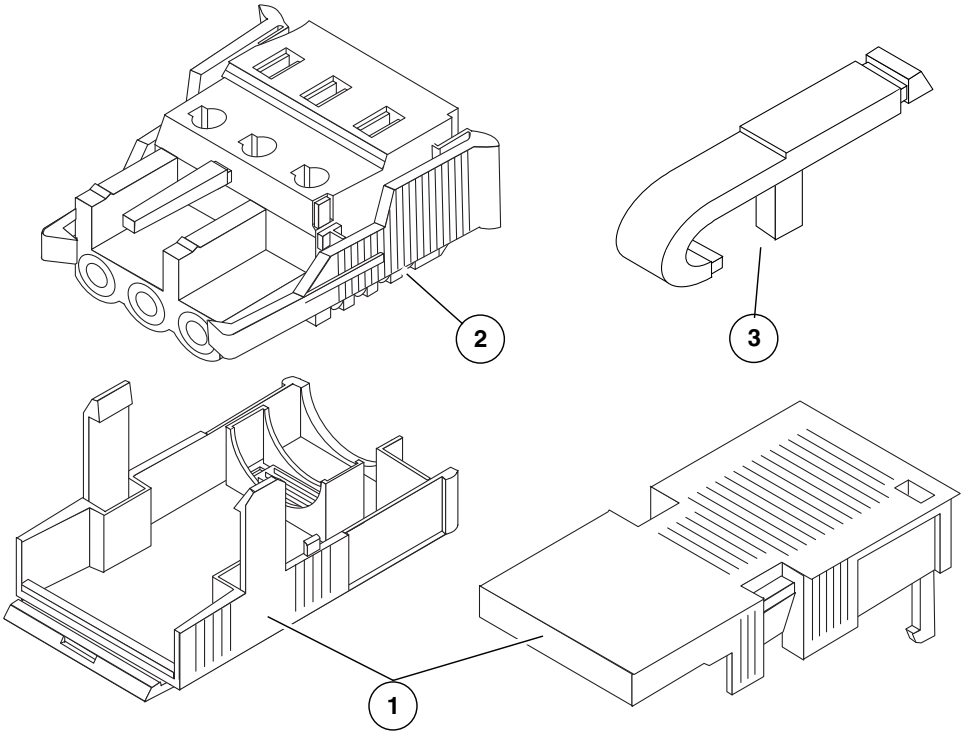


Figure Legend

1	Strain relief housing
2	DC input plug
3	Cage clamp operating lever

2. Turn off power from the DC power source through the circuit breakers.

Caution – Do *not* proceed with these instructions until you have turned off the power from the DC power source through the circuit breakers.

3. Get a DC input plug from the ship kit.

4. Locate the three wires coming from the DC power source that will be used in the connection to your unit:

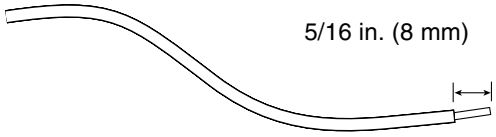
- -48V (negative terminal)
- Chassis ground
- -48V Return (positive terminal)

Note – Depending on the DC power source, the -48V (negative terminal) might be marked with a minus (-) symbol, and the -48V Return (positive terminal) might be marked with a positive (+) symbol.

5. **Strip 5/16 inches (8 mm) of insulation from each of the wires coming from the DC power source.**

   Do not strip more than 5/16 inches (8 mm) from each wire. Doing so leaves uninsulated wire exposed from the DC connector after the assembly is complete.

FIGURE 4-5 Stripping the Insulation From the Wire



6. **Open the cage clamp for this section of the DC input plug by taking one of the following actions:**

   - Insert the tip of the cage clamp operating lever into the rectangular hole directly above the hole in the DC input plug where you want to insert the first wire. Press down on the cage clamp operating lever (FIGURE 4-6).
   - Insert a small slotted screwdriver into the rectangular hole directly above the hole in the DC input plug where you want to insert the first wire, and press down on the screwdriver (FIGURE 4-7).

FIGURE 4-6 Opening the DC Input Plug Cage Clamp Using the Cage Clamp Operating Lever

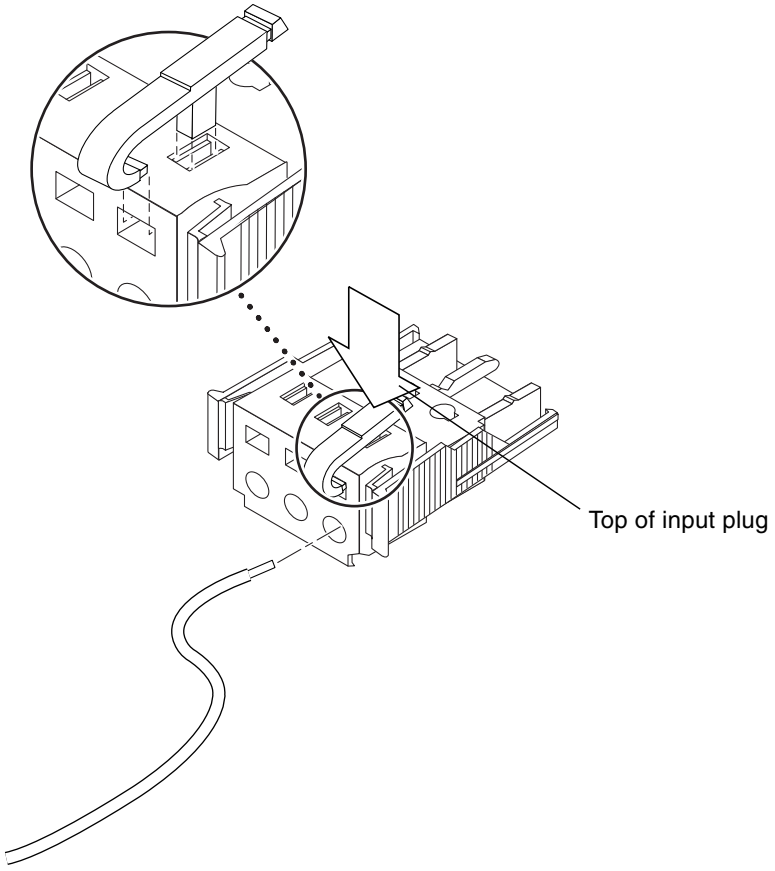
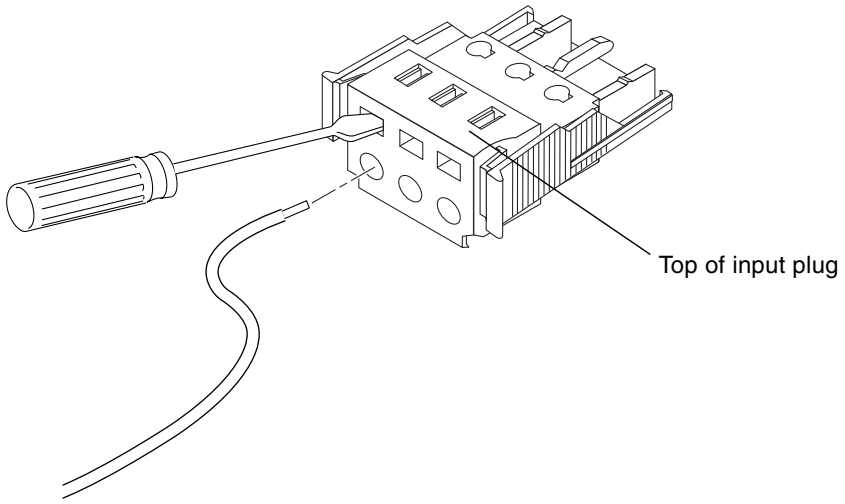


FIGURE 4-7 Opening the Cage Clamp Using a Screwdriver



7. **Feed the exposed section of the appropriate wire into the rectangular plug hole in the DC input plug.**

   FIGURE 4-8 shows which wires should be inserted into each hole in the DC input plug.

FIGURE 4-8 Assembling the DC Input Power Cable

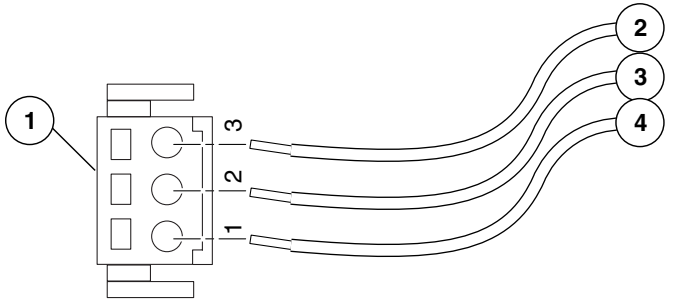


Figure Legend

1	Top of connector	**3**	From chassis ground (green/yellow)
2	From -48V return	**4**	From -48V

8. **Repeat Step 6 and Step 7 for the other two wires to complete the assembly of the DC input power cable.**

9. **Repeat** Step 4 **through** Step 8 **to create as many DC input power cables as you need for your unit.**

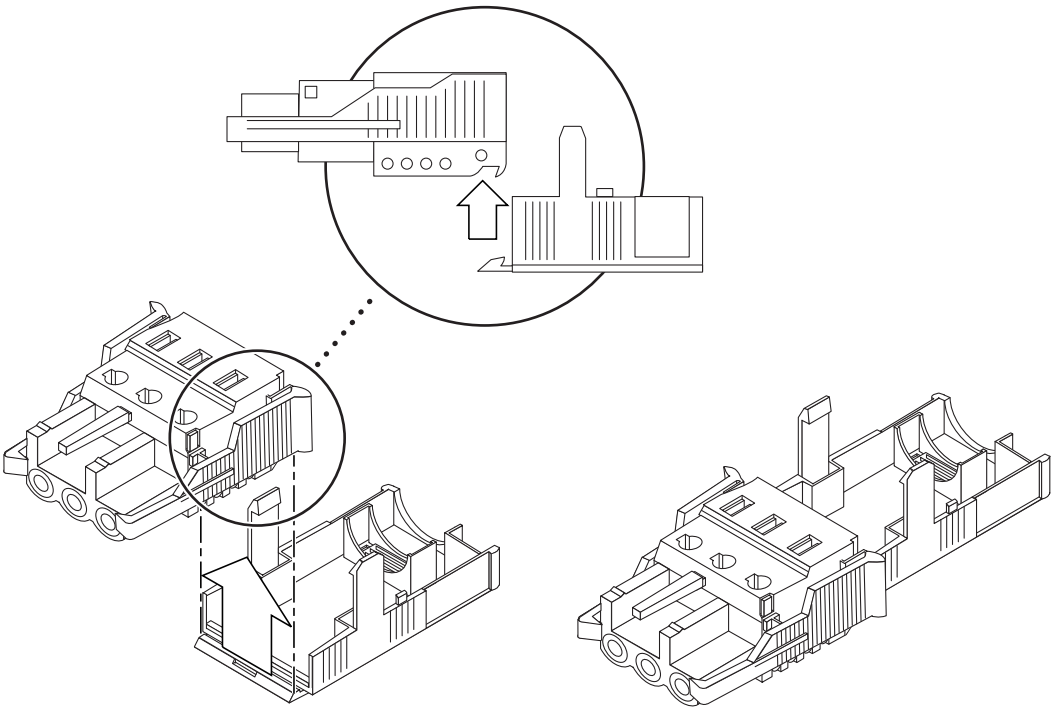
   If you need to remove a wire from the DC input plug, insert the cage clamp operating lever or a small screwdriver into the slot directly above the wire and press down (FIGURE 4-6 and FIGURE 4-7). Pull the wire from the DC input plug.

▼ Install the Strain Relief Housings

1. **Insert the bottom portion of the strain relief housing into the notch on the DC input plug until it snaps into place.**

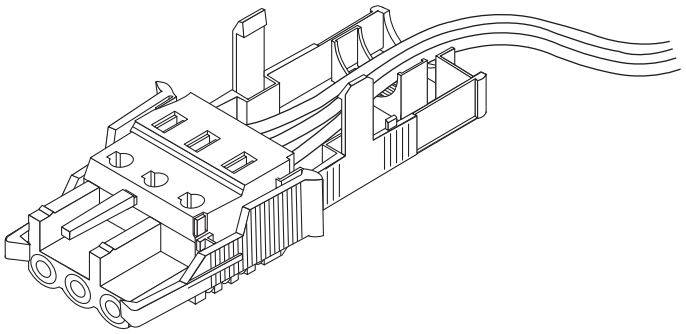
   Ensure that the strain relief housing snaps into place on the DC input plug. You cannot complete the assembly correctly if the strain relief housing is not snapped into place.

FIGURE 4-9 Inserting the Bottom Portion of the Strain Relief Housing



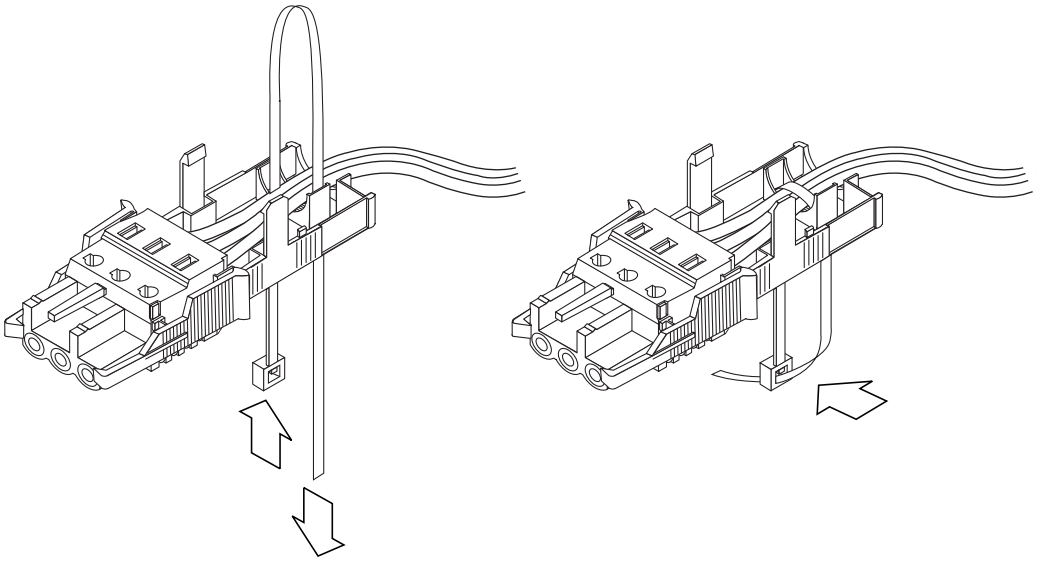
2. **Route the two or three wires coming from the DC power source through the opening at the end of the bottom portion of the strain relief housing (**FIGURE 4-10**).**

FIGURE 4-10 Routing the Wires Out of the Strain Relief Housing



3. **Insert a tie wrap into the bottom portion of the strain relief housing.**

FIGURE 4-11 Securing the Wires to the Strain Relief Housing

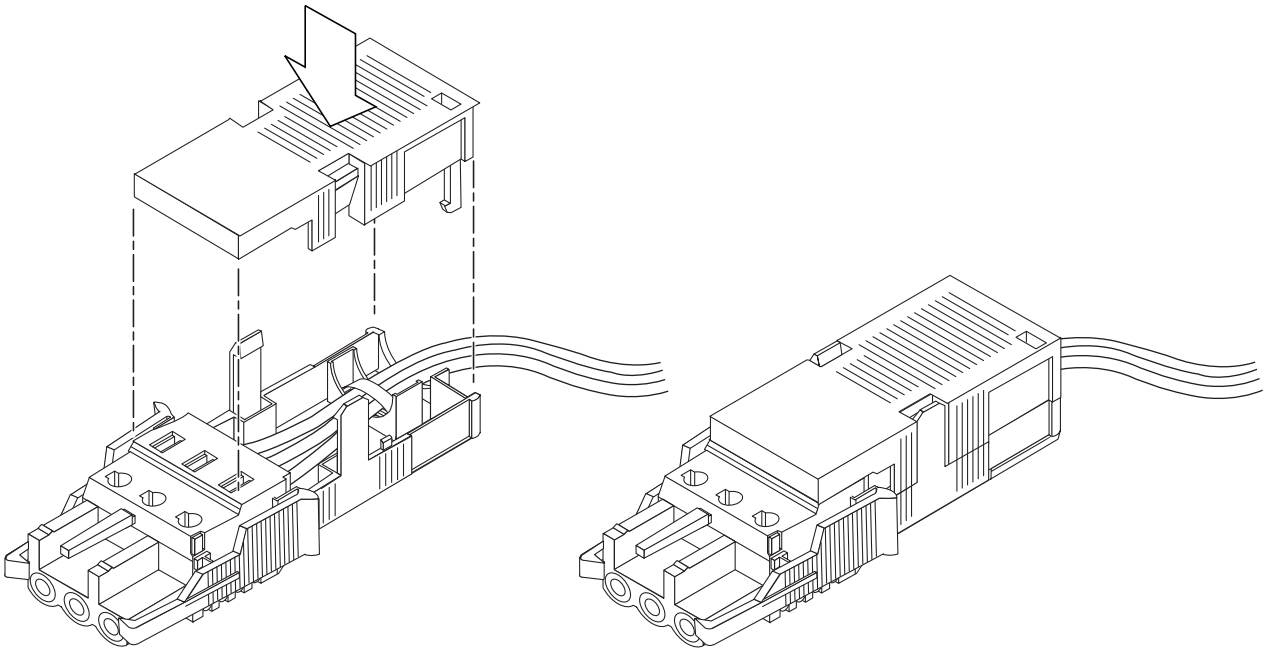


4. **Loop the tie wrap over the wires and back out of the strain relief housing, and tightening the tie wrap to secure the wires to the strain relief housing (**FIGURE 4-11**).**

5. **Lower the top portion of the strain relief housing so that the three prongs on the top portion insert into the openings in the DC input plug.**

   Push the top and bottom portions of the strain relief housing together until they snap into place (FIGURE 4-12).

FIGURE 4-12 Assembling the Strain Relief Housing



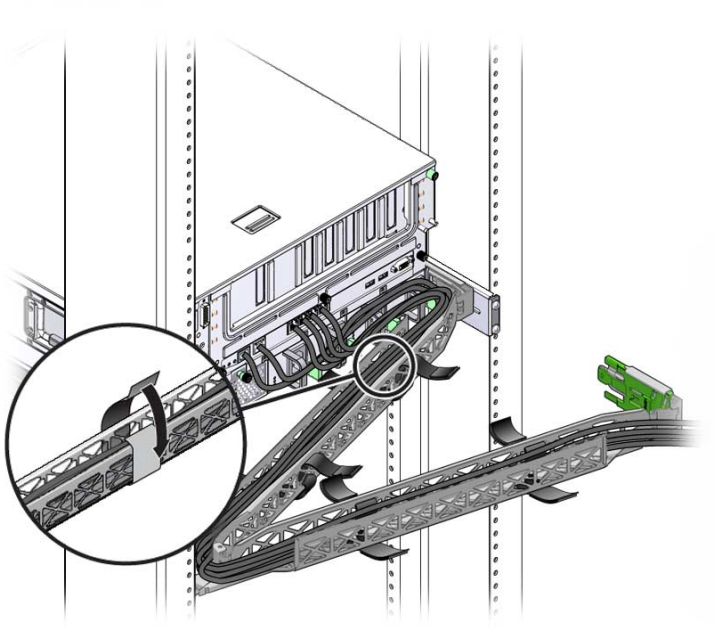
Managing Cables With the CMA

This section provides instruction for using the cable management assembly.

▼ Secure the Server Cables in the CMA

- **After the server cables are connected and placed inside the CMA, open the velcro cable straps and wrap the straps around the CMA securing the cables inside the CMA. (**FIGURE 4-13**).**

FIGURE 4-13 Securing the Server Cables in the CMA



Caution – Verify the operation of the slide rails, CMA, and cable service loops.

CHAPTER 5

Powering On the System

This chapter includes instructions for booting the server and for enabling the system controller network management port.

The following topics are included:

- "Powering On the Server for the First Time" on page 63
- "Connecting to the ILOM Service Processor for the First Time" on page 65

Powering On the Server for the First Time

The service processor runs on the 3.3V standby voltage. As soon as power is connected to the server, the service processor powers on, runs diagnostics, and initializes the ILOM firmware.

Tip – The serial terminal or a terminal emulator should be connected before you connect the power cables, or you will not see the system messages.

▼ Power On the Server

1. **Connect a terminal or a terminal emulator (PC or workstation) to the service processor serial management port.**

   Configure the terminal or terminal emulator with these settings:

   - 9600 baud
   - 8 bits

- No parity
- 1 Stop bit
- No handshake

Note – When you power on the server for the first time and you do not have a terminal or terminal emulator (PC or workstation) connected to the service processor serial management port, you will not see system messages. After connecting to the server with a terminal or terminal emulator, log in to the ILOM CLI to get to the service processor console.

---

2. **Turn on the terminal or terminal emulator.**

3. **Connect the AC or DC power cables, and watch the terminal for system messages.**

   After the service processor boots, the service processor login prompt is displayed on the serial console.

   The following example shows a partial output from the service processor boot sequence leading to the login prompt.

```
U-Boot 1.1.1 (August 23 2007 - 21:30:12)
...
POST cpu PASSED
POST ethernet PASSED
Hit any key to stop autoboot:  0
## Booting image at fe080000 ...

IP Protocols: ICMP, UDP, TCP, IGMP

Checking all file systems...
fsck 1.37 (21-Mar-2005)
Setting kernel variables ...
... done.
Mounting local filesystems...
Cleaning /tmp /var/run /var/lock.

Identifying DOC Device Type(G3/G4/H3) ...
OK

Configuring network interfaces...Internet Systems Consortium DHCP
Client V3.0.1
Copyright 2007 Internet Systems Consortium.
All rights reserved.
For info, please visit http://www.isc.org/products/DHCP

eth0: config: auto-negotiation on, 100FDX, 100HDX, 10FDX, 10HDX.
Listening on LPF/eth0/00:14:4f:3f:8c:af
```

```
Sending on   LPF/eth0/00:14:4f:3f:8c:af
Sending on   Socket/fallback
DHCPDISCOVER on eth0 to 255.255.255.255 port 67 interval 6
eth0: link up, 100 Mbps Full Duplex, auto-negotiation complete.
DHCPDISCOVER on eth0 to 255.255.255.255 port 67 interval 15
Hostname: hostname.
Starting portmap daemon: portmap.
Initializing random number generator...done.
INIT: Entering runlevel: 3
Starting system log daemon: syslogd and klogd.
Starting periodic command scheduler: cron.
Starting IPMI Stack..... Done.
Starting OpenBSD Secure Shell server: sshd.
Starting Servicetags listener: stlistener.
Starting FRU update program: frutool.

hostname login:
```

Caution – Do not operate the server without all fans, component heatsinks, air baffles, and the cover installed. Severe damage to server components can occur if the server is operated without adequate cooling mechanisms.

Connecting to the ILOM Service Processor for the First Time

This section describes how to connect to the ILOM service processor (SP) for initial setup and configuration. This section also includes an overview of SP interfaces and connections.

ILOM Service Processor Software Overview

TABLE 5-1 includes the components of the ILOM service processor.

TABLE 5-1 ILOM Service Processor Components

Item	Port	Function
1	ILOM hardware	ILOM includes the following hardware components: • An embedded service processor (SP) chipset. The service processor monitors the status and configuration of field-replaceable components inside your server, such as fans, disk drives, and power supplies. • Two rear panel external connections: NET MGT port Ethernet connection and RJ-45 serial management port.
2	ILOM firmware	Several system management firmware applications are preinstalled on the SP chipset. These operating system-independent firmware applications provide the following system management interfaces into your server: • Web-based graphical interface • Secure Shell (SSH) command-line interface • IPMI v2.0 command-line interface (CLI) • Simple Network Management Protocol (SNMP) v3 interface These interfaces call the same underlying system management functions on your SP. You can work with one or more of these interfaces to integrate with other management interfaces running in your data center.
3	Remote console application	The Remote Console application allows remote clients to view the graphical console of your host server as though the clients were directly attached to its video connector. The Remote Console mirrors the video display from the server VGA device (up to 1280 x 1024 resolution) locally on the remote management system. The remote keyboard, mouse, CD drive, or diskette drive appear as standard USB devices. The Remote Console depends on the following requirements to run correctly. Client systems require a web browser (at least IE 6, Mozilla, or Firefox) with Sun Java™ Runtime Environment (at least version 1.6 plug-ins) correctly installed. Java runtime environment is available for free download at: `http://java.sun.com`
4	Client-Side Secure Shell application	You must install a Secure Shell communications application on the remote client system (server, workstation, or laptop) to access the ILOM through a remote Secure Shell (SSH). Many Secure Shell communications applications are available from commercial or open-source distribution. Refer to `http://www.openssh.org` for information about open-source client-side SSH applications.
5	Serial redirection	You can set the serial redirection to display system output or ILOM output. A console can also be started to display system output. By default, the ILOM output appears. The BIOS contains these serial redirection options. See the *Sun Netra X4250 Server Service Manual* and the Sun *Integrated Lights Out Manager 2.0 User's Guide* for more information.

Note – The factory has configured the service processor hardware and firmware on your server with the most common settings used in the field. You may not need to change these defaults.

See the *Integrated Lights Out Manager 2.0 User's Guide* for detailed information.

Service Processor Interfaces

After you configure the IP address to comply with your network IP scheme, you can access the ILOM service processor web browser interface using a supported browser. You can also connect to the ILOM service processor through Secure Shell.

Choose from one of several ILOM SP interfaces to support system management on your server. After you have determined the IP address of the SP, you can access SP firmware applications through the following ILOM SP interfaces:

- Serial port CLI
- Secure Shell CLI
- Ethernet-based web browser

ILOM IP Addresses

The ILOM SP is assigned a DHCP IP address by default. There are two requirements for DHCP IP address assignment to occur:

- Connection to your network must be through a NET MGT port.
- DHCP services must be present on your network infrastructure.

If a DHCP server cannot be reached after three DHCP requests, the ILOM SP is assigned a static IP address based on the network management port MAC address. This IP address is always in the format 192.168.*xxx*.*xxx*.

Determining the ILOM Service Processor IP Address

Before connecting to the ILOM service processor (SP), you need to determine the IP address of the SP. There are two methods to determine the IP address of the ILOM SP. Choose one of the following methods:

- "View the Service Processor IP Address Using the BIOS" on page 68
- "View the Service Processor IP Address Using a Serial Connection" on page 68

▼ View the Service Processor IP Address Using the BIOS

1. **Power on the server (or restart the server if it is running).**
2. **When the Sun Microsystems splash screen appears during the power-on self-test (POST) operation, press F2 to access the BIOS settings.**
3. **Navigate to the Server tab, using the left and right keyboard arrows.**
4. **Access the Server tab and AST2000 (LAN) CONFIGURATION, and press Enter.**
5. **Access the IP ADDRESS tab.**
6. **View the SP IP address.**

Tip – If the IP address is in the form of 192.168.*xxx*.*xxx*, the DHCP server might not have assigned an address and the SP might use a static address.

▼ View the Service Processor IP Address Using a Serial Connection

1. **Connect a terminal (or PC running terminal emulation software) to the server serial port.**
2. **Ensure that the server hardware is installed and cables are inserted.**

   Ensure that the power is in Standby mode and the green indicator blinks.
3. **Verify that your terminal, laptop, PC, or terminal server is operational.**
4. **Configure the terminal device or the terminal emulation software running on a laptop or PC to the following settings:**
   - Eight data bits, no parity, one stop bit
   - 9600 baud
   - Disable hardware flow control (CTS/RTS)
   - Disable software flow control (XON/XOFF)
5. **Connect a null serial modem cable from the RJ-45 serial port on the server back panel to a terminal device (if not connected already).**
6. **Press Enter on the terminal device to establish a connection between the terminal device and the ILOM SP.**

Note – If you connect to the serial port on the ILOM before it has been powered on or during its power-on sequence, SP boot messages might be displayed.

The ILOM displays a login prompt, after a short wait.

```
login:
```

7. **Type the default user name** `root`**, and then type the default password** `changeme` **to log in to the ILOM SP.**

   The ILOM displays a default command prompt (->) indicating that you have successfully logged in.

8. **Type the command** `show /SP/network` **to display the current SP IP address.**

   The IP information appears, as shown in the following sample:

```
/SP/network

Properties:
        macaddress = 00:1B:24:BE:4A:52
        ipaddress = 110.7.100.45
....
```

9. **Record the IP address assigned to the ILOM.**

Modifying the Service Processor IP Address

Choose one of the following methods to change the current IP address of the ILOM service processor:

- "Change the SP DHCP IP Address to a Static IP Address Using the Serial Connection" on page 69
- "Change the SP Static IP address to a DHCP IP Address Using the Serial Connection" on page 70
- "Change a Static IP Address Using the SP ILOM Web Browser Interface" on page 71

▼ Change the SP DHCP IP Address to a Static IP Address Using the Serial Connection

1. **Connect a terminal (or a PC running terminal emulation software) to the server serial port.**

2. **Ensure that the server hardware is installed and cables are inserted.**

3. **Verify that your terminal, laptop, PC, or terminal server is operational.**
4. **Configure the terminal device or the terminal emulation software running on a laptop or PC to the following settings:**
   - 8N1: eight data bits, no parity, one stop bit
   - 9600 baud
   - Disable hardware flow control (CTS/RTS)
   - Disable software flow control (XON/XOFF)
5. **Connect a null serial modem cable from the server's back panel RJ-45 serial port to a terminal device (if not connected already).**
6. **Press Enter on the terminal device to establish a connection between the terminal device and the ILOM service processor (SP).**

   The following prompt appears.

   ->
7. **Type the default user name** `root`**, and then type the default password:** `changeme` **to log in to the ILOM SP.**

   The ILOM displays a default command prompt, indicating that you have successfully logged in:

   ->
8. **Type the following command to determine the SP IP address:**

   `show /SP/network`
9. **To assign a static IP ADDRESS, type the following commands in exact order:**

   `set /SP/network ipsource=static`

   `set /SP/network ipaddress=`*xxx.xxx.xxx.xxx*

   `set /SP/network netmask=`*xxx.xxx.xxx.xxx*

   `set /SP/network gateway=`*xxx.xxx.xxx.xxx*

   where *xxx* = IP address numbers

▼ Change the SP Static IP address to a DHCP IP Address Using the Serial Connection

1. **Connect a terminal (or a PC running terminal emulation software) to the server serial port.**
2. **Ensure that the server hardware is installed and cables are inserted.**
3. **Verify that your terminal, laptop, PC, or terminal server is operational.**

4. **Configure the terminal device or the terminal emulation software running on a laptop or PC to the following settings:**
   - 8N1: eight data bits, no parity, one stop bit
   - 9600 baud
   - Disable hardware flow control (CTS/RTS)
   - Disable software flow control (XON/XOFF)
5. **Connect a null serial modem cable from the server's back panel RJ-45 serial port to a terminal device (if not connected already).**
6. **Press** `Enter` **on the terminal device to establish a connection between the terminal device and the ILOM SP.**

   The prompt appears.

   ->
7. **Type the following command to change a static address to a DHCP address:**

   `set /SP/network ipsource=dhcp`
8. **Type** `show /SP/network` **to view the newly assigned DHCP address.**

   DHCP enabled is shown as `ipsource=DHCP`

▼ Change a Static IP Address Using the SP ILOM Web Browser Interface

---

Note – The SP web browser Interface can be accessed *only* if you know the service processor IP address.

---

1. **Open a Sun Microsystems supported web browser, such as Internet Explorer, Mozilla, or Firefox.**
2. **Type the IP address of the SP in the browser address bar.**

   For example: **`http://`***xxx.xxx.xxx.xxx*

   where *xxx* = IP address numbers
3. **Accept the certificate when prompted.**
4. **Enter your username (root) and password (changme).**
5. **Select the Configuration tab and then the Network tab.**
6. **Set configurations, such as IP configuration and DNS, as required.**
7. **Do one of the following:**

- If DHCP is required, select the Enable DHCP check box.
- If STATIC is required, clear the Enable DHCP check box, and manually set all IP information.

8. **If you manually change the IP address, you must manually change the subnet mask, because the subnet mask changes according to the IP address class.**
9. **Note your settings, and log out.**
10. **If the IP address changes, you must reconnect using the newly assigned IP address because the current session will be unresponsive.**

    See the *Integrated Lights Out Manager 2.0 User's Guide* for detailed information.

CHAPTER 6

Configuring the Preinstalled Solaris 10 Operating System

This chapter describes how to configure the Solaris 10 Operating System (OS) that is preinstalled on your Sun Netra X4450.

This chapter includes the following topics:

- "Solaris Preinstallation Overview" on page 73
- "Configuring the Solaris OS" on page 78
- "Configuring RAID Drives" on page 79
- "Solaris 10 OS User Information" on page 83

Solaris Preinstallation Overview

Read this section before you set up the Solaris OS.

Delivery Methods

To configure the preinstalled Solaris OS, you can select a delivery option in the GRUB menu that allows you to choose a delivery method:

- Configure the preinstalled Solaris OS through the serial management port (default method).
- Configure the preinstalled Solaris 10 image using a directly connected monitor and keyboard.

GRUB Menu

Solaris uses a GRUB boot loader with a GRUB menu. When you start the Solaris OS, a GRUB-level menu appears. The GRUB menu enables you to select to direct output to either the serial port or video port.

If you do not select an output within 10 seconds at the GRUB menu, the system boots using the default output (serial management port `ttyb`). Serial redirection requires a connection to the serial management port.

Before You Begin

Before you configure the preinstalled Solaris OS, you must do the following:

1. Perform initial configuration of the service processor, and determine the server's network settings.
2. Gather the information that you will need to configure the server.
3. After these steps are complete, you can configure the preinstalled Solaris OS.
4. Configure RAID, if necessary.

Installation Worksheet

Fill in TABLE 6-1 with information you need to configure the preinstalled Solaris 10 OS for the server. Collect only the information that applies to your system.

TABLE 6-1 Installation Worksheet

Installation Information	Description	Enter System Configuration Asterisk (*) Indicates Default.
Language	Choose from the list of available languages for the Solaris 10 software.	English*
Locale	Choose your geographic region from the list of available locales.	English (C - 7-bit ASCII)*
Terminal	Choose the type of terminal that you are using from the list of available terminal types.	

TABLE 6-1 Installation Worksheet *(Continued)*

Network connection		Is the system connected to a network?	Networked Nonnetworked*
DHCP		Can the system use Dynamic Host Configuration Protocol (DHCP) to configure its network interfaces?	Yes No*
If you are not using DHCP, note the network address.	IP address	If you are not using DHCP, supply the IP address for the system. Example: `129.200.9.1`	
	Subnet	If you are not using DHCP, is the system part of a subnet? If yes, what is the netmask of the subnet? Example: `255.255.0.0`	`255.255.0.0` *
	IPv6	Do you want to enable IPv6 on this machine?	Yes No*
Host name		A host name that you choose for the system.	
Kerberos		Do you want to configure Kerberos security on this machine? If yes, gather the following information: Default realm: Administration server: First KDC: (Optional) Additional KDCs:	Yes No*
Installation Information		**Description**	**Enter System Configuration: Asterisk (*) indicates default.**
Name service: if the system uses a name service, provide the following information.	Name service	Which name service should this system use?	NIS+ NIS DNS LDAP None*
	Domain name	Provide the name of the domain in which the system resides.	
	NIS+ and NIS	Do you want to specify a name server or let the installation program find one?	Specify one Find one*

TABLE 6-1 Installation Worksheet *(Continued)*

DNS	Provide IP addresses for the DNS server. You must enter at least one IP address, but you can enter up to three addresses.	IP addresses (1–3):
	You can also enter a list of domains to search when a DNS query is made.	Search Domains (1–3):
LDAP	Provide the following information about your LDAP profile: If you specify a proxy credential level in your LDAP profile, gather the following information: Proxy-bind distinguished name: Proxy-bind password:	Profile name: Profile server:

TABLE 6-1 Installation Worksheet *(Continued)*

Installation Information	Description	Enter System Configuration: Asterisk (*) indicates default.
Default route	Do you want to specify a default route IP address or let the Solaris installation program find one? The default route provides a bridge that forwards traffic between two physical networks. An IP address is a unique number that identifies each host on a network. Select one of the following routes: • *Specify IP address*. An `/etc/defaultrouter` file is created with the specified IP address. When the system is rebooted, the specified IP address becomes the default route. • *Detect IP address*. Let the Solaris installation program detect an IP address. However, the system must be on a subnet that has a router that advertises itself by using the ICMP router discovery protocol. If you are using the command-line interface, the software detects an IP address when the system is booted. • *None*. Select None if you do not have a router or do not want the software to detect an IP address at this time. The software automatically tries to detect an IP address on reboot.	Specify IP address Detect IP address None*
Time zone	How do you want to specify your default time zone?	Geographic region* Offset from GM Time zone file
Root password	Choose a root password for the system.	

Configuring the Solaris OS

Use the procedures in this section to configure the preinstalled image of the Solaris OS.

▼ Configure the Preinstalled Solaris OS

1. **Log in to the service processor as an administrator. For example:**

   Login: **root**
   Password: **changeme**

2. **To start the ILOM console, type:**

   ```
   start /SP/console
   ```

3. **Follow the Solaris 10 preinstallation onscreen instructions.**

4. **Type the system and network information when prompted.**

   See TABLE 6-1 for collected information.

   The displayed screens can vary, depending on how you chose to assign network information to the server (DHCP or static IP address).

5. **After the system configuration information has been entered, the OS installation continues.**

   On completion, the system reboots and displays the Solaris OS login.

▼ (Optional) Redirect the Console Output to the Video Port

You must be logged in to the service processor before you can redirect the console output to the video port. This procedure is optional.

Note – The Solaris GRUB menu enables you to manually select graphics adapter redirection during the boot process. If not chosen within 30 seconds after the GRUB menu is displayed, the system defaults to serial redirection (`ttyb`).

---

1. **Reboot the system.**

2. **To enable video output, choose** `Solaris Build - Graphics Adapter` **from the GRUB menu** `Changing Default Console Output`**.**

Using the GRUB Menu

The preinstalled Solaris 10 OS image directs console output to the serial port by default. After the initial configuration of the preinstalled Solaris OS is complete, you can modify the Solaris 10 GRUB menu to direct output to the video port by default.

Caution – This procedure is intended only for advanced users of the Solaris OS. You can seriously disrupt server operation or make the server unbootable if you introduce a problem in the `menu.lst` file.

▼ Set the Video Port as the Default Output

1. **Open the** `/boot/grub/menu.lst` **file in a text editor.**
2. **Modify the following line in the file to change the default so that the console output goes to the video port:**

   ```
   default 1
   ```

3. **Run the following command to add the X server startup scripts:**

   ```
   /usr/dt/bin/dtconfig -e
   ```

4. **Reboot the server.**

   After the system reboots, the console output goes to the video port by default.

5. **Configure RAID drives, if necessary.**

Configuring RAID Drives

After you configure the Solaris OS, you might need to configure the RAID drives.

RAID Drive Overview

The Sun Netra X4450 has two optional RAID host bus adapter (HBA) cards. You can access RAID configuration through the HBA card BIOS.

TABLE 6-2 RAID HBA Cards

RAID HBA Cards	Press for BIOS
Sun StorageTek	Ctrl-A
LSI 3081E	Ctrl-C

The system has the preinstalled OS on HD0. When the Solaris OS installation is completed, the option to upgrade your single-disk OS to a mirrored RAID solution is available.

The configuration procedure is different for each supported controller card. For example, a Sun StorageTek™ HBA card has many more options for RAID configuration than an LSI HBA card.

Note – Configuring the Sun Netra X4450 RAID is optional. By default the preinstalled Solaris image is configured in a non-RAID configuration. If anything other than a basic mirror RAID is required, it is recommended to perform a fresh installation of the Solaris Operating System (or other OS) in the desired RAID configuration.

Mirroring the Preinstalled Solaris OS With LSI RAID

The Solaris OS supports hardware RAID and cannot be installed on an existing array if one has been created.

If you choose the preinstalled Solaris OS and want to make the OS part of a RAID set, and if you are using LSI RAID only, perform the following procedure to update the preinstalled Solaris OS to a mirrored RAID set. Only IM (Integrated Mirror) allows data on the primary hard disk drive (HDD) to be preserved or merged into an array of disks.

This example allows the creation of a mirror before or after the Solaris installation. The server has 2 disks: HDD0 (with the OS) and HDD1 (which is blank).

▼ Create a Mirror Image of the Solaris OS on HDD1

1. **Power on your server system for the first time.**
2. **Press Ctrl-C to access the LSI RAID configuration utility.**
3. **Select the SAS card - SAS1068E, and press Enter.**
4. **Choose RAID Properties.**
5. **Create an IM for the required disk configuration.**
6. **Select the hard disks to be used.**

   Use the right arrow to move the cursor to the RAID column. Press the Spacebar to include into RAID.
7. **Because HDD0 contains data, select merge or delete:**
   - Choose M to merge data and start a sync operation.
   - Choose D to erase the preinstalled Solaris OS.
8. **Press C to create the RAID and start the sync operation.**
9. **Click Exit to save the configuration and close the menu.**
10. **Press Esc to exit the configuration utility and reboot.**

Creating a RAID Set to Incorporate a Preinstalled OS Using the Sun StorageTek Card

The Sun StorageTek card enables you to choose from many RAID configurations. How you configure your system depends on your system requirements and the available hard disk drives in the system. The following example shows how to mirror the preinstalled Solaris OS. This is the recommended option, and all remaining disks (should there be more than 2) are incorporated into a DATA RAID set using the available options.

▼ Mirror Your Configured Solaris OS

1. **Using your Solaris Server, log in and start X server.**

   This graphical user interface is required for StorageTek Software Management.

2. **From the supplied Tools & Drivers image, copy the** `StorMan.ds` **application, located in the** `/mount-point/RAIDmgmt/StorageTEK/Solaris` **directory, to a new directory you choose on your Solaris server, for example,** `mkdir /StorMan`.

3. **Change the permissions of the new directory and StorMan application:**

   `Chmod 777 StormMan.ds`

4. **Run the following command to install the application:**

   `pkgadd -d StorMan.ds`

5. **Choose to install all components when prompted.**

6. **To run the application, type the following:**

   `sh /usr/StorMan/StorMan.sh`

   A split screen appears.

7. **Click the screen to activate the Managed Systems List.**

8. **Double-click the local machine (it is displayed by IP Address of the Primary ENET connection).**

   A prompt appears.

9. **At the prompt, log in as** `root`**, using the OS password that was assigned during installation.**

10. **Click the SUN STK RAID Controller.**

    All attached hard disk drives on Enclosure 0 and 1 appear.

Tip – HDD0 (OS) should be Enclosure 0 Logical Volume 1.

---

11. **To mirror the OS, right-click Logical Device 1 and choose Expand or Change Logical Device.**

12. **Choose the appropriate RAID option (in this example, RAID 1 for Mirror).**

13. **Choose a disk to mirror the OS with, from the physical disk list.**

    Select the hard disk drive that best fits your needs.

14. **After you select the HDD, click Next, and then view the configuration summary.**

15. **Click Apply to start the mirroring process.**

    You can also click Schedule to perform the mirroring process at a later time.

    One more confirmation screen is displayed, and when confirmed, the OS will begin to mirror. Mirroring may take several hours, depending on the amount of data and the HDD size.

Solaris 10 OS User Information

This section provides pointers to information about the Solaris 10 OS.

Accessing Solaris 10 User Documentation

You can access the various collections of the Solaris 10 OS user documentation at:

`http://docs.sun.com/app/docs/prod/solaris.10`

Downloading Solaris 10 OS Software

If you need to install the Solaris 10 OS or reinstall the OS after removing it, you can download the CD or DVD image from the following URL:

`http://www.sun.com/software/solaris/get.jsp`

Solaris 10 OS Training

Sun provides flexible training options that accommodate your personal schedule and learning style. The training options include instructor-led, web-based online, CD-ROM, and Live Virtual Classes. For Solaris 10 Training and Certification options at a glance, go to:

`http://www.sun.com/training/catalog/solaris10.html`

CHAPTER 7

Troubleshooting

This chapter describes troubleshooting information and how to apply and remove power to the Sun Netra X4450. Support contacts are also included.

This chapter includes the following topics:

- "Powering On and Off the Server" on page 85
- "Setup Troubleshooting" on page 87
- "Contacting Support" on page 89

Powering On and Off the Server

Use the following procedures to power on and power off the Sun Netra X4450.

▼ Apply Main Power for All Server Components

1. **Verify that the power cord has been connected and that Standby power is on.**

   In standby power mode, the Power OK Indicator on the front panel flashes.

2. **Use a pen, or other pointed object, to press and release the recessed Power button on the server front panel.**

   When the main power is applied to the server, the Power OK Indicator next to the Power button lights and remains lit.

Note – The first time the server powers on, the power-on self-test (POST) can take up to a minute.

Power Off From Main Power Mode

To remove main power from the server, use one of the following two methods:

TABLE 7-1 Shutdown Methods

Shutdown	Method
Graceful shutdown	Use a pen, or other pointed object, to press and release the Power button on the front panel. This action causes Advanced Configuration and Power Interface (ACPI-enabled operating systems to perform an orderly shutdown of the operating system. Servers not running ACPI-enabled operating systems shut down to Standby power mode immediately.
Emergency shutdown	Press and hold the Power button for at least four seconds to force the main power off and cause the server to enter standby power mode. When the main power is off, the Power/OK Indicator on the front panel begins flashing, indicating that the server is in standby power mode.

Caution – To completely power off the server, you must disconnect the power cords from the back panel of the server.

Setup Troubleshooting

This section contains information to help you troubleshoot minor server problems. If you experience problems while setting up your server, refer to the troubleshooting information in TABLE 7-2.

TABLE 7-2 Troubleshooting Procedures

Problem	Possible Solution
Server powers on, but the monitor does not.	• Is the Power button for the monitor turned on? • Is the monitor power cord connected to a wall outlet? • Is the monitor power cord connected to the monitor? • Does the wall outlet have power? Test by plugging in another device.
CD or DVD does not eject from the media tray when you press the Eject button.	• Move the mouse or press any key on the keyboard. The drive might be in low power mode. • Use the utility software installed on your server to eject the CD. • Ensure that the media in the device is not in use and is not mounted by the operating system.
No video is displayed on the monitor screen.	• Is the monitor cable attached to the video connector? • Does the monitor work when connected to another system? • If you have another monitor, does it work when connected to the original system? • If, after POST and BIOS are complete, you no longer see video output on your monitor and see only a flashing cursor, check the configuration of the operating system to determine if it is configured to redirect its output exclusively over the serial line.
Server does not power on when the front panel Power button is pressed.	Keep notes on the following situations in case you need to call service: • Is the Power Indicator illuminated on the front of the system? (Ensure that the power cord is connected to the system and to a grounded power receptacle.) • Does the wall outlet have power? Test by plugging in another device. • Does the monitor sync within five minutes after power on? (The green indicator on the monitor stops flashing and remains illuminated.)

TABLE 7-2 Troubleshooting Procedures *(Continued)*

Problem	Possible Solution
Keyboard or mouse does not respond to actions.	• Verify that the mouse and keyboard cables are connected to the on-board USB 2.0 connectors on the server. • Verify that the server is powered on and the front Power Indicator is illuminated.
Server appears to be in low power mode, but the Power Indicator does not blink.	The Power Indicator only blinks when all server components are in low power mode. A tape drive might be connected to your server. Because tape drives do not enter low power mode, the Power Indicator does not blink.
Hung or frozen server: No response from mouse or keyboard or any application.	Try to access your system from a different server on the network: 1. On another system, type **`ping`** *IP_address_of_server*. 2. If a response is returned, then try logging in to the Sun Netra X4450 using either `telnet`, `ssh`, or `rlogin`. 3. If you successfully log in, list the running processes using the `ps` command. 4. Kill any processes that appear unresponsive or should not be running, by using the `kill` *process_ID* command. 5. Check the responsiveness of the Sun Netra X4450 after each process is killed. If this procedure does not work, power cycle the server: 1. Press the Power button to power off the server and wait 20 to 30 seconds. 2. Press the Power button again to power system back on.

Note – For additional troubleshooting information, see the *Sun Netra X4450* Server *Service Manual*.

Contacting Support

If the troubleshooting procedures in this chapter fail to solve your problem, use TABLE 7-3 to collect information that you might need to communicate to the support personnel. TABLE 7-4 lists the Sun web sites and telephone numbers for additional technical support

TABLE 7-3 System Information Needed for Support

System Configuration Information Needed	Your Information
Sunservice contract number	
System model	
Operating environment	
System serial number	
Peripherals attached to the system	
Email address and phone number for you and a secondary contact Street address where the system is located	
Superuser password	
Summary of the problem and the work being done when the problem occurred	
Other Useful Information	
IP address	
Server name (system host name)	
Network or internet domain name	
Proxy server configuration	

.

TABLE 7-4 Sun Technical Support Contacts

Server Documents and Support Resources	URL or Telephone Number
PDF files for all current Sun Netra X4450 documents.	`http://www.sun.com/documentation/`
Solaris 10 and other software documents. This web site has full search capabilities.	`http://docs.sun.com/documentation/`
Discussion and troubleshooting forums.	`http://supportforum.sun.com/`
Support, diagnostic tools, and alerts for all Sun products.	`http://www.sun.com/bigadmin/`
SunSolve[SM] web site. Contains links to software patches. Lists some system specifications, troubleshooting and maintenance information, and other tools.	`http://www.sunsolve.sun.com/handbook_pub/`
SunService support phone numbers.	1-800-872-4786 (1-800-USA-4Sun), select Option 1
Lists international telephone numbers for SunService support.	`http://www.sun.com/service/contacting/solution.html`
Warranty and contract support contacts. Links to other service tools.	`http://www.sun.com/service/warrantiescontracts/`
Warranties for every Sun product.	`http://www.sun.com/service/support/warranty`

APPENDIX **A**

Updating the Firmware

The ILOM `load` command updates both the service processor firmware and the server firmware.

Updating the Firmware

The flash image consists of the following components:

- Service processor firmware
- BIOS and POST
- Reset/Config
- Sequencer
- Partition description

▼ Update the Firmware

1. **Ensure that the ILOM service processor network management (NET MGT) port is configured.**

   This action is required to access the new flash image over the network..

2. **Open an SSH session to connect to the service processor ILOM CLI:**

```
% ssh root@xx.xxx.xx.x
...
Are you sure you want to continue connecting (yes/no)? yes
...
Password: password (nothing displayed)
Waiting for daemons to initialize...
```

```
Daemons ready

Sun(TM) Integrated Lights Out Manager

Version 2.0.0.0

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Use is subject to license terms.

->
```

3. **Verify that the host is powered off.**

   If the host is not powered off, type the `stop /SYS` command.

```
-> stop /SYS
```

4. **Type the `load` command.**

   The `load` command requires the following information:

   - IP address of a TFTP server on the network that can access the flash image
   - Full path name to the flash image that the IP address can access

   The command usage is as follows:

   `load [-script] -source tftp://`*xxx.xxx.xx.xx/pathname*

   where:

   - `script` – Does not prompt for confirmation, and acts as if yes was specified
   - `source` – Specifies the IP address and full path name (URL) to the flash image

```
-> load -source tftp://xxx.xxx.xx.xx/pathname
 NOTE: A firmware upgrade will cause the server and ILOM to
       be reset. It is recommended that a clean shutdown of
       the server be done prior to the upgrade procedure.
       An upgrade takes about 6 minutes to complete. ILOM
       will enter a special mode to load new firmware. No
       other tasks can be performed in ILOM until the
       firmware upgrade is complete and ILOM is reset.

Are you sure you want to load the specified file (y/n)? y
Do you want to preserve the configuration (y/n)? y
.............................................................

Firmware update is complete.
ILOM will now be restarted with the new firmware.
```

```
Update complete. Reset device to use new image.

->
```

After the flash image has been updated, the system automatically resets.

The service processor resets, runs diagnostics, and returns to the login prompt (on the serial console), similar to the following code example.

```
U-Boot 1.1.1 (May 23 2007 - 21:30:12)
...
POST cpu PASSED
POST ethernet PASSED
Hit any key to stop autoboot:  0
## Booting image at fe080000 ...

IP Protocols: ICMP, UDP, TCP, IGMP

Checking all file systems...
fsck 1.37 (21-Mar-2005)
Setting kernel variables ...
... done.
Mounting local filesystems...
Cleaning /tmp /var/run /var/lock.

Identifying DOC Device Type(G3/G4/H3) ...
OK

Configuring network interfaces...Internet Systems Consortium DHCP
Client V3.0.1
Copyright 2007 Internet Systems Consortium.
All rights reserved.
For info, please visit http://www.isc.org/products/DHCP

eth0: config: auto-negotiation on, 100FDX, 100HDX, 10FDX, 10HDX.
Listening on LPF/eth0/00:14:4f:3f:8c:af
Sending on   LPF/eth0/00:14:4f:3f:8c:af
Sending on   Socket/fallback
DHCPDISCOVER on eth0 to 255.255.255.255 port 67 interval 6
eth0: link up, 100 Mbps Full Duplex, auto-negotiation complete.
DHCPDISCOVER on eth0 to 255.255.255.255 port 67 interval 15
Hostname: hostname.
Starting portmap daemon: portmap.
Initializing random number generator...done.
INIT: Entering runlevel: 3
Starting system log daemon: syslogd and klogd.
Starting periodic command scheduler: cron.
Starting IPMI Stack..... Done.
Starting OpenBSD Secure Shell server: sshd.
```

```
Starting Servicetags listener: stlistener.
Starting FRU update program: frutool.

hostname login:
```