Netra™ 440 Server Installation Guide

Sun Microsystems, Inc.
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Preface

The *Netra 440 Server Installation Guide* provides instructions, some background information, and reference material to help you install a new Netra™ 440 server. Instructions in most of the document assume that a system administrator who is experienced with the Solaris™ Operating System (Solaris OS) is performing the installation. However, you do not need Solaris OS experience to follow instructions in Chapter 3, which detail the installation of the Netra 440 server into a rack.

How This Book Is Organized

This guide is organized into three chapters and three appendixes.

Chapter 1 illustrates the contents of the Netra 440 server ship kit and provides guidelines for planning the installation.

Chapter 2 provides an installation overview for the Netra 440 server.

Chapter 3 provides instructions for installing the Netra 440 server into a rack.

Chapter 4 provides instructions for cabling the Netra 440 server.

Chapter 5 provides instructions for connecting a system console device to the Netra 440 server.

Chapter 6 provides instructions for powering on the server and for installing additional software.

Appendix A provides instructions for installing a DVD-ROM drive into the Netra 440 server.

Appendix B includes information on the system LEDs.

Appendix C provides instructions for selecting a boot device.

Appendix D provides instructions for managing network interfaces.

Using UNIX Commands

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

- Software documentation that you received with your system
- Solaris™ operating environment documentation, which is at

  http://docs.sun.com

Shell Prompts

Shell	Prompt
C shell	*machine-name*%
C shell superuser	*machine-name*#
Bourne shell and Korn shell	$
Bourne shell and Korn shell superuser	#

Typographic Conventions

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

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

Related Documentation

Application	Title	Part Number
Late-breaking product information	*Netra 440 Server Product Note*	817-3885-xx
Product description	*Netra 440 Server Product Overview*	817-3881-xx
Administration	*Netra 440 Server System Administration Guide*	817-3884-xx
Parts installation and removal	*Netra 440 Server Service Manual*	817-3883-xx
Diagnostics and troubleshooting	*Netra 440 Server Diagnostics and Troubleshooting Guide*	817-3886-xx
Advanced Lights Out Manager (ALOM) system controller	*Sun Advanced Lights Out Manager User's Guide for the Netra 440 Server*	817-5481-xx

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

Netra 440 Server Installation Guide, part number 817-3882-11

Preparing for Installation

This chapter includes a description of the components of the Netra 440 server and a set of questions that the system administrator must answer before installing the server software.

This chapter contains the following sections:

Shipping Kit

Standard components of Netra 440 servers are installed at the factory. However, if you ordered options such as a PCI card and monitor, these are shipped to you separately.

Check that you have received everything you ordered.

Note – Inspect the shipping carton for evidence of physical damage. If a shipping carton is 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.

Verifying All Parts

Verify that you have received all the parts of your system. See the illustration below to identify most of the parts shipped with the system.
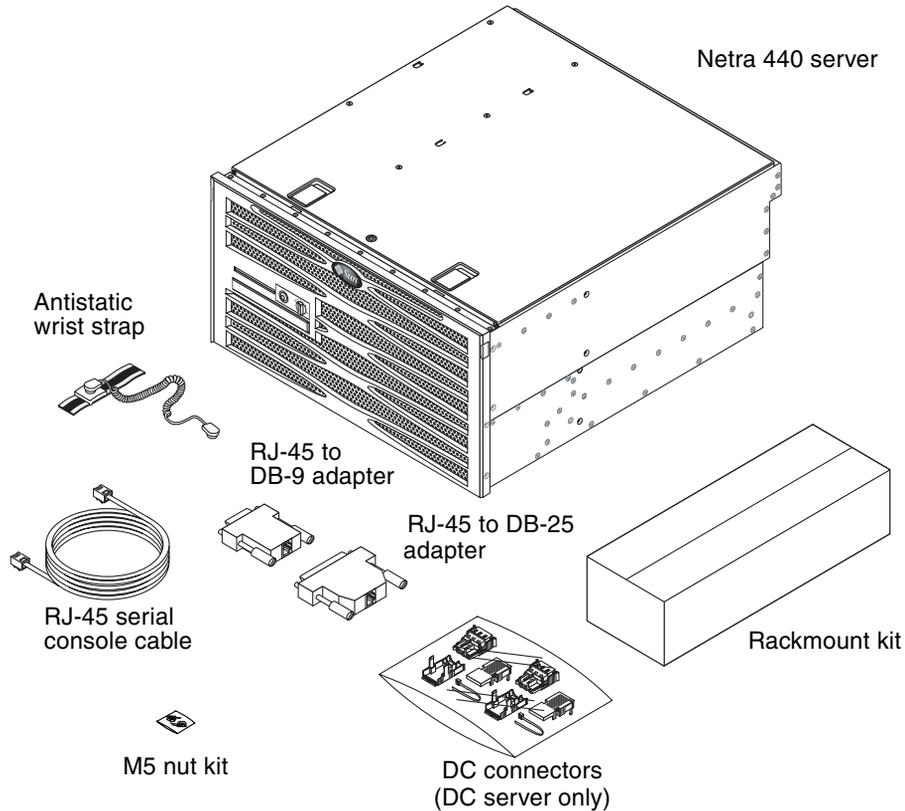
FIGURE 1-1   Netra 440 Server Ship Kit Contents

Note – The DC connector assembly kit is for the DC-powered server only. If you have an AC-powered server, please dispose of this DC connector kit.

Installation Site Requirements

This section provides the specifications and site requirements you may need when planning the installation of the Netra 440 server. For safety and compliance information, refer to the *Netra 440 Safety and Compliance Manual* (817-6225-xx) and the *Important Safety Information for Sun Hardware Systems* document (816-7190-xx) that came with your system.

Physical Dimensions

TABLE 1-1   Physical Specifications, Netra 440 Server

Measure	U.S.	Metric
Width	17.32 inches	440.0 mm
Depth	19.5 inches	495 mm
Height	8.75 inches (5 rack units)	222 mm
Weight (without PCI cards and rack mounts)	79.4 lbs	36 kg
Weight (fully configured with 19-inch 4-post hardmount rack option)	81.6 lbs	37 kg

Environmental Requirements

You can operate and store the Netra 440 server safely in the conditions detailed in TABLE 1-2.

TABLE 1-2   Netra 440 Server Operating and Storage Specifications

Specification	Operating	Storage
Ambient temperature	5°C (41°F) to 40°C (104°F) Short term*: -5°C (23°F) to 55°C (131°F)	-40°C (-40°F) to 70°C (158°F)
Relative humidity	5% to 85% relative humidity, noncondensing Short term*: 5% to 90% relative humidity, noncondensing, but not to exceed 0.024 kg water/kg dry air (0.053 lbs. water/2.205 lb. dry air)	Up to 93% relative humidity noncondensing, 38°C (100.4°F) max wet bulb
Altitude	Up to 3000 m (9842.4 ft.)	Up to 12000 m (39369.6 ft.)

* Short term (no more than 96 hours) temperature and humidity limits apply to servers with altitudes up to 1800 m (5905.44 ft.).

AC Operating Power Limits and Ranges

The information in this section applies to the AC version of the Netra 440 server. TABLE 1-3 gives AC power source requirements for each power supply in the Netra 440 server, and TABLE 1-4 gives AC power source requirements for the Netra 440 server as a whole.

TABLE 1-3   AC Operating Power Limits and Ranges for Each Power Supply in the Netra 440 Server

Description	Limit or Range
Operating input voltage range	90 - 264 VAC
Operating frequency range	47 - 63 Hz
Maximum operating input current	5.5 A @ 90 VAC
Maximum operating input power	500 W

TABLE 1-4 AC Operating Power Limits and Ranges for the Netra 440 Server

Description	Limit or Range
Operating input voltage range	90 - 264 VAC
Operating frequency range	47 - 63 Hz
Maximum operating input current	11 A @ 90 VAC
Maximum operating input power	1000 W

Note – The figures for the maximum operating current are provided to help you specify the fusing and cabling you need to deliver power to your equipment. However, these figures represent worst-case scenarios.

DC Power Source Requirements

The information in this section applies to the DC version of the Netra 440 server. TABLE 1-5 gives DC power source requirements for each power supply in the Netra 440 server, and TABLE 1-6 gives DC power source requirements for the Netra 440 server as a whole.

TABLE 1-5 DC Operating Power Limits and Ranges for Each Power Supply in the Netra 440 Server

Description	Limit or Range
Operating input voltage range	-40 VDC to -75 VDC
Maximum operating input current	11.5 A
Maximum operating input power	450 W

TABLE 1-6 DC Operating Power Limits and Ranges for the Netra 440 Server

Description	Limit or Range
Operating input voltage range	-40 VDC to -75 VDC
Maximum operating input current	23 A
Maximum operating input power	900 W

- Reliably connected to protected earth ground
- May be supplied by one or two power sources, isolated from each other

- Capable of providing up to 500 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 Netra 440 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

- Suitable conductor material: Use copper conductors only
- Power supply connections through the input connector: 12 AWG (between the Netra 440 server and the source). There are three conductors:
  - -48V (negative terminal)
  - Chassis ground connection
  - -48V Return (positive terminal)
- System ground conductor: 12 AWG (to be connected to the chassis)
- Cable insulation rating: Minimum of 75°C (167°F), low smoke fume (LSF), flame retardant
- Only one of the following cable types:
  - UL style 1028 or other UL 1581(VW-1) compliant equivalent
  - IEEE 383 compliant
  - IEEE 1202-1991 compliant
- Branch circuit cable insulation color: According to applicable National Electrical Codes
- Grounding cable insulation color: Green/yellow

Overcurrent Protection 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 Netra 440 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 must be approved for the intended application.

Recommended Operating Environment

Your environmental control system must provide intake air for the server which complies with the limits specified in "Environmental Requirements" on page 4.

To avoid overheating, *do not* direct warmed air:

- Toward the front air intake of the server
- Toward the server access panels

Note – When you receive your system, place it in the environment in which you will install it. Leave it in its shipping crate at its final destination for 24 hours. This resting period prevents thermal shock and condensation.

The system has been tested to meet all functional requirements when operating in the operating environmental limits presented in "Environmental Requirements" on page 4. Operating computer equipment in extremes of temperature or humidity increases the failure rate of hardware components. To minimize the chance of component failure, use the server within the optimal temperature and humidity ranges.

Ambient Temperature

An ambient temperature range of 21˚C (69.8˚F) to 23˚C (73.4˚F) is optimal for system reliability. At 22˚C (71.6˚F) it is easy to maintain safe relative humidity levels. Operating in this temperature range provides a buffer if the environmental support systems fail.

Ambient Relative Humidity

Ambient relative humidity levels between 45% and 50% are the most suitable for data processing operations in order to:

- Prevent corrosion
- Provide an operating time buffer in the event of environmental control system failure
- Help avoid failures caused by the intermittent interference from static discharges that occur when relative humidity is too low

Electrostatic discharge (ESD) is easily generated and less easily dissipated in areas where the relative humidity is below 35%, and becomes critical when levels drop below 30%.

Airflow Considerations

- Ensure unobstructed airflow through the chassis.

- Inlet air enters at the front of the server and exits from the back.

- Ventilation openings such as cabinet doors, for both the inlet and exhaust of the server should provide a minimum open area of 215 cm^2 (33.325 in^2) each. This equates to a 60% open area perforation pattern across the front and rear area of the server (445 mm x 81 mm; 17.5 in x 3.2 in). The impact of other open area characteristics that are more restrictive should be evaluated by the user.

- Front and rear clearance of the server should allow a minimum of 5 mm (.2 in) at the front of the system and 80 mm (3.1 in) at the rear of the server when mounted. These clearance values are based on the above inlet and exhaust impedance (available open area) and assume a uniform distribution of the open area across the inlet and exhaust areas. Clearance values greater than these are recommended for improved cooling performance.

Note – The combination of inlet and exhaust restrictions such as cabinet doors and the spacing of the server from the doors can affect the cooling performance of the system and should be evaluated by the user. The server placement is particularly important for high temperature NEBS environments where the server inlet ambient temperature is 55˚C (131˚F).

- Care should be taken to prevent recirculation of exhaust air within a rack or cabinet.

- Cables should be managed to minimize interfering with the server exhaust vent.

- Air temperature rise through the system is approximately 15˚C (59˚F).

Acoustic Noise Emissions

The acoustic noise emissions on a Netra 440 server are as follows:

- Operating acoustic noise is 7.0 B (LWAd (1B=10dB))
- Idling acoustic noise is 7.0 B (LWAd (1B=10dB))

Declared noise emissions are in accordance with ISO 9296 standards.

Calculating Heat Dissipation

To calculate the heat generated by a server so that you can estimate the heat your cooling system must dissipate, convert the figure for the system's power requirement from Watts to BTU/hr. A general formula for doing this is to multiply the power requirement figure in Watts by 3.412.

NEBS Level 3 Compliance

Telcordia certified that the DC-powered version of the Netra 440 server meets NEBS Level 3 requirements per SR-3580, including the appropriate sections of GR-63-CORE (*Network Equipment-Building System Requirements: Physical Protection*) and GR-1089-CORE (*Electromagnetic Compatibility and Electrical Safety – Generic Criteria for Network Telecommunications Equipment*).

Sun Advanced Lights Out Manager

The Netra 440 server ships with the Sun Advanced Lights Out Manager (ALOM) software preinstalled. By default, the system console is directed to ALOM and is configured to show server console information on startup.

ALOM enables you to monitor and control your server over either a serial connection (using the SERIAL MGT port), or Ethernet connection (using the NET MGT port). See Chapter 4 for the location of these and other ports. For information about configuring an ALOM Ethernet connection, refer to the *Sun Advanced Lights Out Manager User Guide for the Netra 440 Server* (817-5481-xx).

Note – The ALOM serial port, labelled SERIAL MGT, is for server management only. If you need a general purpose serial port, use the standard TTYB serial port. See Chapter 4 for the location of these serial ports.

ALOM can be configured to send e-mail notifications of hardware failures and other events related to the server or to ALOM.

The ALOM circuitry uses standby power from the server, which means:

- ALOM is active as soon as the server is connected to a power source, and remains active until power is removed by unplugging the power cables.
- ALOM continues to be effective even when the operating system is offline and when the server is in Standby mode.

TABLE 1-7 lists the components monitored by ALOM and describes the information provided for each component.

TABLE 1-7 ALOM Component Monitoring

Component Monitored	What ALOM Reveals
Disk drives	Whether each slot has a drive present, and whether it reports OK status
Fans	Whether a fan is present, fan speed and whether the fans report OK status
CPUs	Whether a CPU is present, the temperature measured at the CPU, and any thermal warning or failure conditions
Power supplies	Whether each bay has a power supply present, and whether it reports OK status
System enclosure temperature	System ambient temperature, as well as any enclosure thermal warning or failure conditions
Circuit breakers and voltages	Whether circuit breakers have been tripped, and whether correct voltages are reported
Server front panel	System rotary switch position and status of LEDs
Alarm port	Status of the alarm port

Sun Install Check Tool

The Netra 440 server supports the Sun Install Check tool, which can confirm that your server has been installed successfully. The Install Check software is designed to check the initial server installation and tests your server for:

- Minimum required Solaris OS level
- Presence of key critical patches
- Proper firmware levels
- Unsupported hardware components

If potential issues are identified, the software generates a report that provides specific instructions to remedy the issues.

You can download the Sun Net Connect software and documentation at:

http://www.sun.com/software/installcheck/

Sun Remote Services Net Connect Support

The Netra 440 server supports the Sun^{SM} Remote Services (SRS) Net Connect monitoring services. The SRS Net Connect web services give you the ability to self-monitor systems, create performance and trend reports, and receive automatic notifications so you can act more quickly when a system event occurs and manage potential issues before they become problems.

For more information about SRS Net Connect, including how to sign up and download the documentation, refer to the SRS Net Connect web site at:

`http://www.sun.com/service/support/srs/netconnect/`

Note – The *Net Connect Installation Guide* contains installation instructions specific to the Netra 440 server. This guide can be downloaded after signing up for the service.

Installation Overview

This chapter lists the steps in a typical Netra 440 server installation and contains the procedures that must be performed before installing the server in a rack.

This chapter contains these topics:

- "Installation Overview" on page 13
- "Installing Optional Components" on page 15

Installation Overview

Each step in this task list refers you to the relevant section of the documentation for more information. Complete each step in the order listed.

1. Verify that you have received all of the components that ship with your server.

   See FIGURE 1-1 for the ship kit contents.

2. Install any optional components shipped with your system.

   If you have purchased optional components such as additional memory, install them prior to mounting the server in a rack. See "Installing Optional Components" on page 15 for more information.

3. Mount the server into a rack or cabinet.

   See Chapter 3 for rackmount installation instructions.

4. Connect the chassis grounding cable.

   See "Connecting the Chassis Grounding Cable (DC Version)" on page 49.

5. Connect the serial, network, and all other data cables to the server.

   See "Connecting All Other Cables" on page 50.

6. Assemble and connect the input power cables to the server.

   See "Assembling and Connecting the DC Input Power Cable" on page 60 for complete instructions.

7. Set up a terminal or console for installing your server.

   See Chapter 5 for complete instructions.

8. Gather configuration information for your system.

   See the "Configuring the Server" on page 85.

9. (Optional) Set any desired OpenBoot™ PROM configuration options.

   You can control several aspects of system behavior through OpenBoot PROM commands and configuration variables. Refer to the *OpenBoot 4.x Command Reference Manual* (816-1177-*xx*) and the *Netra 440 Server System Administration Guide* (817-3884-*xx*) for OpenBoot command information.

10. Confirm that the Ethernet connection is attached to the server.

11. Check whether the rotary switch is in the Normal position.

    See "Setting the Rotary Switch" on page 82.

12. Power on the server by either pressing the On/Standby button on the front panel or from a keyboard using the ALOM software.

    See "Powering On the Server" on page 81.

13. Configure the server software.

    The Solaris operating system is preinstalled on the server. When you power on, you are automatically guided through the Solaris operating system configuration procedure. See "Configuring the Server" on page 85 for more information.

14. Install any required patch or patches to the server.

    Refer to the *Netra 440 Server Release Notes* (817-3885-xx) for a list of the required patches.

15. 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. See the documentation provided with the media kit for a complete listing of included software and detailed installation instructions.

Installing Optional Components

The standard components of the Netra 440 server are installed at the factory. However, if you ordered options such as additional memory or a PCI card, these will be shipped separately. If possible, install these components prior to installing the server in a rack.

- If you ordered a DVD drive, go to Appendix A for installation instructions.
- If you ordered any other options that are not factory-installed, see the *Netra 440 Server Service Manual* (817-3883-xx) for installation instructions.

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

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

Note – The optional component list might be updated at any time. Refer to the Sun Store[SM] web site (http://store.sun.com) for the most current list of Netra 440 server supported components.

Installing a Netra 440 Server Into a Rack

This chapter provides instructions for installing the Netra 440 server into a rack, and contains the following sections:

Caution – The server is heavy. Two people are required to lift and mount the system into a rack enclosure when using the procedures in this chapter.
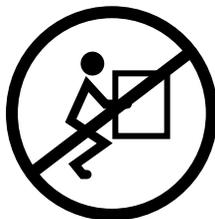
Before starting any of the following rackmounting procedures, identify a helper to assist you in installing the server. Verify that your helper can safely lift and carry 42 lbs. (19 kg), which is approximately half the weight of a fully-equipped server.

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

Rackmounting Options

The Netra 440 server ships with a 19-inch, 4-post hardmount rack kit (see "Hardmount in a 19-Inch 4-Post Rack" on page 19 for installation instructions). TABLE 3-1 lists the four additional rackmount kit options that can be ordered from Sun. This chapter provides installation instructions for all of these rackmount kit options.

TABLE 3-1   Optional Rackmount Kits

Order Number	Mounting Kit	Installation Instructions
X8100A	19-inch 4-post slide mount kit	"Sliding Rail Mount in a 19-Inch 4-Post Rack" on page 24
X7905A	600 mm x 600 mm rackmount kit	"Hardmount in a 600 mm 4-Post Rack" on page 34
X7903A	23-inch 2-post rackmount kit	"Hardmount in a 23-Inch 2-Post Rack" on page 40

Hardmount in a 19-Inch 4-Post Rack

The hardmount kit for a 19-inch 4-post rack consists of:

- Two hardmount brackets
- Two rear mount support brackets
- Two rear mount flanges
- Two bags of screws
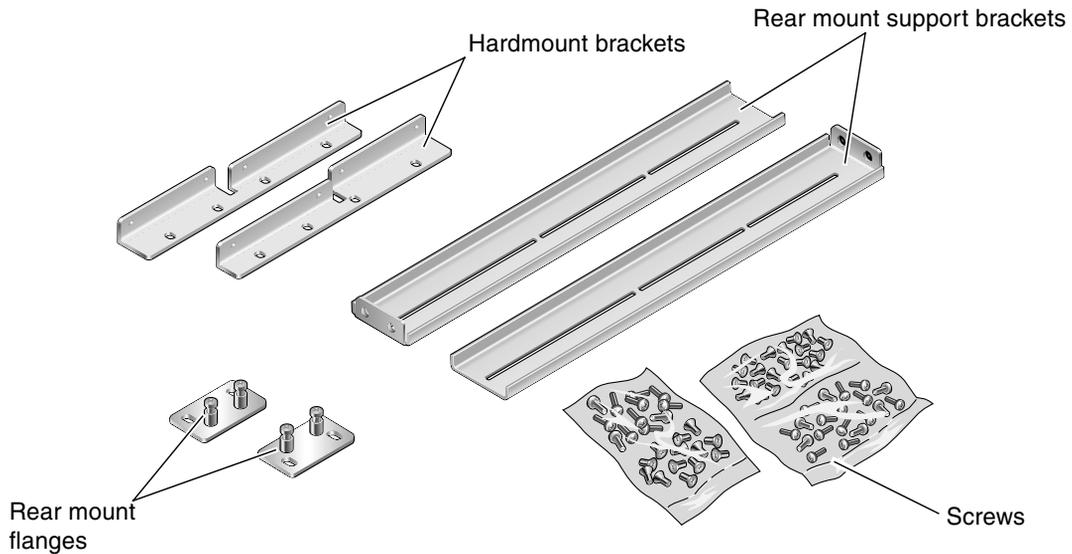
FIGURE 3-1 Contents of the Hardmount 19-Inch 4-Post Kit

TABLE 3-2 19-inch 4-Post Rackmount Screw Kit Contents

Number	Description	Where Used
8	M5 x 8 mm Phillips flathead screws	8 for hardmount brackets
6	M5 x 8 mm Phillips panhead screws	4-6 for rear mount brackets (depending on rack depth)
12	M5 x 12 mm screws	12 for rack, if appropriate
12	M6 x 12 mm screws	12 for rack, if appropriate
12	M6 square clip nuts	12 for rack, if appropriate
12	10-32 x 0.5 in. combo head screws	12 for rack, if appropriate
12	12-24 x 0.5 in. combo head screws	12 for rack, if appropriate

1. **Get the front hardmount brackets from the rack kit (**FIGURE 3-1**).**

2. **Using eight of the supplied M5 × 8 mm flathead Phillips screws (four screws for each bracket), secure the front hardmount brackets to the sides of the server (**FIGURE 3-2**).**

FIGURE 3-2   Securing the Hardmount Brackets to the Server

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

4. **Get the two rear mount support brackets from the rack kit (**FIGURE 3-1**).**

5. **Install the rear mount support brackets at the rear of the server, extending the rear mount support brackets to the measured depth of the rack (**FIGURE 3-3**).**

   Use two to three of the supplied M5 × 8 mm panhead Phillips screws for each bracket, depending on the rack depth. If your rack is especially deep, you may only be able to secure the rear mount support brackets using only two screws per side.
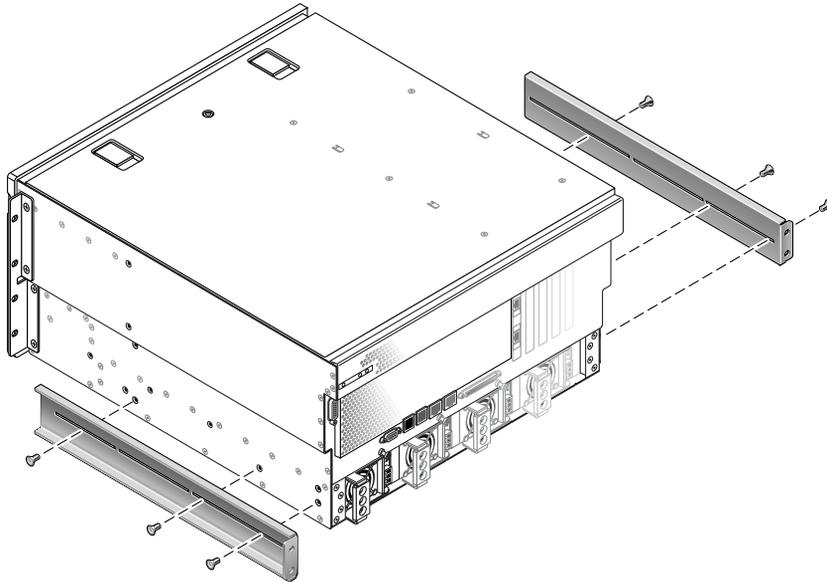
FIGURE 3-3 Attaching the Rear Mount Support Brackets

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

7. **Using four screws per side, secure the front hardmount brackets attached to the sides of the server to the front of the rack (**FIGURE 3-4**).**

   The size of the screws varies, depending on your particular rack.
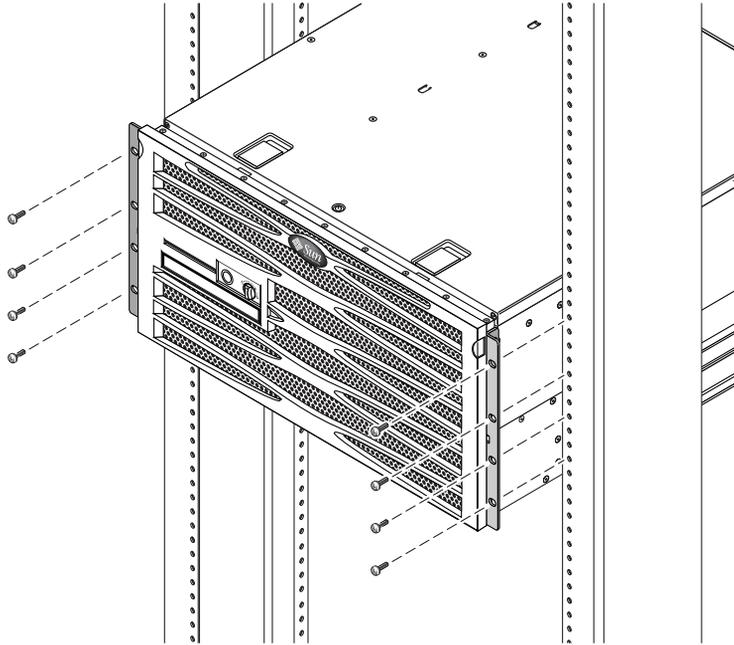
FIGURE 3-4   Securing the Front of the Server to the Rack

8. **Get the two rear mount flanges from the rack kit (**FIGURE 3-1**).**

9. **At the rear of the rack, use the two captive screws to secure the two rear mount flanges to the rear mount support brackets that are attached to the server (**FIGURE 3-5**).**

Captive screws to
secure flange to
rear of server

Screws to secure
flange to rack
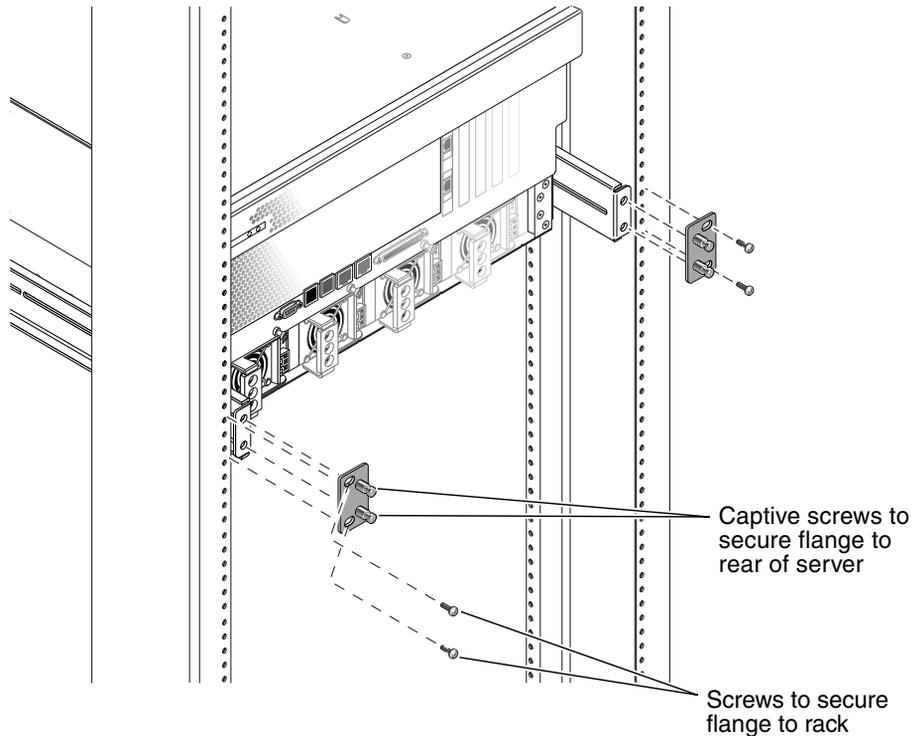
FIGURE 3-5   Securing the Rear of the Server to the Rack

10. **Using two screws for each rear mount support bracket, secure the rear mount support brackets to the rear of the rack (**FIGURE 3-5**).**

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

Sliding Rail Mount in a 19-Inch 4-Post Rack

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

- Two 19-inch 4-post Telco slide assemblies
- Two short brackets
- Two long brackets
- Two hardmount front brackets
- Bag of screws
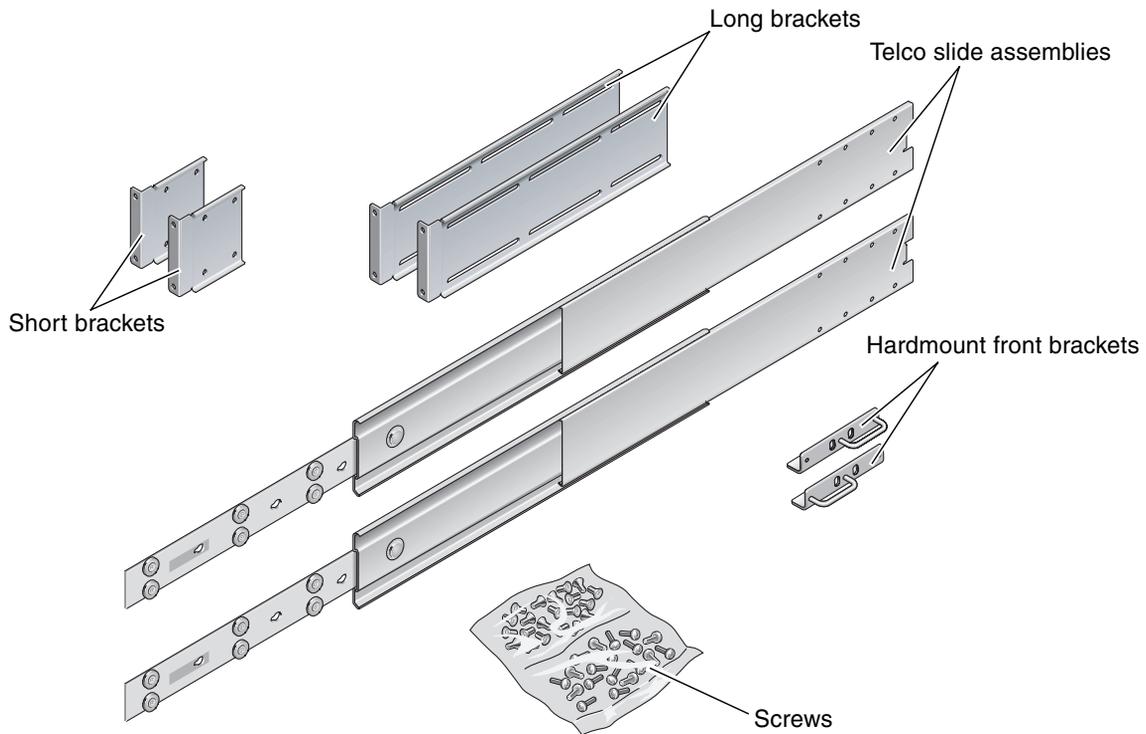
FIGURE 3-6 Contents of the Sliding Rail 19-Inch 4-Post Kit

TABLE 3-3   Sliding Rail 19-inch 4-Post Rackmount Screw Kit Contents

Number	Description	Where Used
4	M5 x 8 mm Phillips flathead screws	4 for hardmount front brackets
8	Shoulder screws	8 for glides
10	M6 brass collar screws	4 for short brackets, 4 for long brackets, 2 extra
8	M5 panhead screws	8 for slides
12	M5 x 12 mm screws	12 for rack, if appropriate
12	M6 x 12 mm screws	12 for rack, if appropriate
12	M6 square clip nuts	12 for rack, if appropriate
12	10-32 x 0.5 in. combo head screws	12 for rack, if appropriate
12	12-24 x 0.5 in. combo head screws	12 for rack, if appropriate

1. **Get the hardmount brackets and M5 × 8 mm flathead Phillips screws from the rack kit (**FIGURE 3-6**).**

2. Using four of the supplied M5 $\times$ 8 mm flathead Phillips screws (two screws for each bracket), secure the hardmount brackets to the sides of the server (FIGURE 3-7**).**

Note that 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.
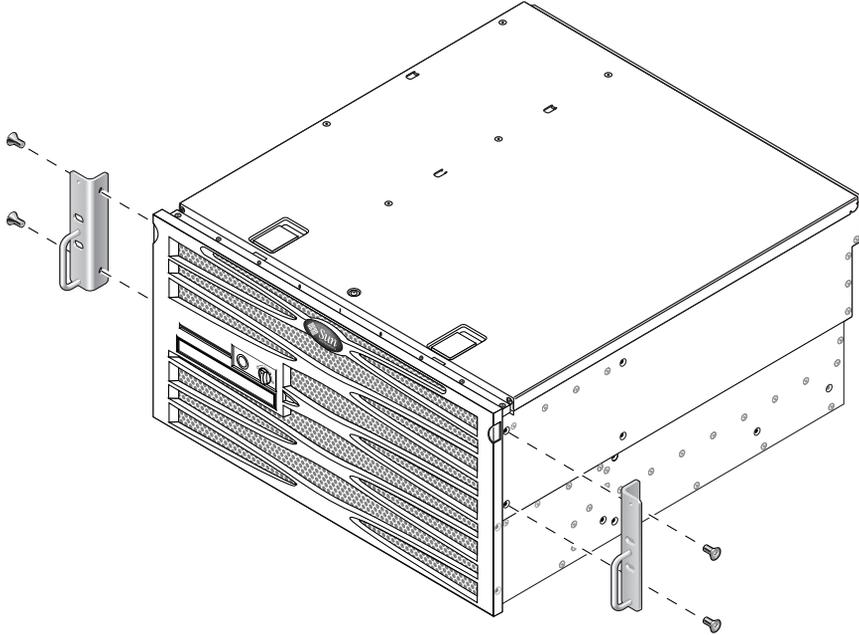
FIGURE 3-7 Securing the Hardmount Bracket to the Server

3. **Get the Telco 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**).**

Button

Slide (in two parts)
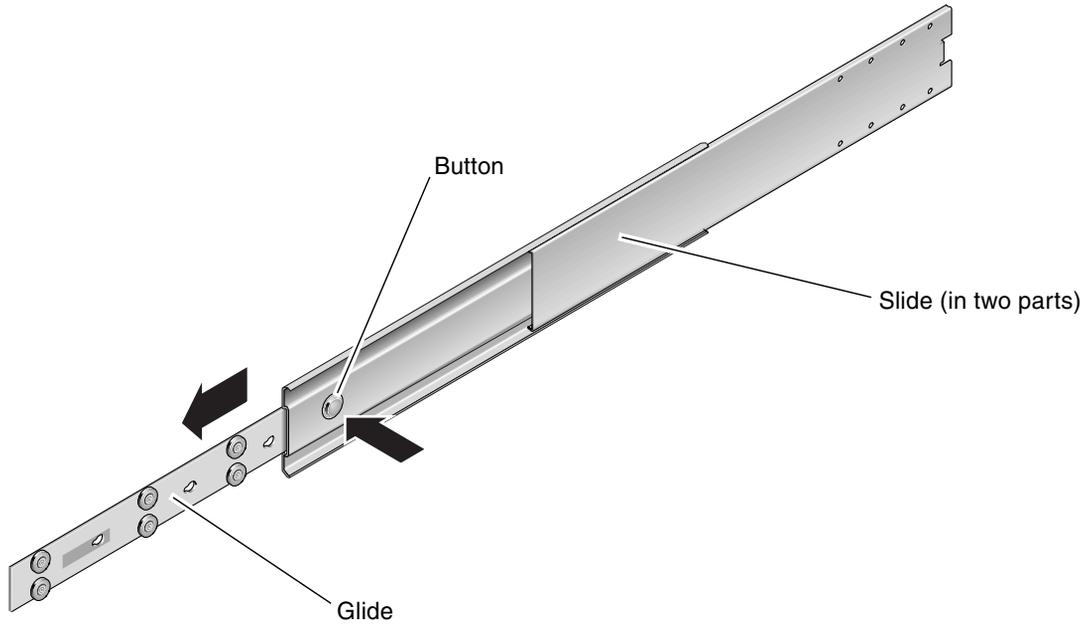
Glide

FIGURE 3-8 Dismantling the Slide

5. Align the holes in the glides with the appropriate holes on the sides of the server and, using the eight screws from the ship kit (four screws for each side), secure the glides to the sides of the server (FIGURE 3-9**).**
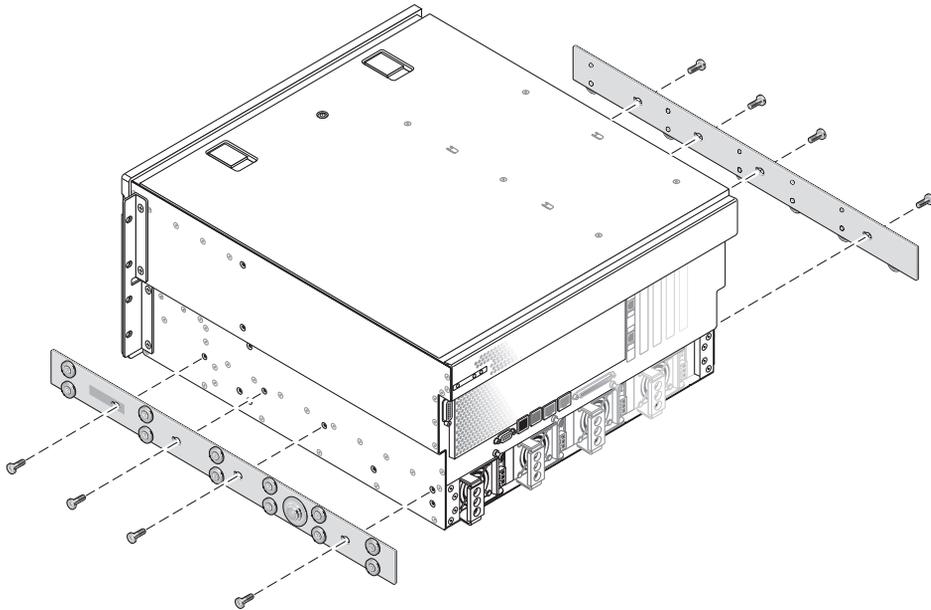
FIGURE 3-9   Securing the Glides to the System Chassis

6. **Get the short brackets and long brackets from the rackmount kit (**FIGURE 3-6**).**

7. **Lift each short bracket to the desired position at the *front* of the rack and attach a short bracket to each of the front rack uprights (**FIGURE 3-10**).**

   Use two of the brass M6 collar screws and M6 cage nuts (if required) to secure each bracket.
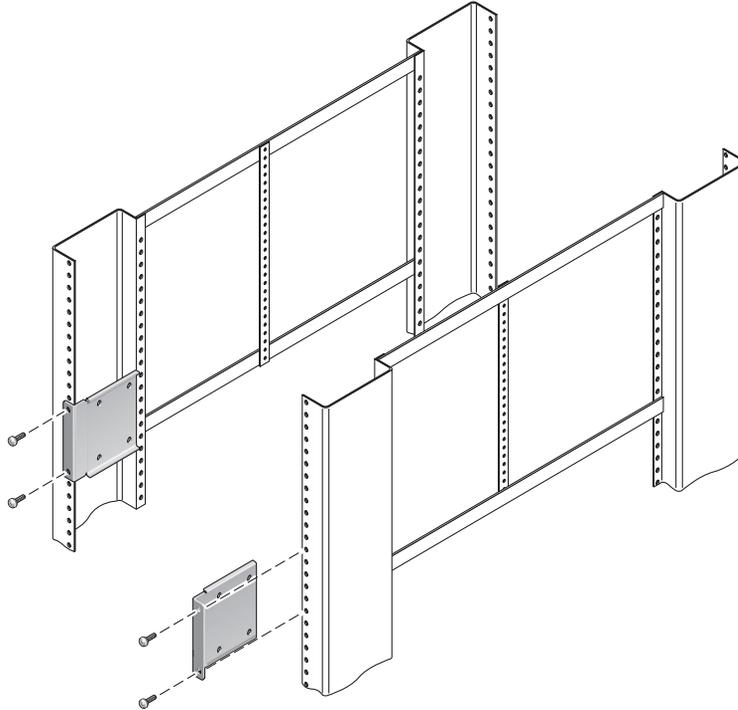
FIGURE 3-10 Securing the Short Brackets to the Front of the Rack

8. Lift each long bracket to the desired position at the *rear* of the rack and 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), exactly as you did for the front rack uprights in the previous step.
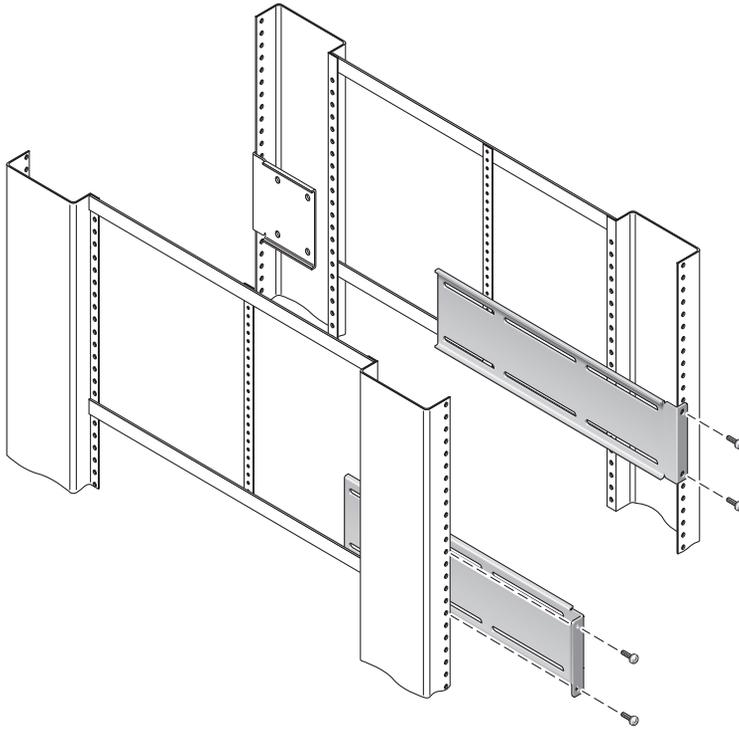
FIGURE 3-11 Securing the Long Brackets to the Rear of the Rack

9. **Extend a slide to line up the access holes with the front screw holes.**

10. **Using the M5 panhead screws (four for the short bracket and four for the long bracket), secure the slide onto the short and long brackets at the front and rear of the rack (**FIGURE 3-12**).**

Long bracket

Short bracket
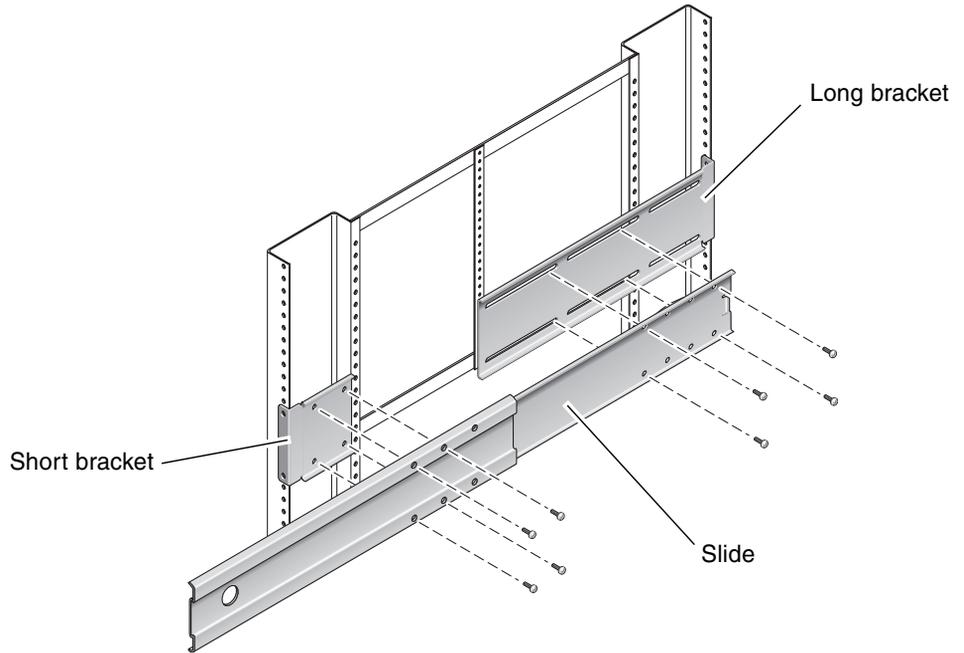
Slide

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 system 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, and the glides attached to the system 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 system all the way into the rack enclosure (**FIGURE 3-13**).**
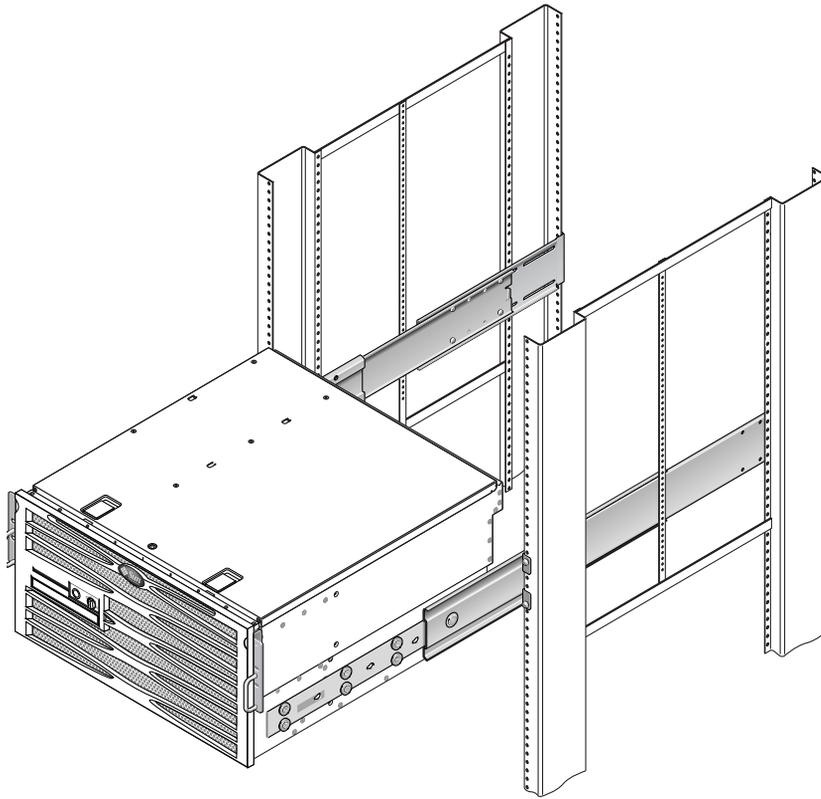
FIGURE 3-13 Sliding the System Into the Rack

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

The size of the screws varies, depending on your particular rack.
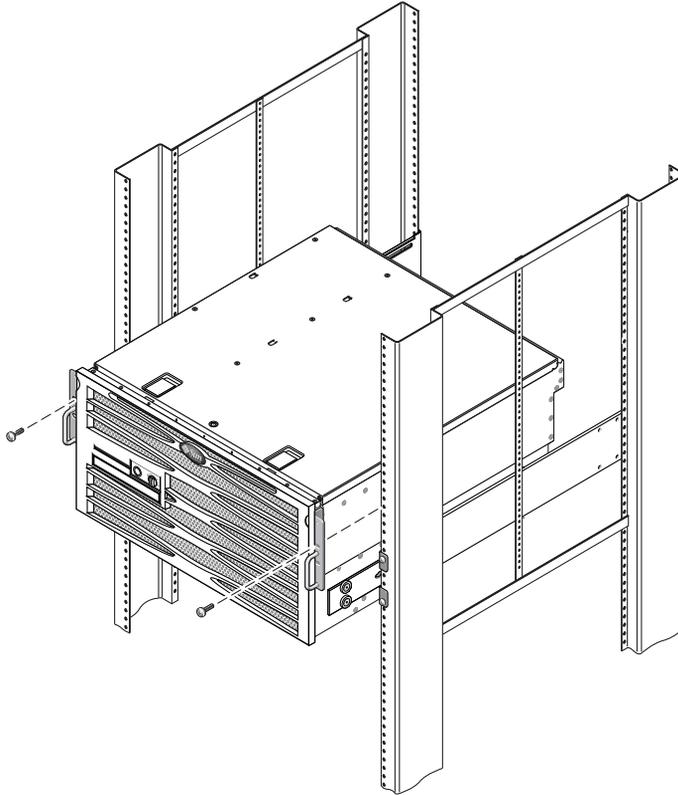
FIGURE 3-14 Securing the Front of the System to the Rack

Hardmount in a 600 mm 4-Post Rack

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

- Two rear mount flanges
- Two front adjuster brackets
- One bag of screws

You will also need the two hardmount brackets and two rear mount support brackets from the standard rackmount kit that came with the Netra 440 server (FIGURE 3-1).
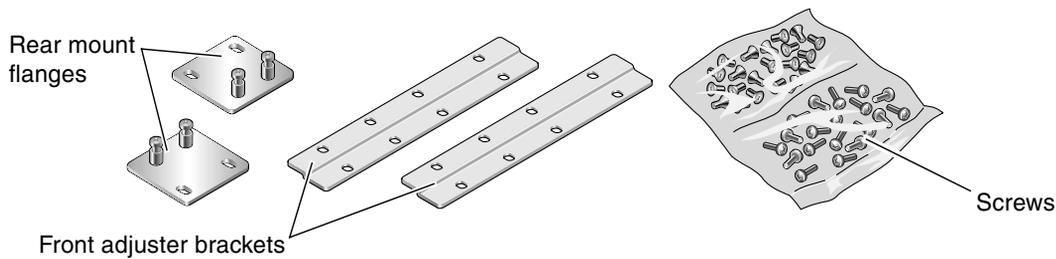
FIGURE 3-15 Contents of the Hardmount 600 mm 4-Post Kit

TABLE 3-4 Hardmount 600 mm 4-Post Rackmount Screw Kit Contents

Number	Description	Where Used
8	M5 x 8 mm Phillips flathead screws	8 for hardmount brackets
14	M5 x 8 mm Phillips panhead screws	8 for front adjuster brackets and 4-6 for rear mount brackets (depending on rack depth)
12	M5 x 12 mm screws	12 for rack, if appropriate
12	M6 x 12 mm screws	12 for rack, if appropriate
12	M6 square clip nuts	12 for rack, if appropriate
12	10-32 x 0.5 in. combo head screws	12 for rack, if appropriate
12	12-24 x 0.5 in. combo head screws	12 for rack, if appropriate

1. **Get the two front hardmount brackets from the standard rack kit (**FIGURE 3-1**).**

   These front hardmount brackets came as part of the standard Netra 440 server ship kit, not as part of the 600 mm four-post rackmount ship kit.

2. **Using eight of the supplied M5 × 8 mm flathead Phillips screws (four screws for each bracket), secure the front hardmount brackets to the sides of the server (**FIGURE 3-16**).**
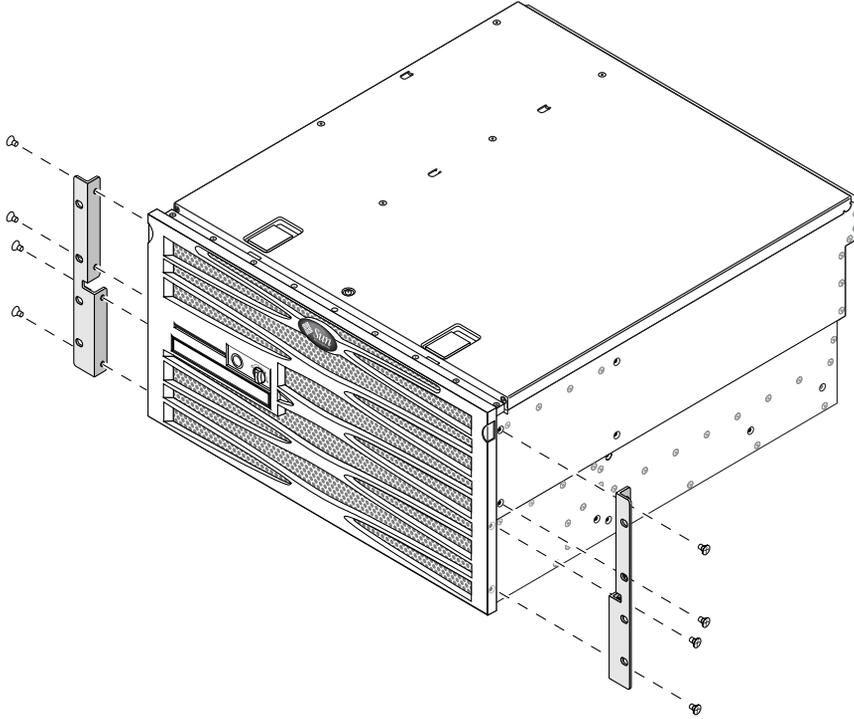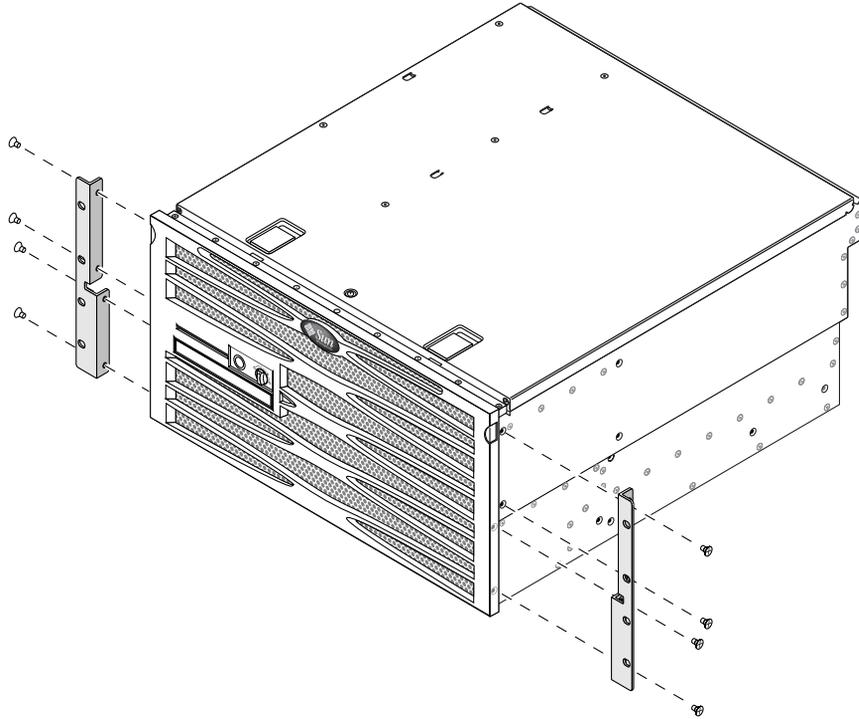

FIGURE 3-16 Securing the Hardmount Brackets to the Server

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

4. **Get the two rear mount support brackets from the standard rack kit (**FIGURE 3-1**).**

   These rear mount support brackets came as part of the standard Netra 440 server ship kit, not as part of the 600 mm four-post rackmount ship kit.

5. **Install the rear mount support brackets at the rear of the server, extending the rear mount support brackets to the measured depth of the rack (**FIGURE 3-17**).**

   Use two to three of the supplied M4 × 8 mm panhead Phillips screws for each bracket, depending on the rack depth. If your rack is especially deep, you may only be able to secure the rear mount support brackets using only two screws per side.
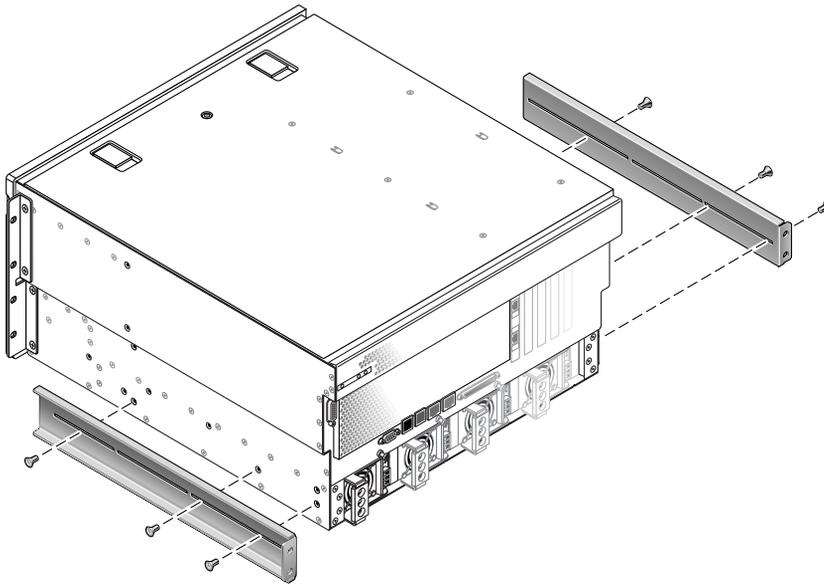
FIGURE 3-17 Attaching the Rear Mount Support Brackets

6. **Get the 600 mm front adjuster brackets from the rack kit (**FIGURE 3-15**).**

7. **Using eight of the supplied M5 × 8 mm panhead Phillips screws (four screws for each adjuster bracket), attach the 600 mm front adjuster brackets to the front hardmount brackets (**FIGURE 3-18**).**
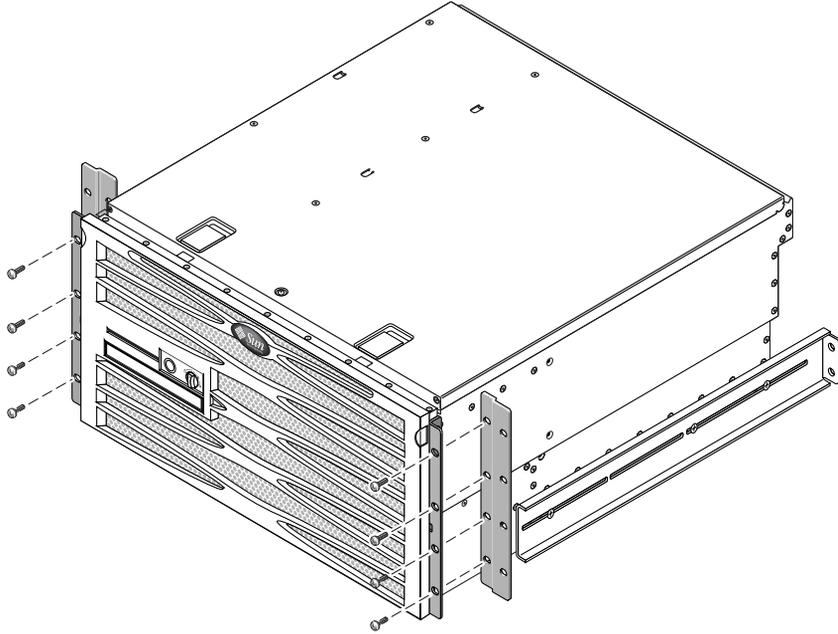
FIGURE 3-18 Attaching the 600 mm Front Adjuster Brackets to the Front Hardmount Brackets

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

9. **Using four screws per side, secure the 600 mm front adjuster brackets to the front of the rack (**FIGURE 3-19**).**

   The size of the screws varies, depending on your particular rack.
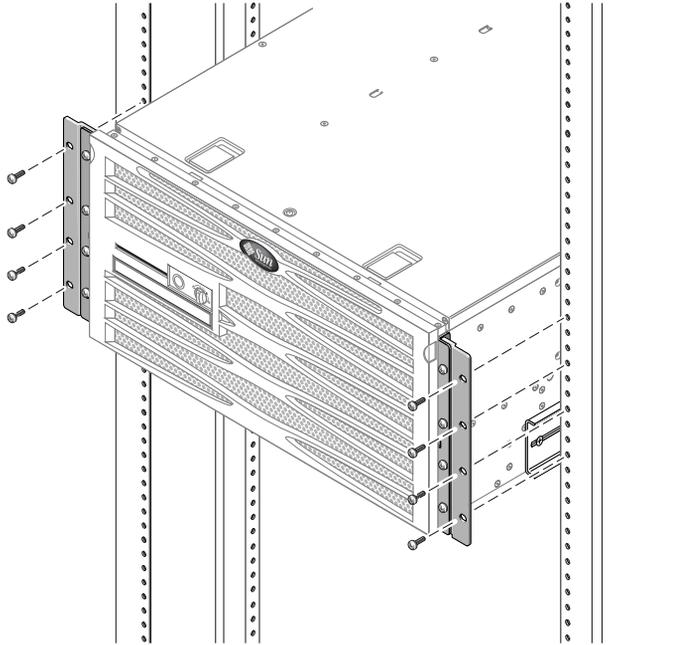
FIGURE 3-19 Attaching the 600 mm Front Adjuster Brackets to the Rack

10. **Get the two rear mount flanges from the rack kit (****).**

11. **At the rear of the rack, use the captive screws to secure the two rear mount flanges to the rear mount support brackets that are attached to the server (****).**

Captive screws to
secure flange to
rear of server

Screws to secure
flange to rack
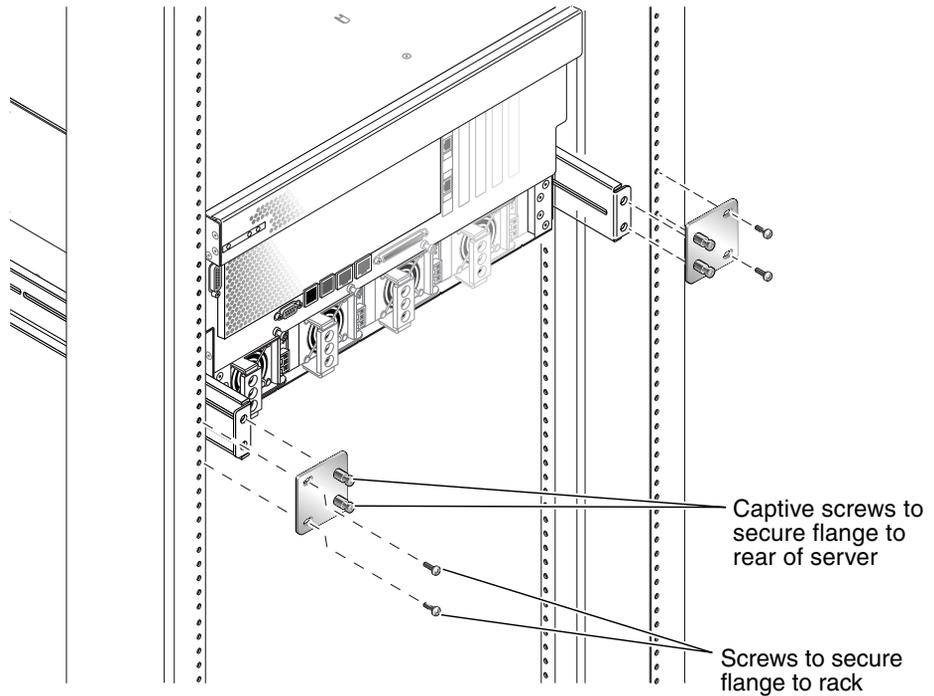
FIGURE 3-20 Securing the Rear Mount Flange

12. **Using two screws for each rear mount support bracket, secure the rear mount support brackets to the rear of the rack (****).**

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

Hardmount 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

Side brackets
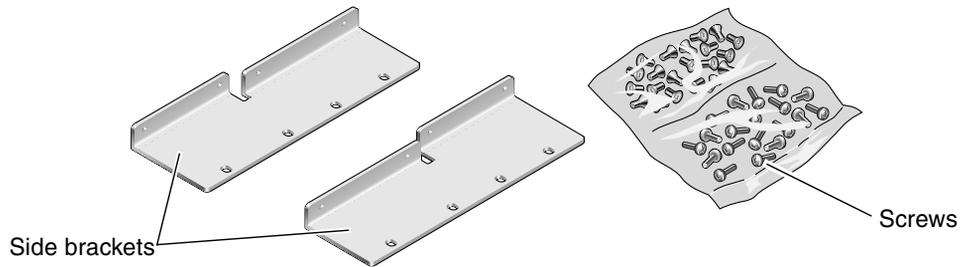
Screws

FIGURE 3-21 Contents of the Hardmount 23-Inch 2-Post Kit

TABLE 3-5 Hardmount 23-Inch 2-Post Rackmount Screw Kit Contents

Number	Description	Where Used
8	M5 x 8 mm Phillips panhead screws	8 for side brackets
12	M5 x 12 mm screws	12 for rack, if appropriate
12	M6 x 12 mm screws	12 for rack, if appropriate
12	M6 square clip nuts	12 for rack, if appropriate
12	10-32 x 0.5 in. combo head screws	12 for rack, if appropriate
12	12-24 x 0.5 in. combo head screws	12 for rack, if appropriate

1. **Get the side brackets from the rack kit (****).**

2. **Using eight of the M5 × 8 mm panhead Phillips screws (four for each side bracket), secure the side brackets to the sides of the server (****).**

   Note that the wide, flat side of the brackets are facing the *rear* of the server for this rackmount option, not the front.

FIGURE 3-22 Securing the Side Brackets to the Side of the Server

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

4. Using four screws per side, secure the front hardmount brackets attached to the sides of the server to the front of the rack (FIGURE 3-23**).**

The size of the screws varies, depending on your particular rack.
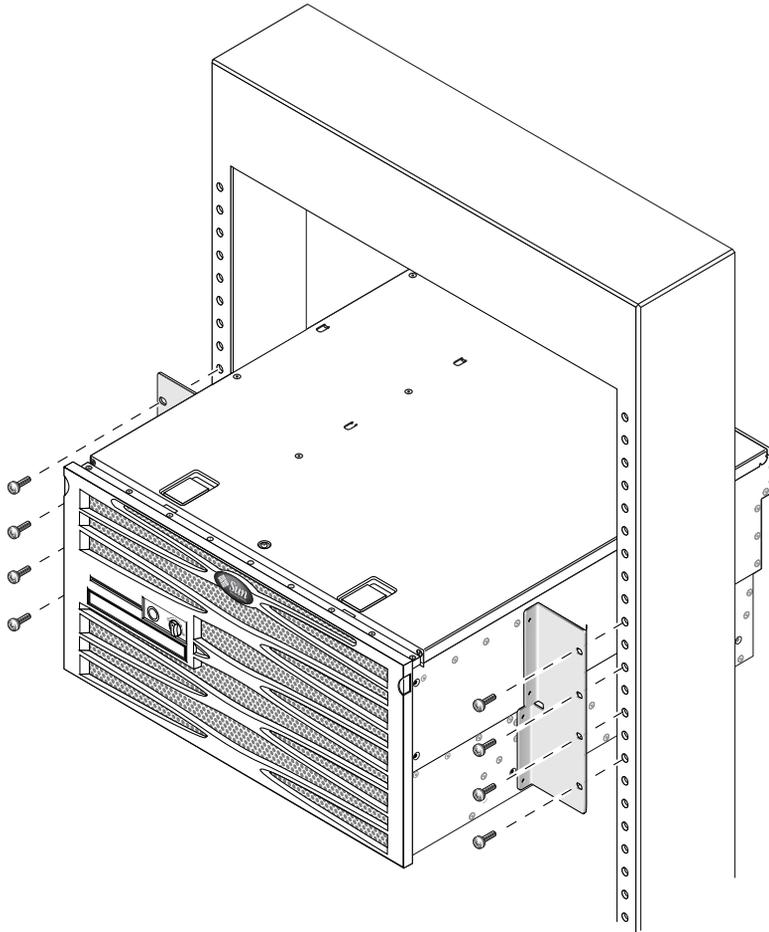
FIGURE 3-23 Securing the Front of the Server to the Rack

Hardmount in a 19-Inch 2-Post Rack

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

- Two hardmount brackets
- Two bags of screws
- Two rear mount support brackets (not used in this option)
- Two rear mount flanges (not used in this option)
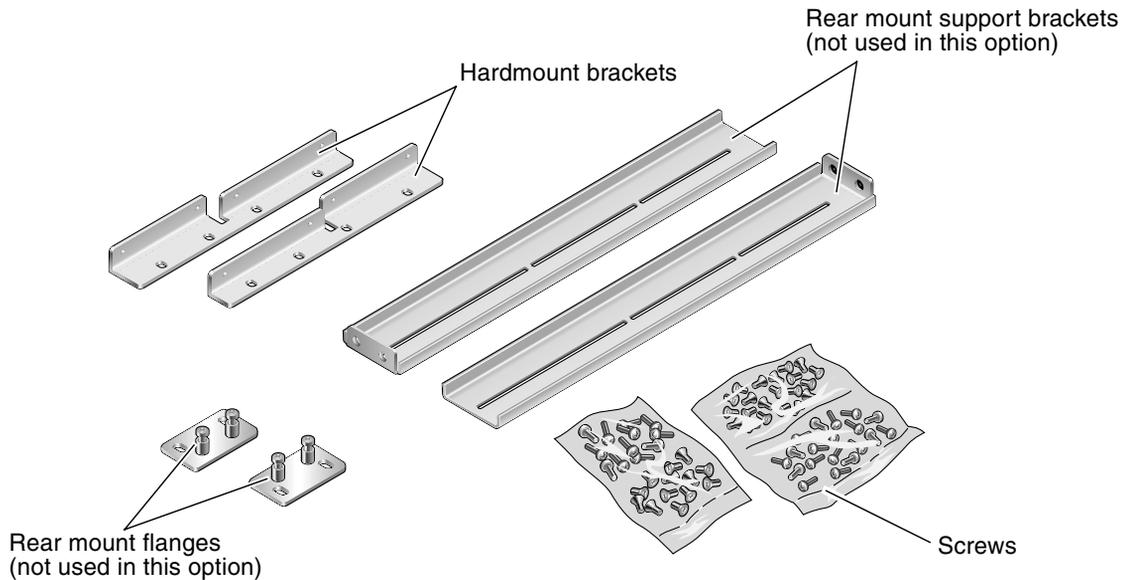
FIGURE 3-24 Contents of the Hardmount 19-Inch 4-Post Kit

TABLE 3-6   19-inch 2-Post Rackmount Screw Kit Contents

Number	Description	Where Used
8	M5 x 8 mm Phillips flathead screws	8 for hardmount brackets
6	M5 x 8 mm Phillips panhead screws	6 for rear mount brackets (not used in this option)
12	M5 x 12 mm screws	12 for rack, if appropriate
12	M6 x 12 mm screws	12 for rack, if appropriate

TABLE 3-6 19-inch 2-Post Rackmount Screw Kit Contents *(Continued)*

Number	Description	Where Used
12	M6 square clip nuts	12 for rack, if appropriate
12	10-32 x 0.5 in. combo head screws	12 for rack, if appropriate
12	12-24 x 0.5 in. combo head screws	12 for rack, if appropriate

1. **Get the side brackets from the rack kit (**FIGURE 3-24**).**

2. **Using eight of the M5 × 8 mm panhead Phillips screws (four for each side bracket), secure the side brackets to the sides of the server (**FIGURE 3-25**).**

   Note that the wide, flat side of the brackets are facing the *rear* of the server for this rackmount option, not the front.
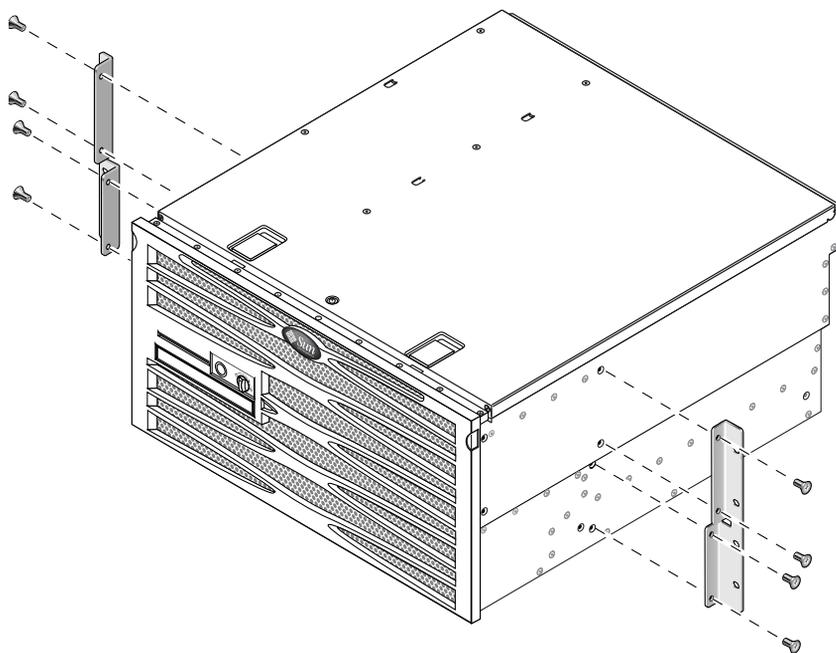
FIGURE 3-25 Securing the Side Brackets to the Side of the Server

3. **Lift the server into the rack.**

4. **Using four screws for each bracket, secure the front of the server to the front of the rack (**FIGURE 3-26**).**

   The size of the screws varies, depending on your rack.
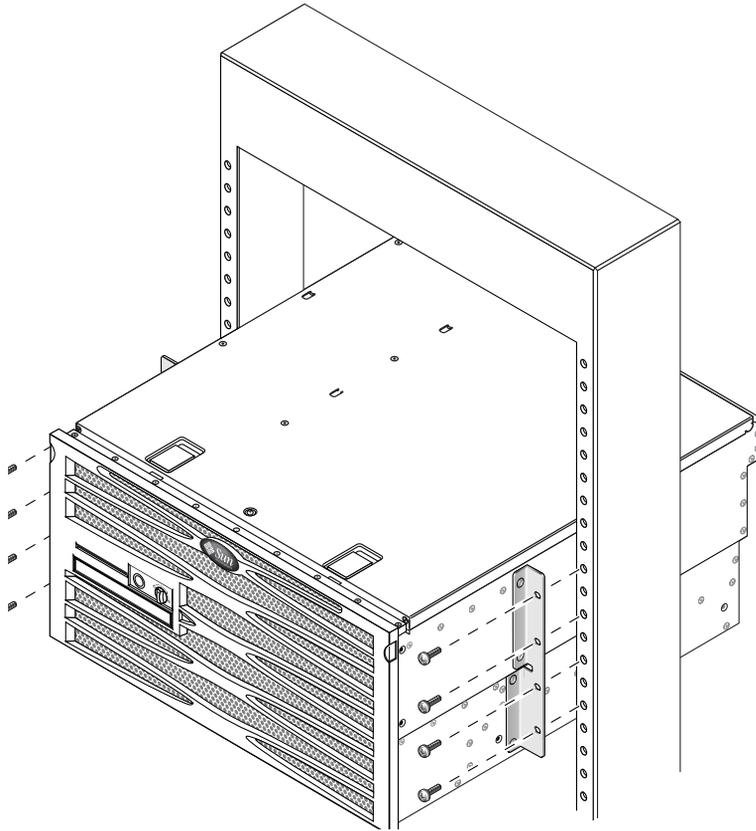
FIGURE 3-26 Installing and Securing the Server in the 2-Post Rack

Connecting Cables

FIGURE 4-1 shows the DC version of the Netra 440 server back panel and identifies the DC power supply connectors and I/O ports. FIGURE 4-2 shows the AC version of the Netra 440 server back panel and identifies the AC power supply connectors and I/O ports.
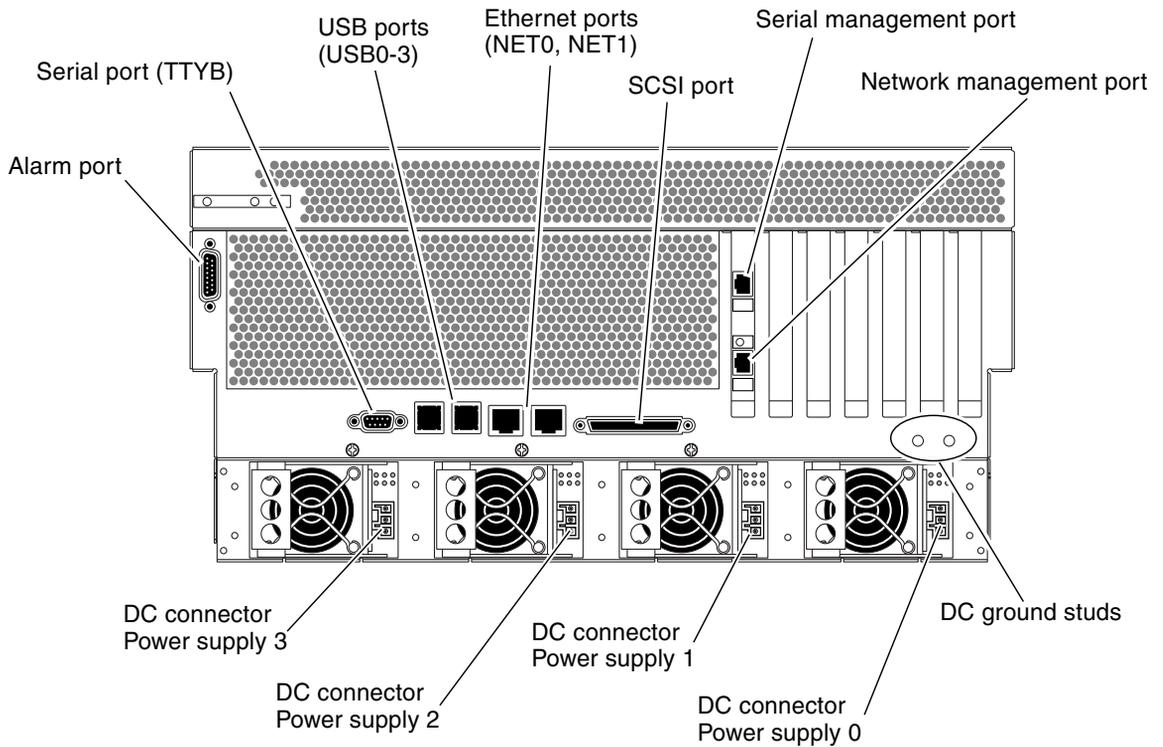
FIGURE 4-1   Back Panel Features (DC Version)
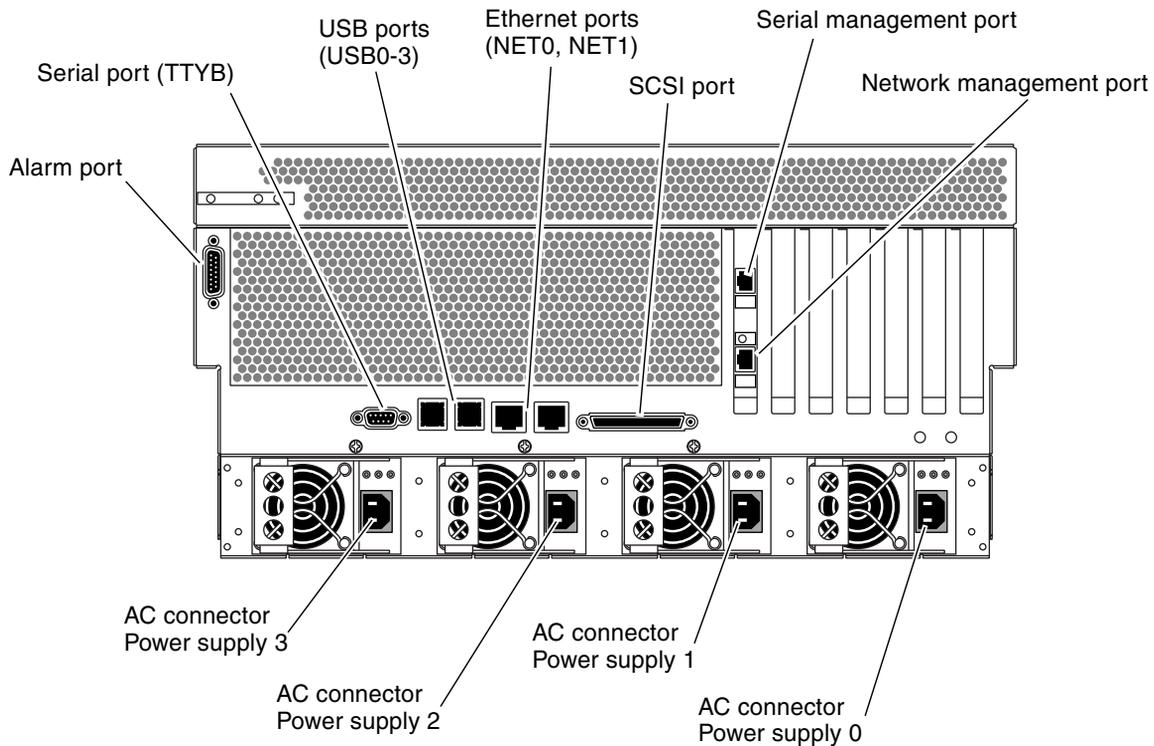
FIGURE 4-2 Back Panel Features (AC Version)

TABLE 4-1 Netra 440 Server Ports

Port	Information
Alarm port	In a telecommunications environment, use this port to connect to the central office alarming system. See the *Netra 440 Server Product Overview* for more information.
Serial port (TTYB)	This port provides standard serial functionality. Note that the system controller serial management port is not a standard serial port. See the *Netra 440 Server Product Overview* for more information.
USB ports	See the *Netra 440 Server Product Overview* for information about devices you can connect to these ports.
Ethernet ports	You use these ports to connect to your Ethernet network. The left port is NET0, and the right port is NET1.
External SCSI port	See the *Netra 440 Server Product Overview* for information about the devices you can connect to this port.

TABLE 4-1 Netra 440 Server Ports *(Continued)*

Port	Information
Serial management port (SERIAL MGT)	Use this, the default port, to attach the system console device.
Network management port (NET MGT)	Use this port to access ALOM features by way of the network.
DC connectors (DC version)	DC power input cables connect to each DC connector. Do *not* connect the cord to a DC connector at this point. See "Assembling and Connecting the DC Input Power Cable" on page 60.
AC connectors (AC version)	AC power cables connect to each AC connector. Do *not* connect the power cable to an AC connector at this point. See "Connecting the AC Power Cables" on page 69.

Connecting the Chassis Grounding Cable (DC Version)

Before installing any other cable, you should first attach the chassis ground cable to the server's chassis grounding studs. Refer to Chapter 1 for the site requirements for this section.

1. **Obtain a chassis grounding cable from your site and two M5 nuts with lock washers from the ship kit.**

2. **Go to the back of the server and locate the two DC ground studs (see FIGURE 4-1).**

3. **Position and align the chassis grounding cable against the two ground studs at the rear of the chassis.**

4. **Tighten the two M5 nuts to secure the grounding cable to the two studs.**

5. **Secure the other end of the grounding cable to the earth ground in the building.**

   You can secure the grounding cable to a proper grounding point on the rack, as long as the rack is properly grounded to the earth ground in the building.

Caution – An electrical hazard is present if energized units are not properly grounded.

Connecting All Other Cables

When connecting the remaining cables to the ports at the rear of the Netra 440 server, keep the following points in mind:

- Although access to the ALOM through the network management port is secure, access through the serial management port is not secure. Therefore, avoid connecting a serial modem to the serial management port.

- The ALOM serial management port (labeled SERIAL MGT) and network management port (labeled NET MGT) are present in the Solaris OS device tree as /dev/ttya, and in the OpenBoot configuration variables as ttya. However, the serial management port does not function as a standard serial connection. If you want to attach a standard serial device to the system (such as a printer), you need to use the DB-9 port labeled "TTYB" on the system back panel, which corresponds to /dev/ttyb in the Solaris OS device tree, and as ttyb in the OpenBoot configuration variables. See the *Netra 440 Server Product Overview* for more information.

- The 10BASE-T network management port on the ALOM is reserved for use with the ALOM and the system console. The network management port does not support connections to 100 Mbps or Gigabit networks. If your configuration requires a high-speed Ethernet port, use one of the Gigabit Ethernet ports instead.

- USB ports support hot-plugging. You can connect and disconnect the USB cable and peripheral devices while the system is running, without affecting system operations. However, you can only perform USB hot-plug operations while the operating system is running.

- USB hot-plug operations are not supported when the system ok 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 per system.

See FIGURE 4-1 for the locations of these ports. The following sections give the pinouts for each of these connectors.

- "Alarm Port" on page 51
- "Serial Port (TTYB)" on page 52
- "USB Ports (USB0-3)" on page 53
- "Ethernet Ports (NET0 and NET1)" on page 54
- "SCSI Port" on page 55
- "ALOM Serial Management Port (TTYA)" on page 57
- "ALOM Network Management Port" on page 59

Alarm Port

The alarm port uses a standard DB-15 connector. In a telecommunications environment, use this port to connect to the central office alarming system. FIGURE 4-3 shows the pin numbering of the alarm port, TABLE 4-2 and describes the pin signals.
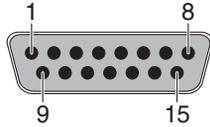
FIGURE 4-3   Alarm Port

TABLE 4-2   Alarm Port Signals

Pin	Signal Description	Pin	Signal Description
1	RESERVED	9	ALARM1_NC
2	RESERVED	10	ALARM1_COM
3	NC	11	ALARM2_NO
4	NC	12	ALARM2_NC
5	ALARM0_NC*	13	ALARM2_COM
6	ALARM0_NO[1]	14	ALARM3_NO
7	ALARM0_COM[1]	15	ALARM3_COM
8	ALARM1_NO	CHASSIS	FRAME GND

* The ALOM software sets the ALARM0 (critical) relay and the associated (critical) LED for the following conditions:
  • When the system is in Standby mode.
  • When the server is powered on and the operating system has not booted or has failed.

Serial Port (TTYB)

The serial port connector (TTYB) uses a DB-9 connector. Use this port for general purpose serial data transfers.

FIGURE 4-4   Serial Port Pin Numbering

TABLE 4-3   Serial Port Connector Signals

Pin	Signal Description	Pin	Signal Description
1	Data Carrier Detect	6	Data Set Ready
2	Receive Data	7	Request to Send
3	Transmit Data	8	Clear to Send
4	Data Terminal Ready	9	Ring Indicate
5	Ground		

USB Ports (USB0-3)

Four Universal Serial Bus (USB) ports are located on the motherboard in a double-stacked layout. The ports can be accessed from the back panel.
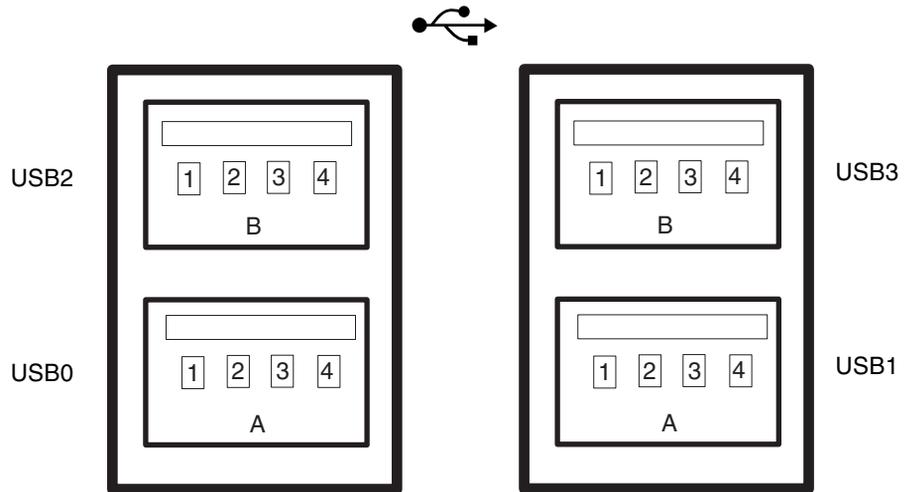
FIGURE 4-5   USB Connector Pin Numbering

TABLE 4-4   USB Ports Pin Numbering

Pin	Signal Description	Pin	Signal Description
A1	+5 V (fused)	B1	+5 V (fused)
A2	USB0/1-	B2	USB2/3-
A3	USB0/1+	B3	USB2/3+
A4	Ground	B4	Ground

Ethernet Ports (NET0 and NET1)

The Netra 440 server has two RJ-45 Gigabit Ethernet connectors (NET0, NET1). The Ethernet interfaces operate at 10 Mbps, 100 Mbps, and 1000 Mbps. The transfer rates for the Ethernet ports are given in TABLE 4-5.

TABLE 4-5 Ethernet Connection Transfer Rates

Connection Type	IEEE Terminology	Transfer Rate
Ethernet	10BASE-T	10 Mbit/s
Fast Ethernet	100BASE-TX	100 Mbits/s
Gigabit Ethernet	1000BASE-T	1000 Mbit/s
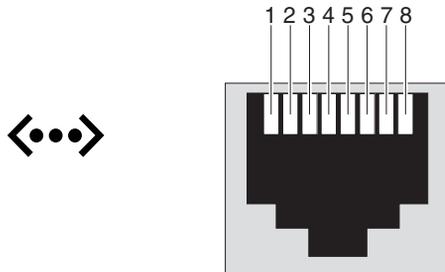
FIGURE 4-6 Ethernet Connector Pin Numbering

TABLE 4-6 Ethernet Connector Pin Signals

Pin	Signal Description	Pin	Signal Description
1	Transmit/Receive Data 0 +	5	Transmit/Receive Data 2 –
2	Transmit/Receive Data 0 –	6	Transmit/Receive Data 1 –
3	Transmit/Receive Data 1 +	7	Transmit/Receive Data 3 +
4	Transmit/Receive Data 2 +	8	Transmit/Receive Data 3 –

TABLE 4-7 OpenBoot PROM Devalias and Device Path Data for the Ethernet Ports

Ethernet Port	OpenBoot PROM Devalias	Device Path
0	net0	/pci@1c,600000/network@2
1	net1	/pci@1f,700000/network@1

SCSI Port

The SCSI serial data connector is located on the motherboard and can be accessed from the back panel.
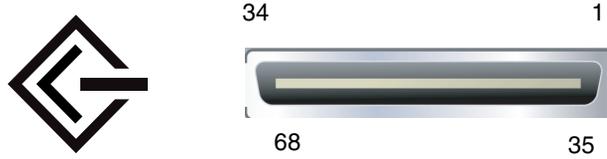
FIGURE 4-7 SCSI Port Pin Numbering

TABLE 4-8 SCSI Port Pin Signals

Pin	Signal Description	Pin	Signal Description
1	Data12 +	35	Data12 –
2	Data13 +	36	Data13 –
3	Data14 +	37	Data14 –
4	Data15 +	38	Data15 –
5	Parity1 +	39	Parity1 –
6	Data0 +	40	Data0 –
7	Data1 +	41	Data1 –
8	Data2 +	42	Data2 –
9	Data3 +	43	Data3 –
10	Data4 +	44	Data4 –
11	Data5 +	45	Data5 –
12	Data6 +	46	Data6 –
13	Data7 +	47	Data7 –
14	Parity0 +	48	Parity0 –
15	Ground	49	Ground
16	DIFF_SENSE	50	Ground
17	TERM_PWR	51	TERM_PWR
18	TERM_PWR	52	TERM_PWR
19	(N/C)	53	(N/C)

TABLE 4-8 SCSI Port Pin Signals *(Continued)*

Pin	Signal Description	Pin	Signal Description
20	Ground	54	Ground
21	ATN +	55	ATN –
22	Ground	56	Ground
23	BSY +	57	BSY –
24	ACK +	58	ACK –
25	RST +	59	RST –
26	MSG +	60	MSG –
27	SEL +	61	SEL –
28	CD +	62	CD –
29	REQ +	63	REQ –
30	I/O +	64	I/O –
31	Data8 +	65	Data8 –
32	Data9 +	66	Data9 –
33	Data10 +	67	Data10 –
34	Data11 +	68	Data11 –

ALOM Serial Management Port (TTYA)

The serial management connector (labeled SERIAL MGT) is an RJ-45 connector located on the ALOM system controller card and can be accessed from the back panel. This port is the default connection to the system, and you should use this port *only* for server management.
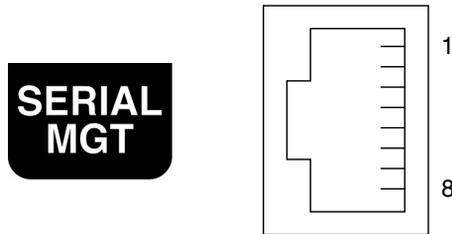
FIGURE 4-8   Serial Management Port Pin Numbering

TABLE 4-9   Serial Management Port Pin Signals

Pin	Signal Description	Pin	Signal Description
1	Request to Send	5	Ground
2	Data Terminal Ready	6	Receive Data
3	Transmit Data	7	Data Set Ready
4	Ground	8	Clear to Send

If you need to connect to the SERIAL MGT port using a cable with either a DB-9 or a DB-25 connector, use a supplied adapter to perform the crossovers given for each connector. The supplied RJ-45 to DB-9 and RJ-45 to DB-25 adapters are wired as described in TABLE 4-10 and TABLE 4-11.

RJ-45 to DB-9 Adapter Crossovers

TABLE 4-10 RJ-45 to DB-9 Adapter Crossovers

Serial Port (RJ-45 Connector)		DB-9 Adapter	
Pin	Signal Description	Pin	Signal Description
1	RTS	8	CTS
2	DTR	6	DSR
3	TXD	2	RXD
4	Signal Ground	5	Signal Ground
5	Signal Ground	5	Signal Ground
6	RXD	3	TXD
7	DSR	4	DTR
8	CTS	7	RTS

RJ-45 to DB-25 Adapter Crossovers

TABLE 4-11 RJ-45 to DB-25 Adapter Crossovers

Serial Port (RJ-45 Connector)		DB-25 Adapter	
Pin	Signal Description	Pin	Signal Description
1	RTS	5	CTS
2	DTR	6	DSR
3	TXD	3	RXD
4	Signal Ground	7	Signal Ground
5	Signal Ground	7	Signal Ground
6	RXD	2	TXD
7	DSR	20	DTR
8	CTS	4	RTS

ALOM Network Management Port

The network management connector (labeled NET MGT) is an RJ-45 connector located on the ALOM system controller card and can be accessed from the back panel. This port needs to be configured prior to use. For information on configuring this port for managing the server with ALOM, see the *Advanced Lights Out Manager User Guide for the Netra 440 Server* (817-5481-xx)
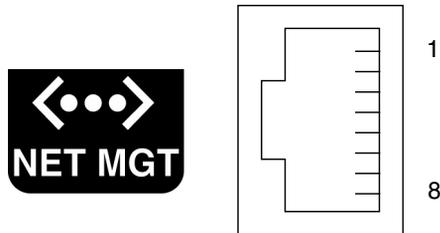
FIGURE 4-9 Network Management Port Pin Numbering

TABLE 4-12 Network Management Port Pin Signals

Pin	Signal Description	Pin	Signal Description
1	Transmit Data +	5	Common Mode Termination
2	Transmit Data –	6	Receive Data –
3	Receive Data +	7	Common Mode Termination
4	Common Mode Termination	8	Common Mode Termination

Assembling and Connecting the DC Input Power Cable

Note – This section describes how to connect DC power input cables to a DC-powered Netra 440 server. For AC-powered server instructions, see "Connecting the AC Power Cables" on page 69.

Caution – Verify that your site meets the source site requirements given in "DC Power Source Requirements" on page 5 before proceeding with these instructions.

The basic system configuration comes with four power supplies installed. The system will continue to operate even if a single power supply fails (known as a 3+1 configuration) or if two power supplies fail (known as a 2+2 configuration). A 2+2 configuration is possible because any two power supplies will satisfy the entire load of a fully-configured system.

▼ Assembling the DC Input Power Cable

Note – If you have already assembled the DC input power cables, skip to "Connecting the DC Input Power Cable to the Server" on page 66.

1. **Identify the parts that you will use to assemble the DC input power cable (**FIGURE 4-10**).**

   The following DC connection parts are provided in this kit so that you can assemble one or more DC power input cables. These cables are used to connect the -48V DC input source(s) to the power supply units in the following components:

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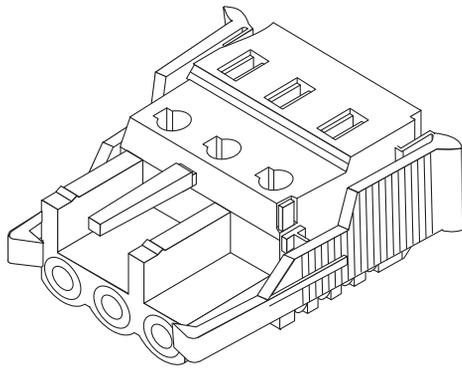
DC input plug
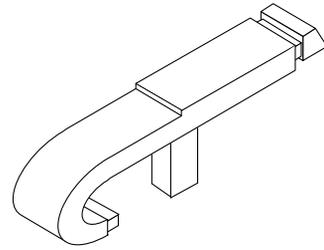
Cage clamp operating lever
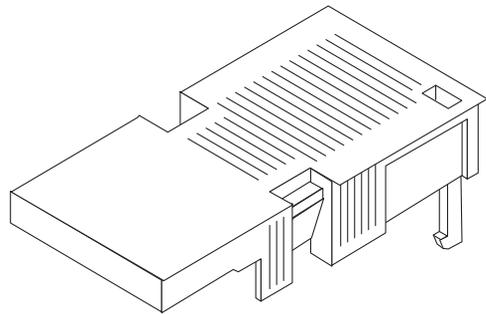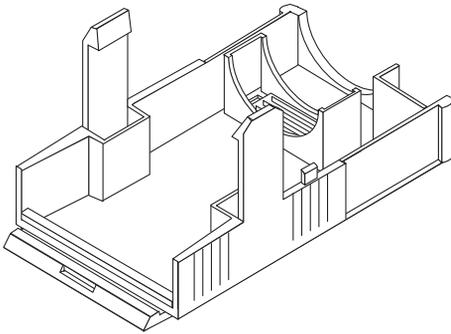
Strain relief housing

FIGURE 4-10 DC Connection Parts

    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)

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

   Do not strip more than 8 mm (5/16 inches) from each wire. Doing so will leave uninsulated wire exposed from the DC connector after the assembly is complete.
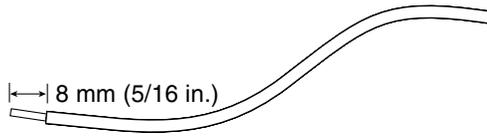
   FIGURE 4-11 Stripping the Insulation From the Wire

6. **Open the cage clamp for a section of the DC input plug.**

   Perform 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, and press down on the cage clamp operating lever.

Top of input plug
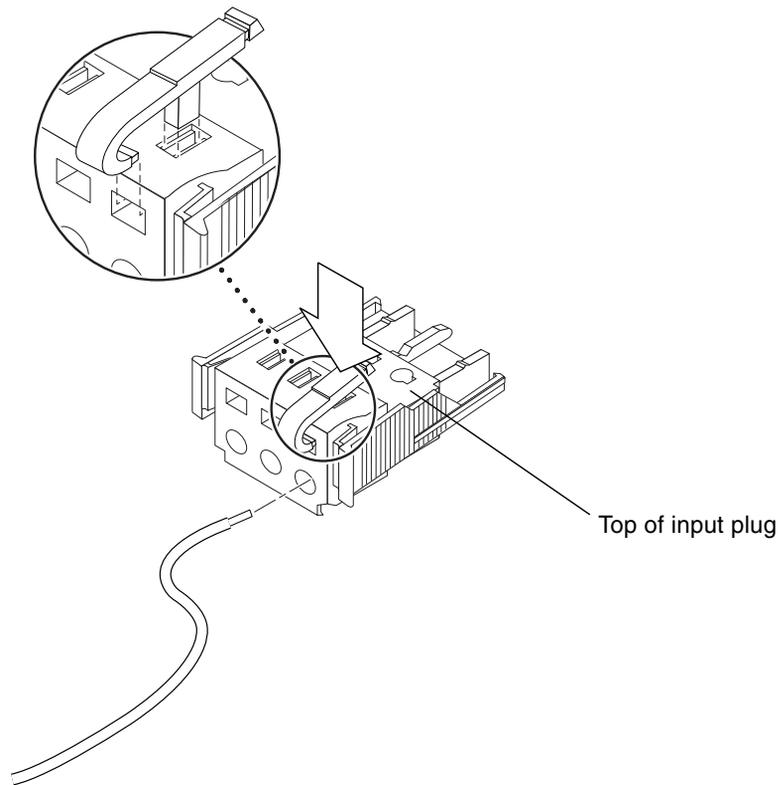
   FIGURE 4-12 Opening the Input Plug Cage Clamp Using the Cage Clamp Operating Lever

- 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.
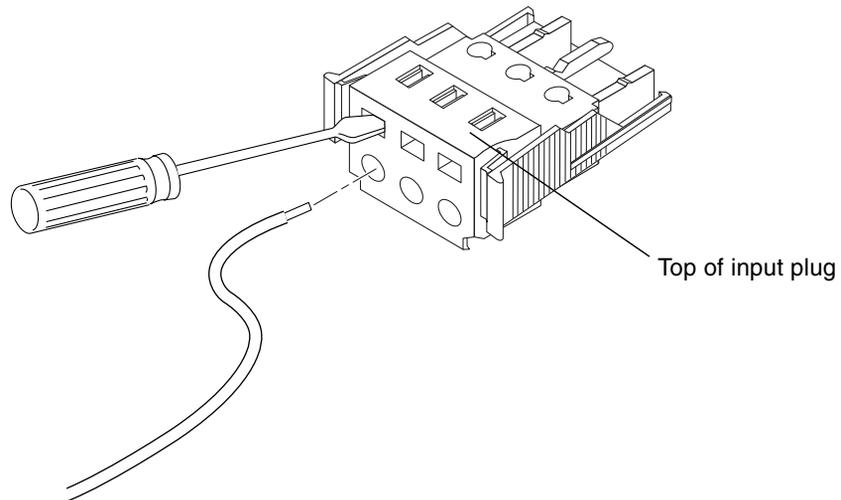
FIGURE 4-13 Opening the Cage Clamp Using a Screwdriver

7. **Feed the exposed section of the appropriate wire into the hole in the DC input plug described in Step 6.**

   FIGURE 4-14 shows which wires should be inserted into each hole in the DC input plug.
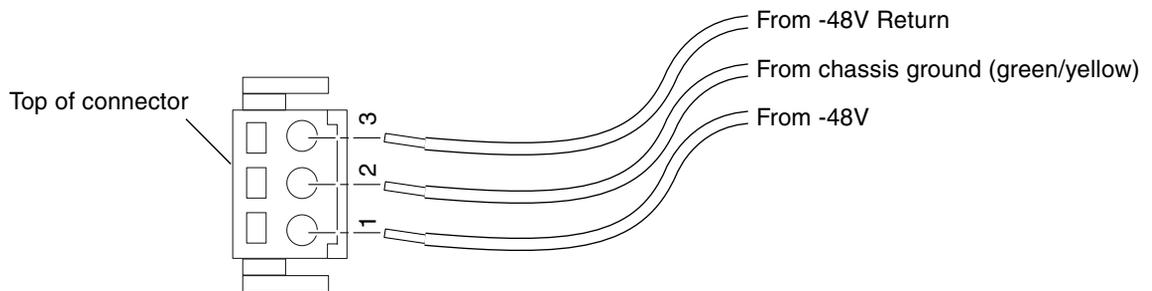
FIGURE 4-14 Assembling the DC Input Power Cable

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.**

   You need one DC input power cable for every power supply that you have in the Netra 440 server chassis.

   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 4-12 and FIGURE 4-13), then pull the wire from the DC input plug.

▼ Installing the Strain Relief Housings

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

   Make sure 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.
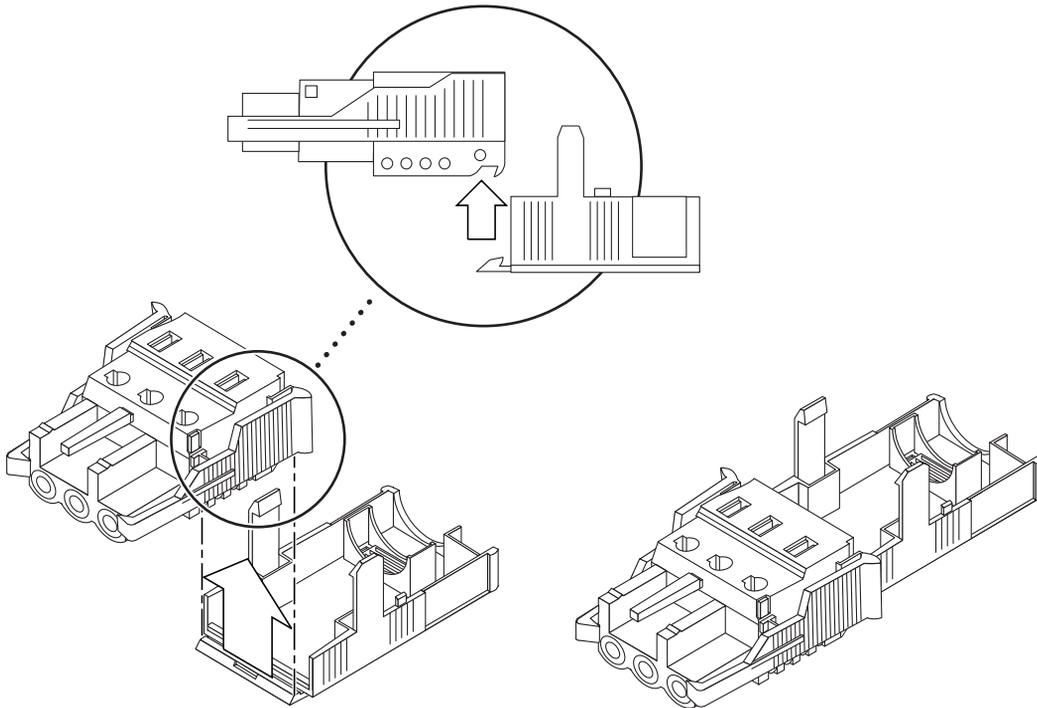
FIGURE 4-15 Inserting the Bottom Portion of the Strain Relief Housing

2. **Route the three wires coming from the DC power source through the opening at the end of the bottom portion of the strain relief housing.**
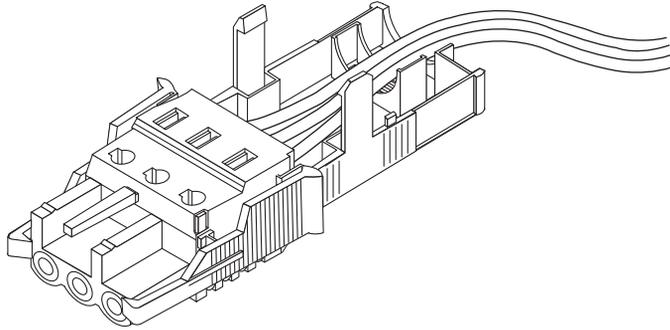
FIGURE 4-16 Routing the Wires out of the Bottom Portion of the Strain Relief Housing

3. **Insert the tie wrap into the bottom portion of the strain relief housing.**
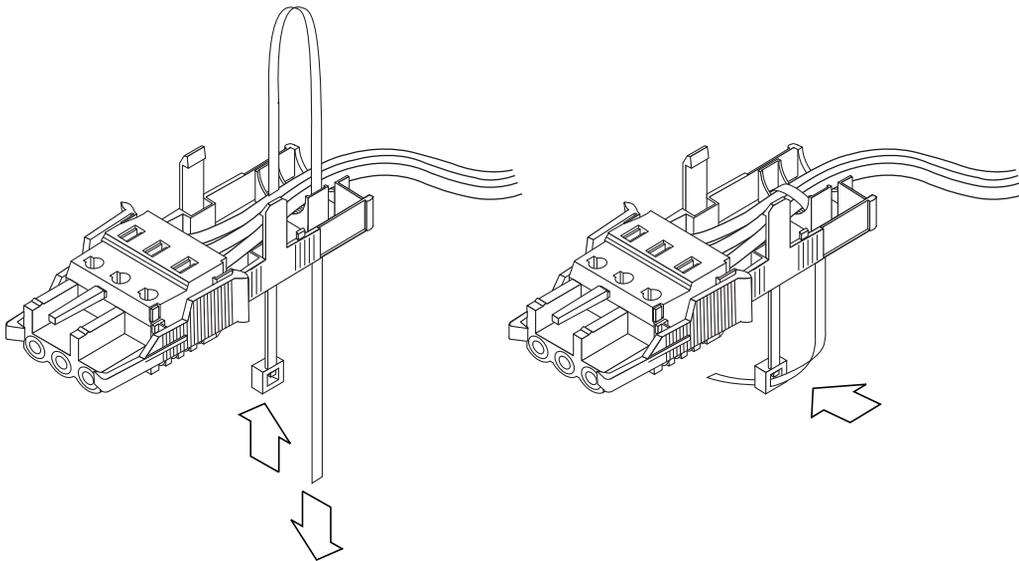
FIGURE 4-17 Securing the Wires to the Strain Relief Housing

4. **Loop the tie wrap over the wires and back out of the strain relief housing.**

Tighten the tie wrap to secure the wires to the strain relief housing (FIGURE 4-17).

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.
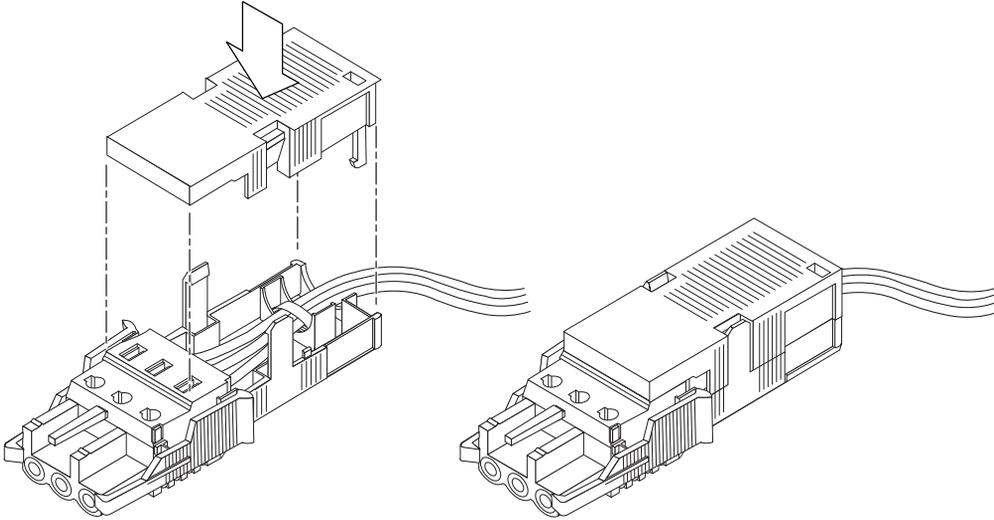
FIGURE 4-18 Assembling the Strain Relief Housing

▼ Connecting the DC Input Power Cable to the Server

Caution – An energy hazard is present when energized units are not properly grounded.

1. **Open the front system door.**

Press in on the door release latches and lower the system door.

Door release latches
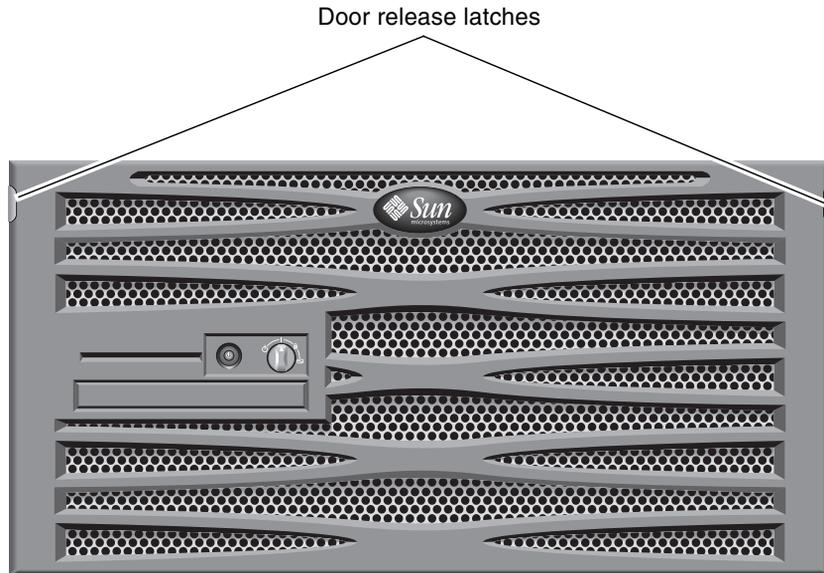
FIGURE 4-19 Opening the System Door

2. Turn the rotary switch to the Standby position (FIGURE 4-20**).**
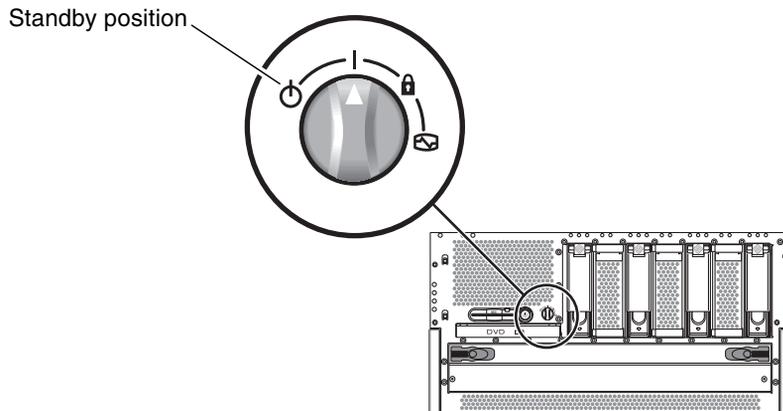
Standby position

FIGURE 4-20 Turning the Rotary Switch to the Standby Position

3. Slide the server out of the rack far enough to give you convenient access to the back of the server.

4. **Connect the DC input power cables to the DC connector on each power supply.**

Good practice is to connect each power supply to a separate DC circuit, which enables the system to remain operational if one of the DC circuits fails. Consult your local electrical codes for any additional requirements.
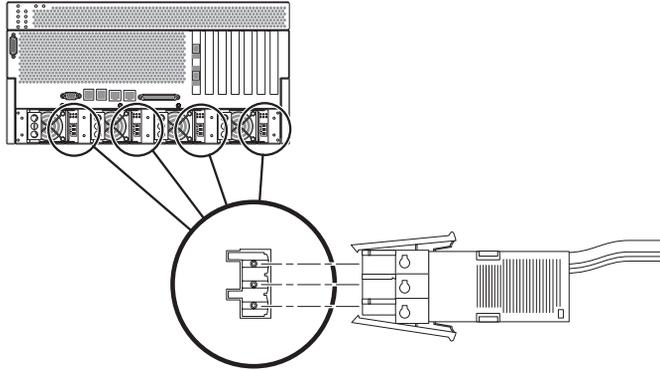
FIGURE 4-21 Connecting the DC Input Power Cable to the DC Connectors

5. **Turn on the circuit breakers to provide power to the servers.**

If you want to disconnect the DC input power cable from the DC connector at some point in the future, turn the circuit breakers off, then squeeze the two tabs on the sides of the DC input power cable and gently disconnect the DC input power cable from the DC power supply.

Caution – Do *not* attempt to disconnect the DC input power cable from the DC connector until you have turned off the power from the DC power source through the circuit breakers.
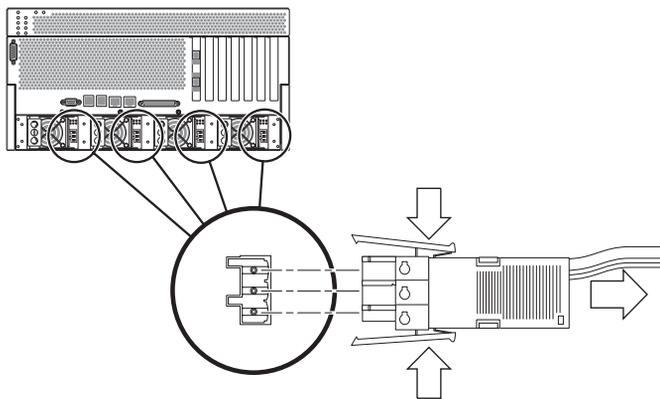
FIGURE 4-22 Disconnecting the DC Input Power Cable From the DC Connector

Connecting the AC Power Cables

Note – This section describes how to connect AC power cords to an AC-powered Netra 440 server. For DC-powered server instructions, see "Assembling and Connecting the DC Input Power Cable" on page 60.

The basic system configuration comes with four power supplies installed. The system will continue to operate even if a single power supply fails (known as a 3+1 configuration) or if two power supplies fail (known as a 2+2 configuration). A 2+2 configuration is possible because any two power supplies will satisfy the entire load of a fully-configured system. Additionally, to ensure true AC line input redundancy for the server, you should use two separate AC power sources, and you should connect the power cables from any two AC power supplies in the server to each AC power source. You can also connect an uninterruptible power supply (UPS) between each AC power source and the server to increase the availability of the server.

Note – The Netra 440 server uses nominal input voltages from 100 VAC to 240 VAC. Sun products are designed to work with power systems having a grounded neutral conductor. To reduce the risk of electrical shock, do not plug Sun products into another type of power source. Contact your facilities manager or a qualified electrician if you are unsure what type of power is supplied to your building.

1. **Open the front system door.**

   Press in on the door release latches and lower the system door.

Door release latches
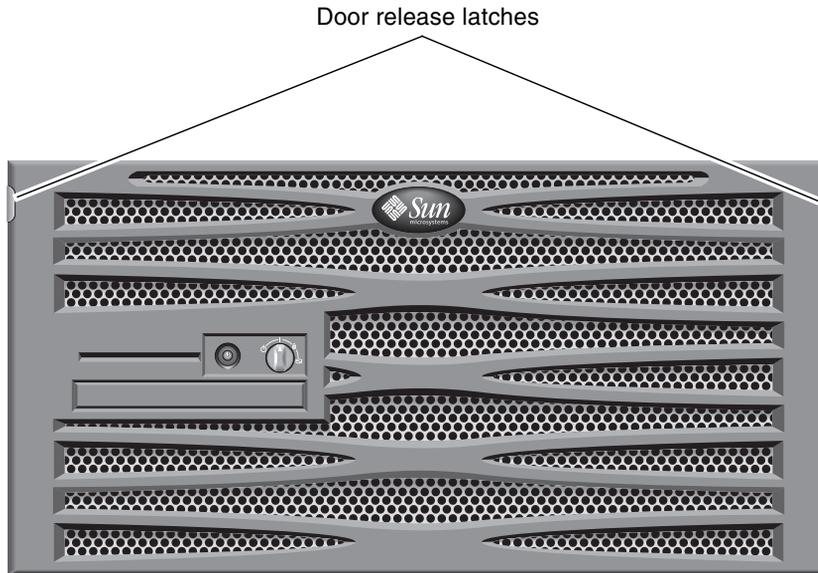
FIGURE 4-23 Opening the System Door

2. Turn the rotary switch to the Standby position (FIGURE 4-24**).**
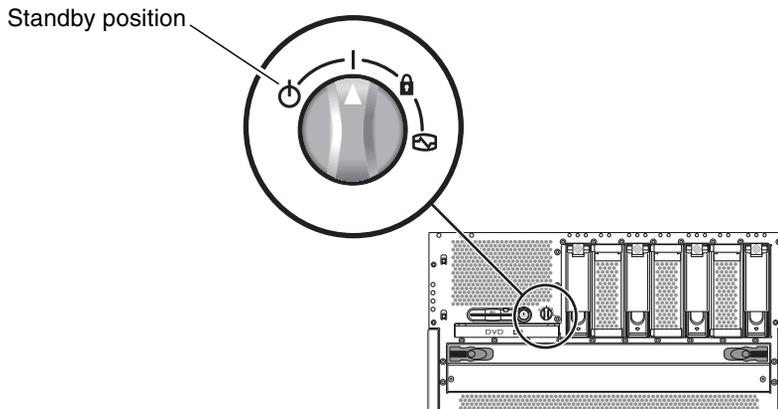
Standby position

FIGURE 4-24 Turning the Rotary Switch to the Standby Position

3. Get the supplied AC power cords from the server's shipment kit.

4. Slide the server out of the rack far enough to give you convenient access to the back of the server.

5. **Connect one end of each AC power cord into the AC connectors located at the rear of the server.**

   See FIGURE 4-25 for the location of the AC connectors.
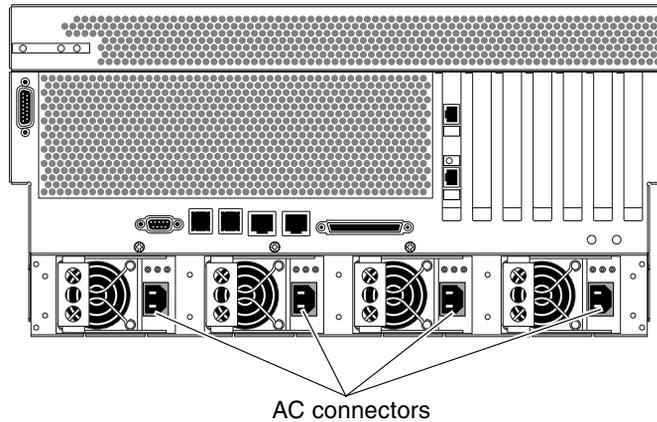
AC connectors

FIGURE 4-25 Connecting the AC Power Cords to the AC Connectors

6. **Connect the other ends of the power cords into AC wall outlets.**

   To ensure true AC line input redundancy for the server, you should use two separate AC power sources, and you should connect the power cables from any two AC power supplies in the server to each AC power source.

Setting Up a System Console Device

This chapter provides information on connecting a system console device to the server. To install the Solaris OS and any application software, you must set up a terminal or other device to access the system console. You can either:

- Connect the system to a terminal server
- Use an alphanumeric (ASCII) terminal
- Establish a TIP connection from another server

Regardless of the method you choose, for *initial* power-on you must connect the device to the serial management port (SERIAL MGT) on the ALOM system controller card. All of the procedures in the following sections assume that you are setting up a system console device by using the default configuration. After initial power-on, you may use the NET MGT port if you choose. See the *Netra 440 Server System Administration Guide* (817-3884-xx) for details.

See the appropriate section for the connection method that you want to use:

- "Accessing the System Console Through a Terminal Server" on page 74
- "Accessing the System Console Through an Alphanumeric Terminal" on page 77
- "Accessing the System Console Through a TIP Connection" on page 78

Accessing the System Console Through a Terminal Server

Connecting the Server to a Terminal Server

The serial management port on the Netra 440 server is a data terminal equipment (DTE) port. The pinouts for the serial management port correspond with the pinouts for the RJ-45 ports on the serial interface breakout cable supplied by Cisco for use with the Cisco AS2511-RJ terminal server. If you use a terminal server made by another manufacturer, check that the serial port pinouts of the Netra 440 server match those of the terminal server you plan to use.

If the pinouts for the server serial ports correspond with the pinouts for the RJ-45 ports on the terminal server, you have two connection options:

- Connect a serial interface breakout cable directly to the Netra 440 server. See the *Netra 440 Server System Administration Guide* (817-3884-xx) for details.
- Connect a serial interface breakout cable to a patch panel and use the straight-through patch cable (supplied by Sun) to connect the patch panel to the server.

The following illustration shows how to connect a patch cable between a terminal server, patch panel, and the serial management port (SERIAL MGT) on the Netra 440 server.
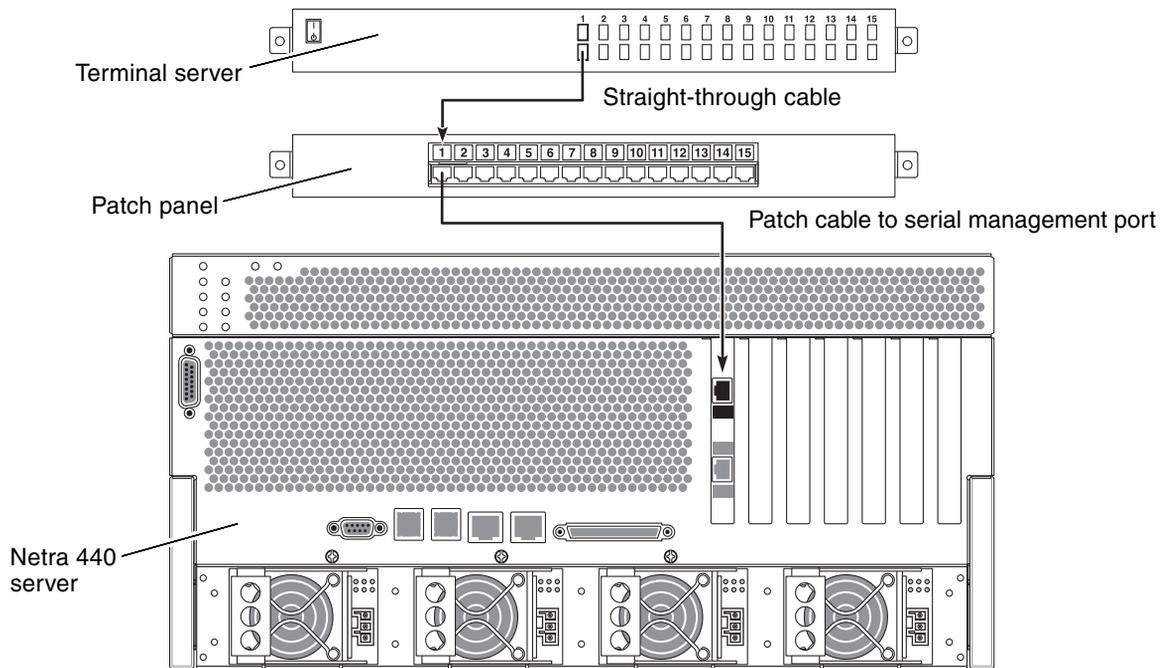
FIGURE 5-1 Patch Panel Connection Between a Terminal Server and a Netra 440 Server

If the pinouts for the serial management port *do not* correspond with the pinouts for the RJ-45 ports on the terminal server, you need to make a crossover cable that takes each pin on the Netra 440 server serial management port to the corresponding pin in the terminal server's serial port.

TABLE 5-1 shows the crossovers that the cable must perform.

TABLE 5-1 Pin Crossovers for Connecting to a Typical Terminal Server

Netra 440 Serial Management Port (RJ-45 Connector) Pin	Terminal Server Serial Port Pin
Pin 1 (RTS)	Pin 1 (CTS)
Pin 2 (DTR)	Pin 2 (DSR)
Pin 3 (TXD)	Pin 3 (RXD)
Pin 4 (Signal Ground)	Pin 4 (Signal Ground)
Pin 5 (Signal Ground)	Pin 5 (Signal Ground)

TABLE 5-1 Pin Crossovers for Connecting to a Typical Terminal Server *(Continued)*

Netra 440 Serial Management Port (RJ-45 Connector) Pin	Terminal Server Serial Port Pin
Pin 6 (RXD)	Pin 6 (TXD)
Pin 7 (DSR /DCD)	Pin 7 (DTR)
Pin 8 (CTS)	Pin 8 (RTS)

Accessing the System Console Through a Terminal Server

● **Open a terminal session on the connecting device, and type:**

```
% telnet IP-address-of-terminal-server  port-number
```

For example, for a Netra 440 server connected to port 10000 on a terminal server whose IP address is 192.20.30.10, you would type:

```
% telnet 192.20.30.10 10000
```

Note – At this point, all system information is delivered to you by way of the ALOM system controller card and its software. ALOM is the default method for communicating with the Netra 440 server. For detailed information about using ALOM, consult the *Advanced Lights Out Manager User's Guide for the Netra 440 Server* (817-5481-xx) and the *Netra 440 Server System Administration Guide* (817-3884-xx), which includes information about reconfiguration options.

Accessing the System Console Through an Alphanumeric Terminal

The following procedure assumes that you are accessing the system console device by connecting an alphanumeric terminal to the serial management port (SERIAL MGT) of the Netra 440 server.

For detailed information about system console options, see the *Netra 440 Server System Administration Guide* (817-3884-xx).

1. **Turn off power to the alphanumeric terminal.**

2. **Attach one end of the serial cable to the alphanumeric terminal's serial port.**

   Use an RJ-45 null modem serial cable or an adapter that is appropriate for your device. If you are using a laptop system or a terminal with a DB-9 connector, use an appropriate RJ-45/DB-9 adapter. Connect this cable or adapter to the terminal's serial port connector.

3. **Attach the serial cable's RJ-45 connector to the server's serial management port (SERIAL MGT) on the ALOM system controller card.**

   See Chapter 4 for more information about the various ports.

4. **Connect the alphanumeric terminal's AC power cord to an AC connector and turn it on.**

5. **Set the terminal to receive:**

   - 9600 baud
   - 8 bits
   - No parity
   - 1 stop bit
   - No handshake protocol

   See the documentation accompanying your terminal for information about how to configure it.

Note – At this point, all system information is delivered to you by way of the ALOM system controller card and its software. ALOM is the default method for communicating with the Netra 440 server. For detailed information about using ALOM, refer to the *Advanced Lights Out Manager User's Guide for the Netra 440 Server* (817-5481-xx) and the *Netra 440 Server System Administration Guide* (817-3884-xx), which includes information about reconfiguration options.

Accessing the System Console Through a TIP Connection

The following procedure assumes that you are setting up a system console device for the Netra 440 server by connecting the serial port of another Sun system to the serial management port (SERIAL MGT) of the Netra 440 server.

For detailed information about system console options, refer to the *Netra 440 Server System Administration Guide* (817-3884-xx).

1. **Ensure that the Sun system to which you are establishing the TIP connection is powered on and active.**

2. **Connect the RJ-45 serial cable and RJ45/DB25 adapter.**

   Use the cable and adapter to connect the other Sun system's `ttyb` serial port to the Netra 440 server's serial management port (SERIAL MGT). Pinouts, part numbers, and other details about the serial cable and adapter are provided in the *Netra 440 Server Service Manual*.

3. **Ensure that the `/etc/remote` file on the Sun system contains an entry for `hardwire`.**

   Most releases of Solaris OS software shipped since 1992 contain an `/etc/remote` file with the appropriate `hardwire` entry. However, if the Sun system is running an older version of Solaris OS software, or if the `/etc/remote` file has been modified, you might need to edit it. See the *Netra 440 Server System Administration Guide* (817-3884-xx) for details.

4. **In a terminal window on the other Sun system, type:**

   ```
   hostname% tip hardwire
   ```

   The other Sun system responds by displaying:

   ```
   connected
   ```

   The terminal window is now a TIP window directed to the Netra 440 server through the other Sun system's TTYB port. This connection is established and maintained even when the Netra 440 server is completely powered off or just starting up.

Note – Use a terminal tool, not a console tool. Some TIP commands might not work properly in a console tool window.

Note – At this point, all system information is delivered to you by way of the ALOM system controller card and its software. ALOM is the default method for communicating with the Netra 440 server. For detailed information about using ALOM, refer to the *Advanced Lights Out Manager User's Guide for the Netra 440 Server* (817-5481-xx) and the *Netra 440 Server System Administration Guide* (817-3884-xx), which includes information about reconfiguration options.

Powering On and Configuring the Server

This chapter describes how to power on and configure the server to suit your application. It contains these sections:

- "Powering On the Server" on page 81
- "Powering Off the System Using the On/Standby Button" on page 84
- "Configuring the Server" on page 85
- "Accessing Advanced Lights Out Manager (ALOM) Software" on page 91

Powering On the Server

To power on the server, you can use either the On/Standby button located behind the front bezel, or you can use the keyboard. If you power on from the keyboard, you can see system output as the server powers on.

Caution – Never move the system when the system power is on. Movement can cause catastrophic hard drive failure. Always power off the system before moving it.

Setting the Rotary Switch

Before you begin powering on the server, make sure that the rotary switch is in the *normal* position. This position allows the On/Standby button to control the power state of the server. For more information on the operation of the rotary switch, refer to the *Netra 440 Server Product Overview* (817-3881-xx).

1. Open the front system door.

Press in on the door release latches and lower the system door.
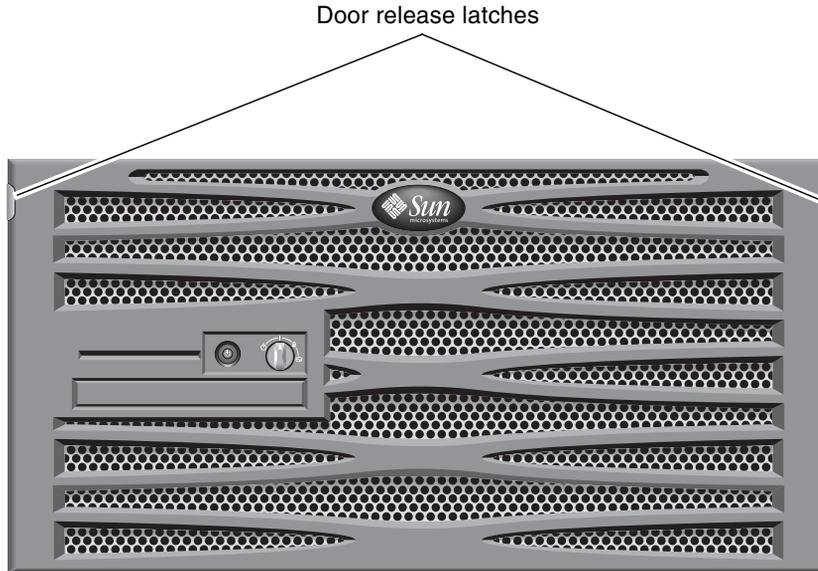
FIGURE 6-1 Opening the System Door

2. Ensure that the rotary switch is set to the normal position.

If the switch is not in the normal position (|), set it now.
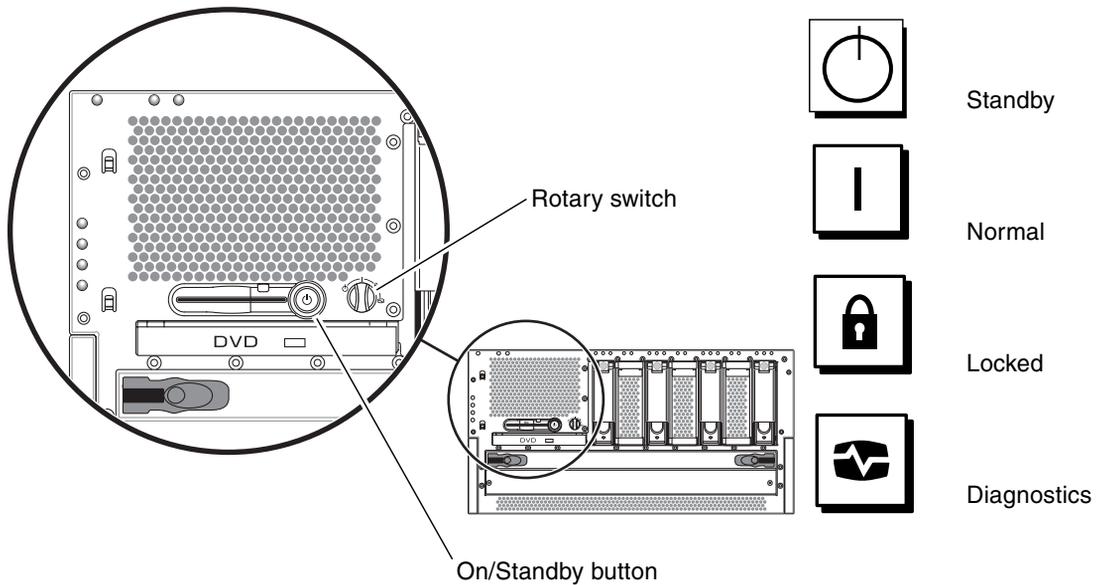
FIGURE 6-2 Rotary Switch Positions

3. **Close the bezel.**

Powering On From the Keyboard

1. **Connect the server to the power supply.**

   The server automatically goes into Standby power mode when it is connected to a power source. See Chapter 4 for instructions on connecting the power cables.

2. **Set up a connection to the SERIAL MGT port.**

   For details, see Chapter 4.

   When you switch to the ALOM prompt after initial power-on, you will be logged in as the admin user and prompted to set a password. You must set this password in order to execute certain commands.

3. **If you are prompted to do so, set a password for the admin user.**

   The password must contain:

   - At least two alphabetic characters
   - At least one numeric or one special character
   - Between six and eight characters

   Once the password is set, the admin user has full permissions and can execute all ALOM command-line interface (CLI) commands.

4. **Turn on power to any peripherals and external storage devices you have connected to the server.**

   Read the documentation supplied with the devices for specific instructions.

5. **At the console** `sc>` **prompt, type the following command to power on the server:**

```
sc> poweron
```

Powering On Using the On/Standby Button

1. **Connect the server to the power supply.**

   The server automatically goes into Standby power mode when it is connected to a power source. See Chapter 4 for instructions on connecting the power cables.

2. **Turn on power to any peripherals and external storage devices you have connected to the server.**

   Read the documentation supplied with the devices for specific instructions.

3. **Set the rotary switch on the front bezel to the Normal (|) position.**

   See FIGURE 6-2 for more information.

4. **Press the On/Standby button.**

5. **Turn the rotary switch to the Locked position.**

   This prevents anyone from accidentally powering off the system.

Powering Off the System Using the On/Standby Button

Caution – Applications running on the Solaris operating system can be adversely affected by a poorly executed system shutdown. Make sure you have gracefully shut down any applications before powering off the system.

1. **Notify users that the system will be powered down.**

2. **Back up the system files and data, if necessary.**

3. **Ensure that the rotary switch is in the Normal or Diagnostics position.**

   See for more information.

4. **Press and release the On/Standby button on the front bezel.**

   The system begins an orderly software system shutdown.

Note – Pressing and releasing the On/Standby button initiates an orderly software shutdown. Pressing and holding the switch for four seconds causes an immediate hardware shutdown. Whenever possible, you should initiate an orderly shutdown. Forcing an immediate hardware shutdown can corrupt the disk drive and cause loss of data.

---

5. **Wait for the front panel green System Activity indicator to go out.**

   See for a description of this indicator.

Configuring the Server

The Netra 440 server comes preinstalled with the Solaris 8 OS.

Note – Solaris 9 is also supported on the Netra 440 server; however, you must order Solaris 9 separately. See the `www.sun.com` website for more details. You may also have to install separate packages and patches after you've installed Solaris 9. Refer to the *Netra 440 Server Release Notes* (817-3885-xx) for more details.

When you power on the server for the first time, you are automatically taken through a configuration procedure. This procedure consists of a number of questions, and the answers you give determine how the server is configured.

Complete the software installation worksheet and choose the configuration that best suits your requirements from the list below. Then follow the instructions in the appropriate section to configure your server.

Software Configuration Worksheet

Use the following worksheet to gather the information that you need to configure software on the Netra 440 server. You do not need to gather all of the information that is requested on the worksheet. You only need to collect the information that applies to your system.

TABLE 6-1   Netra 440 Software Configuration Worksheet

Information Needed to Install	Description/Example	Your Answers
Network	Is the system connected to a network?	Yes/No
DHCP	Can the system use Dynamic Host configuration Protocol (DHCP) to configure its network interfaces?	Yes/No
Host Name	Host name that you choose for the system.	
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	Yes/No
IPv6	Do you want to enable IPv6 on this machine?	Yes/No
Kerberos	Do you want to configure Kerberos security on this machine? If yes, gather this information: Default Realm: Administration Server: First KDC: (Optional) Additional KDCs:	Yes/No
Name Service	Which name service should this system use?	NIS+/NIS/DNS/LDAP/None
Domain Name	If the system uses a name service, supply 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? If you want to specify a name server, provide the following information. Server's host name: Server's IP address:	Specify One/Find One

TABLE 6-1 Netra 440 Software Configuration Worksheet *(Continued)*

Information Needed to Install	Description/Example	Your Answers
DNS	Provide IP addresses for the DNS server. You must enter at least one IP address, but you can enter up to three addresses. Server's IP Address(es): You can enter a list of domains to search when a DNS query is made. Search Domain: Search Domain: Search Domain:	
LDAP	Provide the following information about your LDAP profile. Profile Name: Profile Server: IP Address:	
Default Router	Do you want to specify a default IP router (gateway) or let the Solaris Web Start installation program find one? If you want to specify a default router, provide the following information. Router IP address:	Specify one/Find one
Time Zone	How do you want to specify your default time zone?	Geographic region Offset from GMT Time zone file
Locales	For which geographic regions do you want to install support?	
Power Management	Do you want to use Power Management?	Yes/No
Proxy Server Configuration (Only available in the Solaris Web Start program)	Do you have a direct connection to the Internet or do you need to use a proxy server to gain access to the Internet? If you use a proxy server, provide the following information. Host: Port:	Direct Connection/Proxy Server
Automatic reboot or CD/DVD ejection	Reboot automatically after software installation? Eject CD/DVD automatically after software installation?	Yes/No Yes/No

TABLE 6-1   Netra 440 Software Configuration Worksheet *(Continued)*

Information Needed to Install	Description/Example	Your Answers
Software Group	Which Solaris Group do you want to install?	Entire Plus OEM Entire Developer End User Core
Custom Package Selection	Do you want to add or remove software packages from the Solaris Software Group that you install? Note - When you select which packages to add or remove, you need to know about software dependencies and how Solaris software is packaged.	
64-bit	Do you want to install support for 64-bit applications?	Yes/No
Select Disks	On which disks do you want to install the Solaris software? Example: `c0t0d0`	
Preserver Data	Do you want to preserve any data that exists on the disks where you are installing the Solaris software?	Yes/No
Auto-layout File Systems	Do you want the installation program to lay out file systems on your disks automatically? If yes, which file systems should be used for auto-layout? Example:`/, /opt, /var` If no, you must provide file system configuration information.	Yes/No
Mount Remote File Systems (only available in the Solaris `suninstall` program)	Does this system need to access software on another file system? If yes, provide the following information about the remote file system. Server: IP Address: Remote File System: Local Mount Point:	Yes/No

Configuring With the Server Details Registered as a Name Server

---

Note – Follow the instructions in this section only if you have a name server installed on your network. For instructions on using a name server to automate the process of configuring the Solaris operating system on multiple servers, refer to the Solaris *Advanced Installation Guide* that comes with the Solaris software.

During the boot process, you are prompted for certain information. The information you provide determines the configuration of the server.

1. **Specify the type of terminal you are using to communicate with the server.**

2. **Specify whether you need IPv6 enabled, and then follow the instructions on the screen.**

3. **Specify whether you want to enable the Kerberos Security mechanism, and then follow the instructions on the screen.**

4. **When prompted, give a password (if any) for users logging in as superuser.**

Configuring Without the Server Details Registered as a Name Server

Follow the instructions in this section if you do not have a name server configured on your network.

Tip – Read these instructions through before you follow them, to see what information the system prompts you for when you start it for the first time.

During booting you are prompted for certain information. The information you provide determines the configuration of the server.

1. **Specify the type of terminal you are using to communicate with the server.**

2. **When asked if you want the server to be networked, answer Yes.**

3. **Specify whether the IP address is to be configured by DHCP.**

   If you plan to configure the IP address manually, specify an IP address when prompted.

4. **Specify which of the Ethernet ports you intend to use as the primary Ethernet connection.**

5. **Specify a host name for the server.**

6. **If prompted, specify the IP address for the system.**

   The system prompts you for this address if you declined to use DHCP in Step 3. It also asks you whether the server is to be part of a subnet. If you answer yes, the system prompts you to provide the netmask of the subnet.

7. **Specify whether you need IPv6 enabled, and then follow the instructions on the screen.**

8. **Specify whether you want to enable the Kerberos Security mechanism, and then follow the instructions on the screen.**

9. **Specify the name service you want the server to use.**

10. **Specify the name of the domain of which the server will be a part.**

11. **Specify whether you want the system to search the network for a name server or whether you want it to use a particular name server.**

12. **If you chose to use a particular name server, specify the host name and IP address of the name server.**

13. **At the name server prompt, create entries in the network administration files for the system you are setting up.**

14. **At the system you are setting up, follow the prompts to provide time and date information.**

15. **When prompted, give a password (if any) for users logging in as superuser.**

Configuring a Standalone Server for the First Time

1. **Specify the type of terminal you are using to communicate with the server.**

2. **When prompted to indicate whether you want the server to be networked, specify No.**

3. **Specify a host name for the server.**

4. **Confirm the information you have given.**

5. **Specify the date and time information.**

6. **When prompted, give a password (if any) for users logging in as superuser.**

Clearing Your Configuration and Starting Again

If you want to start the power on process again, as if from a previously unused server, you must clear the configuration of the server.

1. **At the Solaris prompt, type:**

```
# sys-unconfig
```

2. **When prompted to confirm that you want to create a "blank" server, type** y**.**

3. **When the OpenBoot prompt appears, type:**

```
ok> boot
```

4. **Follow the instructions in one of the following sections:**
   - "Configuring With the Server Details Registered as a Name Server" on page 89
   - "Configuring Without the Server Details Registered as a Name Server" on page 89
   - "Configuring a Standalone Server for the First Time" on page 90

Accessing Advanced Lights Out Manager (ALOM) Software

For detailed ALOM instructions and configuration information, refer to the *Sun Advanced Lights Out Manager User Guide For the Netra 440 Server* (817-5481-xx).

The ALOM software is preinstalled on the server and is ready to run as soon as power is supplied to the server. However, you need to perform some basic configuration steps to customize the ALOM software to suit your application.

Displaying the ALOM Prompt

1. **At the command prompt, type the default keystroke sequence (**#**.) to display the ALOM prompt:**

```
# #.
```

> **Note –** When you switch to the ALOM prompt after initial power-on, you are
> logged in as the admin user and prompted to set a password. You must set this
> password in order to execute certain commands.

2. If you are prompted to do so, set a password for the admin user.

The password must contain:

- At least two alphabetic characters
- At least one numeric or one special character
- Between six and eight characters

Once the password is set, the user has full permissions and can execute all ALOM
command-line interface (CLI) commands.

Displaying the Console Prompt

● **At the ALOM prompt, type:**

```
sc> console
```

More than one ALOM user can be connected to the server console stream at a time,
but only one user is permitted to type input characters to the console.

If another user is logged on and has write capability, you will see the message below
after issuing the console command:

```
sc> Console session already in use. [view mode]
```

Taking Console Write Capability Away From Another User

● **At the ALOM prompt, type:**

```
sc> console -f
```

Installing the DVD Drive

Both DVD-ROM drives and DVD-RW drives are supported in the Netra 440 server (both are referred to as the DVD drive in this document). The DVD drive is not a hot-swappable component; you must power down the server before you can remove or install a DVD drive into the system. The DVD drive does not come standard with the Netra 440 server, so you must order it separately. Following are the part numbers for the DVD drives:

- DVD-ROM drive—X7423A
- DVD-RW drive—X7424A

Consult your authorized Sun sales representative or service provider to order a DVD drive.

You may also need to install additional software and patches for the DVD-RW drive. Refer to the *Netra 440 Server Release Notes* (817-3885-xx) for more information.

1. Power off the system, if it is not already powered off.

See "Powering Off the System Using the On/Standby Button" on page 84.

2. Attach the antistatic wrist strap.

3. Open the system door.

4. Remove the DVD slot cover, if one is installed.

Pull down on the top of the DVD slot cover, then lift it up and away from the empty DVD slot (FIGURE A-1). Store the DVD slot cover in a safe place.
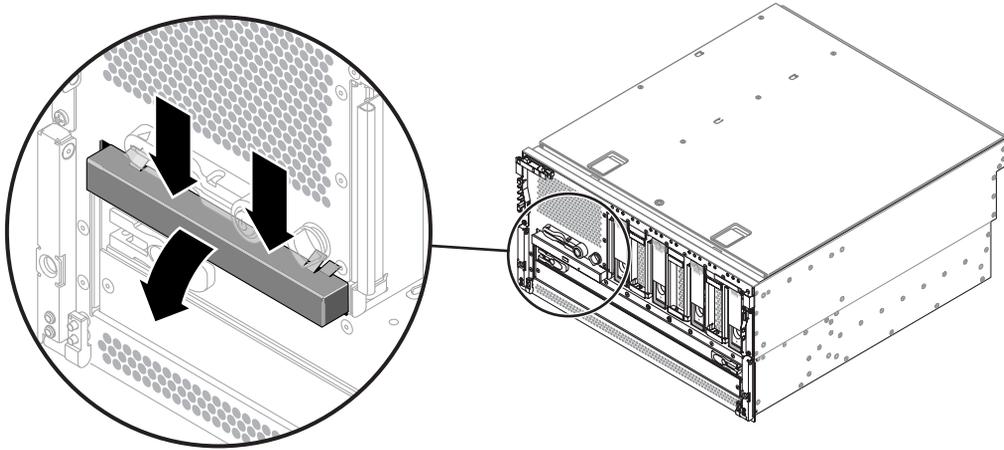
FIGURE A-1 Removing the DVD Slot Cover

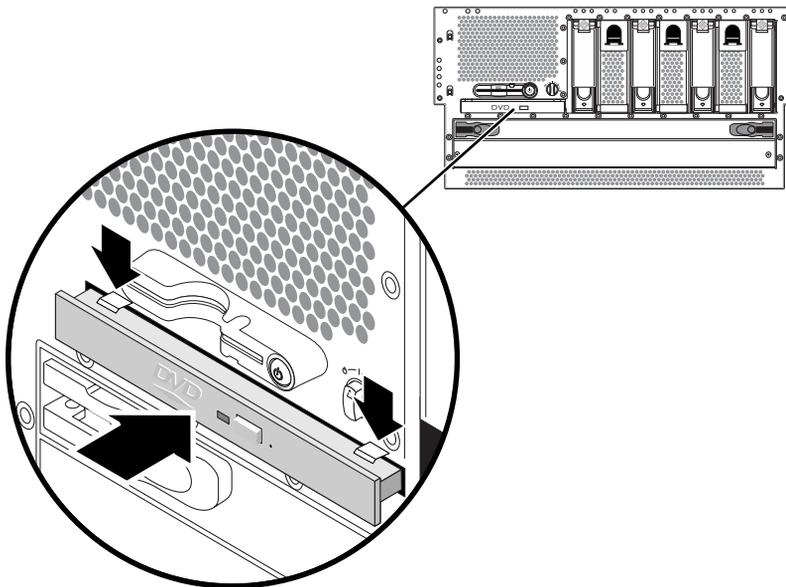5. **Slide the DVD drive into the system until the two DVD drive locking tabs click into place (**FIGURE A-2**).**

FIGURE A-2 Installing the DVD drive.

6. **Close the system door.**

7. **Power on the system and perform a configuration reboot.**

See "Powering On the Server" on page 81.

Netra 440 Server LEDs

This appendix gives information on the Netra 440 server LEDs. All of the information in this appendix is related directly to instructions in this guide.

Enclosure Status LEDs

As you install your Netra 440 server, be aware of several enclosure status LED indicators on both the front and back panels. These indicators provide general enclosure status, alert you to system problems, and help you to determine the location of system faults.

At the top left of the server front are three general enclosure status LEDs. Two of these LEDs, the system *Service Required* LED and the *System Activity* LED, provide a snapshot of the overall enclosure status. One LED, the *Locator* LED, helps you to locate a specific system quickly, even though it might be one of many systems in a room. The Locator LED is lit by command from the administrator. For instructions, refer to the *Netra 440 Server Diagnostics and Troubleshooting Guide* (817-3886-xx).

Other LEDs located on the front of the server work in conjunction with specific fault LED icons. For example, a power supply fault illuminates the associated power supply Service Required LED and the system Service Required LED. Since all front panel status LEDs are powered by the server's 5-volt standby power source, fault

LEDs remain lit for any fault condition that results in a system shutdown. Locator, Service Required, and System Activity LEDs are also found at the upper-left corner of the back panel.

The enclosure status LEDs operate as described in the following table.

TABLE B-1   Enclosure Status LEDs

Name	Icon	Description
Locator		This white LED is lit by Solaris OS command, by Sun Management Center software, or by Sun Remote System Control software, to locate a system. See the *Netra 440 Server System Administration Guide* for more information
Service Required		This amber LED lights when system hardware or software has detected a system fault. This LED lights for any faults or failures detected in the following areas: • Motherboard • CPU/memory module • DIMM • Hard drive • Fan trays • Power supply In addition to the system Service Required LED, other fault LEDs might also be lit, depending on the nature of the fault. If the system Service Required LED is lit, check the status of other fault LEDs on the front panel to determine the nature of the fault. See the *Netra 440 Server Diagnostics and Troubleshooting Guide* for more information.
System Active		This green LED lights when the ALOM detects that Solaris OS is running.

Alarm LEDs

The alarm LEDs are located at the front of the system, along the left side of the front cover.

The dry contact alarm card has four LED status indicators that are supported by ALOM. Information about the alarm indicators and dry contact alarm states is provided in TABLE B-2. For more information about alarm indicators, refer to the *Sun Advanced Lights Out Manager Software User's Guide for the Netra 440 Server* (817-5481-xx). For more information about an API to control the alarm indicators, refer to the *Netra 440 Server System Administration Guide* (817-3884-xx).

TABLE B-2 Alarm Indicators and Dry Contact Alarm States

Indicator and Relay Labels	Indicator Color	Application or Server State	Condition or Action	System Indicator State	Alarm Indicator State	Relay NC[3] State	Relay NO[4] State	Comments
Critical (Alarm0)	Red	Server state (Power on/off and Solaris OS functional/ not functional)	No power input.	Off	Off	Closed	Open	Default state
			System power off.	Off	On	Closed	Open	Input power connected
			System power turns on; Solaris OS not fully loaded.	Off	On	Closed	Open	Transient state
			Solaris OS successfully loaded.	On	Off	Open	Closed	Normal operating state
			Watchdog timeout.	Off	On	Closed	Open	Transient state; reboot Solaris OS
			Solaris OS shutdown initiated by user.[1]	Off	On	Closed	Open	Transient state
			Lost input power.	Off	Off	Closed	Open	Default state
			System power shutdown initiated by user.	Off	On	Closed	Open	Transient state
		Application state	User sets Critical alarm on.[2]	—	On	Closed	Open	Critical fault detected
			User sets Critical alarm off.[2]	—	Off	Open	Closed	Critical fault cleared
Major (Alarm1)	Red	Application state	User sets Major alarm on.[2]	—	On	Open	Closed	Major fault detected
			User sets Major alarm off.[2]	—	Off	Closed	Open	Major fault cleared

Indicator and Relay Labels	Indicator Color	Application or Server State	Condition or Action	System Indicator State	Alarm Indicator State	Relay NC[3] State	Relay NO[4] State	Comments
Minor (Alarm2)	Amber	Application state	User sets Minor alarm on.[2]	—	On	Open	Closed	Minor fault detected
			User sets Minor alarm off.[2]	—	Off	Closed	Open	Minor fault cleared
User (Alarm3)	Amber	Application state	User sets User alarm on.[2]	—	On	Open	Closed	User fault detected
			User sets User alarm off.[2]	—	Off	Closed	Open	User fault cleared

1 The user can shut down the system using commands such as init0 and init6. This does not include the system power shutdown.

2 Based on a determination of the fault conditions, the user can turn the alarm on using the Solaris platform alarm API or ALOM CLI. For more information about the alarm API, see the *Netra 440 Server System Administration Guide* and for more information about ALOM CLI, see the *Sun Advanced Lights Out Manager Software User's Guide for the Netra 440 Server*.

3 NC state is the normally closed state. This state represents the default mode of the relay contacts in the normally closed state.

4 NO state is the normally open state. This state represents the default mode of the relay contacts in the normally open state.

In all cases when the user sets an alarm, a message is displayed on the console. For example, when the critical alarm is set, the following message is displayed on the console:

```
SC Alert: CRITICAL ALARM is set
```

Note that in some instances when the critical alarm is set, the associated alarm indicator is not lit.

Hard Drive LEDs

The hard drive LEDs are located at the front of the system, behind the front cover, directly above each hard drive.

The following table describes the hard drive LEDs.

TABLE B-3   Hard Drive LEDs

Name	Icon	Description
OK-to-Remove		This blue LED lights when the hard drive has been taken offline and is safe to remove from the system.
Service Required		Reserved for future use.
Activity		This green LED lights when the system is powered on and a disk is present in the monitored drive slot. This LED flashes slowly during the hard drive hot-swap procedure. It flashes rapidly when the disk is spinning up or down, or during read/write activity.

Fan Tray LEDs (0-2)

The fan tray LEDs are located behind the front cover, directly above each fan tray. Note that these LEDs give information only for fan trays 0-2; they do not give information on fan tray 3, located inside the system.

The following table describes the fan tray LEDs.

TABLE B-4   Fan Tray LEDs

Name		Description
Service Required		This amber LED lights when there is a fault detected with the fan tray. Note that the Service Required LEDs on the front and back panels also light when this occurs.
Activity		This green LED lights when the fan tray is on and operating normally.

Power Supply LEDs

The power supply LEDs are located at the rear of the system on each power supply. The following table describes the power supply LEDs.

TABLE B-5   Power Supply LEDs

Name	Icon	Description
OK-to-Remove		This blue LED lights when it is safe to remove the power supply from the system. This LED is controlled by the software only.
Service Required		This amber LED lights when the power supply's internal circuitry detects a fault. Note that the Service Required LEDs on the front and back panels also light when this occurs.
Power OK		This green LED lights when the power supply is in standby mode or when it is on and outputting regulated power within specified limits.

Ethernet Connection LEDs

A set of Ethernet LEDs is located on each Ethernet port. The Ethernet LEDs operate as described in .

TABLE B-6   Ethernet LEDs

Name	Description
Link/Activity	This green LED lights when a link is established at the particular port with its link partner, and blinks to indicate activity.
Speed	This amber LED lights when a Gigabit Ethernet connection is established, and is off when a 10/100-Mbps Ethernet connection is established.

Network Management Port LED

The network management port has a Link LED that operates as described in .

TABLE B-7   Network Management Port LED

Name	Description
Link	This green LED is lit when an Ethernet connection is present.

Selecting a Boot Device

The boot device is specified by the setting of an OpenBoot configuration variable called `boot-device`. The default setting of this variable is `disk net`. Because of this setting, the firmware first attempts to boot from the system hard drive, and if that fails, from the on-board NET0 Gigabit Ethernet interface.

This procedure assumes that you are familiar with the OpenBoot firmware and that you know how to enter the OpenBoot environment. For more information, see the *Netra 440 Server System Administration Guide* (817-3884-xx).

Note – The serial management port on the ALOM card is preconfigured as the default system console port. For more information, see the *Netra 440 Server Product Overview* (817-3881-xx).

If you want to boot from a network, you must connect the network interface to the network. See Chapter 4.

● **At the** `ok` **prompt, type:**

```
ok setenv boot-device device-specifier
```

Where the *device-specifier* is one of the following:

- `cdrom` – Specifies the DVD drive
- `disk` – Specifies the system boot disk (internal disk 0 by default)
- `disk0` – Specifies internal drive 0
- `disk1` – Specifies internal drive 1
- `disk2` – Specifies internal drive 2
- `disk3` – Specifies internal drive 3
- `net`, `net0`, `net1`– Specifies the network interfaces
- *full path name* – Specifies the device or network interface by its full path name

Note – The Solaris OS modifies the `boot-device` variable to its full path name, not the alias name. If you choose a nondefault `boot-device` variable, the Solaris OS specifies the full device path of the boot device.

Note – You can specify the name of the program to be booted as well as the way the boot program operates. For more information, refer to the *OpenBoot 4.x Command Reference Manual* in the *OpenBoot Collection AnswerBook* for your specific Solaris OS release.

If you want to specify a network interface other than an onboard Ethernet interface as the default boot device, you can determine the full path name of each interface by typing:

```
ok show-devs
```

The `show-devs` command lists the system devices and displays the full path name of each PCI device.

Managing Network Interfaces

This appendix describes how to manage network interfaces. This appendix contains the following sections:

Network Interfaces

The Netra 440 server provides two on-board Sun Gigabit Ethernet interfaces, which reside on the system motherboard and conform to the IEEE 802.3z Ethernet standard. The Ethernet interfaces operate at 10 Mbps, 100 Mbps, and 1000 Mbps.

Two back panel ports with RJ-45 connectors provide access to the on-board Ethernet interfaces. Each interface is configured with a unique Media Access Control (MAC) address. Each connector features two LEDs, as described in the *Netra 440 Server Product Overview* (817-3881-xx). Additional Ethernet interfaces or connections to other network types are available by installing the appropriate PCI interface cards.

The system's onboard interfaces can be configured for redundancy, or an additional network interface card can serve as a redundant network interface for one of the system's on-board interfaces. If the active network interface becomes unavailable, the system can automatically switch to the redundant interface to maintain availability. This capability is known as *automatic failover* and must be configured at the Solaris OS level. In addition, this configuration provides outbound data load balancing for increased performance. For additional details, see "Redundant Network Interfaces" on page 106.

The Ethernet driver is installed automatically during the Solaris OS installation procedure.

For instructions on configuring the system network interfaces, see:

- "Configuring the Primary Network Interface" on page 107
- "Configuring Additional Network Interfaces" on page 109

Redundant Network Interfaces

You can configure your system with redundant network interfaces to provide a highly available network connection. Such a configuration relies on special Solaris OS features to detect a failed or failing network interface and automatically switch all network traffic over to the redundant interface. This capability is known as automatic failover.

To set up redundant network interfaces, you can enable automatic failover between the two similar interfaces using the IP Network Multipathing feature of the Solaris OS. For additional details, refer to the *Netra 440 Server System Administration Manual* (817-3884-xx). You can also install a pair of identical PCI network interface cards, or add a single card that provides an interface identical to one of the two on-board Ethernet interfaces.

To ensure maximum redundancy, each onboard Ethernet interface resides on a different PCI bus. To help further maximize system availability, ensure that any additional network interfaces added for redundancy also reside on separate PCI buses, which are supported by separate PCI bridges. For additional details, refer to the *Netra 440 Server Product Overview* (817-3881-xx).

Attaching a Twisted-Pair Ethernet Cable

1. **Locate the RJ-45 twisted-pair Ethernet (TPE) connector for the appropriate Ethernet interface—the left connector (net0) or the right connector (net1).**

   For a PCI Ethernet adapter card, see the documentation supplied with the card.

2. **Connect a Category-5 unshielded twisted-pair (UTP) cable to the appropriate RJ-45 connector on the system back panel.**

   You should hear the connector tab click into place. The UTP cable length must not exceed 100 meters (328 feet).

3. **Connect the other end of the cable to the RJ-45 outlet of the appropriate network device.**

You should hear the connector tab click into place.

Consult your network documentation if you need more information about how to connect to your network.

If you are adding an additional network interface to the system, you need to configure that interface. See "Configuring Additional Network Interfaces" on page 109.

Configuring the Primary Network Interface

For background information, see "Network Interfaces" on page 105.

If you are using a PCI network interface card, see the documentation supplied with the card.

1. **Choose a network port, using the following table as a guide.**

Ethernet Port	PCI Bus/Clock Rate	OpenBoot PROM devalias	Device Path
1	PCI 2B/66 MHz	net1	/pci@1f,700000/network@1
0	PCI 1A/66 MHz	net0	/pci@1c,600000/network@2

2. **Attach an Ethernet cable to the port you chose.**

See "Attaching a Twisted-Pair Ethernet Cable" on page 106.

3. **Choose a network host name for the system and make a note of it.**

You need to furnish the name in a later step.

The host name must be unique within the network. It can consist only of alphanumeric characters and the dash (–). Do not use a dot in the host name. Do not begin the name with a number or a special character. The name must not be longer than 30 characters.

4. **Determine the unique Internet Protocol (IP) address of the network interface and make a note of it.**

You need to furnish the address in a later step.

An IP address must be assigned by the network administrator. Each network device or interface must have a unique IP address.

During installation of the Solaris OS, the software automatically detects the system's on-board network interfaces and any installed PCI network interface cards for which native Solaris device drivers exist. The operating environment then asks you to select one of the interfaces as the primary network interface and prompts you for its host name and IP address. You can configure only one network interface during installation of the operating system. You must configure any additional interfaces separately, after the operating system is installed. For more information, see "Configuring Additional Network Interfaces" on page 109.

For Additional Information

After completing this procedure, the primary network interface is ready for operation. However, in order for other network devices to communicate with the system, you must enter the system's IP address and host name into the namespace on the network name server. For information about setting up a network name service, see the *Solaris Naming Configuration Guide* for your specific Solaris OS release.

The device driver for the system's on-board Sun Gigabit Ethernet interfaces is automatically installed with the Solaris OS release. For information about operating characteristics and configuration parameters for this driver, refer to the *Platform Notes: The Sun GigaSwift Ethernet Device Driver.*

This document is available on the *Solaris on Sun Hardware AnswerBook*, which is provided on the Solaris Supplement CD for your specific Solaris OS release.

If you want to set up an additional network interface, you must configure it separately, after installing the operating environment. See "Configuring Additional Network Interfaces" on page 109.

Note – The Netra 440 server conforms to the Ethernet 10/100BASE-T standard, which states that the Ethernet 10BASE-T link integrity test function should always be enabled on both the host system and the Ethernet hub. If you have problems establishing a connection between this system and your hub, verify that the Ethernet hub also has the link test function enabled. Consult the manual provided with your hub for more information about the link integrity test function.

Configuring Additional Network Interfaces

Perform the following tasks to prepare an additional network interface:

- If you are setting up a redundant network interface, see "Redundant Network Interfaces" on page 106.
- If you need to install a PCI network interface card, follow the installation instructions in the *Netra 440 Server Service Manual* (817-3883-xx).
- Attach an Ethernet cable to the appropriate port on the system back panel. See "Attaching a Twisted-Pair Ethernet Cable" on page 106. If you are using a PCI network interface card, see the documentation supplied with the card.

Note – All internal devices, except hard drives, must be installed by qualified service personnel only. Installation procedures for these components are covered in the *Netra 440 Server Service Manual* (817-3883-xx).

---

1. **Choose a network host name for each new interface.**

   You need to furnish the name in a later step.

   The host name must be unique within the network. It can consist only of alphanumeric characters and the dash (–). Do not use a dot in the host name. Do not begin the name with a number or a special character. The name must not be longer than 30 characters.

   Usually an interface host name is based on the system host name. For example, if the system is assigned the host name `sunrise`, the added network interface could be named `sunrise-1`. For more information, see the installation instructions accompanying the Solaris OS.

2. **Determine the Internet Protocol (IP) address for each new interface.**

   You need to furnish the IP address in a later step.

   An IP address must be assigned by your network administrator. Each interface on a network must have a unique IP address.

3. **Boot the operating system, if it is not already running.**

   Be sure to perform a reconfiguration boot if you just added a new PCI network interface card. See "Initiating a Reconfiguration Boot" on page 112.

4. **Log in to the system as superuser.**

5. **Create an appropriate** `/etc/hostname` **file for each new network interface.**

The name of the file you create should be of the form /etc/hostname.*typenum*, where *type* is the network interface type identifier (some common types are ce, le, hme, eri, and ge) and *num* is the device instance number of the interface according to the order in which it was installed in the system.

For example, the file names for the system's Gigabit Ethernet interfaces are /etc/hostname.ce0 and /etc/hostname.ce1 If you add a PCI Fast Ethernet adapter card as a third interface, its file name should be /etc/hostname.eri0. At least one of these files—the primary network interface—should exist already, having been created automatically during the Solaris OS installation process.

Note – The documentation accompanying the network interface card should identify its type. Alternatively, you can enter the show-devs command from the ok prompt to obtain a list of all installed devices.

---

6. **Edit the** /etc/hostname **file(s) created in Step 5 to add the host name(s) determined in Step 1.**

   Following is an example of the /etc/hostname files required for a system called sunrise, which has two on-board Sun Gigabit Ethernet interfaces (ce0 and ce1) and a PCI Fast Ethernet adapter card (eri2). A network connected to the on-board ce0 and ce1 interfaces would recognize the system as sunrise and sunrise-1, while networks connected to the PCI-based eri0 interface would recognize the system as sunrise-2.

   ```
   sunrise #  cat /etc/hostname.ce0
   sunrise
   sunrise #  cat /etc/hostname.ce1
   sunrise-1
   sunrise #  cat /etc/hostname.eri0
   sunrise-2
   ```

7. **Create an entry in the** /etc/hosts **file for each active network interface.**

   An entry consists of the IP address and the host name for each interface.

The following example shows an `/etc/hosts` file with entries for the three network interfaces used as examples in this procedure.

```
sunrise #  cat /etc/hosts
#
# Internet host table
#
127.0.0.1     localhost
129.144.10.57 sunrise loghost
129.144.14.26 sunrise-1
129.144.11.83 sunrise-2
```

8. **Manually configure and enable each new interface using the** `ifconfig` **command.**

   For example, for the interface `eri0`, type:

   ```
   # ifconfig eri0 inet ip-address netmask ip-netmask broadcast +
   ```

   For more information, see the `ifconfig`(1M) man page.

   After completing this procedure, any new network interfaces are ready for operation. However, in order for other network devices to communicate with the system through the new interface, the IP address and host name for each new interface must be entered into the namespace on the network name server. For information about setting up a network name service, consult the *Solaris Naming Configuration Guide* for your specific Solaris release.

   The `ce` device driver for each of the system's on-board Sun Gigabit Ethernet interfaces is automatically configured during Solaris installation. For information about operating characteristics and configuration parameters for these drivers, refer to the *Platform Notes: The Sun GigaSwift Ethernet Device Driver.*

   This document is available on the *Solaris on Sun Hardware AnswerBook*, which is provided on the Solaris Supplement CD for your specific Solaris release.

Note – The Netra 440 server conforms to the Ethernet 10/100BASE-T standard, which states that the Ethernet 10BASE-T link integrity test function should always be enabled on both the host system and the Ethernet hub. If you have problems establishing a connection between this system and your Ethernet hub, verify that the hub also has the link test function enabled. Consult the manual provided with your hub for more information about the link integrity test function.

Initiating a Reconfiguration Boot

After installing any new internal option or external storage device, you must perform a reconfiguration boot so that the operating system is able to recognize the newly installed device(s). In addition, if you remove any device and do not install a replacement device prior to rebooting the system, you must perform a reconfiguration boot in order for the operating system to recognize the configuration change. This requirement also applies to any component that is connected to the system I^2C bus to ensure proper environmental monitoring.

This requirement *does not* apply to any component that is:

- Installed or removed as part of a hot-swap operation
- Installed or removed before the operating system is installed
- Installed as an identical replacement for a component that is already recognized by the operating system

To issue software commands, you need to set up an alphanumeric terminal connection, a local graphics monitor connection, ALOM connection, or a TIP connection to the Netra 440 server. See Chapter 5 for more information about connecting the Netra 440 server to a terminal or similar device.

⚠ **Caution –** Before you power on the system, ensure that the system doors and all panels are properly installed.

This procedure assumes that you are accessing the system console using the serial management or network management port.

1. **Turn on power to any external peripherals and storage devices.**

   Read the documentation supplied with the device for specific instructions.

2. **Turn on power to the alphanumeric terminal or local graphics monitor, or log in to the ALOM.**

3. **Turn the rotary switch to the Diagnostics position.**

   Use the Diagnostics position to run power-on self-test (POST) and OpenBoot Diagnostics tests to verify that the system functions correctly with the new part(s) you just installed. See "Setting the Rotary Switch" on page 82 for information about rotary switch settings.

4. **Press the On/Standby button to power on the system.**

5. **If you are logged in to the** `sc>` **prompt, switch to the** `ok` **prompt. Type:**

```
sc> console
```

6. **When the system banner is displayed on the system console, immediately abort the boot process to access the system** `ok` **prompt.**

   The system banner contains the Ethernet address and host ID. To abort the boot process, use one of the following methods:

   - Hold down the Stop (or L1) key and press A on your keyboard.
   - Press the Break key on the terminal keyboard.
   - Type the `break` command from the `sc>` prompt.

7. **At the** `ok` **prompt, type the following commands:**

```
ok setenv auto-boot? false
ok reset-all
```

   You must set the `auto-boot?` variable to `false` and issue the `reset-all` command to ensure that the system correctly initiates upon reboot. If you do not issue these commands, the system may fail to initialize, because the boot process was aborted in .

8. **At the** `ok` **prompt, type the following command:**

```
ok setenv auto-boot? true
```

   You must set the `auto-boot?` variable back to `true` so that the system boots automatically after a system reset.

9. **At the** `ok` **prompt, type the following command:**

```
ok boot -r
```

   The `boot -r` command rebuilds the device tree for the system, incorporating any newly installed options so that the operating system recognizes them.

Note – The system can take anywhere from 30 seconds to 20 minutes before the system banner appears. This time depends on the system configuration (number of CPUs, memory modules, PCI cards) and the level of POST and OpenBoot Diagnostics tests being performed. For more information about OpenBoot configuration variables, refer to the *Netra 440 Server System Administration Guide* (817-3884-xx).

10. **Turn the rotary switch to the Locked position.**

    This prevents anyone from accidentally powering off the system. See "Setting the Rotary Switch" on page 82 for information about rotary switch settings.

11. **Close the system door.**

    The system front panel LED indicators provide power-on status information. For information about the system LEDs, refer to "Enclosure Status LEDs" on page 95.

    If the system encounters a problem during startup, and the rotary switch is in the Normal position, try restarting the system in diagnostics mode to determine the source of the problem. Turn the rotary switch to the Diagnostics position and power cycle the system. See "Powering On the Server" on page 81 for more information.

    For information about system diagnostics and troubleshooting, see the *Netra 440 Server Diagnostics and Troubleshooting Guide* (817-3886-xx).

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