Sun Netra T5220 Server

Installation Guide

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Contents

Preface

This installation guide explains how to install, cable and power on the Sun Netra T5220 server from Oracle. This document is written for technicians, system administrators, authorized service providers, and users who have advanced experience troubleshooting and replacing hardware.

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

- Product Notes
- Related Documentation
- Feedback
- Support and Accessibility

Product Notes

For late-breaking information and known issues about this product, refer to the products notes at:

http://download.oracle.com/docs/cd/E19350-01/index.html

Related Documentation

Documentation	Link
All Oracle products	http://www.oracle.com/documentation
your-product-name	http://download.oracle.com/docs/cd/E19350-01/index.html
other-product-name	http://download.oracle.com/docs/cd/E19874-01/index.html
Oracle Solaris OS and systems software library	http://www.oracle.com/technetwork/indexes/documentation/index.html#sys_sw

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Support and Accessibility

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Sun Netra T5220 Features Overview

This chapter describes the features of the Sun Netra T5220 server. Topics include:

- "Sun Netra T5220 Server" on page 2
- "Features at a Glance" on page 5
- "Performance Enhancements" on page 8
- "High Levels of System Reliability, Availability, and Serviceability" on page 11
- "Fault Management and Predictive Self Healing" on page 13

Note – Review the *Sun Netra T5220 Server Product Notes* (820-3014) for the most recent system firmware release. The system firmware postings contain a README file detailing the fixes and new features.

Sun Netra T5220 Server

The Sun Netra T5220 server is a 2-rack unit (2U) server.

The Sun Netra T5220 server is a scalable, reliable, high-performance, entry-level server, optimized for enterprise data centers. The server offers the following key features:

- The UltraSPARC T2 multicore processor with CoolThreads technology for high-throughput and energy savings.

- High levels of system uptime through the processor and memory reliability-availability-serviceability (RAS) features, coupled with redundancy of some system components, support for hardware RAID (0+1), and the predictive self-healing features of the Solaris™ 10 Operating System (Solaris OS).

- A space efficient, rack-optimized form factor 2U chassis.

- Investment protection with SPARC V9 binary application compatibility and the Solaris 10 OS. The Solaris 10 OS also provides features such as Solaris Predictive Self-Healing, Solaris Dynamic Tracing, and support across UltraSPARC platforms.

- Unified server management though the use of the Integrated Lights Out Manager (ILOM) system controller interface. ILOM integrates and manages CoolThreads and x64 platforms with the same tool set, and in heterogeneous environments, using industry standard element management tools and enterprise frameworks.

Chassis Identification

The following figures show the physical characteristics of the front and rear panels of the Sun Netra T5220 server (FIGURE 1-1, FIGURE 1-2, and FIGURE 1-4).

FIGURE 1-1 Front Panel of the Sun Netra T5220 Server

Figure Legend

1	Alarm status indicators: Top to bottom: Critical LED, Major LED, Minor LED, User LED
2	System Status Indicators: Left to right: Locator LED Button, Service Required LED, System Activity LED, Power Button
3	Removable media in 2 hard drive configuration

FIGURE 1-2 Front Panel of the Sun Netra T5220 Server With the Bezel Removed
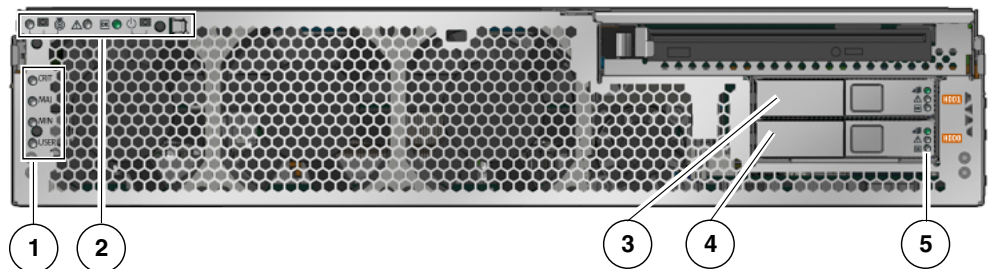
Figure Legend

1	Alarm status indicators (also displayed with front bezel installed, see FIGURE 1-1)
2	System status indicators (also displayed with front bezel installed, see FIGURE 1-1)
3	Hard drive 1 (HDD 1)
4	Hard drive 0 (HDD 0)
5	Hard drive LEDs top to bottom: OK to Remove LED, Service Required LED, Power OK LED

FIGURE 1-3   Front Panel of the Sun Netra T5220 Server With the Bezel Removed
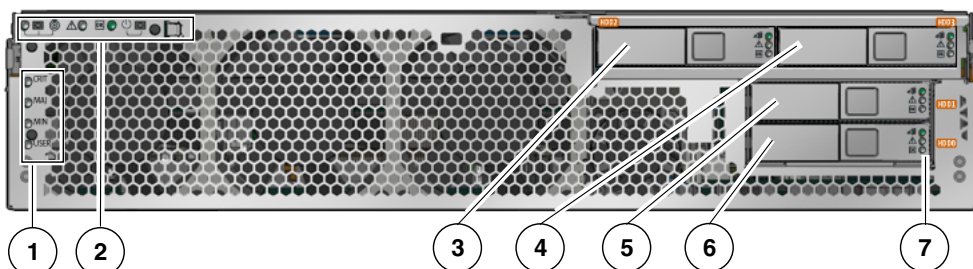
Figure Legend

1	Alarm Status Indicators (also displayed with front bezel installed, see FIGURE 1-1)
2	System Status Indicators (also displayed with front bezel installed, see FIGURE 1-1)
3	Hard drive 2 (HDD 2)
4	Hard drive 3 (HDD 3)
5	Hard drive 1 (HDD 1)
6	Hard drive 0 (HDD 0)
7	Hard drive LEDs top to bottom: OK to Remove LED, Fault LED, Activity LED

FIGURE 1-4   Rear Panel Cable Connectors and LEDs on the Sun Netra T5220 Server

Figure Legend

1	Power Supply 0 LEDs top to bottom: Locator LED Button, Service Required LED, Power OK LED
2	Power Supply 0
3	Power Supply 1 LEDs top to bottom: Locator LED Button, Service Required LED, Power OK LED
4	Power Supply 1

5	Captive screw for securing motherboard (1 of 2)
6	System LEDs left to right: Locator LED Button, Service Required LED, Power OK LED
7	Service Processor Serial Management Port
8	Service Processor Network Management Port
9	Captive screws for securing the bottom PCI cards. Each bottom card has screws on both sides
10	Gigabit Ethernet Ports left to right: NET0, NET1, NET2, NET3
11	Alarm Port
12	USB ports left to right: USB0, USB1
13	TTYA Serial Port
14	Captive screw for securing motherboard (2 of 2)
15	PCI-X Slot 3
16	PCIe or XAUI Slot 0
17	PCI-X Slot 4
18	PCIe or XAUI Slot 1
19	PCIe Slot 5
20	PCIe Slot 2

Features at a Glance

TABLE 1-1 lists the features of the Sun Netra T5220 server

TABLE 1-1   Feature Specifications

Feature	Description
Processor	One UltraSPARC T2 multicore processor running at 1.2Ghz with one of the following number of cores: • 4 cores (32 threads) • 6 cores (48 threads) • 8 cores (64 threads)
Memory Slots/Capacity	16 slots that can be populated with one of the following types of fully buffered (FB) DIMMS: • 1 GB (16 GB maximum) • 2 GB (32 GB maximum) • 4 GB (64 GB maximum)

TABLE 1-1 Feature Specifications *(Continued)*

Feature	Description
Internal Hard Drives	Two hot-pluggable 146 GB SAS drives with a DVD-RW drive Or Four hot-pluggable 146 GB SAS drives *without* a DVD-RW drive Integrated hard drive controller supports RAID 0 and RAID 1.
Optical Media Drive	One, slot-loading, slimline DVD drive, supporting CD-R/W, CD+R/W, DVD-R/W, DVD+R/W
Power Supplies	Two hot-swappable 660W AC/DC power supply units (PSUs) providing N+1 redundancy
Alarm	One Telco alarm
Cooling	Three high-power fans for processor, memory FB-DIMM, and PCI card cooling Three low-power fans for hard drive and removable media drive cooling
Ethernet Ports	Four 10/100/1000 Mbps Ethernet, RJ-45-based, autonegotiating ports (on two separate controllers) Note - Two 10 GbEports are available by adding XAUI cards
PCI Express Interfaces[*]	• One eight-lane PCIe slots • Three four-lane PCIe slots • Two PCI-X (one full-length and full-height, one half-length/full-height) slots
USB Ports	Two USB 2.0 ports on rear panel
Additional Ports	The following ports are located on the rear panel of the server: • One RJ-45 serial management port (SER MGT) – the default connection to system controller • One 10/100 Mbps Ethernet network management port (NET MGT) – connection to the system controller • One Alarm port – connection to the alarm card • One DB-9 serial port – connection to the host
Remote Management	On-board Integrated Lights Out Manager with two command sets: • ILOM CLI • ALOM CMT compatibility CLI (legacy command set)
Firmware	Firmware comprising: • OpenBoot™ PROM for system settings and power-on self test (POST) support • ILOM for remote management
Cryptography	Processor integrated, cyptographic acceleration that supports industry standard security ciphers

TABLE 1-1   Feature Specifications *(Continued)*

Feature	Description
Operating System	Solaris 10 8/07 Operating System preinstalled on disk 0
	Refer to the *Sun Netra T5220 Server Product Notes (*820-3014*)* for information on the minimum version of supported OS and required patches
Other Software (refer to the *Sun Netra T5220 Server Product Notes* [820-3014] for details)	• Solaris Live Upgrade • Java™ Enterprise System with a 90-day trial licence • Logical Domains Manager • Sun™ Studio 12 • Sun N1™ System Manager • Cool Tools GCC • Corestat • CMT Tools • SunVTS 6.4 Patch Set (PS) 2 • Sun Update Connection

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

Chip-Multitheaded Processor and Memory Technology

The UltraSPARC® T2 multicore processor is the basis of the Sun Netra T5220 server. The UltraSPARC T2 processor is based on chip multithreading (CMT) technology that is optimized for highly threaded transactional processing. The UltraSPARC T2 processor improves throughput while using less power and dissipating less heat than conventional processor designs.

Depending on the model purchased, the processor has four, six, or eight UltraSPARC cores. Each core equates to a 64-bit execution pipeline capable of running eight threads. The result is that the 8-core processor handles up to 64 active threads concurrently.

Additional processor components, such as L1 cache, L2 cache, memory access crossbar, memory controllers, and the I/O interface have been carefully tuned for optimal performance.

Performance Enhancements

The Sun Netra T5220 server, with the Solaris 10 OS, provide several new performance enhancing technologies with its sun4v architecture and multicore, multithreaded UltraSPARC T2 processor.

Some of these enhancements are:

- A dedicated floating point unit (FPU) for each core (processor thread)
- Four independent dual-channel memory controllers that use the latest fully buffered memory technology.
- Processor-integrated cyptographic acceleration
- Large page optimization
- Reduction on TLB misses
- Optimized block copy
- Support for Sun's 10 Gigabit Ethernet with the addition of XAUI cards in PCI slots 0 and 1

Preinstalled Solaris Operating System

The Sun Netra T5220 server is preinstalled with the Solaris 10 OS, and offers the following Solaris OS features:

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

You can use the preinstalled Solaris 10 OS, or reinstall a supported version of the Solaris 10 OS from your network, CD, or downloaded copy. Refer to the *Sun Netra T5220 Server Product Notes* for information on the supported OS releases for your server.

Hardware-Assisted Cryptography

The UltraSPARC T2 multicore processor provides hardware-assisted acceleration of RSA and DSA cryptographic operations. The Solaris 10 OS provides the multithreaded device driver that supports the hardware-assisted cryptography.

Support for Virtualization Through Logical Domains (LDoms)

The Sun Netra T5220 servers support the use of Logical Domains (LDoms) technology. Through the use of the Solaris OS and the built-in server firmware, and by installing the Logical Domains Manager software, you can virtualize the compute services that run on your server.

A *logical domain* is a discrete, logical grouping with its own operating system, resources, and identity within a single computer system. Each logical domain can be created, destroyed, reconfigured, and rebooted independently, without requiring a power cycle of the server.

You can run a variety of applications software in different logical domains and keep them independent for performance and security purposes.

Each logical domain can be managed as an entirely independent machine with its own resources, such as:

- Kernel, patches, and tuning parameters
- User accounts and administrators
- Network interfaces, MAC addresses, and IP addresses

Each logical domain can interact only with those server resources made available to it, and the configuration is controlled using the Logical Domains Manger.

For more information on Logical Domains, refer to the *Logical Domains (LDoms) Administration Guide*.

Remote Manageability With ILOM

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

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

You can configure ILOM to send email alerts of hardware failures and warnings, and other events related to the server. The ILOM circuitry runs independently of the server, using the server's standby power. Therefore, ILOM firmware and software continue to function when the server operating system goes offline or when the server is powered off. ILOM monitors the following Sun Netra T5220 server conditions:

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

In addition to the ILOM CLI and browser interface (BI), you can set up the server to use an ALOM CMT compatibility CLI. The ALOM CMT compatibility CLI provides commands that approximate the ALOM CMT CLI that is a system controller interfaced provided on some previous servers.

For information about configuring and using the ILOM service processor, refer to the latest *Integrated Lights Out Management (ILOM) User's Guide* and the *Sun Integrated Lights Out Managment 2.0 (ILOM 2.0) Supplement for the Sun Netra T5220 Server.*

High Levels of System Reliability, Availability, and Serviceability

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

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

To deliver high levels of reliability, availability, and serviceability, the Sun Netra T5220 server offers the following features:

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

Hot-Pluggable and Hot-Swappable Components

Sun Netra T5220 server hardware is designed to support hot-plugging of the chassis-mounted hard drives and power supplies. By using the proper software commands, you can install or remove these components while the system is running. Hot-swap and hot-plug technology significantly increases the system's serviceability and availability by providing the ability to replace hard drives, fan units, and power supplies without service disruption.

Power Supply Redundancy

The Sun Netra T5220 server provides two hot-swappable power supplies, enabling the system to continue operating should one of the power supplies fail or if a power source fails.

Environmental Monitoring

The Sun Netra T5220 server features an environmental monitoring subsystem that protects the server and its components against:

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

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

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

Support for RAID Storage Configurations

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

By attaching one or more external storage devices to the Sun Netra T5220 server, you can use a redundant array of independent drives (RAID) software application such as Solstice DiskSuite™[1] or VERITAS Volume Manager to configure system drive storage in a variety of different RAID levels.

Error Correction and Parity Checking

The UltraSPARC T2 multicore processor provides parity protection on its internal cache memories, including tag parity and data parity on the D-cache and I-cache. The internal L2 cache has parity protection on the tags, and ECC protection on the data.

Advanced ECC, corrects up to 4 bits in error on nibble boundaries, as long as they are all in the same DRAM. If a DRAM fails, the DIMM continues to function.

Fault Management and Predictive Self Healing

The Sun Netra T5220 server provides the latest fault management technologies. The Solaris 10 OS architecture provides a means for building and deploying systems and services capable of *predictive self-healing*. Self-healing technology enables systems to

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

accurately predict component failures and mitigate many serious problems before they actually occur. This technology is incorporated into both the hardware and software of the Sun Netra T5220 server.

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

Rackmountable Enclosure

The Sun Netra T5220 server uses a space-saving 2U-high rackmountable enclosure that can be installed into a variety of industry standard racks.

Preparing for Installation

This chapter provides background information about the server installation procedures. Topics include:

- "Tools and Equipment Needed" on page 16
- "Shipping Kit Inventory List" on page 16
- "Optional Component Installation" on page 17
- "ESD Precautions" on page 17
- "Installation Overview" on page 17
- "Safety Precautions" on page 19

Server and Rack Installation Measurements

The Sun Netra T5220 server mounted in a 2-post rack with the 19-inch, 2 post mounting kit (X7901A-4) protrudes 193 millimeters (7.59 inches) beyond the front of the rack rail post.

For less protrusion in the front of the rack, the server can also be mounted using the rear portion of the rail, which reduces protrusion to 115 millimeters (4.52 inches) beyond the front of the rack rail post.

Tools and Equipment Needed

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

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

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

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

Shipping Kit Inventory List

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

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

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

- Server chassis
- 19-inch, 4-post hardmount rack rail kit

Note – The other rack rail kits described in Chapter 3 and Chapter 4 must be ordered separately from Sun.

- Package of mounting screws and nuts in assorted sizes to fit various types of racks and cabinets
- Miscellaneous hardware, cables, and connectors
- Any optional components that were ordered with the server

Optional Component Installation

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

If you ordered any options that are not factory-installed, see the *Sun Netra T5220 Server Service Manual* (820-3012) for installation instructions.

Note – The list of optional components can be updated without notice. See the product web pages for the most current list of components supported in the server.

ESD Precautions

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

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

Installation Overview

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

1. Verify that you have received all of the components that ship with your server. See "Shipping Kit Inventory List" on page 16.

2. Gather configuration information for your system. See your system administrator for specific details, including these parameters:

- Netmask
- IP address for the service processor
- Gateway IP address

3. Install any optional components shipped with your system. If you have purchased other optional components such as additional memory, install them prior to mounting the server in a rack. See "Optional Component Installation" on page 17.

4. Mount the server into a rack or cabinet. See Chapter 3 for 4-post racks, or Chapter 4 for 2-post racks.

Note – In the rest of this manual, the term *rack* means either an open rack or a closed cabinet.

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5. Connect the server to a serial terminal or a terminal emulator (PC or workstation) to display system messages. See "Powering On the System for the First Time" on page 79.

Tip – The serial terminal or a terminal emulator should be connected before you connect the power cables. As soon as power is connected to the system, the service processor immediately powers on and runs diagnostics. Diagnostic test failures will be printed on the serial terminal. For more information, refer to the *Integrated Lights Out Management 2.0 (ILOM 2.0) Supplement for the Sun Netra T5220 Server.*

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6. Connect the data cables to the server, but do not connect the power cable yet. See "Connecting the Server Cables" on page 69.

7. Connect the power cable to the server and examine the display for any error messages. See "Powering On the System for the First Time" on page 79.

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

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

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8. After the service processor boots, access the ILOM command-line interface (CLI) through the serial management port. See "To Log In To the Service Processor Using the Serial Management Port" on page 84.

9. Configure the service processor network addresses. See "Configuring the Service Processor Network Management Port" on page 86.

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

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10. Commit the changes to the service processor network parameters. See Step 7 in "To Power On the System for the First Time" on page 81.

11. Power on the server from a keyboard using the ILOM software. See "To Power On the System" on page 91.

12. Configure the Solaris OS. See "Booting the Solaris Operating System" on page 94.

    The Solaris OS is preinstalled on the servers. When you power on, you are automatically guided through the Solaris OS configuration procedure.

13. Install any required patches to the server.

    Refer to the *Sun Netra T5220 Server Product Notes* for a list of required patches.

14. Load additional software from the Solaris media kit (optional).

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

Safety Precautions

Caution – Deploy the antitilt bar on the equipment rack before beginning an installation.

Caution – The Sun Neta T5220 server weighs approximately 40 lb (18.14 kg). Two people are required to lift and mount this 2U server into a rack enclosure when using the procedures in this document.

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

Mounting the Server Into a 4-Post Rack

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

Note – The 19-inch 4-post hardmount rack kit is included in the standard Sun Netra T5220 server configuration.

This chapter contains the following sections:

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

Caution – The server is heavy. Two people are required to lift and mount the server into a rack enclosure when following the procedures in this chapter.

4-Post Rackmounting Options

The server ships with a 19-inch, 4-post hardmount rack kit (see "To Install a Server With a Hardmount 19-Inch 4-Post Rack" on page 22 for installation instructions). TABLE 3-1 lists three additional 4-post rackmount kit options that must be ordered separately from Sun. This chapter provides installation instructions for these rackmount kit options.

TABLE 3-1 Optional Rackmount Kits

Mounting Kit	Installation Instructions
19-inch, 4-post hardmount rack kit for 600–800 mm cabinet depths	"To Install a Server With a Hardmount 19-Inch 4-Post Rack" on page 22
19-inch, 4-post slide rail rackmount kit for 600-800 mm cabinet depths	"To Install a Server With a Sliding Rail Mount in a 19-Inch 4-Post Rack" on page 26
600 mm x 600 mm hardmount rack kit	"To Install a Server With a Hardmount in a 600-mm 4-Post Rack" on page 33

Note – If you have more than six DC-powered servers in the same rack, you might exceed Telcordia NEBS EMI limits.

Note – The server ships with a 19-inch, 4-post hardmount rack kit. All other rack rail kits must be ordered separately from Sun.

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

▼ To Install a Server With a Hardmount 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
- Bag of screws

Note – The front-to-back rail spacing must be at least 460 mm (18.11 in.) and not more than 715 mm (28.15 in.) from the outside face of the front rail to the outside face of the back rail.

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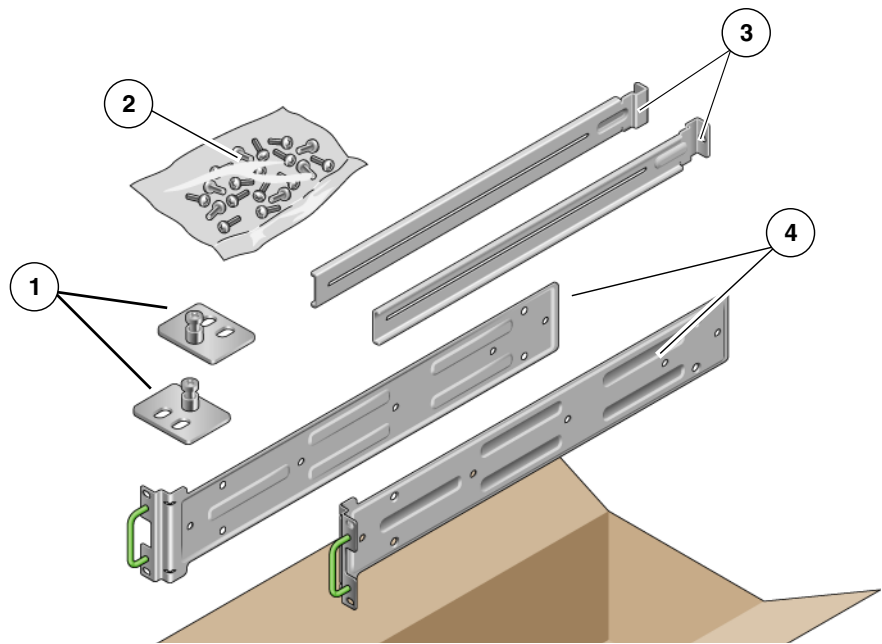
Figure Legend

1	Rear mount flanges	**3**	Rear mount support brackets
2	Screws	**4**	Hardmount brackets

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

Number	Description	Where Used
10	M5 x 4.5 mm Phillips flathead screws	8 for hardmount brackets, 2 extra
10	M4 x 0.5 mm x 5 mm Phillips panhead screws	4-6 for rear mount brackets, 6-4 extra
10	M5 x 12.7 mm screws	10 for rack, if appropriate

TABLE 3-2 19-inch 4-Post Rackmount Screw Kit Contents *(Continued)*

Number	Description	Where Used
10	M6 x 13 mm screws	10 for rack, if appropriate
9	M6 square clip nuts	9 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 from the rack kit (**FIGURE 3-1**).**

2. **Use four of the supplied M5 × 4.5 mm flathead Phillips screws to secure each of the hardmount brackets to the sides of the server (**FIGURE 3-2**).**

FIGURE 3-2 Securing the Hardmount Brackets to the Server
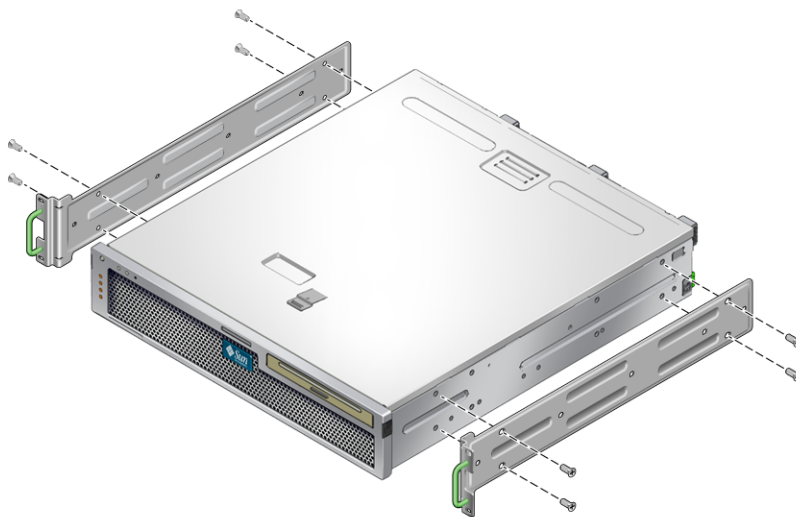
3. **Measure the depth of the rack.**

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 3-2**).**

   Use two to three of the supplied M4 × 0.5 × 5 mm panhead Phillips screws for each bracket, depending on the rack depth.

FIGURE 3-3   Attaching the Rear Mount Support Brackets
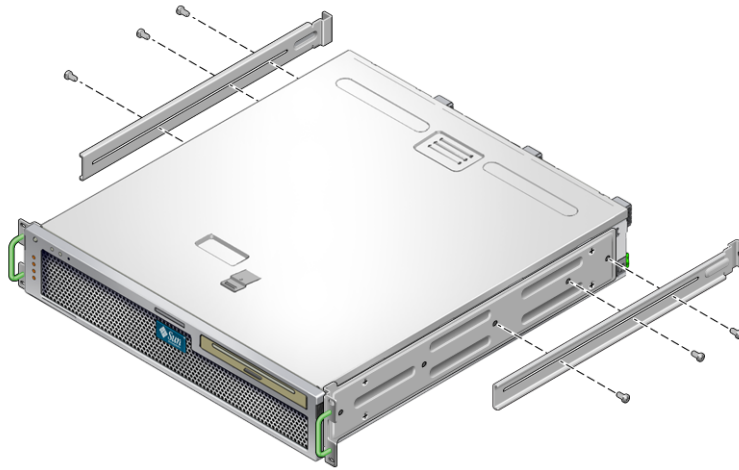
6. **Lift the server to the desired location in the rack.**

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

FIGURE 3-4   Securing the Front of the Server to the Rack
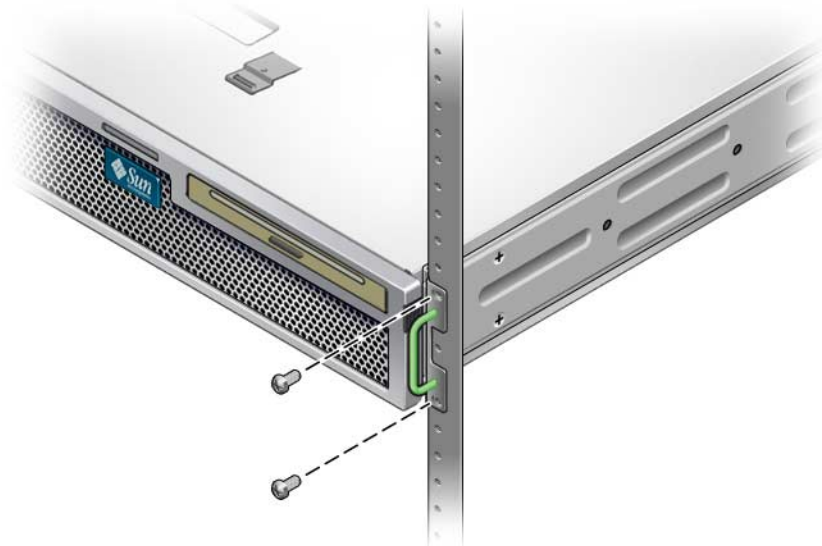
8. **Get the two rear mount flanges from the rack kit (**FIGURE 3-1**).**

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

FIGURE 3-5   Securing the Rear of the Server to the Rack
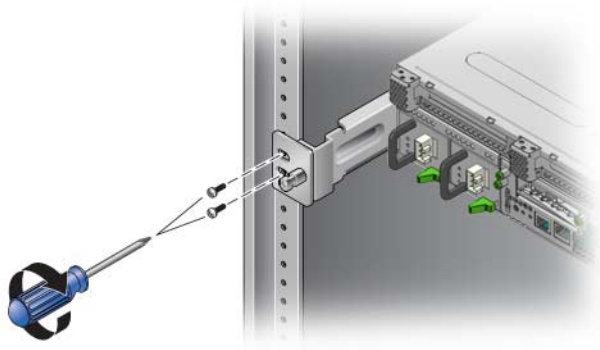
Mounting the Server in a Sliding Rail Mount 19-Inch 4-Post Rack

▼ To Install a Server With a 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
- Four M6 and four 10–32 threaded strips
- Two extension brackets
- Bag of screws

Note – The front-to-back rail spacing must be at least 392 mm (15.43 in.) and not more than 863.6 mm (34 in.) from the outside face of the front rail to the outside face of the back rail.

You also need the hardmount brackets from the standard rackmount kit that came with the server (FIGURE 3-6).

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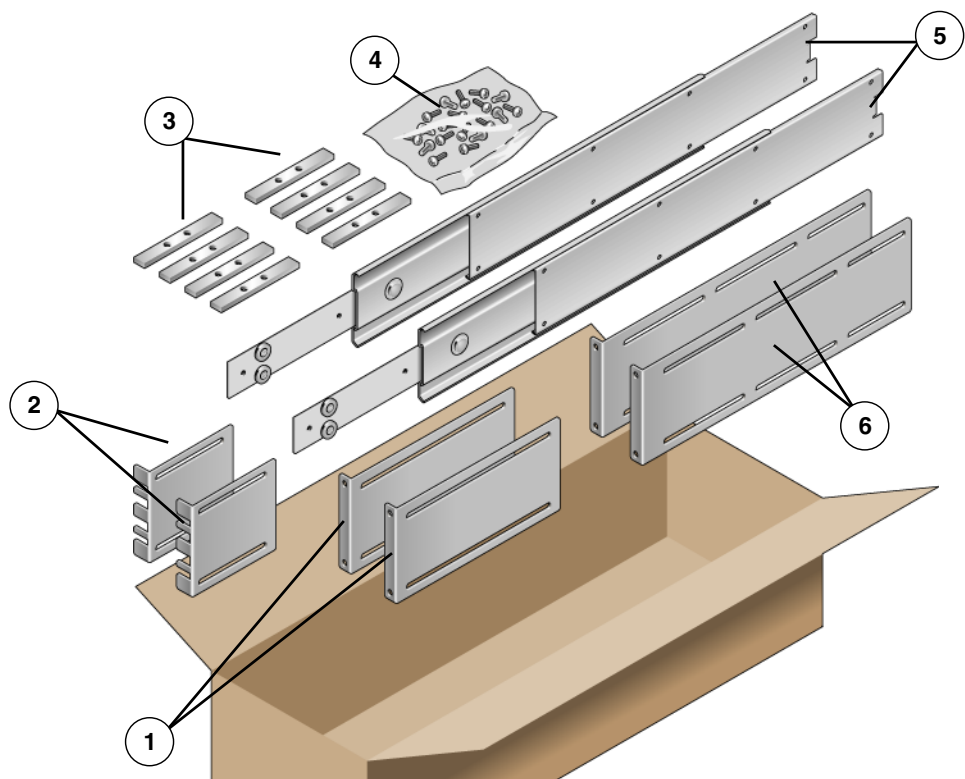
Figure Legend

1	Long brackets	**4**	Screws
2	Short brackets	**5**	Telco slide assemblies
3	Threaded strips	**6**	Extension brackets

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

Number	Description	Where Used
10	M4 x 0.5 mm x 5 mm Phillips panhead screws	8 for glides, 2 extra
10	M6 brass collar screws	4 for short brackets, 4 for long brackets, 2 extra
8	M5 panhead screws, nuts, plain washers and star washers	8 for slides

Number	Description	Where Used
10	M5 x 12.7 mm screws	10 for rack, if appropriate
12	M6 x 13 mm screws	10 for rack, if appropriate
9	M6 square clip nuts	9 for rack, if appropriate
10	10–32 collar screws 4 short, 4 long, 2 extra	8 for racks with 10-32 holes, 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 $\times$ 4.5 mm flathead Phillips screws from the standard rack kit (**FIGURE 3-1**).**

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

2. **Use four of the supplied M5 $\times$ 4.5 mm flathead Phillips screws to secure each of the hardmount brackets to the sides of the server (**FIGURE 3-7**).**

FIGURE 3-7   Securing the Hardmount Bracket to the Server
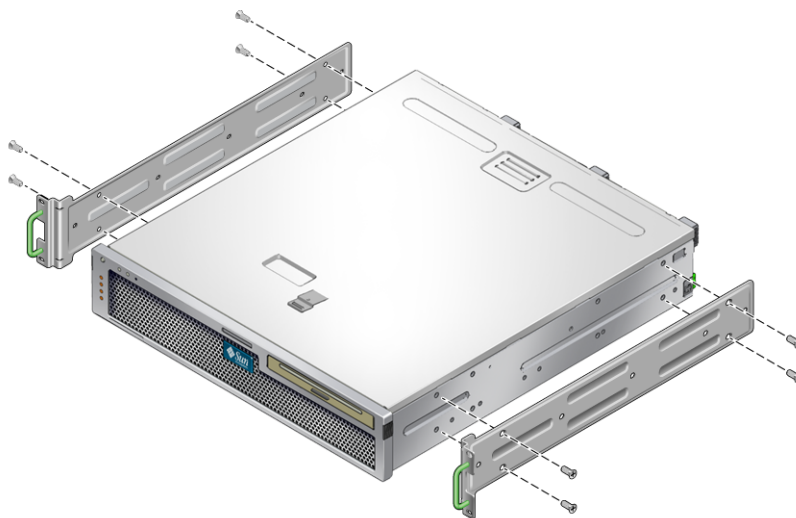
3. **Get the Telco slide assemblies from the rack kit (**FIGURE 3-6**).**

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

FIGURE 3-8   Dismantling the Slide
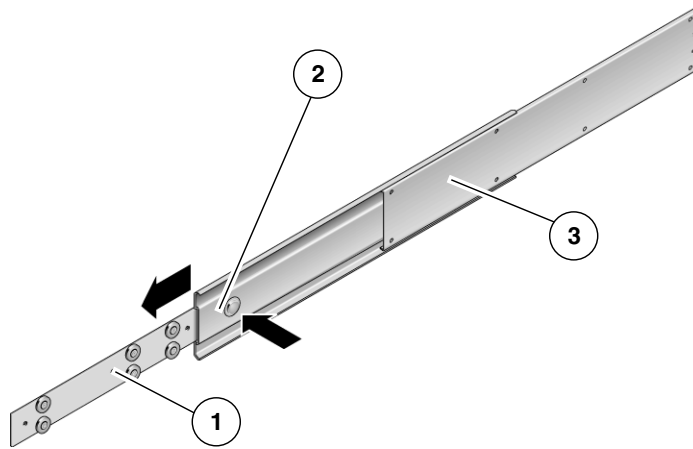
Figure Legend

1	Glide
2	Button
3	Slide (in two parts)

5. **Using eight of the M4 × 0.5 × 5 mm panhead Phillips screws from the rackmount kit (four for each side), screw each glide to the side of the server chassis (**FIGURE 3-9**).**

FIGURE 3-9   Fixing the Glides to the Server Chassis
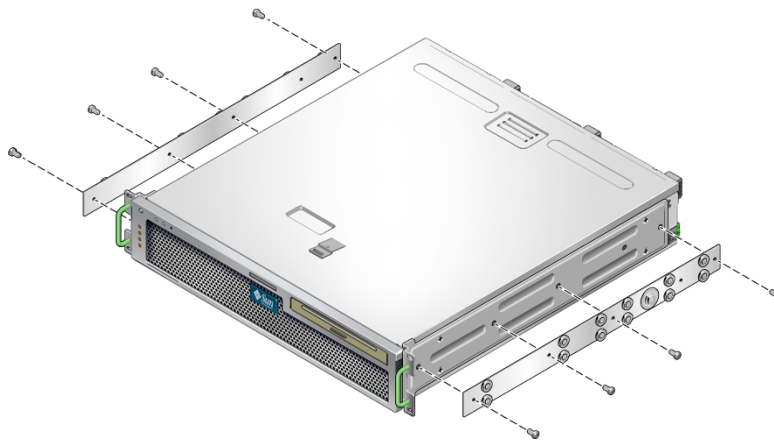
6. **Get the short brackets and long brackets from the rackmount kit (**FIGURE 3-6**).**

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), and one threaded strip, to secure each bracket (FIGURE 3-10).

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 3-10**).**

   To secure each bracket, use two of the brass M6 collar screws and M6 cage nuts (if required) and one threaded strip, exactly as you did for the front rack uprights in the previous step.

FIGURE 3-10 Securing the Brackets to the Rack
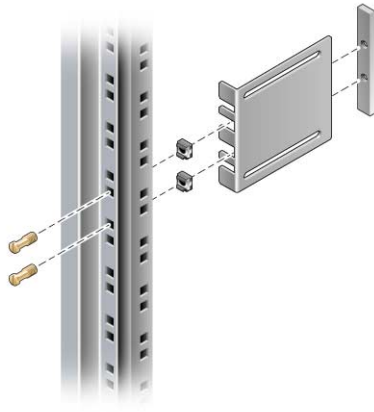
> **Note –** If your rack has 10–32 holes, use the 10–32 collar screws and 10–32 threaded strips.

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

10. **Secure the slide onto the short and long brackets at the front and rear of the rack (**FIGURE 3-11**).**

    Use the M5 panhead screws from the inside. Use the M5 nuts, plain washers, and star washers from the outside. Use extension brackets instead of the long brackets if the dimension is greater than 665 mm.

FIGURE 3-11 Securing the Slide to the Brackets
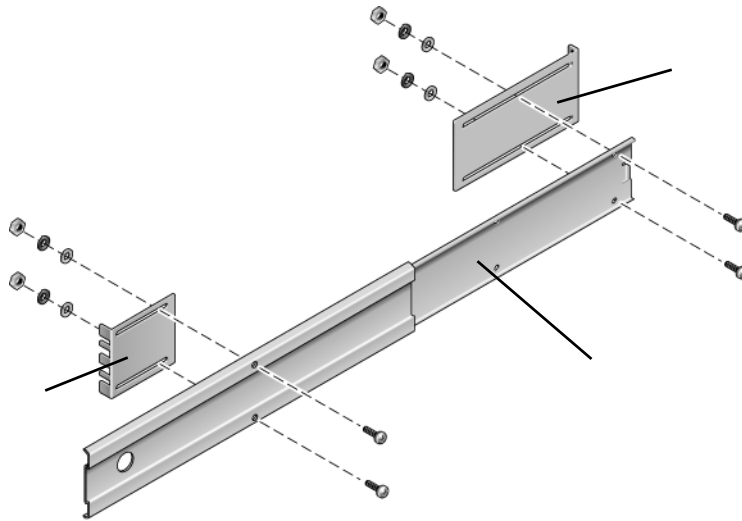
Figure Legend

1	Short bracket
2	Slide
3	Long bracket

11. **Repeat** Step 9 **and** Step 10 **for the slide on the other side of the rack.**

12. **Push the slides completely into the assembly on each side of the rack and release the stop catches.**

13. **Align the glides attached to the server with the slide assemblies in the rack.**

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

14. **Push in the slide buttons and slide the server all the way into the rack enclosure (**FIGURE 3-12**).**

FIGURE 3-12 Sliding the Server Into the Rack
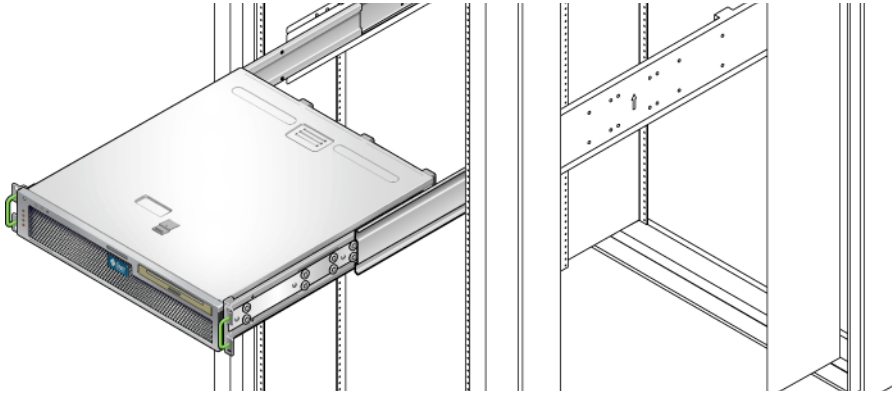
15. **Using two screws per side, secure the front of the hardmount brackets that are attached to the sides of the server to the front of the rack (**FIGURE 3-13**).**

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

FIGURE 3-13 Securing the Front of the Server to the Rack
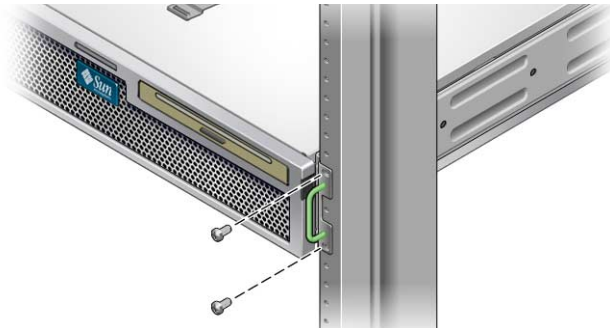
Hardmounting the Server in a 600-mm 4-Post Rack

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

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

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

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

FIGURE 3-14 Contents of the Hardmount 600-mm 4-Post Kit
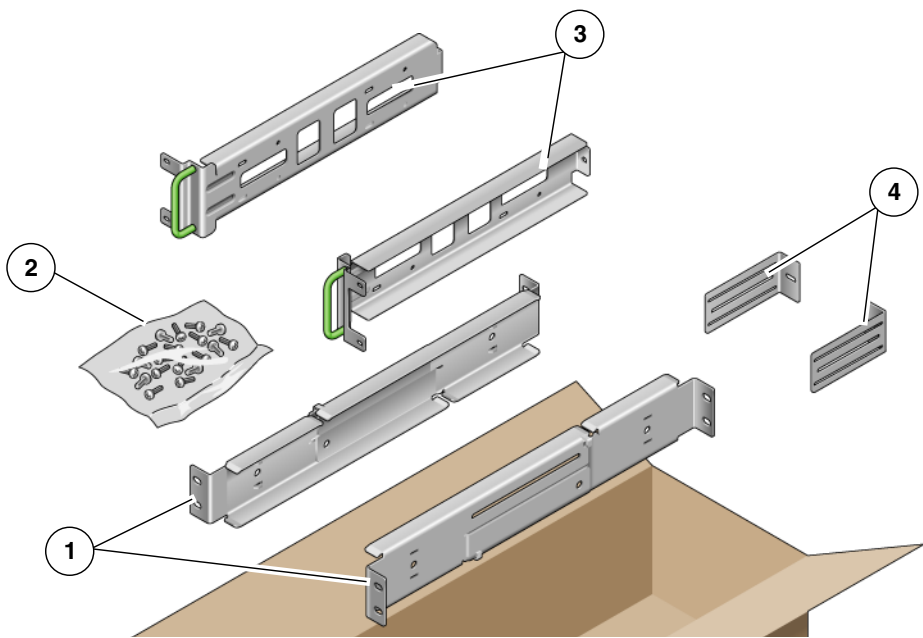
Figure Legend

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

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

Number	Description	Where Used
12	M5 x 7 SEM screws	8 for side rails, 4 for rear flanges
10	M5 x 12.7 mm screws	10 for rack, if appropriate

Number	Description	Where Used
10	M6 x 13 mm screws	10 for rack, if appropriate
9	M6 square clip nuts	9 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 adjustable rails from the rack kit (**FIGURE 3-14**).**

2. **Loosen the two screws at the middle of each adjustable rail so that you can extend the adjustable rail (**FIGURE 3-15**).**

FIGURE 3-15 Adjustable Rail Screws

Adjustable rail screws
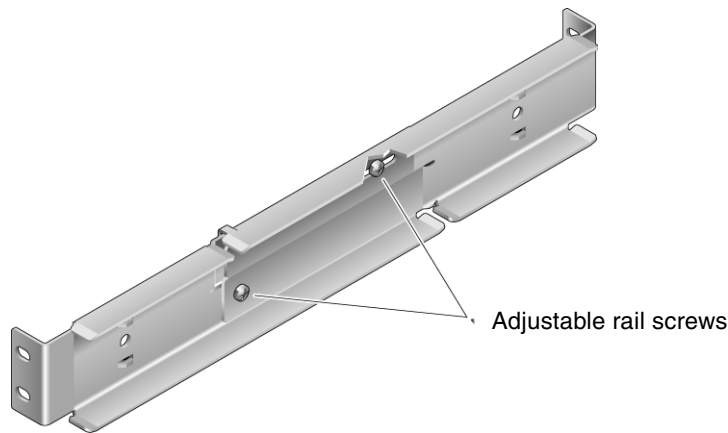
3. **Lift one of the adjustable rails to the desired location in the rack. Using two screws, secure the front of the rail in the rack (**FIGURE 3-16**).**

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

FIGURE 3-16 Securing the Front of the Adjustable Rails to the Rack
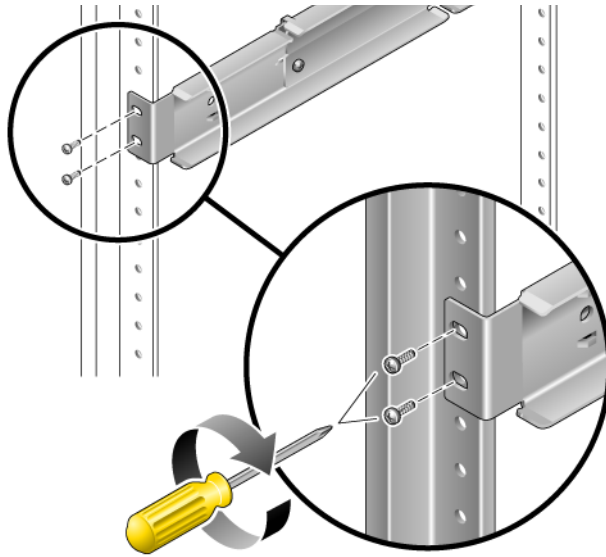
4. **At the rear of the rack, use two screws to secure the rear of the adjustable rails to the rack (**FIGURE 3-17**).**

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

FIGURE 3-17 Securing the Rear of the Adjustable Rails to the Rack
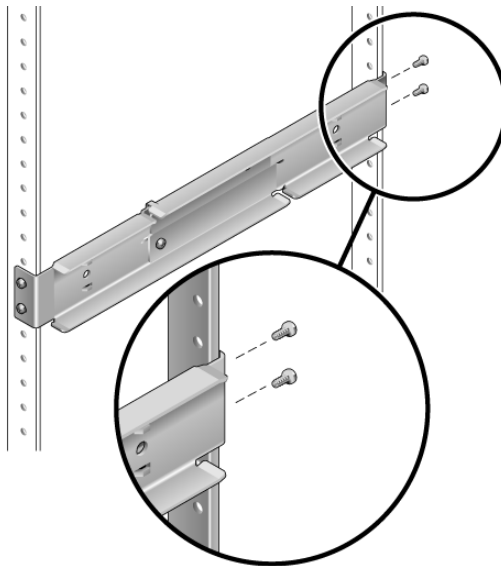
5. **Tighten the two screws at the middle of each adjustable rail (**FIGURE 3-15**).**

6. **Repeat** Step 3 **through** Step 5 **to mount the other adjustable rail into the rack.**

7. **Get the rear flanges from the rack kit (**FIGURE 3-14**).**

8. **Using one M5 × 7 SEM screw for each rear flange, loosely install the rear flange onto the rear of each of the adjustable rails (**FIGURE 3-18**).**

   Do not completely secure the rear flanges to the adjustable rails. You will use these flanges to set the rack depth for the server in a later step.

FIGURE 3-18 Installing the Rear Flange Onto the Adjustable Rail
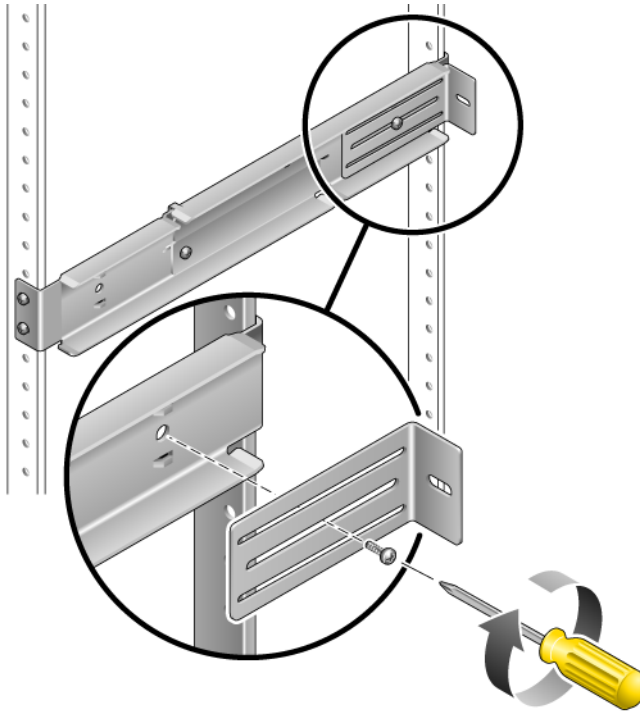
9. **Get the side rails from the rack kit (**FIGURE 3-14**).**

10. **Using eight of the M5 × 7 SEM screws (four for each side rail), secure the side rails to the sides of the server (**FIGURE 3-19**).**

    The side rails can accommodate rack rail setbacks (the distance from the front of the rack to the rack rail) of 50 mm, 75 mm, or 100 mm, depending on the type of rack you are installing the server into.

FIGURE 3-19 Securing the Side Rails to the Server
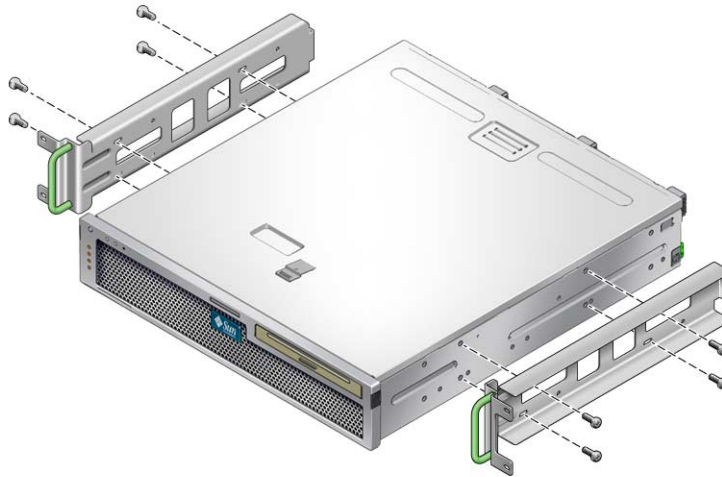
11. **Lift the server into the rack and slide the server onto the adjustable rails** (FIGURE 3-20)**.**

FIGURE 3-20 Sliding the Server Onto the Adjustable Rails
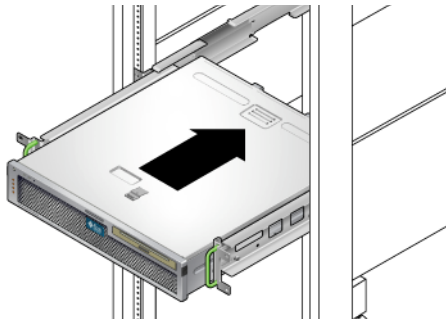
12. **Push the server to the desired depth in the rack, then go to the rear of the server and push the rear flanges flush against the back of the server** (FIGURE 3-18)**.**

    If the rack is especially shallow, you can flip the rear flanges around so that they rest flush against the rear of the server.

13. **Lift the server out of the rack.**

14. **Set the rear flanges to the desired depth in the rack, then tighten the single M5 × 7 SEM screw on each of the flanges to secure them to the adjustable rails** (FIGURE 3-18)**.**

15. **Lift the server into the rack and slide it onto the adjustable rails.**

16. **Push the server backward until it rests flush against the rear flanges, then use one M5 × 7 SEM screw for each rear flange to secure the rear of the server to the rear flanges (**FIGURE 3-21**).**

FIGURE 3-21   Securing the Rear of the Server to the Rear Flanges
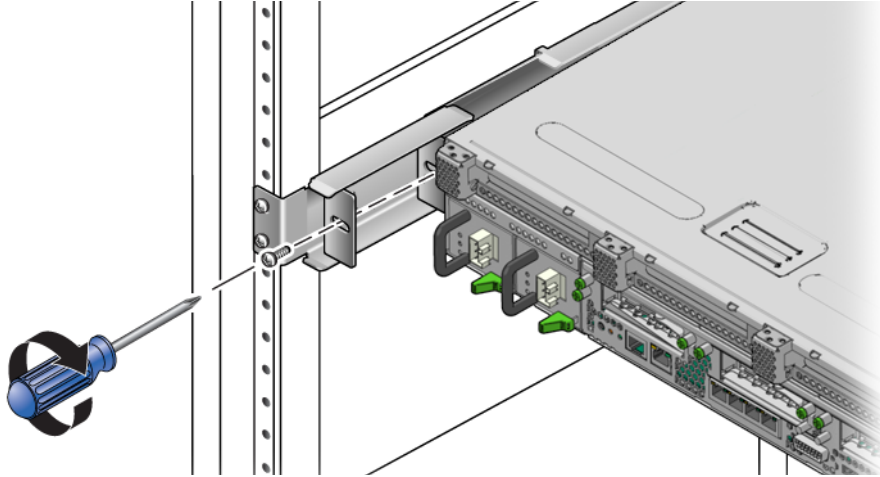
17. **At the front of the rack, use two screws per side to secure the side rails that are attached to the server to the front of the rack (**FIGURE 3-22**).**

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

FIGURE 3-22   Securing the Front of the Server to the Front of the Rack
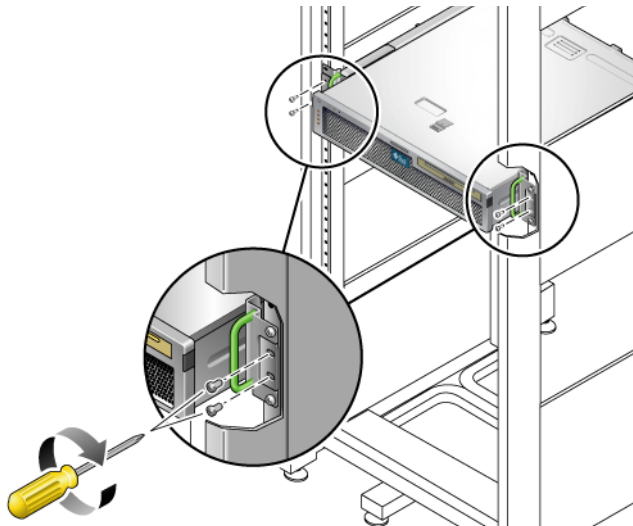
Mounting the Server Into a 2-Post Rack

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

Note – The server ships with a 19-inch, 4-post hardmount rack kit. The rack rail kits described in this chapter must be ordered separately from Sun.

This chapter contains the following sections:

■ "2-Post Rackmounting Options" on page 42
■ "Hardmounting the Server in a 23-Inch 2-Post Rack" on page 43
■ "Hardmounting the Server in a 19-Inch 2-Post Rack" on page 48
■ "Mounting the Server With a Sliding Rail Mount in a 19-Inch 2-Post Rack" on page 54

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

Caution – The server is heavy. Two people are required to lift and mount the server into a rack enclosure when following the procedures in this chapter.

Tip – The Sun Netra T5220 server mounted in a 2-post rack with the 19-inch, 2 post mounting kit (X7901A-4) protrudes 193 millimeters (7.59 inches) beyond the front of the rack rail post.

For less protrusion in the front of the rack, the server can also be mounted using the rear portion of the rail, which reduces protrusion to 115 millimeters (4.52 inches) beyond the front of the rack rail post.

2-Post Rackmounting Options

The server ships with a 19-inch, 4-post hardmount rack kit (see "Hardmounting the Server in a 19-Inch 4-Post Rack" on page 22 for installation instructions). TABLE 4-1 lists two additional 2-post rackmount kit options that can be ordered from Sun. This chapter provides installation instructions for these rackmount kit options.

TABLE 4-1   Optional Rackmount Kits

Mounting Kit	Installation Instructions
23-inch 2-post rackmount kit	"To Install a Server With a Hardmount in a 23-Inch 2-Post Rack" on page 43
19-inch 2-post rackmount kit	"To Install a Server With a Hardmount in a 19-Inch 2-Post Rack" on page 48
19-inch 2-post slide rackmount kit	"To Install a Server With a Sliding Rail Mount in a 19-Inch 2-Post Rack" on page 54

Note – If you have more than six DC-powered servers in the same rack, you might exceed Telcordia NEBS EMI limits.

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

▼ To Install a Server With a Hardmount in a 23-Inch 2-Post Rack

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

- Two side brackets
- Two rail guides
- Two rear plates
- Bag of screws

Note – The 23-inch 2-post rackmount kit supports rack web thicknesses (the width of the rack post) of 76.20 mm (3 in.), 101.6 mm (4 in.), and 127 mm (5 in.).

FIGURE 4-1   Contents of the Hardmount 23-Inch 2-Post Kit
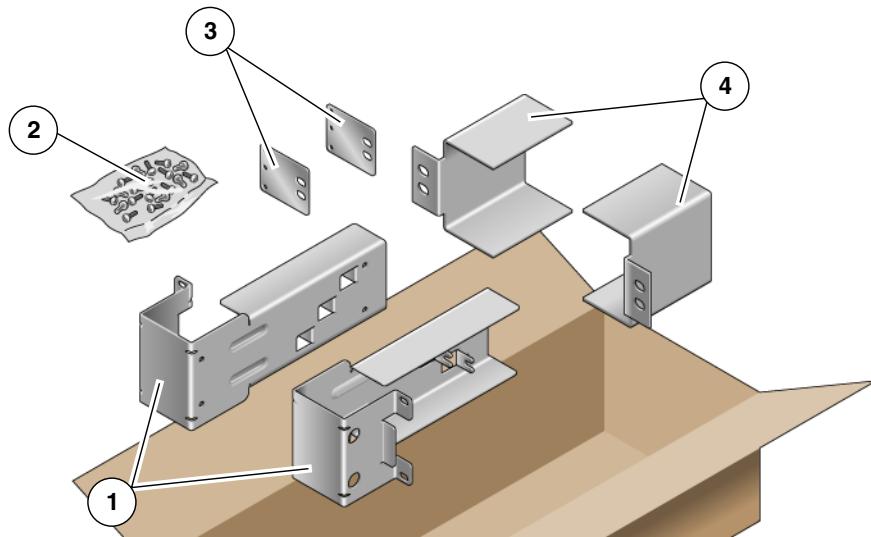
Figure Legend

1	Side brackets	**3**	Rear plates
2	Screws	**4**	Rail guides

TABLE 4-2 Hardmount 23-Inch 2-Post Rackmount Screw Kit Contents

Number	Description	Where Used
10	M5 x 7 SEM screws	8 for side brackets, 2 for rear plates
10	M5 x 12.7 mm screws	10 for rack, if appropriate
10	M6 x 13 mm screws	10 for rack, if appropriate
9	M6 square clip nuts	9 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 4-1**).**

2. Using eight of the M5 $\times$ 7 SEM screws (four for each side bracket), secure the side brackets to the sides of the server (FIGURE 4-2**).**

FIGURE 4-2 Securing the Side Brackets to the Side of the Server
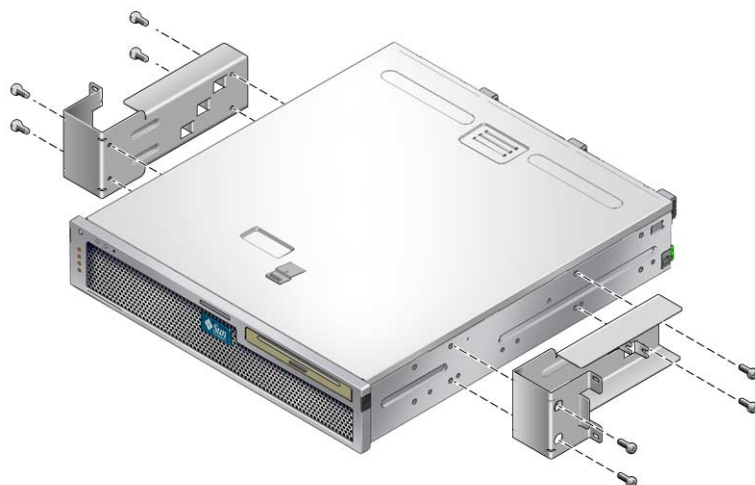
3. Get the rail guides from the rack kit (FIGURE 4-1**).**

4. Lift the rail guides to the desired height in the rack and, using two screws each, secure both rail guides to the rack (FIGURE 4-3**).**

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

FIGURE 4-3 Installing the Rail Guides in the Rack

5. Lift the server into the rack and slide it onto the rail guides (FIGURE 4-4**).**

FIGURE 4-4 Installing and Securing the Server in the 2-Post Rack
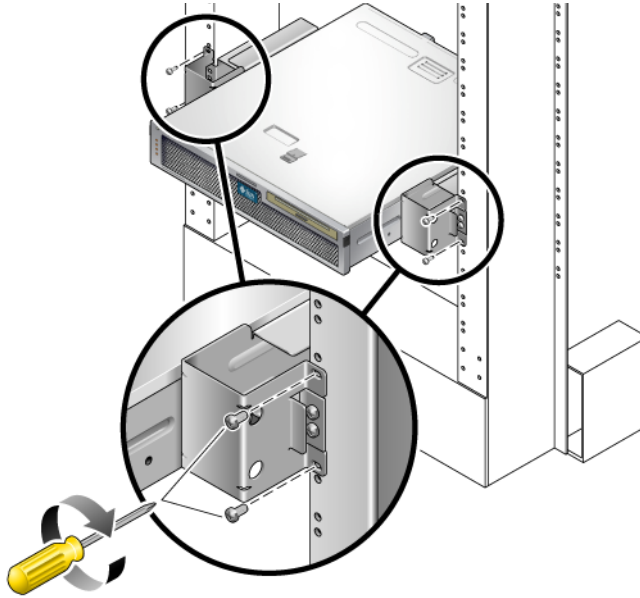
6. **Using two screws on each side, secure each side bracket on the server to the front of the rack (**FIGURE 4-4**).**

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

7. **(Optional) If your environment contains especially high vibrations, use the rear plates to further secure the server to the rack (**FIGURE 4-1**).**

   The rear plates attach to the rear of the post and to one of the three eyelets on each side bracket, depending on the thickness of the post.

   a. **Using one M5 × 7 SEM screw for each rear plate, loosely install the screw in one of the three positions on the rear plate (**FIGURE 4-5**).**

      The position varies depending on the thickness of the rail in the rack. For example, FIGURE 4-5 shows where you would install the screw for the middle rack position on the rear plate.

FIGURE 4-5   Installing a Screw on the Middle Rack Position on the Rear Plate
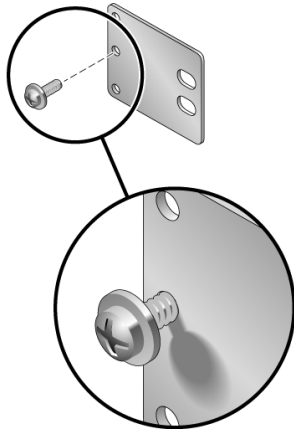
b. **Slide the rear plate in so that the screw slides into position into one of the eyelets.**

   The screw head should be facing the rear of the server and the other side of the rear plate should be in front of the rack post (FIGURE 4-6).

FIGURE 4-6   Installing the Rear Plate to the Side Bracket
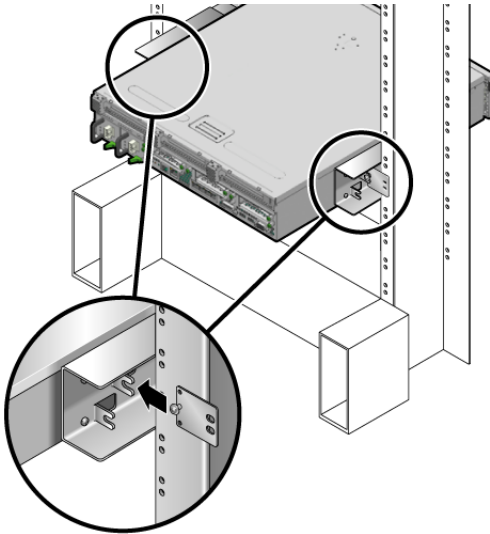
c. **Tighten the screw to secure the rear plate to the eyelet on the side bracket (FIGURE 4-6).**

d. **Using two screws, secure the other side of the rear plate to the back of the post (FIGURE 4-7).**

FIGURE 4-7   Securing the Rear Plate to the Back of the Post
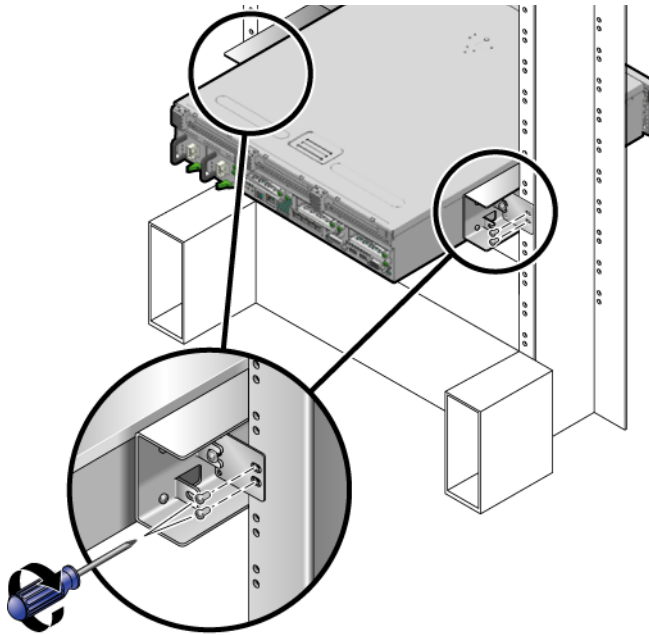
The size of the screws varies, depending on your rack.

e. Repeat Step a **through** Step d **to secure the rear plate on the other post.**

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

▼ To Install a Server With a Hardmount in a 19-Inch 2-Post Rack

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

- Two side brackets
- Two rear plates
- Bag of screws

Note – The 19-inch 2-post rackmount kit supports rack web thicknesses (the width of the rack post) of 76.20 mm (3 in.), 101.6 mm (4 in.), and 127 mm (5 in.).

**FIGURE 4-8**   Contents of the Hardmount 19-Inch 2-Post Kit
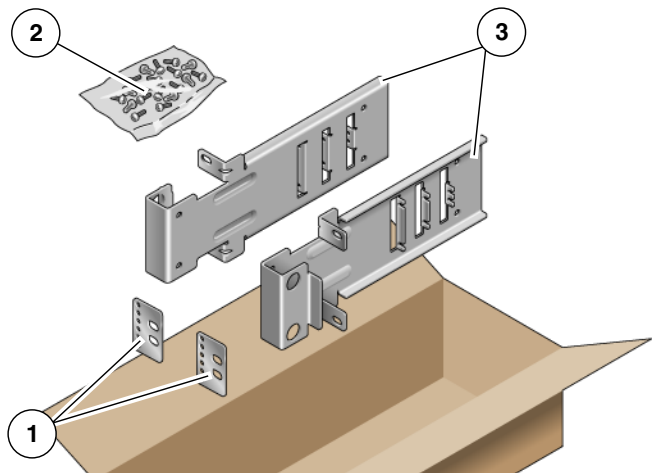

Figure Legend

1	Rear plates	**3**	Side brackets
2	Screws		

TABLE 4-3   Hardmount 19-Inch 2-Post Rackmount Screw Kit Contents

Number	Description	Where Used
10	M5 x 7 SEM screws	8 for side brackets, 2 extra
6	M3 x 8 SEM screws	4 for rear plates, 2 extra
10	M5 x 12.7 mm screws	10 for rack, if appropriate
10	M6 x 13 mm screws	10 for rack, if appropriate
9	M6 square clip nuts	9 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 4-8**).**

2. **Using four of the M5 × 7 SEM screws for each side bracket, secure the side brackets to the sides of the server (**FIGURE 4-9**).**

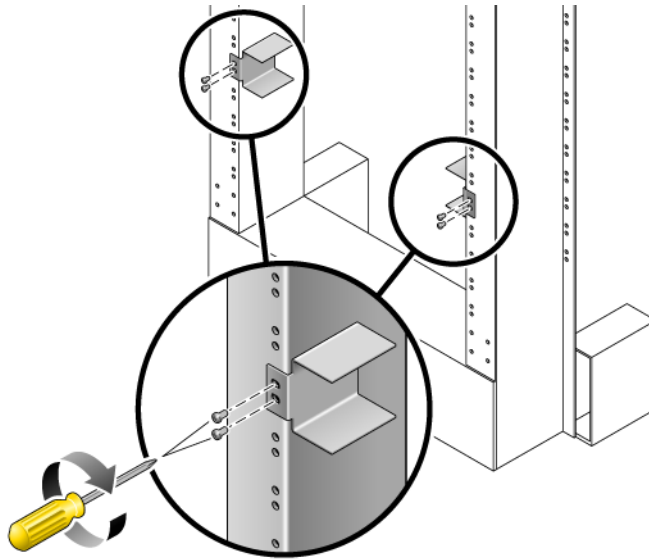**FIGURE 4-9** Securing the Side Brackets to the Side of the Server
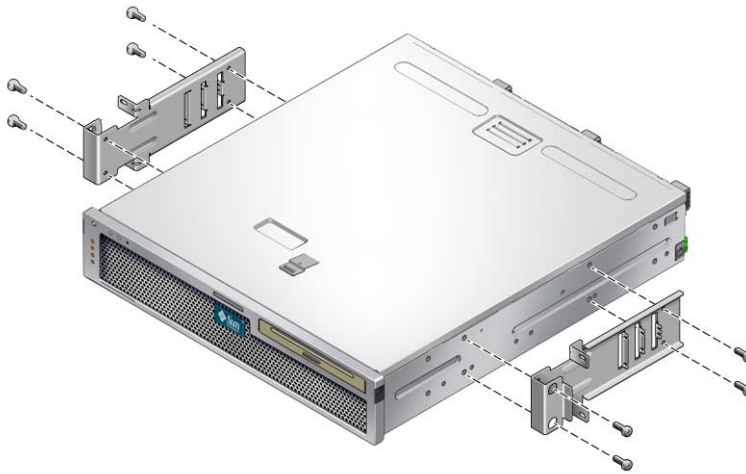
3. **Lift the server into the rack.**

4. **Using two screws for each bracket, secure the front of the server to the front of the rack (**FIGURE 4-10**).**

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

FIGURE 4-10 Installing and Securing the Server in the 2-Post Rack
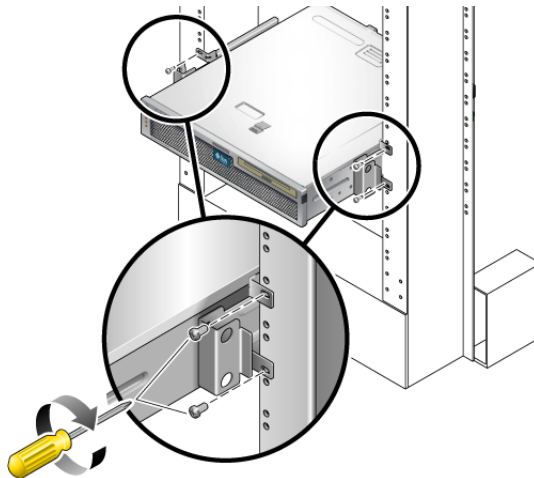
5. **(Optional) If your environment contains especially high vibrations, use the rear plates to further secure the server to the rack (**FIGURE 4-8**).**

   The rear plates attach to the rear of the post and to one of the three sets of eyelets on each side bracket, depending on the thickness of the post.

a. **Using two of the M3 × 8 SEM screws for each rear plate, loosely install the screws in one of the six positions on the rear plate (**FIGURE 4-11**).**

The position varies depending on the thickness of the rail in the rack. For example, FIGURE 4-11 shows where you would install the screws for the optimum rack position on the rear plate.

FIGURE 4-11 Installing Screws on the Optimum Rack Position on the Rear Plate
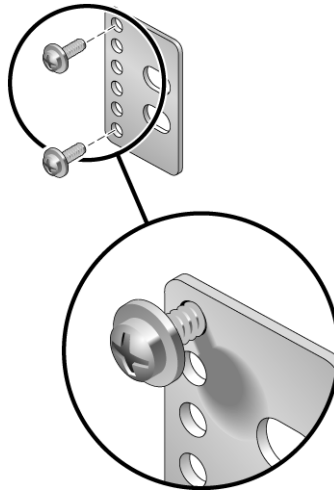
b. **Slide the rear plate in so that the screws slide into position into one set of the eyelets.**

The screw heads should be facing the rear of the server and the other side of the rear plate should be in front of the rack post (FIGURE 4-12).

FIGURE 4-12 Installing the Rear Plate to the Side Bracket
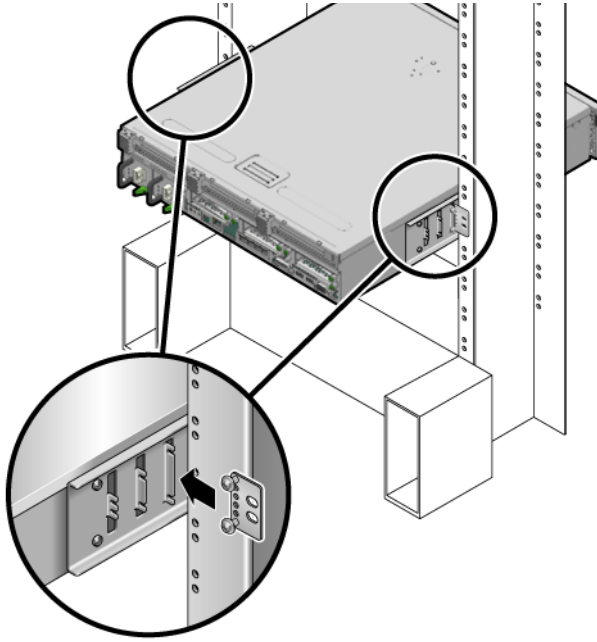
c. **Tighten the screws to secure the rear plate to the set of eyelets on the side bracket (**FIGURE 4-12**).**

d. **Using two screws, secure the other side of the rear plate to the back of the post (**FIGURE 4-13**).**

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

FIGURE 4-13 Securing the Rear Plate to the Rack
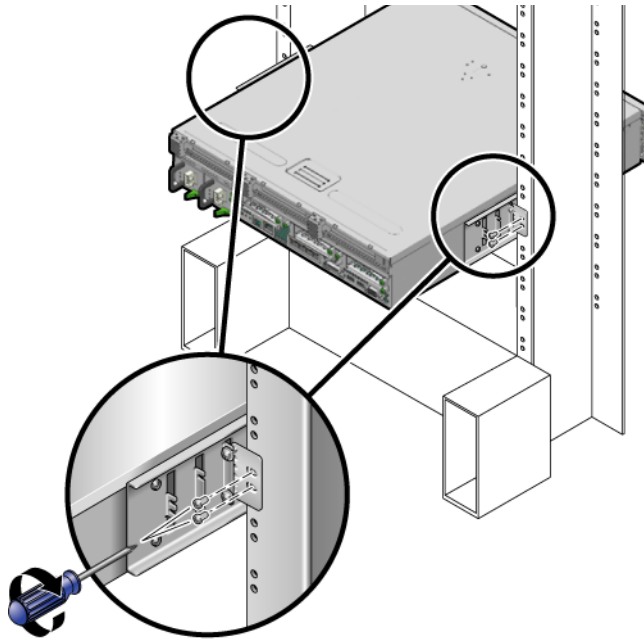
   e. Repeat Step a **through** Step d **to secure the rear plate on the other post.**

Mounting the Server With a Sliding Rail Mount in a 19-Inch 2-Post Rack

▼ To Install a Server With a Sliding Rail Mount in a 19-Inch 2-Post Rack

The sliding rail mount kit for a 19-inch 2-post rack consists of:

- Two 19-inch 2-post Telco slide assemblies
- Two short brackets
- Two long brackets
- Four M4 and four 10-32 threaded strips
- Two extension brackets

■ Bag of screws

Note – The 19-inch 2-post sliding rail rackmount kit supports rack web thicknesses (the width of the rack post) of 76.20 mm (3 in.), 101.6 mm (4 in.), and 127 mm (5 in.).

Note – The front-to-back rail spacing must be at least 392 mm (15.43 in.) and not more than 863.6 mm (34 in.) from the outside face of the front rail to the outside face of the back rail.

FIGURE 4-14 Contents of the Sliding Rail 19-Inch 2-Post Kit
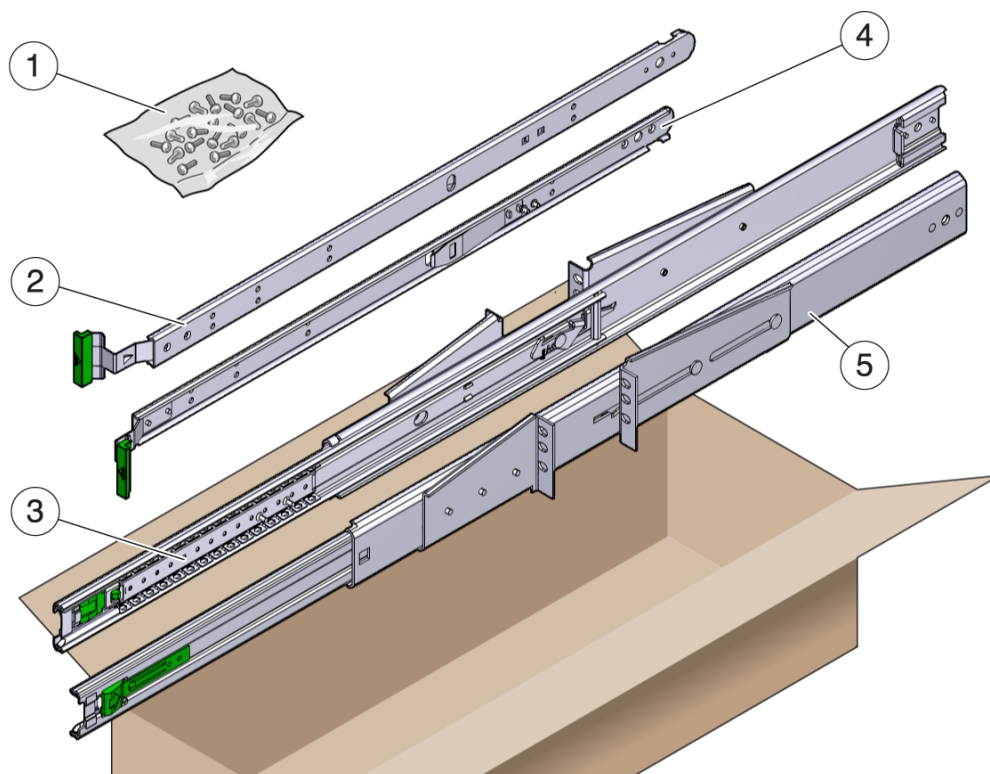
TABLE 4-4 Sliding Rail 19-Inch 4-Post Rackmount Screw Kit Contents

Number	Description	Where Used
10	M4 x 0.5 mm x 5 mm Phillips panhead screws	8 for glides, 2 extra
10	M5 x 12.7 mm screws	10 for rack, if appropriate
12	M6 x 13 mm screws	10 for rack, 2 extra
9	M6 square clip nuts	9 for rack, if appropriate
10	10–32 collar screws, 4 short, 4 long, 2 extra	8 for racks with 10-32 holes, 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. **Obtain the slide assemblies from the rack kit (**FIGURE 4-14**).**

2. **Press in the green button on each slide assembly and pull the right side and left side inner members (glides) completely out of the slides (**FIGURE 4-15**).**

FIGURE 4-15 Removing Glides from the Slides
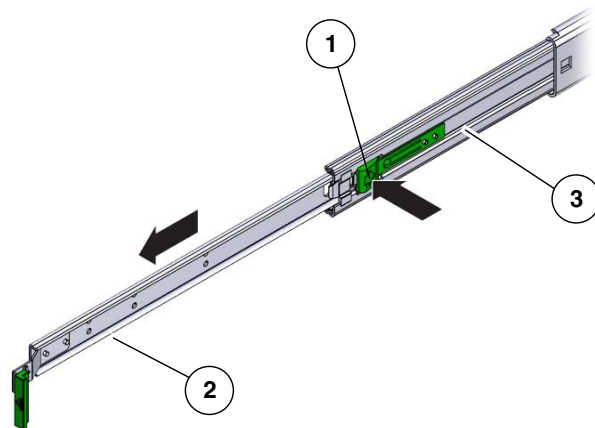
Figure Legend

1	Button
2	Glide
3	Slide (in two parts)

3. **Using eight of the M4 x 0.5 x 5 mm Phillips panhead screws from the rackmount kit (four for each side), attach each glide to the side of the server chassis (**FIGURE 4-16**).**

FIGURE 4-16 Attaching the Glides to the Server Chassis
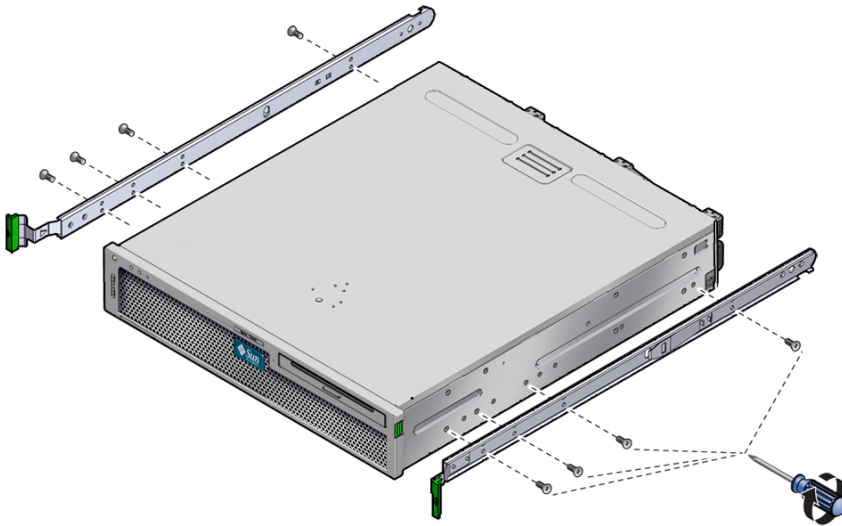
4. **Get the rack brackets (front and rear) from the rackmount kit (**FIGURE 4-14**).**

5. **Lift each front bracket to the desired position at the front of the rack, and attach a front bracket to each of the front rack posts (**FIGURE 4-18**).**

   To secure each bracket, use two of the M5 x 12.7 mm screws or two of the M6 x 13 mm screws. Tighten the screws enough to secure the brackets, but leave them loose enough for adjustment later.

FIGURE 4-17 Attaching the Front Brackets to the Posts
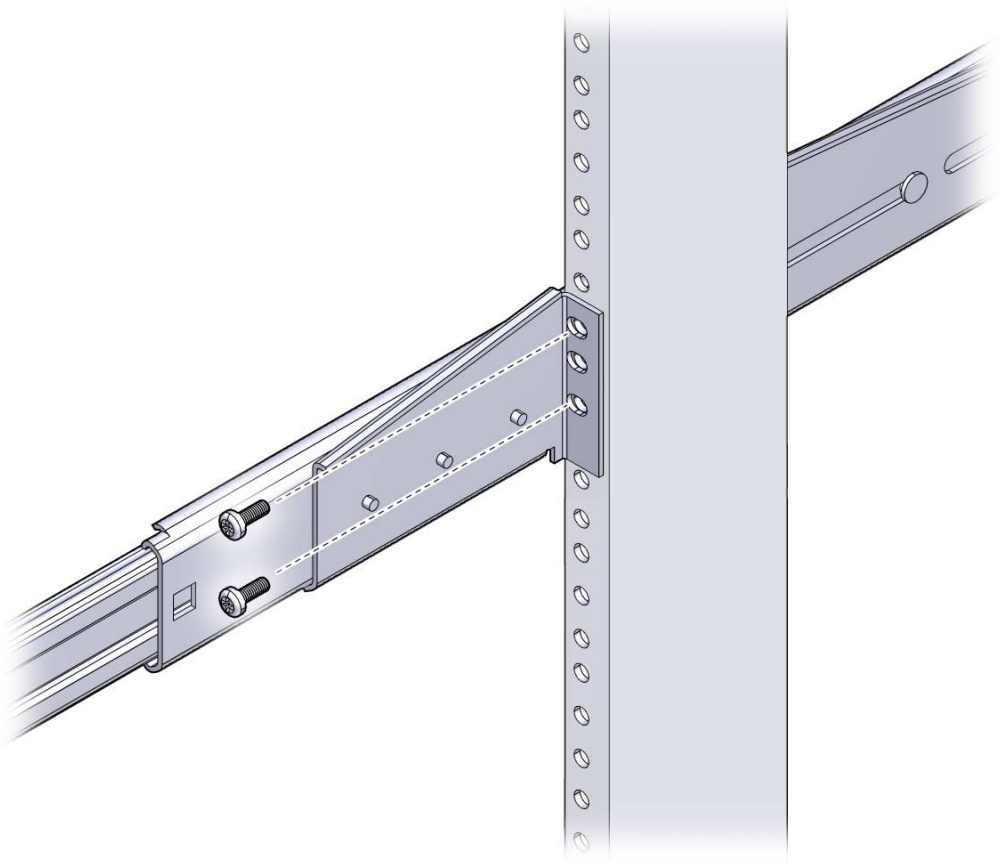
6. **Lift each rear bracket to the desired position at the rear of the rack, and attach a rear bracket to each of the rear rack posts (**FIGURE 4-18**).**

To secure each bracket, use two of the M5 x 12.7 mm screws or two of the M6 x 13 mm screws, as you did in Step 5. Tighten the screws enough to secure the brackets, but leave them loose enough for adjustment later.

FIGURE 4-18 Securing the Rear Brackets to the Rack Posts
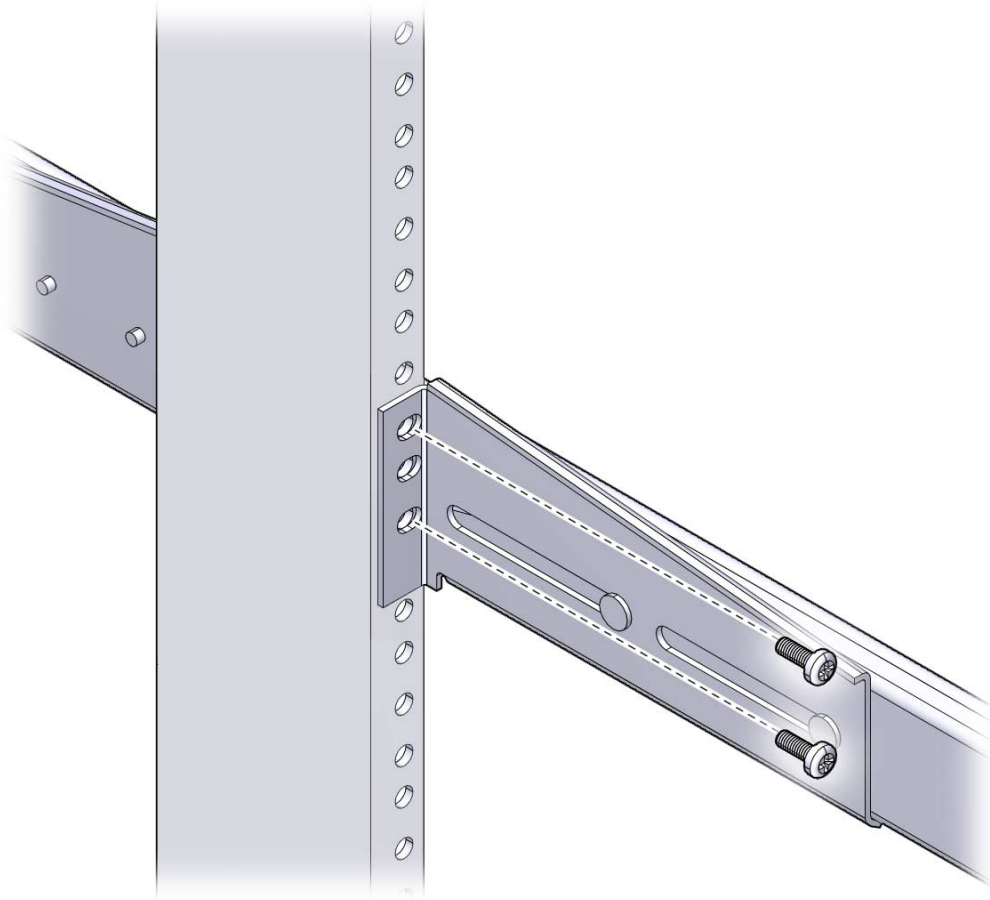
Note – If your rack has 10–32 holes, use the 10–32 collar screws and 10–32 threaded strips.

7. **Align the glides attached to the server with the slide assemblies in the rack.**

   You might find that there is too much or too little room between the two slides mounted in the rack, consequently the glides attached to the server might not align correctly with the slides in the rack. If either situation occurs, loosen the screws on the front and back brackets (Step 5 and Step 6), move the brackets inward or outward to the appropriate points, then tighten the brackets again.

8. **Push in the slide buttons and slide the server all the way into the rack enclosure (**FIGURE 4-19**).**

FIGURE 4-19 Sliding the Server Into the Rack
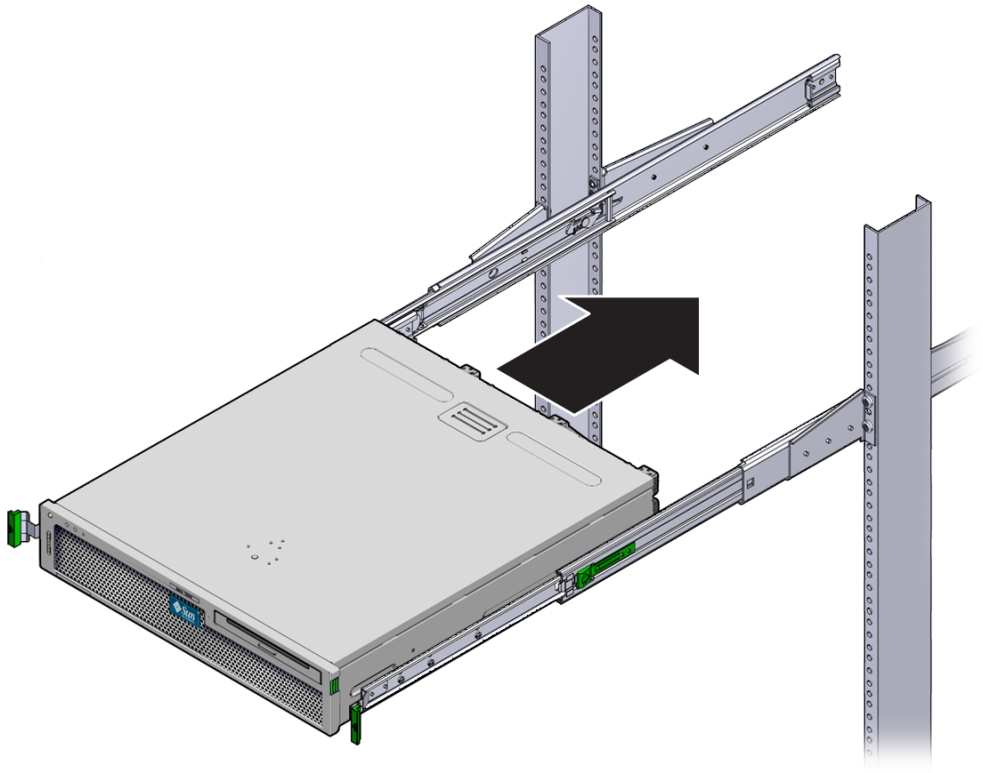
9. Fully tighten the screws on the front and rear brackets.

FIGURE 4-20 Tightening the Front Bracket Screws
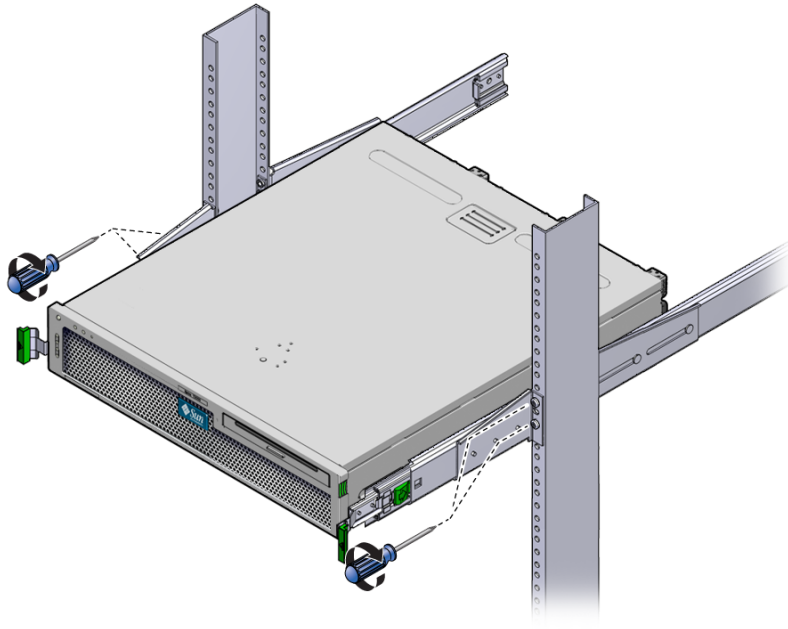
FIGURE 4-21 Tightening the Rear Bracket Screws
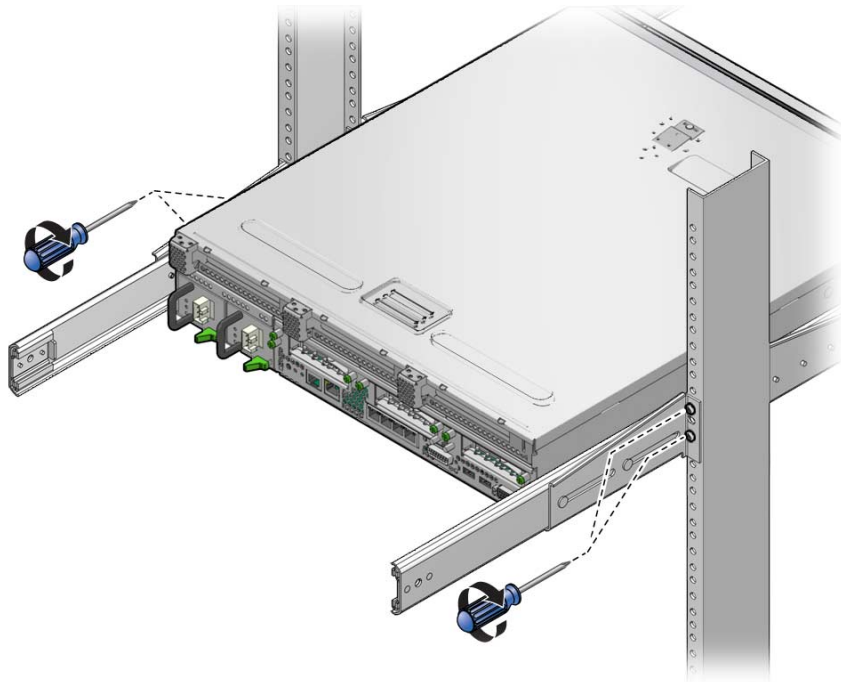
10. **Attach Cable Management Arm (CMA) to rails (note labels on rails and CMA) to right (**FIGURE 4-22**) side.**

Side with arrow attaches to inner glide; other side attached to outer member.

FIGURE 4-22 Attaching Cable Management Arm to Right Side
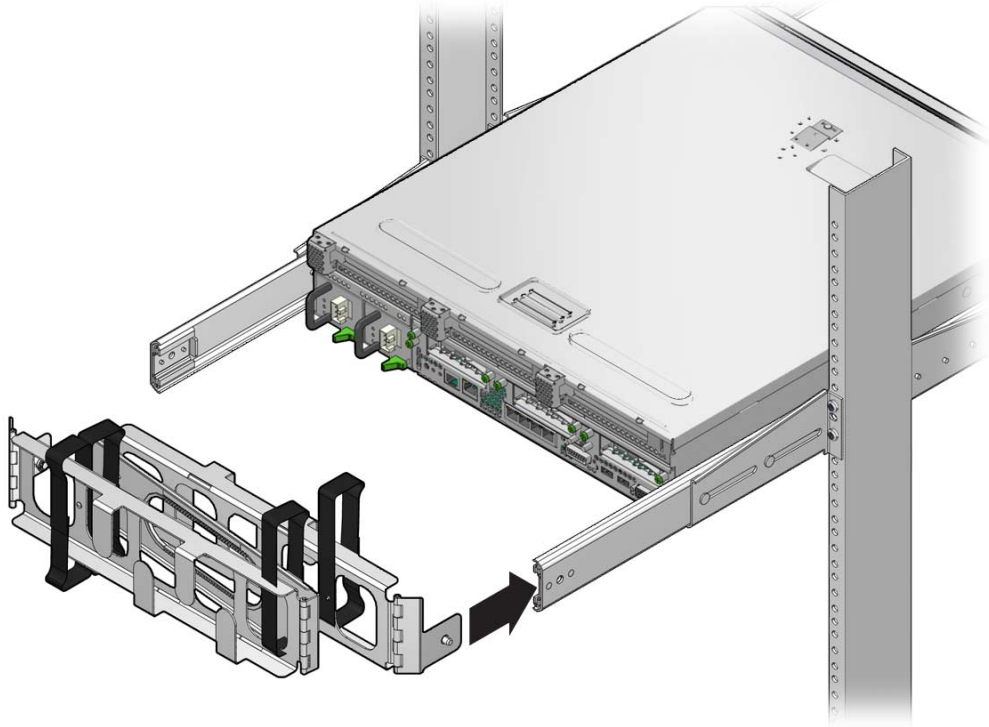
11. Attach CMA to rails (note labels on rails and CMA) to left (FIGURE 4-23**) side.**

Side with arrow attaches to inner glide; other side attached to outer member.

FIGURE 4-23 Attaching Cable Management Arm to Left Side
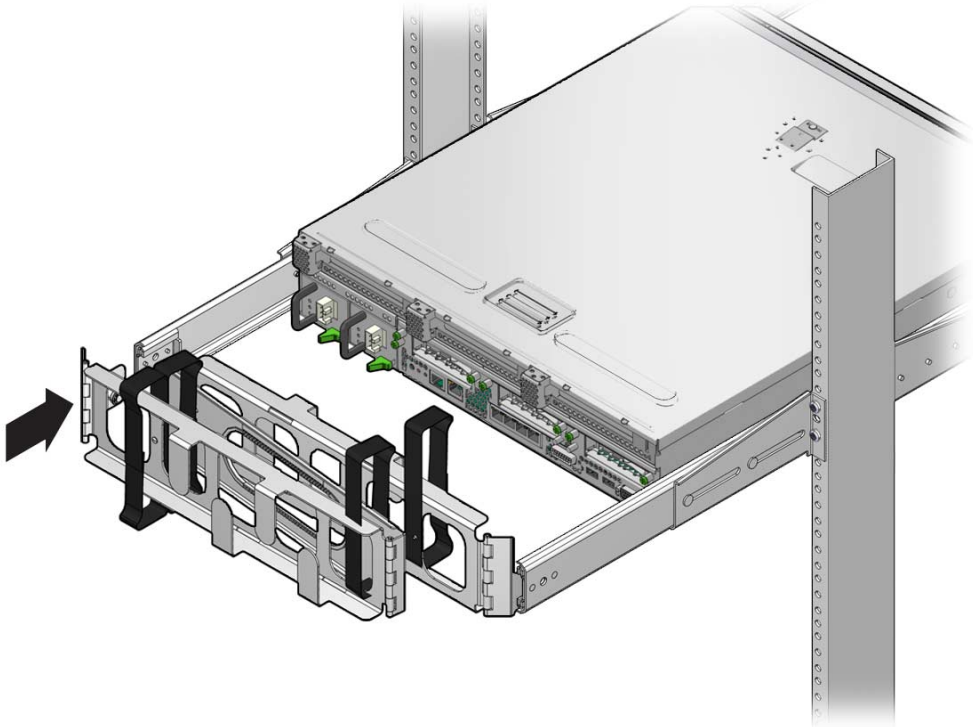
Cabling the Server

This chapter provides instructions for cabling the server. Topics include:

- "Cable Connections and Ports" on page 65
- "Connecting the Server Cables" on page 69
- "DC Operation Conditions and Procedures" on page 73

Note – Both AC and DC versions of the server must be installed in a restricted-access location.

⚠ **Caution –** The Sun Netra T5220 must not be directly connected to Outside Plant cables.

Cable Connections and Ports

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

- **Minimum cable connections for the servers:**
  - At least one system on-board Ethernet network connection (NET port)
  - The service processor serial management port (SER MGT port)
  - The service processor network management port (NET MGT port)
  - AC or DC power cables for the two system power supplies
- **Service processor management ports:** There are two serial management ports for use with the ILOM system controller.

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

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

- **Ethernet ports**: Labeled NET0, NET1, NET2, and NET3. The Ethernet interfaces operate at 10 Mbps, 100 Mbps, and 1000 Mbps. The transfer rates for the Ethernet ports are given in TABLE 5-1.

TABLE 5-1   Ethernet Connection Transfer Rates

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

- **TTYA serial port:** The TTYA serial port has a DB-9 connector, which is located at the lower right corner of the rear panel (FIGURE 5-1). A DB-9 to RJ-45 adapter cable is included in the shipping kit.

  - Use the DB-9 connector with a null modem cable for serial devices. This port appears as ttya in Solaris OS and OpenBoot™ messages.

  - This port is not connected to the service processor serial management port.

  - Use this serial port only for general purpose serial data transfers.

  - Use a null modem cable or an adapter to perform the crossovers given for each connector.

- **USB Ports:** Two Universal Serial Bus (USB) ports labeled USB 0 and USB 1 are provided on the rear panel (FIGURE 5-1). USB ports support hot-plugging. You can connect and disconnect USB cables and peripheral devices while the server is running, without affecting system operations.

  - You can only perform USB hot-plug operations while the OS is running. USB hot-plug operations are not supported when the OpenBoot PROM 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 server.

- **Input AC/DC power cables:** Do not attach power cables to the power supplies until you have finished connecting the data cables, and have connected the server to a serial terminal or a terminal emulator (PC or workstation). The server goes

into Standby mode and the ILOM system controller initializes as soon as the input power cables are connected to the power source. System messages might be lost if the server is not connected to a terminal, PC, or workstation at this time.

Connector Locations

shows the connectors on the rear panel of the Sun Netra T5220 server.

FIGURE 5-1   Rear Panel Connectors and Features on the Sun Netra T5220 Server

Figure Legend

1	Power Supply 0 LEDs top to bottom: Locator LED Button, Service Required LED, Power OK LED
2	Power Supply 0
3	Power Supply 1 LEDs top to bottom: Locator LED Button, Service Required LED, Power OK LED
4	Power Supply 1
5	Captive screw for securing motherboard (1 of 2)
6	System LEDs left to right: Locator LED Button, Service Required LED, Power OK LED
7	Service Processor Serial Management Port
8	Service Processor Network Management Port
9	Captive screws for securing the bottom PCI cards. Each bottom card has screws on both sides
10	Gigabit Ethernet Ports left to right: NET0, NET1, NET2, NET3
11	Alarm Port
12	USB ports left to right: USB0, USB1
13	TTYA Serial Port
14	Captive screw for securing motherboard (2 of 2)
15	PCI-X Slot 3

16	PCIe or XAUI Slot 0
17	PCI-X Slot 4
18	PCIe or XAUI Slot 1
19	PCIe Slot 5
20	PCIe Slot 2

Status Indicator Locations

FIGURE 5-2 shows the status indicators on the front panel of the Sun Netra T5220 server.

FIGURE 5-2   Location of the Bezel Server Status and Alarm Status Indicators
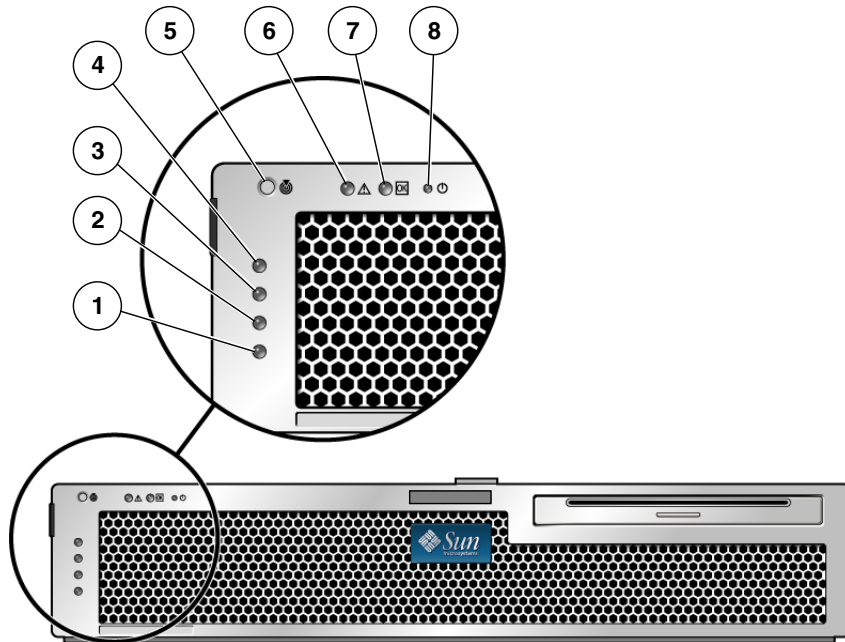
Figure Legend

1	User (amber) Alarm Status Indicator		**5**	Locator LED
2	Minor (amber) Alarm Status Indicator		**6**	Fault LED
3	Major (red) Alarm Status Indicator		**7**	Activity LED
4	Critical (red) Alarm Status Indicator		**8**	Power LED

TABLE 5-2   Bezel Server Status Indicators

Indicator	LED Color	LED State	Component Status
Locator	White	On	Server is identified with the superuser `locator` or ILOM `setlocator` command.
		Off	Normal state
Fault	Amber	On	The server has detected a problem and requires the attention of service personnel.
		Off	The server has no detected faults.
Activity	Green	On	The server is powered up and running the Solaris Operating System.
		Off	Either power is not present or the Solaris software is not running.

Connecting the Server Cables

To boot the server, you must connect and configure the network and serial ports. The procedures are given in the following sections.

- "To Connect the Service Processor Serial Management Port" on page 70
- "To Connect the Service Processor Network Management Port" on page 71
- "To Connect the Ethernet Network Cables" on page 71
- "To Connect AC Power Cables to the Server" on page 72

The server also has serial and USB ports available for connections to optional devices (see "Cable Connections and Ports" on page 65).

Note – When you are finished connecting the cables to the server, ensure that the server can slide smoothly in and out of the rack without binding or damaging the cables.

▼ To Connect the Service Processor Serial Management Port

The service processor serial management port is marked SER MGT (FIGURE 5-3). It is the leftmost RJ-45 port on the rear panel.

Note – The cable and DB-9 RJ-45 adapters are for the host serial port, and not for the server SER MGT port.

FIGURE 5-3   Service Processor Serial Management Port – Rear Panel

Use this port for server management. This port is needed to set up the service processor network management port, as detailed in "Enabling the Service Processor Network Management Port" on page 83.

Note – Use the service processor serial management port *only* for server management. It is the default connection between the service processor and a terminal or a computer.

Caution – Do not attach a modem to this port.

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

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

▼ To Connect the Service Processor Network Management Port

The service processor network management port is labeled NET MGT (FIGURE 5-4). It is located just to the right of the serial management (SER MGT) port on the rear panel.

FIGURE 5-4   Service Processor Network Management Port – Rear Panel
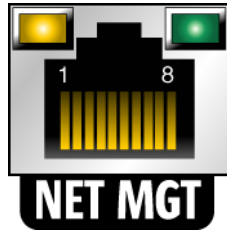
Note – This port is not operational until you configure the network settings (through the serial managment port), as detailed in "Configuring the Service Processor Network Management Port" on page 86.

Note – If you have access to a DHCP server on the network, you can see the service processor get an IP address because the DHCP client is enabled by default.

Note – The service processor network management port is configured by default to retrieve network settings with Dynamic Host Configuration Protocol (DHCP) and allow connections using Solaris Secure Shell (SSH). You might need to modify these settings for your network. Instructions are given in Chapter 6.

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

▼ To Connect the Ethernet Network Cables

The server has four network connectors, marked NET0, NET1, NET2, and NET3 (FIGURE 5-5). These connectors are RJ-45 Gigabit Ethernet.

FIGURE 5-5   Service Processor Ethernet Network Ports – Rear Panel
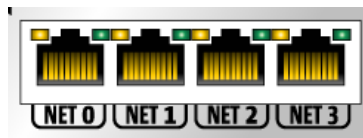
1. **Connect a Category 5 cable from your network switch or hub to Ethernet Port 0 (**NET0**) on the rear of the chassis.**

   NET0 is the farthest left port in the 4-port network cluster in .

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

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

▼ To Connect AC Power Cables to the Server

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

⚠ **Caution –** Finish the hardware procedures in this chapter, but do not attach the AC power cable yet.

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

⚠ **Caution –** The server goes into Standby mode and the service processor initializes as soon as the AC power cable is connected to the power source.

● **Go to** **for instructions on connecting the server to AC power.**

DC Operation Conditions and Procedures

This section provides DC power cabling and requirements information.

DC Power Source Requirements

TABLE 5-3 lists DC power source requirements for each power supply in the Sun Netra T5220 server, and TABLE 5-4 lists DC power source requirements for the server as a whole.

TABLE 5-3   DC Operating Power Limits and Ranges for Each Power Supply in the Server

Description	Limit or Range
Operating input voltage range	-40 VDC to -75 VDC nominal
Maximum operating input current	11.7 A
Maximum operating input power	660 W

TABLE 5-4   DC Operating Power Limits and Ranges for the 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

The server must meet the following:

- Must be reliably connected to protected earth ground
- May be supplied by one or two power sources, isolated from each other
- Must be 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 server must be installed in a restricted-access location. According to the intent of the National Electrical Code, a restricted-access location is an area intended for qualified or trained personnel only and has access controlled by a locking mechanism, such as a key lock or an access card system.

DC Supply and Ground Conductor Requirements

The server must meet the following:

- Suitable conductor material: use copper conductors only

- Power supply connections through the input connector: 12 AWG (between the Sun Netra T5220 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
- Cable type one of the following:
  - UL style 1028 or other UL 1581 (VW-1) compliant equivalent
  - IEEE 383 compliant
  - IEEE 1202-1991 compliant
- Branch circuit cable insulation color: Per applicable National Electrical Codes
- Grounding cable insulation color: Green/yellow

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

When attaching DC cables, keep the following requirement in mind:

Caution – You must restrict the connection of the Sun Netra T5220 server to the DC power source to minimize the possibility that transient energy will appear on the main input to the equipment. The DC battery power source must be in the same premises as the server. The server cannot be in one building with the power source in another building.

Overcurrent Protection Requirements

- Overcurrent protection devices must be provided as part of each equipment rack.
- Circuit breakers must be located between the DC power source and the Sun Netra T5220 server. Use one 20 A double-pole, fast trip DC-rated circuit breaker for each power supply unit.

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

▼ To Assemble the DC Input Power Cable

1. Identify the parts that you will use to assemble the DC input power cable (FIGURE 5-6**).**

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

- DC input plugs
- Cage clamp operating lever
- Tie wraps

FIGURE 5-6   DC Connection Parts
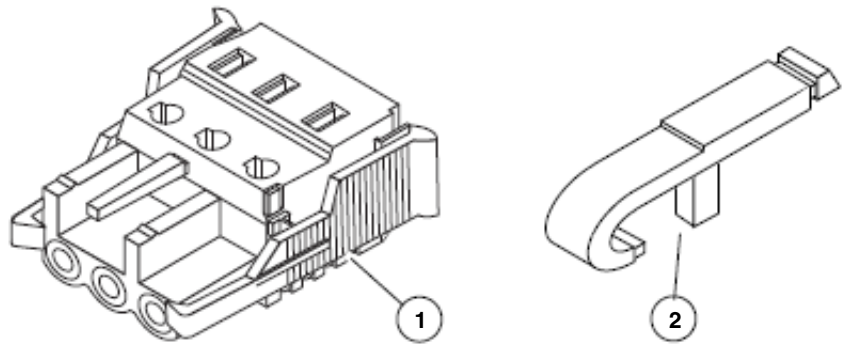
Figure Legend

1	DC input plug
2	Cage clamp operating lever

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

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

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

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

- -48V (negative terminal)
- Chassis ground

■ -48V Return (positive terminal)

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

---

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

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

FIGURE 5-7   Stripping the Insulation From the Wire

5/16 in. (8 mm)
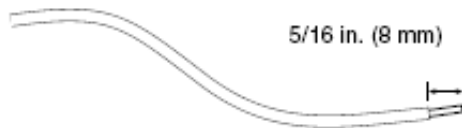
6. **Open the cage clamp for this section of the DC input plug by taking one of the following actions:**

■ Insert the tip of the cage clamp operating lever into the rectangular hole directly above the hole in the DC input plug where you want to insert the first wire. Press down on the cage clamp operating lever (FIGURE 5-8).

■ 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 5-9).

FIGURE 5-8 Opening the DC Input Plug Cage Clamp Using the Cage Clamp Operating Lever

Top of input plug
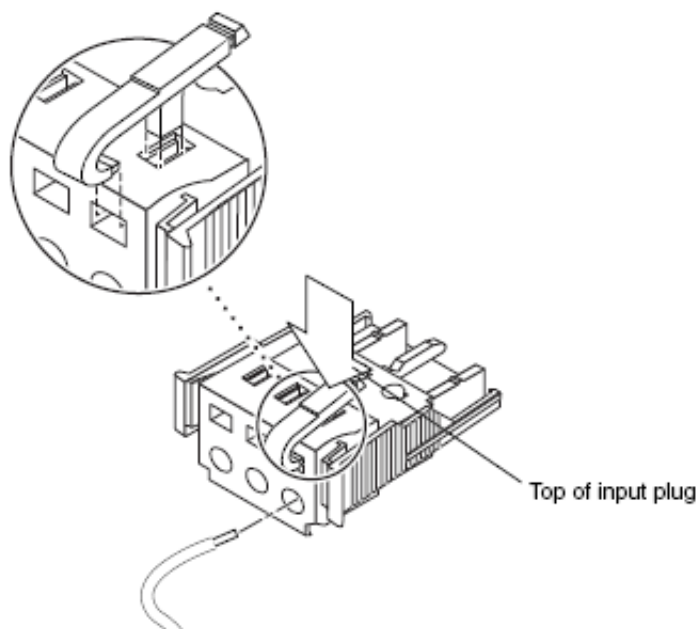
FIGURE 5-9 Opening the Cage Clamp Using a Screwdriver

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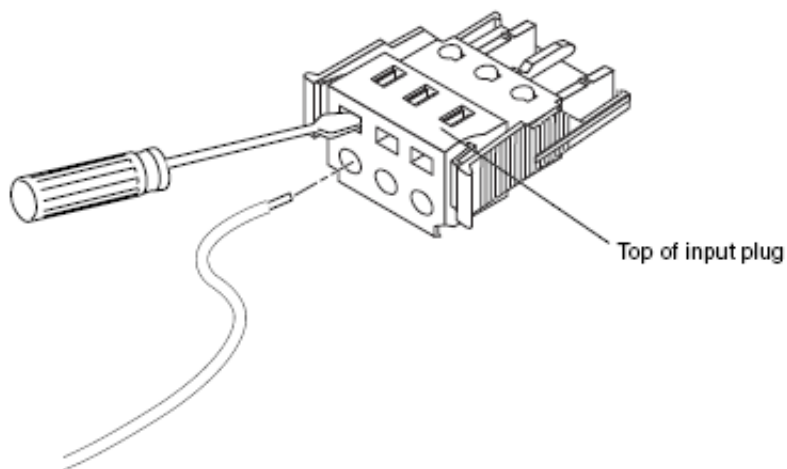
7. **Feed the exposed section of the appropriate wire into the rectangular plug hole in the DC input plug.**

FIGURE 5-10 shows which wires should be inserted into each hole in the DC input plug.

FIGURE 5-10 Assembling the DC Input Power Cable
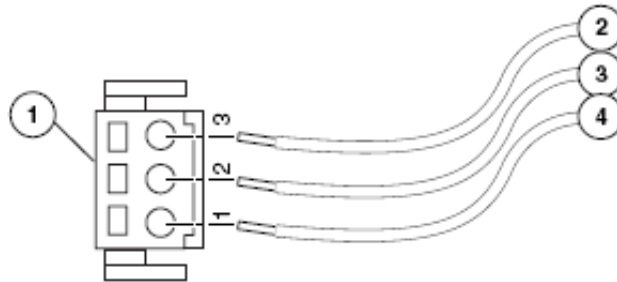
Figure Legend

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

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

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

You need two DC input power cables for each of the power supplies.

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 5-8 and FIGURE 5-9). Pull the wire from the DC input plug.

Powering On the System

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

The following topics are included:

- "Powering On the System for the First Time" on page 79
- "Enabling the Service Processor Network Management Port" on page 83
- "Logging In To the Service Processor" on page 84
- "Using the Service Processor for Common Operations" on page 90
- "Booting the Solaris Operating System" on page 94
- "Verifying System Functionality" on page 97

Powering On the System for the First Time

This section provides an overview and instructions for powering on your system the first time.

ILOM System Console

When you power on the system, the boot process begins under the control of the Integrated Lights Out Manager (ILOM) system console. The system console displays status and error messages generated by firmware-based tests during system startup.

Note – To see these status and error messages, connect a terminal or terminal emulator to the serial management port (SERIAL MGT). For a basic procedure to connect a terminal or terminal emulator, see "To Power On the System for the First Time" on page 81.

For a more detailed discussion on configuring the system console and connecting terminals, refer to the *Sun Netra T5220 Server Administration Guide*.

ILOM Service Processor

After the system console finishes its low-level system diagnostics, the ILOM service processor initializes and runs a higher level of diagnostics. When you access the ILOM service processor using a device connected to the serial management port, you see the output of the ILOM diagnostics.

By default, the network management port is configured to automatically retrieve network configuration using Dynamic Host Configuration Protocol (DHCP) and to allow connections using Secure Shell (SSH).

Note – If you are unable to use DHCP and SSH on your network, you must connect to the ILOM service processor using the serial management port to reconfigure the network management port. See "Configuring the Service Processor Network Management Port" on page 86.

Once the network management port (NET MGT) has been assigned an IP address, you can connect to the ILOM service processor using SSH.

CLIs, User Accounts, and Passwords for Connecting to the ILOM Service Processor

When connecting to the ILOM service processor for the first time using the serial or network management ports, the default CLI is ILOM, the default user account is root, and the default password is *changeme*. Examples in this document use the default ILOM CLI.

ILOM also provides an Advanced Lights Out Management (ALOM) compatability CLI that uses commands that resemble the ALOM CMT CLI commands. To access the ALOM compatability CLI, you must first create an admin account with the role of administrator. Once you create the admin account, assign the ALOM

compatability CLI as the default CLI (`role=administrator, cli=alom`). For more information on using the ALOM compatability CLI, refer to the *Integrated Lights Out Management 2.0 (ILOM 2.0) Supplement for Sun Netra T5220 Server.*

▼ To Power On the System for the First Time

Tip – The serial terminal or a terminal emulator should be connected before you connect the power cables, or you will not see the system messages. The server goes into Standby mode and the ILOM service processor initializes as soon as the AC power cables are connected to the power source.

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

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

   Configure the terminal or terminal emulator with these settings:

   - 9600 baud
   - 8 bits
   - No parity
   - 1 Stop bit
   - No handshake

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

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

3. **Connect the AC power cables to Power Supply 0 and Power Supply 1. Watch the terminal for system messages.**

FIGURE 6-1   Rear Panel Power Connectors of a Sun Netra T5220 Server
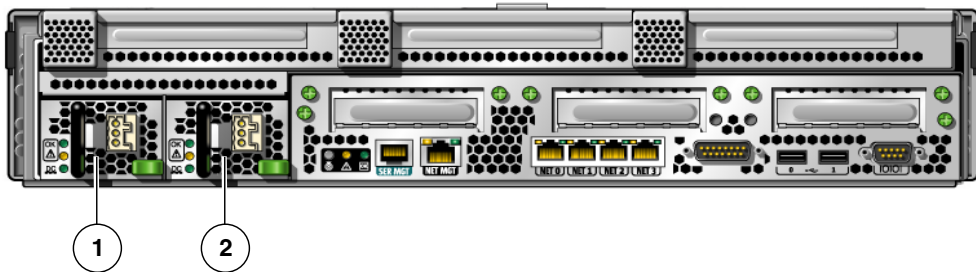
Figure Legend

1	Power Supply 0
2	Power Supply 1

After the service processor boots, the service processor login prompt is displayed on the serial console. The following example shows a partial output from the service processor boot sequence leading to the login prompt.

EXAMPLE 6-1   Sample Service Processor Output

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

IP Protocols: ICMP, UDP, TCP, IGMP

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

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

Configuring network interfaces...Internet Systems Consortium DHCP
Client V3.0.1
Copyright 2007 Internet Systems Consortium.
All rights reserved.
```

EXAMPLE 6-1 Sample Service Processor Output *(Continued)*

```
For info, please visit http://www.isc.org/products/DHCP


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


hostname login:
```

▼ To Avoid Booting the Solaris Operating System at Start Up

In hard drive HDD0, the Solaris OS is preinstalled.

● **If you do not want to start the preinstalled OS, set the OBP parameter** auto-boot? **to** false**. For example from the ILOM CLI:**

```
-> bootmode bootscript "setenv auto-boot? false"
```

Enabling the Service Processor Network Management Port

The service processor network management port is not operational until you configure network settings for the service processor. Configure the service processor in this order:

1. After the service processor boots, access the ILOM CLI through the serial management port. See "To Log In To the Service Processor Using the Serial Management Port" on page 84.

2. Configure the service processor. See "Configuring the Service Processor Network Management Port" on page 86.

3. Commit the changes to the service processor parameters. See Step 7 in "To Power On the System for the First Time" on page 81.

You can now use the network management port at any time to access the service processor. See "To Log In To the Service Processor Using the Network Management Port" on page 90.

Logging In To the Service Processor

If you are powering on the system for the first time after installation, use the service processor serial port to power on the system and run POST. See "To Log In To the Service Processor Using the Serial Management Port" on page 84.

If the network management port has already been configured, you can use it instead of the serial management port. See "To Log In To the Service Processor Using the Network Management Port" on page 90.

▼ To Log In To the Service Processor Using the Serial Management Port

After the service processor boots, access the ILOM CLI to configure and manage the system. The ILOM CLI prompt (`->`) is displayed at the first time the service processor is booted. The default configuration provides an ILOM CLI `root` user account. The default `root` password is *changeme*. Change the password using the service processor ILOM CLI `password` command.

1. **If this is the first time the system has been powered on, use the** `password`
   command to change the `root` **password.**

```
...
Starting OpenBSD Secure Shell server: sshd.
Starting Servicetags listener: stlistener.
Starting FRU update program: frutool.

hostname login: root
Password: changeme

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...

Warning: password is set to factory default.

-> set /SP/users/root password
Enter new password: ********
Enter new password again: ********

->
```

Note – After the `root` password has been set, on subsequent reboots, the ILOM CLI
login prompt is displayed.

2. **Enter** `root` **for the login name followed by your password.**

```
...
hostname login: root
Password: password (nothing displayed)
Waiting for daemons to initialize...

Daemons ready

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->
```

Configuring the Service Processor Network Management Port

Note – If your network allows the use of DHCP and SSH, this configuration is performed automatically the first time you boot the system.

Use this procedure only when:

- You are unable to use DHCP and SSH on your network.
- You need to modify the ILOM service processor network management port settings.

In this procedure, you connect to the ILOM service processor using the serial management port to manually reconfigure the network management port.

Note – For more information on configuring ILOM, refer to the *Integrated Lights Out Management 2.0 (ILOM 2.0) Supplement for Sun Netra T5220 Server.*

Set these network parameters according to the specific details of your network configuration:

- `/SP/network state` – Specifies whether the service processor is on the network or not
- `/SP/network pendingipaddress` – IP address of the service processor
- `/SP/network pendingipgateway` – IP address of the gateway for the subnet
- `/SP/network pendingipnetmask` – Netmask for the service processor subnet
- `/SP/network pindingipdiscovery` - Specifies whether the service processor uses DHCP or static IP address assignment
- `/SP/network commitpending` - Commits the service processor to use the pending settings

Configure these parameters with the `set` command. The usage is as follows: `set` *target property=value* where `/SP/network` is the target and `pendingipaddress=`*xx.x.xx.xxx*, for example, is the *property=value*. The following example sets the pending service processor IP address:

```
-> set /SP/network pendingipaddress=xx.x.xx.xxx
Set 'pendingipaddress' to 'xx.x.xx.xxx'
```

▼ To Configure the Service Processor Network Management Port

1. Set the `/SP/network state` **parameter to** `enabled`**.**

```
-> set /SP/network state=enabled
Set 'state' to 'enabled'
```

2. Enable and disable SSH connections as needed.

```
-> set /SP/services/ssh state=enabled
Set 'state' to 'enabled'
-> set /SP/services/ssh state=disabled
Set 'state' to 'disabled'
```

See the *Integrated Lights Out Management 2.0 (ILOM 2.0) Supplement for Sun Netra T5220 Server* for more information about SSH support in ILOM.

3. Choose one of these methods to configure the service processor using information from your network administrator:

- Use DHCP to retrieve the network settings. Go to Step 4.
- Configure a static IP configuration. Go to Step 5.

4. If you choose to use DHCP, set `pendingipdiscovery` **to** `dhcp`**.**

```
-> set /SP/network pendingipdiscovery=dhcp
Set 'pendingipdiscovery' to 'dhcp'
```

Go to Step 6.

5. If you choose to use a static IP configuration, set the parameters `pendingipdiscovery`**,** `pendingipaddress`**,** `pendingipgateway`**, and** `pendingipnetmask` **as follows.**

a. Set the service processor to accept a static IP address.

```
-> set /SP/network pendingipdiscovery=static
Set 'pendingipdiscovery' to 'static'
```

b. Set the IP address for the service processor.

```
-> set /SP/network pendingipaddress=service-processor-IPaddr
Set 'pendingipaddress' to 'service-processor-IPaddr'
```

c. Set the IP address for the service processor gateway.

```
-> set /SP/network pendingipgateway=gateway-IPaddr
Set 'pendingipgateway' to 'gateway-IPaddr'
```

d. Set the netmask for the service processor.

```
-> set /SP/network pendingipnetmask=255.255.255.0
Set 'pendingipnetmask' to '255.255.255.0'
```

This example uses 255.255.255.0 to set the netmask. Your network environment subnet might require a different netmask. Use a netmask number most appropriate to your environment.

6. **Use the** show /SP/network **command to verify that the parameters were set correctly.**

```
-> show /SP/network
  /SP/network
     Targets:
     Properties:
         commitpending = (Cannot show property)
         dhcp_server_ip = xx.x.xx.x
         ipaddress = xx.x.xx.x
         ipdiscovery = dhcp
         ipgateway = xx.x.xx.x
         ipnetmask = 255.255.252.0
         macaddress = 00:14:4F:3F:8C:AF
         pendingipaddress = xx.x.xx.x
         pendingipdiscovery = static
         pendingipgateway = xx.x.xx.x
         pendingipnetmask = 255.255.255.0
         state = enabled
     Commands:
         cd
         set
         show
->
```

Note – After setting the configuration parameters, you must enter the set /SP/network commitpending=true command for the new values to take affect.

7. Commit the changes to the service processor network parameters.

```
-> set /SP/network commitpending=true
Set 'commitpending' to 'true'
```

▼ To Reset the Service Processor

It is not necessary to reset the service processor for new network values to take effect. To commit the changes to the service processor network parameters, use the `set /SP/network commitpending=true` command. See Step 7 in "Configuring the Service Processor Network Management Port" on page 86.

● **Type the** `reset /SP` **command.**

You are prompted to confirm that you want to reset the service processor. Reply **y** when prompted.

```
-> reset /SP
Are you sure you want to reset /SP (y/n)? y
```

Note – You can specify the `-script` option to bypass the confirmation question, for example, `reset -script /SP`.

The service processor resets, runs diagnostics, and returns to the login prompt.

```
...
hostname login: root
Password: password (nothing displayed)
Waiting for daemons to initialize...

Daemons ready

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->
```

▼ To Log In To the Service Processor Using the Network Management Port

Note – You must configure the service processor parameters shown in "Configuring the Service Processor Network Management Port" on page 86 before you can use the network management port.

● **Open an SSH session and connect to the service processor by specifying its network address.**

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

Daemons ready

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->
```

Using the Service Processor for Common Operations

Note – For more information on using the ILOM service processor, refer to the *Integrated Lights Out Management 2.0 (ILOM 2.0) Supplement for Sun Netra T5220 Server.*

▼ To Power On the System

1. Perform the following steps to verify that there are no faults:

a. Set the virtual keyswitch to `diag` **mode so that POST will run in Service mode.**

```
-> set /SYS keyswitch_state=diag
```

b. To initiate the power on sequence, type the `start /SYS` **command.**

You see an ILOM CLI alert message on the system console. This message indicates that the system has reset.

```
-> start /SYS
Are you sure you want to start /SYS (y/n)? y
Starting /SYS

->
```

c. Switch to the system `console` **to view POST output.**

```
-> start /SP/console
```

Watch the POST output for possible fault messages. The following output is a sign that POST did not detect any faults:

```
.
.
.
0:0>POST Passed all devices.
0:0>
0:0>DEMON: (Diagnostics Engineering MONitor)
0:0>Select one of the following functions
0:0>POST:Return to OBP.
0:0>INFO:
0:0>POST Passed all devices.
0:0>Master set ACK for vbsc runpost command and spin...
```

2. Check the POST execution result with the following command:

```
-> show /SYS/faultmgmt -level all
```

Note – Depending on the configuration of ILOM, POST variables, and whether POST detected faults or not, the server might boot, or the system might remain at the ok prompt. If the system is at the ok prompt, type boot.

3. Use the set /SYS keyswitch_state=normal **command to return the virtual keyswitch to Normal mode (default) so that the system can power on and start the boot process.**

```
-> set /SYS keyswitch_state=normal
```

▼ To Connect to the System Console

Output from POST, OpenBoot, and the Solaris OS is displayed in the system console using the network console on the service processor.

● **Type the** start /SP/console **command.**

Multiple users can be connected to the console, but only one can be attached.

```
-> start /SP/console
Are you sure you want to start /SP/console (y/n)? y
Serial console started.  To stop, type #.
```

Note – For more information about POST output, refer to the *Sun Netra T5220 Server Service Manual*.

▼ To Perform a Normal System Initialization

After you issue the start /SYS command, the CPU and memory controllers initialize, and eventually OpenBoot initializes. After a number of system console messages, the ok prompt appears, or the system will boot into the Solaris OS.

Note – System behavior depends on how the auto-boot variable is set. See the *Sun Netra T5220 Server Service Manual* for more information.

The following example output is a small section of the complete output.

```
-> start /SYS
Find dropin, Copying Done, Size 0000.0000.0000.1110
Find dropin, (copied), Decompressing Done, Size
0000.0000.0006.06e0 cpu cpu cpu cpu cpu cpu cpu cpu cpu cpu cpu cpu
cpu cpu cpu cpu cpu cpu cpu cpu cpu cpu cpu cpu cpu cpu cpu
vpci mem32base, mem64base, cfgbase: e800000000 e000000000
e900000000
pci /pci@780: Device 0 pci pci
/pci@780/pci@0: Device 0 Nothing there
/pci@780/pci@0: Device 1 pci pci

...................

/pci@7c0/pci@0: Device a Nothing there
/pci@7c0/pci@0: Device b Nothing there
/pci@7c0/pci@0: Device c Nothing there
/pci@7c0/pci@0: Device d Nothing there
/pci@7c0/pci@0: Device e Nothing there
/pci@7c0/pci@0: Device f Nothing there
Probing I/O buses

Netra T5220, No Keyboard
...


{0} ok
```

To understand the various devices and their path names as represented in the OpenBoot device tree, refer to TABLE 6-1 for disks and TABLE 6-2 for optional PCI cards.

TABLE 6-1   Device Identifiers and Devices

Device Identifiers	Devices
/SYS/MB/CMP*cpu-number*/P*strand-number*	CPU strand (Number: 0-63)
/SYS/MB/RISER*riser-number*/PCIE*slot-number*	PCIe slot (Number: 0-5)
/SYS/MB/RISER*riser-number*/XAUI*card-number*	XAUI card (Number: 0-1)
/SYS/MB/GBE*controller-number*	GBE controllers (Number: 0-1) • GBE0 controls NET0 and NET1 • GBE1 controls NET2 and NET3
/SYS/MB/PCIE	PCIe root complex
/SYS/MB/USB*number*	USB ports (Number: 0-1, located on rear of chassis)

TABLE 6-1   Device Identifiers and Devices *(Continued)*

Device Identifiers	Devices
`/SYS/MB/CMP0/L2-BANK`*number*	(Number: 0-3)
`/SYS/DVD`	DVD
`/SYS/USBBD/USB`*number*	USB ports (Number: 2-3, located on front of chassis)
`/SYS/TTYA`	DB9 serial port
`/SYS/MB/CMP0/BR`*branch-number*`/CH`*channel-number*`/D`*dimm-number*	DIMMS

Booting the Solaris Operating System

The Solaris OS is preinstalled on the servers on the disk in slot 0. The Solaris OS is not configured (that is, the `sys-unconfig` command was run in the factory). If you boot the system from this disk, you will be prompted to configure the Solaris OS for your environment.

▼ To Boot the Solaris Operating System

1. **At the** `ok` **prompt, boot from the disk that contains the Solaris OS.**

- If you know which disk to boot from, skip this step and perform Step 2.
- If you need to determine which disk to boot from, issue the `show-disks` command at the `ok` prompt to see the path to the configured disks, similar to the following:

```
ok show-disks
a) /pci@7c0/pci@0/pci@2/pci@0,2/LSILogic,sas@4/disk
q) NO SELECTION
Enter Selection, q to quit: q
ok
```

2. **Type the** `boot` **command at the** `ok` **prompt.**

   Use the value from Step 1 to construct the `boot` command. You must append the target to the disk path.

In the following example, the system is being booted from disk 0 (zero) on a Sun Netra T5220 server from Oracle. Thus, @0,0 is appended to the disk path.

```
ok boot /pci@7c0/pci@0/pci@2/pci@0,2/LSILogic,sas@4/disk@0,0
Boot device: / pci@7c0/pci@0/pci@2/pci@0,2/LSILogic,sas@4/
disk@0,0
File and args:
Notice: Unimplemented procedure 'encode-unit' in
/pci@7c0/pci@0/pci@2/pci@0/LSILogic,sas@4
Loading ufs-file-system package 1.4 04 Aug 1995 13:02:54.
FCode UFS Reader 1.12 00/07/17 15:48:16.
Loading: /platform/SUNW,Ontario/ufsboot
Loading: /platform/sun4v/ufsboot
SunOS Release 5.10 Version
/net/spa/export/spa2/ws/pothier/grlks10-ontario:12/01/2004 64-bit
...

DEBUG enabled
misc/forthdebug (159760 bytes) loaded
/platform/sun4v/kernel/drv/sparcv9/px symbol
intr_devino_to_sysino multiply defined
...
os-tba FPU not in use
configuring IPv4 interfaces: ipge0.
Hostname: wgs94-181
The system is coming up. Please wait.
NIS domain name is xxx.xxx.xxx.xxx
starting rpc services: rpcbind keyserv ypbind done.
Setting netmask of lo0 to 255.0.0.0
Setting netmask of bge0 to 255.255.255.0
Setting default IPv4 interface for multicast: add net 224.0/4:
gateway wgs94-181
syslog service starting.
volume management starting.
Creating new rsa public/private host key pair
Creating new dsa public/private host key pair
The system is ready.
wgs94-181 console login:
```

▼ To Reset the System

● **If it is necessary to reset the system, use the** shutdown -g0 -i6 -y
  command.

```
# shutdown -g0 -i6 -y
```

It is not necessary to power the system off and on to simply reset the system.

▼ To Power Cycle the System

If a simple reset does not clear a system problem, you can power the system off and
on with this procedure.

1. **Shut down the Solaris OS.**

   At the Solaris OS prompt, type the shutdown -g0 -i0 -y command and then
   type h when prompted to halt the Solaris OS and to return to the ok prompt.

```
# shutdown -g0 -i0 -y
# svc.startd: The system is coming down.  Please wait.
svc.startd: 91 system services are now being stopped.
Jun 12 19:46:57 wgs40-58 syslogd: going down on signal 15
svc.startd: The system is down.
syncing file systems... done
Program terminated
r)eboot, o)k prompt, h)alt?
```

2. **Switch from the system console prompt to the service processor console prompt
   by issuing the #. escape sequence.**

```
ok #.
->
```

3. **Using the ILOM CLI, type the** stop /SYS **command to perform a graceful
   shutdown of the system.**

```
-> stop /SYS
Are you sure you want to stop /SYS (y/n)? y
Stopping /SYS

->
```

> **Note –** To perform an immediate and ungraceful shutdown, use the `stop -force -script /SYS` or `stop -script /SYS` commands. These commands stop everything immediately, so ensure that all data is saved before entering these commands.

4. **Type the** `start /SYS` **command.**

```
-> start /SYS
Are you sure you want to start /SYS (y/n)? y
Starting /SYS

->
```

> **Note –** To force a power on sequence, use the `start -script /SYS` command.

5. **Reconnect to the system console with the** `start /SP/console` **command.**

```
-> start /SP/console
Are you sure you want to start /SP/console (y/n)? y
Serial console started.  To stop, type #.
```

The systems displays various messages, followed by the `ok` prompt.

Verifying System Functionality

After powering on the system for the first time, you can use the Sun Validation Test Suite (SunVTS™) software to verify the functionality and performance of any installed components, as well as its network connections. Refer to the SunVTS documentation at `http://www.oracle.com/technetwork/indexes/documentation/index.html` for more information.

Updating the Firmware

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

The flash image consists of the following components:

- Service processor firmware
- OpenBoot firmware
- POST
- Reset/Config
- Sequencer
- Partition description

Updating the Firmware

To use the features and fixes in subsequent firmware releases, perform "To Update the Firmware" on page 99.

▼ To Update the Firmware

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

   This action is required to access the new flash image over the network. See "Configuring the Service Processor Network Management Port" on page 86.

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

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

Daemons ready

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->
```

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

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

```
-> stop /SYS
```

4. **Verify that the** `keyswitch_state` **parameter is set to** `normal`**.**

```
-> set /SYS keyswitch_state=normal
```

5. **Type the** `load` **command.**

    The `load` command updates the service processor flash image and the host firmware. The `load` command requires the following information:

    ▪ IP address of a TFTP server on the network that can access the flash image

    ▪ Full path name to the flash image that the IP address can access

    The command usage is as follows:

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

    where:

    ▪ `-script` – Do not prompt for confirmation and act as if yes was specified

- -source – Specifies the IP address and full path name (URI) to the flash image

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

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

Firmware update is complete.
ILOM will now be restarted with the new firmware.
Update complete. Reset device to use new image.

->
```

After the flash image has been updated, the system will automatically reset.

The service processor resets, runs diagnostics, and returns to the login prompt (on the serial console), similar to EXAMPLE A-1.

EXAMPLE A-1   Typical Boot Sequence Following Firmware Update

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

IP Protocols: ICMP, UDP, TCP, IGMP

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

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

Configuring network interfaces...Internet Systems Consortium DHCP
```

EXAMPLE A-1 Typical Boot Sequence Following Firmware Update *(Continued)*

```
Client V3.0.1
Copyright 2007 Internet Systems Consortium.
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For info, please visit http://www.isc.org/products/DHCP

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

hostname login:
```

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 *Sun Netra T5220 Server Administration Guide*.

Note – The serial management port on the ILOM card is preconfigured as the default system console port. For more information, see the *Sun Netra T5220 Server Overview.*

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

Selecting a Boot Device

▼ To Select a Boot Device

● **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`, `net2`, `net3` – 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 on-board Ethernet interface as the default boot device, you can determine the full path name of each interface by typing either of the following commands:

```
ok show-devs
ok show-nets
```

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

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