FUJITSU

SPARC Enterprise
T5120 and T5220 Servers

Installation Guide

C120-E462-01EN

FUJITSU

SPARC® Enterprise T5120 and T5220 Servers Installation Guide

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Preface

The *SPARC Enterprise T5120 and T5220 Servers Installation Guide* provides instructions, background information, and reference material to help you install SPARC® Enterprise T5120 and T5220 servers.

The installation instructions in this document assume that a system administrator is experienced with the Solaris™ Operating System (Solaris OS).

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

FOR SAFE OPERATION

This manual contains important information regarding the use and handling of this product. Read this manual thoroughly. Pay special attention to the section "Notes on Safety" on page xx. Use the product according to the instructions and information available in this manual. Keep this manual handy for further reference.
Fujitsu makes every effort to prevent users and bystanders from being injured or from suffering damage to their property. Use the product according to this manual.

Structure and Contents of This Manual

This manual is organized as described below:

- CHAPTER 1 Preparing for Installation

  Provides an installation overview for the servers.

- CHAPTER 2 Installing the SPARC Enterprise T5120 and T5220 Servers

  Provides instructions for installing the servers into a rack.

- CHAPTER 3 Powering On the System

  Provides instructions for configuring and powering on the servers and for installing additional software.

- APPENDIX A Updating the Firmware

  Provides instructions for updating the service processor firmware and the system firmware.

- APPENDIX B Selecting a Boot Device

  Provides instructions for selecting a boot device.

- APPENDIX C Installing the Servers With the Express Rail Rackmounting Kit

  Provides instructions for installing the servers into a rack with the Express rail rackmounting kit.

- INDEX

  Provides keywords and corresponding reference page numbers so that the reader can easily search for items in this manual as necessary.

Shipping Kit Inventory List for Both Servers

Standard components of the SPARC Enterprise T5120 and T5220 are installed at the factory. However, if you ordered options such as PCI cards or a 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 of the following:

- Server
- Either the regular rackmounting kit or the express rail rackmounting kit:
- Regular rackmounting kit
  - Two slide rail assemblies
  - Slide spacing tool
  - Package of mounting screws and nuts in assorted sizes to fit various types of equipment racks
  - Cable management arm
  - Two extension brackets for use with racks up to 39.5 in. (1000 mm) in depth
- Express rail rackmounting kit
  - Two slide rail assemblies
  - Two inner section mounting brackets (locked inside the slide rail assemblies)
  - Cable management arm (CMA) shipped in different box (included only with Express rail and CMA combination kit)
  - Cable fasteners installed on the CMA (included only with Express rail and CMA combination kit)
  - One removable rear left attachment bracket secured to CMA with removable tape
  - Ten M4x5 bracket attachment screws (only for select servers)

Related Documentation

The latest versions of all the SPARC Enterprise Series manuals are available at the following Web sites:

Global Site

http://www.fujitsu.com/sparcenterprise/manual/

Japanese Site

http://primeserver.fujitsu.com/sparcenterprise/manual/

Title	Description	Manual Code
SPARC Enterprise T5120 and T5220 Servers Product Notes	Information about the latest product updates and issues	C120-E458
SPARC Enterprise T5120 and T5220 Servers Overview Guide	Product features	C120-E460
SPARC Enterprise T5120 and T5220 Servers Site Planning Guide	Server specifications for site planning	C120-H027
SPARC Enterprise T5120 and T5220 Servers Service Manual	How to run diagnostics to troubleshoot the server, and how to remove and replace parts in the server	C120-E463
SPARC Enterprise T5120 and T5220 Servers Administration Guide	How to perform administrative tasks that are specific to the servers	C120-E464
Integrated Lights Out Manager 2.0 User's Guide	Information that is common to all platforms managed by ILOM	C120-E474
Integrated Lights Out Manager 2.0 Supplement for SPARC Enterprise T5120 and T5220 Servers	How to use the Integrated Lights Out Manager (ILOM) software on the servers	C120-E465 (Varies based on version)
SPARC Enterprise T5120 and T5220 Servers Safety and Compliance Guide	Safety and compliance information that is specific to the servers	C120-E461

Note – Product Notes is available on the website only. Please check for the recent update on your product.

Using UNIX Commands

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

- Software documentation that you received with your system
- Solaris™ Operating System documentation, which is at:

  http://docs.sun.com

Text Conventions

This manual uses the following fonts and symbols to express specific types of information.

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

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

Prompt Notations

The following prompt notations are used in this manual.

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

Conventions for Alert Messages

This manual uses the following conventions to show alert messages, which are intended to prevent injury to the user or bystanders as well as property damage, and important messages that are useful to the user.

Warning – This indicates a hazardous situation that could result in death or serious personal injury (potential hazard) if the user does not perform the procedure correctly

Caution – This indicates a hazardous situation that could result in minor or moderate personal injury if the user does not perform the procedure correctly. This signal also indicates that damage to the product or other property may occur if the user does not perform the procedure correctly.

Tip – This indicates information that could help the user to use the product more effectively.

Alert messages in the text

An alert message in the text consists of a signal indicating an alert level followed by an alert statement. Alert messages are indented to distinguish them from regular text. Also, a space of one line precedes and follows an alert statement.

Caution – The following tasks regarding this product and the optional products provided from Fujitsu should only be performed by a certified service engineer. Users must not perform these tasks. Incorrect operation of these tasks may cause malfunction.

- Unpacking optional adapters and such packages delivered to the users

Also, important alert messages are shown in "Important Alert Messages" on page xx

Notes on Safety

Important Alert Messages

This manual provides the following important alert signals:

Caution – This indicates a hazardous situation could result in minor or moderate personal injury if the user does not perform the procedure correctly. This signal also indicates that damage to the product or other property may occur if the user does not perform the procedure correctly.

Task	Warning
Installation	**Electric shock** There is a potential for electric shock if the server and related equipment are not properly grounded. **Damage** Deploy the antitilt feature on the rack before beginning an installation. The SPARC Enterprise T5220 server weighs approximately 46 lb (20.7 kg). Two people are required to lift and mount the system into a rack enclosure when using the procedures in this book. When completing a two-person procedure, always communicate your intentions clearly before, during, and after each step to minimize confusion. The weight of the server on extended slide rails can be enough to overturn an equipment rack.

Product Handling

Maintenance

Warning – Certain tasks in this manual should only be performed by a certified service engineer. User must not perform these tasks. Incorrect operation of these tasks may cause electric shock, injury, or fire.

- Installation and reinstallation of all components, and initial settings
- Removal of front, rear, or side covers
- Mounting/de-mounting of optional internal devices
- Plugging or unplugging of external interface cards
- Maintenance and inspections (repairing, and regular diagnosis and maintenance)

Caution – The following tasks regarding this product and the optional products provided from Fujitsu Siemens Computers should only be performed by a certified service engineer. Users must not perform these tasks. Incorrect operation of these tasks may cause malfunction.

- Unpacking optional adapters and such packages delivered to the users
- Plugging or unplugging of external interface cards

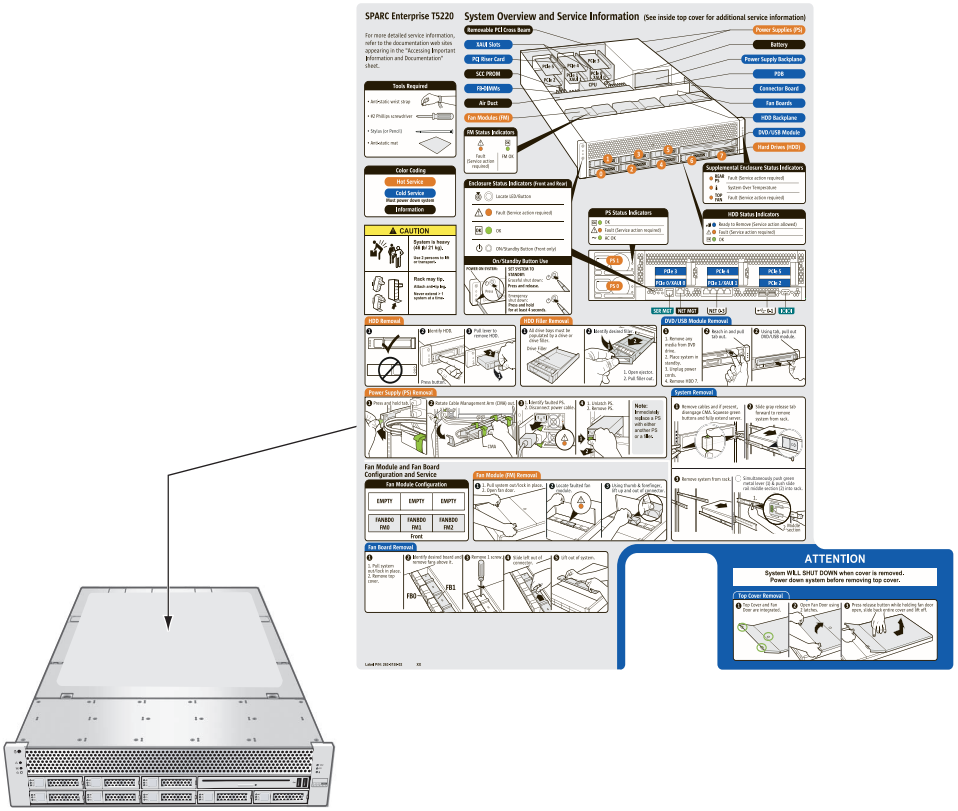
Remodeling/Rebuilding

Caution – Do not make mechanical or electrical modifications to the equipment. Using this product after modifying or reproducing by overhaul may cause unexpected injury or damage to the property of the user or bystanders.

Alert Labels

The followings are labels attached to this product:

- Never peel off the labels.
- The following labels provide information to the users of this product.



Example: SPARC Enterprise T5220

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CHAPTER 1

Preparing for Installation

This chapter provides background information about both the servers installation procedures that are provided in Chapter 2.

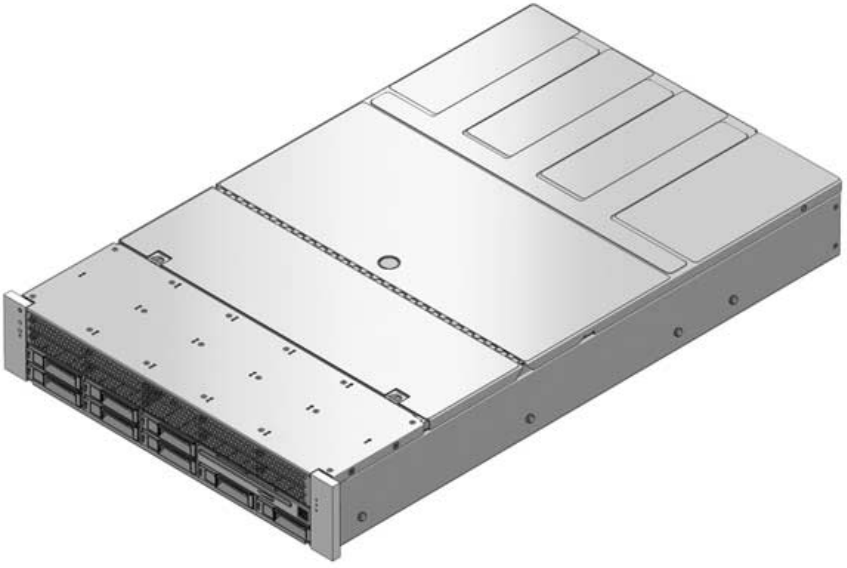
This chapter contains these topics:

- "Tools and Equipment Needed" on page 3
- "Optional Component Installation" on page 3
- "ESD Precautions" on page 4
- "Installation Overview" on page 4
- "Cabling Notes for Both Servers" on page 6
- "Slide Rail Assembly Notes for Both Servers" on page 10
- "Cable Management Notes for Both Servers" on page 13
- "Safety Precautions" on page 14

The SPARC Enterprise T5120 server is a 1 rack unit (1U) server (FIGURE 1-1) and the SPARC Enterprise T5220 server is a 2 rack unit (2U) server (FIGURE 1-2).

FIGURE 1-1 SPARC Enterprise T5120 Server

FIGURE 1-2 SPARC Enterprise T5220 Server



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

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 *SPARC Enterprise T5120 and T5220 Servers Service Manual* 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 for Both Servers" on page xv.
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 3.
4. Mount the server into a rack or cabinet. See "Installing the Servers in a Rack" on page 16 for both the 1U and 2U servers. Or, if you ordered the Express rail rackmounting kit, which has the same rack rail assemblies for both servers, see "Installing the Servers in a Rack With Express Rails" on page 71.

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

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 41.

Tip – The serial terminal or a terminal emulator should be connected before you connect the power cables. As soon as AC 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 Manager 2.0 Supplement for SPARC Enterprise T5120 and T5220 Servers*.

6. Connect the data cables to the server, but do not connect the AC power cable yet. See "Connecting the Server Cables for Both Servers" on page 32.

7. Connect the AC power cable to the server and examine the display for any error messages. See "Powering On the System for the First Time" on page 41.

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.

8. After the service processor boots, access the ILOM command-line interface (CLI) through the serial management port. See "To Log Into the Service Processor Using the Serial Management Port" on page 47.

9. Configure the service processor network addresses. See "To Configure the Service Processor Network Management Port" on page 48.

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

10. Commit the changes to the service processor network parameters. See Step 7 in "To Power On the System for the First Time" on page 43.

11. Power on the server from a keyboard using the ILOM software. See "To Power On the System" on page 53.

12. Configure the Solaris OS. See "Booting the Solaris Operating System" on page 57.

    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 *SPARC Enterprise T5120 and 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.

Cabling Notes for Both Servers

- **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)
  - Power cables for the two system power supplies
- **Service processor management ports:** There are two service processor management ports for use with the ILOM service processor.
  - **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 service processor.
  - **The service processor network management port** (labeled NET MGT) is the optional connection to the ILOM service processor. This port is not available until you have configured network settings for the service processor (through the service processor serial management port). See "Enabling the Service Processor Network Management Port" on page 46. The service processor network management port uses an RJ-45 cable for a 10/100 BASE-T connection. This port does not support connections to Gigabit networks.

    See the *SPARC Enterprise T5120 and T5220 Servers Overview* for more information.

- **Ethernet ports** are 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 1-1.

TABLE 1-1 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:** 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.
- **USB Ports:** USB ports support hot-plugging. You can connect and disconnect USB cables and peripheral devices while the system is running, without affecting system operations.
  - You can only perform USB hot-plug operations while the OS is running. USB hot-plug operations are not supported when the system `ok` prompt is displayed or before the system has completed booting.
  - You can connect up to 126 devices to each of the four USB controllers, for a total of 504 USB devices per system.
- **AC 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 service processor initializes as soon as the AC power cables are connected to the power source. System messages might be lost after 60 seconds if the server is not connected to a terminal, PC, or workstation.

Port Locations for Both Servers

See FIGURE 1-3 and FIGURE 1-4 for the locations of the ports on the SPARC Enterprise T5120 server.

FIGURE 1-3 Rear Panel Cable Connectors and LEDs on the SPARC Enterprise T5120 Server

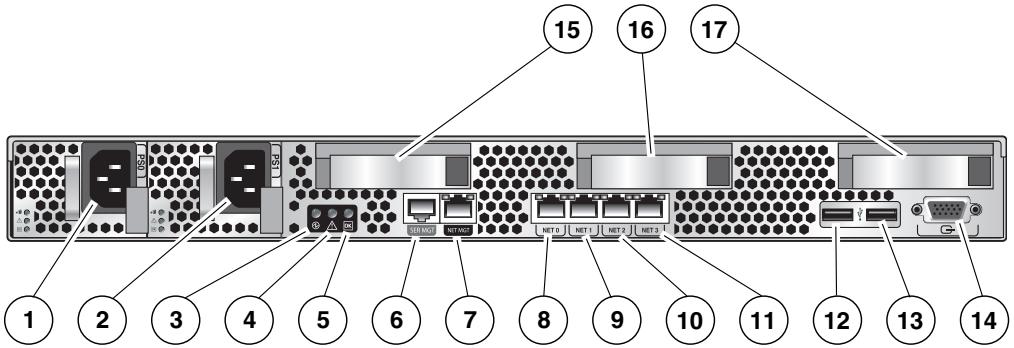


Figure Legend

1	Power Supply 0	**10**	Gbit Enet Port NET2
2	Power Supply 1	**11**	Gbit Enet Port NET3
3	Locator LED Button	**12**	USB Port 0
4	Service Required LED	**13**	USB Port 1
5	Power OK LED	**14**	TTYA Serial Port
6	Service Processor Serial Management Port	**15**	PCIe/XAUI Slot 0
7	Service Processor Network Management Port	**16**	PCIe/XAUI Slot 1
8	Gbit Enet Port NET0	**17**	PCIe Slot 2
9	Gbit Enet Port NET1		

USB ports 2 and 3 are located on the front panel (FIGURE 1-4).

FIGURE 1-4 Front Panel USB Ports on the SPARC Enterprise T5120 Server

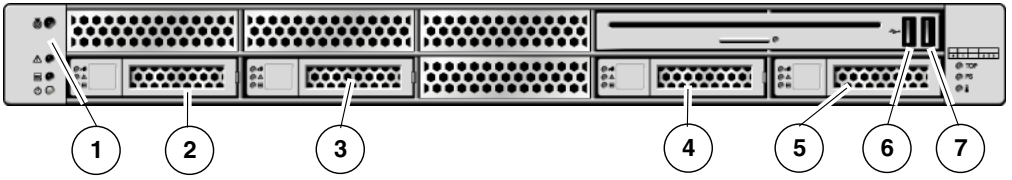


Figure Legend

1	System Status Indicators: Top to bottom: Power Button, Power OK LED, Service Required LED, Locator LED Button
2	Hard Drive HDD0
3	Hard Drive HDD1
4	Hard Drive HDD2

Figure Legend

5	Hard Drive HDD3
6	USB Port 2
7	USB Port 3

See FIGURE 1-5 and FIGURE 1-6 for the locations of the ports on the SPARC Enterprise T5220 server.

FIGURE 1-5 Rear Panel Cable Connectors and LEDs on the SPARC Enterprise T5220 Server

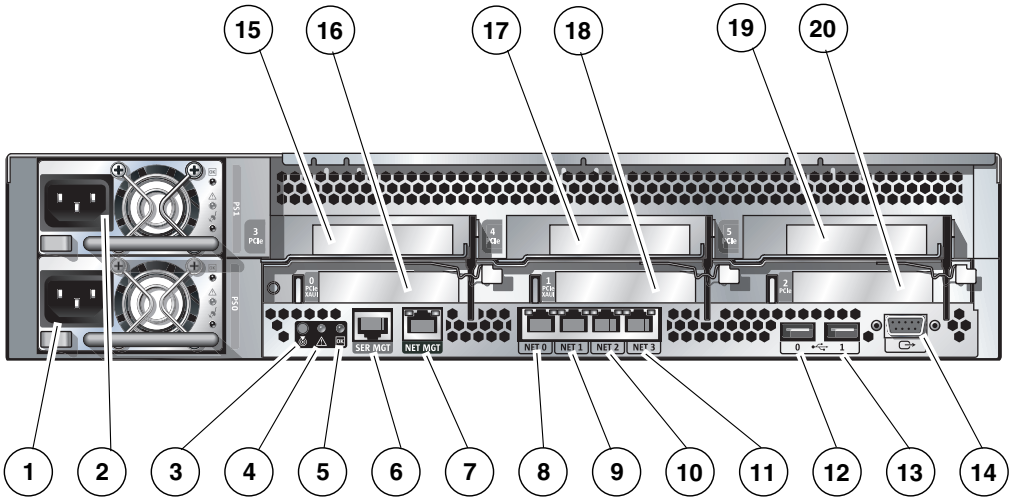


Figure Legend

1	Power Supply 0	**11**	Gbit Enet Port NET3
2	Power Supply 1	**12**	USB Port 0
3	Locator LED Button	**13**	USB Port 1
4	Service Required LED	**14**	TTYA Serial Port
5	Power OK LED	**15**	PCIe Slot 3
6	Service Processor Serial Management Port	**16**	PCIe or XAUI Slot 0
7	Service Processor Network Management Port	**17**	PCIe slot 4
8	Gbit Enet Port NET0	**18**	PCIe or XAUI Slot 1
9	Gbit Enet Port NET1	**19**	PCIe Slot 5
10	Gbit Enet Port NET2	**20**	PCIe Slot 2

USB ports 2 and 3 are located on the front panel (FIGURE 1-6).

FIGURE 1-6 Front Panel USB Ports on the SPARC Enterprise T5220 Server

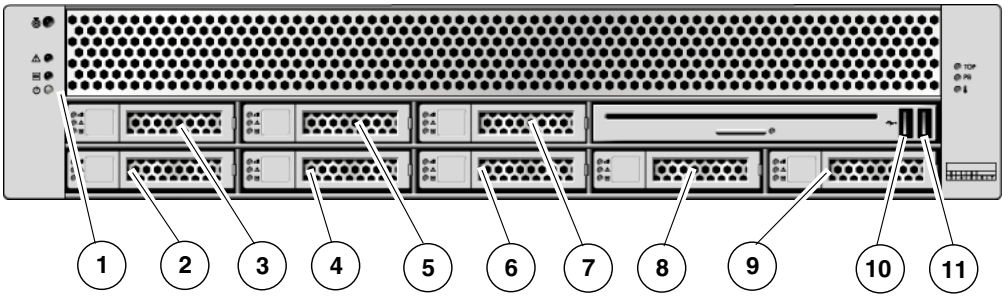


Figure Legend

1	System Status Indicators: Top to bottom: Power Button, Power OK LED, Service Required LED, Locator LED Button
2	Hard Drive HDD0
3	Hard Drive HDD1
4	Hard Drive HDD2
5	Hard Drive HDD3
6	Hard Drive HDD4
7	Hard Drive HDD5
8	Hard Drive HDD6
9	Hard Drive HDD7
10	USB Port 2
11	USB Port 3

Slide Rail Assembly Notes for Both Servers

The rackmount kit has two *slide rail assemblies*. A slide rail assembly can be installed on either the right or left side of the rack.

Note – The slide rail assemblies are different for the T5120 and T5220 servers. The removable mounting bracket of the SPARC Enterprise T5120 rails slides 13 in. (33 cm) out of the slide rail, then locks in place. The removable mounting bracket of the SPARC Enterprise T5220 rails slide 14 in. (35.5 cm) before locking.

Each slide rail assembly consists of a three-section slide rail and a removeable mounting bracket (FIGURE 1-7).

FIGURE 1-7 Sections of the Slide Rail Assembly on the SPARC Enterprise T5220 Server

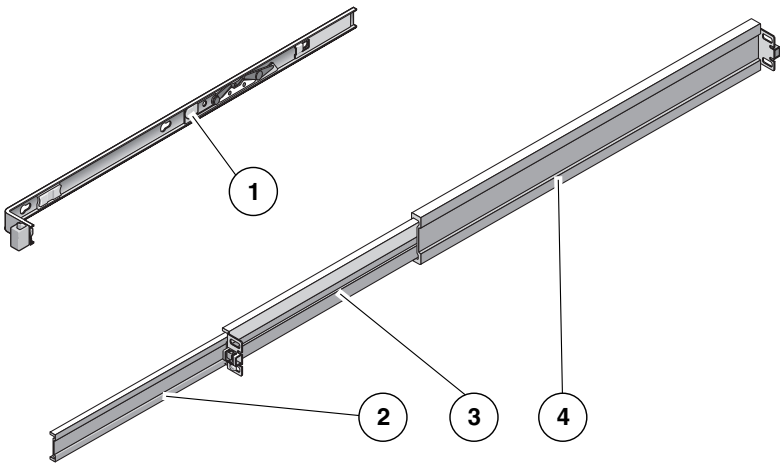
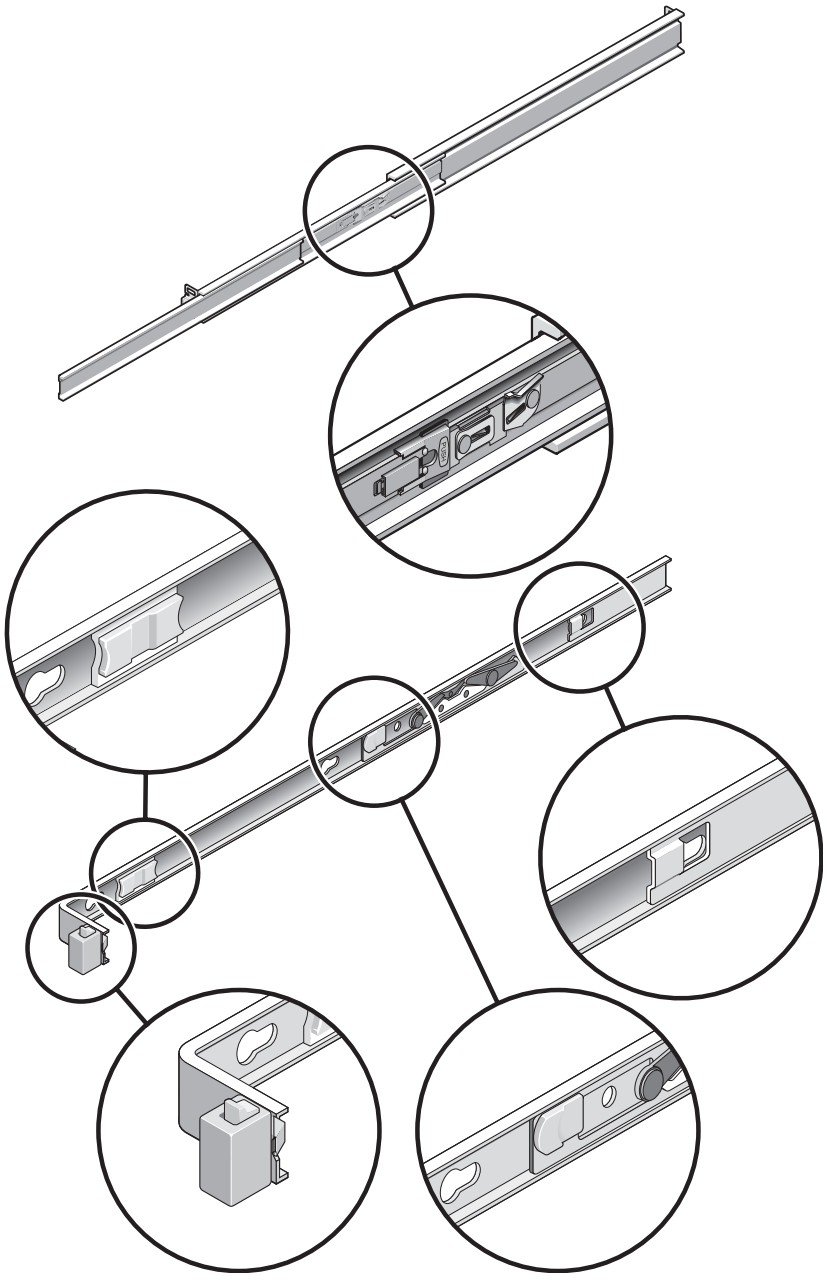


Figure Legend

1	Mounting bracket
2	Front section
3	Middle section
4	Rear section

- The *front*, *middle*, and *rear* sections form the *slide rail*. The middle and rear sections have holes for mounting screws and adjust to fit rack depths from 24 in. (61 cm) to 36.5 in. (93 cm). The front section can be extended to allow movement of the server out of the rack.
- The removeable *mounting bracket* slides 14 in. (35.5 cm) out of the slide rail, then locks in place. If you unlock the mounting bracket at this point, it slides an additional 12 in. (30 cm) before separating from the slide rail. You can then mount the mounting bracket to the right or left side of the server chassis.
- Note that there are a total of five locks (FIGURE 1-8) in a slide rail assembly. Four are on the mounting bracket. One lock is on the front section of the slide rail. The uses of these locks are described in the installation procedure in Chapter 2.

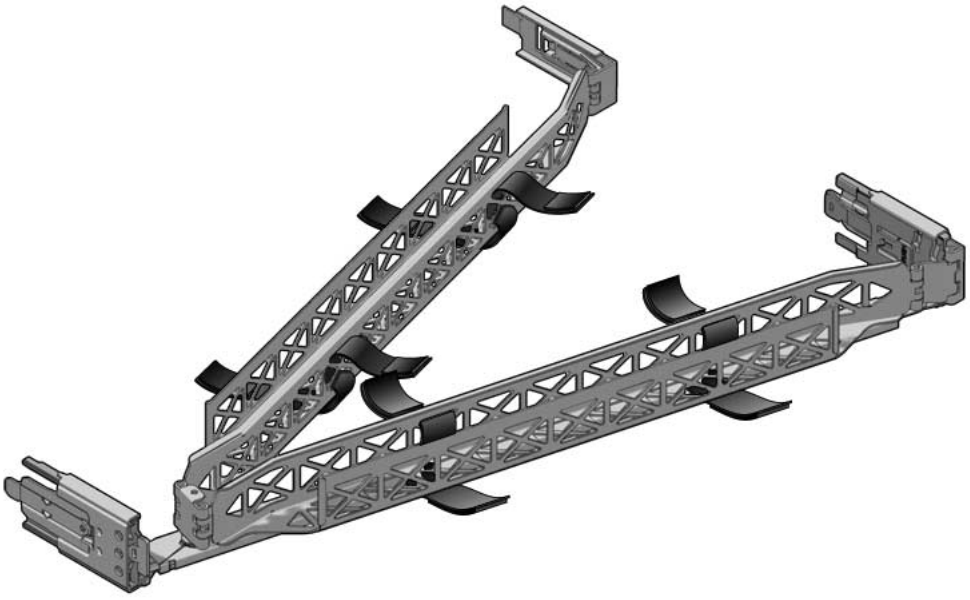
FIGURE 1-8 Locating the Locks on the Slide Rail Assembly for the SPARC Enterprise T5220 Server



Cable Management Notes for Both Servers

The same cable management arm (CMA) is included with the rackmounting kit for each server (FIGURE 1-9). The CMA clips onto the slide rails. Use the velcro straps to secure cabling to the CMA.

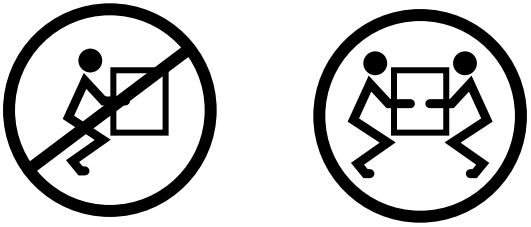
FIGURE 1-9 Cable Management Arm for Both Servers



Safety Precautions

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

Caution – The SPARC Enterprise T5220 server weighs approximately 46 lb (20.7 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.

CHAPTER 2

Installing the SPARC Enterprise T5120 and T5220 Servers

This chapter provides instructions for installing the servers into an equipment rack.

Note – If your rackmount kit came with its own instructions, use the instructions in your rackmount kit instead of the instructions in this chapter. After performing the SPARC Enterprise T5120 and T5220 installation, proceed to Chapter 3 for first-time power on.

This chapter contains the following sections:

- "Installing the Servers in a Rack" on page 16
- "Installing the Cable Management Arm for Both Servers" on page 25
- "Connecting the Server Cables for Both Servers" on page 32
- "Managing Cables With the CMA" on page 38
- "Dismounting the Servers" on page 39

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

Installing the Servers in a Rack

Note – Ensure that you have all of the parts in the rackmount kit before you begin the installation of the server. See "Shipping Kit Inventory List for Both Servers" on page xv.

Note – The procedures in this chapter are the same for both the 1U and 2U servers. The illustrations show a 2U server only as an example.

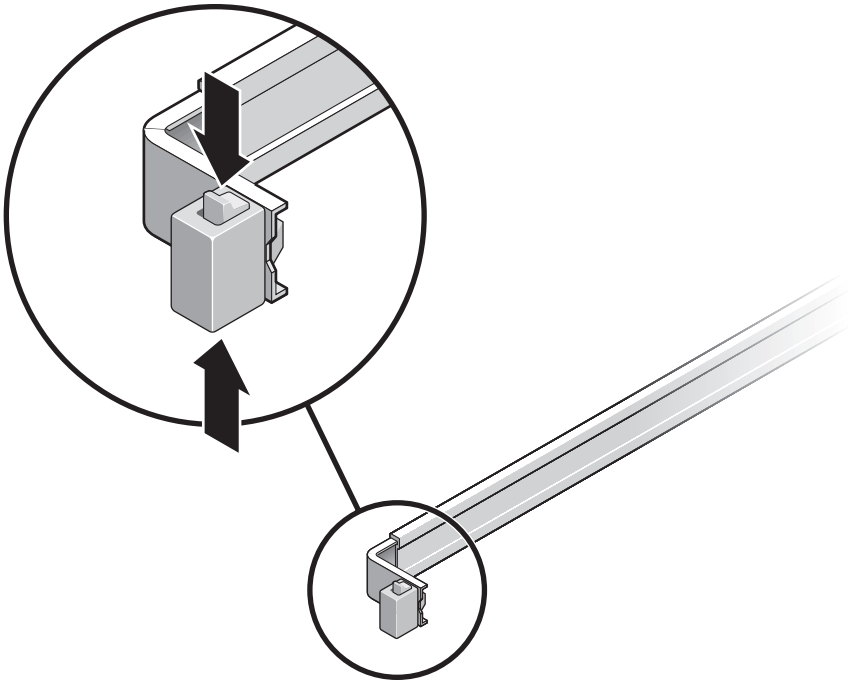
The rackmount kit (same for both 1U and 2U servers) contains two slide rail assemblies, which can be installed on either the right or left side of the rack. A slide rail assembly consists of two parts: a slide rail and a removeable mounting bracket. The slide rail attaches to the rack posts. The mounting bracket attaches to the SPARC Enterprise T5120 and T5220 chassis.

▼ To Install the Slide Rail Assemblies

1. **Pull both mounting brackets completely out of their respective slide rails.**

   a. **Simultaneously press and hold the upper and lower lock buttons of the slide rail lock (**FIGURE 2-1**).**

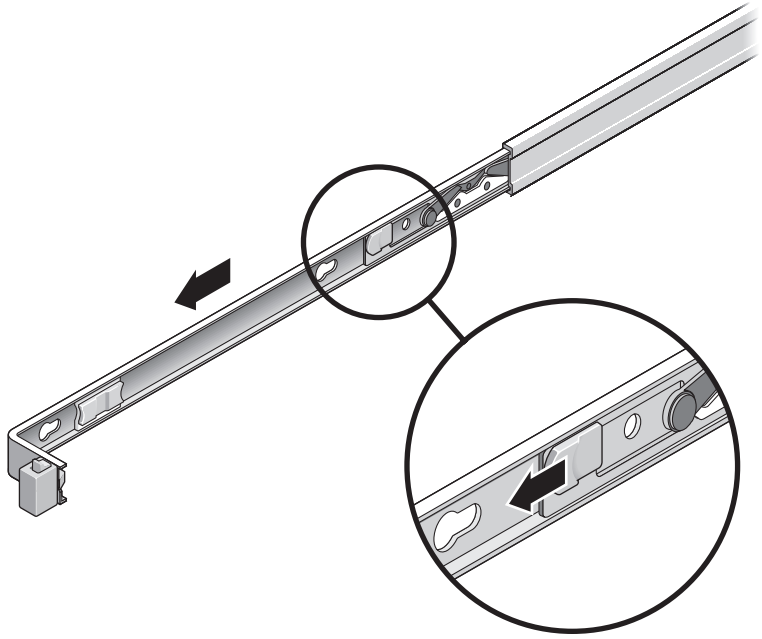
FIGURE 2-1 Unlocking the Slide Rail Assembly (Either Server)



b. Pull the mounting bracket out until it locks in the extended position.

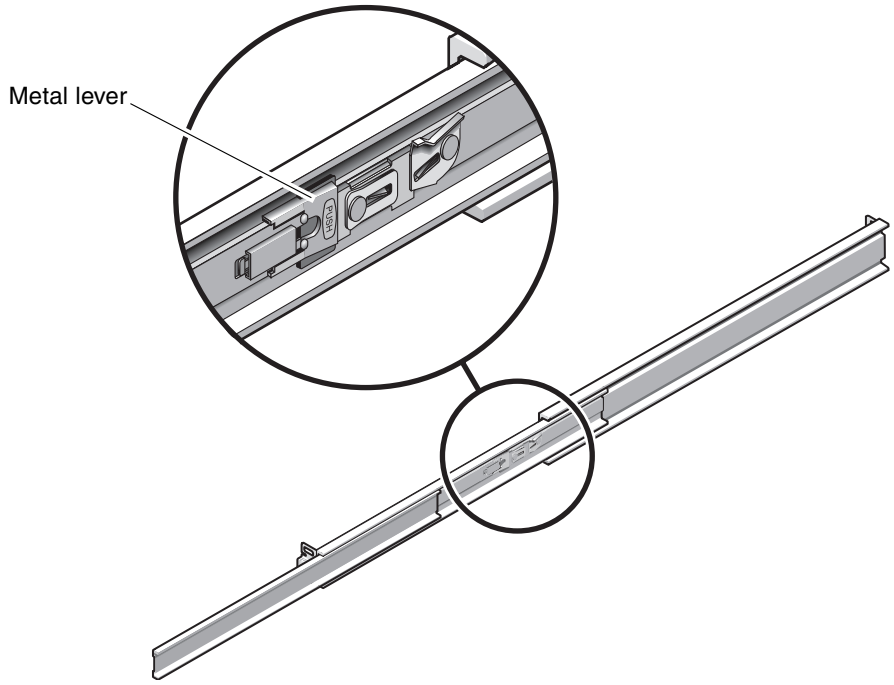
c. Slide the mounting bracket release button in the direction shown in FIGURE 2-2, then slide the mounting bracket out of the slide rail.

FIGURE 2-2 Location of the Mounting Bracket Release Button (Either Server)



d. Press the metal lever (labeled Push) on the middle section (FIGURE 2-3) of the sliding rail, then push the middle section back into the rack.

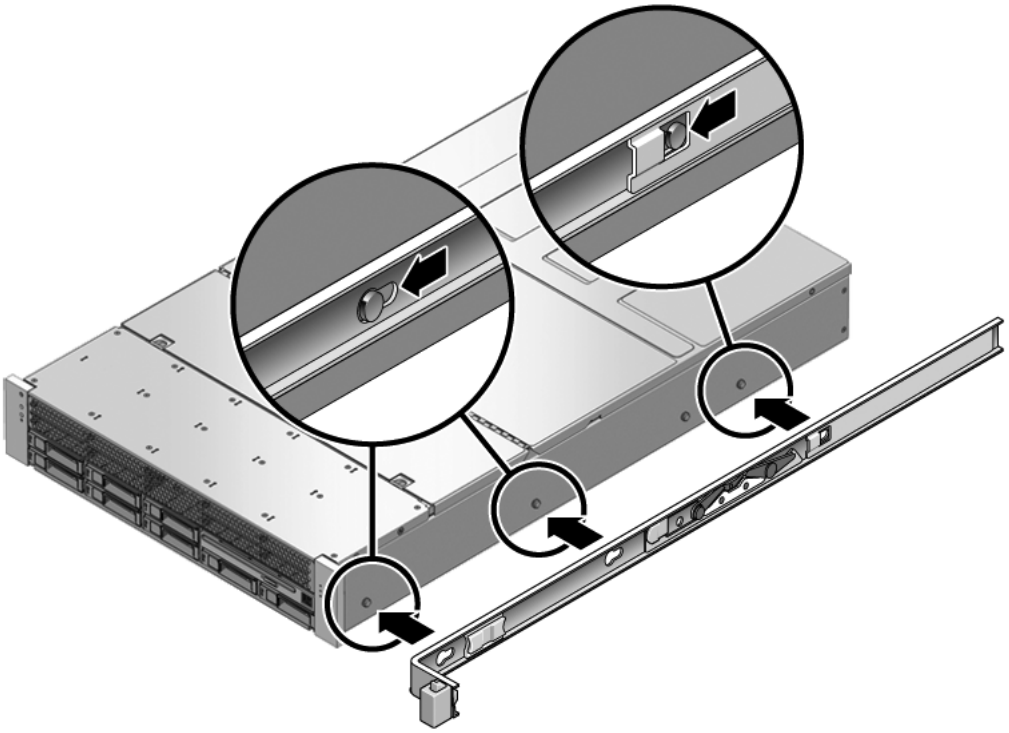
FIGURE 2-3 Unlocking the Slide Rail Middle Section (Either Server)



2. **Attach a mounting bracket to the right side of the chassis.**

   a. **Position the mounting bracket against the chassis (**FIGURE 2-4**) so that the slide rail lock is at the front and the three keyed openings on the mounting bracket are aligned with the three locating pins on the side of the chassis.**

FIGURE 2-4 Attaching a Mounting Bracket to the Chassis (Either Server)



b. With the heads of the locating pins protruding though the keyed openings in the mounting bracket, pull the mounting bracket toward the front of the chassis until the bracket locks into place with an audible click.

c. Verify that all locating pins are trapped in the keyed openings and that the correct locating pin has engaged the mounting bracket lock, as shown in the right side of FIGURE 2-4**.**

3. Attach the second mounting bracket to the left side of the chassis.

4. Determine which rack hole numbers to use when attaching the slide rails to the rack posts.

If the SPARC Enterprise T5120 and T5220 is two rack units tall (2U), the slide rails occupy the lower half of the 2U space.

5. **Determine which screws you will use to mount the slide rails.**

   If your rack has threaded mounting holes in the rack posts, determine whether the threads are metric or standard. Select the appropriate screws from the package included in the mounting kit.

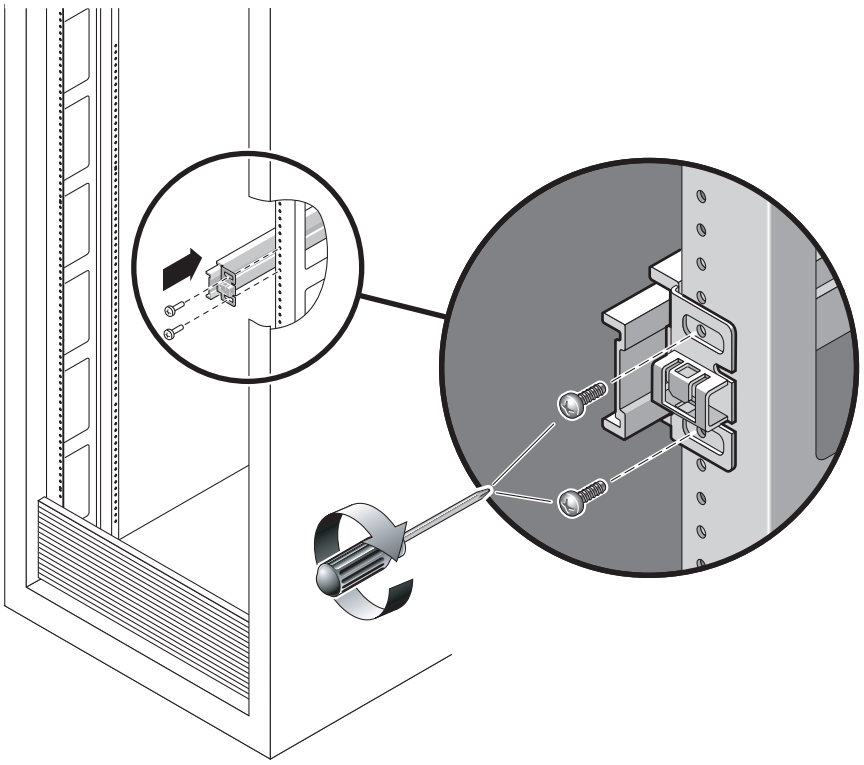
   If your rack does not have threaded mounting holes, the mounting screws are secured with a caged nut.

6. **Attach a slide rail to the right front rack post.**

   a. **Loosely attach the front of a slide rail to the right front rack post using two screws (**FIGURE 2-5**).**

Note – Do not tighten the screws yet.

FIGURE 2-5 Mounting a Slide Rail (Either Server)



   b. **Adjust the length of the slide rail by sliding the rear mounting flange to reach the outside edge of the rear rack post.**

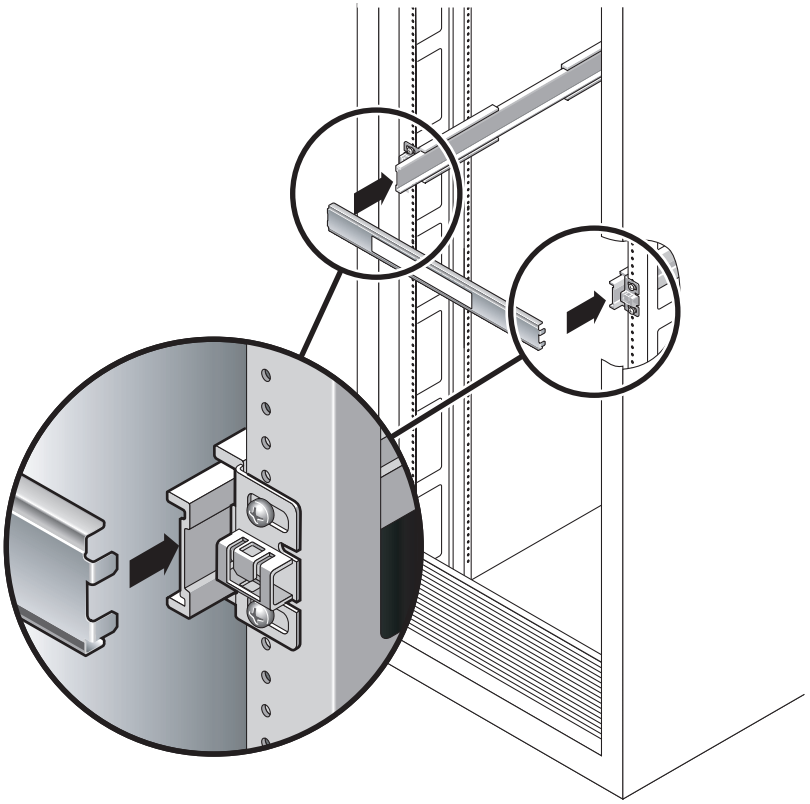
c. Loosely attach the rear of the slide rail to the rear rack post with two screws.

7. Attach the second slide rail to the left rack posts in a similar manner. Do not tighten the screws.

8. Use the slide rail spacing tool to adjust the distance between the slide rails.

a. At the front of the rack, plug the left side of the tool into slots at the end of the left rail (FIGURE 2-6**).**

FIGURE 2-6 Using the Slide Rail Spacing Tool to Adjust the Distance Between the Slide Rails (Either Server)



b. Insert the right side of the tool into the front end of the right rail.

c. Slide the end of the rail to the right or left as needed to allow the the ends of the tool to enter the ends of both rails.

The distance between the rails is now equal to the width of the server with mounting brackets.

d. Tighten the screws to lock the ends of the rails in place.

e. At the rear of the rack, repeat Step a through Step d. for the rear ends of the rails.

▼ To Insert and Lock the Server in the Rack

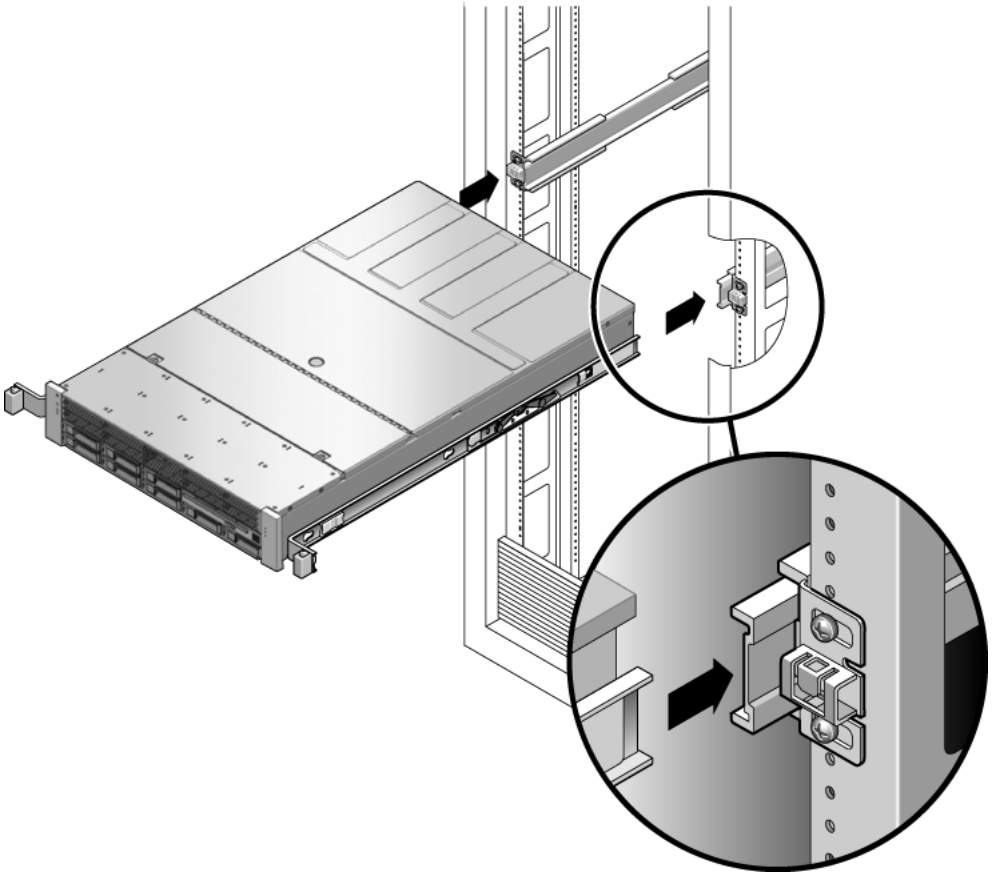
1. Deploy the antitilt bar, if the chassis or rack is so equipped.

Caution – The weight of the servers on extended slide rails can be enough to overturn an equipment rack.

Caution – The 2U server weighs approximately 46 lb (20.7 kg). Two people are required to lift and mount the server into a rack enclosure when using the procedures in this chapter.

2. Insert the ends of the mounting brackets into the sliding rails (FIGURE 2-7).

FIGURE 2-7 Mounting the Chassis on the Slide Rails (Either Server)



3. **Slide the chassis into the rack.**

Caution – Before continuing, verify that the server is securely mounted in the rack, and that the slide rails are locked to the mounting brackets.

Installing the Cable Management Arm for Both Servers

The rack mounting kit for each server comes with the same cable management arm (CMA) assembly. The CMA installation and cable management procedures are the same for both servers.

Note – The CMA includes velcro straps to secure the cables inside the CMA. Do not install the velcro straps until you install the CMA, connect the cables, and place the cabling inside the CMA as described in the following procedures.

▼ To Install the Cable Management Arm

Caution – Support the CMA during this installation. Do not allow the assembly to hang by its own weight until it is secured by all three attachment points.

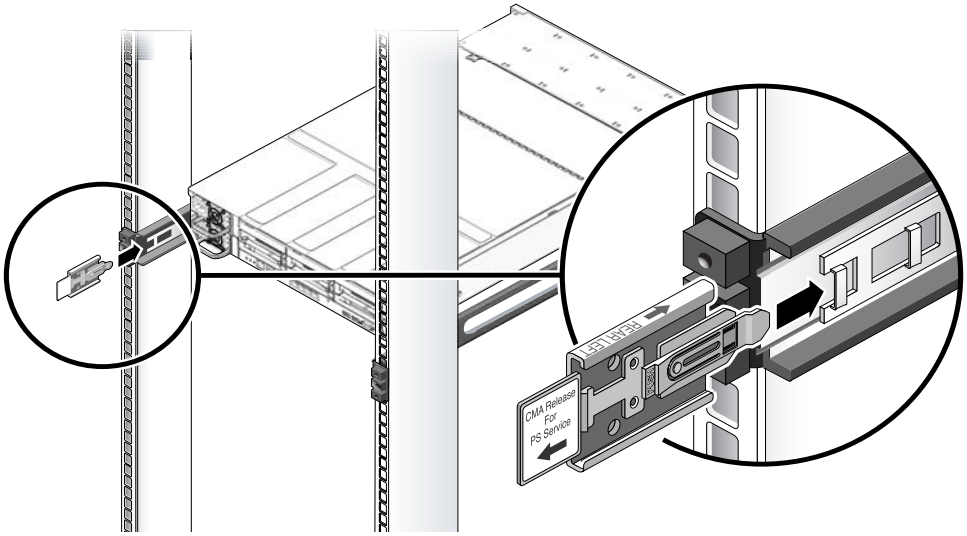
---

1. **Remove the tape from the CMA rail extension (on the left of the CMA) and remove the CMA rail extension.**

2. **Attach the CMA rail extension to rear left slide rail (**FIGURE 2-8**).**

   At the rear of the rack, plug the CMA rail extension into the end of the left sliding rail assembly. The tab at the front of the rail extension will click into place.

FIGURE 2-8 Inserting the CMA Rail Extension Into the Rear of the Left Slide Rail (Either Server)

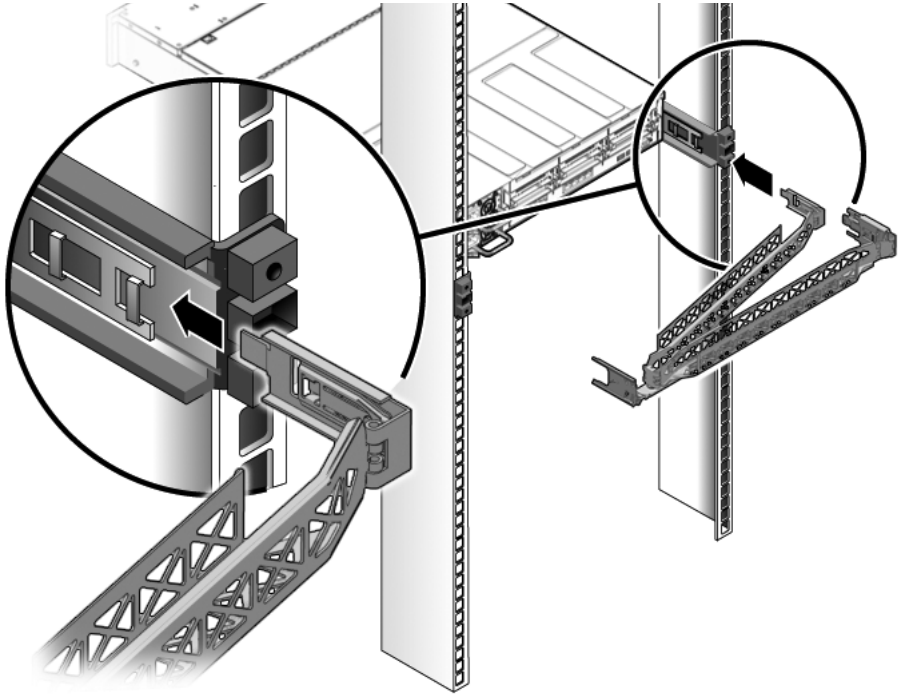


The right sides of the two CMA arms have hinged extensions. On the manufacturer's instruction sheet, the smaller extension is called the CMA Connector for Inner Member. It attaches to the right mounting bracket. The larger extension is called the CMA Connector for Outer Member, and attaches to the right sliding rail.

3. **Insert the smaller extension into the clip located at the end of the mounting bracket (**FIGURE 2-9**).**

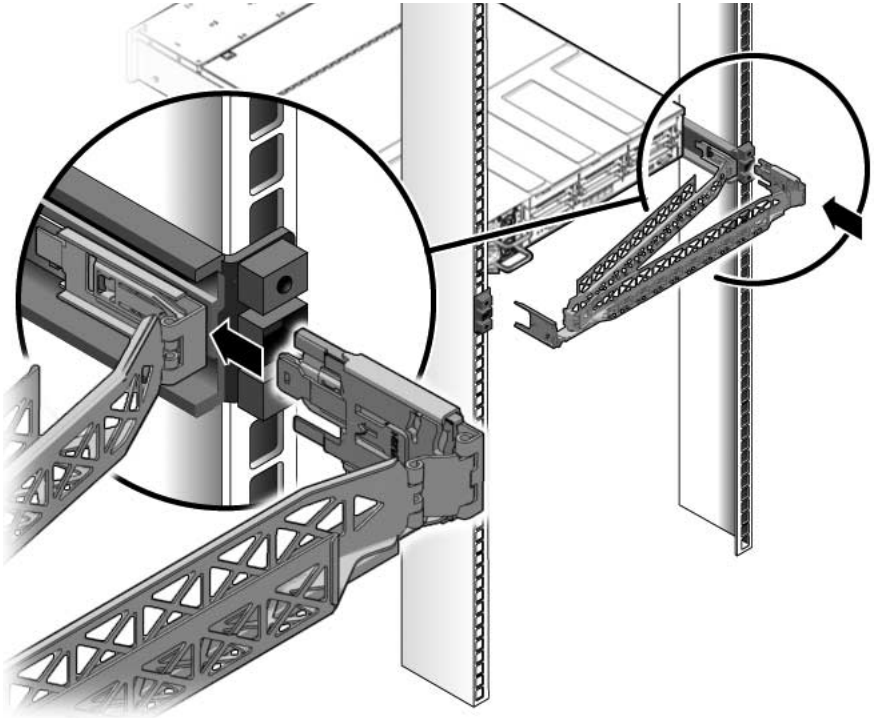
   Slide the smaller extension into the square hole on the middle-in-width of the clip located at the end of the mounting bracket.

FIGURE 2-9 Mounting the Inner CMA Connector (Either Server)



4. **Insert the larger extension into the end of the right sliding rail (**FIGURE 2-10**).**

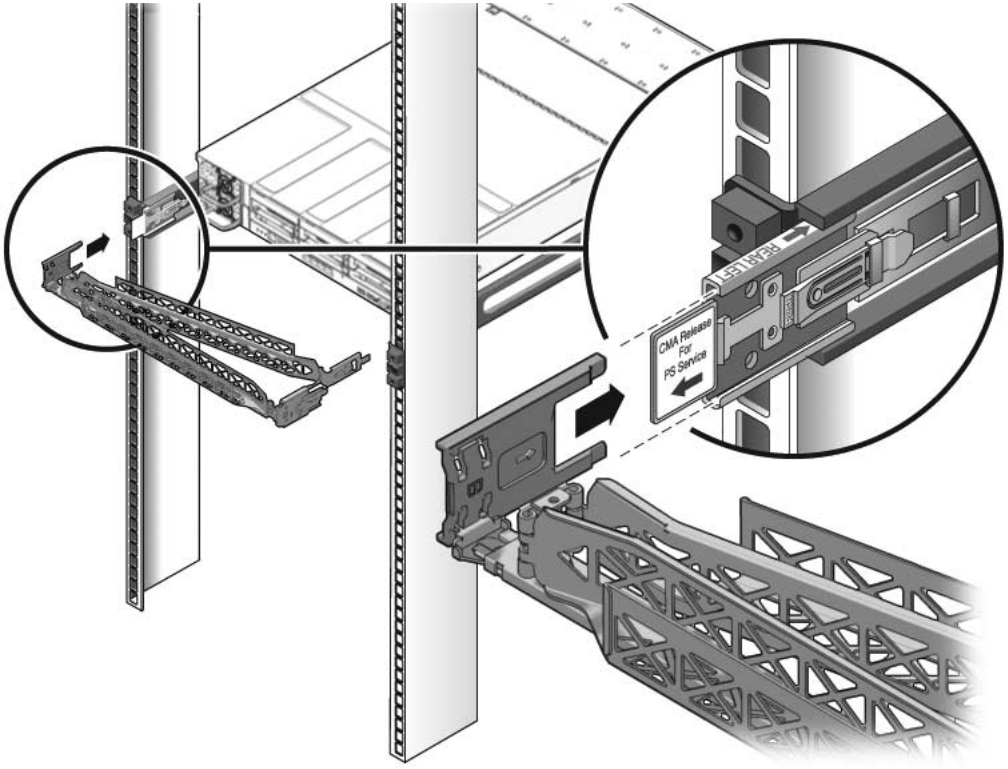
FIGURE 2-10 Attaching the Outer CMA Connector (Either Server)



5. **Insert the hinged plastic connector at the left side of the CMA fully into the CMA rail extension (**FIGURE 2-11**).**

   The plastic tab on the CMA rail extension locks the hinged plastic connector in place.

FIGURE 2-11 Mounting the Left Side of the Slide Rail (Either Server)

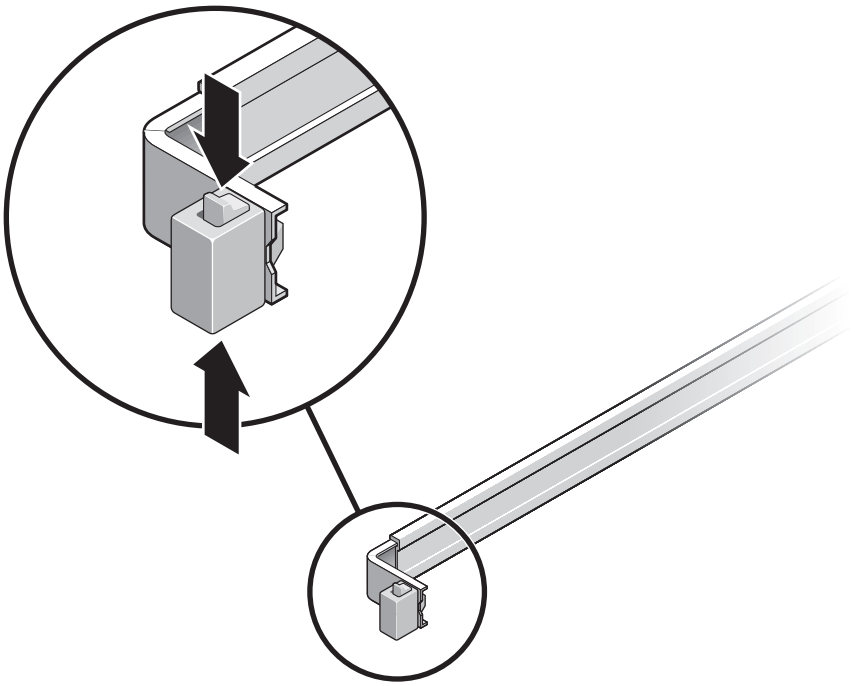


▼ To Verify the Operation of the Slide Rails and the CMA

Tip – Two people are needed for this procedure: one to move the server in and out of the rack, and one to observe the cables and CMA.

1. **For a free-standing rack, deploy the antitilt bar.**
2. **Unlock the slide lock buttons (**FIGURE 2-12**) at the right and left sides of the chassis.**
3. **Slowly pull the server out of the rack until the slide rails reach their stops.**

FIGURE 2-12 Unlocking the Slide Rail Assembly (Either Server)

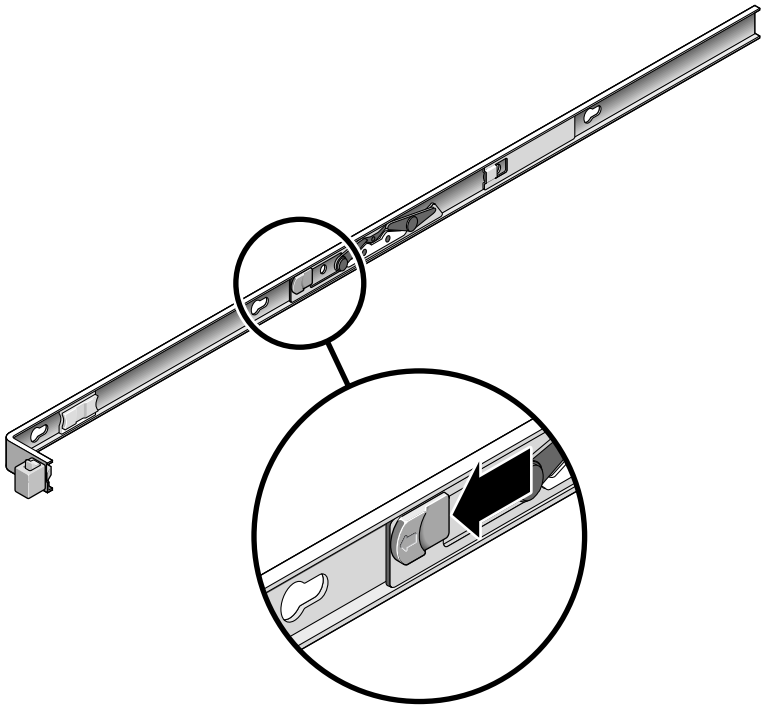


4. **Inspect any attached cables for binding or kinks.**
5. **Verify that the CMA extends fully and does not bind in the slide rails.**
6. **Verify that the server extends fully and locks in the maintenance position.**
   The server should stop after approximately 15 inches (40 cm) of travel.

7. **Pull both slide rail release buttons toward you simultaneously and slide the server back into the rack (**FIGURE 2-13**).**

   The server should slide smoothly into the rack without binding.

FIGURE 2-13 Rail Mounting Bracket Release Button (Either Server)



8. **Verify that the CMA retracted without binding.**
9. **Adjust the cable straps and CMA as required to secure the cables.**

   See "Managing Cables With the CMA" on page 38.

Connecting the Server Cables for Both Servers

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 35
- "To Connect the Service Processor Network Management Port" on page 36
- "To Connect the Ethernet Network Cables" on page 36
- "To Connect the AC Power Cable to the Server" on page 38

The servers also have serial and USB ports available for connections to optional devices.

- "TTYA Serial Port" on page 37
- "USB Ports" on page 37

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. See the section, "To Verify the Operation of the Slide Rails and the CMA" on page 30.

Connector Locations

FIGURE 2-14 and FIGURE 2-15 show the connectors on the rear and front panels of the SPARC Enterprise T5120 server.

FIGURE 2-14 Rear Panel Connectors on the SPARC Enterprise T5120 Server

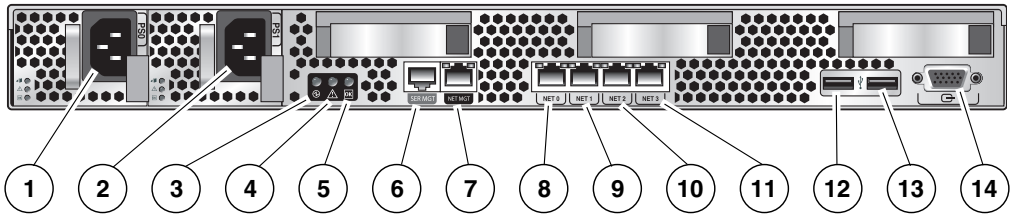


Figure Legend

1	Power Supply 0	**8**	NET0
2	Power Supply 1	**9**	NET1
3	Locator LED Button	**10**	NET2
4	Service Required LED	**11**	NET3
5	Power OK LED	**12**	USB Port 0
6	Service Processor Serial Management Port	**13**	USB Port 1
7	Service Processor Network Management Port	**14**	TTYA Serial Port

USB ports 2 and 3 are located on the front panel (FIGURE 2-15).

FIGURE 2-15 Front Panel USB Ports on the SPARC Enterprise T5220 Server

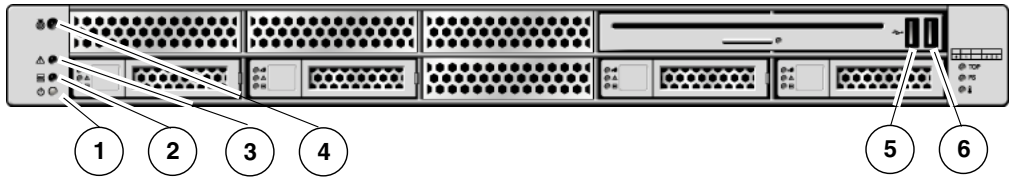


Figure Legend

1	Power Button
2	Power OK LED
3	Service Required LED
4	Locator LED Button
5	USB Port 2
6	USB Port 3

FIGURE 2-16 .and FIGURE 2-17 show the connectors on the rear and front panels of the SPARC Enterprise T5220 server.

FIGURE 2-16 Rear Panel Features on the SPARC Enterprise T5220 Server

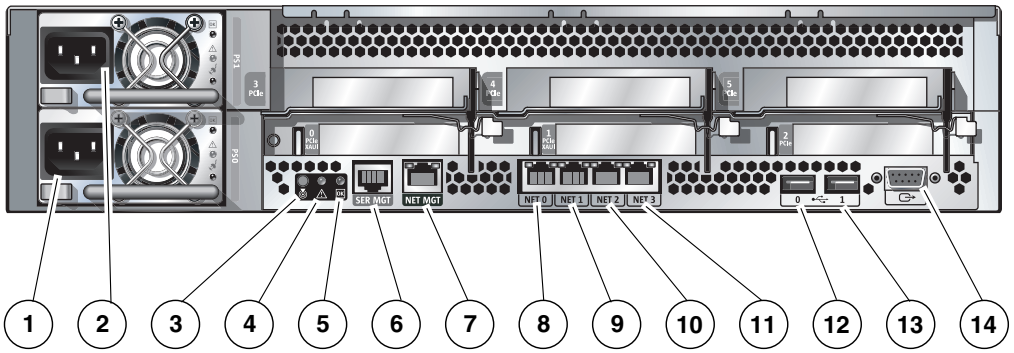


Figure Legend

1	Power Supply 0	**8**	NET0
2	Power Supply 1	**9**	NET1
3	Locator LED Button	**10**	NET2
4	Service Required LED	**11**	NET3
5	Power OK LED	**12**	USB Port 0
6	Service Processor Serial Management Port	**13**	USB Port 1
7	Service Processor Network Management Port	**14**	TTYA Serial Port

USB ports 2 and 3 are located on the front panel (FIGURE 2-17).

FIGURE 2-17 Front Panel USB Ports on the SPARC Enterprise T5220 Server

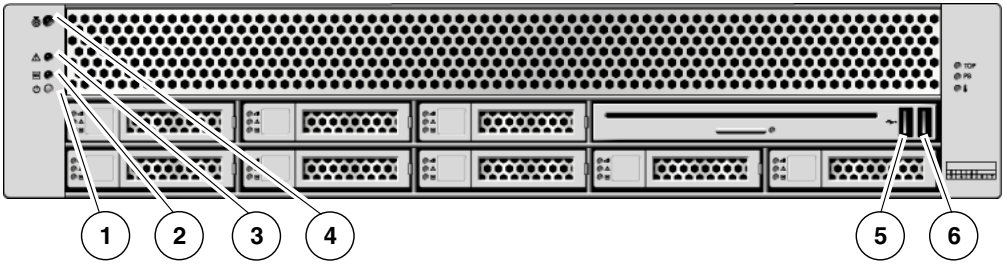


Figure Legend

1	Power Button
2	Power OK LED
3	Service Required LED

Figure Legend

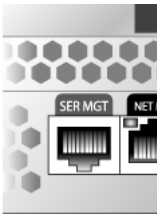
4	Locator LED Button
5	USB Port 2
6	USB Port 3

▼ To Connect the Service Processor Serial Management Port

The service processor serial management port is marked SER MGT (FIGURE 2-18). 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 2-18 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 46.

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.

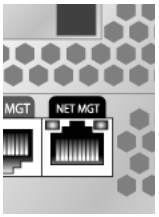
- **Connect a Category 5 cable from the SER MGT serial management port to the terminal device.**

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 2-19). It is located just to the right of the serial management (SER MGT) port on the rear panel.

FIGURE 2-19 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 "To Configure the Service Processor Network Management Port" on page 48.

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.

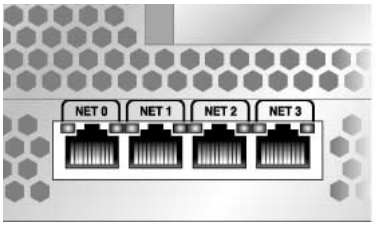
Note – The service processor network management port is configured by default to retrieve network settings with Dynamic Host Configuration Protocol (DHCP) and allow connections using Solaris Secure Shell (SSH). You might need to modify these settings for your network. Instructions are given in Chapter 3.

- **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 2-20). These connectors are RJ-45 Gigabit Ethernet.

FIGURE 2-20 Service Processor Ethernet Network Ports – Rear Panel



1. **Connect a Category 5 cable from your network switch or hub to Ethernet Port 0 (**NET**0) on the rear of the chassis.**

   NET**0** is the farthest left port in the 4-port network cluster in FIGURE 2-20.

2. **Connect Category 5 cables from your network switch or hub to the remaining Ethernet ports (**NET**1,** NET**2,** NET**3), as needed.**

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 2-14). A DB-9 to RJ-45 adapter cable is included in the shipping kit.

Note – This serial port is not the same as the service processor serial management port. Use the 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

Four Universal Serial Bus (USB) ports are provided on the SPARC Enterprise T5120 and T5220. USB ports 0 and 1 are located on the rear panel (FIGURE 2-14 and FIGURE 2-16). Ports 2 and 3 are located on the front panel (FIGURE 2-15 and FIGURE 2-17).

▼ To Connect the AC Power Cable 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 lost.

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** "Powering On the System for the First Time" on page 41 **for instructions on connecting the server to AC power.**

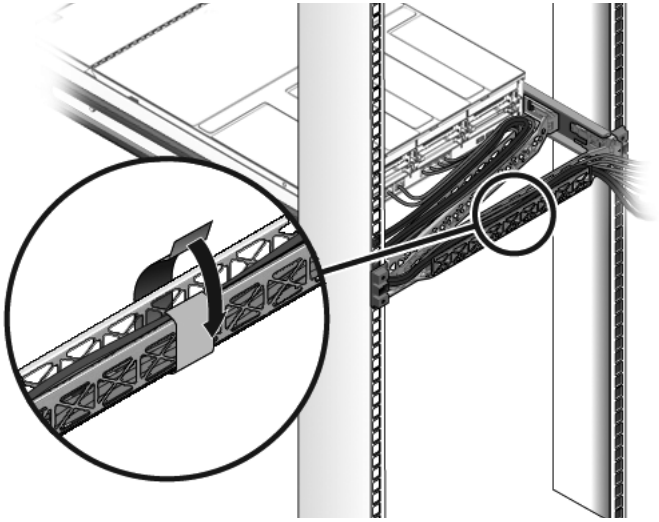
Managing Cables With the CMA

Managing the cables with the CMA is the same for both servers.

▼ Securing the Server Cables in the CMA

- **Once the server cables are connected and placed inside the CMA, open the velcro cable straps and wrap the straps around the CMA securing the cables inside the CMA. (**FIGURE 2-21**).**

FIGURE 2-21 Securing the Server Cables With the CMA and Velcro Straps (Either Server)



Caution – Verify the operation of the slide rails and CMA, and cable service loops. Perform the steps in the following procedure again before continuing: "To Verify the Operation of the Slide Rails and the CMA" on page 30.

Dismounting the Servers

To install or replace internal parts in the server, you must first remove the server from the rack. For the removal procedure, refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual*.

CHAPTER 3

Powering On the System

This chapter includes instructions for booting the servers and for enabling the service processor network management port.

The following topics are included:

- "Powering On the System for the First Time" on page 41
- "Enabling the Service Processor Network Management Port" on page 46
- "Logging Into the Service Processor" on page 46
- "Using the Service Processor for Common Operations" on page 53
- "Booting the Solaris Operating System" on page 57
- "Verifying System Functionality" on page 60

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 43.

For a more detailed discussion on configuring the system console and connecting terminals, refer to the *SPARC Enterprise T5120 and 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 "To Configure the Service Processor Network Management Port" on page 48.

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 Manager 2.0 Supplement for SPARC Enterprise T5120 and T5220 Servers.*

▼ 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 into 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, and watch the terminal for system messages.**

FIGURE 3-1 Rear Panel Power Connectors of a SPARC Enterprise T5120 Server

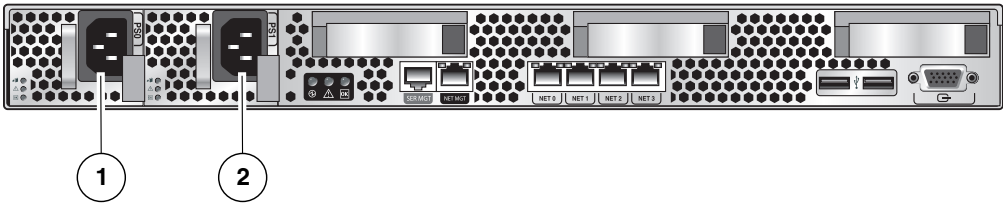


Figure Legend

1	Power Supply 0
2	Power Supply 1

FIGURE 3-2 Rear Panel Power Connectors of a SPARC Enterprise T5220 Server

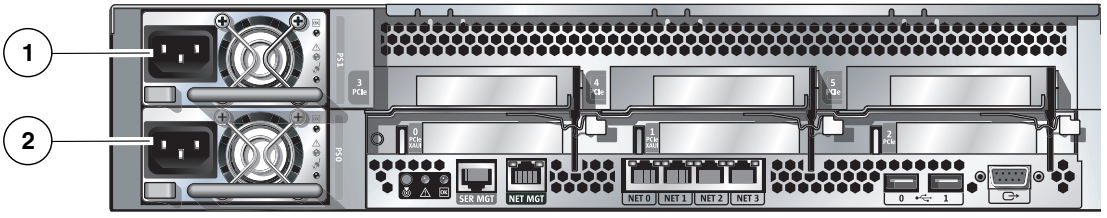


Figure Legend

1	Power Supply 1
2	Power Supply 0

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.

CODE EXAMPLE 3-1 Sample Service Processor Output

```
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...
```

CODE EXAMPLE 3-1 Sample Service Processor Output *(Continued)*

```
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.
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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:
```

▼ To Avoid Booting the Solaris Operating System at Start Up

In hard drive HDD0, the Solaris OS preinstalled. If you do not want to start the preinstalled OS, set the OBP parameter `auto-boot?` to `false`. For example:

```
-> set /HOST/bootmode script="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 Into the Service Processor Using the Serial Management Port" on page 47.
2. Configure the service processor. See "To Configure the Service Processor Network Management Port" on page 48.
3. Commit the changes to the service processor parameters. See Step 7 in "To Power On the System for the First Time" on page 43.

You can now use the network management port at any time to access the service processor. See "To Log Into the Service Processor Using the Network Management Port" on page 52.

Logging Into 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 Into the Service Processor Using the Serial Management Port" on page 47.

If the network management port has already been configured, you can use it instead of the serial management port. See "To Log Into the Service Processor Using the Network Management Port" on page 52.

▼ To Log Into 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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...
Federal Acquisitions: Commercial Software -- Government Users
Subject to Standard License Terms and Conditions.
...

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

Sun(TM) Integrated Lights Out Manager

Version 2.0.0.0

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->
```

▼ To Configure 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 Manager 2.0 Supplement for SPARC Enterprise T5120 and T5220 Servers.*

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'
```

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 Manager 2.0 Supplement for SPARC Enterprise T5120 and T5220 Servers* 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.**

CODE EXAMPLE 3-2 `show /SP/network` Command Output

```
-> 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
```

CODE EXAMPLE 3-2 `show /SP/network` Command Output

```
          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 affect. To commit the changes to the service processor network parameters, use the `set /SP/network commitpending=true` command. See Step 7 in "To Configure the Service Processor Network Management Port" on page 48.

- **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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Version 2.0.0.0

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->
```

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

Note – You must configure the service processor parameters shown in "To Configure the Service Processor Network Management Port" on page 48 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

Sun(TM) Integrated Lights Out Manager

Version 2.0.0.0

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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 Manager 2.0 Supplement for SPARC Enterprise T5120 and T5220 Servers.*

▼ 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 will see an ILOM CLI alert message on the system console. This 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 /SP/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 *SPARC Enterprise T5120 and T5220 Servers 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 *SPARC Enterprise T5120 and T5220 Servers 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
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

SPARC Enterprise T5220, No Keyboard
...


{0} ok
```

To understand the various devices and their path names as represented in the OpenBoot device tree, refer to TABLE 3-1 for disks and TABLE 3-2 for optional PCI cards.

TABLE 3-1 Disk Slot Numbers, Logical Device Names, and Physical Device Names

Disk Slot Number	Logical Device Name*	Physical Device Name
Slot 0	c0t0d0	/devices/pci@0/pci@0/pci@2/scsi@0/sd@0,0
Slot 1	c0t1d0	/devices/pci@0/pci@0/pci@2/scsi@0/sd@1,0
Slot 2	c0t2d0	/devices/pci@0/pci@0/pci@2/scsi@0/sd@2,0
Slot 3	c0t3d0	/devices/pci@0/pci@0/pci@2/scsi@0/sd@3,0

* The logical device names might appear differently on your system, depending on the number and type of add-on disk controllers installed.

TABLE 3-2 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/NET*port_number*	Ethernet ports (Number: 0-3)
/SYS/MB/PCIE	PCIe root complex
/SYS/MB/USB*number*	USB ports (Number: 0-1, located on rear of chassis)
/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 server is booted from disk 0 (zero) on a SPARC Enterprise T5120 server.

```
ok boot disk0
Boot device: /pci@7c0/pci@0/pci@8/scsi@2/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,T1000/ufsboot
Loading: /platform/sun4v/ufsboot
.....................
Hostname: hostname
The system is coming up. Please wait.
NIS domain name is x.x.x.x
```

```
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 xxxx
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.
hostname console login:
```

In the following example, the system is being booted from disk 0 (zero) on a SPARC Enterprise T5220 server. 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, 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.sun.com/documentation for more information.

APPENDIX A

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
- 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 61.

▼ To Update the Firmware

1. **Ensure that the ILOM service processor network management port is configured.**

   This is required to access the new flash image over the network. See "To Configure the Service Processor Network Management Port" on page 48.

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

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

Daemons ready

Sun(TM) Integrated Lights Out Manager

Version 2.0.0.0

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->
```

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 CODE EXAMPLE A-1.

CODE 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
```

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

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

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

hostname login:
```

APPENDIX **B**

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 *SPARC Enterprise T5120 and T5220 Servers Administration Guide*.

Note – The serial management port on the ILOM card is preconfigured as the default system console port. For more information, see the *SPARC Enterprise T5120 and T5220 Servers Overview*.

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

▼ 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.

APPENDIX **C**

Installing the Servers With the Express Rail Rackmounting Kit

This appendix provides instructions for installing the servers in an equipment rack with Express (snap-in) rails. The Express rail rackmounting kit installs quickly and does not require mounting screws or nuts. The kit and the installation procedures are the same for both the SPARC Enterprise T5120 and T5220 servers.

Note – If your rackmount kit came with its own instructions, use the instructions in your rackmount kit instead of the instructions in this appendix. After performing the server installation, proceed to Chapter 3 for first-time power on.

Note – The procedures in this appendix are the same for both the 1U and 2U servers. The illustrations show a 2U server only as an example.

This chapter contains the following sections:

- "Installing the Servers in a Rack With Express Rails" on page 71
- "Installing the Cable Management Arm" on page 79
- "Connecting the Server Cables" on page 79
- "Managing Cables With the CMA" on page 79
- "Dismounting the Server" on page 79

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

Slide Rail Assembly Notes for the Express Rail Rackmounting Kit

The Express rail rackmount kit has two slide rail assemblies. A slide rail assembly can be installed on either the right or left side of the rack.

Each slide rail assembly consists of a three-section slide rail and a removeable mounting bracket (FIGURE C-1).

FIGURE C-1 Sections of the Express Rail Slide Rail Assembly

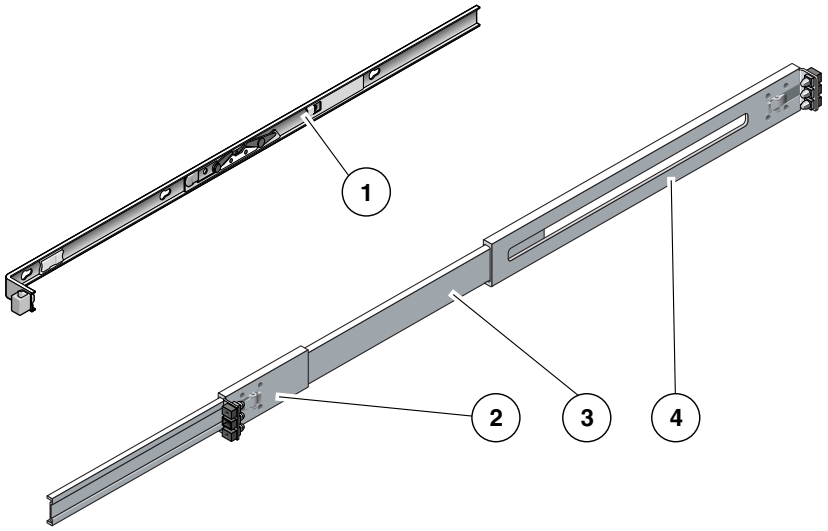


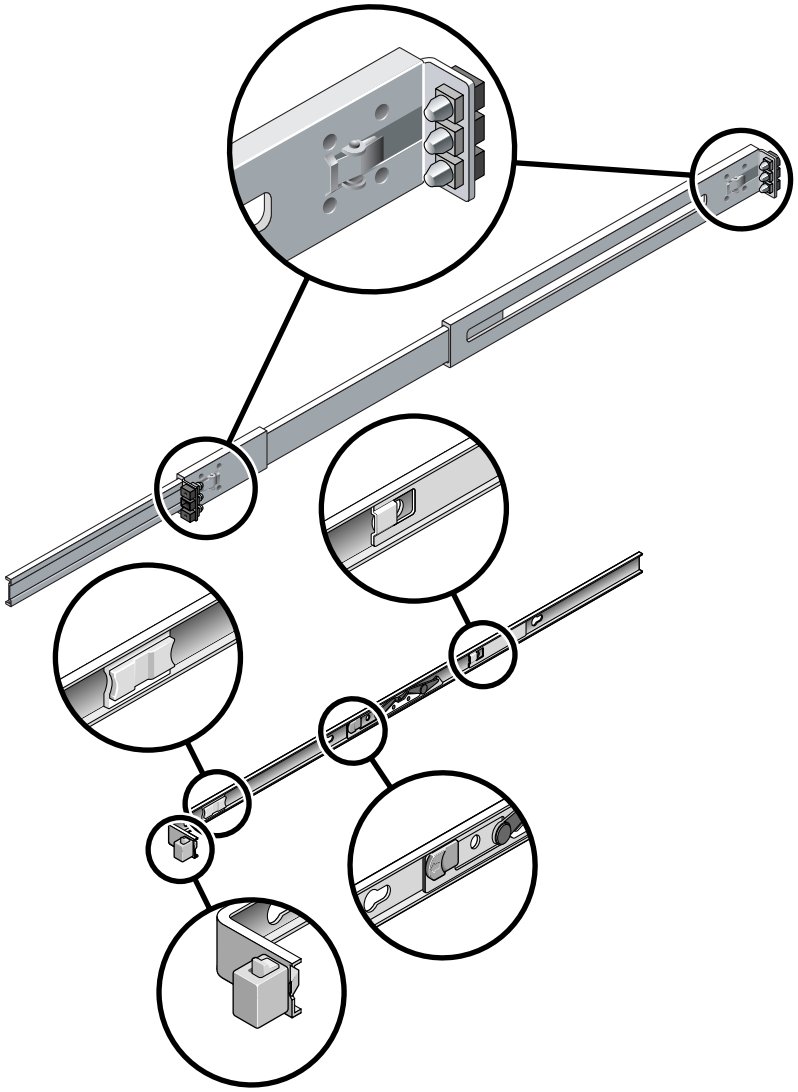
Figure Legend

1	Mounting bracket
2	Front section
3	Middle section
4	Rear section

- The *front*, *middle*, and *rear* sections form the *slide rail*. The middle and rear sections have holes for mounting and adjust to fit rack depths from 24 in. (61 cm) to 36.5 in. (93 cm). The front section can be extended to allow movement of the server out of the rack.

- The removeable *mounting bracket* slides 14.5 in. (37 cm) out of the slide rail, then locks in place. If you unlock the mounting bracket at this point, it slides an additional 14.5 in. (37 cm) before separating from the slide rail. You can then mount the mounting bracket to the right or left side of the server chassis.
- Note that there are a total of six locks (FIGURE C-2) in a slide rail assembly. Four are on the mounting bracket. Two locks are on the slide rail. The uses of these locks are described in the following installation procedure.

FIGURE C-2 Locating the Locks on the Slide Rail Assembly for the SPARC Enterprise T5220 Server



Installing the Servers in a Rack With Express Rails

Note – Ensure that you have all of the parts in the rackmount kit before you begin the installation of the server. See "Shipping Kit Inventory List for Both Servers" on page xv.

The rackmount kit contains two slide rail assemblies, which can be installed on either the right or left side of the rack.

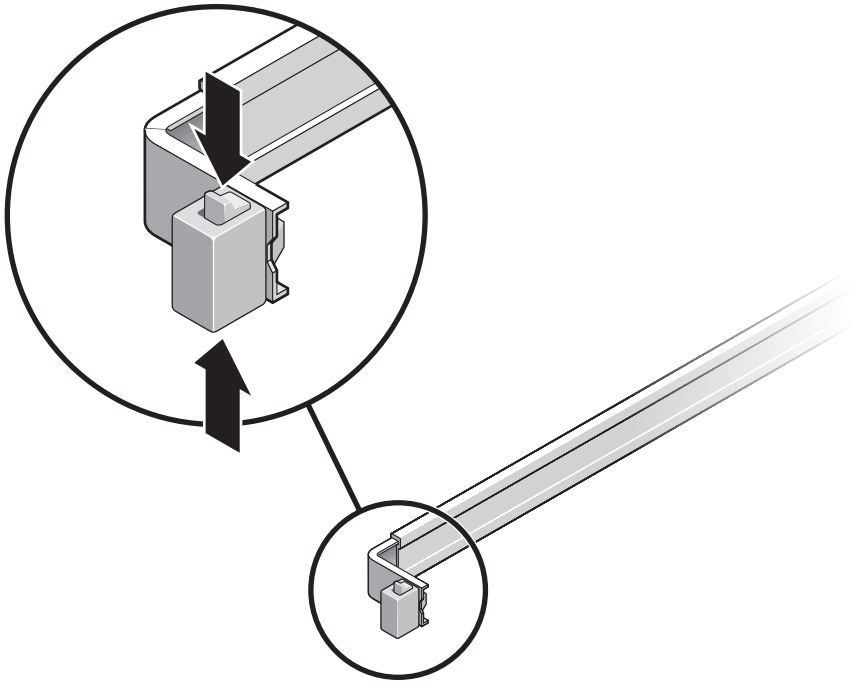
A slide rail assembly consists of two parts: a slide rail and a removeable mounting bracket. The slide rail attaches to the rack posts. The mounting bracket attaches to the server chassis.

▼ To Install the Slide Rail Assemblies

1. **Pull both mounting brackets completely out of their respective slide rails.**

   a. **Simultaneously press and hold the upper and lower lock buttons of the slide rail lock (**FIGURE C-3**).**

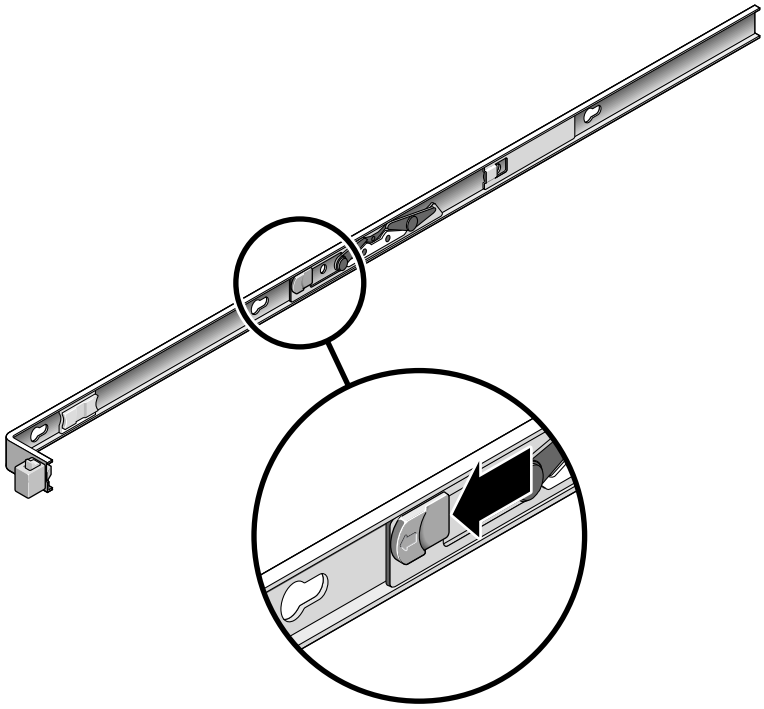
FIGURE C-3 Unlocking the Express Rail Slide Rail Assembly



b. Pull the mounting bracket out until it stops.

c. Slide the mounting bracket release button to the left (FIGURE C-4), then slide the mounting bracket completely out of the slide rail.

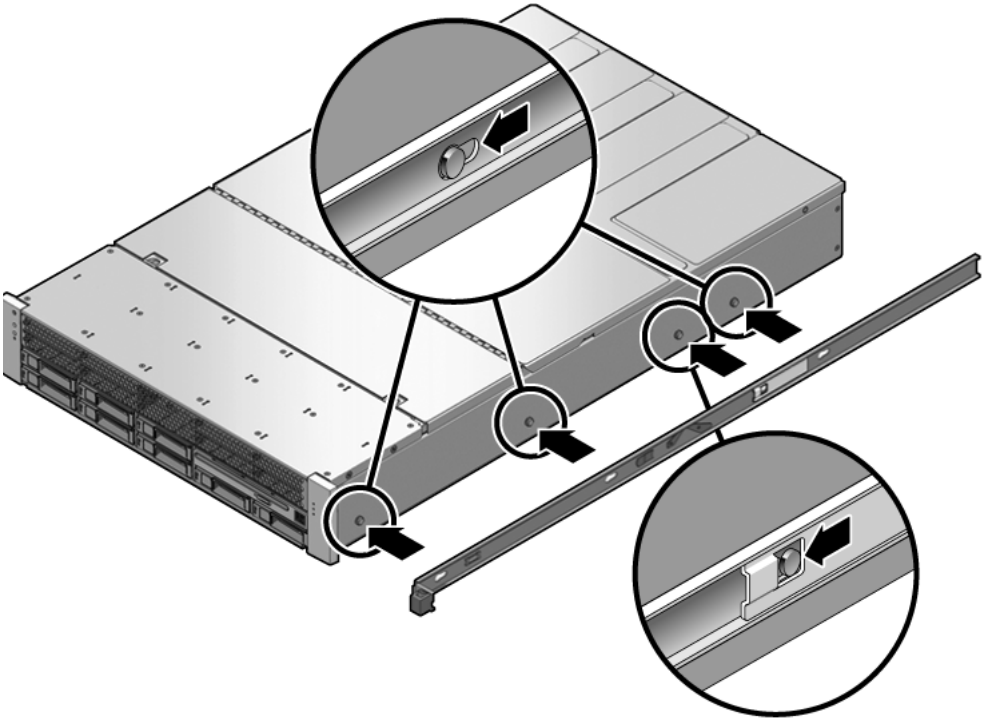
FIGURE C-4 Express Rail Mounting Bracket Release Button



2. **Attach a mounting bracket to the right side of the server chassis.**

   a. **Position the mounting bracket against the chassis (FIGURE C-5) so that the slide rail lock is at the front and the keyed openings on the mounting bracket are aligned with the locating pins on the side of the chassis.**

FIGURE C-5 Attaching an Express Rail Mounting Bracket to the Chassis



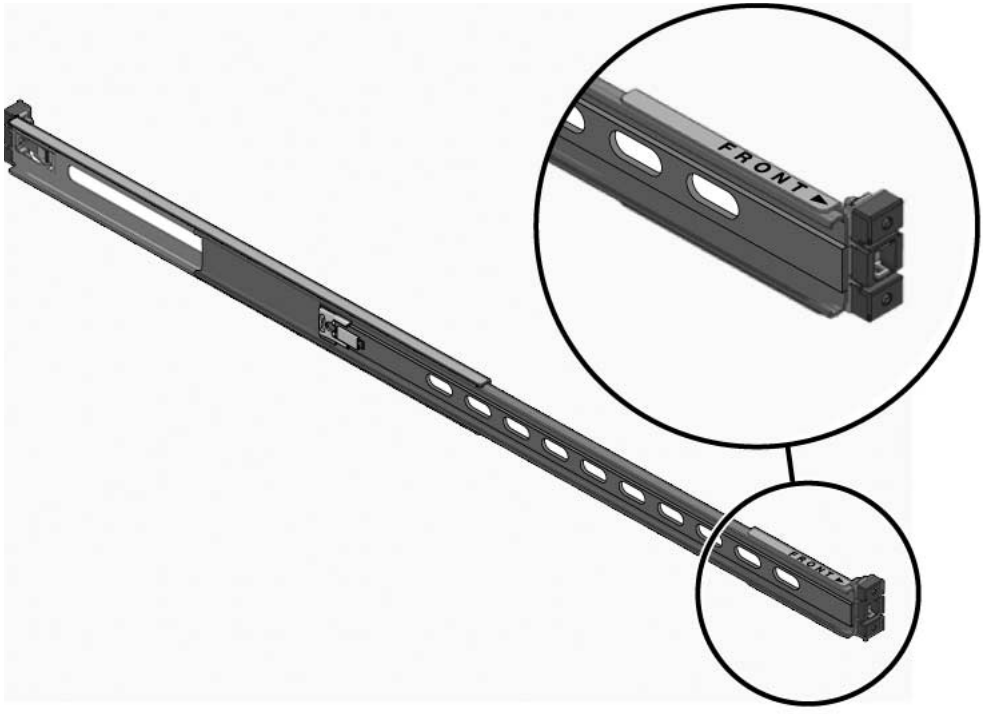
   b. **With the heads of the four locating pins protruding through the keyed openings in the mounting bracket, slide the mounting bracket toward the front of the chassis until the bracket locks into place with an audible click.**

   c. **Verify that all four locating pins are trapped in the keyed openings and that the third from the front locating pin has engaged the mounting bracket lock (FIGURE C-5).**

3. **Attach the second mounting bracket to the left side of the server chassis.**

4. **Orient slide rails and ensure that the ball bearing tracks (labeled FRONT) are forward (**FIGURE C-6**).**

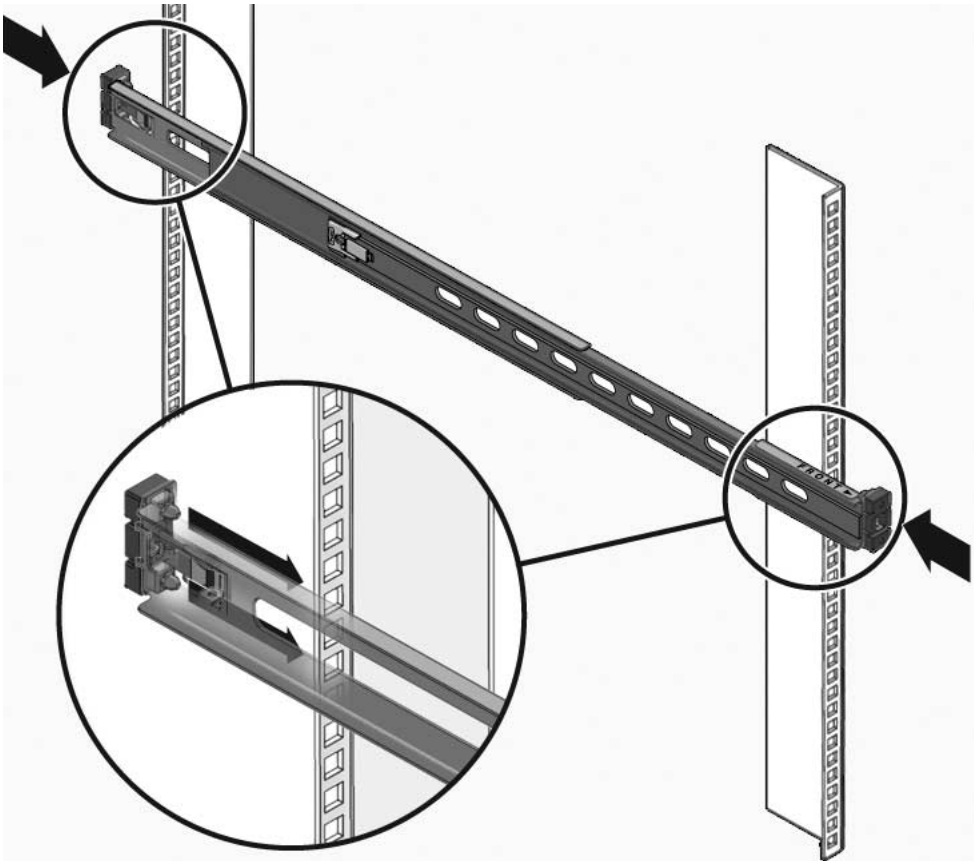
FIGURE C-6 Express Rail Slide Rails Orientation for Installation



5. **Extend the slide rails (outer section) to fit the rack and attach the slide rails to the rack (**FIGURE C-7**).**

   You hear an audible click when the rails securely attach to the rack.

FIGURE C-7 Attaching Express Slide Rails to the Rack



Caution – Deploy the antitilt feature on the rack before continuing the installation.

▼ To Insert and Lock the Server in the Rack

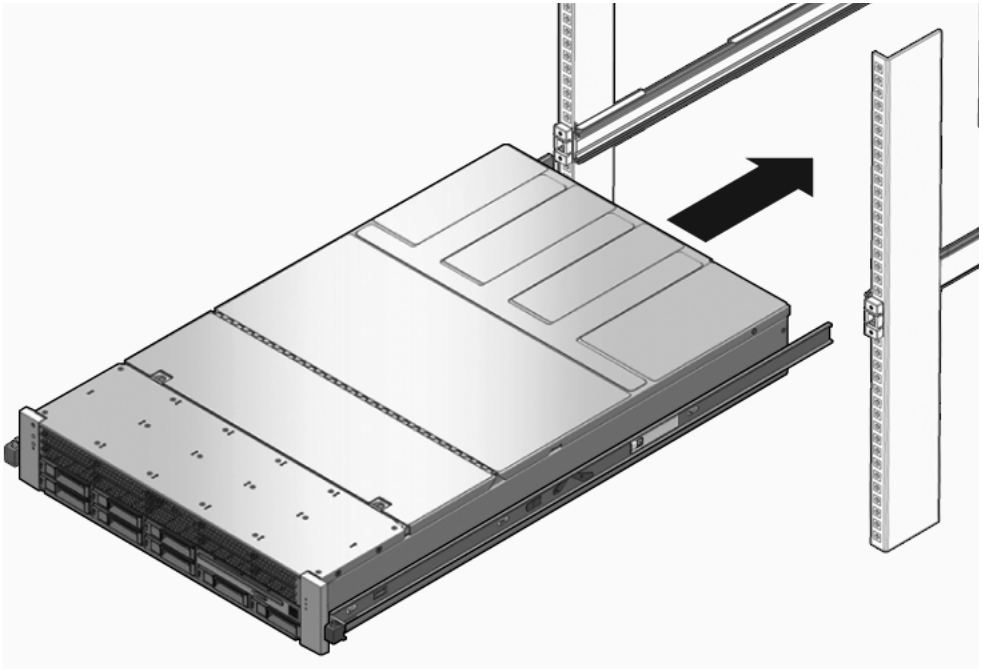
1. **Deploy the antitilt feature, if the rack is so equipped.**

Caution – The weight of the servers on extended slide rails can be enough to overturn an equipment rack.

Caution – The 2U server weighs approximately 46 lb (20.7 kg). Two people are required to lift and mount the server into a rack enclosure when using the procedures in this chapter.

2. **Insert the ends of the mounting brackets into the sliding rails (**FIGURE C-8**).**
3. **Slide the server approximately halfway into the chassis (**FIGURE C-8**).**

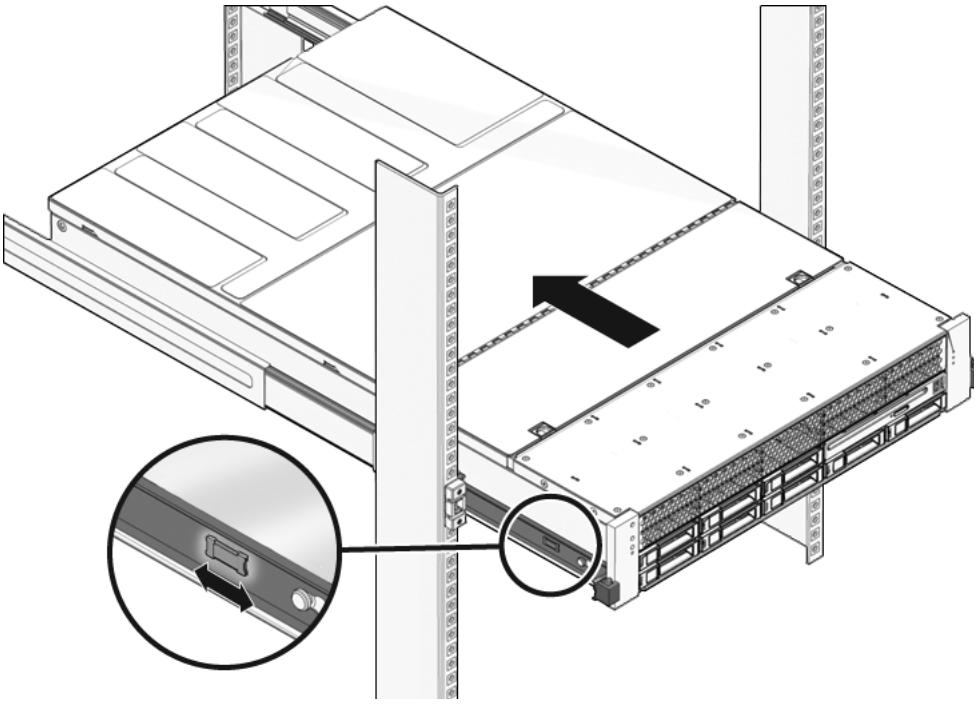
FIGURE C-8 Inserting Express Rail Mounting Brackets Into the Slide Rails



4. **Slide the green release tab (**FIGURE C-9**).**

5. **Push the server all the way into the the rack until it locks into place (**FIGURE C-9**).**

FIGURE C-9 Sliding the Express Rail Release Tab and Securing the Server in the Rack



Caution – Before continuing, verify that the server is securely mounted in the rack, and that the slide rails are locked in the mounting brackets.

Installing the Cable Management Arm

The rackmounting kit for each server comes with the same cable management arm (CMA) assembly. The CMA installation procedures are the same for both servers. See "Installing the Cable Management Arm for Both Servers" on page 25.

Connecting the Server Cables

To boot the server, you must connect and configure the network and serial ports. For instructions, see "Connecting the Server Cables for Both Servers" on page 32.

Managing Cables With the CMA

Managing the cables with the CMA is the same for both servers. See "Managing Cables With the CMA" on page 38.

Dismounting the Server

To install or replace internal parts in the server, you must first remove the server from the rack. For the removal procedure, refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual*.

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