SPARC T4-1 Server

Installation Guide

Part No.: E22988-09
August 2013

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Using This Documentation

This installation guide provides instructions, background information, and reference material to help you install Oracle's SPARC T4-1 Server.

- "Related Documentation" on page vii
- "Feedback" on page vii
- "Support and Accessibility" on page viii

Related Documentation

Documentation	Links
All Oracle products	http://www.oracle.com/documentation
SPARC T4-1 Server	http://www.oracle.com/pls/topic/lookup?ctx=SPARCT4-1
Oracle ILOM 3.0	http://www.oracle.com/pls/topic/lookup?ctx=ilom30
Oracle Solaris OS and other systems software	http://www.oracle.com/technetwork/indexes/documentation/index.html#sys_sw
Oracle VTS 7.0	http://www.oracle.com/pls/topic/lookup?ctx=OracleVTS7.0

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Support and Accessibility

Description	Links
Access electronic support through My Oracle Support	http://support.oracle.com For hearing impaired: http://www.oracle.com/accessibility/support.html
Learn about Oracle's commitment to accessibility	http://www.oracle.com/us/corporate/accessibility/index.html

Confirming Server and Site Specifications

This chapter explains how to verify that the server and the installation site are ready for the installation to take place. It contains these topics:

Step	Description	Links
1.	Review the product notes for any late-breaking news.	*SPARC T4-1 Server Product Notes*
2.	Review the server features, components, LEDs, and external I/O ports.	"Server Overview" on page 1 "Front Panel Components" on page 3 "Front Panel System LEDs and Buttons" on page 4 "Rear Panel Components" on page 6 "Rear Panel System LED and Button" on page 7
3.	Review the server specifications and site requirements.	"Confirming Specifications" on page 8
4.	Prepare the information and tools needed to install the server.	"Preparing for Installation" on page 15

Server Overview

This topic provides a high-level introduction to the main components and capabilities of the server.

FIGURE: Oracle's SPARC T4-1 Server

Component	Description
Chassis	Rack-mountable server with a 2RU form-factor.
CPU	One T4 2.85 GHz multicore processor.
Memory	Sixteen DDR3 DIMM memory slots supporting 4, 8, or 16 GB modules.
Storage devices	For internal storage, the server provides: • Eight 2.5-inch drive bays, accessible through the front panel. • A slot-loading DVD+/-RW drive on front panel.
USB ports	Four external USB 2.0 ports (two each on the front and rear panels).
Video ports	One high-density DB-15 video port (rear panel).
PCI Express 2.0 I/O slots	Six standard half-length, low-profile PCIe 2.0 slots. Two of the six slots are capable of accepting either a PCIe card or a XAUI card.
Ethernet ports	Four 10/100/1000 Mbps, RJ-45-based, autonegotiating Ethernet ports (rear panel).
SP	Oracle Integrated Lights Out Manager (ILOM) with RJ-45 serial and Ethernet interfaces.
Power supplies	Two hot-swappable power supplies
Cooling fans	Six sets (N+1) of hot-swappable counter-rotating fan modules.

Related Information

- *SPARC T4-1 Server Service Manual*
- Oracle ILOM documentation
- "Front Panel Components" on page 3
- "Front Panel System LEDs and Buttons" on page 4
- "Rear Panel Components" on page 6
- "Rear Panel System LED and Button" on page 7

Front Panel Components

The following figure shows the components that are accessible on the server front panel.

FIGURE: Components on the Server Front Panel

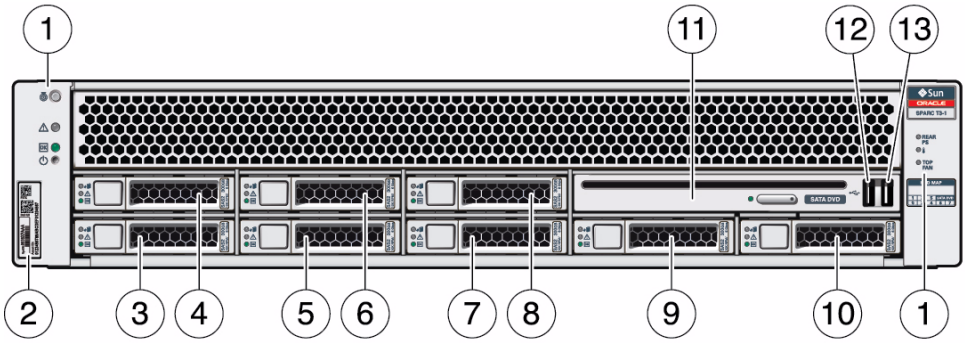


Figure Legend

1	System controls and indicators	**8**	Hard drive HDD5
2	RFID tag	**9**	Hard drive HDD6
3	Hard drive HDD0	**10**	Hard drive HDD7
4	Hard drive HDD1	**11**	SATA DVD module
5	Hard drive HDD2	**12**	USB port 2
6	Hard drive HDD3	**13**	USB port 3
7	Hard drive HDD4		

Related Information

- "Server Overview" on page 1
- "Front Panel System LEDs and Buttons" on page 4
- "Rear Panel Components" on page 6
- "Rear Panel System LED and Button" on page 7

Front Panel System LEDs and Buttons

The following figure shows the layout of the system LEDs and the power control button on the front panel.

FIGURE: Front Panel System LEDs and Power Buttons

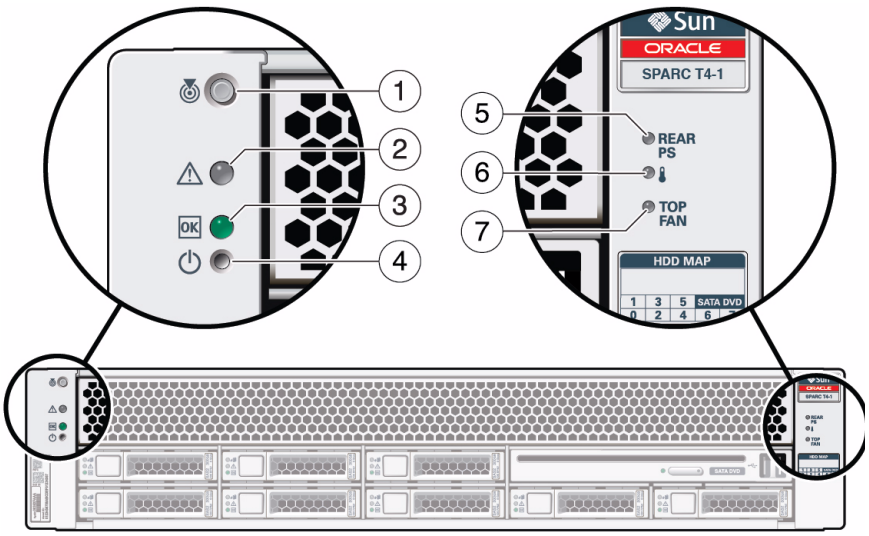


Figure Legend

1	Locator LED and button	**5**	Power Supply Service Required LED
2	Fault - Service Required LED	**6**	System Overtemperature Fault - Service Required LED
3	Power OK LED	**7**	Top Fan Fault - Service Required LED
4	Power ON/Standby button		

TABLE: Front Panel System LED Descriptions

LED or Button	Icon or Label	Description
Locator LED and button (white)		The Locator LED can be turned on to identify a particular system. When on, it blinks rabidly. There are two methods for turning a Locator LED on: • Issuing the Oracle ILOM command `set /SYS/LOCATE value=Fast_Blink` • Pressing the Locator button.
Service Required LED (amber)		Steady on light indicates that a fault has been detected in the system and that service is required.
Power OK LED (green)		Indicates the following conditions: • Off – System is not running in its normal state. System power might be off. The SP might be running. • Steady on – System is powered on and is running in its normal operating state. No service actions are required. • Blink – System is running in standby mode and can be quickly returned to full operation. • Slow blink – A transitional activity is taking place. • Fast blink – SP is booting.
Power button		The recessed Power button toggles the system on or off. • Press and release to turn the system on. • Press and release to shut the system down in a normal manner. • Press and hold for more than 5 seconds to perform an emergency shutdown.
Power Supply Fault LED (amber)	REAR PS	Indicates that a power supply fault has been detected and that service is required.
Overtemp LED (amber)		Indicates that an overtemperature condition within the chassis has been detected and that service is required.
Fan Fault LED (amber)	TOP FAN	Indicates that a fan module fault has been detected and that service is required.

Related Information

- "Front Panel Components" on page 3
- "Rear Panel Components" on page 6
- "Rear Panel System LED and Button" on page 7

Rear Panel Components

The following figure shows the components that are accessible on the server rear panel.

FIGURE: Components on the Server Rear Panel

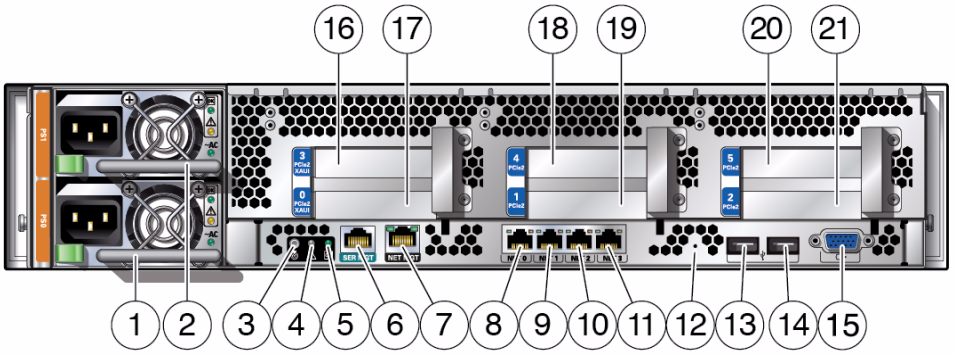


Figure Legend

1	Power supply 0	**12**	Access to physical presence button
2	Power supply 1	**13**	USB port 0
3	Locator LED button	**14**	USB port 1
4	Service Required LED	**15**	VGA video port
5	Power OK LED	**16**	PCIe slot 3 or XAUI slot 1
6	SP SER MGT port	**17**	PCIe slot 0 or XAUI slot 0
7	SP NET MGT port	**18**	PCIe slot 4
8	Gbit Ethernet port NET0	**19**	PCIe slot 1
9	Gbit Ethernet port NET1	**20**	PCIe slot 5
10	Gbit Ethernet port NET2	**21**	PCIe slot 2
11	Gbit Ethernet port NET2		

Related Information

- "Front Panel Components" on page 3
- "Front Panel System LEDs and Buttons" on page 4
- "Rear Panel System LED and Button" on page 7

Rear Panel System LED and Button

The following figure shows location of the system LEDs and the locator button on the rear panel.

FIGURE: Rear Panel System LEDs

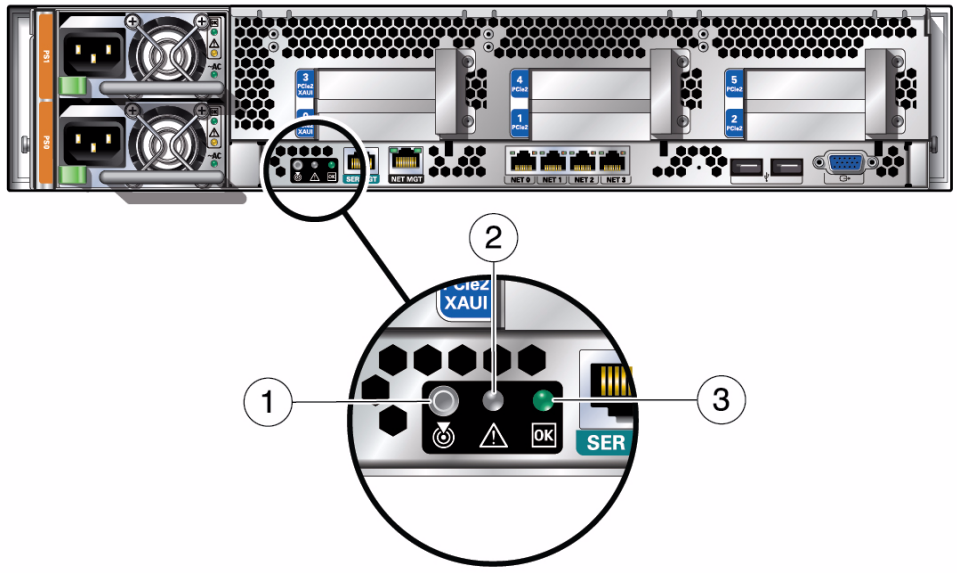


Figure Legend

1	Locator LED and button	**3**	Power OK LED
2	Fault - Service Required LED		

TABLE: Rear Panel System LED Descriptions

LED or Button	Icon or Label	Description
Locator LED and button (white)		The Locator LED can be turned on to identify a particular system. When on, it blinks rabidly. There are two methods for turning a Locator LED on: • Issuing the Oracle ILOM command `set /SYS/LOCATE value=Fast_Blink` • Pressing the Locator button.
Service Required LED (amber)		Steady on light indicates that a fault has been detected in the system and that service is required.
Power OK LED (green)		Indicates the following conditions: • Off – System is not running in its normal state. System power might be off. The SP might be running. • Steady on – System is powered on and is running in its normal operating state. No service actions are required. • Blink – System is running in standby mode and can be quickly returned to full operation. • Slow blink – A transitional activity is taking place. • Fast blink – SP is booting.

Related Information

- "Front Panel Components" on page 3
- "Front Panel System LEDs and Buttons" on page 4
- "Rear Panel Components" on page 6

Confirming Specifications

This section contains physical and environmental specifications for the server.

- "Physical Specifications" on page 9
- "Minimum Clearance for Service Access" on page 9
- "Electrical and Power Specifications" on page 9
- "Environmental Specifications" on page 11
- "Acoustic Noise Emissions" on page 12

- “Airflow Considerations” on page 12

Physical Specifications

TABLE: System Specifications

Measure	U.S.	Metric
Width	16.75 in.	425.5 mm
Depth	28.13 in.	714.5 mm
Height (2 rack units)	3.49 in.	88.6 mm
Weight, approximate (with 2 power supplies and 8 HDDs, but without PCI cards and rackmount hardware)	60 lb	27.2 kg

Related Information

- “Server Overview” on page 1
- “Minimum Clearance for Service Access” on page 9

Minimum Clearance for Service Access

TABLE: Minimum Clearances Needed

Parameter	Value
Clearance, front of server	36 in. (91 cm)
Clearance, rear of server	36 in. (91 cm)

Related Information

- “Server Overview” on page 1
- “Physical Specifications” on page 9

Electrical and Power Specifications

Use these specifications only as a general planning guide. To determine power values based on expected workloads, use the SPARC T4-1 power calculator located at this online site:

http://www.oracle.com/goto/powercalculators/

Parameter	Value (at 200 VAC)	Value (at 100 VAC)
Operating input voltage ranges (input voltage tolerance +/- 10%)	200 to 240 VAC, 50-60 Hz	100 to 120 VAC, 50/60 Hz
Maximum operating input current (see note)	3.9 A	7.87 A
Maximum operating input power (see note)	762 W	771 W
Maximum heat dissipation	2330 BTU/hr 2459 KJ/hr	2239.7 BTU/hr 2556.8 KJ/hr
Maximum standby power	20 W	22 W
Maximum server configuration specification under nominal temperature and voltage conditions: One T4 processor, sixteen 32-GByte DDR3 DIMMs, eight HDDs, and six I/O cards.		
Idle AC input power	469 W	485 W
Peak AC input power (running SpecJBB)	762 W	713 W
Minimum server configuration specification under nominal temperature and voltage conditions: One T4 processor, four 4-GByte DDR3 DIMMs, no HDDs, and no I/O cards.		
Idle AC input power	276 W	280 W
Peak AC input power (running SpecJBB)	335 W	358 W

Note – The maximum operating input current values are based on the formula P / (V *0.90), where P = maximum operating input power and V=input voltage. For example: 620W / (100V * 0.90) = 6.89A. You can use this formula to calculate the maximum operating current at your input voltage.

Related Information

- "Airflow Considerations" on page 12

Environmental Specifications

Install and operate the server in a site with an ambient temperature range of 21°C (69.8°F) to 23°C (73.4°F), which is an optimal range for server reliability. At 22°C (71.6°F) it is easy to maintain safe relative humidity levels. Operating in this temperature range provides a buffer if the environmental support systems fail.

Operating the server in a site with ambient relative humidity levels between 45% and 50% prevents corrosion, provides an operating time buffer in the event of environmental control system failure, and helps avoid failures caused by static discharges that occur when relative humidity is too low.

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

The server has been tested to meet all functional requirements when operating in the operating environmental limits listed in the table below (all values are for a single, non-rackmounted server).

Parameter	Value
Operating temperature	5°C to 35°C (41°F to 95°F)
Non-operating temperature	-40°C to 65°C (-40°F to 149°F)
Operating humidity	10% to 90% relative humidity, 27°C (80.6°F) maximum web bulb, noncondensing
Non-operating humidity	Up to 93% relative humidity, 38°C (100.4°F) maximum web bulb, noncondensing
Operating altitude	Up to 3000 m (10,000 ft)*, maximum ambient temperature is derated by 2 degrees C for every 1 km (3.6 degree F per 3,280 ft); IEC 60068-2-13 Test M, and 60068-2-41 Test Z/BM
Non-operating altitude	Up to 12,000 m (40,000 ft); IEC 60068-2-13 Test M
Operating vibration	0.15 G (vertical), 0.10 G (horizontal), 5 – 500 Hz, swept-sine
Non-operating vibration	0.5 G (vertical), 0.25 G (horizontal), 5 – 500 Hz, swept-sine
Operating shock	3.0 G, 11 ms, half-sine
Non-operating shock	• Roll-off: 1-inch roll-off free fall, front to back rolling directions • Threshold: 25 mm threshold height at 0.75 m/s impact velocity

* Except in China markets where regulations may limit installations to a maximum altitude of 2000 m.

Related Information

- "Acoustic Noise Emissions" on page 12
- "Airflow Considerations" on page 12

Acoustic Noise Emissions

Declared noise emissions for the SPARC T4-1 server are in accordance with ISO 9296 standards.

TABLE: Acoustic Noise Emissions for the SPARC T4-1 Server

Description	Parameter	Value
LwAd	Operating acoustic noise (max.)	8.5 B*
	Idling acoustic noise	7.1 B
LwAm (bystander positions)	Operating acoustic noise (max.)	70.1 dB
	Idling acoustic noise	59.3 dB

* 1 B = 10 dB

Related Information

- *SPARC T4-1 Server Safety and Compliance Guide*
- "Environmental Specifications" on page 11

Airflow Considerations

The servers have been tested to meet all functional requirements when operating in the operating environmental limits presented in "Environmental Specifications" on page 11. In addition to having proper environmental conditions, keeping the server's internal temperatures within a safe operating range depends on having sufficient airflow into and out of the chassis.

- Ensure unobstructed airflow through the chassis.
- Ensure that inlet air enters at the front of the server and exits from the back.

  Ensure that the inlet air is within.

- Ensure that the server ventilation openings used for intake and outflow of air provide an open area that is at least 60% of the open area perforations across the front and rear of the server. This 60% minimum open area equates to the following measurements:

Metric Units	US Units
224.4 cm^2 (425 mm x 88 mm)	34.8 in^2 (16.7 in x 3.5 in)

- Allow a minimum of 5 mm (0.2 in) clearance from the ventilation opening at the front of the server and 80 mm (3.1 in) at the rear of the server when mounted. These clearance values are based on the preceding inlet and exhaust impedance (available open area) and assume a uniform distribution of the open area across the inlet and exhaust areas. Clearance values greater than these are recommended for improved cooling performance.

Note – The combination of inlet and exhaust restrictions such as cabinet doors and the spacing of the server from the doors can affect the cooling performance of the server and should be evaluated by the user.

- Take care to prevent recirculation of exhaust air within a rack or cabinet.
- Manage cables to minimize interfering with the server exhaust vent.

Related Information

- "Minimum Clearance for Service Access" on page 9
- "Environmental Specifications" on page 11
- "Acoustic Noise Emissions" on page 12

Preparing for Installation

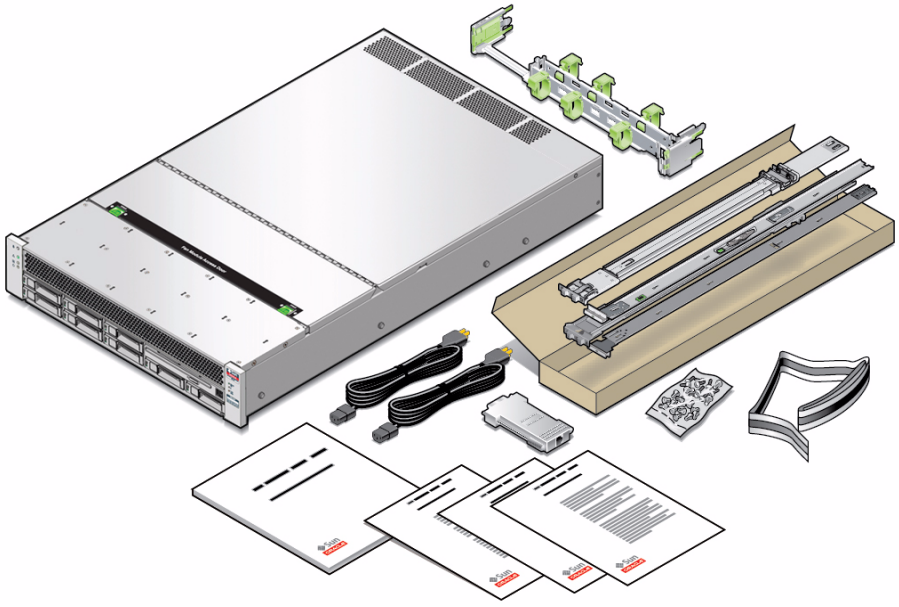
This chapter identifies steps you must take to prepare for the installation. It contains these topics:

- "Server Overview" on page 1
- "Front Panel Components" on page 3
- "Front Panel System LEDs and Buttons" on page 4
- "Rear Panel Components" on page 6
- "Rear Panel System LED and Button" on page 7
- "Confirming Specifications" on page 8
- "Handling Precautions" on page 17
- "ESD Precautions" on page 17
- "Tools Needed for Installation" on page 18

Shipping Kit Inventory List

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

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



- SPARC T4-1 server
- 2 AC power cords
- RJ-45 to DB-9 crossover adapter for the SER MGT port
- Antistatic wrist strap
- Rackmount kit
- Cable management arm (if ordered)
- *SPARC T4-1 Server Getting Started Guide* with license and safety documents
- Optional components (for example, PCIe cards) that are packaged separately from the other items

Related Information

- "Server Overview" on page 1
- "Preparing for Installation" on page 15

Handling Precautions

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

Caution – The server weighs approximately 60 lb (25. kg). Two people are required to lift and mount the server into a rack.

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

Related Information

- "ESD Precautions" on page 17

ESD Precautions

Electronic equipment is susceptible to damage by static electricity. Use a grounded antistatic wrist strap, foot strap, 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 server 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 server components.

Related Information

- "Handling Precautions" on page 17

Tools Needed for Installation

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

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

You must also provide a system console device, such as one of the following:

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

Related Information

- "ESD Precautions" on page 17
- "Handling Precautions" on page 17

Installing the Server

These topics describe how to install the server into a rack using the rail assembly in the rackmount kit. Perform these procedures if you purchased the rail assembly.

Note – In this guide, the term rack means either an open rack or a closed cabinet.

Step	Description	Links
1.	Verify that the rack is compatible with the server's installation requirements.	"Rack Compatibility" on page 19
2.	Take antitilt precautions to ensure the rack does not tip forward when the server is installed.	"Stabilize the Rack" on page 21
3.	Attach the slide rails.	"Install the Slide Rail Assemblies" on page 25
4.	Install the server in the rack.	"Install the Server" on page 29
5.	(Optional) Install the CMA.	"Install the CMA" on page 31
6.	Verify that the slide rails and CMA (if used) operate correctly.	"Verify Correct Operation of the Slide Rails and the CMA" on page 36

Rack Compatibility

Verify that your rack is compatible with the slide rail and cable management arm options. The slide rails are compatible with a wide range of equipment racks that meet the following standards.

Item	Requirement
Structure	Four-post rack (mounting at both front and rear). Two-post racks are not compatible.

Item	Requirement
Rack horizontal opening and unit vertical pitch	Conforms to ANSI/EIA 310-D-1992 or IEC 60927 standards.
Rack rail mounting hole sizes	Only 9.5 mm square hole and M6 round mounting holes are supported. All other sizes, including 7.2 mm, M5, or 10-32 mounting holes, are *not* supported.
Distance between front and rear mounting planes	Minimum 622 mm and maximum 895 mm (24.5 inches to 35.25 inches).
Clearance depth in front of front mounting plane	Distance to front cabinet door is at least 27 mm (1.06 inch).
Clearance depth behind front mounting plane	Distance to rear cabinet door is at least 900 mm (35.5 inches) with the cable management arm, or 770 mm (30.4 inches) without the cable management arm.
Clearance width between front and rear mounting planes	Distance between structural supports and cable troughs is at least 456 mm (18 inches).

Caution – Equipment Loading: Always load equipment into a rack from the bottom up so that the rack will not become top-heavy and tip over. Deploy your rack's anti-tip bar to prevent the rack from tipping during equipment installation.

Caution – Elevated Operating Ambient Temperature: If the server is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment might be greater than room ambient temperature. Therefore, install the equipment only in an environment compatible with the maximum ambient temperature (Tma) specified for the server.

Caution – Reduced Air Flow: Install the equipment in a rack so that the amount of air flow is adequate for the safe operation of the equipment.

Caution – Mechanical Loading: Mount the equipment in the rack so that the weight is distributed evenly. A hazardous condition can exist with uneven mechanical loading.

Caution – Circuit Overloading: Do not overload the power supply circuits. Before connecting the server to the supply circuit, review the equipment nameplate power ratings and consider the effect that circuit overloading might have on overcurrent protection and supply wiring.

Caution – Reliable Earthing: Maintain reliable earthing of rackmounted equipment. Give particular attention to supply connections other than direct connections to the branch circuit (for example, use of power strips).

Caution – Do not use slide rail mounted equipment as a shelf or a work space.

▼ Stabilize the Rack

Caution – To reduce the risk of personal injury, stabilize the expansion rack cabinet and extend all anti-tilt devices before installing the server.

Refer to your rack documentation for detailed instructions for the following steps.

1. **Open and remove the front and rear doors from the rack cabinet.**
2. **To prevent the rack cabinet from tipping during the installation, stabilize the cabinet using all anti-tilt mechanisms provided.**
3. **If there are leveling feet beneath the rack cabinet to prevent it from rolling, extend these leveling feet fully downward to the floor.**
4. **Fully extend the rack cabinet's anti-tilt legs or anti-tilt bar, which are located at the bottom front of the rack cabinet.**

Related Information

- The rack documentation
- *SPARC T4-1 Server Safety and Compliance Guide*
- "Rack Compatibility" on page 19

Installing Slide Rails

- "Slide Rail Assemblies" on page 22
- "Install the Slide Rail Assemblies" on page 25

Slide Rail Assemblies

Each slide rail assembly consists of a three-section slide rail and a removable mounting bracket. The slide rail attaches to the rack posts. The mounting bracket attaches to the server chassis.

FIGURE: Sections of the Snap-In Slide Rail Assembly

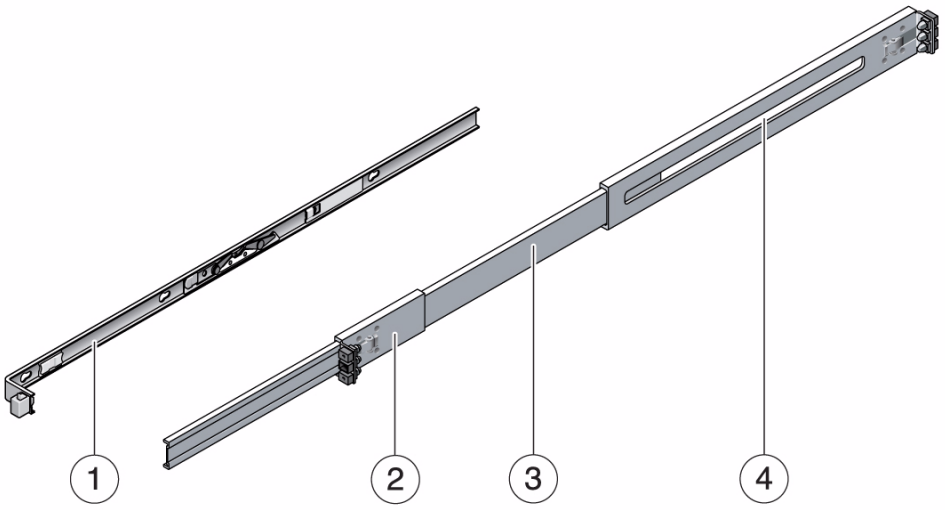


Figure Legend

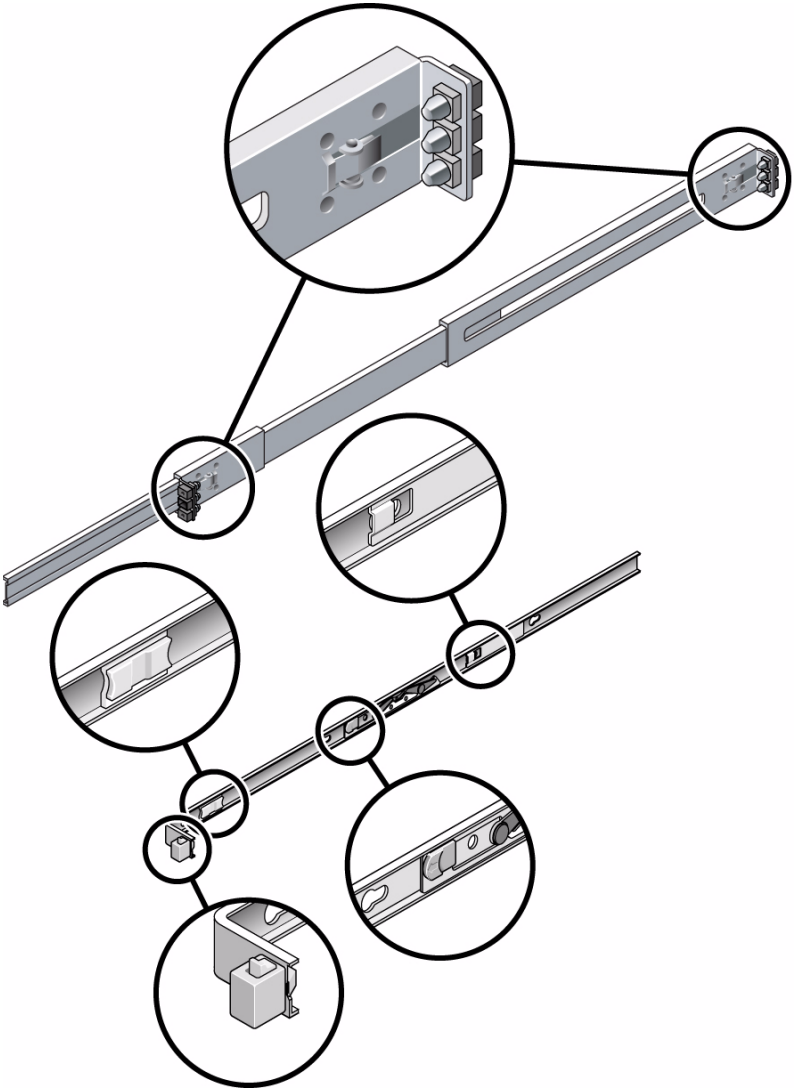
1	Mounting bracket
2	Front section
3	Middle section
4	Rear section

- The slide rails adjust to fit rack depths from 24 in. (61 cm) to 36.5 in. (93 cm). The middle and rear sections of the slide rails have holes for mounting the rail to the rack posts.

- The front section extends out of the middle section, which allows the server to be positioned far enough out of the rack for many service operations to be performed.
- The removable 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.

There are six locks in a slide rail assembly. Four are on the mounting bracket. Two locks are on the slide rail.

FIGURE: Locating the Locks on the Slide Rail Assembly



Related Information

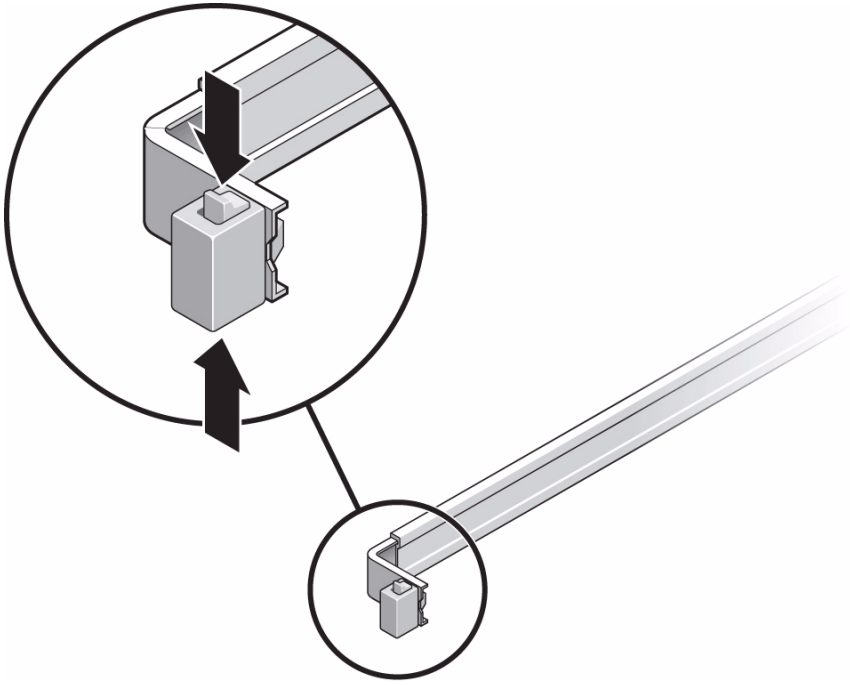
- "Rack Compatibility" on page 19
- "Install the Slide Rail Assemblies" on page 25

▼ 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.**

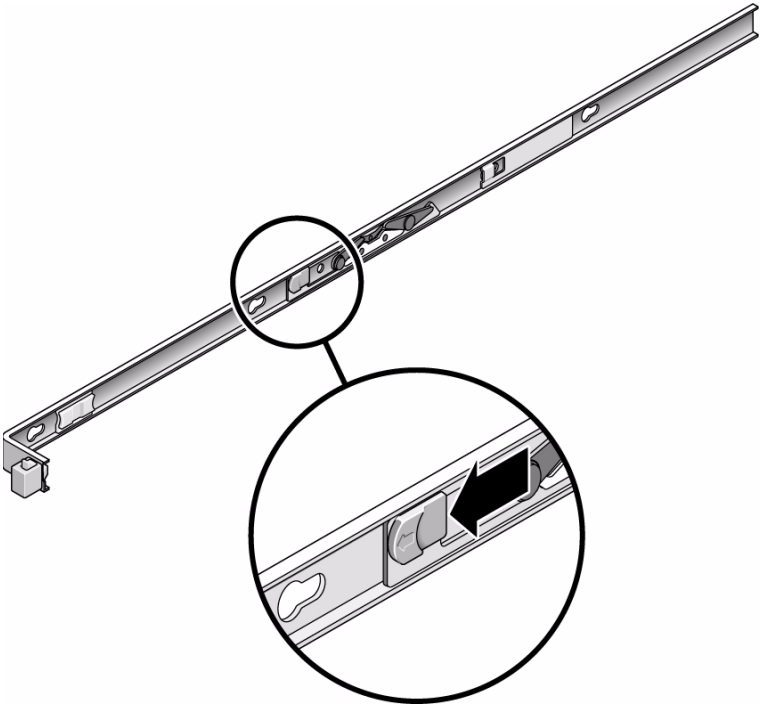
FIGURE: Unlocking the Express Rail Slide Rail Assembly



   b. **Pull the mounting bracket out until it stops.**

   c. **Slide the mounting bracket release button to the left, then slide the mounting bracket completely out of the slide rail.**

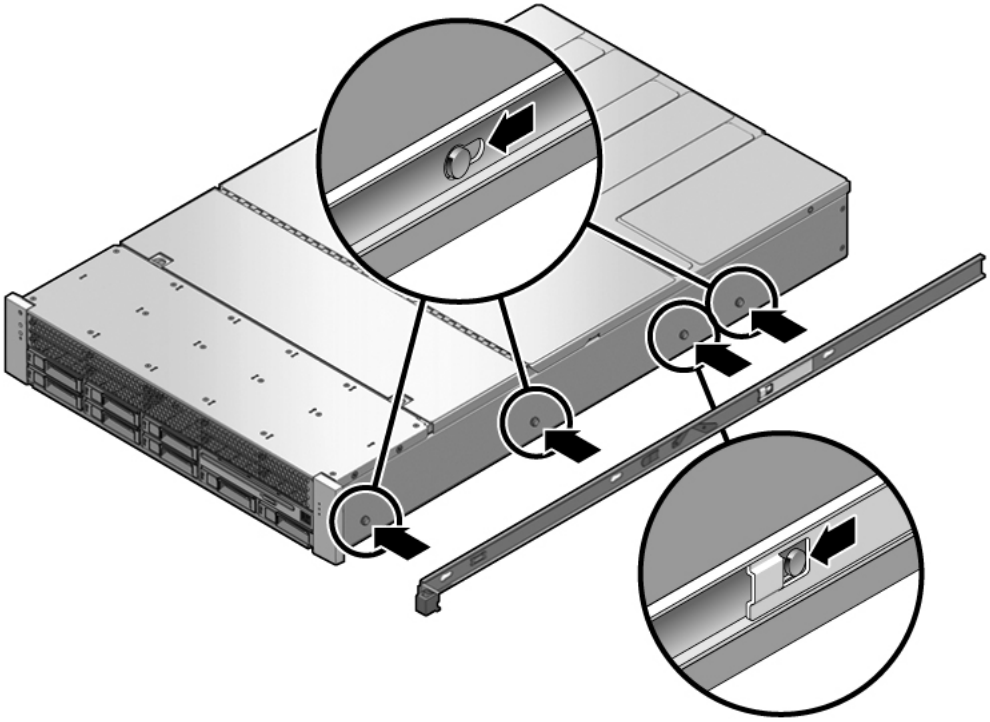
FIGURE: Express Rail Mounting Bracket Release Button



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

   a. **Position the mounting bracket against the chassis. Ensure 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: Attaching an Express Rail Mounting Bracket to the Chassis



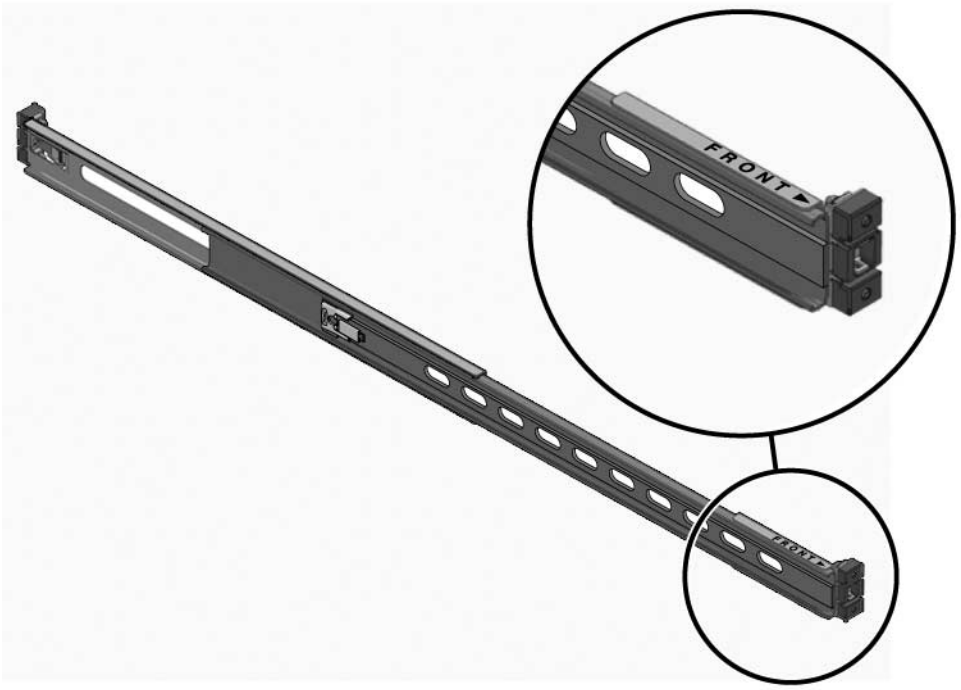
b. **Ensure that the heads of the four locating pins protrude through the keyed openings in the mounting bracket. Slide the mounting bracket toward the front of the chassis until the bracket locks into place with an audible click.**

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

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

4. **Orient the slide rails, ensuring that the ball bearing tracks (labeled FRONT) are forward.**

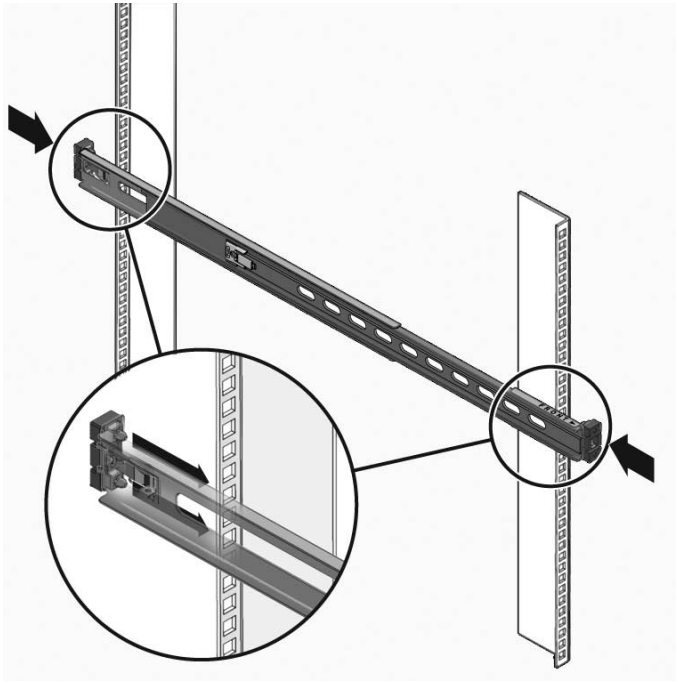
FIGURE: Express Rail Slide Rails Orientation for Installation



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

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

FIGURE: Attaching Express Slide Rails to the Rack



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

Related Information

- "Rack Compatibility" on page 19
- "Slide Rail Assemblies" on page 22

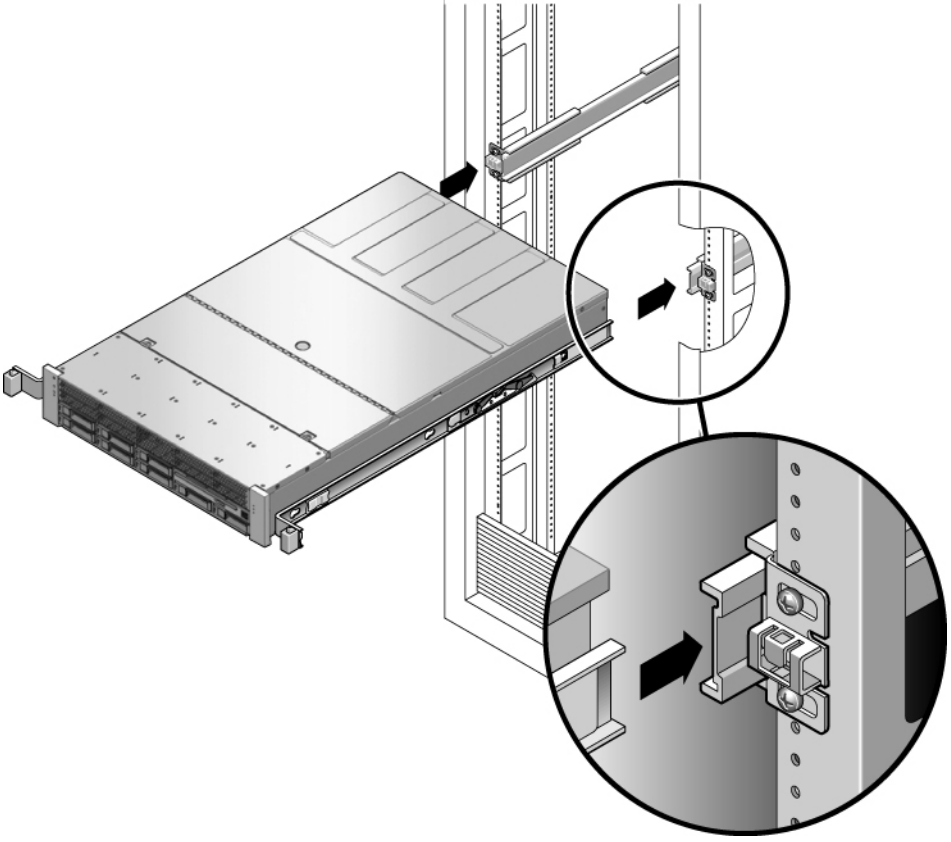
▼ Install the Server

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

Caution – The server weighs approximately 60 lb (25 kg). Two people are required to lift and mount the server into a rack enclosure.

1. **If the rack is equipped with an antitilt bar, verify that it has been deployed and, if not, deploy it.**
2. **Insert the ends of the mounting brackets into the sliding rails.**

FIGURE: Mounting the Chassis on the Slide Rails



3. **While pressing the two green slide rail release buttons, push the server into the rack until the slide rail locks on the front of the mounting brackets engage the slide rail assemblies. You will hear a click at that point.**

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

Related Information

- "Rack Compatibility" on page 19
- "Slide Rail Assemblies" on page 22
- "Install the Slide Rail Assemblies" on page 25
- "Install the CMA" on page 31
- "Verify Correct Operation of the Slide Rails and the CMA" on page 36

(Optional) Installing the CMA

- "Install the CMA" on page 31
- "Verify Correct Operation of the Slide Rails and the CMA" on page 36

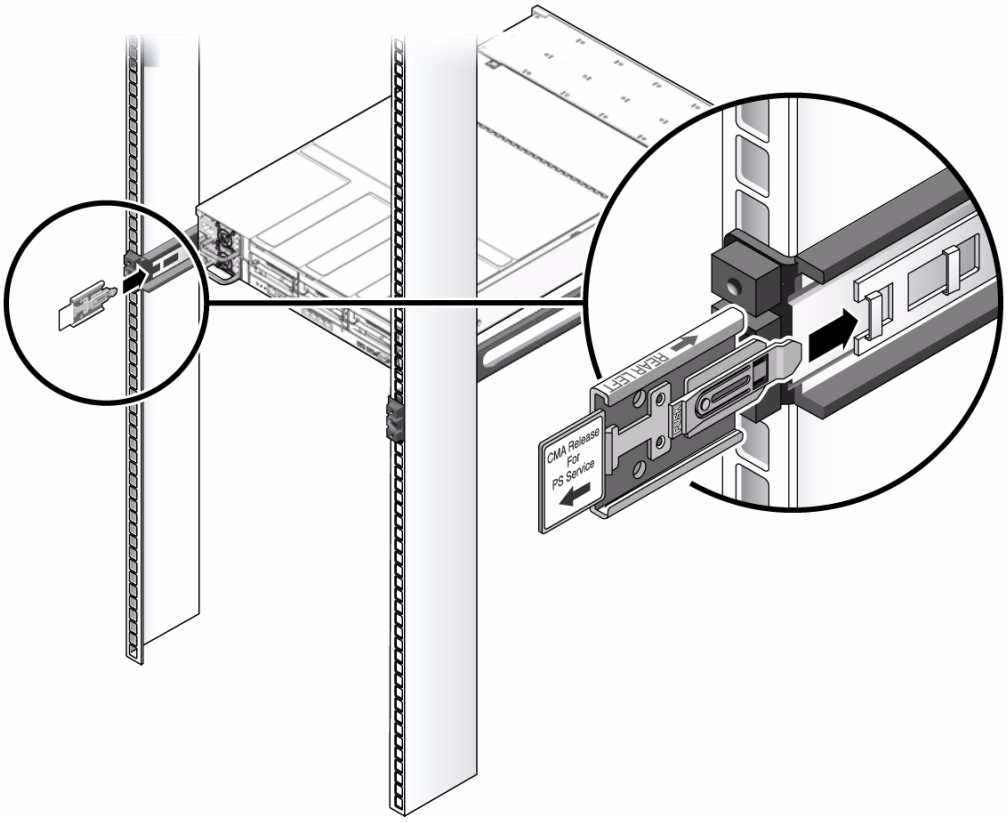
▼ Install the CMA

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.**

   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 clicks into place.

FIGURE: Inserting the CMA Rail Extension Into the Rear of the Left Slide Rail

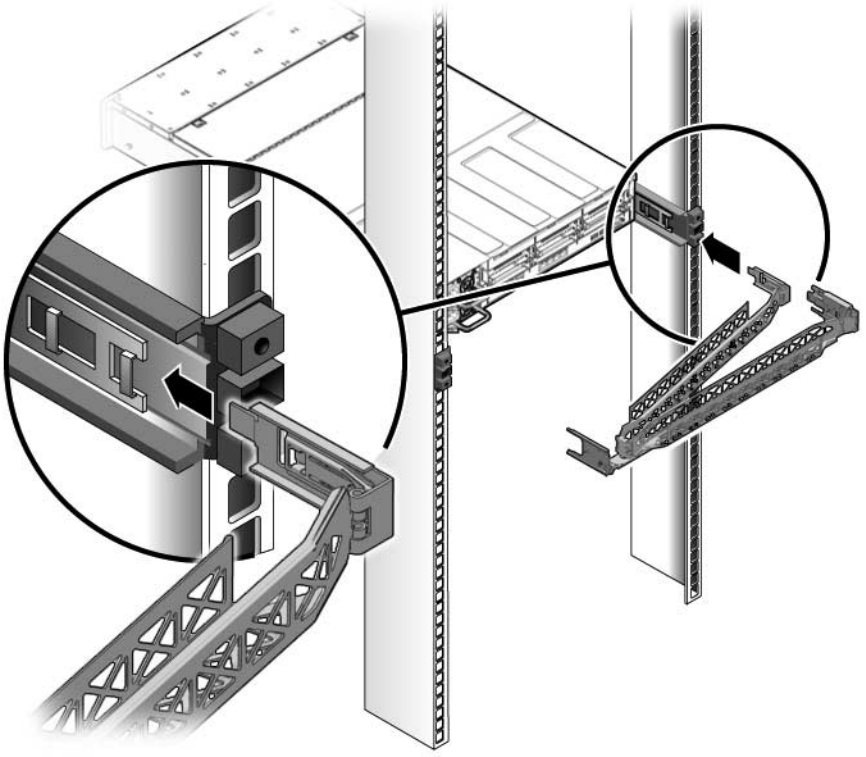


The right sides of the two CMA arms have hinged extensions. On the manufacturer's instruction sheet, the smaller extension is called the CMA Connector for Inner Member. This extension attaches to the right mounting bracket. The larger extension is called the CMA Connector for Outer Member, and attaches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

3. **Insert the smaller extension into the clip located at the end of the mounting bracket.**

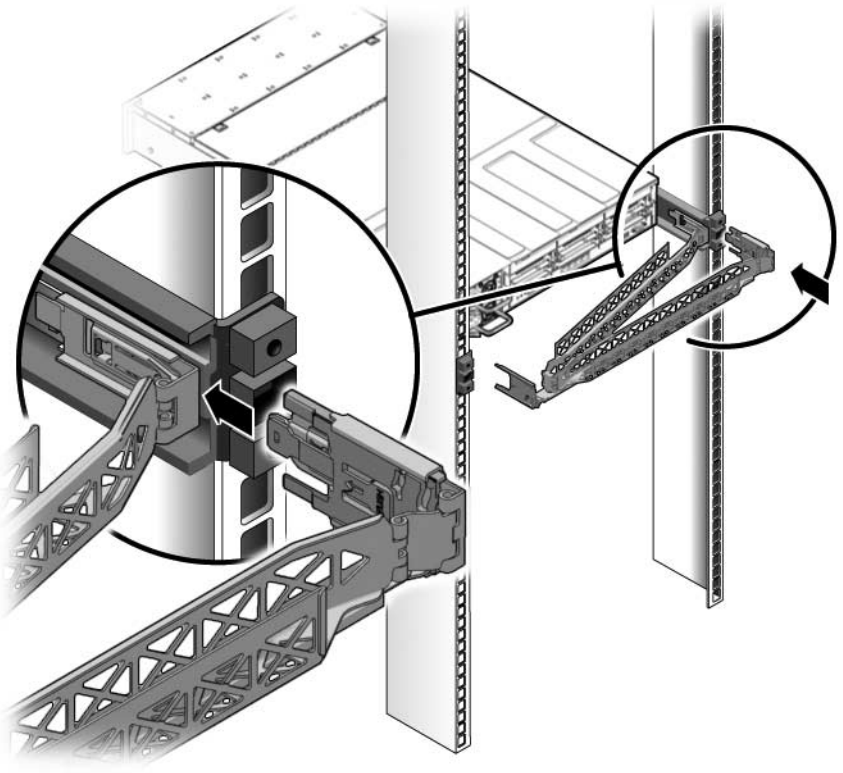
   Slide the smaller extension into the square hole on the middle-in-width of the clip that is located at the end of the mounting bracket.

FIGURE: Mounting the Inner CMA Connector



4. Insert the larger extension into the end of the right sliding rail.

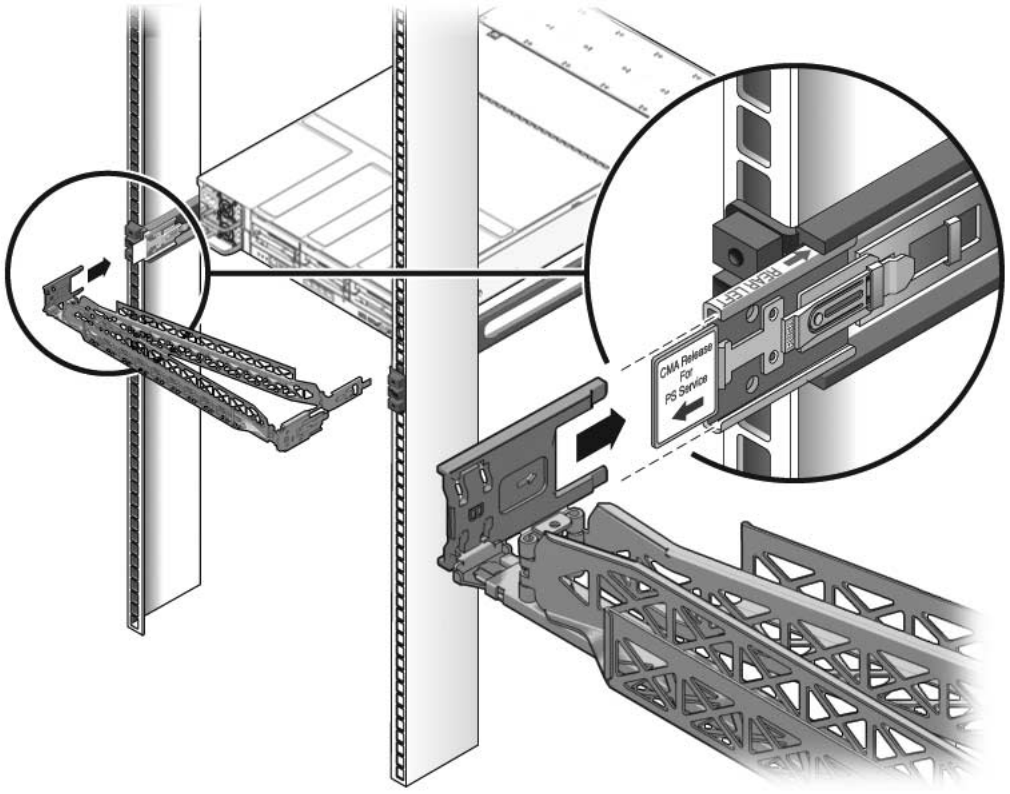
FIGURE: Attaching the Outer CMA Connector



5. **Insert the hinged plastic connector at the left side of the CMA fully into the CMA rail extension.**

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

FIGURE: Mounting the Left Side of the Slide Rail



Related Information

- "Rack Compatibility" on page 19
- "Slide Rail Assemblies" on page 22
- "Install the Slide Rail Assemblies" on page 25
- "Install the Server" on page 29
- "Verify Correct Operation of the Slide Rails and the CMA" on page 36

▼ Verify Correct Operation of the Slide Rails and the CMA

Perform this procedure both before and after you install the server cables in the CMA. Performing the procedure before the CMA contains cables helps ensure that it extends and contracts smoothly before the cables are added.

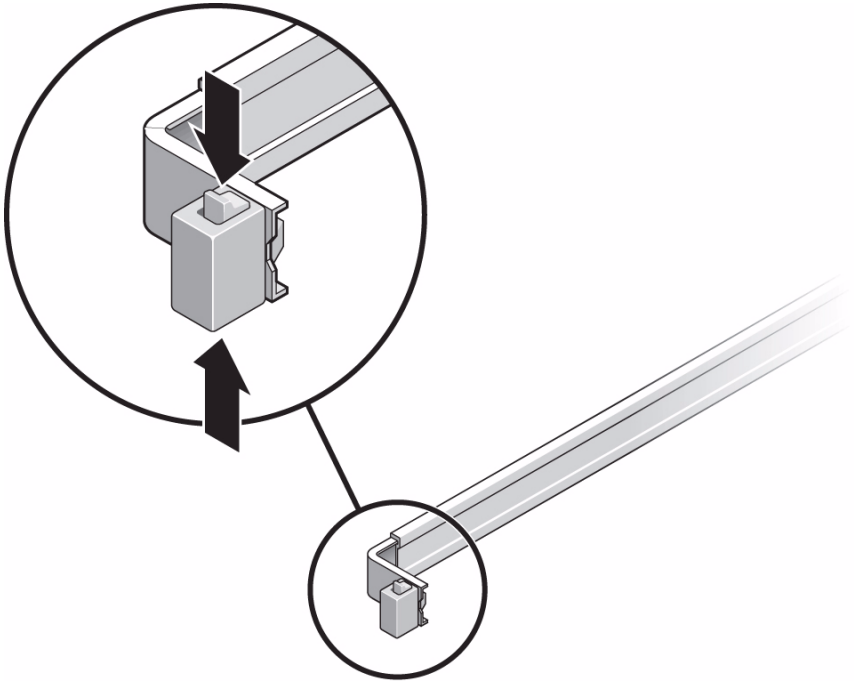
Note – The CMA includes velcro straps to secure the cables inside the CMA. Do not install the velcro straps until you have installed the CMA, connected the cables, and placed the cabling inside the CMA.

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 at the right and left sides of the chassis.**

FIGURE: Unlocking the Slide Rail Assembly

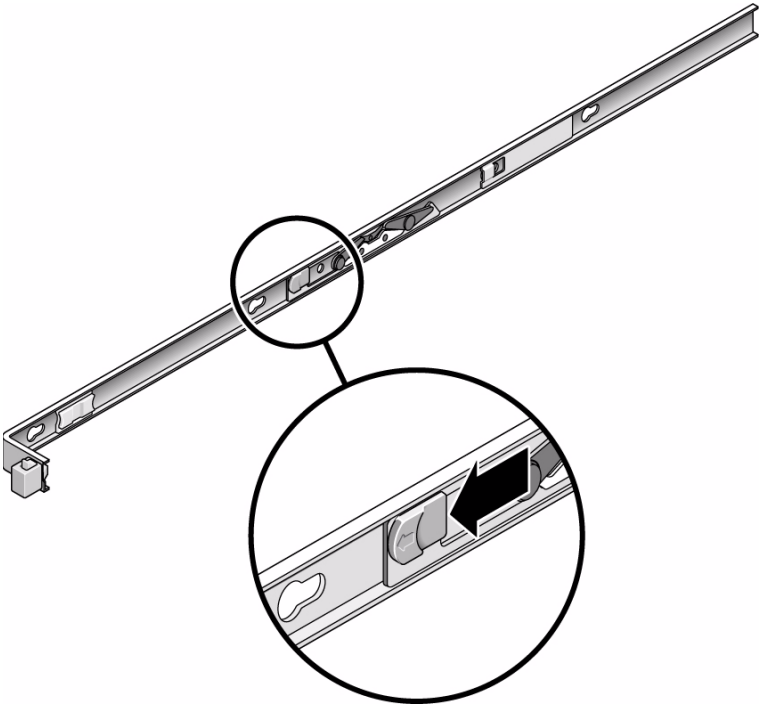


3. **If the server cables have been placed inside the CMA, inspect them for binding or kinks.**
4. **Slowly pull the server out of the rack until the slide rails reach their stops.**
5. **Verify that the CMA extends fully and does not bind in the slide rails.**
6. **Verify that the server extends fully and locks in the maintenance position.**

   The server should stop after approximately 15 in. (40 cm) of travel.
7. **Pull both slide rail release buttons toward you simultaneously and slide the server back into the rack.**

   The server should slide smoothly into the rack without binding.

FIGURE: Rail Mounting Bracket Release Button



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

Related Information

- "Rack Compatibility" on page 19
- "Slide Rail Assemblies" on page 22
- "Install the Slide Rail Assemblies" on page 25
- "Install the Server" on page 29
- "Install the CMA" on page 31

Connecting Cables

These topics explain how to connect the data and power cables to the server:

Step	Description	Links
1.	Review the cabling requirements.	"Cabling Requirements" on page 39
2.	Review I/O port connector details.	"Identifying Ports" on page 40
3.	Connect the management and data cables.	"Connecting Data and Management Ports" on page 44
4.	Secure cables in the CMA.	"Secure Cables in the CMA" on page 48

Cabling Requirements

Review these cabling notes before attaching cables to the server.

- Minimum cable connections for the server:
  - At least one server on-board Ethernet network connection (NET port)
  - The SER MGT port
  - The NET MGT port
  - A power cable for each power supply
- **SP management ports:** There are two management ports for use with the SP.
  - **The SER MGT port** uses an RJ-45 cable and is always available. This port is the default connection to the SP.
  - **The NET MGT port** is the optional connection to the SP. This port becomes available after you configure network settings for the SP (through the SER MGT port).

    The NET MGT port uses an RJ-45 cable for a 10/100 BASE-T connection. This port does not support connections to Gigabit networks.

- **Ethernet ports** are labeled NET0, NET1, NET2, and NET3. The Ethernet interfaces operate at 10 Mbps, 100 Mbps, and 1000 Mbps.

TABLE: 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

- **VGA DB-15 video port:** Use the video port to attach a color monitor to the server.
- **USB Ports:** USB ports support hot-plugging. You can connect and disconnect USB cables and peripheral devices 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.
- **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).

Note – The server goes into Standby mode and the SP initializes as soon as a power cable connects a power supply to an external power source. System messages might be lost after 60 seconds if a terminal or terminal emulator is not connected to the SER MGT port before power is applied.

Related Information

- "Connecting Cables" on page 39
- "Identifying Ports" on page 40

Identifying Ports

These topics provide reference information about the front and rear panel ports and pin assignments.

- "USB Ports" on page 41

- "SER MGT Port" on page 41
- "NET MGT Port" on page 42
- "Gigabit Ethernet Ports" on page 43
- "Video Port" on page 43

USB Ports

Two USB ports can be accessed on the server's front panel and two on the rear panel.

Each Each USB port supplies 5V output at 500 mA.

FIGURE: USB Connector

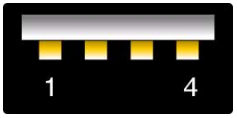


Figure Legend

1	+5V supply	**3**	Data +
2	Data -	**4**	Ground

Related Information

- "Front Panel Components" on page 3
- "Rear Panel Components" on page 6

SER MGT Port

The SER MGT RJ-45 port, located on the rear panel, provides the default connection to the system console.

FIGURE: SER MGT Port

Figure Legend

1	Clear to Send	**5**	Ground
2	Data Carrier Detect	**6**	Receive Data
3	Transmit Data	**7**	Data Terminal Ready
4	Ground	**8**	Ready to Send

Related Information

- "Front Panel Components" on page 3
- "Rear Panel Components" on page 6
- "Connect the SER MGT Port Cable" on page 44
- "Connect a Terminal or Emulator to the SER MGT Port" on page 52

NET MGT Port

The NET MGT RJ-45 port, located on the rear panel, provides an optional Ethernet connection to the service processor.

FIGURE: NET MGT Port

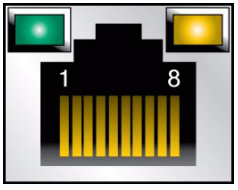


Figure Legend

1	Transmit Data +	**5**	No Connect
2	Transmit Data –	**6**	Receive Data –
3	Receive Data +	**7**	No Connect
4	No Connect	**8**	No Connect

Related Information

- “Front Panel Components” on page 3
- “Rear Panel Components” on page 6
- “Connect the NET MGT Port Cable” on page 45
- “Assign a Static IP Address to the SP” on page 55

Gigabit Ethernet Ports

Four RJ-45 Gigabit-Ethernet connectors (NET0, NET1, NET2, NET3) are located on the rear panel. The Ethernet interfaces operate at 10 Mbit/sec, 100 Mbit/sec, and 1000 Mbit/sec.

FIGURE: Gigabit Ethernet Port

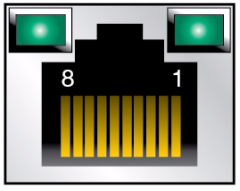


Figure Legend

1	Transmit/Receive Data 0 +	**5**	Transmit/Receive Data 2 –
2	Transmit/Receive Data 0 –	**6**	Transmit/Receive Data 1 –
3	Transmit/Receive Data 1 +	**7**	Transmit/Receive Data 3 +
4	Transmit/Receive Data 2 +	**8**	Transmit/Receive Data 3 –

Related Information

- “Front Panel Components” on page 3
- “Rear Panel Components” on page 6
- “Connect the NET MGT Port Cable” on page 45

Video Port

The server has one 15-pin VGA video port located on the server’s rear panel. Maximum supported resolution is 1024 x 768.

FIGURE: Video Connector

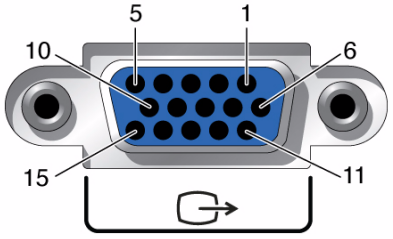


Figure Legend

1	Red Video	**9**	+5V
2	Green Video	**10**	Sync Ground
3	Blue Video	**11**	Monitor ID - Bit 0 (Ground)
4	Monitor ID - Bit 2 (Ground)	**12**	VGA 12C Serial Data
5	Ground	**13**	Horizontal Sync
6	Red Ground	**14**	Vertical Sync
7	Green Ground	**15**	VGA 12C Serial Clock
8	Blue Ground		

Related Information

- "Rear Panel Components" on page 6

Connecting Data and Management Ports

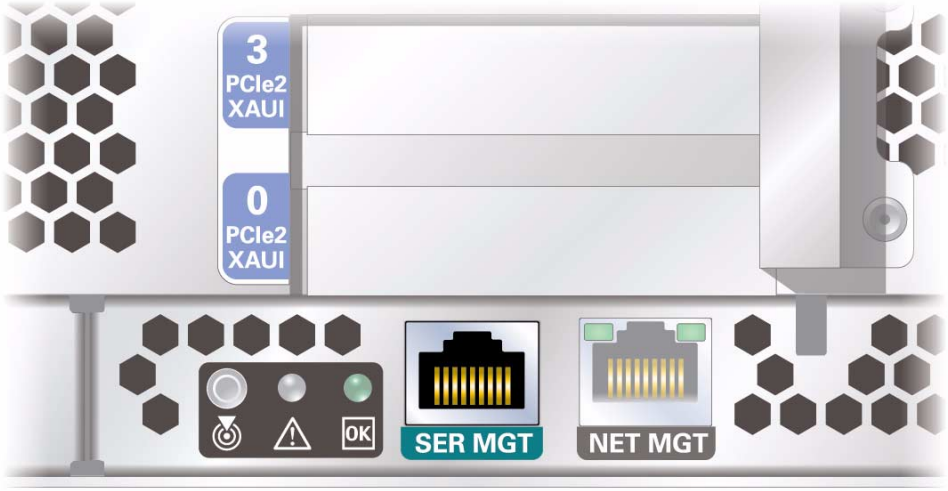
- "Connect the SER MGT Port Cable" on page 44
- "Connect the NET MGT Port Cable" on page 45
- "Connect the Ethernet Network Cables" on page 46
- "Connect Other Data Cables" on page 47

▼ Connect the SER MGT Port Cable

The SER MGT port is the farthest left RJ-45 port on the rear panel.

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

FIGURE: SER MGT port – Rear Panel



This port is needed to set up the NET MGT port.

When connecting a DB-9 cable, use an RJ-45 to DB-9 adapter to perform the crossovers given for each connector.

Note – Use the SER MGT port *only* for server management. This port is the default connection between the SP and a terminal or a computer.

Caution – Do not attach a modem to this port.

Related Information

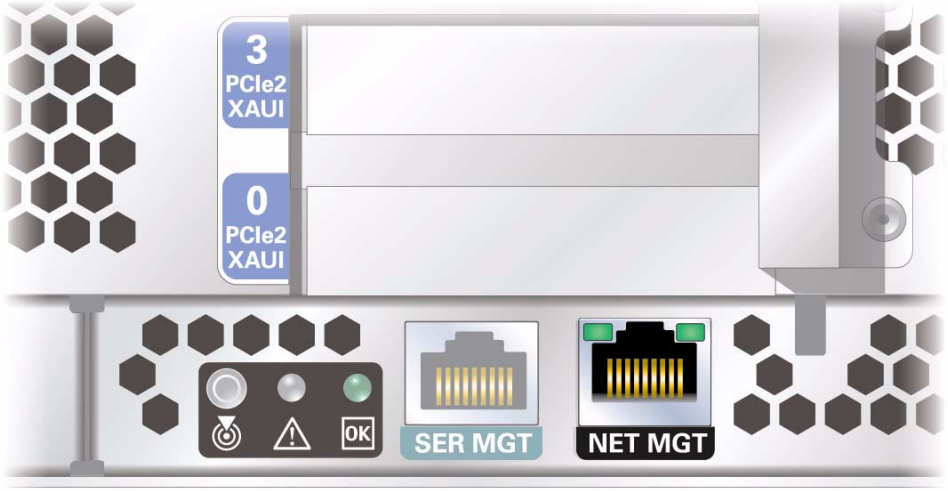
- "Connect the NET MGT Port Cable" on page 45
- "Connecting Cables" on page 39

▼ Connect the NET MGT Port Cable

The NET MGT port is located just to the right of the SER MGT port on the rear panel.

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

FIGURE: NET MGT port – Rear Panel



Note – This port is not operational until you configure the network settings (through the SER MGT port).

Note – The NET MGT port is configured by default to retrieve network settings with Dynamic Host Configuration Protocol (DHCP) and allow connections using SSH. You might need to modify these settings for your network. Instructions are given in "Powering On the Server for the First Time" on page 51.

Related Information

- "Connect the SER MGT Port Cable" on page 44
- "Connecting Cables" on page 39

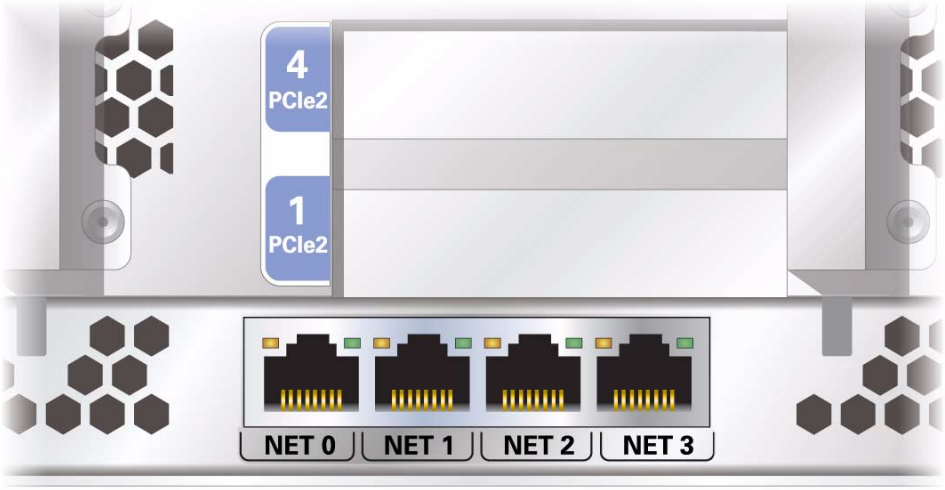
▼ Connect the Ethernet Network Cables

The server has four RJ-45 Gigabit Ethernet network connectors. They are marked NET0, NET1, NET2, and NET3.

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.

FIGURE: Ethernet Network Ports – Rear Panel



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

Related Information

- "Connecting Cables" on page 39

▼ Connect Other Data Cables

- **If your server configuration includes PCIe expansion modules, connect the appropriate I/O cables to their connectors.**

FIGURE: PCIe and PCIe/XAUI Slot Configuration

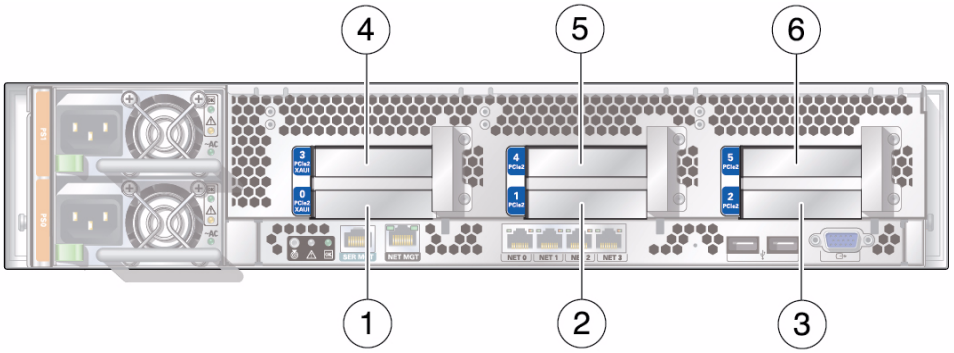


Figure Legend

1	PCIe slot 0 or XAUI slot 0	**4**	PCIe slot 3 or XAUI slot 1
2	PCIe slot 1	**5**	PCIe slot 4
3	PCIe slot 2	**6**	PCIe slot 5

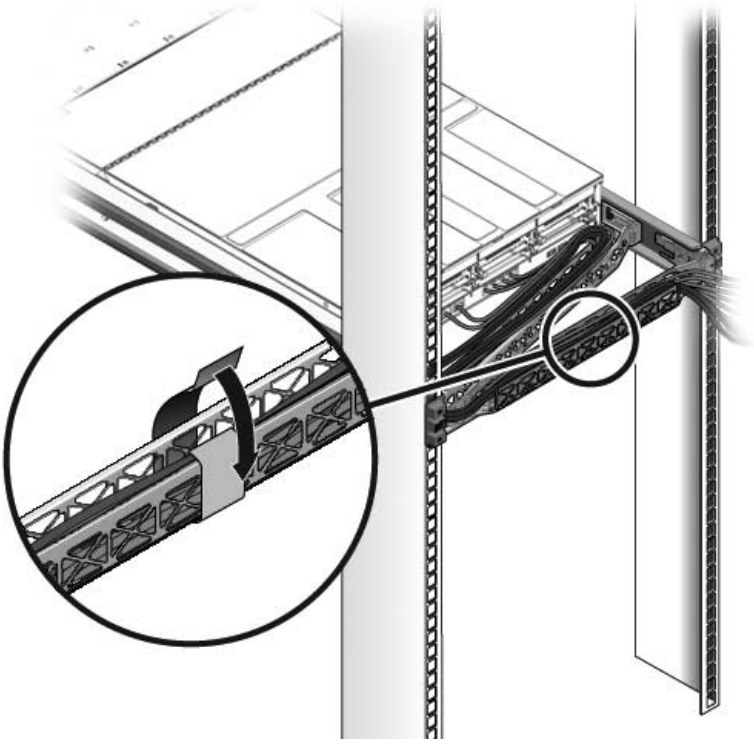
Related Information

- "Connecting Cables" on page 39

▼ Secure Cables in the CMA

1. **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: Securing the Server Cables With the CMA and Velcro Straps



2. **Verify the operation of the slide rails and CMA, and cable service loops.**

   Repeat the steps described in the procedure: "Verify Correct Operation of the Slide Rails and the CMA" on page 36.

Related Information

- "Install the CMA" on page 31
- "Verify Correct Operation of the Slide Rails and the CMA" on page 36

Powering On the Server for the First Time

These topics provide instructions for booting Oracle's SPARC T4-1 server for the first time and for enabling the NET MGT port. It consists of the following topics:

Step	Description	Links
1.	Review the behavior of Oracle ILOM console output when the system is powered on the first time.	"Oracle ILOM System Console" on page 51
2.	Connect the server to a terminal display.	"Connect a Terminal or Emulator to the SER MGT Port" on page 52
3.	Power on the server.	"Power On the Server for the First Time" on page 53
4.	Check that the server is operational.	"Verify Functionality" on page 55
5.	(Optional) Assign a static IP address to the SP.	"Assigning a Static IP Address to the SP" on page 55
6.	Review the Oracle Solaris OS configuration parameter descriptions.	"Oracle Solaris OS Configuration Parameters" on page 57

Oracle ILOM System Console

When you power on the system, the boot process begins under the control of the Oracle ILOM system console. The system console displays status and error messages generated by firmware-based tests that are run during system startup.

Note – To see these status and error messages, connect a terminal or terminal emulator to the SER MGT port before power is applied to the server.

After the system console finishes its low-level system diagnostics, the SP initializes and runs a suite of higher level diagnostics. When you access the SP using a device connected to the SER MGT port, you see the output of the Oracle ILOM diagnostics.

By default, the SP configures the NET MGT port automatically, retrieving network configuration settings using the Dynamic Host Configuration Protocol (DHCP) and allowing connections using SSH.

For a more detailed discussion on configuring the system console and connecting terminals, refer to the system administration documentation for your server.

Related Information

- "Connect a Terminal or Emulator to the SER MGT Port" on page 52
- "Power On the Server for the First Time" on page 53

▼ Connect a Terminal or Emulator to the SER MGT Port

A null modem configuration is needed for DTE to DTE communications. You can use the supplied RJ-45 crossover adapter with a standard RJ-45 cable to achieve the null modem configuration.

1. **Connect a terminal or a terminal emulator (PC or workstation) to the SER MGT port.**
2. **Configure the terminal or terminal emulator with these settings:**
   - 9600 baud
   - 8 bits
   - No parity
   - 1 Stop bit
   - No handshake
3. **(Optional) Connect an Ethernet cable between the server's NET MGT port and the network to which future connections to the SP and host will be made.**

Related Information

- "Oracle ILOM System Console" on page 51
- "Power On the Server for the First Time" on page 53

▼ Power On the Server for the First Time

1. **Confirm that you have completed all of the preparations for installation.**

   See the instructions in "Confirming Server and Site Specifications" on page 1.

2. **Confirm that you have completed the installation of the server in its rack.**

   See the instructions in "Installing the Server" on page 19.

3. **(Recommended) Connect an Ethernet cable between one of the server's NET ports and the network to which the server will communicate.**

Note – After the initial configuration of the system, communication with the SP and host is usually performed through an Ethernet interface.

---

4. **Plug the power cords into the power supplies and into separate power sources.**

   To provide redundancy, plug both power supplies into separate power sources.

   The system can operate with only one power connection, but there is no redundancy in this case.

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

   After a few minutes, the SP login prompt appears on the terminal device. The host is not initialized or powered on yet.

5. **At the terminal device, log in to the SP as `root` with a password of `changeme`.**

```
hostname login: root
Password: changeme
. . .
->
```

6. **Change the `root` password.**

```
...
Warning: password is set to factory default.

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

->
```

7. **Power on the server and redirect the host output to display on the serial terminal device:**

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

   After you start the HOST console, the server initialization takes approximately 20 minutes to complete.

8. **Configure the OS by entering parameter values as prompted by a series of onscreen instructions.**

Tip – If you are not sure how to respond to a particular value, you can accept the default and make changes at another time when the OS is running.

Note – You will be prompted to confirm the configuration multiple times. You will be able to change parameter values if desired at each of these confirmation points.

---

9. **(Optional) Deploy the server for its intended use.**

   Once the server has been configured and you have changed the default password, the server is ready for normal use.

Related Information

- "Connect a Terminal or Emulator to the SER MGT Port" on page 52
- "Connecting Cables" on page 39
- "Assign a Static IP Address to the SP" on page 55

▼ Verify Functionality

- **After powering on the system for the first time, use the Sun Validation Test Suite (Sun VTS) software to verify the functionality and performance of the system, including network connections.**

  Refer to the Sun VTS documentation for instructions on running these test utilities, available at:

  `http://www.oracle.com/pls/topic/lookup?ctx=OracleVTS7.0`

Assigning a Static IP Address to the SP

- "Assign a Static IP Address to the SP" on page 55
- "Oracle Solaris OS Configuration Parameters" on page 57

▼ Assign a Static IP Address to the SP

If the network your server is connected to does not support DHCP for IP addressing, perform the following procedure to update the OS configuration to static IP addressing and to assign a static IP address to the SP.

1. Set the SP to accept a Static IP Address.

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

2. Set the IP address for the SP.

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

3. Set the IP address for the SP gateway.

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

4. **Set the netmask for the SP.**

```
-> 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.

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

```
-> show /SP/network
  /SP/network
     Targets:
         interconnect
         ipv6
         test

     Properties:
         commitpending = (Cannot show property)
         dhcp_server_ip = none
         ipaddress = xxx.xxx.xxx.xxx
         ipdiscovery = static
         ipgateway = xxx.xxx.xxx.xxx
         ipnetmask = 255.255.252.0
         macaddress = xx:xx:xx:xx:xx:xx
         pendingipaddress = xxx.xxx.xxx.xxx
         pendingipdiscovery = static
         pendingipgateway = xxx.xxx.xxx.xxx
         pendingipnetmask = 255.255.255.0
         sidebandmacaddress = xx:xx:xx:xx:xx:xx
         state = enabled
     Commands:
         cd
         set
         show
->
```

6. **Commit the changes to the SP network parameters.**

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

Note – You can run the `show /SP/network` command again (after performing the `set /SP/network commitpending=true` command) to verify that the parameters have been updated.

Related Information

- "Power On the Server for the First Time" on page 53

Oracle Solaris OS Configuration Parameters

When configuring the Oracle Solaris OS, you will be prompted for the following configuration parameters. For more information about these settings, refer to the Oracle Solaris documentation.

Parameter	Description
Language	Select a number from the displayed languages list.
Locale	Select a number from the displayed locale list.
Terminal Type	Select a terminal type that corresponds with your terminal device.
Network?	Select Yes.
Multiple Network Interfaces	Select the network interfaces that you plan to configure. If you are not sure, select the first one in the list.
DHCP?	Select Yes or No according to your network environment.
Host Name	Type the host name for the server.
IP Address	Type the IP address for this Ethernet interface.
Subnet?	Select Yes or No according to your network environment.
Subnet Netmask	If your answer to Subnet? was Yes, type the netmask for the subnet for your network environment.
IPv6?	Specify whether or not to use IPv6. If you are not sure, select No to configure the Ethernet interface for IPv4.
Security Policy	Select either standard UNIX security (no) or Kerberos Security (Yes). If you are not sure, select No.
Confirm	When prompted with this, review the onscreen information and change it if needed. Otherwise, continue.
Name Service	Select the name service according to your network environment. Note – If you select a name service other than None, you will be prompted for additional name service configuration information.

Parameter	Description
NFSv4 Domain Name	Select the type of domain name configuration according to your environment. If you are not sure, select `Use the NFSv4 domain derived by the system`.
Time Zone (Continent)	Select your continent.
Time Zone (Country or Region)	Select your country or region.
Time Zone	Select the time zone.
Date and Time	Accept the default date and time, or change the values.
`root` Password	Type the `root` password twice. This password is for the superuser account for the Oracle Solaris OS on this server. This password is not the SP password.

Related Information

- "Oracle ILOM System Console" on page 51
- "Connect a Terminal or Emulator to the SER MGT Port" on page 52
- "Power On the Server for the First Time" on page 53

Glossary

A

ANSI SIS American National Standards Institute Status Indicator Standard.

ASF Alert standard format (Netra products only).

ASR Automatic system recovery.

AWG American wire gauge.

B

blade Generic term for server modules and storage modules. *See server module and storage module*.

blade server Server module. See *server module*.

BMC Baseboard management controller.

BOB Memory buffer on board.

C

chassis For servers, refers to the server enclosure. For server modules, refers to the modular system enclosure.

CMA Cable management arm.

CMM Chassis monitoring module. The CMM is the service processor in the modular system. Oracle ILOM runs on the CMM, providing lights out management of the components in the modular system chassis. *See Modular system and Oracle ILOM*.

CMM Oracle ILOM Oracle ILOM that runs on the CMM. *See Oracle ILOM*.

D

DHCP Dynamic Host Configuration Protocol.

disk module or disk blade Interchangeable terms for storage module. *See storage module*.

DTE Data terminal equipment.

E

EIA Electronics Industries Alliance.

ESD Electrostatic discharge.

F

FEM Fabric expansion module. FEMs enable server modules to use the 10GbE connections provided by certain NEMs. *See NEM*.

FRU Field-replaceable unit.

H

HBA Host bus adapter.

host The part of the server or server module with the CPU and other hardware that runs the Oracle Solaris OS and other applications. The term *host* is used to distinguish the primary computer from the SP. *See SP*.

I

ID PROM Chip that contains system information for the server or server module.

IP Internet Protocol.

K

KVM Keyboard, video, mouse. Refers to using a switch to enable sharing of one keyboard, one display, and one mouse with more than one computer.

L

LwA Sound power level.

M

MAC Machine access code.

MAC address Media access controller address.

Modular system The rackmountable chassis that holds server modules, storage modules, NEMs, and PCI EMs. The modular system provides Oracle ILOM through its CMM.

MSGID Message identifier.

N

name space Top-level Oracle ILOM CMM target.

NEBS Network Equipment-Building System (Netra products only).

NEM Network express module. NEMs provide 10/100/1000 Mbps Ethernet, 10GbE Ethernet ports, and SAS connectivity to storage modules.

NET MGT Network management port. An Ethernet port on the server SP, the server module SP, and the CMM.

NIC Network interface card or controller.

NMI Nonmaskable interrupt.

O

OBP OpenBoot PROM.

Oracle ILOM Oracle Integrated Lights Out Manager. Oracle ILOM firmware is preinstalled on a variety of Oracle systems. Oracle ILOM enables you to remotely manage your Oracle servers regardless of the state of the host system.

Oracle Solaris OS Oracle Solaris operating system.

P

PCI Peripheral component interconnect.

PCI EM PCIe ExpressModule. Modular components that are based on the PCI Express industry-standard form factor and offer I/O features such as Gigabit Ethernet and Fibre Channel.

POST Power-on self-test.

PROM Programmable read-only memory.

PSH Predictive self healing.

Q

QSFP Quad small form-factor pluggable.

R

REM RAID expansion module. Sometimes referred to as an HBA *See HBA*. Supports the creation of RAID volumes on drives.

S

SAS Serial attached SCSI.

SCC System configuration chip.

SER MGT Serial management port. A serial port on the server SP, the server module SP, and the CMM.

server module Modular component that provides the main compute resources (CPU and memory) in a modular system. Server modules might also have onboard storage and connectors that hold REMs and FEMs.

SP Service processor. In the server or server module, the SP is a card with its own OS. The SP processes Oracle ILOM commands providing lights out management control of the host. *See host*.

SSD Solid-state drive.

SSH Secure shell.

storage module Modular component that provides computing storage to the server modules.

T

TIA Telecommunications Industry Association (Netra products only).

Tma Maximum ambient temperature.

U

UCP Universal connector port.

UI User interface.

UL Underwriters Laboratory Inc.

US. NEC United States National Electrical Code.

UTC Coordinated Universal Time.

UUID Universal unique identifier.

W

WWN World wide name. A unique number that identifies a SAS target.

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