

SPARC T3-1 Server

Installation Guide



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Using This Documentation

This installation guide provides instructions, background information, and reference material to help you install Oracle's SPARC T3-1 Server.

- [“Related Documentation” on page vii](#)
- [“Feedback” on page viii](#)
- [“Support and Accessibility” on page viii](#)

Related Documentation

Documentation	Links
All Oracle products	http://www.oracle.com/documentation
Oracle Solaris OS and other systems software	http://www.oracle.com/technetwork/indexes/documentation/index.html#sys_sw http://www.oracle.com/technetwork/indexes/documentation/#sys_sw
Oracle Integrated Lights Out Manager (ILOM) 3.0	http://www.oracle.com/pls/topic/lookup?ctx=ilom30
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

Preparing for the Installation

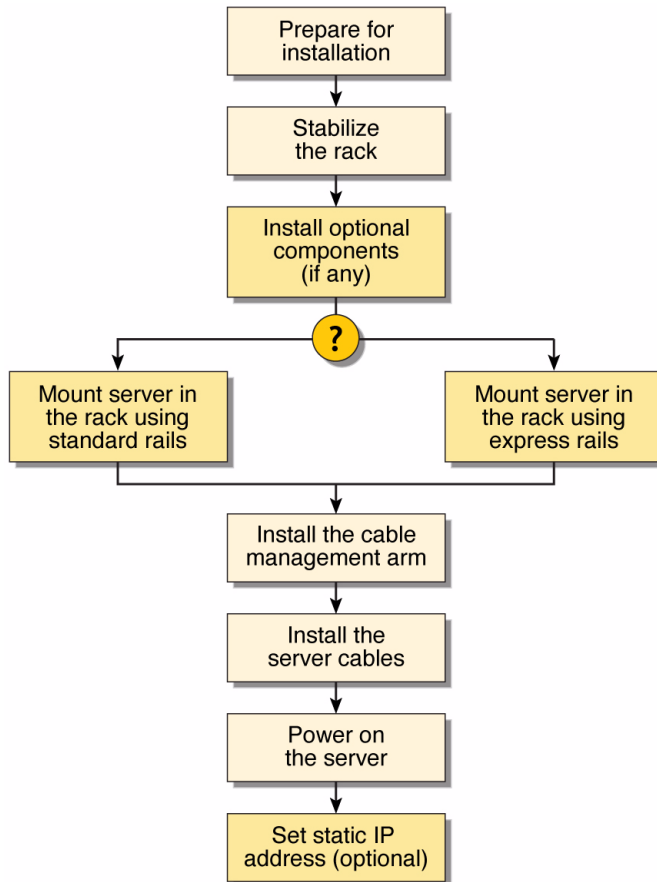
This chapter provides background information about the installation procedures for the server. This chapter contains these topics:

- “Installation Task Overview” on page 1
- “Server Overview” on page 2
- “Server Specifications” on page 4
- “Front Panel Components” on page 12
- “Front Panel System LEDs and Buttons” on page 14
- “Rear Panel Components” on page 17
- “Rear Panel System LEDs and Button” on page 18
- “Server Handling Precautions” on page 19
- “ESD Precautions” on page 20
- “Tools Needed for Installation” on page 21
- “Optional Component Installation” on page 21

Installation Task Overview

The following diagram illustrates the main server installation tasks and the order in which they are performed.

FIGURE: Server Installation Task Flowchart



Server Overview

The server is a rack-mountable system with a 2RU form-factor.

FIGURE: SPARC T3-1 Server



The following list identifies the items that comprise the server's base configuration:

- 2 RU system enclosure with rack-mount slide hardware.
- Motherboard with a service processor, two embedded RAID 0, 1, and 1E hard drive controllers, system configuration PROM, and other system infrastructure components.
- Memory slots for up to sixteen DDR3 memory modules.
- A hard drive enclosure with 8 or 16 drive bays and a corresponding connector backplane that can support either 8 or 16 hard disk drives (HDDs).
- An optical disk drive that fits into the hard drive enclosure and plugs into the disk backplane.
- Six fan modules (two fans per module).
- One or two power supplies and associated power distribution circuitry.
- I/O interface assembly to support up to six PCIe expansion modules. Two slots may be used by XAUI modules.

Related Information

- ["Front Panel Components" on page 12](#)
- ["Front Panel System LEDs and Buttons" on page 14](#)

- [“Rear Panel Components” on page 17](#)
- [“Rear Panel System LEDs and Button” on page 18](#)

Server Specifications

This section contains physical and environmental specifications for the server.

- [“Physical Specifications” on page 4](#)
- [“Minimum Clearance for Service Access” on page 5](#)
- [“Environmental Specifications” on page 6](#)
- [“Input Power Overview” on page 7](#)
- [“Acoustic Noise Emissions” on page 10](#)
- [“Agency Compliance Specifications” on page 10](#)
- [“Operating Environment Requirements” on page 11](#)
- [“Airflow Considerations” on page 11](#)

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 16 HDDs, but without PCI cards and rackmount hardware)	60 lb	27.2 kg

Related Information

- [“Minimum Clearance for Service Access” on page 5](#)

Minimum Clearance for Service Access

TABLE: Minimum Clearances Needed

Description	Clearance
Clearance, front of system	36 in. (91 cm)
Clearance, rear of system	36 in. (91 cm)

Related Information

- [“Physical Specifications” on page 4](#)

Environmental Specifications

TABLE: Environmental Specifications

Specification	Operating	Nonoperating	Notes
Temperature	<ul style="list-style-type: none"> Sea level to 2953 ft (900 m): 41°F to 95°F (5°C to 35°C) Above 2953 ft (900 m): Decrease the maximum allowable temperature by 1.6°F/1000 ft (1°C/300m) 	-40° F to 149° F (-40° C to 65° C) IEC 60068-2-1 Test Ab and 60068-2-2 Test Bb	An ambient temperature range of 21°C (69.8°F) to 23°C (73.4°F) is optimal 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.
	IEC 60068-2-1 Test Ad, and 60068-2-2 Test Bd		
Relative Humidity	10 to 90% RH, 27°C maximum wet bulb (noncondensing)	93% RH, 35°C maximum wet bulb (noncondensing)	Ambient relative humidity levels between 45% and 50% are the most suitable for data processing operations in order to: <ul style="list-style-type: none"> Prevent corrosion Provide an operating time buffer in the event of environmental control system failure Help avoid failures caused by the intermittent interference from static discharges that occur when relative humidity is too low Electrostatic discharge (ESD) is easily generated and less easily dissipated in areas where the relative humidity is below 35%, and becomes critical when levels drop below 30%.
	IEC 60068-2-56 Test Cb	IEC 60068-2-56 Test Cb	

TABLE: Environmental Specifications (*Continued*)

Specification	Operating	Nonoperating	Notes
Maximum Altitude	10,000 ft (3,000m)	40,000 ft (12,000 m)	
	IEC 60068-2-13 Test M, and 60068-2-41 Test Z/BM	IEC 60068-2-13 Test M	
Vibration	0.15 G (x-axis)	0.5 G (x-axis)	
	0.10 G (x-, y-axes), 5-500 Hz swept sine	0.25 G (x-, y-axis), 5-500 Hz swept sine	
Shock	IEC 60068-2-6 Test Fc	IEC 60068-2-6 Test Fc	
	3 Gs, 11 ms half-sine	<ul style="list-style-type: none">Roll-off: 1-inch roll-off free fall, front to back rolling direction	
	IEC 60068-2-27 Test Ea	<ul style="list-style-type: none">Threshold: 25 mm threshold height at 0.75 m/s impact velocity	
ETE-1010-02 Rev A			

Related Information

- [“Server Specifications” on page 4](#)

Input Power Overview

The SPARC T3-1 server can be equipped with one or two autoranging power supplies. They have the following input power requirements:

Specification	Values
System rating	100Vac, 13A max, 50/60 Hz
	110-127Vac, 12A max, 50/60 Hz
	200-240Vac, 7A max, 50/60 Hz

To ensure redundant operation of the power supplies, connect the two power cords to separate circuits.

Tip – Do not connect the power supply cables before you connect a terminal device to the server. As soon as a power source is applied to the server, the service processor performs an initialization routine, which generates messages. If you do not have a terminal connected to the system before this starts, you will not see the initialization messages.

Related Information

- [“Server Specifications” on page 4](#)

Guidelines for Planning Power Requirements

Use the following specifications only as a planning guide. For more precise power values, make power measurements on your specific server configuration using your planned workload. Refer to one of the following tables based on the model of your server.

TABLE: SPARC T3-1 Server (8-Disk Capacity) Power Specifications

General Specifications	Values
Operating input voltage range (input voltage tolerance +/- 10%)	100 to 240 VAC, 50-60 Hz
Maximum operating input current at 100 VAC	8.4 A
Maximum operating input current at 200 VAC	4.2 A
Maximum operating input power at 100 VAC	800 W
Maximum operating input power at 200 VAC	792 W
Maximum heat dissipation	2730 BTU/hour (2880 KJ/hour) 2702 BTU/hour (2851 KJ/hour)
Maximum standby power	30 W
Inrush current (peak)	25 A
Leakage current	1.6 mA
Maximum Server Configuration Specifications	
Under Nominal Temperature and Voltage Conditions (16 core, 1.6 GHz processor, with sixteen 8 GB DIMMs, 8 HDDs, 6 PCIe I/O cards)	
Idle input power	416 W

TABLE: SPARC T3-1 Server (8-Disk Capacity) Power Specifications *(Continued)*

Peak input power running SpecJBB	582 W
Minimum Server Configuration Specifications Under Nominal Temperature and Voltage Conditions (16 core, 1.6 GHz processor, with four 2 GB DIMMs, 1 HDD, no PCIe I/O cards)	
Idle input power	290 W
Peak input power running SpecJBB	352 W

TABLE: SPARC T3-1 Server (16-Disk Capacity) Power Specifications

General Specifications	Values
Operating input voltage range (input voltage tolerance +/- 10%)	100 to 240 VAC, 50-60 Hz
Maximum operating input current at 100 VAC	9.4 A
Maximum operating input current at 200 VAC	4.7 A
Maximum operating input power at 100 VAC	896 W
Maximum operating input power at 200 VAC	888 W
Maximum heat dissipation at 100 VAC	3057 BTU/hour (3226 KJ/hour)
Maximum heat dissipation at 200 VAC	3030 BTU/hour (3197 KJ/hour)
Maximum standby power	30 W
Inrush current (peak)	25 A
Leakage current	1.6 mA
Maximum Server Configuration Specifications Under Nominal Temperature and Voltage Conditions (16 core, 1.6 GHz processor, with sixteen 8 GB DIMMs, 16 HDDs, 6 PCIe I/O cards)	
Idle input power	494 W
Peak input power running SpecJBB	678 W
Minimum Server Configuration Specifications Under Nominal Temperature and Voltage Conditions (16 core, 1.6 GHz processor, with four 2 GB DIMMs, 1 HDD, no PCIe I/O cards)	
Idle input power	297 W
Peak input power running SpecJBB	359 W

Notes:

- The maximum operating input = {Max op input power} / Vac / 0.95 (for PSU PFC)
- $W(AC) = W(DC) / 0.90$ (for PSU efficiency)
- HDD power: 10W (DC) while busy (budgeted), 8W idle
- PCIe card pwer: 17W (DC) while busy (budgeted), 5W (DC) idle

Related Information

- [“Server Specifications” on page 4](#)

Acoustic Noise Emissions

Declared noise emissions for the SPARC T3-1 server are in accordance with ISO 9296 standards.

TABLE: Acoustic Noise Emissions for the SPARC T3-1 Server

Description	Mode	Specification
LwAd	Operating acoustic noise	7.1 B*
LpAm	Operating acoustic noise (bystander positions)	63 dB

* 1 B = 10 dB

Related Information

- [“Server Specifications” on page 4](#)

Agency Compliance Specifications

Refer to the *SPARC T3-1 Server Safety and Compliance Guide* for a full list of agency compliance specifications.

Related Information

- [“Server Specifications” on page 4](#)

Operating Environment Requirements

Your environmental control system must provide intake air for the servers that complies with the limits specified in [“Environmental Specifications” on page 6](#).

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

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

Note – When you receive your 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.

The servers have been tested to meet all functional requirements when operating in the operating environmental limits presented [“Environmental Specifications” on page 6](#). Operating computer equipment in extremes of temperature or humidity increases the failure rate of hardware components. To minimize the chance of component failure, use the server within the optimal temperature and humidity ranges.

Related Information

- [“Airflow Considerations” on page 11](#)
- [“Minimum Clearance for Service Access” on page 5](#)

Airflow Considerations

Proper airflow into and out of the server is essential for keeping the server’s internal temperatures within a safe operating range.

- 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 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 system 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

- [“Operating Environment Requirements” on page 11](#)
- [“Minimum Clearance for Service Access” on page 5](#)

Front Panel Components

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

FIGURE: Components on the Server Front Panel (Eight-Disk Backplane Configuration)

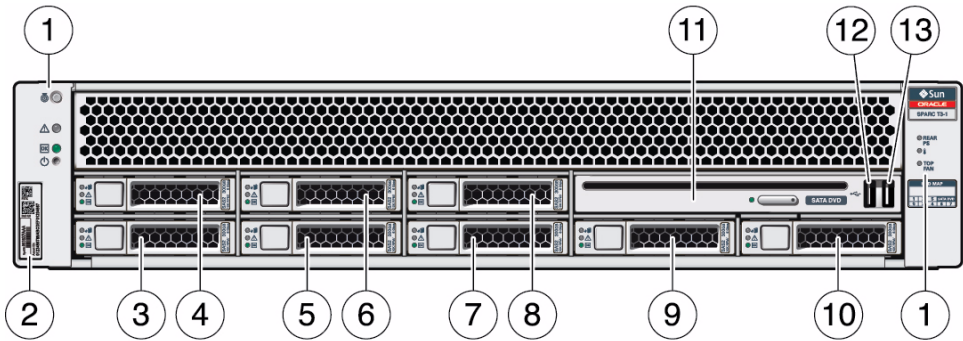


Figure Legend

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		

FIGURE: Components on the Server Front Panel (Sixteen-Disk Backplane Configuration)

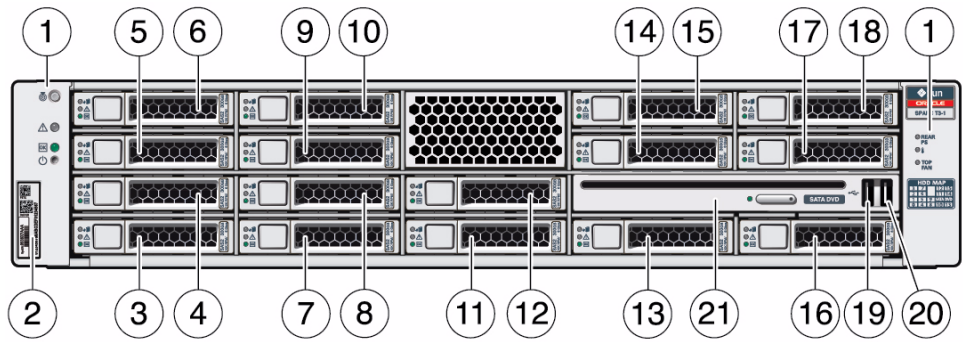


Figure Legend

1	System controls and indicators	12	Hard drive HDD9
2	RFID tag	13	Hard drive HDD10
3	Hard drive HDD0	14	Hard drive HDD11
4	Hard drive HDD1	15	Hard drive HDD12
5	Hard drive HDD2	16	Hard drive HDD13
6	Hard drive HDD3	17	Hard drive HDD14

Figure Legend *(Continued)*

7	Hard drive HDD4	18	Hard drive HDD15
8	Hard drive HDD5	19	USB port 2
9	Hard drive HDD6	20	USB port 3
10	Hard drive HDD7	21	SATA DVD module
11	Hard drive HDD8		

Related Information

- [“Server Overview” on page 2](#)
- [“Front Panel System LEDs and Buttons” on page 14](#)
- [“Rear Panel Components” on page 17](#)
- [“Rear Panel System LEDs and Button” on page 18](#)

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

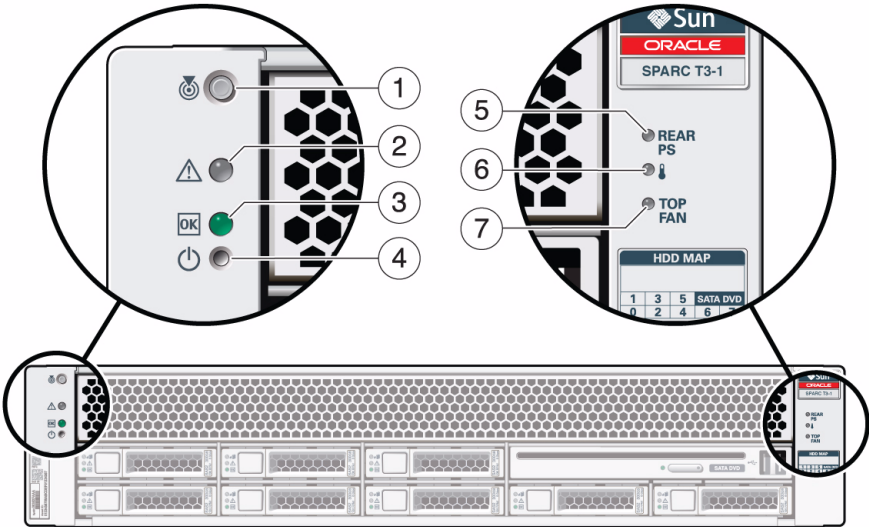







Figure Legend

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 rapidly. There are two methods for turning a Locator LED on: <ul style="list-style-type: none">• Issuing the Oracle ILOM command <code>set /SYS/LOCATE value=Fast_Blink</code>• 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: <ul style="list-style-type: none">• Off – System is not running in its normal state. System power might be off. The service processor 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 – Service processor is booting.
Power button		The recessed Power button toggles the system on or off. <ul style="list-style-type: none">• 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

- [“Server Overview” on page 2](#)
- [“Front Panel Components” on page 12](#)
- [“Rear Panel Components” on page 17](#)
- [“Rear Panel System LEDs and Button” on page 18](#)

Rear Panel Components

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

FIGURE: Components on the Server Rear Panel

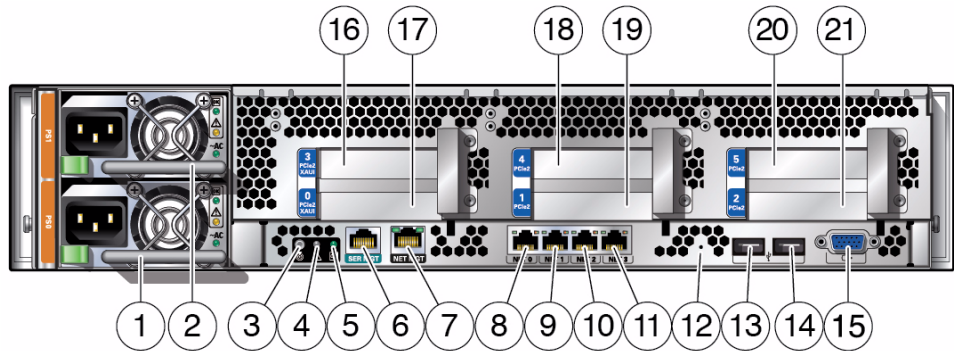


Figure Legend

1 Power supply 0	12 Hole for pressing the 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

- [“Server Overview” on page 2](#)
- [“Front Panel Components” on page 12](#)
- [“Front Panel System LEDs and Buttons” on page 14](#)
- [“Rear Panel System LEDs and Button” on page 18](#)

Rear Panel System LEDs and Button

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

FIGURE: Rear Panel System LEDs

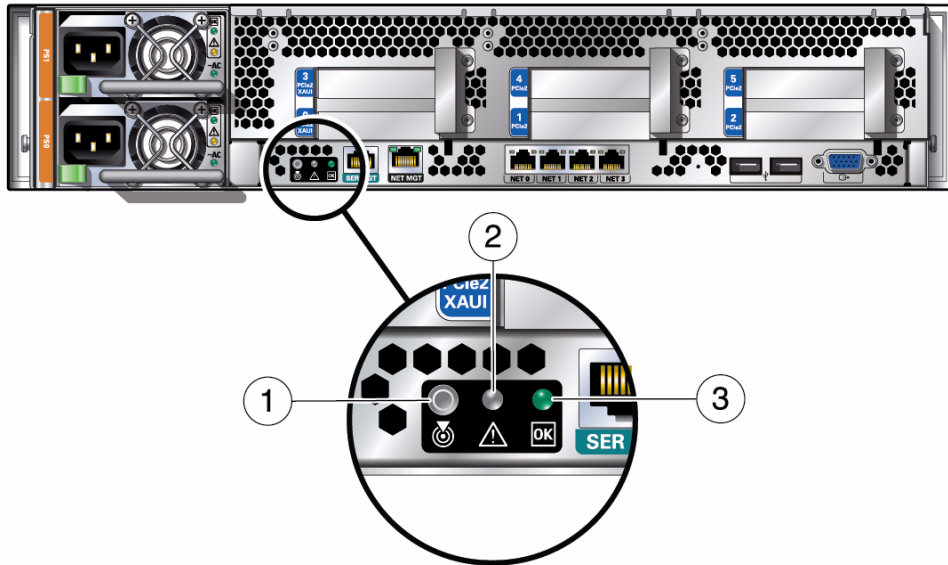





Figure Legend

- | | | | |
|---|------------------------------|---|--------------|
| 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 rapidly. There are two methods for turning a Locator LED on: <ul style="list-style-type: none">• Issuing the Oracle ILOM command <code>set /SYS/LOCATE value=Fast_Blink</code>• 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: <ul style="list-style-type: none">• Off – System is not running in its normal state. System power might be off. The service processor 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 – Service processor is booting.

Related Information

- [“Server Overview” on page 2](#)
- [“Front Panel Components” on page 12](#)
- [“Front Panel System LEDs and Buttons” on page 14](#)
- [“Rear Panel Components” on page 17](#)

Server 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 20](#)

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.

Related Information

- [“Server Handling Precautions” on page 19](#)

Tools Needed for Installation

To install the system, 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 20](#)
- [“Server Handling Precautions” on page 19](#)

Optional Component Installation

Optional components that are ordered as part of the server’s initial configuration will be installed in the server before it is shipped. However, if you place a separate order for optional components, you will need to install them in the server on site. See the service manual for instructions on installing optional components.

Tip – If possible, install any additional components in the server before you install the server in its rack or cabinet.

Related Information

- [“Tools Needed for Installation” on page 21](#)

Installing the Server

These topics explain how to install the server in an equipment rack:

- [“Stabilize the Rack” on page 23](#)
- [“Slide Rail Assembly Overview” on page 23](#)
- [“Install the Screw-Mount Slide Rail Assemblies” on page 27](#)
- [“Install the Snap-In Slide Rail Assemblies” on page 34](#)
- [“Insert and Lock the Server in the Rack” on page 38](#)
- [“Install the Cable Management Arm” on page 40](#)
- [“Verify Correct Operation of the Slide Rails and the CMA” on page 44](#)

▼ Stabilize the Rack

Your server rack should include an anti-tilt legs that prevent the rack from tipping forward when a server is extended out of the rack.

- **Set the anti-tilt legs on the server rack before extending slide rails that are supporting a server or before installing a server on extended rails.**

See your rack’s documentation for instructions.

Slide Rail Assembly Overview

The server can be installed with either of two types of rack mount kits:

- Screw-mount (tooled) rack mount kit
- Snap-in (tool-less) rack mount kit

Both kit types consist of a pair of slide rails that attach to the rack corner posts and a pair of mounting brackets that attach to the server chassis. The difference between them is that the screw-mount slide rails are attached to the rack posts using screws and the snap-in rails are attached with screwless clips.

Slide-Rail Assembly Details for the Screw-Mount Rack Mount Kit

Each screw-mount slide rail assembly consists of a three-section slide rail and a removable mounting bracket. These components can be installed on either side of the chassis.

FIGURE: Sections of the Screw-Mount Slide Rail Assembly

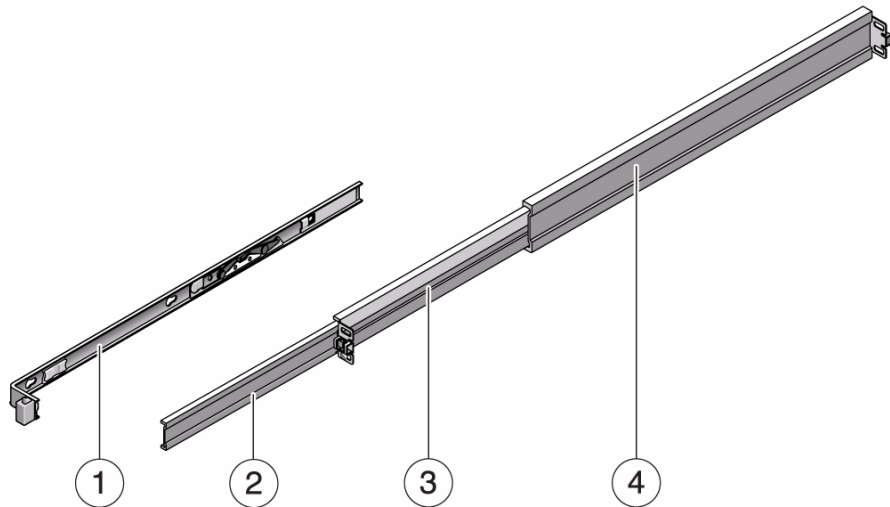


Figure Legend

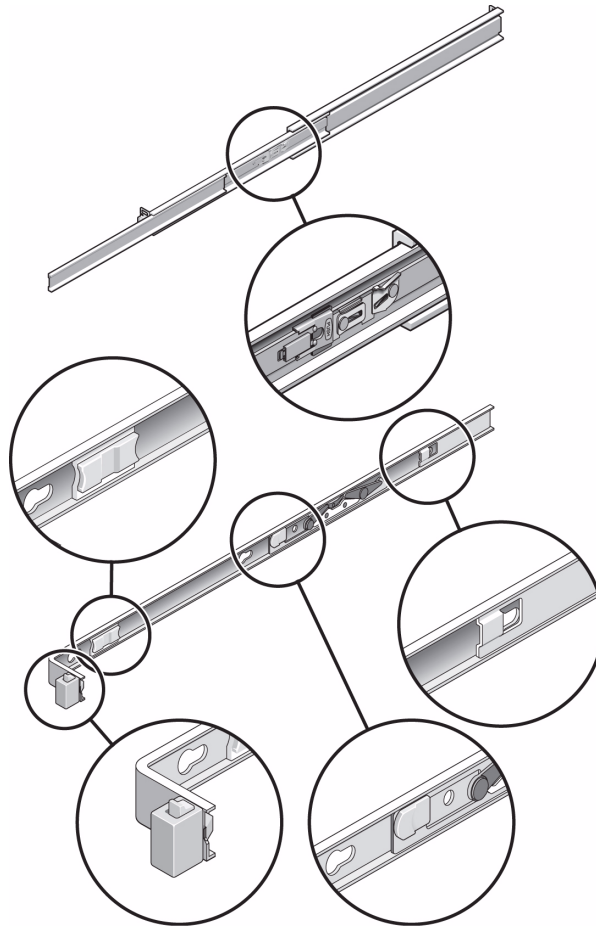
1	Mounting bracket
2	Front section
3	Middle section
4	Rear section

- The middle and rear sections have holes for attaching to the rack posts. They adjust to fit rack depths from 24 in. (61 cm) to 36.5 in. (93 cm).
- 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 operationsto be performed.

- The removable 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.

That there are five locks in a slide rail assembly. Four are on the mounting bracket. One lock is on the front section of the slide rail. The locks are described in [“Installing the Server” on page 23](#).

FIGURE: Locating the Locks on the Screw-Mount Slide Rail Assembly



Slide Rail Assembly Details for the Snap-In Rack Mount Kit

Each snap-in 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

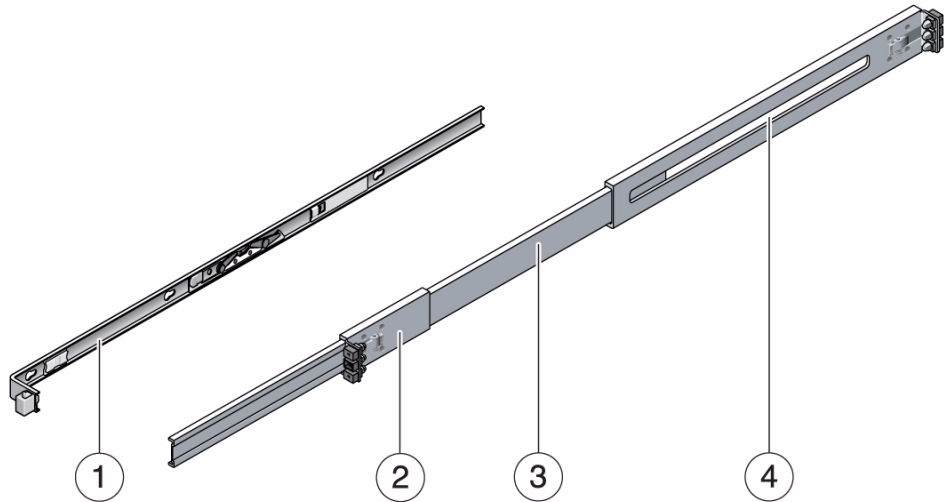


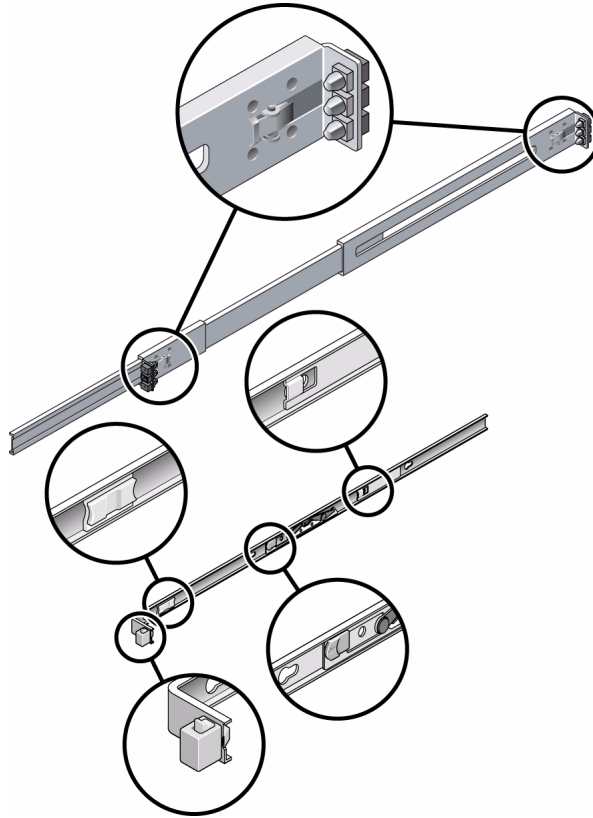
Figure Legend

-
- | | |
|---|------------------|
| 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

- [“Install the Screw-Mount Slide Rail Assemblies” on page 27](#)
- [“Install the Snap-In Slide Rail Assemblies” on page 34](#)

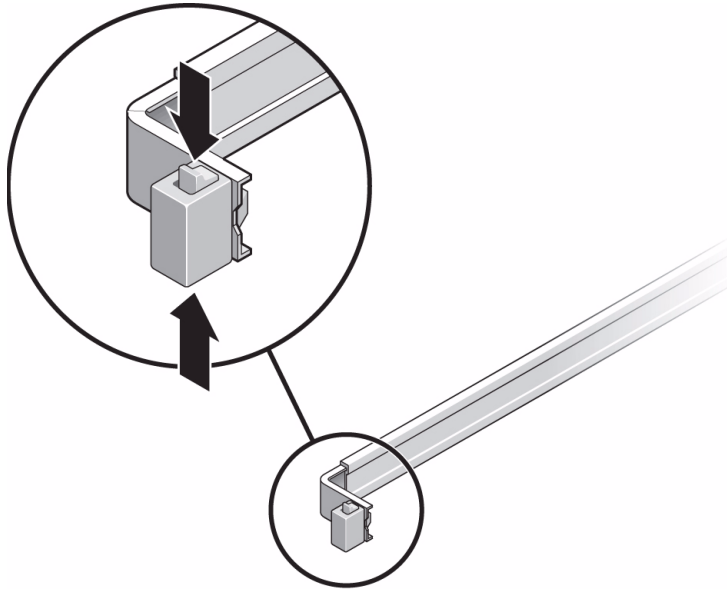
▼ Install the Screw-Mount Slide Rail Assemblies

- 1. Stabilize the rack by extending its anti-tilt legs.**

See your rack documentation for instructions.

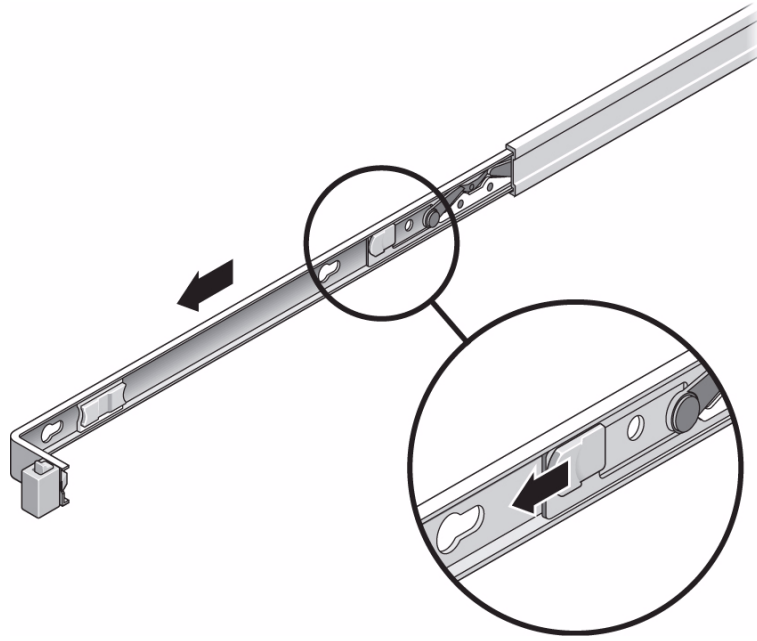
2. Pull both mounting brackets completely out of their respective slide rails.
 - a. Simultaneously press and hold the upper and lower lock buttons of the slide rail lock.

FIGURE: Unlocking the Slide Rail Assembly



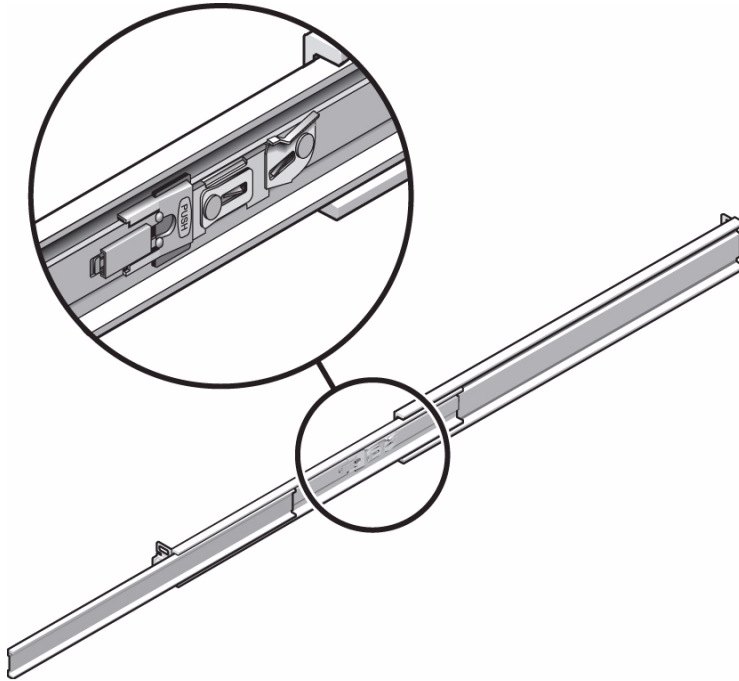
- b. Pull the mounting bracket out until it locks in the extended position.
 - c. Slide the mounting bracket release button out in the direction shown, then slide the mounting bracket out of the slide rail.

FIGURE: Location of the Mounting Bracket Release Button



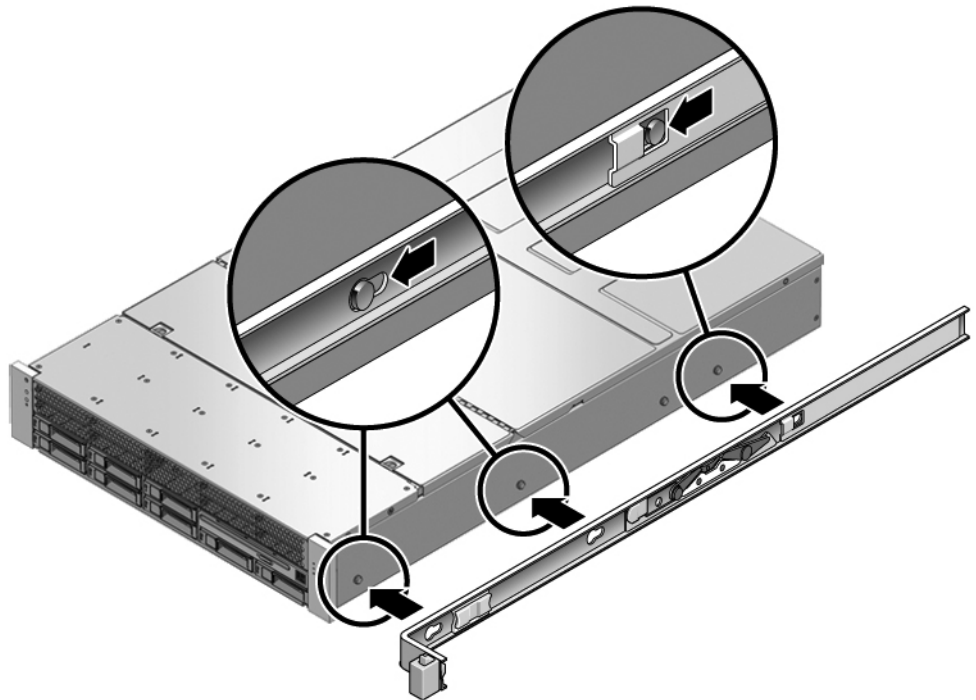
- d. Press the metal lever (labeled Push) on the middle section of the sliding rail, then push the middle section back into the rack.

FIGURE: Unlocking the Slide Rail Middle Section



3. Attach a mounting bracket to the right side of the chassis.
 - a. Position the mounting bracket against the chassis. Ensure 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: Attaching a Mounting Bracket to the Chassis

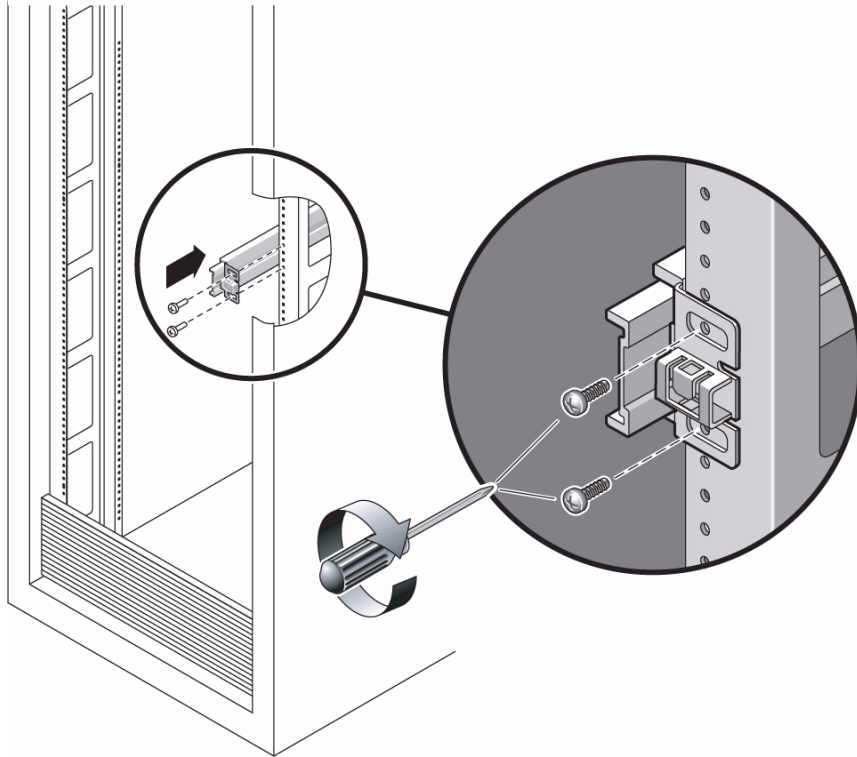


- b. Ensure that the heads of the locating pins protrude through the keyed openings in the mounting bracket. Pull the mounting bracket toward the front of the chassis until the bracket locks into place with an audible *click*.
 - c. Verify that all locating pins are trapped in the keyed openings and that the correct locating pin has engaged the mounting bracket lock.
4. Attach the second mounting bracket to the left side of the chassis.
 5. Determine which rack post holes to use for attaching the slide rails.
Use the mounting holes that are in line with the lower half of the 2U space.
 6. 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, secure the mounting screws with a caged nut.
 7. Attach a slide rail to the right front rack post.

- a. Use two screws to loosely attach the front of a slide rail to the right front rack post.

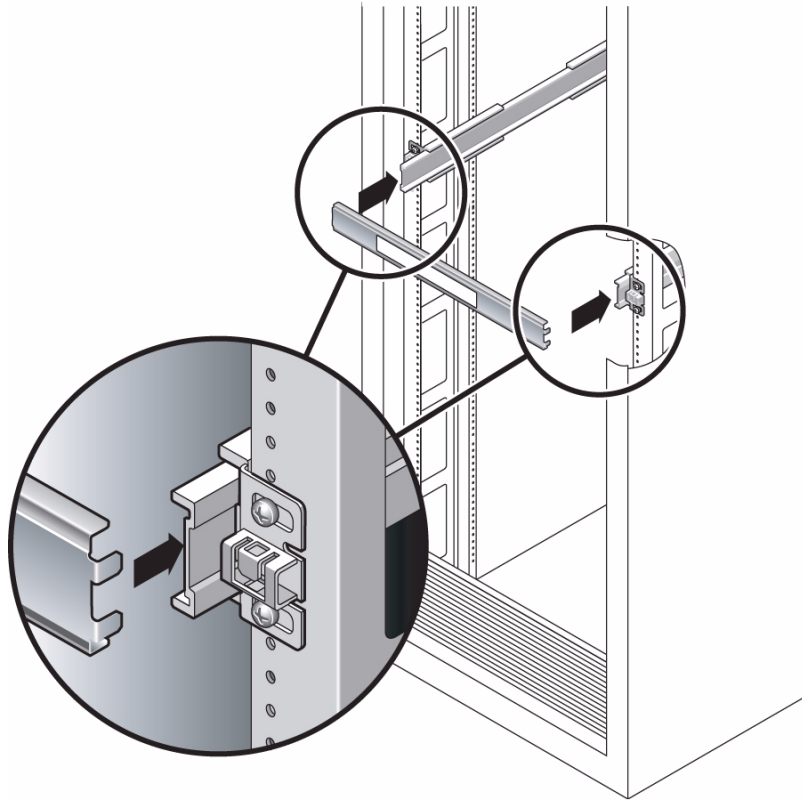
Note – Do not tighten the screws yet.

FIGURE: Mounting a Slide Rail



- b. Adjust the length of the slide rail until the rear mounting flange reaches the outside edge of the rear rack post.
 - c. Use two screws to loosely attach the rear of the slide rail to the rear rack post.
8. Attach the second slide rail to the left rack posts in a similar manner.
Do not tighten the screws.
 9. 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: Using the Slide Rail Spacing Tool to Adjust the Distance Between the Slide Rails



- 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 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.

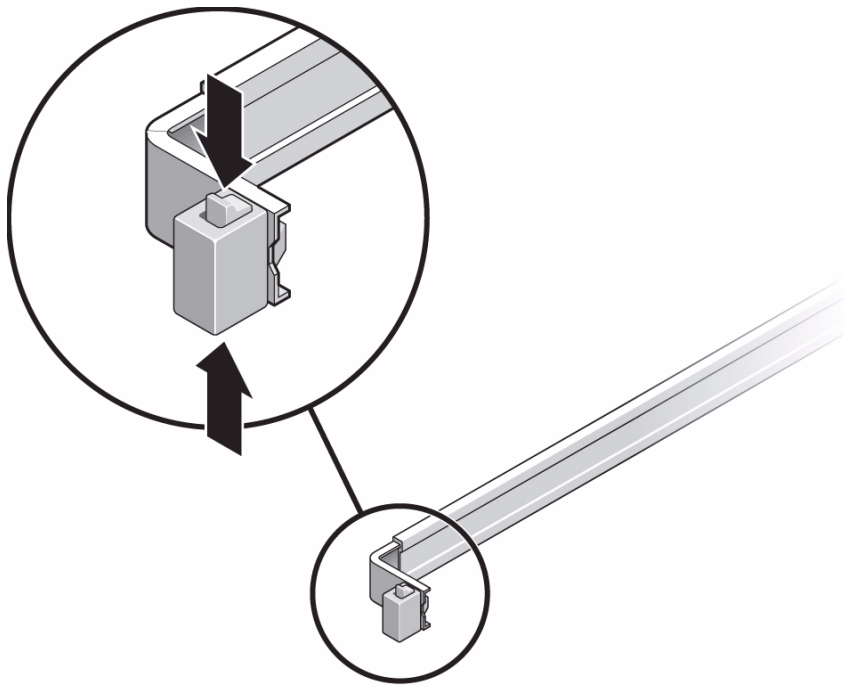
Related Information

- [“Slide Rail Assembly Overview” on page 23](#)

▼ Install the Snap-In Slide Rail Assemblies

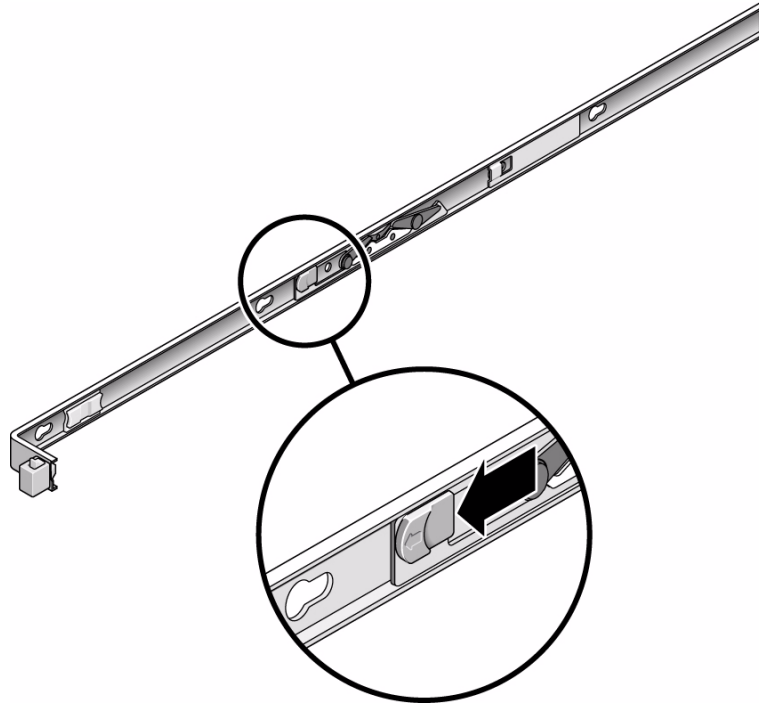
1. Pull both mounting brackets completely out of their respective slide rails.
 - a. Simultaneously press and hold the upper and lower lock buttons of the slide rail lock.

FIGURE: Unlocking the Express Rail Slide Rail Assembly



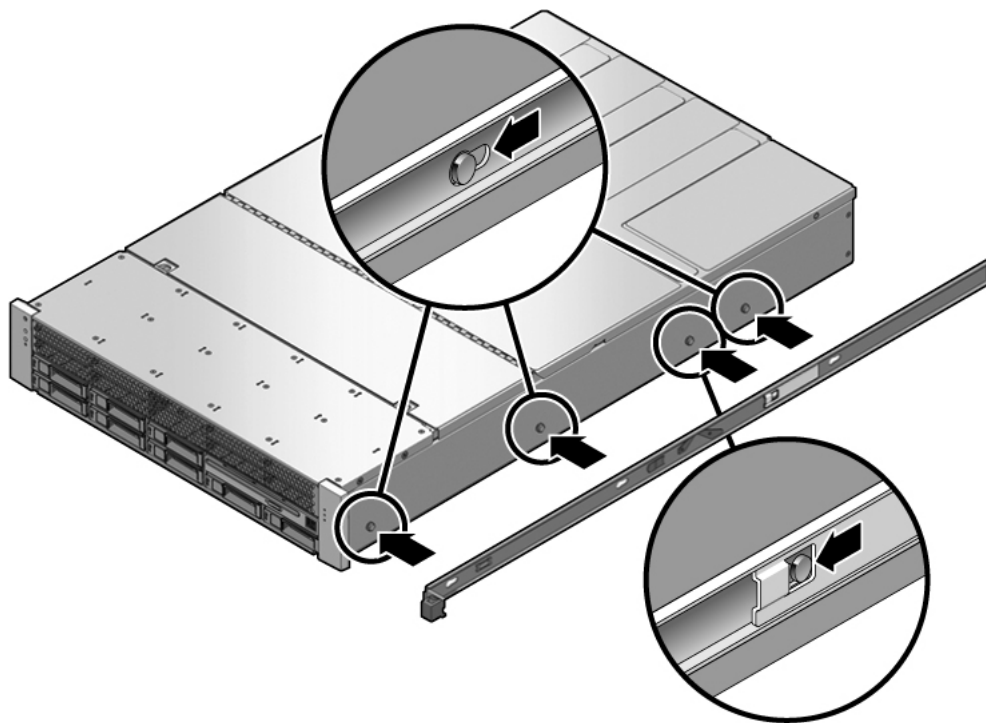
- b. Pull the mounting bracket out until it stops.
 - c. Slide the mounting bracket release button to the left, then slide the mounting bracket completely out of the slide rail.

FIGURE: Express Rail Mounting Bracket Release Button



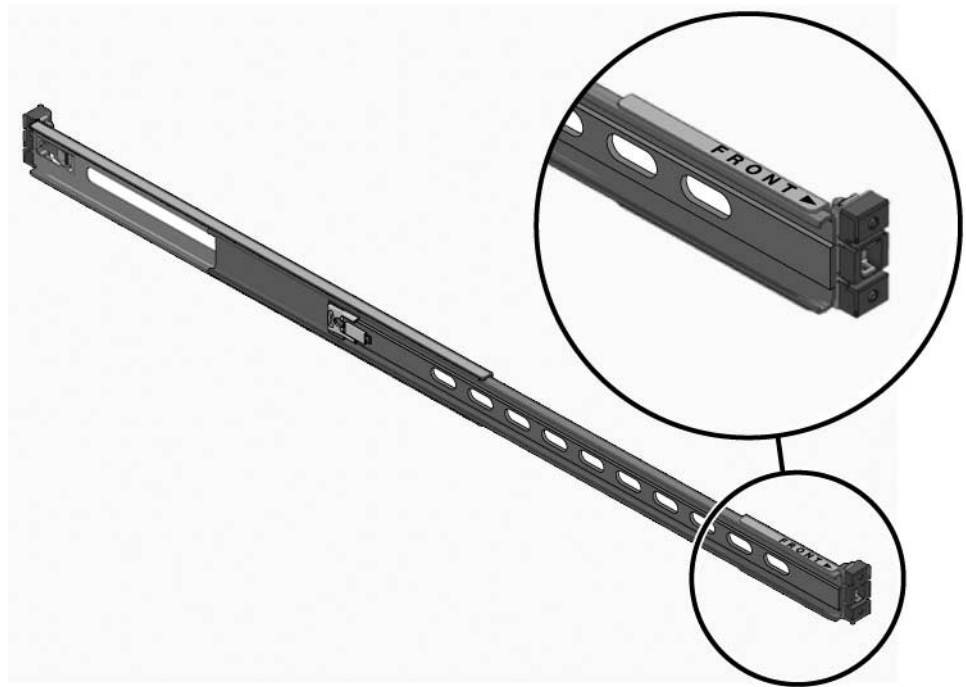
2. Attach a mounting bracket to the right side of the server chassis.
 - a. Position the mounting bracket against the chassis. Ensure that the slide rail lock is at the front and the keyed openings on the mounting bracket are aligned with the locating pins on the side of the chassis.

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.

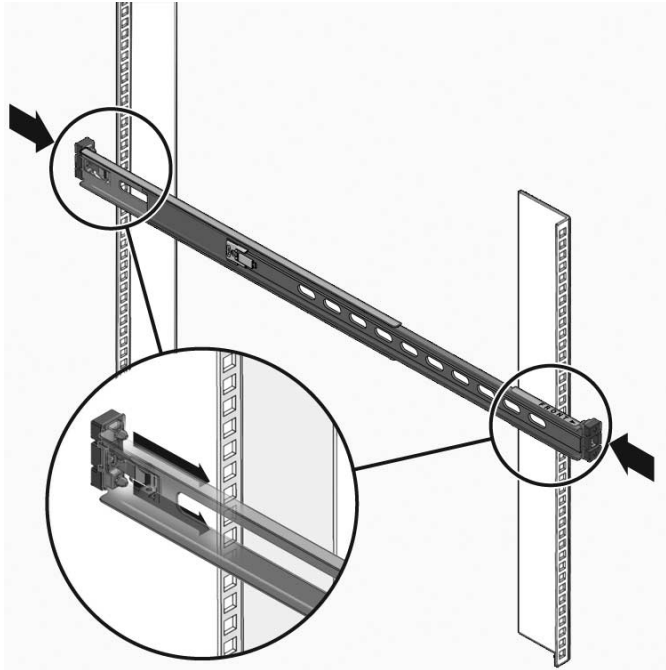
FIGURE: Express Rail Slide Rails Orientation for Installation



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

- [“Slide Rail Assembly Overview” on page 23](#)

▼ Insert and Lock the Server in the Rack

1. Insert the ends of the mounting brackets into the sliding rails.



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



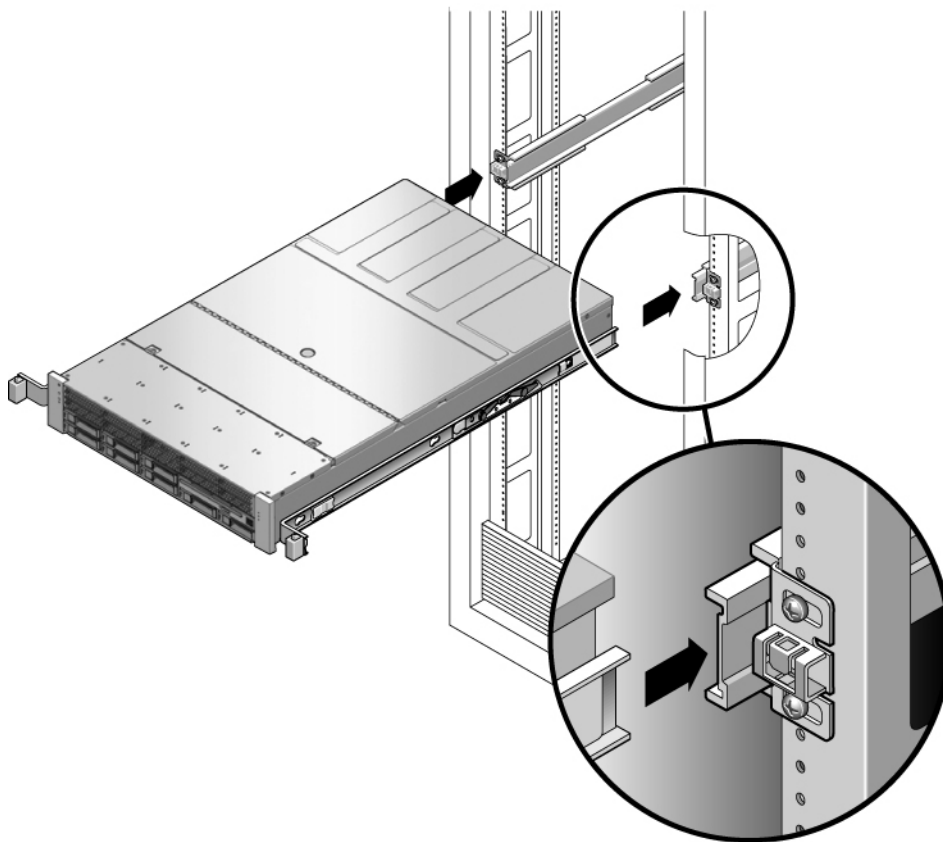
Caution – The server weighs approximately 60 lb (25 kg). Two people are required to lift and mount the server into a rack enclosure when using the procedures in this chapter.



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

2. If the chassis or rack is equipped with an antitilt bar, deploy it.
3. Slide the chassis into the rack.

FIGURE: Mounting the Chassis on the Slide Rails



Related Information

- [“Slide Rail Assembly Overview” on page 23](#)

▼ Install the Cable Management Arm



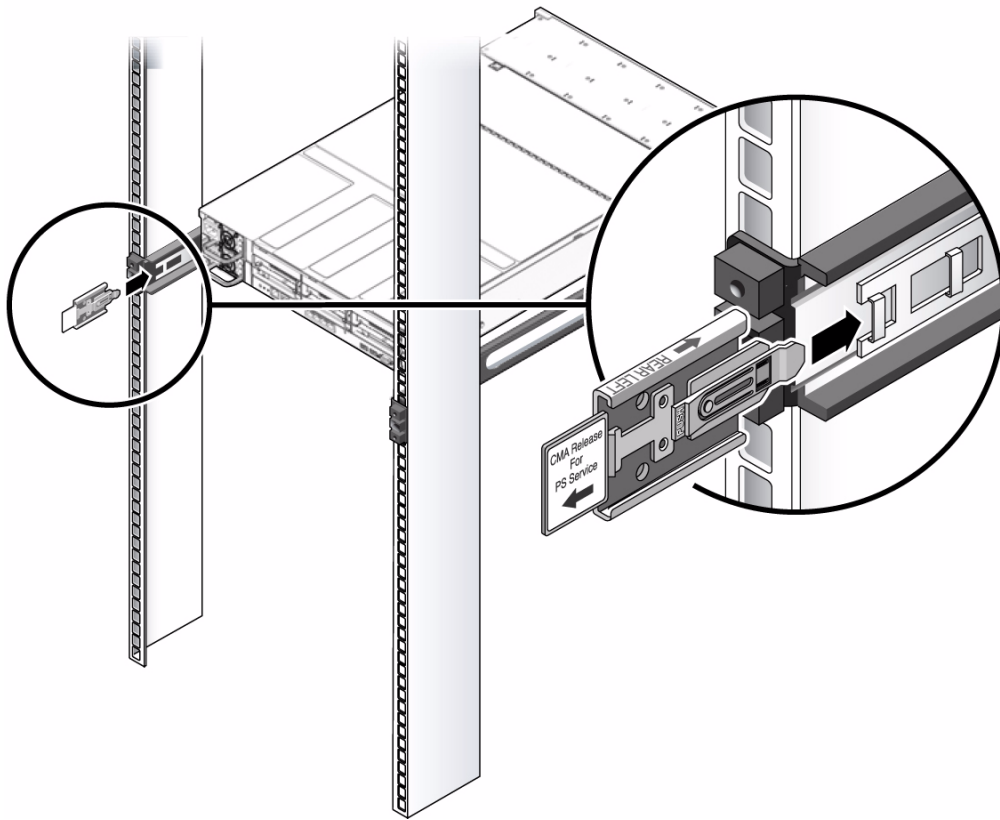
Caution – Support the CMA during this installation. Do not allow the assembly to hang by its own weight until it is secured by all three attachment points.

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.**

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

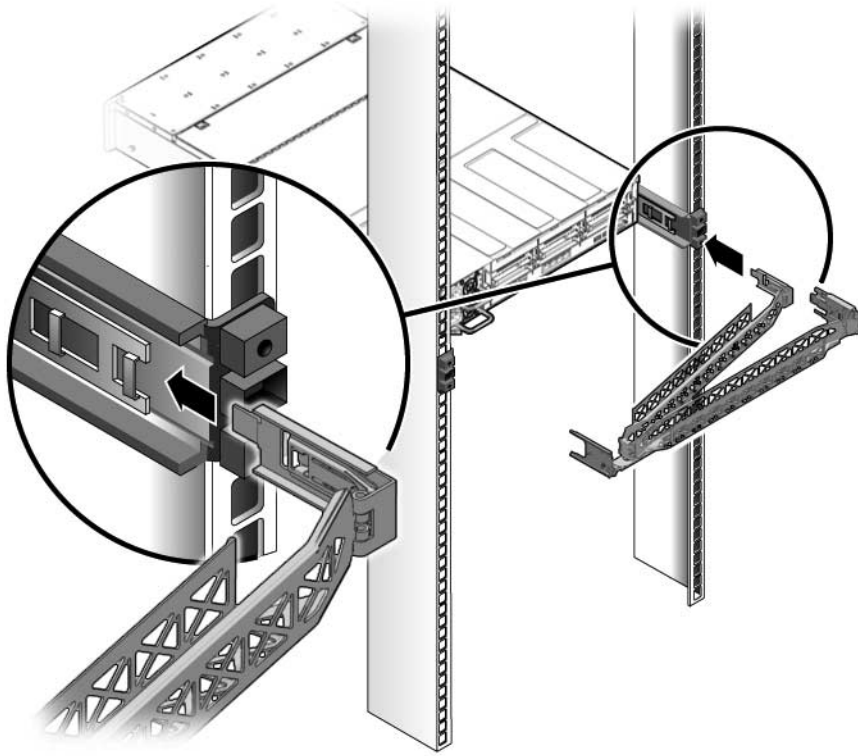


The right sides of the two CMA arms have hinged extensions. On the manufacturer's instruction sheet, the smaller extension is called the CMA Connector for Inner Member. This extension attaches to the right mounting bracket. The larger extension is called the CMA Connector for Outer Member, and attaches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

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

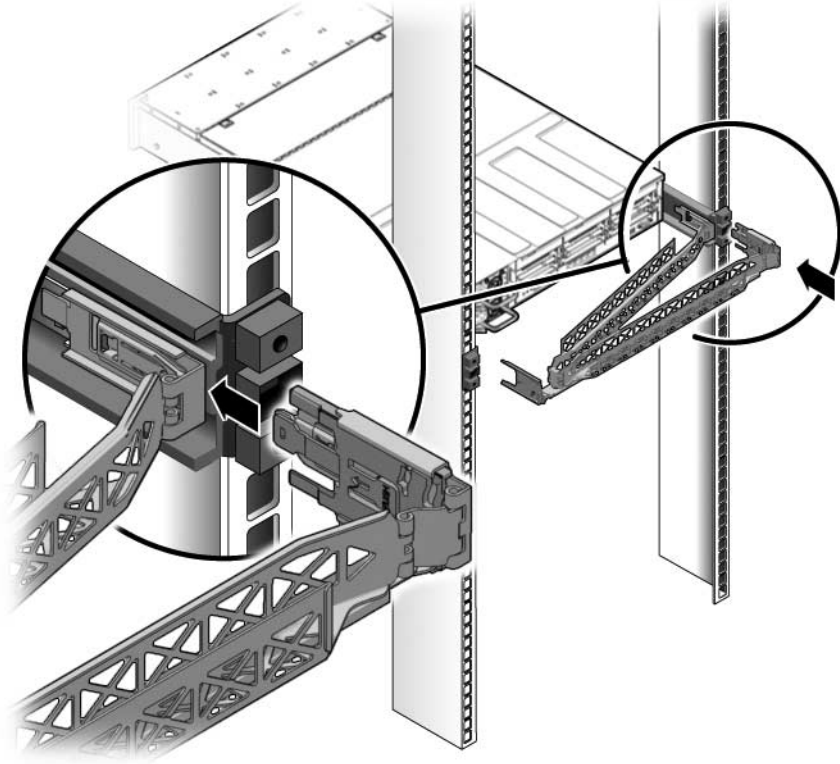
Slide the smaller extension into the square hole on the middle-in-width of the clip that is located at the end of the mounting bracket.

FIGURE: Mounting the Inner CMA Connector



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

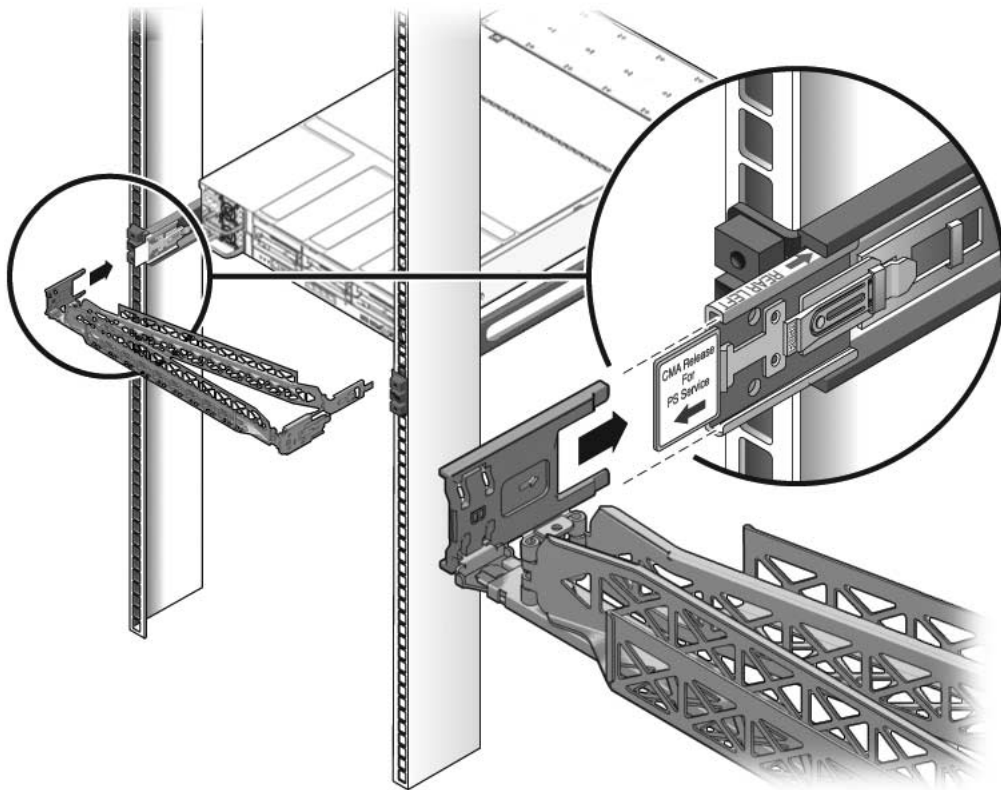
FIGURE: Attaching the Outer CMA Connector



- 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



▼ Verify Correct Operation of the Slide Rails and the CMA

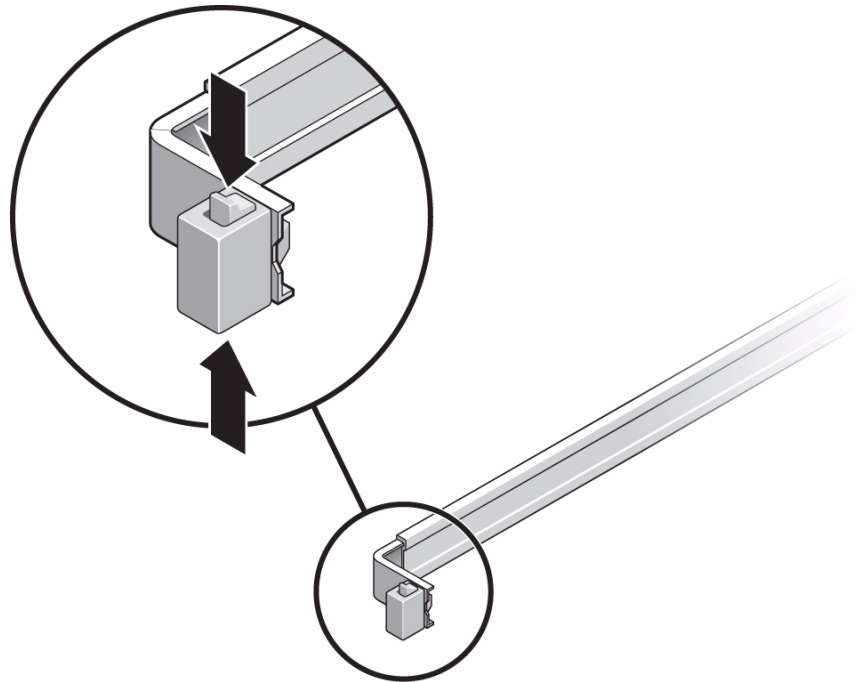
Perform this procedure both before and after you install the server cables in the CMA. Performing the procedure before the CMA contains cables helps ensure that it extends and contracts smoothly before the cables are added.

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

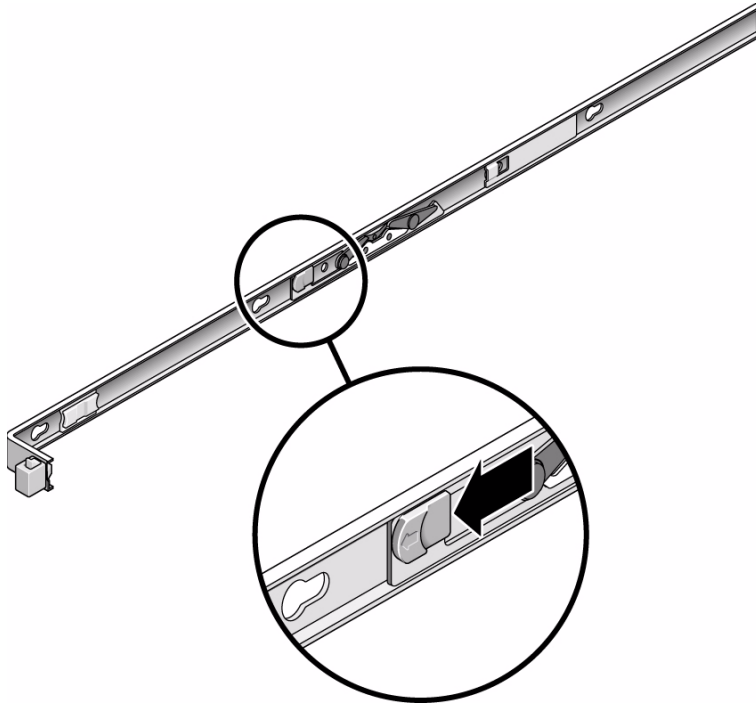


3. If the server cables have been placed inside the CMA, inspect them for binding or kinks.
4. Slowly pull the server out of the rack until the slide rails reach their stops.
5. Verify that the CMA extends fully and does not bind in the slide rails.
6. Verify that the server extends fully and locks in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

Connecting the Server Cables

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

- [“Cabling Requirements” on page 47](#)
- [“Connect the SER MGT Port Cable” on page 49](#)
- [“Connect the NET MGT Port Cable” on page 50](#)
- [“Connect the Ethernet Network Cables” on page 51](#)
- [“Connect Other I/O Cables” on page 51](#)
- [“Prepare the Power Cords” on page 52](#)
- [“Secure the Server Cables in the CMA” on page 53](#)

Cabling Requirements

Review these cabling notes before attaching cables to the server.

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

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.

- **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 Oracle ILOM service processor 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 serial management port before power is applied.

Related Information

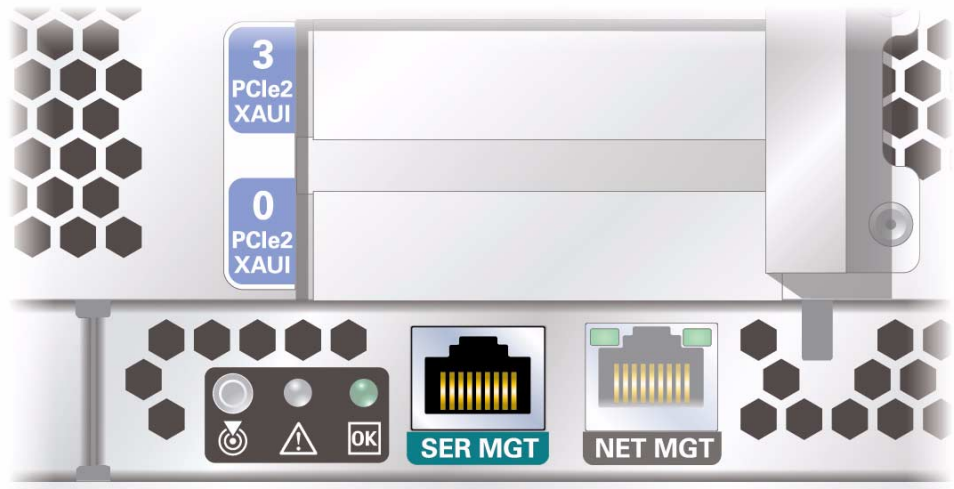
- [“Connecting the Server Cables” on page 47](#)

▼ Connect the SER MGT Port Cable

The service processor serial management port is marked SER MGT. This port is the farthest left RJ-45 port on the rear panel.

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

FIGURE: Service Processor Serial Management Port – Rear Panel



This port is needed to set up the service processor network management 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 service processor serial management port *only* for server management. This port is the default connection between the service processor and a terminal or a computer.



Caution – Do not attach a modem to this port.

Related Information

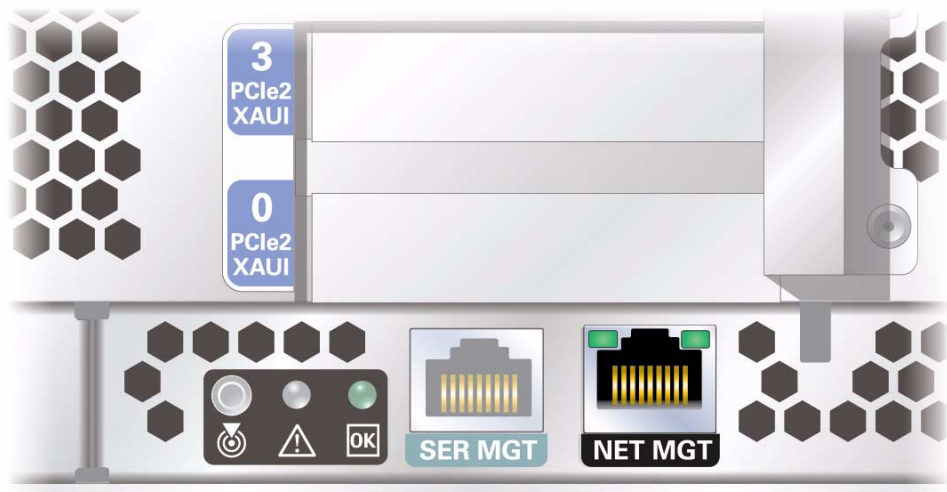
- [“Connect the NET MGT Port Cable” on page 50](#)
- [“Connecting the Server Cables” on page 47](#)

▼ Connect the NET MGT Port Cable

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

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

FIGURE: Service Processor Network Management Port – Rear Panel



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

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 [“Powering On the Server For the First Time”](#) on page 55.

Related Information

- [“Connect the SER MGT Port Cable”](#) on page 49
- [“Connecting the Server Cables”](#) on page 47

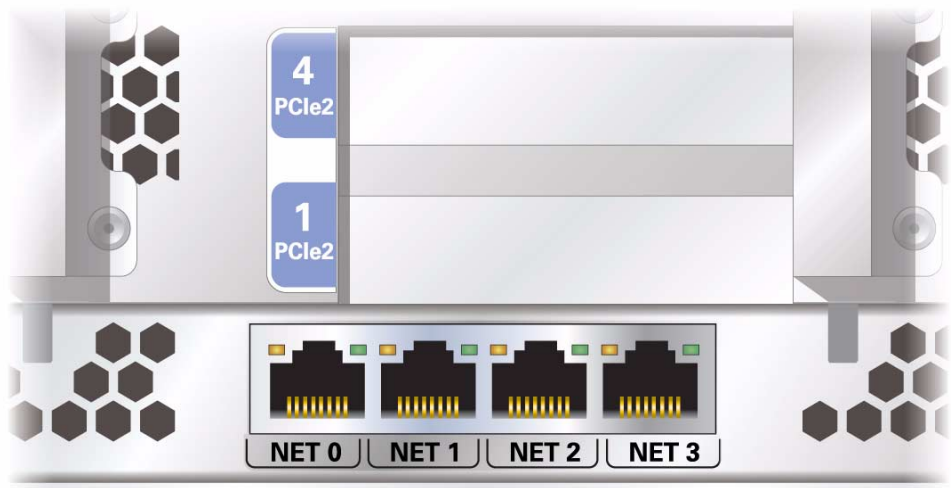
▼ Connect the Ethernet Network Cables

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: Service Processor 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 the Server Cables” on page 47](#)

▼ Connect Other I/O 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

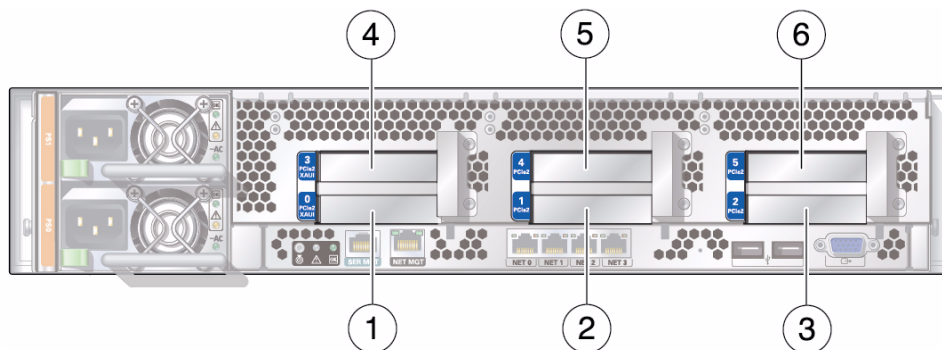


Figure Legend

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 the Server Cables” on page 47](#)

▼ Prepare the Power Cords

The service processor runs on the 3.3V standby voltage, which becomes available as soon as a power source is connected to the server. If you do not want the server to start the initialization diagnostics at this point, connect only the power supply end of the power cord(s).

- **Plug the power cords into the power supplies.**

Note – Do not connect the power cords to the power sources at this time. Doing so will cause you to miss system initialization and diagnostic messages that are output during the power-up phase.

Related Information

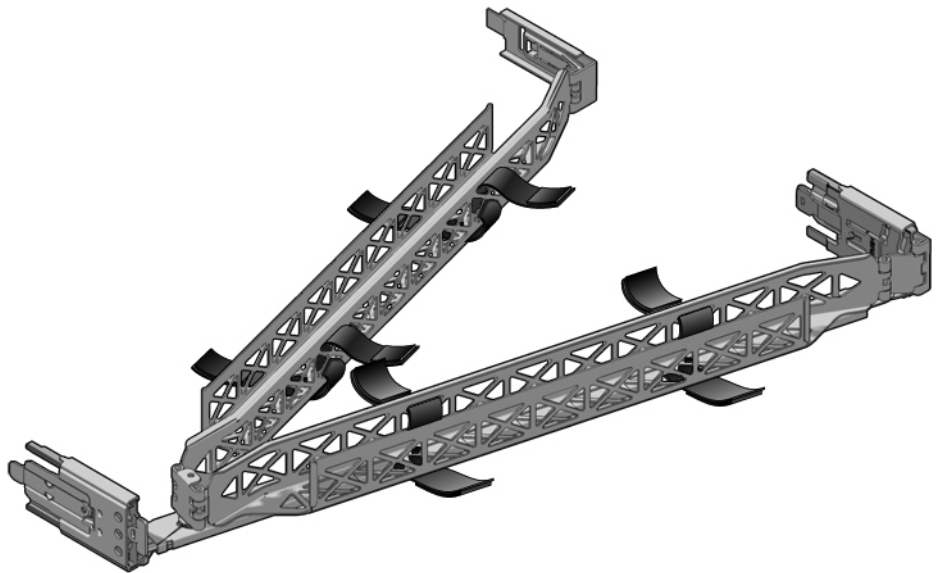
- [“Connect a Terminal or Emulator to the SER MGT Port” on page 57](#)

Cable Management Overview

The Cable Management Arm (CMA) is used to keep the server's external cables secure and out of the way of servicing activity. The CMA can be used with either type of rack mounting kit: screw mount (tooled) and snap-in (tool-less).

The CMA clips onto the slide rails. Use the velcro straps to secure cabling to the CMA.

FIGURE: Cable Management Arm



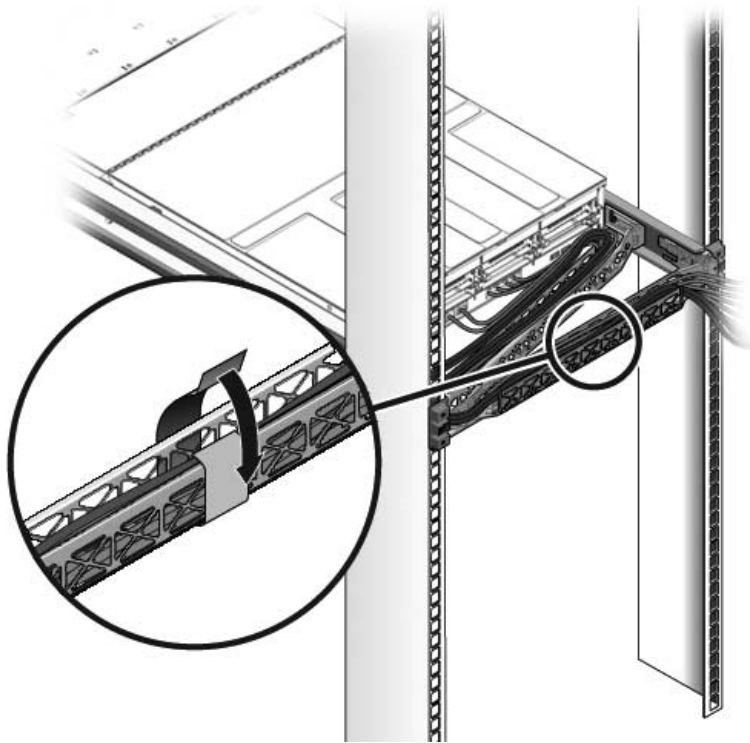
Related Information

- [“Secure the Server Cables in the CMA” on page 53](#)

▼ Secure the Server 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 44.

Related Information

- [“Cable Management Overview”](#) on page 53

Powering On the Server For the First Time

These topics provide instructions for booting the server for the first time and for enabling the service processor network management port. It consists of the following topics:

- [“Initial Power-On Tasks Overview” on page 55](#)
- [“Oracle ILOM System Console Overview” on page 56](#)
- [“Connect a Terminal or Emulator to the SER MGT Port” on page 57](#)
- [“Power On the Server for the First Time” on page 57](#)
- [“Verify System Functionality” on page 59](#)
- [“Assign a Static IP Address to the Service Processor” on page 60](#)

Initial Power-On Tasks Overview

When you power on the server for the first time, you must take various steps that are not required in subsequent power-on sessions.

Preparatory step	Purpose
Connect a terminal or terminal emulator to the SER MGT port.	This enables logging into the service processor before it has been configured for network access. “Connect a Terminal or Emulator to the SER MGT Port” on page 57
Log in to the service processor and change the default root password.	To protect the system from unauthorized superuser access, change the default password to a secure value. “Power On the Server for the First Time” on page 57

Preparatory step	Purpose
Start the Oracle ILOM system console.	This enables you to monitor system initialization output generated by the Oracle ILOM firmware. “Power On the Server for the First Time” on page 57
Configure the Oracle Solaris OS.	The preinstalled Oracle Solaris OS is shipped in the unconfigured state. “Power On the Server for the First Time” on page 57
(If necessary) Specify a static IP address.	DHCP is the default IP addressing protocol. If your server will be connected to a network that uses static IP addressing, you will need to assign a static IP address to the service processor. “Assign a Static IP Address to the Service Processor” on page 60

Oracle ILOM System Console Overview

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 serial management port (SER MGT) before power is applied to the server.

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

By default, the service processor configures the network management port automatically, retrieving network configuration settings using the Dynamic Host Configuration Protocol (DHCP) and allowing connections using Secure Shell (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 57](#)
- [“Power On the Server for the First Time” on page 57](#)

▼ 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 service processor serial management 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 service processor and host will be made.**

Related Information

- ["Oracle ILOM System Console Overview" on page 56](#)
- ["Power On the Server for the First Time" on page 57](#)

▼ Power On the Server for the First Time

1. **Confirm that you have completed all of the preparations for installation.**
See the instructions in ["Preparing for the Installation" 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 23](#).
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 service processor 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 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 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 57](#)
- [“Connecting the Server Cables” on page 47](#)
- [“Assign a Static IP Address to the Service Processor” on page 60](#)

▼ **Verify System 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=E19719-01&id=homepage>

▼ Assign a Static IP Address to the Service Processor

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 service processor.

1. Set the service processor to accept a Static IP Address.

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

2. Set the IP address for the service processor.

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

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

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

4. 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.

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 service processor 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 57](#)

Glossary

B

BMC baseboard management controller

C

CMA cable management arm

D

DHCP Dynamic Host Configuration Protocol

DTE data terminal equipment

E

ESD electrostatic discharge

H

HBA host bus adapter

I

ILOM Oracle Integrated Lights Out Manager

IP Internet Protocol

N

NET MGT network management port

NIC network interface card or controller

O

Oracle Solaris OS Oracle Solaris Operation System

POST

POST power-on self-test

Q

QSFP quad small form-factor pluggable

S

SAS	serial attached SCSI
SER MGT	serial management port
SP	service processor
SSD	solid-state drive
SSH	Secure Shell

U

UI	user interface
UUID	Universal Unique Identifier

W

WWID	world-wide identifier. A unique number that identifies a SAS target.
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