

# **Netra SPARC T4-1 Server**

## **Installation Guide**



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# Using This Documentation

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This installation guide provides instructions, background information, and reference material to help you install Oracle's Netra SPARC T4-1 server. This document is written for technicians, system administrators, authorized service providers, and users who have advanced experience installing hardware.

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

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## Product Notes

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

[http://www.oracle.com/pls/topic/lookup?ctx=Netra\\_SPARCT4-1](http://www.oracle.com/pls/topic/lookup?ctx=Netra_SPARCT4-1)

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## Related Documentation

Documentation	Links
All Oracle products	<a href="http://www.oracle.com/documentation">http://www.oracle.com/documentation</a>
Netra SPARC T4-1 server	<a href="http://www.oracle.com/pls/topic/lookup?ctx=Netra_SPARCT4-1">http://www.oracle.com/pls/topic/lookup?ctx=Netra_SPARCT4-1</a>
Oracle Solaris OS and other systems software	<a href="http://www.oracle.com/technetwork/indexes/documentation/index.html#sys_sw">http://www.oracle.com/technetwork/indexes/documentation/index.html#sys_sw</a>
Oracle Integrated Lights Out Manager (Oracle ILOM) 3.0	<a href="http://www.oracle.com/pls/topic/lookup?ctx=ilom30">http://www.oracle.com/pls/topic/lookup?ctx=ilom30</a>
Oracle VTS 7.0	<a href="http://www.oracle.com/pls/topic/lookup?ctx=OracleVTS7.0">http://www.oracle.com/pls/topic/lookup?ctx=OracleVTS7.0</a>

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<http://www.oracle.com/goto/docfeedback>

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## Support and Accessibility

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

# Understanding the Server

These topics present the server, detail and identify components, and provide an installation overview for the server.

- [“Installation Task Overview” on page 1](#)
- [“Server Overview” on page 2](#)
- [“Front Panel Components” on page 5](#)
- [“Rear Panel Components” on page 6](#)

## Related Information

- [“Confirming Server and Site Specifications” on page 9](#)
- [“Preparing for Installation” on page 19](#)
- [“Installing the Server” on page 23](#)
- [“Connecting Cables” on page 67](#)
- [“Powering On the Server for the First Time” on page 79](#)

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## Installation Task Overview

Perform the following tasks to install and configure the server.

Step	Description	Links
1.	Review the product notes for any late-breaking news about the server.	<a href="#">Netra SPARC T4-1 Server Product Notes</a>
2.	Review the server features and familiarize yourself with the server components.	<a href="#">“Server Overview” on page 2</a> <a href="#">“Front Panel Components” on page 5</a> <a href="#">“Rear Panel Components” on page 6</a>
3.	Review the server specifications and the site requirements.	<a href="#">“Confirming Server and Site Specifications” on page 9</a>

Step	Description	Links
4.	Confirm that you received all the items you ordered.	<a href="#">"Shipping Kit" on page 19</a>
5.	Review safety and ESD precautions.	<a href="#">"Handling Precautions" on page 21</a> <a href="#">"ESD Precautions" on page 21</a>
6.	Assemble the required tools.	<a href="#">"Tools Needed for Installation" on page 22</a>
7.	Install any optional components that you ordered.	<a href="#">"Optional Components" on page 23</a>
8.	Review the rack cautions.	<a href="#">"Rack Cautions" on page 24</a>
9.	Install the server into either a 4-post or 2-post rack.	<a href="#">"Stabilize the Rack for Installation" on page 25</a> <a href="#">"Mounting the Server Into a 4-Post Rack" on page 25</a> <a href="#">"Mounting the Server Into a 2-Post Rack" on page 45</a>
10.	Review cabling requirements and port information. Attach data and management cables to the server.	<a href="#">"Connecting Cables" on page 67</a>
11.	Prepare the power cords. Configure the Oracle ILOM service processor, power on the server for the first time, and boot the operating system.	<a href="#">"Powering On the Server for the First Time" on page 79</a>

### Related Information

- *Netra SPARC T4-1 Server Product Notes*
- *Netra SPARC T4-1 Server Safety and Compliance Guide*
- *Server Service*

## Server Overview

The server is a carrier-grade, NEBS-certified, 2U server. The first illustration shows the server with the air filter. The second illustration shows the server without the air filter.



Component	Description
CPU	One 8-core 64 thread 2.85 GHz SPARC T4 processor or one 4-core 32 threads 2.85 GHz SPARC T4 processor
Memory	8 GB and 16 GB DDR3 DIMMs 16 DIMM slots, supporting a maximum of 256 GB

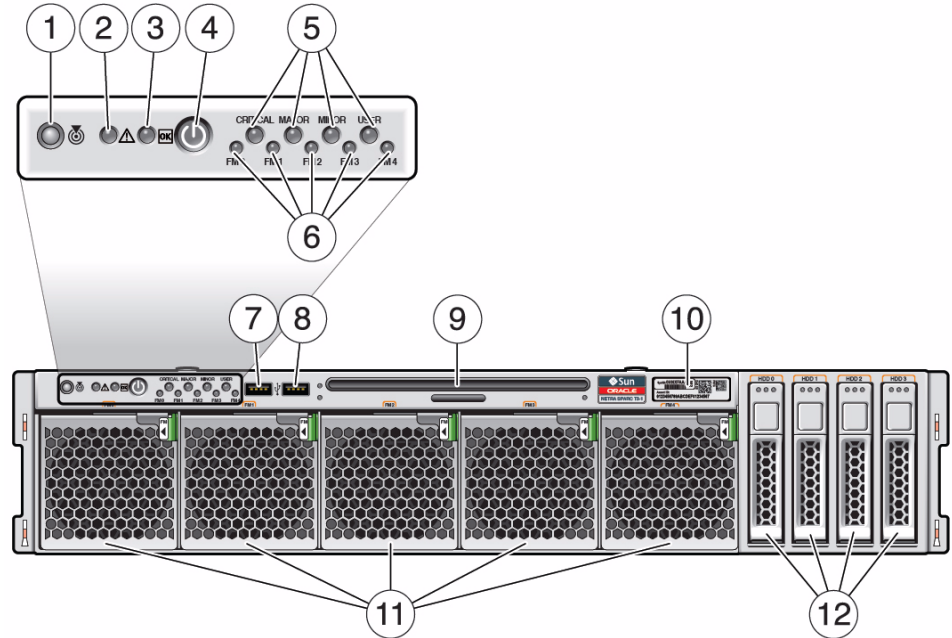
Component	Description
Removable mass storage	Up to four SFF (2.5 in.) SAS drives One slim line SATA DVD+/-RW drive
Service processor	ASPEED AST2200 BMC running Oracle ILOM 3.x. service processor firmware with provision for: <ul style="list-style-type: none"> <li>• 2D graphics (HD-15 VGA Connector)</li> <li>• 128 MB SDRAM</li> <li>• Serial management</li> <li>• Network management (10/100BASE-T Ethernet RJ-45)</li> <li>• Complete host remote management, including remote KVMs over Ethernet</li> </ul>
TPM support	TCG TPM v1.2 functionality support with an Infineon SLB 9635
Front I/O ports	Two USB 2.0 port (Type A)
Rear I/O ports	From the motherboard: <ul style="list-style-type: none"> <li>• Four 10/100/1000BASE-T Ethernet with integrated link/speed LEDs</li> <li>• SER MGT</li> <li>• NET MGT 10/100BASE-T Ethernet</li> <li>• Two USB 2.0 ports</li> <li>• VGA video port</li> <li>• Optional 10Gb dual ports with XAUI cards</li> </ul> From the PCI mezzanine board: <ul style="list-style-type: none"> <li>• DCA relay connection</li> </ul>
Front panel indicators and switches	Provision for the following indicators and switches: <ul style="list-style-type: none"> <li>• Power button switch</li> <li>• Locate button switch with integrated LED</li> <li>• System OK LED</li> <li>• System fault LED</li> <li>• Alarm LEDs - Critical, Major, Minor, and User</li> <li>• Fan module fault LEDs</li> </ul>
Expansion slots	PCI-Express Generation 2: <ul style="list-style-type: none"> <li>• Two full-height / half-length PCI2 2.0 x8 electrical / x16 mechanical slots with tool-less mechanical fillers</li> <li>• Three PCIe 2.0 x8 mechanical, x8 electrical low-profile, or one PCIe 2.0 x8 mechanical, x8 electrical low-profile and two XAUI cards (fiber or copper versions)</li> </ul>

## Related Information

- [“Confirming Server and Site Specifications” on page 9](#)
- [“Installation Task Overview” on page 1](#)
- [“Front Panel Components” on page 5](#)



## Front Panel Components



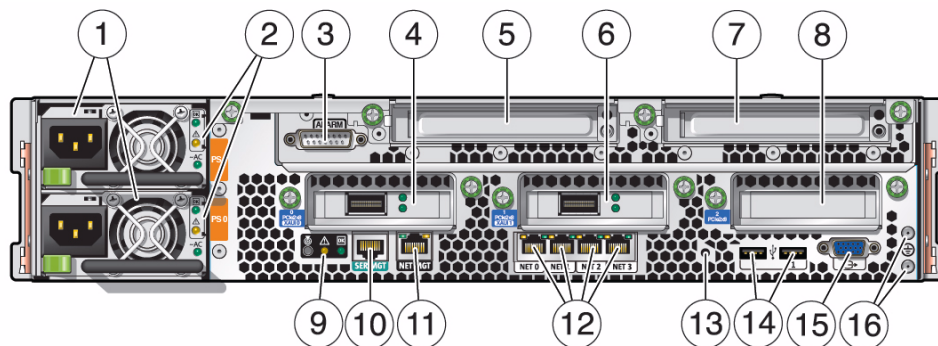
No.	Description	Link
1	Locator LED/Locator button: white	<a href="#">Server Service</a> , interpreting diagnostic LEDs
2	Service Action Required LED: amber	<a href="#">Server Service</a> , interpreting diagnostic LEDs
3	Main Power/OK LED: green	<a href="#">Server Service</a> , interpreting diagnostic LEDs
4	Power button	
5	Alarm LEDs: Critical (red), Major (red), Minor (amber), and User (amber)	<a href="#">Server Service</a> , interpreting diagnostic LEDs <a href="#">“Alarm Port” on page 68</a>
6	Fan Fault (FM 0 to FM4) LEDs: green (normal), amber (fault)	<a href="#">Server Service</a> , serving the fan modules
7, 8	USB 2.0 port (USB 3, USB 4))	<a href="#">“USB Ports” on page 72</a>
9	DVD drive	<a href="#">Server Service</a> , interpreting diagnostic LEDs

No.	Description	Link
10	Radio Frequency Identification (RFID) tag	
11	Fan modules (FM0 - FM4)	<a href="#">Server Service</a> , serving the fan modules
12	Hard drives (HDD0- HDD3)	<a href="#">Server Service</a> , serving the hard drives
	Hard drive fan module (FM 5) (internal - not shown)	<a href="#">Server Service</a> , serving the hard drive fan

## Related Information

- [“Rear Panel Components” on page 6](#)
- [“Server Overview” on page 2](#)

# Rear Panel Components



No.	Description	Link
1	Power supplies (PS1 - PS0 top to bottom) (AC supplies shown)	<a href="#">“Prepare the Power Cords” on page 83</a> <a href="#">“Assemble the DC Power Cords” on page 80</a>
2	Power supply status LEDs: - OK (output): (green) - Service Action Required: (amber) - AC or DC (input power): (green)	<a href="#">Server Service</a> , interpreting diagnostic LEDs
3	Alarm port	<a href="#">“Alarm Port” on page 68</a>

No.	Description	Link
4	Expansion slot 0 (PCIe 2.0 x8 or XAUI)	<a href="#">“Optional Components” on page 23</a>
5	Expansion slot 3 (PCIe 2.0 x8)	<a href="#">“Optional Components” on page 23</a>
6	Expansion slot 1 (PCIe 2.0 x8 or XAUI)	<a href="#">“Optional Components” on page 23</a>
7	Expansion slot 4 (PCIe 2.0 x8)	<a href="#">“Optional Components” on page 23</a>
8	Expansion slot 2 (PCIe 2.0 x8)	<a href="#">“Optional Components” on page 23</a>
9	Service LEDs: - Locator LED/Locator button (white) - Service Action Required LED (amber) - Main Power/OK LED (green)	<i>Server Service</i> , interpreting diagnostic LEDs
10	SER MGT RJ-45 serial port	<a href="#">“SER MGT Port” on page 70</a>
11	NET MGT RJ-45 network port	<a href="#">“NET MGT Port” on page 70</a>
12	Network 10/100/1000 ports (NET0 to NET3) for host	<a href="#">“Gigabit Ethernet Ports” on page 71</a>
13	Physical Presence button access hole	
14	USB 2.0 ports (USB 0, USB 1)	<a href="#">“USB Ports” on page 72</a>
15	Video connector (HD-15)	<a href="#">“Video Port” on page 73</a>
16	Grounding studs	

## Related Information

- [“Front Panel Components” on page 5](#)



# Confirming Server and Site Specifications

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These topics provide background information needed to install the server.

- [“Physical Specifications” on page 9](#)
- [“Electrical Specifications” on page 10](#)
- [“Input Power Information” on page 11](#)
- [“Overcurrent Protection Requirements” on page 12](#)
- [“DC Power Source, Power Connection, and Grounding Requirements” on page 13](#)
- [“Environmental Requirements” on page 14](#)
- [“Acoustic Noise Emissions” on page 15](#)
- [“Airflow Clearance” on page 16](#)

## Related Information

- [“Server Overview” on page 2](#)
- [“Installing the Server” on page 23](#)

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## Physical Specifications

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**Note** – To enable safe installation and servicing, provide 36 in. (91 cm) clearance in the front and rear of the server.

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Dimension	Value
Height	87.1 mm (3.43 in.)
Width	445 mm (17.52 in.) including bezel

Dimension	Value
Depth	526 mm (20.71 in.) max to PSU handles. 501 mm (19.72 in.) max to rear I/O.
Weight (server only)	18.6 kg (41 lb.) fully configured without PCI cards
Minimum service access clearance (front)	91 cm (36 in.)
Minimum service access clearance (rear)	91 cm (36 in.)

### Related Information

- [“Electrical Specifications” on page 10](#)
- [“Input Power Information” on page 11](#)
- [“Overcurrent Protection Requirements” on page 12](#)
- [“DC Power Source, Power Connection, and Grounding Requirements” on page 13](#)
- [“Environmental Requirements” on page 14](#)
- [“Acoustic Noise Emissions” on page 15](#)
- [“Airflow Clearance” on page 16](#)

## Electrical Specifications

**Note** – The values in this table are the power supply specifications.

Parameter	AC	DC
Voltage (nominal)	100 to 127 or 200 to 240 VAC (90 to 140 or 180 to 264 VAC ranges)	-48 or -60 VDC (-40 to -75 VDC range)
Input current (maximum)	9.4 A @ 100 VAC or 4.7 A @ 200 VAC (940 VA)	19.58 A -48 VDC (940 VA)
Frequency (nominal)	50/60 Hz (47 to 63 Hz range)	N/A
DC input treatment	N/A	Isolated DC Return (DC-I)



**Caution** – The ports of this equipment or subassembly are suitable for connection to intra-building or unexposed wiring or cabling only. The intra-building port(s) of the equipment or subassembly must not be metalically connected to interfaces that

connect to the outside plant wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE, Issue 4) and require isolation from the exposed outside plant cabling. The addition of primary protectors is not sufficient protection in order to connect these interfaces metallically to outside plant wiring.

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**Caution** – The intra-building port(s) of the equipment or subassembly must use shielded intra-building cabling or wiring that is grounded at both ends.

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### Related Information

- [“Input Power Information” on page 11](#)
- [“Overcurrent Protection Requirements” on page 12](#)
- [“DC Power Source, Power Connection, and Grounding Requirements” on page 13](#)
- [“Physical Specifications” on page 9](#)
- [“Environmental Requirements” on page 14](#)
- [“Acoustic Noise Emissions” on page 15](#)
- [“Airflow Clearance” on page 16](#)

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## Input Power Information

The total input power for the server is divided equally among the power supplies in operation. Reversing the positive and negative inputs to the power supplies of a DC input server will not cause damage. However, the power supplies with reversed input will not operate.

The inputs to a power supply are isolated from the server chassis and the other power supply inputs. The AC or DC power inputs might be at different voltages within the acceptable range and might have different offset voltages relative to the server chassis.

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**Note** – The server does not require an additional surge protector for the AC power configurations if the facility has a surge protector that limits voltage surges to less than 2000V. You can, however, install a surge protector if your site requires an additional protector.

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**Caution** – Safety agency requirements prohibit Oracle Corporation from changing a product from AC input to DC input or from DC input to AC input after the product has been removed from the agency approved manufacturing site.

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### Related Information

- “Electrical Specifications” on page 10
- “Overcurrent Protection Requirements” on page 12
- “DC Power Source, Power Connection, and Grounding Requirements” on page 13
- “Physical Specifications” on page 9
- “Environmental Requirements” on page 14
- “Acoustic Noise Emissions” on page 15
- “Airflow Clearance” on page 16

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## Overcurrent Protection Requirements

This product does not provide branch circuit overcurrent protection as defined by the U.S. NEC. To comply with the U.S. NEC, you must install this product on branch circuits that have overcurrent protection as defined by Article 240 of the U.S. NEC.

- Product power inputs with a current ratings of 16A or less must have a branch circuit, or a supplementary overcurrent protection device, rated at no more than 20A.
- Product power inputs with current ratings of more than 16A must have a branch circuit, or a supplementary overcurrent protection device, rated at no more than 160% of the product input current rating.
- Other national or local electrical codes might apply to the installation of this product.

As a general guideline, overcurrent protection devices should be rated at a minimum of 125% of the product input current rating in order to provide reliable power under high temperature and transient voltage disturbance conditions. However, you must consider the characteristics of the protection device and the applicable electrical codes when selecting the rating of a protection device for the product installation.

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

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## Related Information

- “Electrical Specifications” on page 10
- “Input Power Information” on page 11
- “DC Power Source, Power Connection, and Grounding Requirements” on page 13
- “Physical Specifications” on page 9
- “Environmental Requirements” on page 14
- “Acoustic Noise Emissions” on page 15
- “Airflow Clearance” on page 16

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# DC Power Source, Power Connection, and Grounding Requirements

The server power source and connections must meet the following requirements.

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**Note** – The DC version of the server must be installed in a restricted-access location. According to the intent of the U.S. NEC, a restricted-access location is an area intended for qualified or trained personnel only and has access controlled by a locking mechanism, such as a key lock or an access card system.

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**Caution** – The DC power source must be reliably grounded. The server chassis must be grounded with the power supply ground pins or with the chassis ground studs. It is acceptable to have both grounds connected.

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

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- Suitable conductor material: Use copper conductors only.
- Power supply connections through the input connector: 8 AWG (between the server and the source). There are three conductors:
  - -48V or -60V (negative terminal, might be marked with a minus (-) symbol).
  - Chassis ground connection (optional if chassis ground wire is connected).

- -48V or -60V return (positive terminal, might be marked with a plus (+) symbol).
- Server chassis ground 8 AWG conductor (optional if power supply grounds are connected).
- Grounding cable insulation color: Green/yellow.
- Cable insulation rating: Minimum of 75°C (167°F). Low smoke fume, flame retardant insulation might be required in some installations.)
- Use mating connectors, Wago part number 51204745, for proper connection to the product DC inputs. Connectors are included in the server's shipping kit.
- Branch circuit cable insulation color: According to applicable national electrical codes.
- DC power source must meet TNV-2 requirements as defined by UL 60950-1 and IEC 60950-1.

### Related Information

- [“Electrical Specifications” on page 10](#)
- [“Input Power Information” on page 11](#)
- [“Overcurrent Protection Requirements” on page 12](#)
- [“Physical Specifications” on page 9](#)
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- [“Powering On the Server for the First Time” on page 79](#)

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## Environmental Requirements



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**Caution** – Netra rackmounted servers are certified to meet these worst-case operating conditions only when using an approved rackmount kit. You must strictly follow the rackmounting instructions in order to meet these environmental specifications.

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Specification	Operating	Nonoperating
Ambient temperature*	Maximum: 5°C to 45°C (41°F to 113°F) up to 1829 meters (6000 feet) <sup>†</sup> Optimal: 21°C to 23°C (69.8°F to 73.4°F) Short term maximum: -5°C to 55°C (23°F to 131°F)	-40°C to 70°C (-40°F to 158°F)
Relative humidity	5% - 85% RH, non condensing, but not to exceed 0.024 kg water/kg dry air (0.053 lb. water/2.205 lbs. dry air). Short term: 5%- 90% RH, non condensing, not to exceed 0.024 kg water/kg dry air (0.053 lb. water/2.205 lbs. dry air).	93%, non condensing, 40°C (104°F)
Elevation (Company requirement)	Maximum 3000 meters (9840 feet) at 40°C (104°F)	Maximum 12,000 meters (39,370 feet)
Elevation (NEBS requirement)	-60 meters to 1800 meters (-200 feet to 5905 feet) at 40°C (104°F) 1800 meters to 4000 meters (5905 feet to 13,123 feet) at 30°C (86°F)	Up to 12,000 meters (39,370 feet)

\* Does not apply to removable media devices.

† Maximum ambient operating temperature is derated by 1°C per 500m elevation.

### Related Information

- [“Acoustic Noise Emissions” on page 15](#)
- [“Airflow Clearance” on page 16](#)
- [“Physical Specifications” on page 9](#)
- [“Electrical Specifications” on page 10](#)
- [“Input Power Information” on page 11](#)
- [“Overcurrent Protection Requirements” on page 12](#)
- [“DC Power Source, Power Connection, and Grounding Requirements” on page 13](#)

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## Acoustic Noise Emissions

The declared noise emissions for the server are in accordance with ISO 9296 standards.

Parameter	Operating Noise Emissions
Acoustic power LwA (dBA)	69.2 dBA (AC server) 68.2 dBA (DC server)

### Related Information

- [“Environmental Requirements” on page 14](#)
- [“Physical Specifications” on page 9](#)
- [“Electrical Specifications” on page 10](#)
- [“Input Power Information” on page 11](#)
- [“Overcurrent Protection Requirements” on page 12](#)
- [“DC Power Source, Power Connection, and Grounding Requirements” on page 13](#)
- [“Airflow Clearance” on page 16](#)

## Airflow Clearance

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

The server draws cool air from the front of the server and expels hot air out the rear. To avoid overheating the server:

- Ensure that inlet air enters at the front of the server and exits from the back.
- Ensure unobstructed airflow through the server.
- Do not direct warm air toward the front air intake of the server.
- Prevent recirculation of exhaust air within a rack or cabinet.
- Manage cables to minimize interfering with the server exhaust vent.
- 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.
- Allow a minimum of 0.2 in. (5 mm) clearance at the front of the system and 3.1 in. (80 mm) 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** – Be mindful that 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.

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### **Related Information**

- [“Physical Specifications” on page 9](#)
- [“Environmental Requirements” on page 14](#)
- [“Electrical Specifications” on page 10](#)
- [“Input Power Information” on page 11](#)
- [“Overcurrent Protection Requirements” on page 12](#)
- [“DC Power Source, Power Connection, and Grounding Requirements” on page 13](#)
- [“Airflow Clearance” on page 16](#)
- [“Acoustic Noise Emissions” on page 15](#)



# Preparing for Installation

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These topics provide background information needed to install the server.

- [“Shipping Kit” on page 19](#)
- [“Handling Precautions” on page 21](#)
- [“ESD Precautions” on page 21](#)
- [“Tools Needed for Installation” on page 22](#)

## **Related Information**

- [“Confirming Server and Site Specifications” on page 9](#)
- [“Installing the Server” on page 23](#)

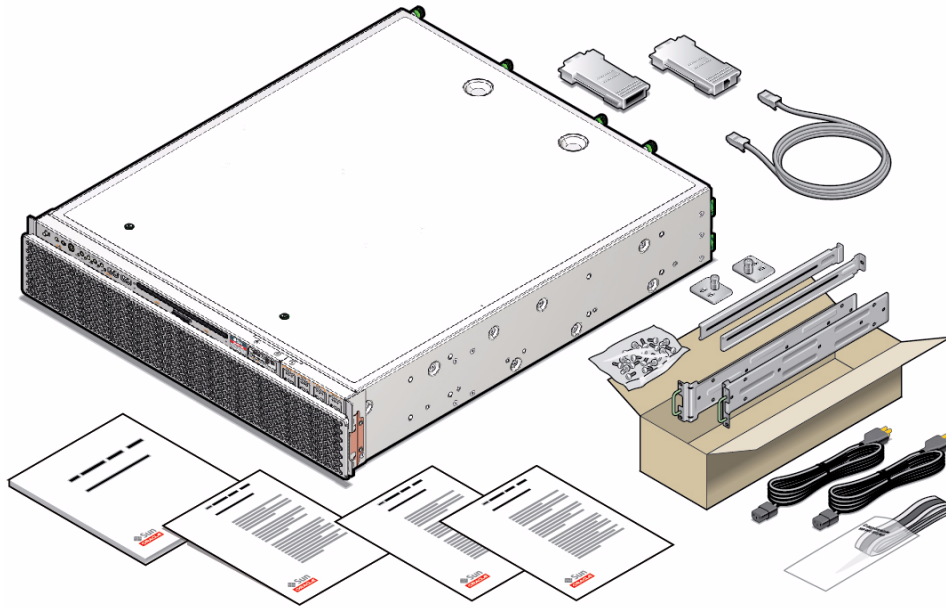
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## Shipping Kit

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

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

- Server
- 2 AC power cords (if ordered)
- RJ-45 to DB-9 crossover serial adapter
- RJ-45 to DB-25 analog to digital video adapter
- 1 set of Wago DC connectors (2 connectors per set)
- Antistatic wrist strap
- 19-inch, 4-post rackmount kit
- *Netra Rack Server Getting Started Guide* with license and safety documents

Optional components (for example, PCIe cards) are packaged separately from the other items unless they are installed at the factory as part of the system.

### Related Information

- [“Handling Precautions” on page 21](#)
- [“ESD Precautions” on page 21](#)



---

## Handling Precautions



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

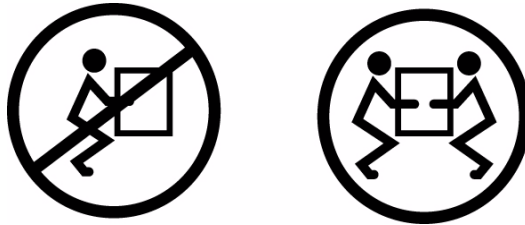
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---

**Caution** – The server weighs approximately 55 lb (25 kg). Two people are required to lift and mount this 2U server into a rack enclosure when using the procedures in this document.

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

---

### Related Information

- [“Physical Specifications” on page 9](#)
- [“ESD Precautions” on page 21](#)
- [“Installing the Server” on page 23](#)

---

## 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 ESD when you install or service the server.



---

**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**

- [“Installing the Server” on page 23](#)
- [“Handling Precautions” on page 21](#)
- [“Tools Needed for Installation” on page 22](#)

---

## **Tools Needed for Installation**

To install the system, you must have these tools:

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

In addition, you must provide a system console device, such as:

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

### **Related Information**

- [“Optional Components” on page 23](#)
- [“ESD Precautions” on page 21](#)
- [“Installing the Server” on page 23](#)

# Installing the Server

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These topics describe how to install the server into an equipment rack using a rackmount kit.

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

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- [“Optional Components” on page 23](#)
- [“Rack Cautions” on page 24](#)
- [“Stabilize the Rack for Installation” on page 25](#)
- [“Mounting the Server Into a 4-Post Rack” on page 25](#)
- [“Mounting the Server Into a 2-Post Rack” on page 45](#)

## Related Information

- [“Preparing for Installation” on page 19](#)

---

## Optional Components

Optional components, such as additional memory or PCIe2 cards that were ordered as part of the system, are installed in the server at the factory before the server is shipped. Any options not ordered with the system are shipped separately. If possible, install these components prior to installing the server in a rack.

Except for rackmount kits, if you ordered any options that are not factory-installed, refer to the *Server Service* and the component’s documentation for installation instructions.

---

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

---

## Related Information

- *Server Service*
- Optional component documentation

---

# Rack Cautions



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**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 antitip bar to prevent the rack from tipping during equipment installation.

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**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.

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**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.

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**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.

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**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.

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

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

---

#### **Related Information**

- [“Stabilize the Rack for Installation” on page 25](#)

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## ▼ Stabilize the Rack for Installation



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**Caution** – To reduce the risk of personal injury, stabilize the expansion rack cabinet and extend all antitilt 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 antitilt 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 antitilt legs or antitilt bar, which are located at the bottom front of the rack cabinet.**

#### **Related Information**

- [“Rack Cautions” on page 24](#)
- Documentation for your rack cabinet
- *Netra SPARC T4-1 Server Safety and Compliance Guide*

---

## Mounting the Server Into a 4-Post Rack

These topics provide installation instructions for the 4-post rackmount kits. The server ships with a 19-inch, 4-post hardmount rackmount kit. You can order two optional rackmount kits for your specific 4-post rack.

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

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---

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

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---

**Caution** – You *must* install the server into a rack following these instructions. If you deviate from these instructions when installing the server, your installation will not be supported.

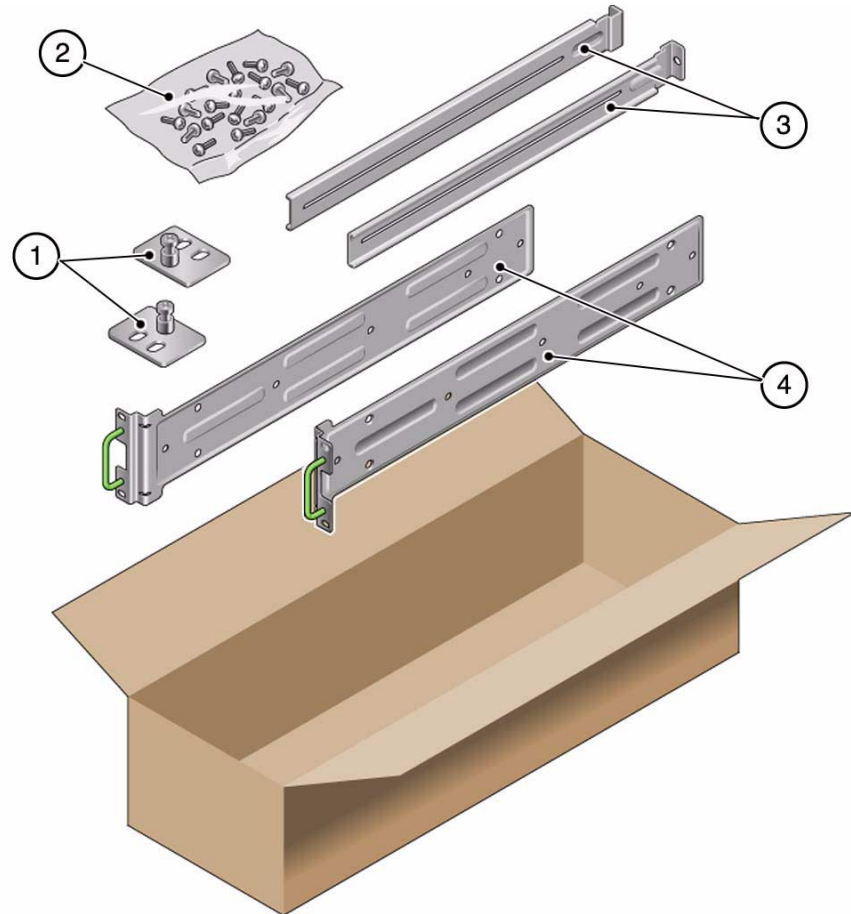
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Description	Links
Mount the server using a 19-inch, 4-post hardmount rackmount kit (included with the server).	<a href="#">“19-Inch, 4-Post Hardmount Rackmount Kit” on page 27</a> <a href="#">“Install the Server (19-Inch, 4-Post Hardmount Rackmount Kit)” on page 28</a>
Mount the server using an optional 19-inch, 4-post slide rackmount kit for 600–800 mm cabinet depths.	<a href="#">“19-Inch, 4-Post Sliding Rail Rackmount Kit” on page 30</a> <a href="#">“Install the Server (19-Inch, 4-Post Sliding Rail Rackmount Kit)” on page 32</a>
Mount the server using an optional 600 mm x 600 mm rackmount kit.	<a href="#">“600-mm, 4-Post Hardmount Rackmount Kit” on page 37</a> <a href="#">“Install the Server (600-mm, 4-Post Hardmount Rackmount Kit)” on page 38</a>

### Related Information

- [“Preparing for Installation” on page 19](#)
- [“Rack Cautions” on page 24](#)
- [“Stabilize the Rack for Installation” on page 25](#)

## 19-Inch, 4-Post Hardmount Rackmount Kit



1	Rear mount flanges (2)	3	Rear mount support brackets (2)
2	Bag of fasteners	4	Hardmount brackets (2)

### Related Information

- [“Install the Server \(19-Inch, 4-Post Hardmount Rackmount Kit\)” on page 28](#)

## ▼ Install the Server (19-Inch, 4-Post Hardmount Rackmount Kit)

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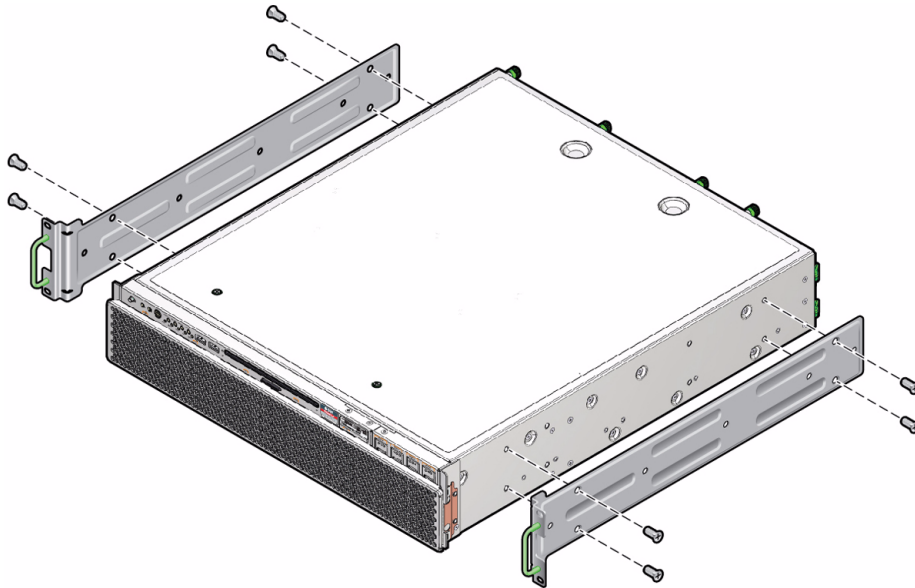
**Note** – The front-to-back rail spacing must be at least 460 mm (18.11 in.) and not more than 715 mm (28.15 in.) from the outside face of the front rail to the outside face of the back rail.

---

**1. Read the Cautions for racks.**

See [“Rack Cautions”](#) on page 24.

**2. Use four of the supplied M5 x 4.5-mm flathead Phillips screws to secure each of the hardmount brackets to the sides of the server.**

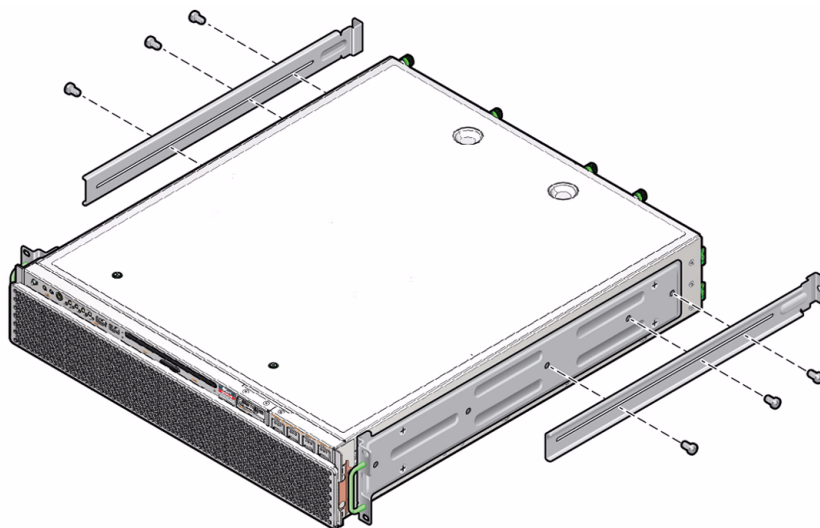


**3. Measure the depth of the rack.**

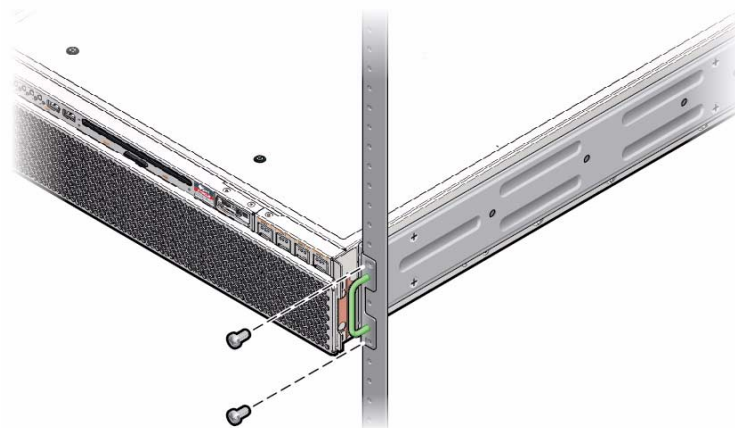
**4. Install the rear mount support brackets at the rear of the server, extending the rear mount support brackets to the measured depth of the rack.**

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

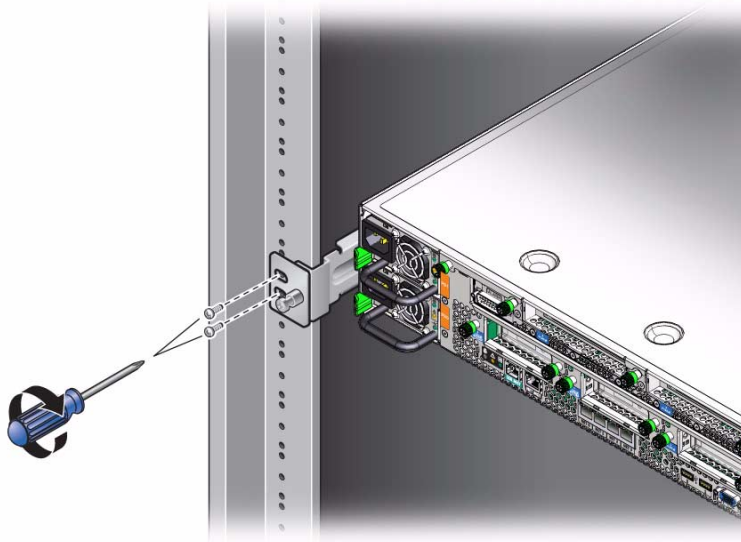




5. Lift the server to the desired location in the rack.
6. Using two screws per side, secure the front of the hardmount brackets attached to the sides of the server to the front of the rack.



7. Get the two rear mount flanges from the rackmount kit.
8. Using two screws for each rear mount support bracket, secure the rear mount support brackets to the rear of the rack.



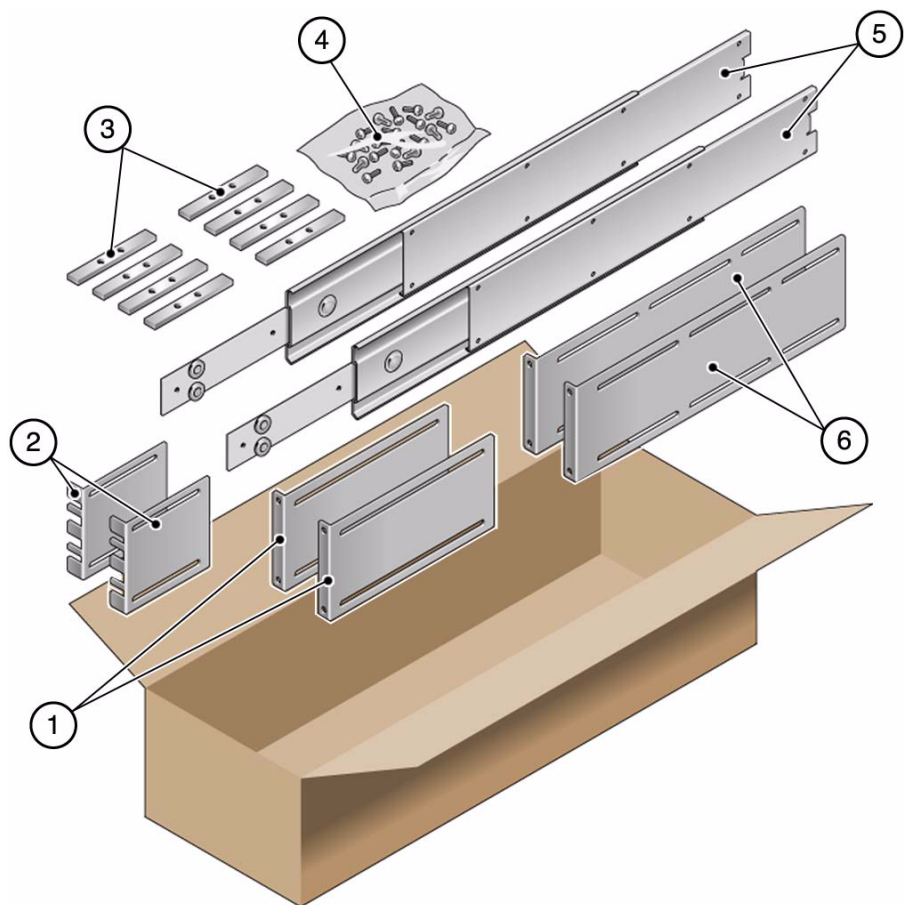
#### **Related Information**

- [“Stabilize the Rack for Installation” on page 25](#)
- [“19-Inch, 4-Post Hardmount Rackmount Kit” on page 27](#)

## **19-Inch, 4-Post Sliding Rail Rackmount Kit**

After installing the server using this optional 19-inch, 4-post sliding rail rackmount kit, you can extend the server out of the rack for servicing.

You also need the hardmount brackets from the standard rackmount kit that came with the server.



1	Short brackets (2)	4	Bag of fasteners
2	Extension brackets (2)	5	Telco slide assemblies (2)
3	Threaded strips – M6 (4) 10-32 (4)	6	Long brackets (2)

### Related Information

- [“Install the Server \(19-Inch, 4-Post Sliding Rail Rackmount Kit\)” on page 32](#)

## ▼ Install the Server (19-Inch, 4-Post Sliding Rail Rackmount Kit)

---

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

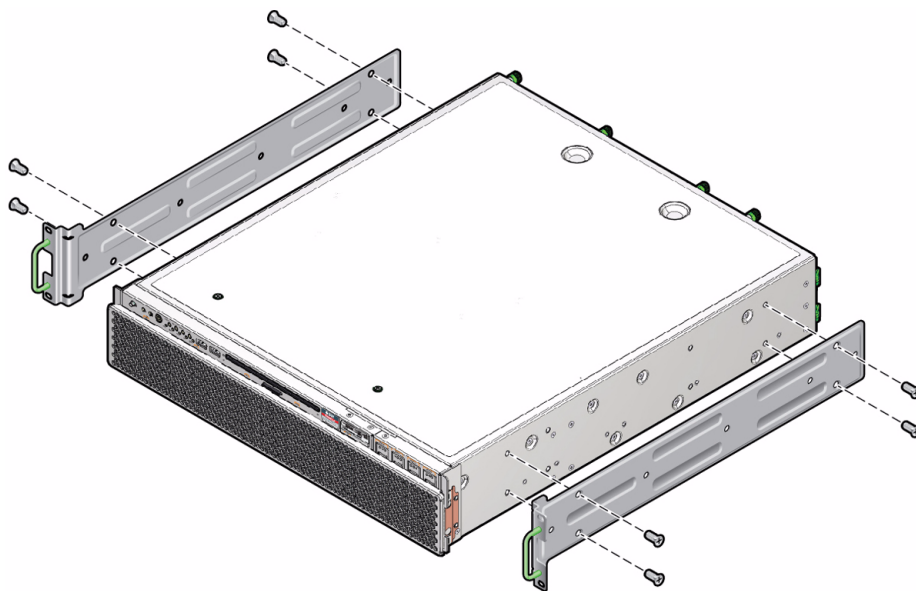
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**1. Read the Cautions for racks.**

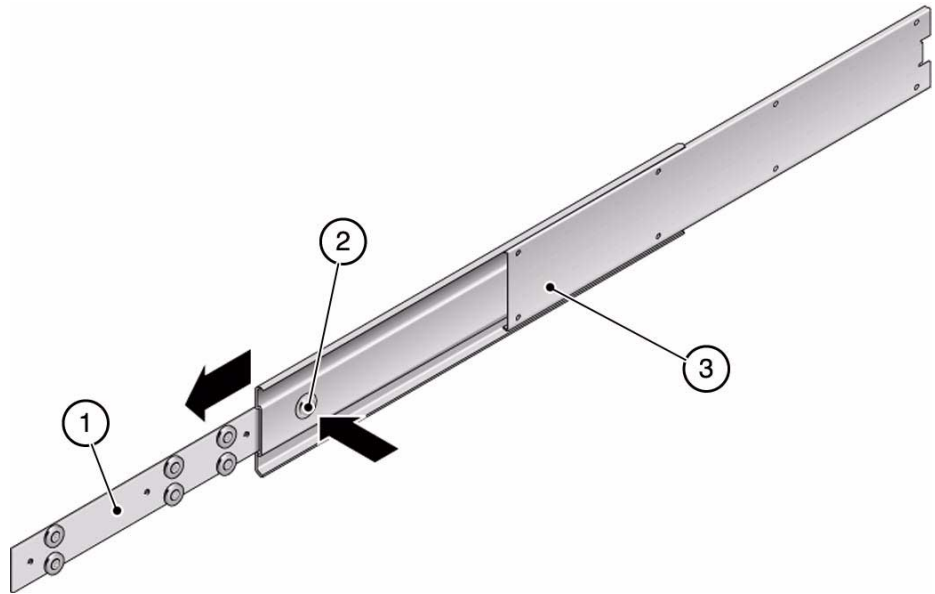
See [“Rack Cautions”](#) on page 24.

**2. Use four of the supplied M5 x 4.5 mm flathead Phillips screws to secure each of the hardmount brackets to the sides of the server.**

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



**3. Press in the button on each slide assembly and pull the glide completely out of the slide.**

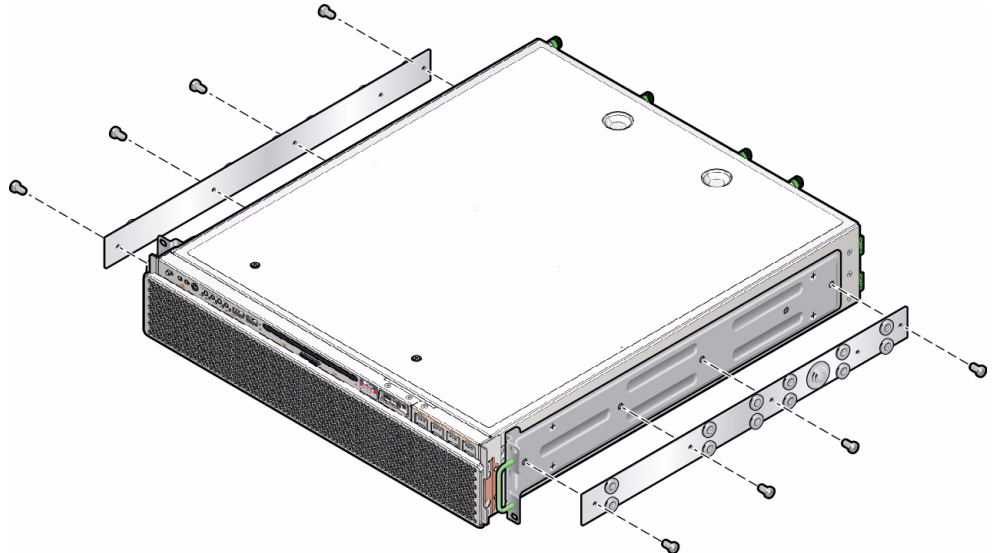



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1	Glide	3	Slide (in two parts)
2	Button		

---

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

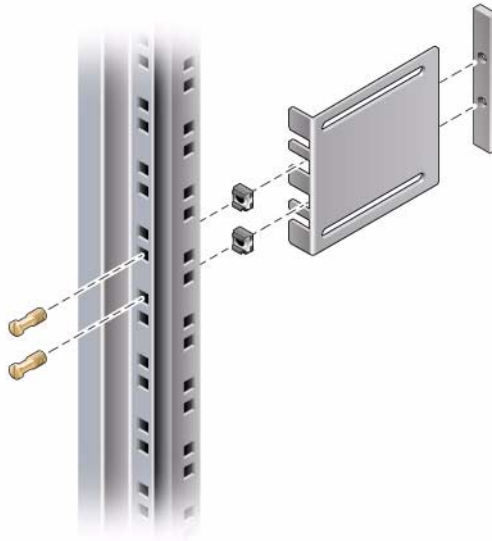


5. **Lift each short bracket to the desired position at the *front* of the rack and attach a short bracket to each of the front rack uprights.**

Use two of the brass M6 collar screws and M6 cage nuts (if required), and one threaded strip, to secure each bracket.

6. **Lift each long bracket to the desired position at the *rear* of the rack and attach a long bracket to each of the rear rack uprights.**

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



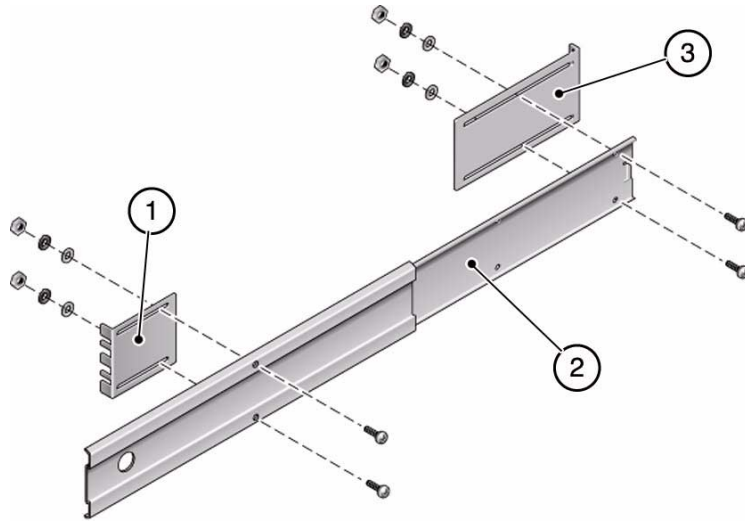
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**Note** – If your rack has 10–32 holes, use the 10–32 collar screws and 10–32 threaded strips.

---

7. **Extend a slide to line up the access holes with the front screw holes.**
8. **Secure the slide onto the short and long brackets at the front and rear of the rack.**

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



- 
- |   |               |
|---|---------------|
| 1 | Short bracket |
| 2 | Slide         |
| 3 | Long bracket  |
- 

**9. Mount the slide on the other side of the rack.**

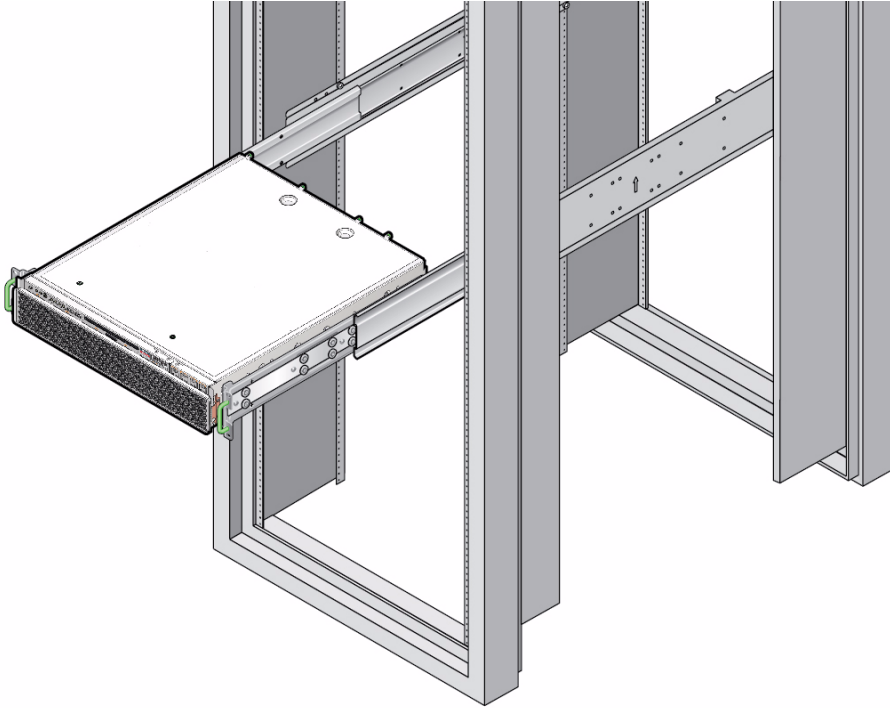
Repeat [Step 7](#) and [Step 8](#).

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

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

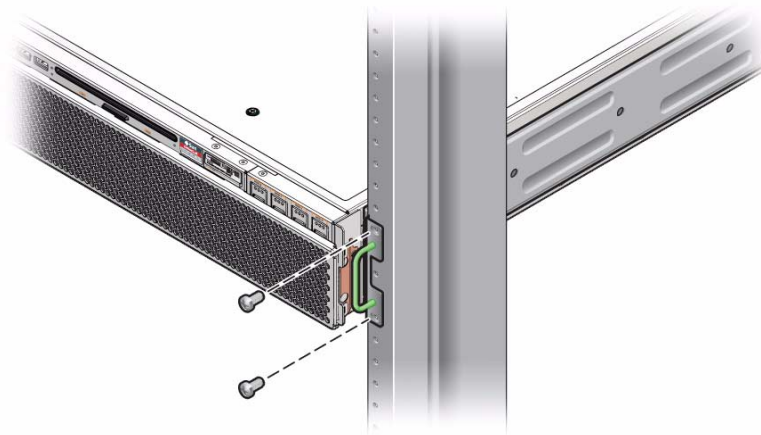
You might find that there is too much or too little room between the two slides mounted in the rack. Consequently, the glides attached to the server might not align correctly with the slides in the rack. If either situation occurs, loosen the M6 collar screws and cage nuts on the long and short brackets ([Step 5](#) and [Step 6](#)), move the brackets inward or outward to the appropriate points, then tighten the screws and cage nuts again.

**12. Push in the slide buttons and slide the server all the way into the rack enclosure.**



13. Using two screws per side, secure the front of the hardmount brackets that are attached to the sides of the server to the front of the rack.

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



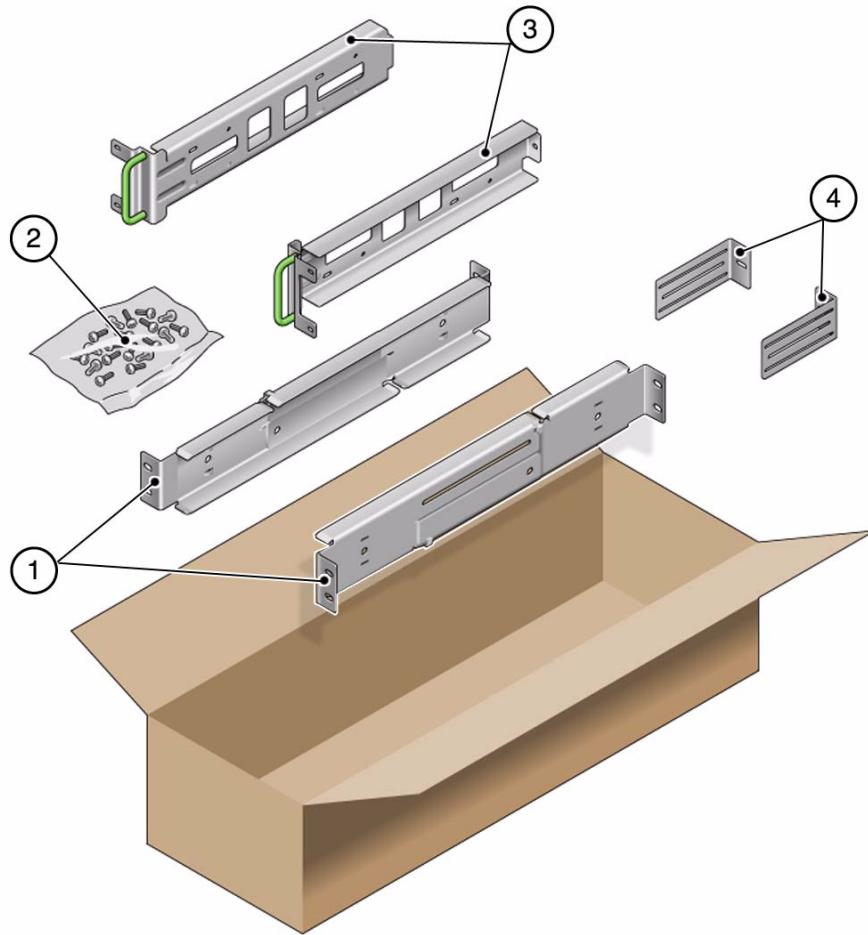
### Related Information

- [“Stabilize the Rack for Installation” on page 25](#)



- [“19-Inch, 4-Post Sliding Rail Rackmount Kit” on page 30](#)

## 600-mm, 4-Post Hardmount Rackmount Kit



1	Adjustable rails (2)	3	Side rails (2)
2	Bag of fasteners	4	Rear flanges (2)

### Related Information

- [“Install the Server \(600-mm, 4-Post Hardmount Rackmount Kit\)” on page 38](#)

## ▼ Install the Server (600-mm, 4-Post Hardmount Rackmount Kit)

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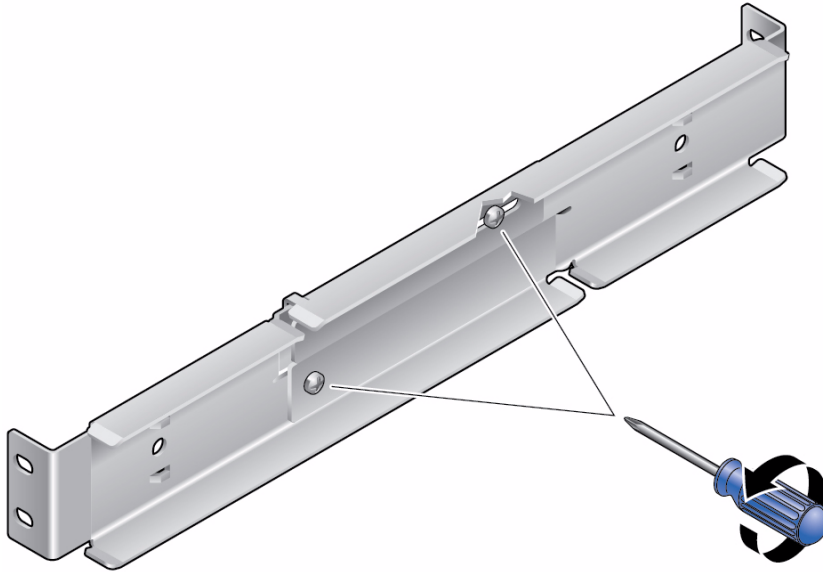
**Note** – The front-to-back rail spacing must be at least 392 mm (15.43 in.) and not more than 504 mm (19.84 in.) from the outside face of the front rail to the outside face of the back rail.

---

**1. Read the Cautions for racks.**

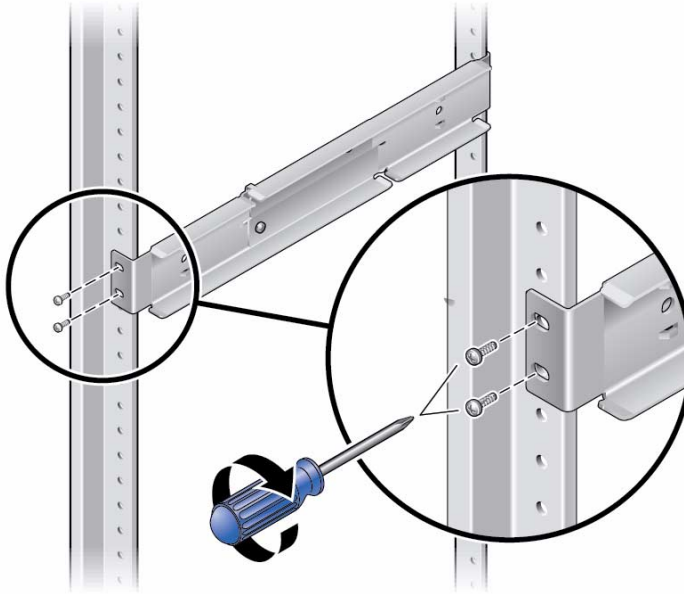
See [“Rack Cautions”](#) on page 24.

**2. Loosen the two screws at the middle of each adjustable rail so that you can extend the adjustable rail.**



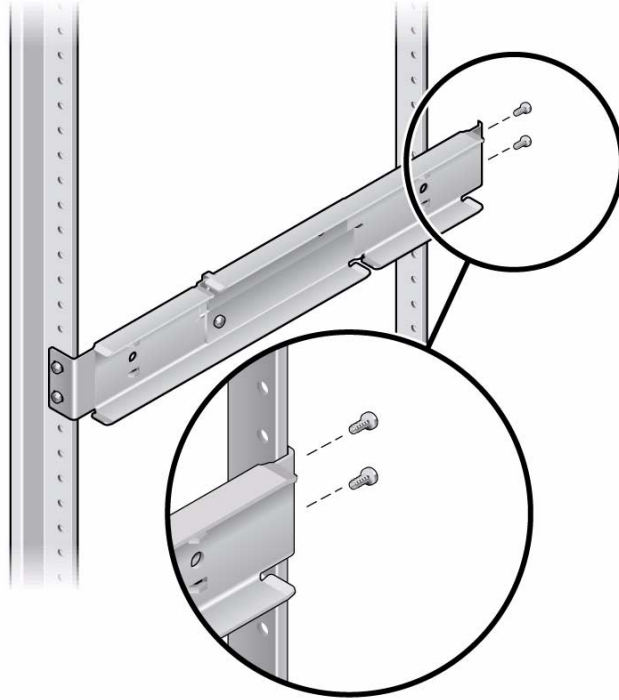
**3. Lift one of the adjustable rails to the desired location in the rack.**

Using two screws, secure the front of the rail in the rack. The size of the screws varies, depending on your particular rack.

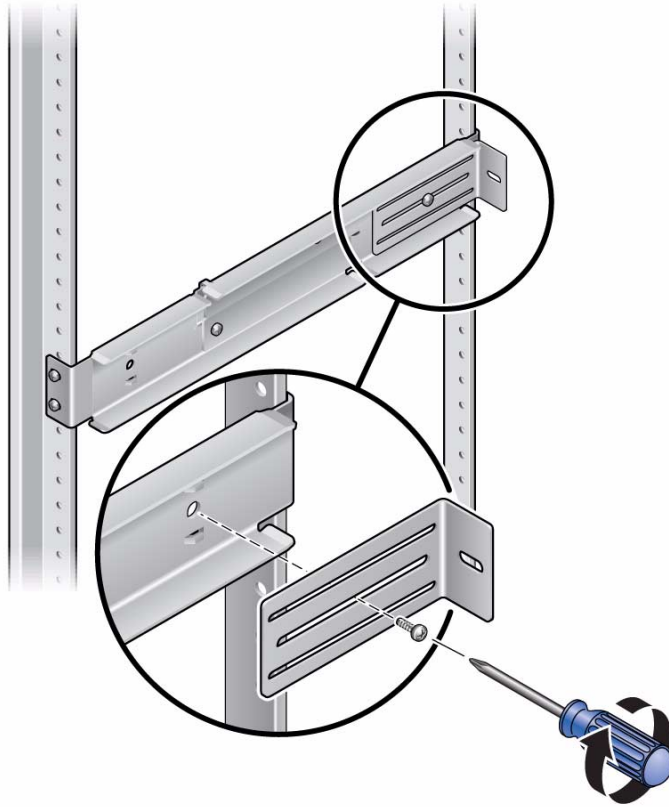


4. At the rear of the rack, use two screws to secure the rear of the adjustable rails to the rack.

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

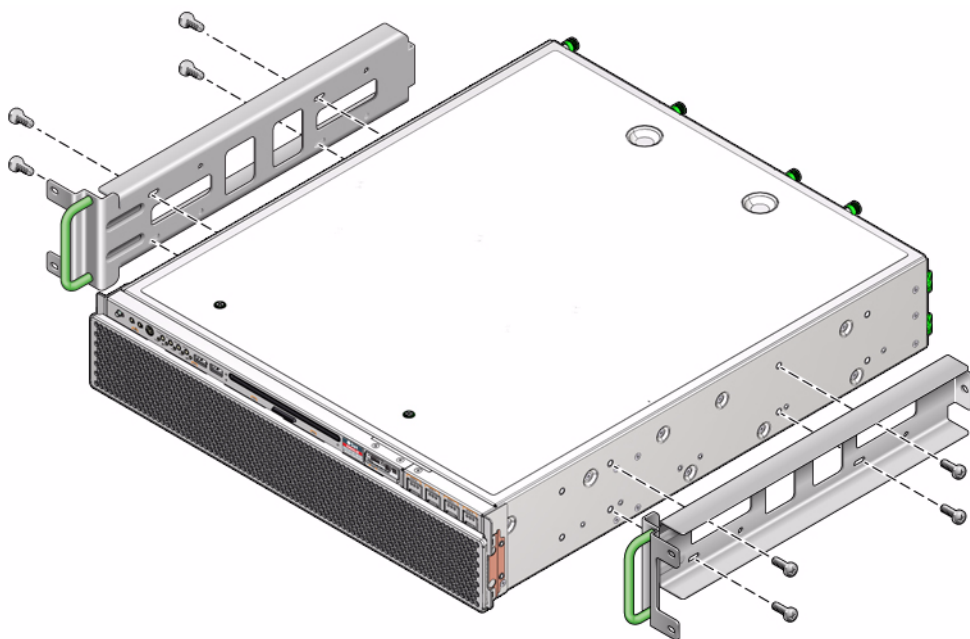


5. Tighten the two screws at the middle of each adjustable rail.
6. Mount the other adjustable rail into the rack.  
Repeat [Step 3](#) through [Step 5](#).
7. Using one M5 x 7 SEM screw for each rear flange, loosely install the rear flange onto the rear of each of the adjustable rails.  
Do not completely secure the rear flanges to the adjustable rails. You will use these flanges to set the rack depth for the server in a later step.

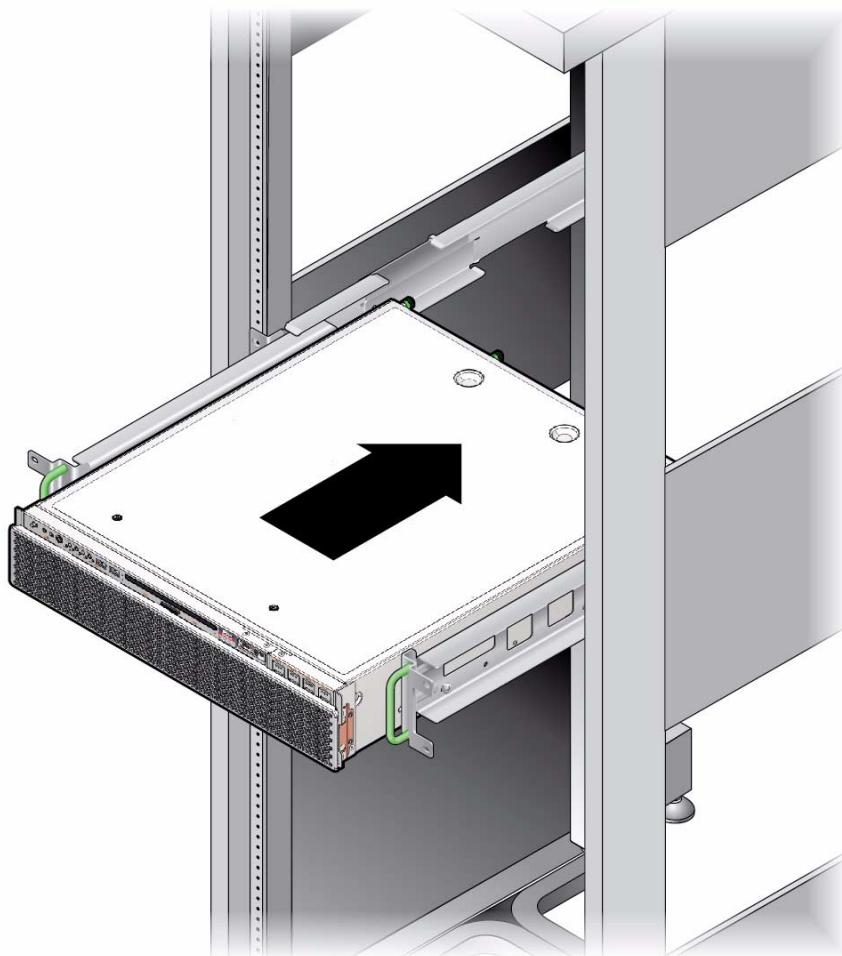


8. **Using eight of the M5 x 7 SEM screws (four for each side rail), secure the side rails to the sides of the server.**

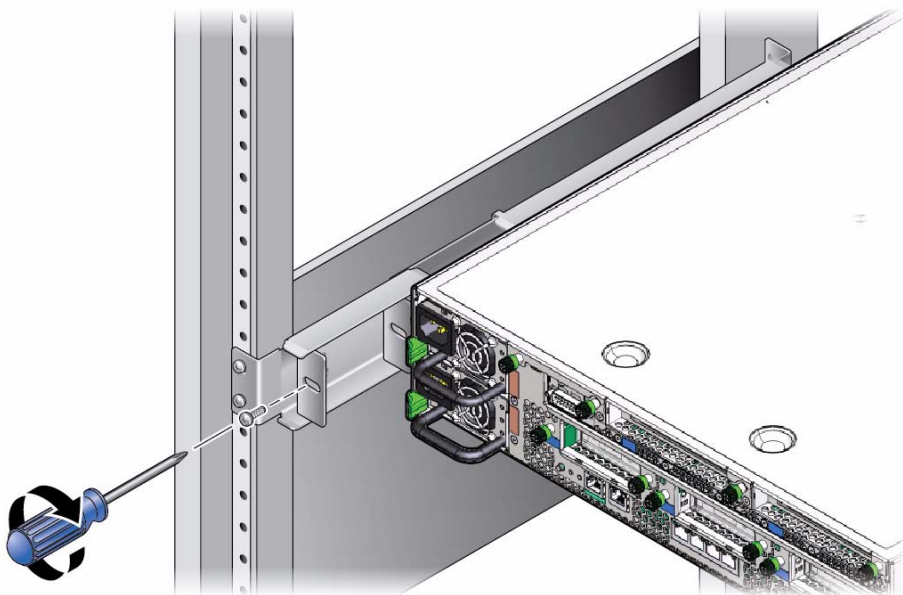
The side rails can accommodate rack rail setbacks (the distance from the front of the rack to the rack rail) of 50 mm, 75 mm, or 100 mm, depending on the type of rack you are installing the server into.



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



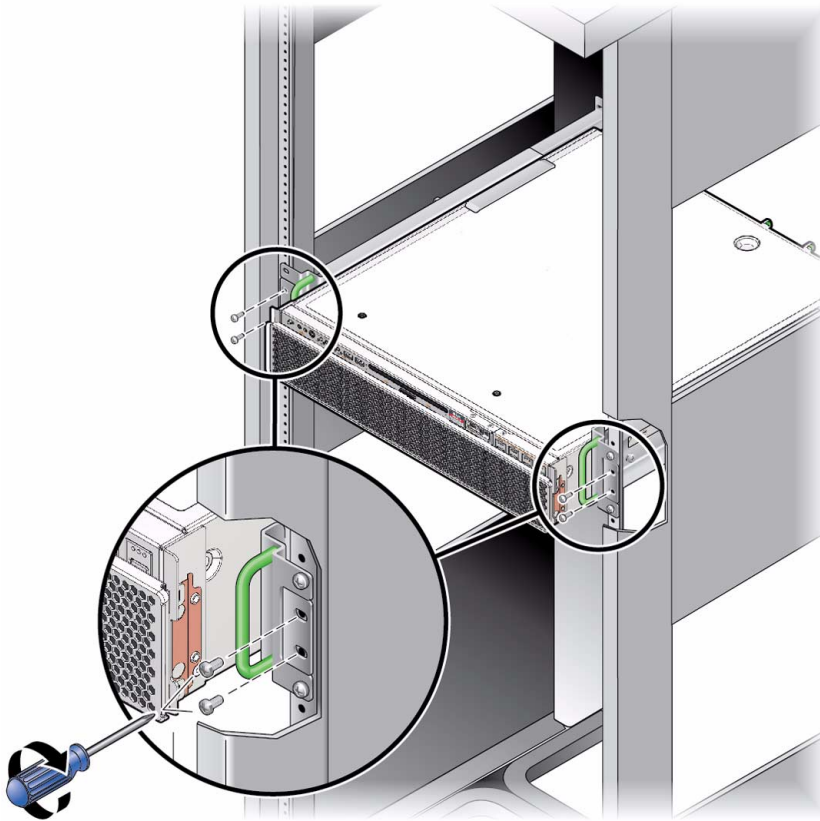
10. Push the server to the desired depth in the rack, then go to the rear of the server and push the rear flanges flush against the back of the server.  
If the rack is especially shallow, you can flip the rear flanges around so that they rest flush against the rear of the server.
11. Lift the server out of the rack.
12. Set the rear flanges to the desired depth in the rack, then tighten the single M5 x 7 SEM screw on each of the flanges to secure them to the adjustable rails.
13. Lift the server into the rack and slide it onto the adjustable rails.
14. Push the server backward until it rests flush against the rear flanges, then use one M5 x 7 SEM screw for each rear flange to secure the rear of the server to the rear flanges.



15. At the front of the rack, use two screws per side to secure the side rails that are attached to the server to the front of the rack.

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





#### Related Information

- [“Stabilize the Rack for Installation” on page 25](#)
- [“600-mm, 4-Post Hardmount Rackmount Kit” on page 37](#)

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## Mounting the Server Into a 2-Post Rack

The server ships with a 19-inch, 4-post hardmount rackmount kit, but you can order optional rackmount kits for 2-post racks.

---

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

---



---

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

---



---

**Caution** – You *must* install the server into a rack following these instructions. If you deviate from these instructions when installing the server, your installation will not be supported.

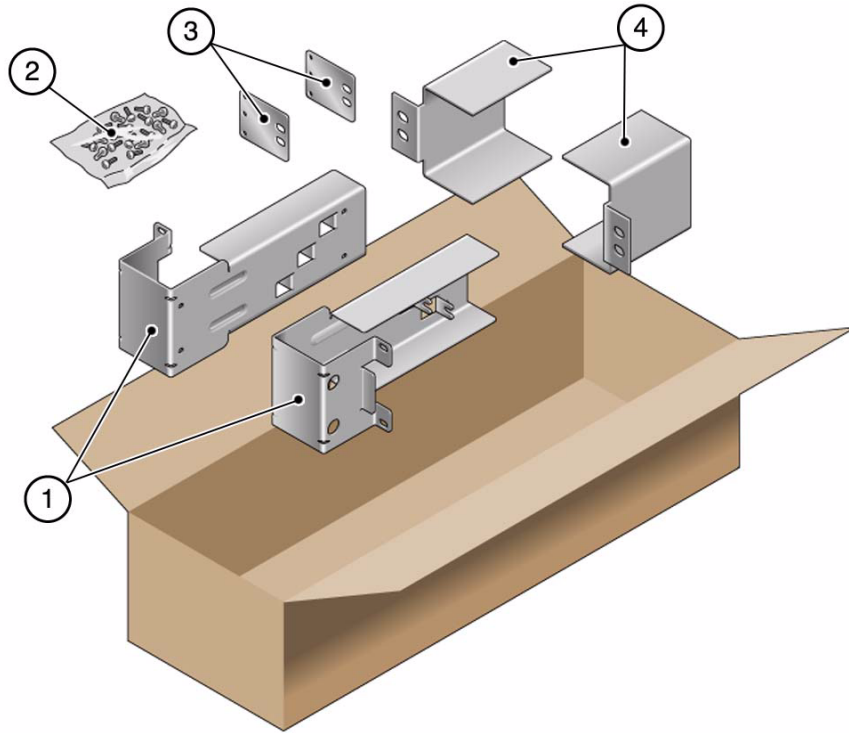
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Description	Links
Install the server using a 23-inch 2-post rackmount kit.	<a href="#">“23-Inch, 2-Post Hardmount Rackmount Kit” on page 47</a> <a href="#">“Install the Server (23-Inch, 2-Post Hardmount Rackmount Kit)” on page 47</a>
Install the server using a 19-inch 2-post rackmount kit.	<a href="#">“19-Inch, 2-Post Hardmount Rackmount Kit” on page 53</a> <a href="#">“Install the Server (19-Inch, 2-Post Hardmount Rackmount Kit)” on page 54</a>
Install the server using a 19-inch 2-post sliding rail rackmount kit.	<a href="#">“19-Inch, 2-Post Rack Sliding Rail Rackmount Kit” on page 58</a> <a href="#">“Install a Server (19-Inch, 2-Post Sliding Rail Rackmount Kit)” on page 59</a>

### Related Information

- [“Mounting the Server Into a 4-Post Rack” on page 25](#)
- [“Preparing for Installation” on page 19](#)

## 23-Inch, 2-Post Hardmount Rackmount Kit



---

1	Side brackets (2)	3	Rear plates (2)
2	Bag of fasteners	4	Rail guides (2)

---

### Related Information

- [“Install the Server \(23-Inch, 2-Post Hardmount Rackmount Kit\)” on page 47](#)

## ▼ Install the Server (23-Inch, 2-Post Hardmount Rackmount Kit)

---

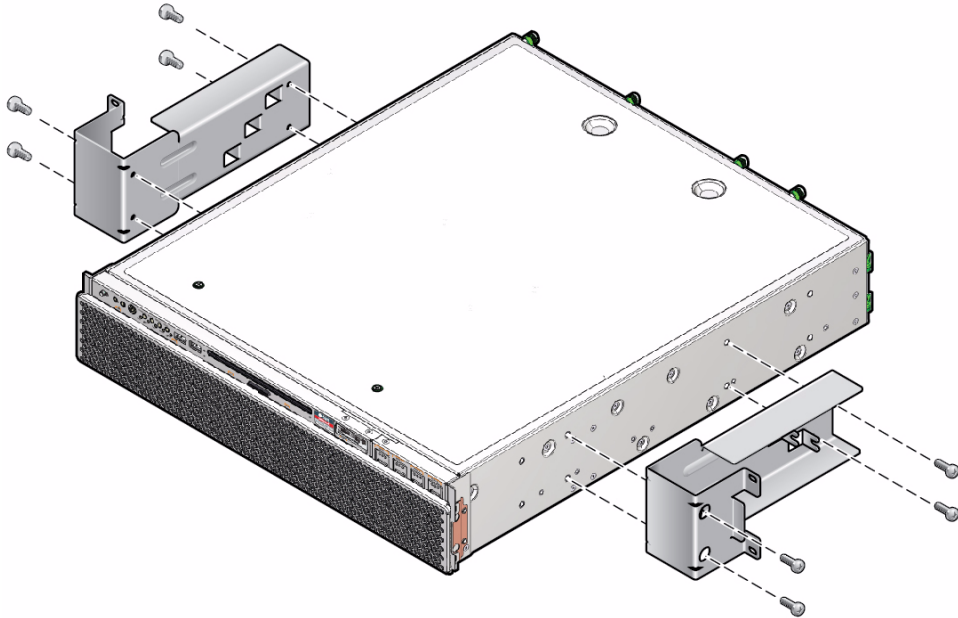
**Note** – The 23-inch, 2-post rackmount kit supports rack web thicknesses (the width of the rack post) of 76.20 mm (3 in.), 101.6 mm (4 in.), and 127 mm (5 in.).

---

1. Read the Cautions for racks.

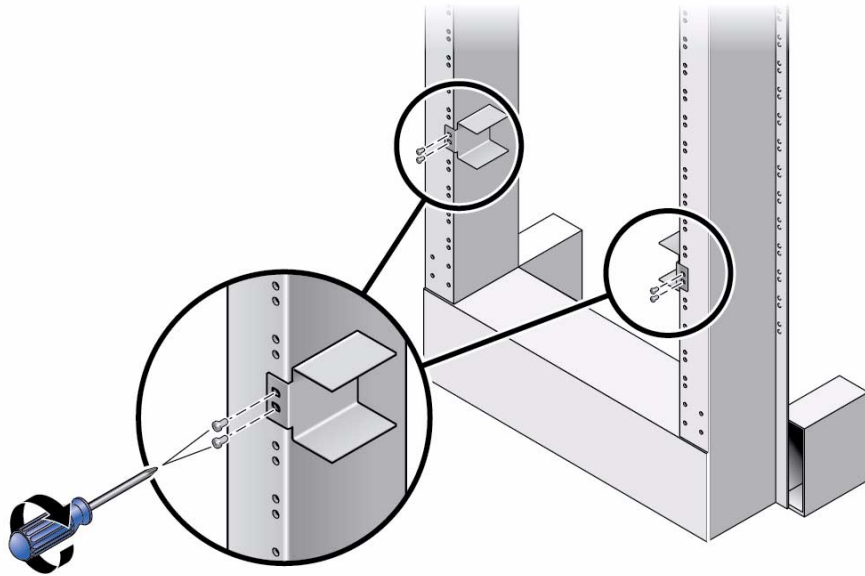
See ["Rack Cautions"](#) on page 24.

2. Using eight of the M5 x 7 SEM screws (four for each side bracket), secure the side brackets to the sides of the server.

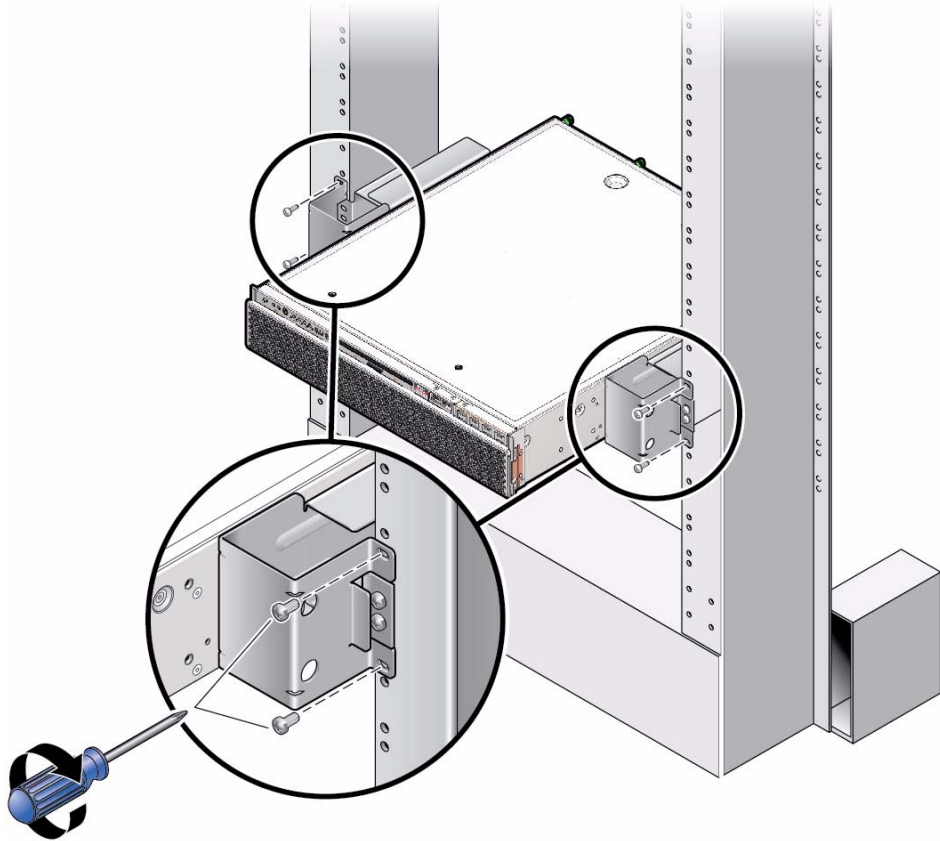


3. Lift the rail guides to the desired height in the rack and, using two screws each, secure both rail guides to the rack.

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



4. Lift the server into the rack, and slide the server onto the rail guides.



5. Using two screws on each side, secure each side bracket on the server to the front of the rack.

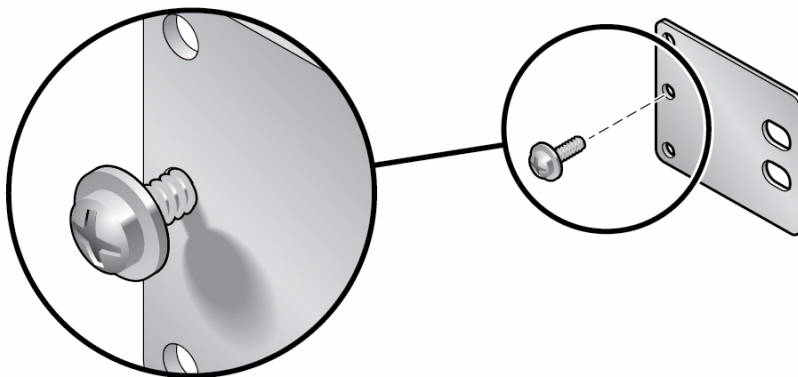
The size of the screws varies, depending on your particular rack.

6. (Optional) If your environment contains especially high vibrations, install the rear plates to further secure the server to the rack.

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

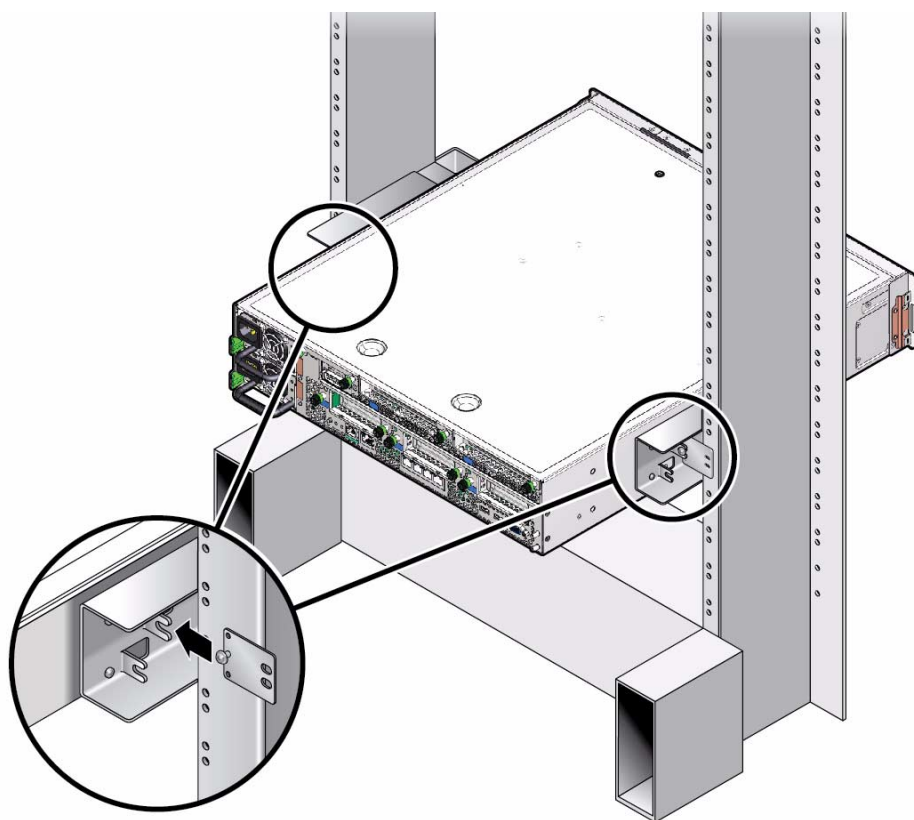
- a. Using one M5 x 7 SEM screw for each rear plate, loosely install the screw in one of the three positions on the rear plate.

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

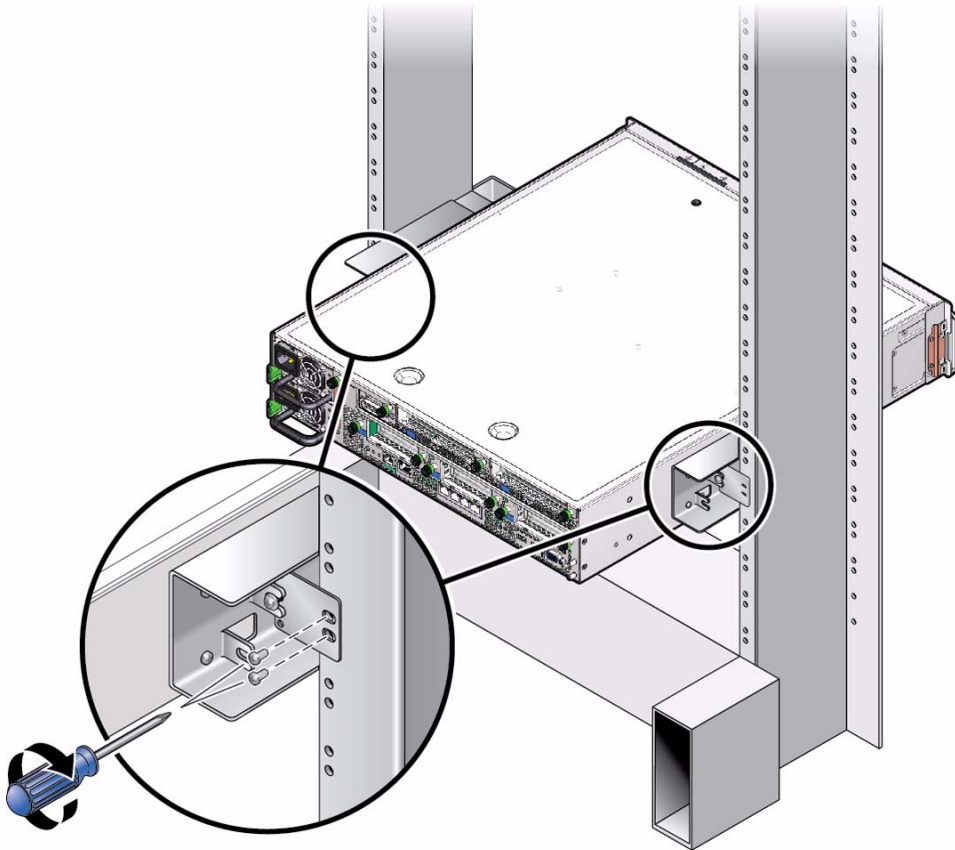


- b. Slide the rear plate in so that the screw slides into position into one of the eyelets.**

The screw head should be facing the rear of the server. The other side of the rear plate should be in front of the rack post.



- c. Tighten the screw to secure the rear plate to the eyelet on the side bracket.
- d. Using two screws, secure the other side of the rear plate to the back of the post.



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

- e. Secure the rear plate on the other post.

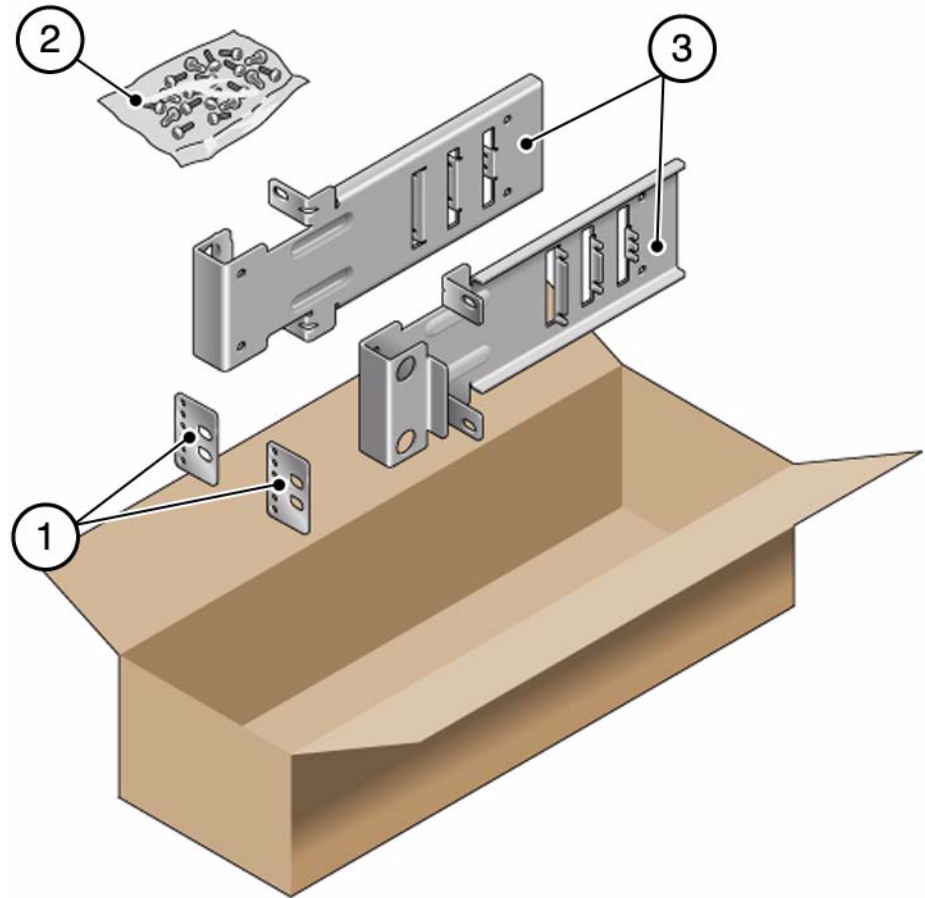
Repeat [Step a](#) through [Step d](#).

### Related Information

- [“Stabilize the Rack for Installation”](#) on page 25
- [“23-Inch, 2-Post Hardmount Rackmount Kit”](#) on page 47



## 19-Inch, 2-Post Hardmount Rackmount Kit



- 
- |   |                   |
|---|-------------------|
| 1 | Rear plates (2)   |
| 2 | Bag of fasteners  |
| 3 | Side brackets (2) |
- 

### Related Information

- [“Install the Server \(19-Inch, 2-Post Hardmount Rackmount Kit\)” on page 54](#)

## ▼ Install the Server (19-Inch, 2-Post Hardmount Rackmount Kit)

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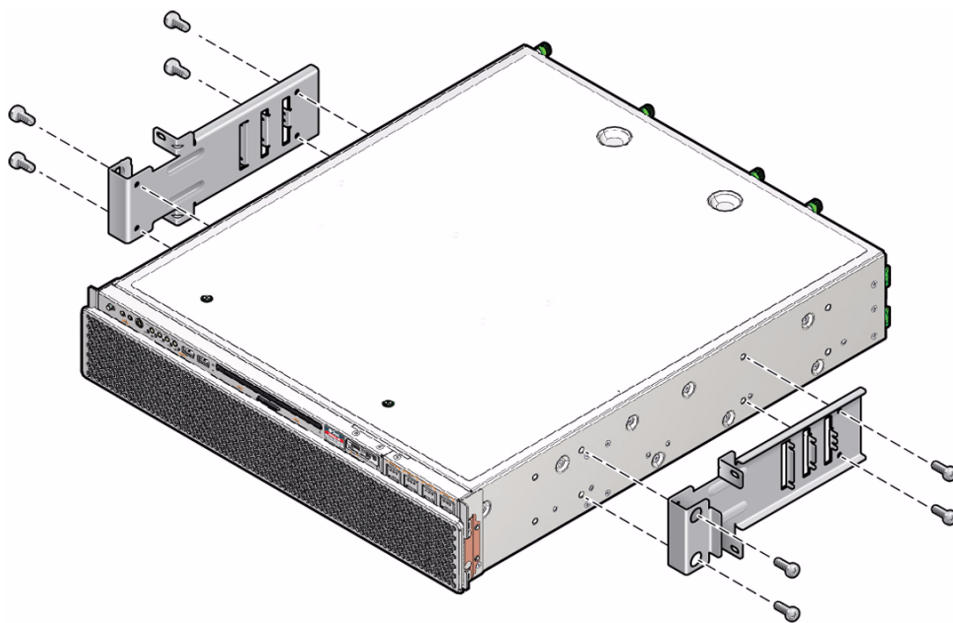
**Note** – The 19-inch, 2-post rackmount kit supports rack web thicknesses (the width of the rack post) of 76.20 mm (3 in.), 101.6 mm (4 in.), and 127 mm (5 in.).

---

**1. Read the Cautions for racks.**

See [“Rack Cautions”](#) on page 24.

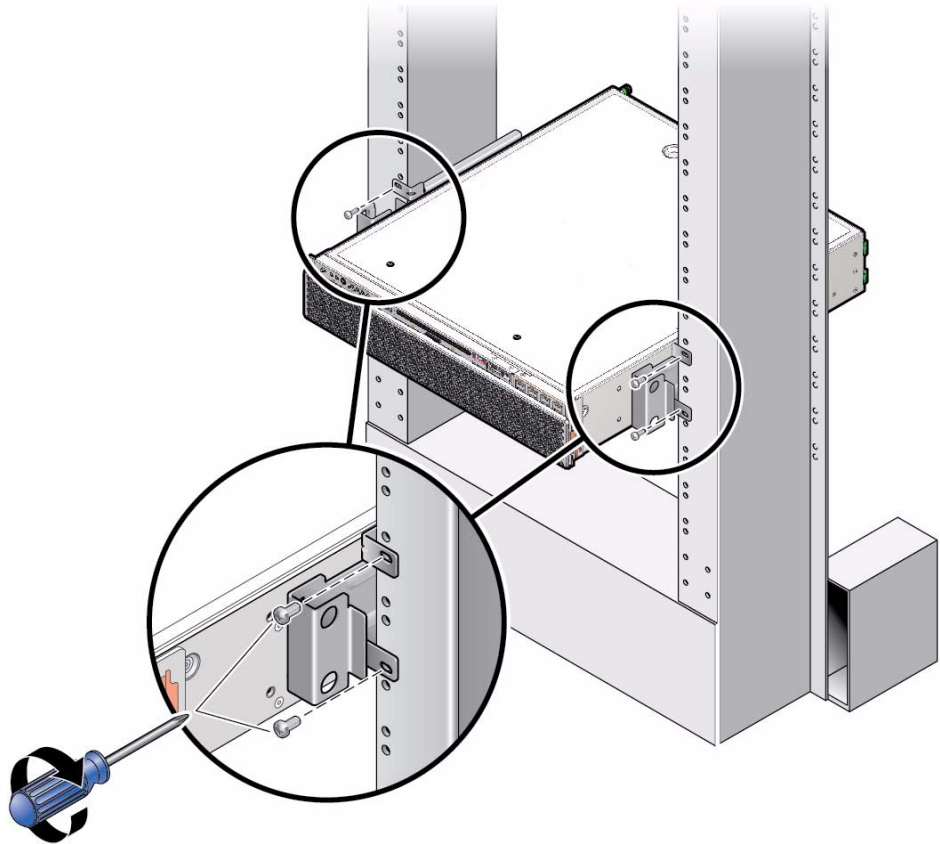
**2. Using four of the M5 x 7 SEM screws for each side bracket, secure the side brackets to the sides of the server.**



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

**4. Using two screws for each bracket, secure the front of the server to the front of the rack.**

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

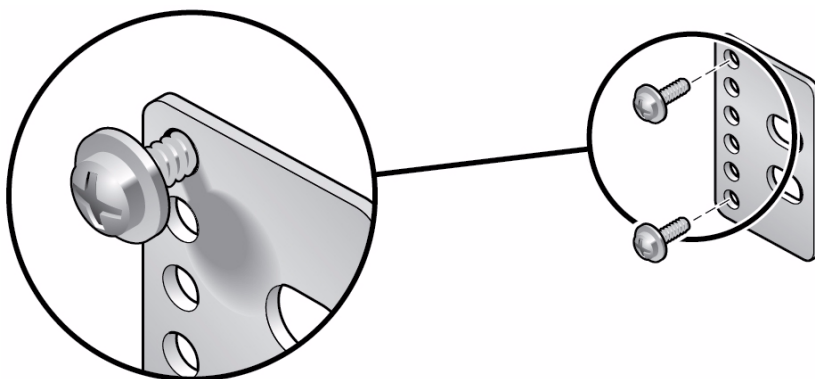


5. (Optional) If your environment contains especially high vibrations, install the rear plates to further secure the server to the rack.

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

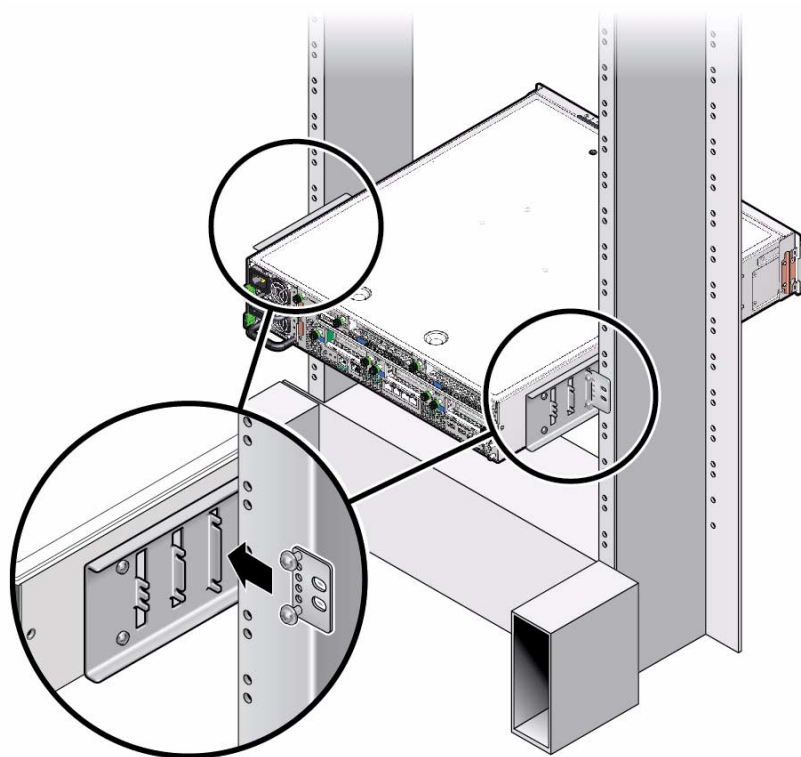
- a. Using two of the M3 x 8 SEM screws for each rear plate, loosely install the screws in one of the six positions on the rear plate.

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



- b. Slide the rear plate in so that the screws slide into position into one set of the eyelets.**

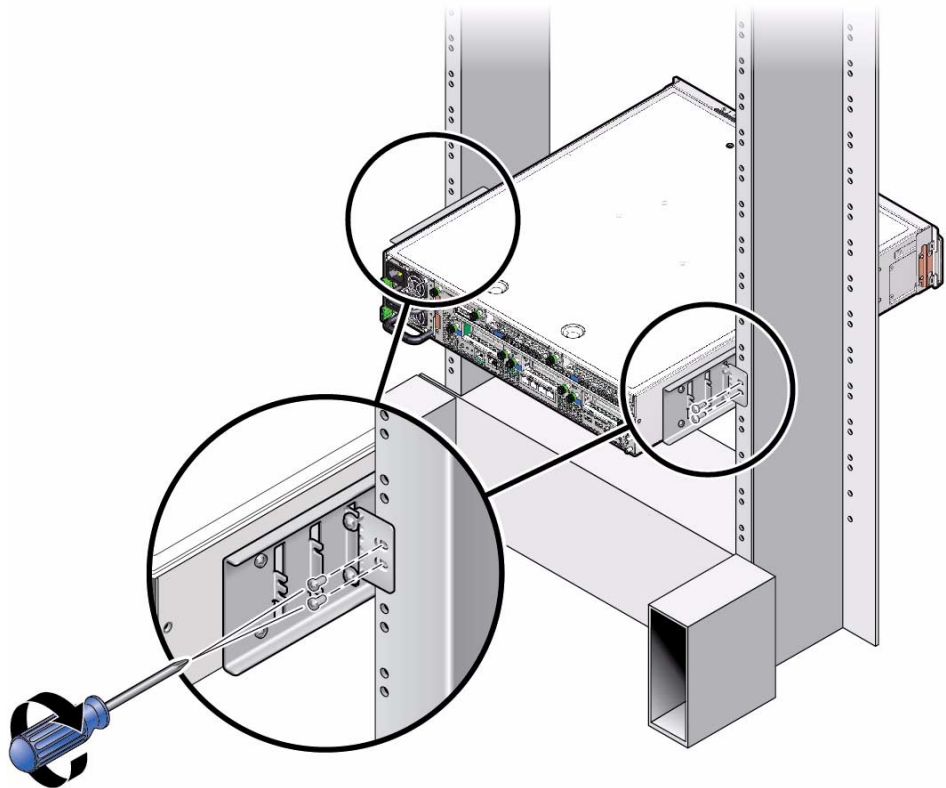
The screw heads should be facing the rear of the server. The other side of the rear plate should be in front of the rack post.



- c. Tighten the screws to secure the rear plate to the set of eyelets on the side bracket.**

- d. Using two screws, secure the other side of the rear plate to the back of the post.

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



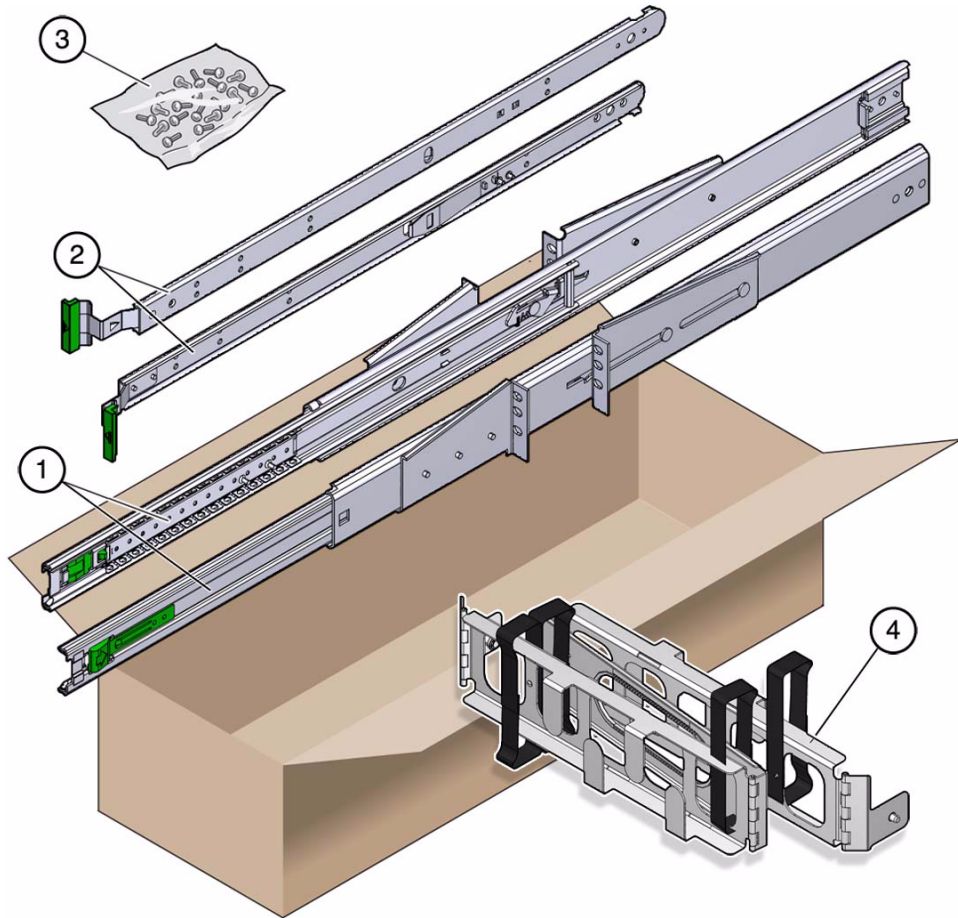
- e. Secure the rear plate on the other post.

Repeat [Step a](#) through [Step d](#).

#### Related Information

- [“Stabilize the Rack for Installation”](#) on page 25
- [“19-Inch, 2-Post Hardmount Rackmount Kit”](#) on page 53

# 19-Inch, 2-Post Rack Sliding Rail Rackmount Kit



---

1	Slide assemblies (2)	4	Cable management arm
2	Inside glides (2)		Threaded strips – M6 (4) 10-32 (4) (not pictured)
3	Bag of fasteners		

---

## Related Information

- [“Install a Server \(19-Inch, 2-Post Sliding Rail Rackmount Kit\)” on page 59](#)

## ▼ Install a Server (19-Inch, 2-Post Sliding Rail Rackmount Kit)

---

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

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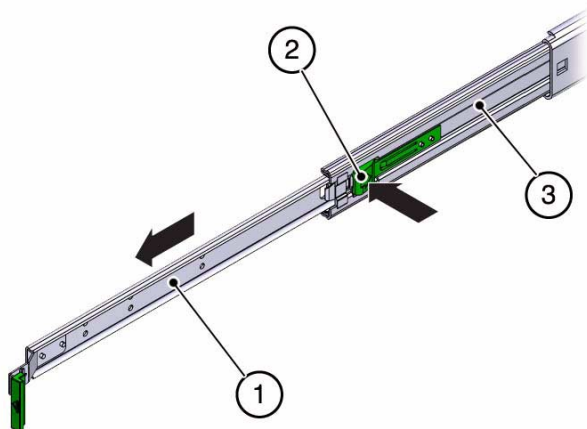
**Note** – The front-to-back rail spacing must be at least 392 mm (15.43 in.) and not more than 863.6 mm (34 in.) from the outside face of the front rail to the outside face of the back rail.

---

**1. Read the Cautions for racks.**

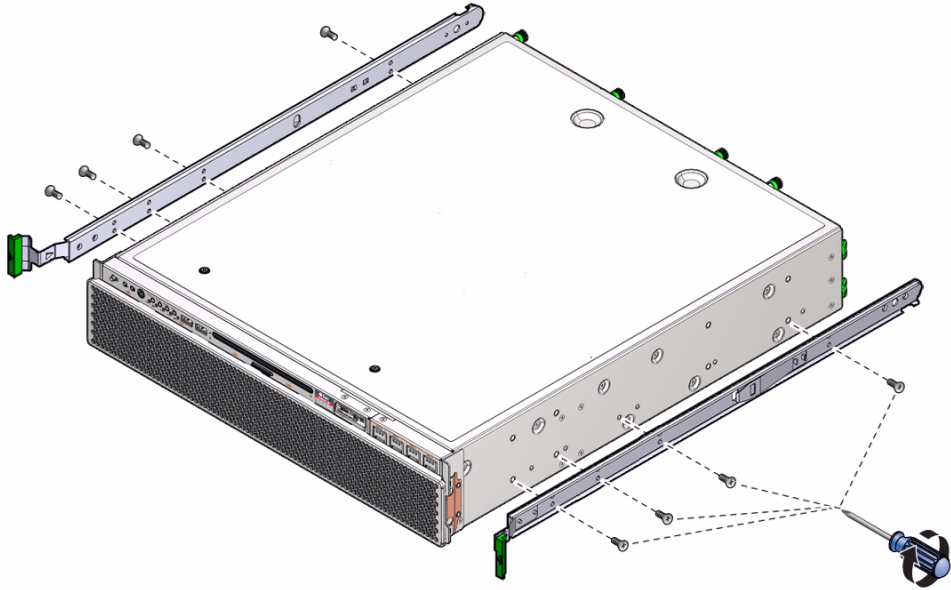
See [“Rack Cautions”](#) on page 24.

**2. Press in the green button on each slide assembly, and pull the right side and left side inner glides completely out of the slides.**



- 
- |   |                      |
|---|----------------------|
| 1 | Glide                |
| 2 | Button               |
| 3 | Slide (in two parts) |
- 

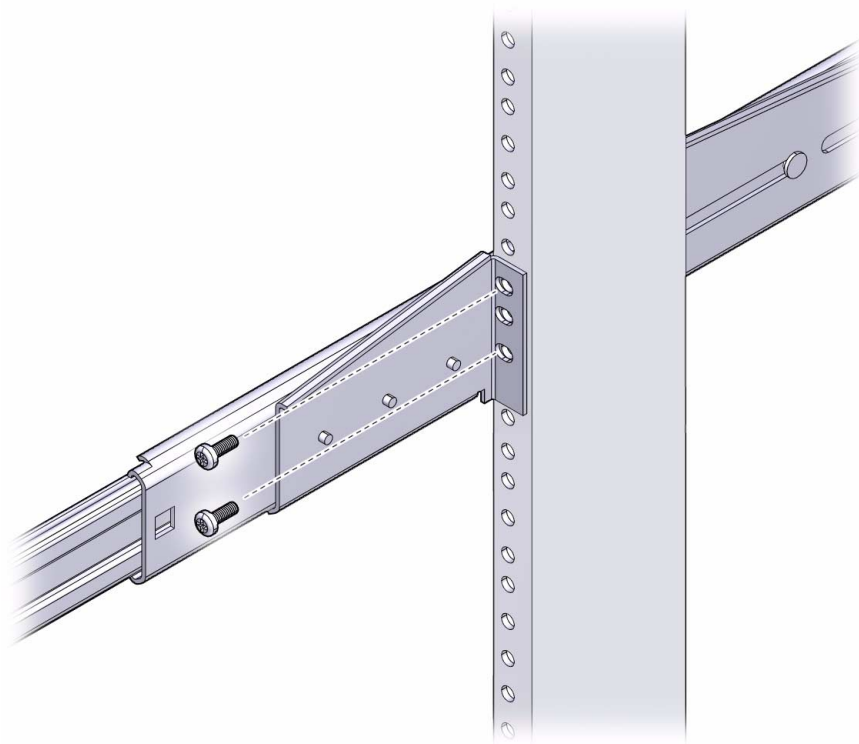
**3. Using eight of the M4 x 0.5 x 5 mm Phillips panhead screws from the rackmount kit (four for each side), attach each glide to the side of the server chassis.**



- 4. Lift each front bracket to the desired position at the *front* of the rack and attach a front bracket to each of the front rack posts.**

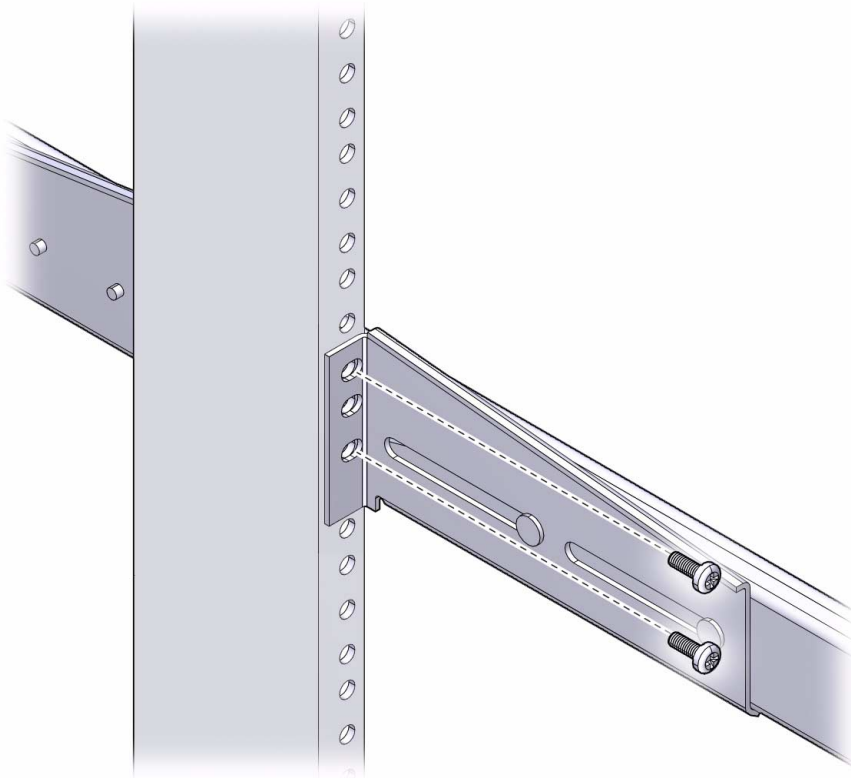
To secure each bracket, use two of the M5 x 12.7 mm screws or two of the M6 x 13 mm screws. Tighten the screws enough to secure the brackets, but leave them loose enough for adjustment later.





5. **Lift each rear bracket to the desired position at the *rear* of the rack and attach a rear bracket to each of the rear rack posts.**

To secure each bracket, use two of the M5 x 12.7 mm screws or two of the M6 x 13 mm screws, as you did in [Step 4](#). Tighten the screws enough to secure the brackets, but leave them loose enough for adjustment later.



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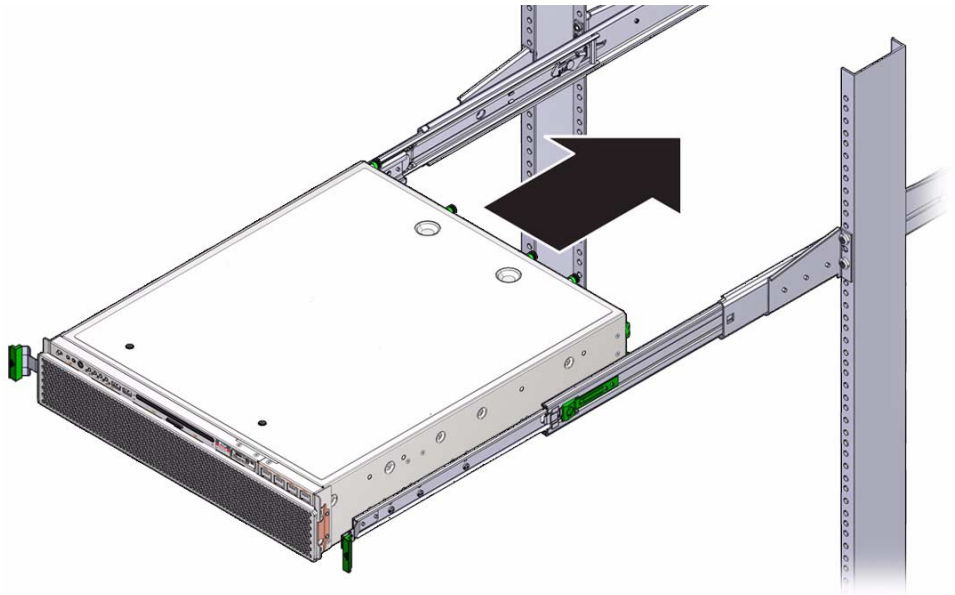
**Note** – If your rack has 10–32 holes, use the 10–32 collar screws and 10–32 threaded strips.

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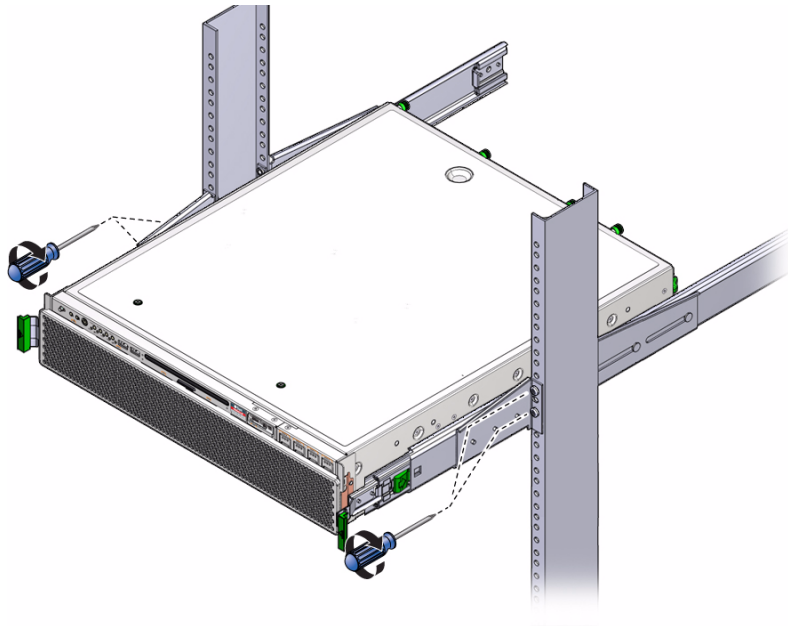
**6. Align the glides attached to the server with the slide assemblies in the rack.**

You might find that there is too much or too little room between the two slides mounted in the rack. Consequently the glides attached to the server might not align correctly with the slides in the rack. If either situation occurs, loosen the screws on the front and back brackets ([Step 4](#) and [Step 5](#)), move the brackets inward or outward to the appropriate points, then tighten the brackets again.

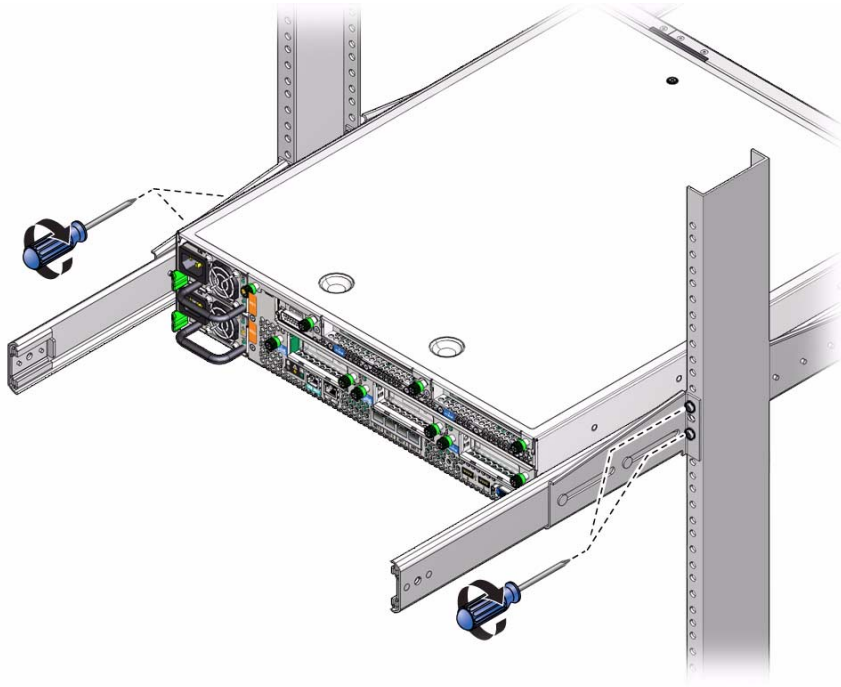
**7. Push in the slide buttons and slide the server all the way into the rack enclosure.**



**8. Fully tighten the screws on the front brackets.**

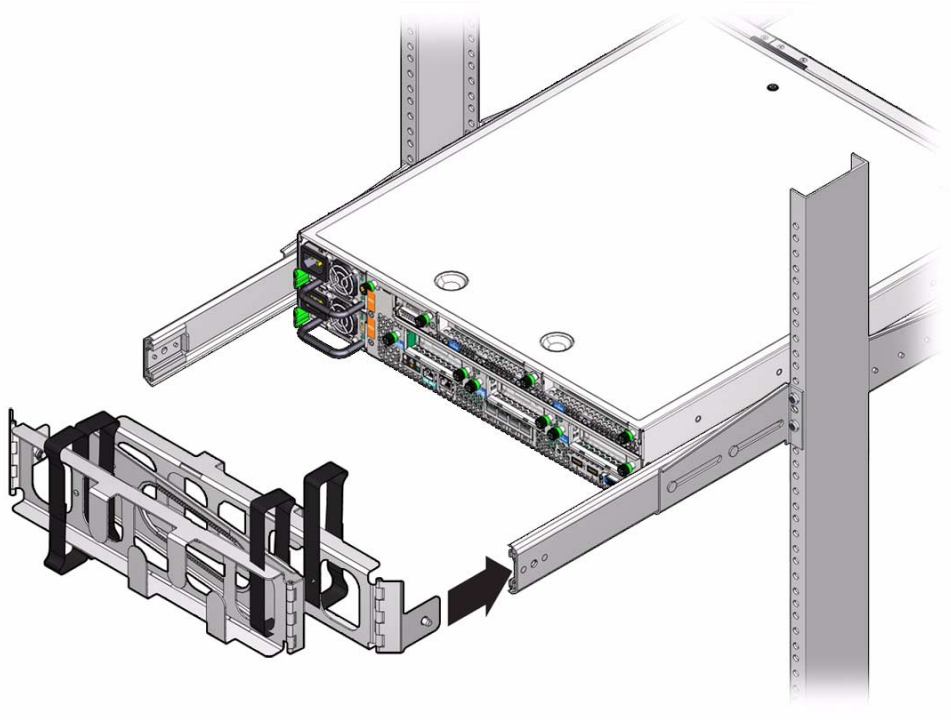


**9. Fully tighten the screws on the rear brackets.**



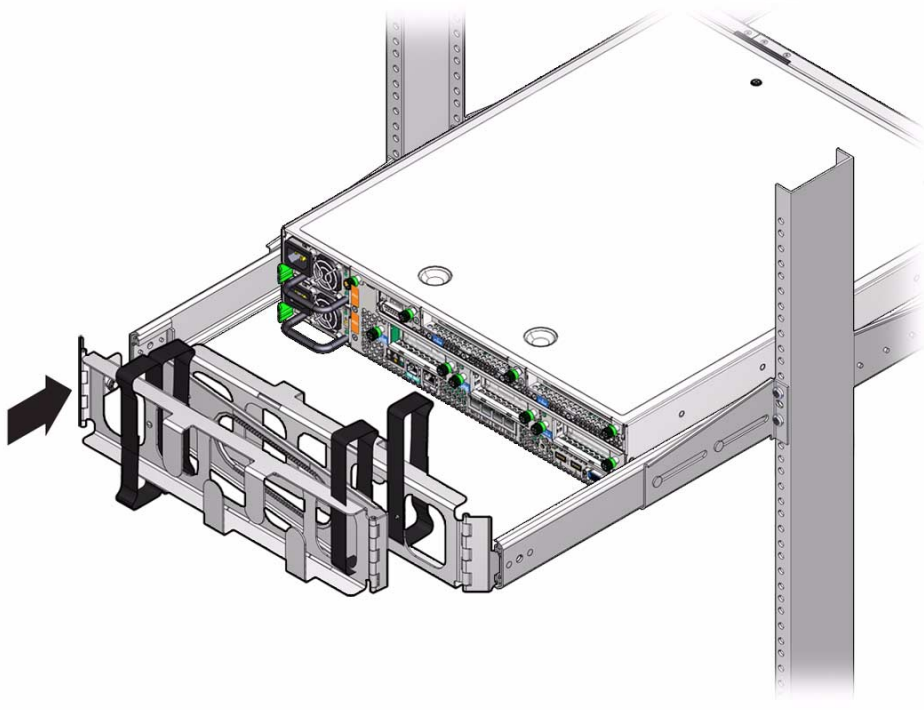
**10. Attach the CMA to the right rail on the right side.**

There are labels on both the rails and the CMA. The CMA side that has an arrow attaches to the right inner glide. The other side of the CMA attaches to the outer member.



**11. Attach the CMA to the left rail.**

There are labels on both the rails and the CMA. The CMA side that has an arrow attaches to the left inner glide. The other side of the CMA attaches to the outer member.



### Related Information

- [“Stabilize the Rack for Installation” on page 25](#)
- [“19-Inch, 2-Post Rack Sliding Rail Rackmount Kit” on page 58](#)

# Connecting Cables

Perform the following tasks to connect and configure the network and serial ports before you attempt to boot the server.

Step	Description	Links
1.	Review the cabling requirements.	<a href="#">“Cabling Requirements” on page 67</a>
2.	Review the rear panel connectors and ports.	<a href="#">“Identifying Ports” on page 68</a>
3.	Connect the management and data cables.	<a href="#">“Connecting Data and Management Cables” on page 74</a>

## Related Information

- [“Rear Panel Components” on page 6](#)
- [“Preparing for Installation” on page 19](#)
- [“Powering On the Server for the First Time” on page 79](#)

---

## Cabling Requirements

Prior to cabling and powering on the server, gather the following network information from your network administrator:

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

At a minimum, you must connect cables to these ports before powering on the server for the first time:

- SER MGT port
- NET MGT port
- At least one system on-board Ethernet network port

- Power cables to the power supply inlet ports

### **Related Information**

- [“Electrical Specifications” on page 10](#)
- [“Rear Panel Components” on page 6](#)
- [“Identifying Ports” on page 68](#)

---

## Identifying Ports

These topics provide the pin descriptions of the ports. See [“Rear Panel Components” on page 6](#).

- [“Alarm Port” on page 68](#)
- [“SER MGT Port” on page 70](#)
- [“NET MGT Port” on page 70](#)
- [“Gigabit Ethernet Ports” on page 71](#)
- [“USB Ports” on page 72](#)
- [“Video Port” on page 73](#)

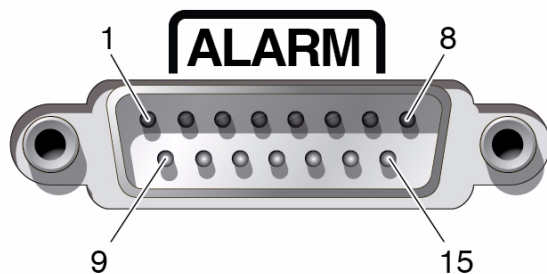
### **Related Information**

- [“Rear Panel Components” on page 6](#)
- [“Cabling Requirements” on page 67](#)

## Alarm Port

The alarm port on the rear panel uses a standard DB-15 connector that provides a connection for a Telco dry alarm relay cable. In a telecommunications environment, use this port to connect to the central office alarming system. The alarm port relay contacts are rated for 100V, 0.2A maximum.





Pin	Signal Description	Pin	Signal Description
1	RESET0+	9	ALARM1_NC
2	RESET0-	10	ALARM1_COM
3	RESET1+	11	ALARM2_NO
4	RESET1-	12	ALARM2_NC
5	ALARM0_NO	13	ALARM2_COM
6	ALARM0_NC	14	ALARM3_NO
7	ALARM0_COM	15	ALARM3_COM
8	ALARM1_NO	CHASSIS	FRAME GND

Each alarm has a corresponding alarm LED on the front panel:

- ALARM0 and the Critical LED
- ALARM1 and the Major LED
- ALARM2 and the Minor LED
- ALARM3 and the User LED

### Related Information

- [“Rear Panel Components” on page 6](#)
- [“Front Panel Components” on page 5](#)
- [“Connect Other Data Cables” on page 77](#)

## SER MGT Port

The SER MGT RJ-45 port, located on the rear panel, provides an TIA/EIA-232 serial Oracle/Cisco standard connection to the SP. This port is the default connection to the Oracle ILOM system controller. For DTE-to-DTE communications, you can use the supplied RJ-45 to DB-9 crossover adapter with a standard RJ-45 cable to achieve the required null modem configuration.



Pin	Signal Description	Pin	Signal Description
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

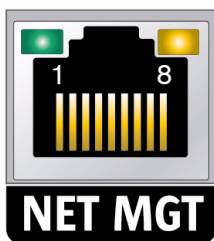
### Related Information

- [“Rear Panel Components” on page 6](#)
- [“Connect the SER MGT Cable” on page 74](#)
- [“Connect a Terminal or Emulator to the SER MGT Port” on page 84](#)

## NET MGT Port

The NET MGT RJ-45 port, located on the rear panel, provides an optional Ethernet connection to the SP. The NET MGT port is an optional connection to the Oracle ILOM SP. The service processor network management port uses an RJ-45 cable for a 10/100BASE-T connection. If your network does not use a DHCP server, this port will not be available until you configure network settings through the SER MGT port.

This port does not support connections to Gigabit networks.



Pin	Signal Description	Pin	Signal Description
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

- [“Rear Panel Components” on page 6](#)
- [“Connect the NET MGT Cable” on page 75](#)
- [“Assign a Static IP Address to the SP” on page 88](#)

## Gigabit Ethernet Ports

Four RJ-45 Gigabit Ethernet connectors (NET0, NET1, NET2, NET3) can be accessed from the rear panel. The Ethernet interfaces operate at 10 Mbit/sec, 100 Mbit/sec, and 1000 Mbit/sec. These ports enable you to connect the server to the network.

**Note** – Using the Oracle ILOM sideband management feature, you can access the SP using one of these ports. Refer to the *Servers Administration* for instructions.



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

### Related Information

- [“Rear Panel Components” on page 6](#)
- [“Connect Ethernet Network Cables” on page 76](#)

## USB Ports

You can access two USB ports from the front of the server and two USB ports from the rear of the server. The USB ports support hot-plugging. You can connect and disconnect USB cables and peripheral devices while the server is running, without affecting server operations.

---

**Note** – The maximum USB cable length for connecting to the server’s full-speed USB ports is 5 meters.

---



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**Note** – You can connect up to 126 devices to each of the four USB controllers (two ports in front, two ports in rear), for a total of 504 USB devices per server.

---



Pin	Signal Description	Pin	Signal Description
1	+5V supply	3	Data +
2	Data -	4	Ground

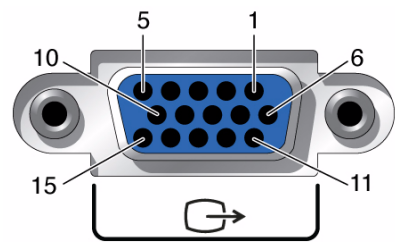
**Related Information**

- [“Rear Panel Components” on page 6](#)
- [“Front Panel Components” on page 5](#)

**Video Port**

The server has one 15-pin VGA video port on the rear of the server. Use a HDB-15 video cable to connect to a video device. You can also use the supplied RJ-45 to DB-25 analog-to-digital video adapter to achieve the required connection.

**Note** – The cable length used to connect between monitor and the VGA port should not be over 6 meters.



Pin	Signal Description	Pin	Signal Description
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](#)
- [“Connect Other Data Cables” on page 77](#)

---

# Connecting Data and Management Cables

These topics describe how to connect cables to the server.

- [“Connect the SER MGT Cable” on page 74](#)
- [“Connect the NET MGT Cable” on page 75](#)
- [“Connect Ethernet Network Cables” on page 76](#)
- [“Connect Other Data Cables” on page 77](#)

## Related Information

- [“Rear Panel Components” on page 6](#)
- [“SER MGT Port” on page 70](#)
- [“NET MGT Port” on page 70](#)
- [“Gigabit Ethernet Ports” on page 71](#)
- [“Alarm Port” on page 68](#)
- [“USB Ports” on page 72](#)
- [“Video Port” on page 73](#)

## ▼ Connect the SER MGT Cable

The service processor serial management port is labeled SER MGT. Use the SER MGT port *only* for server management. see [“SER MGT Port” on page 70](#).



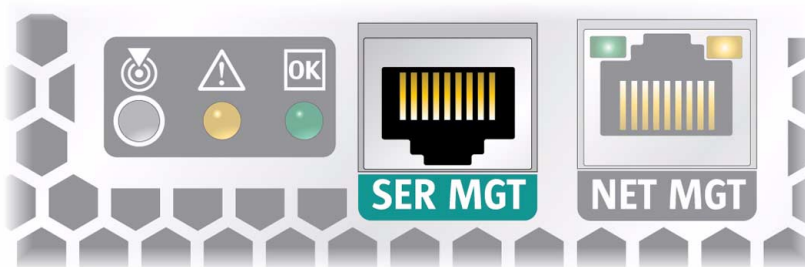
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**Caution** – Do not attach a modem to this port.

---

- **Connect a Category 5 (or better) cable from the SER MGT to a terminal device.**

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



### Related Information

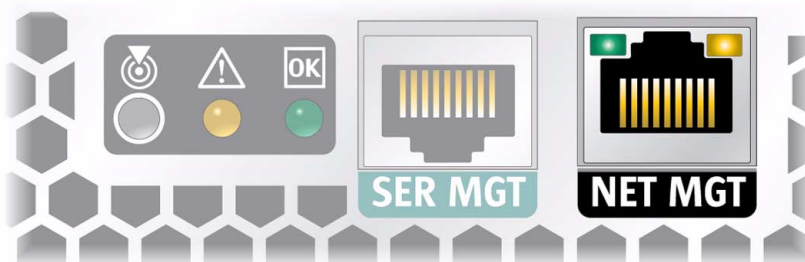
- [“SER MGT Port” on page 70](#)
- [“Connect the NET MGT Cable” on page 75](#)
- [“Connect Ethernet Network Cables” on page 76](#)
- [“Connect Other Data Cables” on page 77](#)

## ▼ Connect the NET MGT Cable

The service processor network management port is labeled NET MGT. After the initial server configuration, you can connect to the service processor over an Ethernet network using this NET MGT port. See [“NET MGT Port” on page 70](#).

If your network uses a DHCP server to assign IP addresses, the DHCP server will assign an IP address to this NET MGT port. With this IP address, you can connect to the service processor using an SSH connection. If your network does not use DHCP, this NET MGT port will not be accessible until you configure the network settings through the SER MGT port. For instructions, see [“Assign a Static IP Address to the SP” on page 88](#).

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



### Related Information

- [“NET MGT Port” on page 70](#)
- [“Connect the SER MGT Cable” on page 74](#)
- [“Connect Ethernet Network Cables” on page 76](#)
- [“Connect Other Data Cables” on page 77](#)

## ▼ Connect Ethernet Network Cables

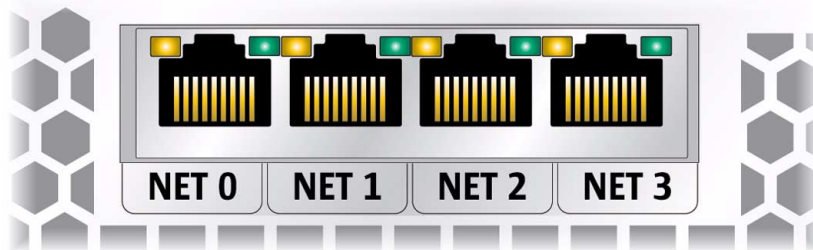
The server has four Gigabit-Ethernet network connectors, marked NET0, NET1, NET2, and NET3. Use these ports to connect the server to the network. The Ethernet interfaces operate at 10 Mbps, 100 Mbps, and 1000 Mbps. See [“Gigabit Ethernet Ports” on page 71](#).

---

**Note** – The Oracle ILOM sideband management feature enables you to access the SP using one of these Ethernet ports. Refer to the *Servers Administration* for instructions.

---

1. Connect a Category 5 (or better) cable from your network switch or hub to Ethernet Port 0 (NET0) on the rear of the chassis.



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

### Related Information

- [“Gigabit Ethernet Ports” on page 71](#)
- [“Powering On the Server for the First Time” on page 79](#)
- [“Connect the SER MGT Cable” on page 74](#)
- [“Connect the NET MGT Cable” on page 75](#)
- [“Connect Other Data Cables” on page 77](#)



## ▼ Connect Other Data Cables

If your server includes optional PCIe cards, connect the appropriate I/O cables to their connectors.

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

Refer to the PCIe card documentation for specific instructions.

### **Related Information**

- PCIe card documentation
- [“Identifying Ports” on page 68](#)
- [“Rear Panel Components” on page 6](#)
- [“Connect the SER MGT Cable” on page 74](#)
- [“Connect the NET MGT Cable” on page 75](#)
- [“Connect Ethernet Network Cables” on page 76](#)



# Powering On the Server for the First Time

These topics include instructions for powering on the server for the first time, booting the server, and configuring the Oracle Solaris OS.

Step	Description	Links
1.	Review requirements for the AC or DC power source, chassis ground, the DC connectors, and the overcurrent protection.	<a href="#">“Electrical Specifications” on page 10</a> <a href="#">“DC Power Source, Power Connection, and Grounding Requirements” on page 13</a> <a href="#">“Input Power Information” on page 11</a> <a href="#">“Overcurrent Protection Requirements” on page 12</a>
2.	For DC powered servers, assemble the DC power cords.	<a href="#">“Assemble the DC Power Cords” on page 80</a>
3.	Prepare the power cords.	<a href="#">“Prepare the Power Cords” on page 83</a>
4.	Connect a serial terminal device or terminal server to the SER MGT port.	<a href="#">“Connect a Terminal or Emulator to the SER MGT Port” on page 84</a>
5.	Power on the server. Set Oracle Solaris OS configuration parameters during the process.	<a href="#">“Power On the Server for the First Time” on page 85</a> <a href="#">“Oracle Solaris OS Configuration Parameters” on page 87</a>
6.	(Optional) Configure the NET MGT port to use a static IP address.	<a href="#">“Assign a Static IP Address to the SP” on page 88</a>

## Related Information

- [“Preparing for Installation” on page 19](#)
- [“Installing the Server” on page 23](#)
- [“Connecting Cables” on page 67](#)
- *Servers Administration*

## ▼ Assemble the DC Power Cords

Assemble one DC input power cable for each DC power supply in your server.

1. **Install a DC power source that meets the server's input power specifications.**  
See ["Input Power Information"](#) on page 11.
2. **Secure DC power cables that meet the server's power cabling specifications.**  
See ["DC Power Source, Power Connection, and Grounding Requirements"](#) on page 13.
3. **Turn off power from the DC power source using the circuit breakers.**



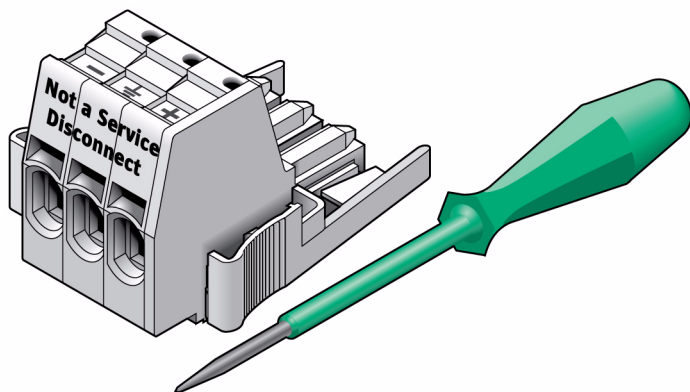
---

**Caution** – Before proceeding with these instructions, turn off the power from the DC power source through the circuit breakers.

---

4. **Identify the parts that you will use to assemble the DC input power cables.**

For each cable, you need a Wago DC input plug, and a cage clamp tool or small screwdriver. These items are provided in the shipping kit that came with your server. See ["Shipping Kit"](#) on page 19.



5. **Locate the three wires coming from your DC power source that will be used in the connection to your unit.**
  - -48V or -60V (negative terminal)
  - Chassis ground
  - -48V or -60V Return (positive terminal)

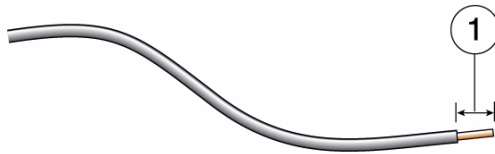
---

**Note** – Depending on the DC power source, the -48V or -60V (negative terminal) might be marked with a minus (-) symbol. The -48V or -60V Return (positive terminal) might be marked with a positive (+) symbol.

---

6. Strip 1/2 in. (13 mm) of insulation from each of the wires coming from the DC power source.

Do not strip more than 1/2 in. (13 mm) from each wire. Doing so leaves uninsulated wire exposed from the DC connector after the assembly is complete.

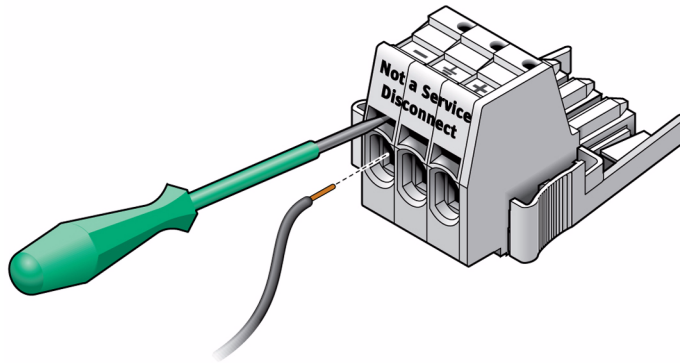


---

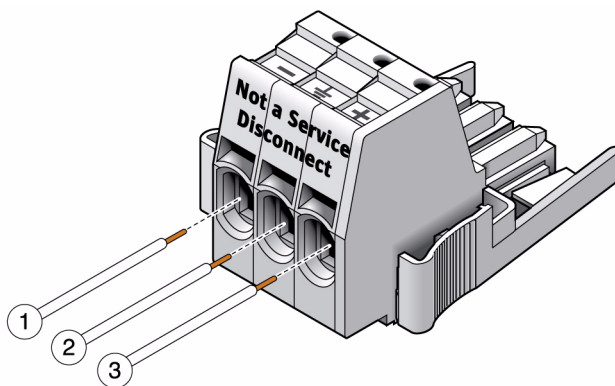
1      1/2 in. (13 mm)

---

7. Open the cage clamp by inserting the cage clamp tool (or small screwdriver) into the rectangular hole directly above the hole in the DC input plug where you want to insert the first wire, and push in to open the cage clamp.



8. Feed the exposed section of the appropriate wire into the round plug hole in the DC input plug.



- 
- |   |                                    |
|---|------------------------------------|
| 1 | From -48V or -60V                  |
| 2 | From chassis ground (green/yellow) |
| 3 | From -48V or -60V Return           |
- 

---

**Note** – If you need to remove a wire from the DC input plug, insert the cage clamp operating tool or a small screwdriver into the slot directly above the wire and push in. Pull the wire from the DC input plug.

---

9. Remove the cage clamp tool to secure the wire.
10. Repeat the procedures for the other two wires to complete the assembly of the DC input power cable.
11. Repeat this procedure to create as many DC input power cables as you need for your unit.
12. Prepare the power cords.  
See [“Prepare the Power Cords”](#) on page 83.

### Related Information

- [“Prepare the Power Cords”](#) on page 83
- [“Power On the Server for the First Time”](#) on page 85

---

## ▼ Prepare the Power Cords

Prepare the power cords by routing them from the power source to the server.



---

**Caution** – Do not attach power cables to the power supplies until you first connect the server to a serial terminal or a terminal emulator (PC or workstation).

---

---

**Note** – The server goes into Standby mode and the Oracle ILOM 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.

---

---

**Note** – Oracle ILOM will signal a fault if both power supplies are not cabled at the same time, since that situation will be a nonredundant condition.

---

1. Ensure that the circuit breakers are off for the AC or DC power source or that the DC input cables are de-energized with no DC power present.
2. Route the power cords from the power source to the rear of the server and secure the cables with nylon tie wraps.
3. Connect the chassis ground wire to the facility ground and ensure that this connection has proper bonding.
4. For DC servers, connect the -48V or -60V Return to the -48V or -60V wires to the circuit breaker.



---

**Caution** – Do not close circuit breakers or attach power cables to the power supplies At this time.

---

5. Make a serial connection to the SP.

See [“Connect a Terminal or Emulator to the SER MGT Port” on page 84](#)

### Related Information

- Power source documentation
- [“Connect a Terminal or Emulator to the SER MGT Port” on page 84](#)
- [“Power On the Server for the First Time” on page 85](#)

---

## ▼ Connect a Terminal or Emulator to the SER MGT Port

Prior to powering on the server for the first time, make a serial connection to the SP. After making this serial connection, you will be able to view the system messages when you connect the power cords.

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

See [“Preparing for Installation” on page 19.](#)

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

See [“Installing the Server” on page 23.](#)

**3. Confirm that you have connected the necessary cables.**

See [“Connecting Cables” on page 67.](#)

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

Configure the terminal or terminal emulator with these settings:

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

A null modem configuration is needed, meaning the transmit and receive signals are reversed (crossed over) for DTE-to-DTE communications. You can use the supplied RJ-45 crossover adapters with a standard RJ-45 cable to achieve the null modem configuration.

---

**Note** – When you power on the server for the first time and you do not have a terminal or terminal emulator (PC or workstation) connected to the SP SER MGT port, you will not see system messages.

---

**5. Continue with the installation by powering on the server for the first time.**

See [“Power On the Server for the First Time” on page 85.](#)

**Related Information**

- [“Connect the SER MGT Cable” on page 74](#)



- [“SER MGT Port” on page 70](#)
- [“Rear Panel Components” on page 6](#)
- [“Power On the Server for the First Time” on page 85](#)

---

## ▼ Power On the Server for the First Time

1. **Confirm that you have installed the server in a rack and attached all of the data cables.**

See [“Preparing for Installation” on page 19](#), [“Installing the Server” on page 23](#), and [“Connecting Cables” on page 67](#).

2. **Confirm that you made a serial connection to the SP.**

See [“Connect a Terminal or Emulator to the SER MGT Port” on page 84](#).

---

**Note** – When you power on the server for the first time and you do not have a terminal or terminal emulator (PC or workstation) connected to the SP SER MGT port, you will not see system messages.

---

3. **(Optional) Connect an Ethernet cable between the server’s NET MGT port and the network from which future connections to the SP and host will be made.**

See [“Connect the NET MGT Cable” on page 75](#).

---

**Note** – After the initial configuration of the server using the SER MGT port, communication with the SP and host is usually performed through this NET MGT port.

---

4. **Connect an Ethernet cable between one of the server’s Gigabit Ethernet ports and the network to which the server will communicate.**

See [“Connect Ethernet Network Cables” on page 76](#).

5. **Plug the power cords into the power supplies on the server.**

6. **Plug the power cords into the power source and close the circuit breakers.**

---

**Note** – Use two power connections on separate circuits for redundancy.

---

Power is immediately supplied to the SP and the front panel SP OK/Fault LED flashes (See “[Front Panel Components](#)” on page 5). The SP then runs diagnostics and initializes the Oracle ILOM firmware.

After the Oracle ILOM firmware initializes, the SP OK/Fault LED remains lit, the main power OK/Fault LED slowly flashes, and the SP login prompt displays on the terminal device. However, the host is not initialized or powered on yet.

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

```
ORACLESP-xxxxxxxxx login: root
Password: changeme
. . .
->
```

After a brief delay, the Oracle ILOM prompt is displayed (->). At this point, there are many commands you can perform using the Oracle ILOM interface.

Additional SP information, such as how to change the password and how to set up the SP network parameters is available in the *Servers Administration*.

- 8. 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 SP host console, the server initialization takes approximately 20 minutes to complete.

- 9. When prompted, follow the onscreen instructions for configuring the Oracle Solaris OS on your host and enter configuration information.**

You are prompted to confirm the configuration several times, enabling confirmation and changes. If you are not sure how to respond to a particular value, you can accept the default, and make future changes when the Oracle Solaris OS is running. See “[Oracle Solaris OS Configuration Parameters](#)” on page 87 for a description of the Oracle Solaris OS parameters you must provide during initial configuration.

## 10. (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

- [“Oracle Solaris OS Configuration Parameters” on page 87](#)
- [“Front Panel Components” on page 5](#)
- [“Preparing for Installation” on page 19](#)
- [“Connecting Cables” on page 67](#)

---

# Oracle Solaris OS Configuration Parameters

You must provide these parameters during initial Oracle Solaris OS configuration.

Parameter	Description
Language	Select a number from the displayed language list.
Locale	Select a number from the displayed locale list.
Terminal Type	Select a terminal type that corresponds with your terminal device.
Network?	Select <i>Yes</i> .
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 <i>Yes</i> or <i>No</i> 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 <i>Yes</i> or <i>No</i> according to your network environment.
Subnet Mask	(If subnet was <i>Yes</i> ) Type the netmask for the subnet for your network environment.
IPv6	Specify whether or not to use IPv6. If you are not sure, select <i>No</i> to configure the Ethernet interface for IPv4.
Security Policy	Select either standard UNIX security ( <i>No</i> ) or Kerberos Security ( <i>Yes</i> ). If you are not sure, select <i>No</i> .
Confirm	Review the onscreen information and change it if needed. Otherwise, continue.

Parameter	Description
Name Service	Select the name service according to your network environment. If you select a name service other than None, you will be prompted for additional name service configuration information.
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 server.
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

- [“Power On the Server for the First Time” on page 85](#)
- [“Rear Panel Components” on page 6](#)
- [“Assign a Static IP Address to the SP” on page 88](#)
- *Servers Administration*

## ▼ Assign a Static IP Address to the SP

If your network uses DHCP to assign IP addresses, the DHCP device will automatically assign an IP address to the SP. If your network does not use DHCP, follow this procedure to assign a static IP address to the SP.

---

**Note** – For more information on configuring Oracle ILOM, refer to the *Servers Administration* and the Oracle ILOM documentation.

---

**1. Log in to the SP using a serial connection through the SER MGT port.**

For serial connection instructions, see [“Connect a Terminal or Emulator to the SER MGT Port” on page 84](#). Log in to the SP as root (*changeme* is the default root password) to display the Oracle ILOM prompt.

```
hostname login: root
Password: password (nothing displayed)

Oracle(R) Integrated Lights Out Manager

Version 3.0.12.2

Copyright (c) 2010, Oracle and/or its affiliates. All rights reserved.

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

**2. Set the SP to accept a static IP address.**

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

**3. Set the IP address for the SP.**

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

**4. Set the IP address for the SP gateway.**

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

**5. 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.

## 6. Verify that the parameters were set correctly.

This example shows parameters that have been set to convert an SP from a DHCP configuration to a static configuration.

```
-> show /SP/network -display properties
/SP/network
Properties:
  commitpending = (Cannot show property)
  dhcp_server_ip = none
  ipaddress = xxx.xxx.xxx.xxx
  ipdiscovery = dhcp
  ipgateway = xxx.xxx.xxx.xxx
  ipnetmask = 255.255.255.0
  macaddress = 00:21:28:6F:A7:BB
  managementport = /SYS/MB/SP/NETMGMT
  outofbandmacaddress = 00:21:28:6F:A7:BB
  pendingipaddress = xxx.xxx.xxx.xxx
  pendingipdiscovery = static
  pendingipgateway = xxx.xxx.xxx.xxx
  pendingipnetmask = 255.255.255.0
  pendingmanagementport = /SYS/MB/SP/NETMGMT
  sidebandmacaddress = 00:21:F8:6F:A7:BA
  state = enabled
->
```

## 7. Commit the changes to the SP network parameters

You must perform this action for the new values to take effect.

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

## 8. (Optional) Verify that the parameters have been updated.

```
-> show /SP/network -display properties
/SP/network
Properties:
  :
  :
->
```

## 9. Perform administrative tasks or service the Oracle's Netra SPARC T4-1 server as needed.

Refer to the *Servers Administration* and *Server Service*.

**Related Information**

- [“Oracle Solaris OS Configuration Parameters” on page 87](#)
- Oracle ILOM documentation
- *Servers Administration*





# Glossary

---

---

## A

<b>ANSI SIS</b>	American National Standards Institute Status Indicator Standard.
<b>ASF</b>	Alert standard format (Netra products only).
<b>ASR</b>	Automatic system recovery.
<b>AWG</b>	American wire gauge.

---

## B

<b>blade</b>	Generic term for server modules and storage modules. See <i>server module</i> and <i>storage module</i> .
<b>blade server</b>	Server module. See <i>server module</i> .
<b>BMC</b>	Baseboard management controller.
<b>BOB</b>	Memory buffer on board.

---

## C

<b>chassis</b>	For servers, refers to the server enclosure. For server modules, refers to the modular system enclosure.
<b>CMA</b>	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

<b>ID PROM</b>	Chip that contains system information for the server or server module.
<b>IP</b>	Internet Protocol.

---

## K

<b>KVM</b>	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

<b>LwA</b>	Sound power level.
------------	--------------------

---

## M

<b>MAC</b>	Machine access code.
<b>MAC address</b>	Media access controller address.
<b>Modular system</b>	The rackmountable chassis that holds server modules, storage modules, NEMs, and PCI EMs. The modular system provides Oracle ILOM through its CMM.
<b>MSGID</b>	Message identifier.

---

## N

<b>name space</b>	Top-level Oracle ILOM CMM target.
<b>NEBS</b>	Network Equipment-Building System (Netra products only).

<b>NEM</b>	Network express module. NEMs provide 10/100/1000 Mbps Ethernet, 10GbE Ethernet ports, and SAS connectivity to storage modules.
<b>NET MGT</b>	Network management port. An Ethernet port on the server SP, the server module SP, and the CMM.
<b>NIC</b>	Network interface card or controller.
<b>NMI</b>	Nonmaskable interrupt.

---

## O

<b>OBP</b>	OpenBoot PROM.
<b>Oracle ILOM</b>	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.
<b>Oracle Solaris OS</b>	Oracle Solaris operating system.

---

## P

<b>PCI</b>	Peripheral component interconnect.
<b>PCI EM</b>	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.
<b>POST</b>	Power-on self-test.
<b>PROM</b>	Programmable read-only memory.
<b>PSH</b>	Predictive self healing.

---

## Q

<b>QSFP</b>	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.

<b>UI</b>	User interface.
<b>UL</b>	Underwriters Laboratory Inc.
<b>U.S. NEC</b>	United States National Electrical Code.
<b>UTC</b>	Coordinated Universal Time.
<b>UUID</b>	Universal unique identifier.

---

## W

<b>WWN</b>	World wide name. A unique number that identifies a SAS target.
------------	--

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