

Hitachi Advanced Server HA810 G3 Series

User Guide

This document is for the person who installs, administers, and troubleshoots servers and storage systems. Hitachi Vantara assumes you are qualified in the servicing of computer equipment and trained in recognizing hazards in products with hazardous energy levels.

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Preface

This document is for the person who installs, administers, and troubleshoots servers and storage systems. Hitachi Vantara assumes you are qualified in the servicing of computer equipment and trained in recognizing hazards in products with hazardous energy levels.

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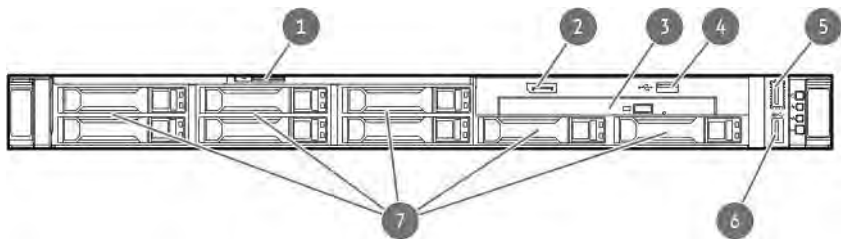
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Component identification

Front panel components

SFF

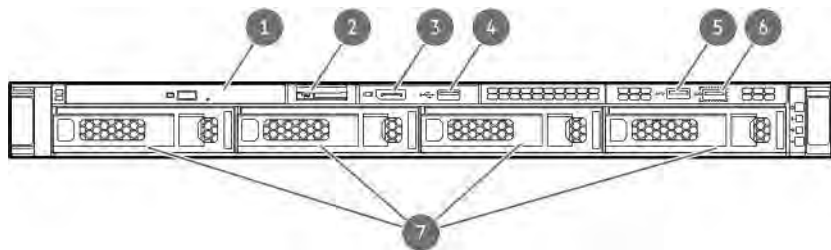


Item	Description
1	Serial number/iLO information pull tab
2	Display port (optional) ¹
3	Optical drive (optional) ¹
4	USB 2.0 port (optional) ¹
5	iLO Service Port ²
6	USB 3.2 Gen 1 port
7	Drive bays

¹ This option can be replaced by 2SFF drive bays.

² The operating system does not recognize this port as a USB port.

LFF

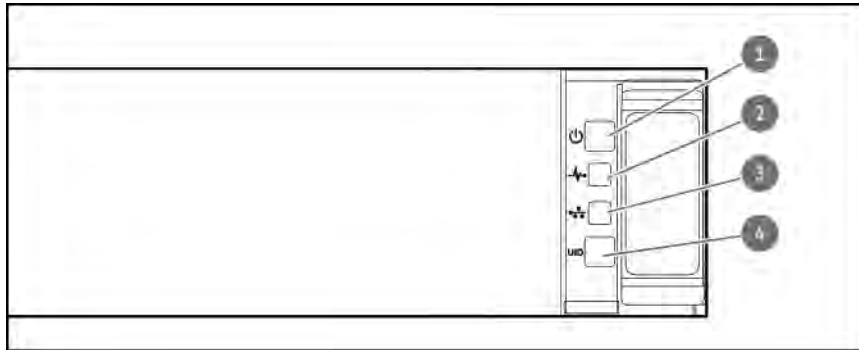


Item	Description
1	Optical drive (optional)
2	Serial number/iLO information pull tab
3	Display port (optional)
4	USB 2.0 port (optional)
5	USB 3.2 Gen 1 port

Table Continued

Item	Description
6	iLO Service Port ²
7	Drive bays

Front panel LEDs and buttons



Item	Description	Status
1	Power On/Standby button and system power LED ¹	<p>Solid green = System on</p> <p>Flashing green = Performing power on sequence</p> <p>Solid amber = System in standby</p> <p>Off = No power present¹</p>
2	Health LED ¹	<p>Solid green = Normal</p> <p>Flashing green = iLO is rebooting.</p> <p>Flashing amber = System degraded</p> <p>Flashing red = System critical²</p>
3	NIC status LED ¹	<p>Solid green = Link to network</p> <p>Flashing green = Network active</p> <p>Off = No network activity</p>
4	UID button/LED ³	<p>Solid blue = Activated</p> <p>Flashing blue:</p> <ul style="list-style-type: none"> • 1 Hz = Remote management or firmware upgrade in progress • 4 Hz = iLO manual reboot sequence initiated • 8 Hz = iLO manual reboot sequence in progress <p>Off = Deactivated</p>

¹ Facility power is not present, power cord is not attached, no power supplies are installed, power supply failure has occurred, or the power button cable is disconnected.

² If the health LED indicates a degraded or critical state, use iLO to review the system health status.

³ When all four LEDs described in this table flash simultaneously, a power fault has occurred.

UID button functionality

The UID button can be used to identify a specific server in a rack or display the Server Health Summary when the server will not power on. For more information, contact customer support.

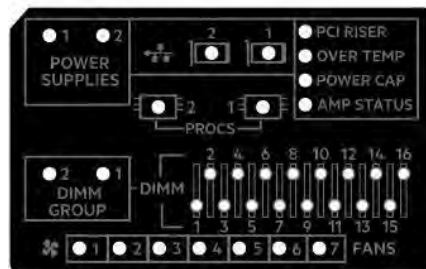
Front panel LED power fault codes

The following table provides a list of power fault codes, and the subsystems that are affected. Not all power faults are used by all servers.

Subsystem	LED behavior
System board	1 flash
Processor	2 flashes
Memory	3 flashes
Riser board PCIe slots	4 flashes
OCP adapter	5 flashes
Storage controller	6 flashes
System board PCIe slots	7 flashes
Power backplane	8 flashes
Storage backplane	9 flashes
Power supply	10 flashes
PCIe expansion cards installed in riser board	11 flashes
Chassis	12 flashes
GPU card	13 flashes

Systems Insight Display LEDs

The Systems Insight Display LEDs represent the system board layout. The display enables diagnosis with the access panel installed.



Description	Status
Processor LEDs	Off = Normal Amber = Failed processor
DIMM LEDs	Off = Normal Amber = Failed DIMM or configuration issue
DIMM group LEDs	Off = Normal Amber = Failed DIMM group or configuration issue
Fan LEDs	Off = Normal Amber = Failed fan or missing fan
NIC LEDs ¹	Off = No link to network Solid green = Network link Flashing green = Network link with activity If power is off, the front panel LED is not active. For status, see <u>Rear panel LEDs</u> .
Power supply LEDs	Off = Normal Solid amber = Power subsystem degraded, power supply failure, or input power lost.
PCI riser LED	Off = Normal Amber = Incorrectly installed PCI riser cage
Over temp LED	Off = Normal Amber = High system temperature detected
Power cap LED	Off = System is in standby, or no cap is set. Solid green = Power cap applied
AMP Status LED	Off = AMP modes disabled Solid green = AMP mode enabled Solid amber = Failover Flashing amber = Invalid configuration

¹ Embedded NIC ports are not equipped on the server. NIC LEDs on the Systems Insight Display will flash based on the network adapter port activity. In the case of a dual-port adapters, only NIC LED 1 and 2 will illuminate to correspond with the activity of the respective network ports.

When the health LED on the front panel illuminates either amber or red, the server is experiencing a health event. For more information on the combination of these LEDs, see **Systems Insight Display combined LED descriptions**.

Systems Insight Display combined LED descriptions

The combined illumination of the following LEDs indicates a system condition:

- Systems Insight Display LEDs
- System power LED
- Health LED

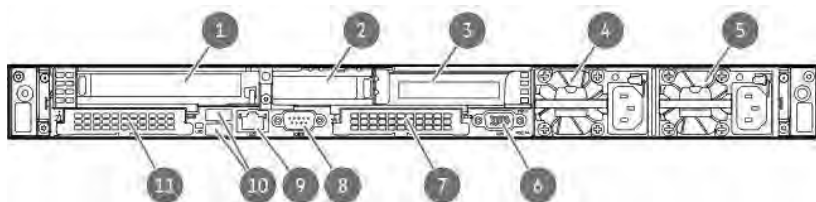
Systems Insight Display LED and color	Health LED	System power LED	Status
Processor (amber)	Red	Amber	One or more of the following conditions might exist: <ul style="list-style-type: none"> • Processor in socket X has failed. • Processor X is not installed in the socket. • Processor X is unsupported. • ROM detects a failed processor during POST.
Processor (amber)	Amber	Green	Processor in socket X is in a pre-failure condition.
DIMM (amber)	Red	Green	One or more DIMMs have failed.
DIMM (amber)	Amber	Green	DIMM in slot X is in a pre-failure condition.
Over temp (amber)	Amber	Green	The Health Driver has detected a cautionary temperature level.
Over temp (amber)	Red	Amber	The server has detected a hardware critical temperature level.
PCI riser (amber)	Red	Green	The PCI riser cage is not seated properly.
Fan (amber)	Amber	Green	One fan has failed or has been removed.
Fan (amber)	Red	Green	Two or more fans have failed or been removed.

Table Continued

Systems Insight Display LED and color	Health LED	System power LED	Status
Power supply (amber)	Red	Amber	One or more of the following conditions might exist: <ul style="list-style-type: none"> Only one power supply is installed and that power supply is in standby. Power supply fault. System board fault.
Power supply (amber)	Amber	Green	One or more of the following conditions might exist: <ul style="list-style-type: none"> Redundant power supply is installed and only one power supply is functional. AC power cord is not plugged into redundant power supply. Redundant power supply fault. Power supply mismatch at POST or power supply mismatch through hot-plug addition.
Power cap (off)	—	Amber	Standby.
Power cap (green)	—	Flashing green	Waiting for power.
Power cap (green)	—	Green	Power is available.
Power cap (flashing amber)	—	Amber	Power is not available.

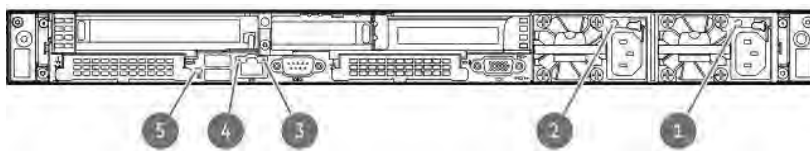
! **IMPORTANT:** If more than one DIMM slot LED is illuminated, further troubleshooting is required. Test each bank of DIMMs by removing all other DIMMs. Isolate the failed DIMM by replacing each DIMM in a bank with a known working DIMM.

Rear panel components



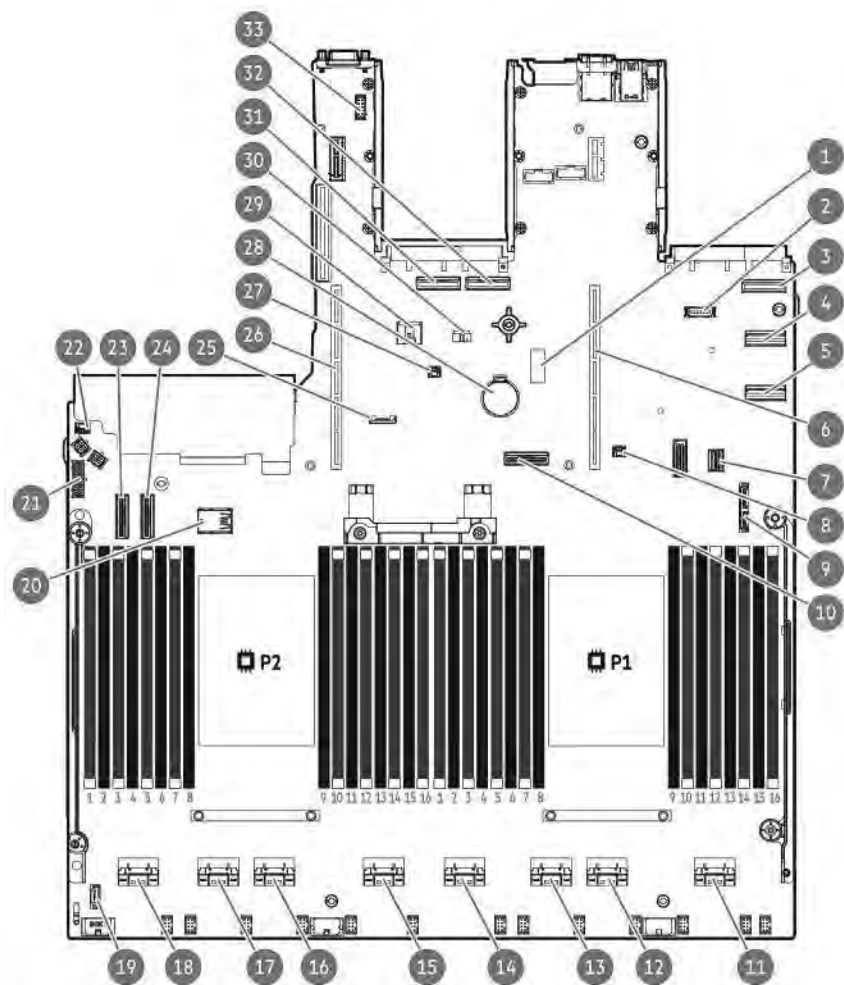
Item	Description
1	Slot 1 PCIe5
2	Slot 2 PCIe5
3	Slot 3 PCIe5 (optional - requires second processor)
4	Power supply 2 (PS2)
5	Power supply 1 (PS1)
6	Video (VGA) port
7	OCP 3.0 slot 15
8	Serial port (optional)
9	iLO Management Port
10	USB 3.2 Gen 1 ports
11	OCP 3.0 slot 14

Rear panel LEDs



Item	Description	Status
1	Power supply 1 LED	<p>Solid green = Normal</p> <p>Off = One or more of the following conditions exists:</p> <ul style="list-style-type: none"> • AC power unavailable • Power supply failed • Power supply in standby mode • Power supply exceeded current limit.
2	Power supply 2 LED	<p>Solid green = Normal</p> <p>Off = One or more of the following conditions exists:</p> <ul style="list-style-type: none"> • AC power unavailable • Power supply failed • Power supply in standby mode • Power supply exceeded current limit.
3	iLO/standard NIC activity LED	<p>Solid green = Activity exists.</p> <p>Flashing green = Activity exists.</p> <p>Off = No activity exists.</p>
4	iLO/standard NIC link LED	<p>Solid green = Link exists.</p> <p>Off = No link exists.</p>
5	UID LED	<p>Solid blue = Identification is activated.</p> <p>Flashing blue = System is being managed remotely.</p> <p>Off = Identification is deactivated.</p>

System board components



Item	Description
1	System maintenance switch
2	Front DisplayPort/USB 2.0 connector
3	OCP slot 14 port 2
4	LP SlimSAS port 2
5	LP SlimSAS port 1
6	Primary riser connector
7	Front I/O connector & USB 3.2 Gen 1 port
8	OCP slot 14 backup power connector
9	SATA optical port
10	Socket 1 MCIO port 1
11-18	x8 SlimSAS ports ¹

Table Continued

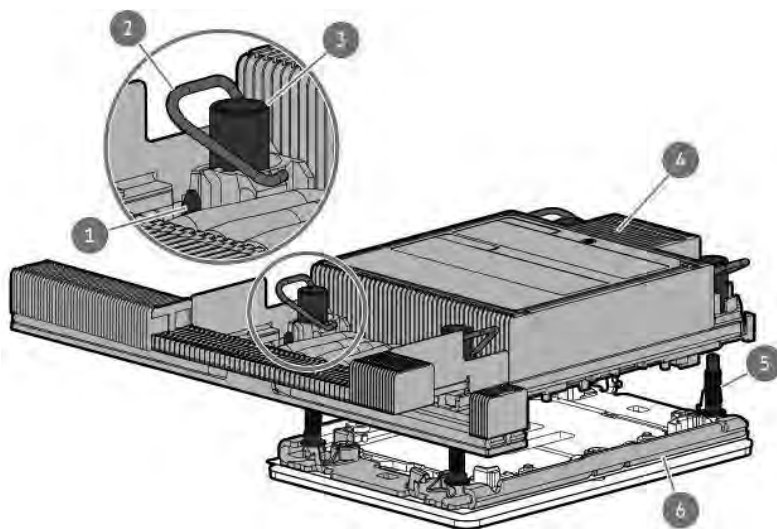
Item	Description
19	Cooling module connector
20	Internal USB ports ²
21	Drive backplane power connector
22	Chassis Intrusion Detection switch connector
23	Socket 2 MCIO connector 2
24	Socket 2 MCIO connector 1
25	SID connector
26	Secondary riser connector
27	OCP slot 15 backup power connector
28	System battery
29	Energy pack connector
30	NS204i-u power connector
31	OCP slot 15 port 1
32	OCP slot 15 port 2
33	Serial port connector

¹ The SlimSAS ports are numbered 1B-4B, 1A-4A from left to right. B is for processor 2 and A is for processor 1.

² Top = USB 3.2 Gen 1 port, Bottom = USB 2.0 port

Heatsink and processor socket components

A high-performance heatsink is shown. Your heatsink might look different.



Item	Description
1	Processor carrier latches
2	Heatsink latches
3	Heatsink nuts
4	Processor-heatsink module ¹
5	Alignment screws
6	Bolster plate

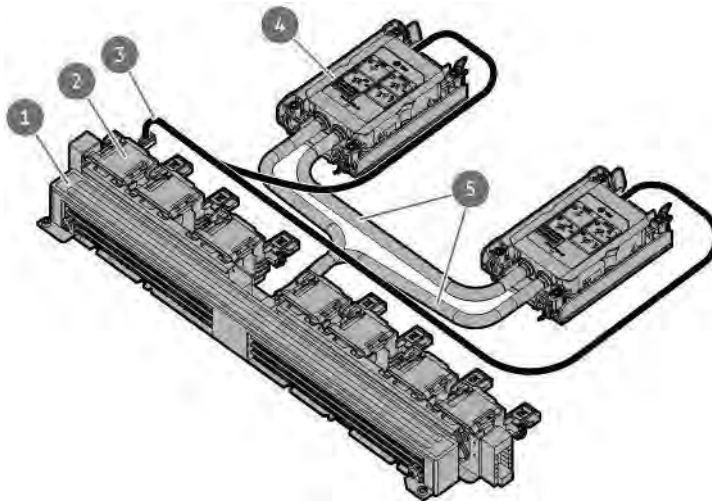
¹ This module consists of the heatsink attached to the processor that is already secured in its carrier.

Closed-loop liquid cooling heatsink components

⚠ IMPORTANT:

- **Maximum Usage Limitation Reminder:** The closed-loop liquid cooling heatsink used in this server is subject to a Maximum Usage Limitation not to exceed five (5) years of operation. After reaching this five (5) years limit, it is required that the liquid cooling heatsink be replaced. Parts and components that Hitachi Vantara determines have reached or exceeded their Maximum Usage Limitation will not be provided, repaired, or replaced under a warranty or service contract. Contact your local sales representative for additional information.
- The tubes of the liquid cooling heatsink are prefilled with coolant. In the unlikely event of a spill or leak of this server coolant, follow the recommended procedure in *Appendix I: Server coolant spill response* of the server maintenance guide:

<https://knowledge.hitachivantara.com/Documents/Servers>



Item	Description
1	Radiator
2	Fans
3	Signal cable

Table Continued

Item	Description
4	Coolant tubes
5	Pump-cold plate ¹

¹ The liquid cooling heatsink has two pumps for redundancy.

System maintenance switch descriptions

Position	Default	Function
S1 ¹	Off	<ul style="list-style-type: none"> Off—iLO security is enabled. On—iLO security is disabled.
S2	Off	Reserved
S3	Off	Reserved
S4	Off	Reserved
S5 ¹	Off	<ul style="list-style-type: none"> Off—Power-on password is enabled. On—Power-on password is disabled.
S6 ^{1,2 3}	Off	<ul style="list-style-type: none"> Off—No function On—Restore default manufacturing settings
S7	Off	Reserved
S8	Off	Reserved
S9	Off	Reserved
S10	Off	Reserved
S11	Off	Reserved
S12	Off	Reserved

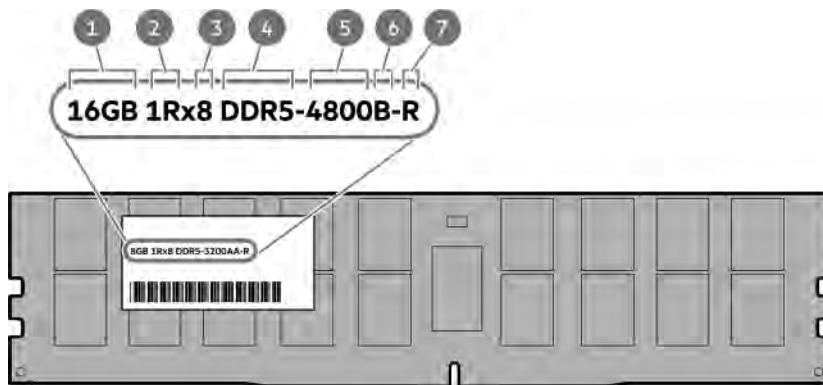
¹ To access the redundant ROM, set S1, S5, and S6 to On.

² When the system maintenance switch position 6 is set to the On position, the system is prepared to restore all configuration settings to their manufacturing defaults.

³ When the system maintenance switch position 6 is set to the On position and Secure Boot is enabled, some configurations cannot be restored. For more information, see [Configuring the server](#).

DIMM label identification

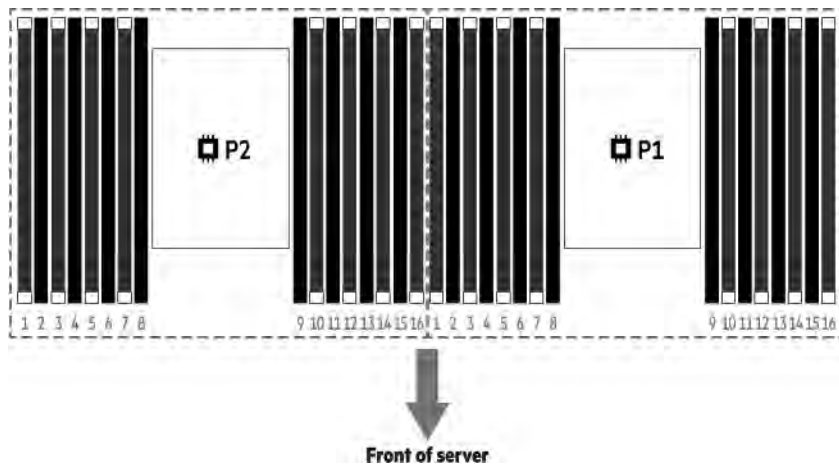
To determine DIMM characteristics, see the label attached to the DIMM. The information in this section helps you to use the label to locate specific information about the DIMM.



Item	Description	Example
1	Capacity	16 GB 32 GB 64 GB 128 GB 256 GB
2	Rank	1R—Single rank 2R—Dual rank 4R—Quad rank 8R—Octal rank
3	Data width on DRAM	x4—4-bit x8—8-bit
4	Memory generation	PC5—DDR5
5	Maximum memory speed	4800 MT/s
6	CAS latency	B—42-42-42 B—50-42-42 (for 128 GB and 256 GB capacities)
7	DIMM type	R—RDIMM (registered)

DIMM slot locations

DIMM slots are numbered sequentially (1 through 16) for each processor.



Drive boxes and numbering

SFF drive boxes

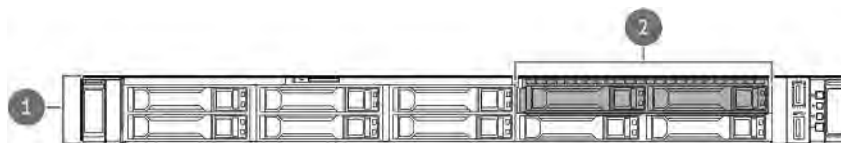


Table 1:

Item	Description
1	Box 1
2	Box 2

8 SFF drive bay numbering

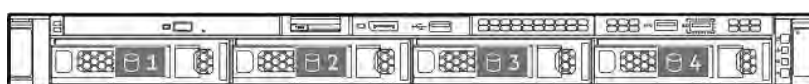


8 SFF + 2 SFF drive bay numbering



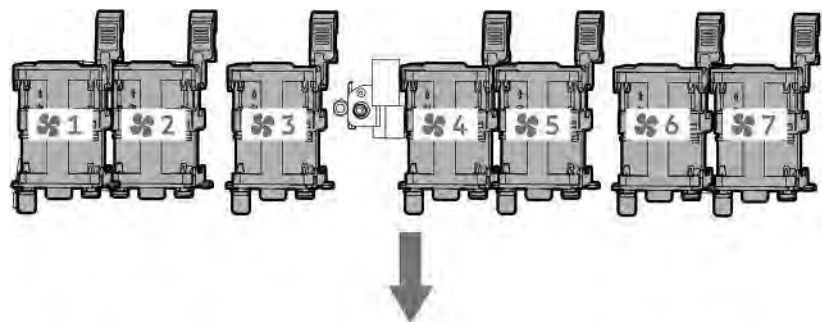
4 LFF drive box and bays

All LFF drives are in box 1.



Hot-plug fans

CAUTION: To avoid damage to the equipment, do not operate the server for extended periods of time if the server does not have the optimal number of fans installed. Although the server might boot, do not operate the server without the required fans installed and operating.



Fan bay 1	Fan bay 2	Fan bay 3	Fan bay 4	Fan bay 5	Fan bay 6	Fan bay 7
Fan	Fan	Fan	Fan	Fan	Fan	Fan

The loss of a single fan rotor (one standard fan) causes loss of redundancy. The loss of two fan rotors (two standard fans or one high performance fan) causes the server to initiate a shutdown.

High-performance fans are required for some configurations. They are also required for ASHRAE-compliant configurations. For more information on ASHRAE-compliant configurations, contact customer support.

The server supports variable fan speeds. The fans operate at minimum speed until a temperature change requires a fan speed increase to cool the server. The server shuts down during the following temperature-related scenarios:

- At POST and in the OS, iLO performs an orderly shutdown if a cautionary temperature level is detected. If the server hardware detects a critical temperature level before an orderly shutdown occurs, the server performs an immediate shutdown.
- When the Thermal Shutdown feature is disabled in the BIOS/Platform Configuration (RBSU), iLO does not perform an orderly shutdown when a cautionary temperature level is detected. Disabling this feature does not disable the server hardware from performing an immediate shutdown when a critical temperature level is detected.

CAUTION: A thermal event can damage server components when the Thermal Shutdown feature is disabled in the BIOS/Platform Configuration (RBSU).

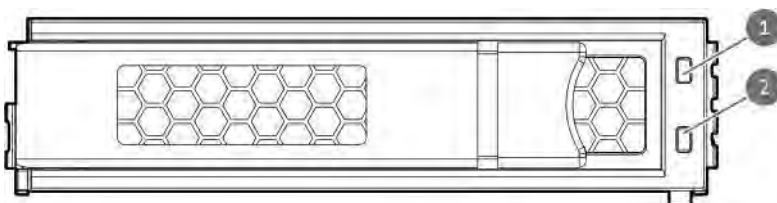
Basic Drive LED definitions

The Basic drive carrier has the following LEDs:

- Amber/blue LED—Managed by the drive backplane in conjunction with the storage controller and is used to indicate drive status.
- Green LED—Managed by the drive itself and indicates the drive activity.

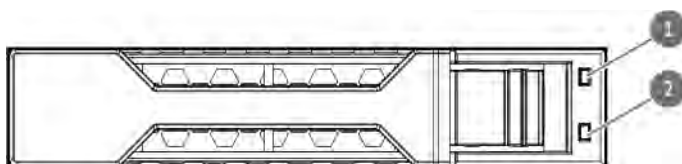
LFF low-profile drive carrier

The LFF low-profile drive carrier supports hot-plug SAS or SATA.



SFF basic drive carrier

The SFF basic drive carrier supports hot-plug SAS, SATA, or U.3 NVMe.

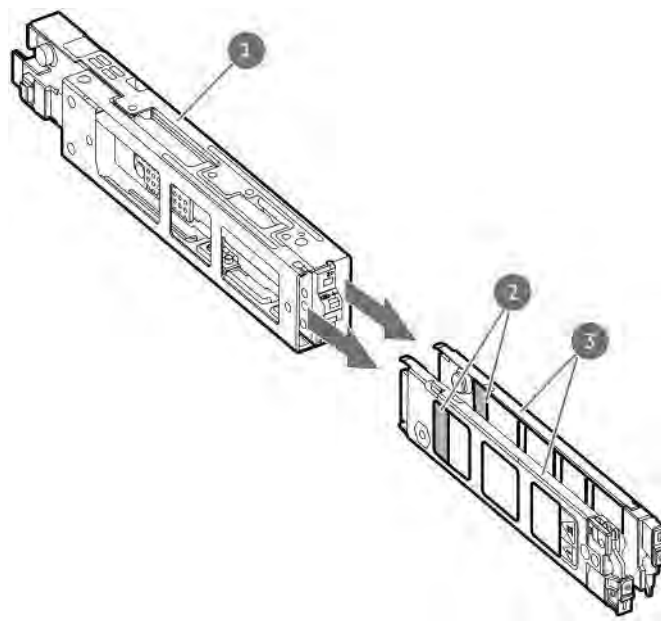


Item	LED	State	Definition
1	Fault/Locate	Solid amber	This drive has failed, is unsupported, or is invalid.
		Solid blue	The drive is operating normally and being identified by a management application.
		Flashing amber/blue (1 flash per second)	The drive has failed, or a predictive failure alert has been received for this drive. The drive has also been identified by a management application.
		Flashing amber (1 flash per second)	A predictive failure alert has been received for this drive. Replace the drive as soon as possible.
		Off	The drive is operating normally and not being identified by a management application.
2	Online/Activity	Solid green	The drive is online and has no activity.

Table Continued

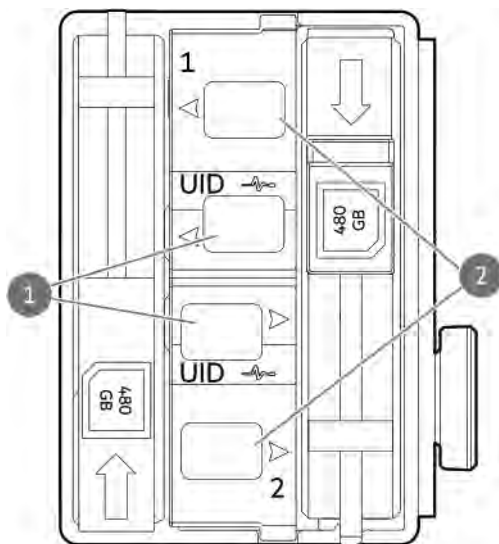
Item	LED	State	Definition
		Flashing green (1 flash per second)	<p>The drive is doing one of the following:</p> <ul style="list-style-type: none"> • Rebuilding or performing a RAID • Performing a stripe size migration • Performing a capacity expansion • Performing a logical drive extension • Erasing • Spare part activation
		Flashing green (4 flashes per second)	The drive is operating normally and has activity.
		Off	The drive is not configured by a RAID controller or is a spare drive.

NS204i-u Boot Device components



Item	Description
1	Boot device cage
2	M.2 slots
3	Boot device carriers

NS204i-u Boot Device LED definitions



Item	LED	Status	Definition
1	Fault/Locate	Solid amber	Drive has failed, unsupported, or invalid.
		Solid blue	Drive is operating normally and being identified by a management application.
		Flashing amber/blue (1 flash per second)	Drive has failed, or a predictive failure alert is received for the drive. The drive has also been identified by a management application.
		Flashing amber (1 flash per second)	Drive predictive failure alert is received. Replace the drive as soon as possible.
		Off	Drive is operating normally and is not identified by a management application.
2	Online/Activity	Solid green	Drive is online and has no activity.
		Flashing green (1 flash per second)	Drive is doing one of the following: <ul style="list-style-type: none"> Rebuilding or performing a RAID Erasing
		Flashing green (4 flashes per second)	Drive is operating normally and has activity.
		Off	Drive is not configured by a RAID controller or is a spare drive.

Setup

Setting up the server

Prerequisites

Before setting up the server:

- Read the operational requirements for the server:

Operational requirements

Procedure

1. Unbox the server and verify the contents:

- A server
- A power cord
- Rack-mounting hardware
- Documentation

2. (Optional) Install hardware options.

3. Install the server in a rack.

The rack procedures are included with the rack rails.

- a. Connect devices, cables, and cords to the server.
 - b. Secure cables using the cable management arm.
4. Decide how to manage the server:
- Locally: use a KVM switch or a connect a keyboard, monitor, and mouse.
 - Remotely: connect to the iLO web interface using remote console.
 - a. Verify the iLO management port is connected to a secure network.
 - b. Using a browser, navigate to the iLO web interface, and then log in.
`https://<iLO hostname or IP address>`
Note the following:
 - The hostname is on the serial pull tab.
 - If a DHCP server assigns the IP address, the IP address appears on the boot screen.
 - If a static IP address is assigned, use that IP address.
 - The default login credentials are on the serial label pull tab.
 - c. In the side navigation, click the **Remote Console & Media** link, and then launch a remote console.
5. Press the Power On/Standby button.
For remote management, use the iLO virtual power button.

Operational requirements

When preparing the site and planning the installation for the Hitachi Advanced Server HA810 G3, be sure to observe the following general operational requirements:

- **Space and airflow requirements**
- **Temperature requirements**
- **Power requirements**
- **Electrical grounding requirements**

For server-specific environmental requirements, see **Environmental specifications**.

Space and airflow requirements

To allow for servicing and adequate airflow, observe the following space and airflow requirements when deciding where to install a rack:

- Leave a minimum clearance of 63.5 cm (25 in) in front of the rack.
- Leave a minimum clearance of 76.2 cm (30 in) behind the rack.
- Leave a minimum clearance of 121.9 cm (48 in) from the back of the rack to the back of another rack or row of racks.

Hitachi Advanced Server models draw in cool air through the front door and expel warm air through the rear door. Therefore, the front and rear rack doors must be adequately ventilated to allow ambient room air to

enter the cabinet, and the rear door must be adequately ventilated to allow the warm air to escape from the cabinet.

⚠ CAUTION: To prevent improper cooling and damage to the equipment, do not block the ventilation openings.

When vertical space in the rack is not filled by a server or rack component, the gaps between the components cause changes in airflow through the rack and across the servers. Cover all gaps with blanking panels to maintain proper airflow.

⚠ CAUTION: Always use blanking panels to fill empty vertical spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels results in improper cooling that can lead to thermal damage.

The 9000 and 10000 Series Racks provide proper server cooling from flow-through perforations in the front and rear doors that provide 64 percent open area for ventilation.

⚠ CAUTION: If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment:

- Front and rear doors—If the 42U rack includes closing front and rear doors, you must allow 5,350 sq cm (830 sq in) of holes evenly distributed from top to bottom to permit adequate airflow (equivalent to the required 64 percent open area for ventilation).
 - Side—The clearance between the installed rack component and the side panels of the rack must be a minimum of 7 cm (2.75 in).
-

Temperature requirements

To ensure continued safe and reliable equipment operation, install or position the system in a well-ventilated, climate-controlled environment.

The maximum recommended ambient operating temperature (TMRA) for most server products is 35°C (95°F). The temperature in the room where the rack is located must not exceed 35°C (95°F).


⚠ CAUTION: To reduce the risk of damage to the equipment when installing third-party options:

- Do not permit optional equipment to impede airflow around the server or to increase the internal rack temperature beyond the maximum allowable limits.
 - Do not exceed the manufacturer's TMRA.
-

Power requirements

Installation of this equipment must comply with local and regional electrical regulations governing the installation of information technology equipment by licensed electricians. This equipment is designed to operate in installations covered by NFPA 70, 1999 Edition (National Electric Code) and NFPA-75, 1992 (code for Protection of Electronic Computer/Data Processing Equipment). For electrical power ratings on options, refer to the product rating label or the user documentation supplied with that option.

⚠ WARNING: To reduce the risk of personal injury, fire, or damage to the equipment, do not overload the AC supply branch circuit that provides power to the rack. Consult the electrical authority having jurisdiction over wiring and installation requirements of your facility.


-
-  **CAUTION:** Protect the server from power fluctuations and temporary interruptions with a regulating uninterruptible power supply. This device protects the hardware from damage caused by power surges and voltage spikes and keeps the system in operation during a power failure.
-

Electrical grounding requirements


The server must be grounded properly for proper operation and safety. In the United States, you must install the equipment in accordance with NFPA 70, National Electric Code Article 250, as well as any local and regional building codes. In Canada, you must install the equipment in accordance with Canadian Standards Association, CSA C22.1, Canadian Electrical Code. In all other countries, you must install the equipment in accordance with any regional or national electrical wiring codes, such as the International Electrotechnical Commission (IEC) Code 364, parts 1 through 7. Furthermore, you must be sure that all power distribution devices used in the installation, such as branch wiring and receptacles, are listed or certified grounding-type devices.

Because of the high ground-leakage currents associated with multiple servers connected to the same power source, use a PDU that is either permanently wired to the building's branch circuit or includes a nondetachable cord that is wired to an industrial-style plug. NEMA locking-style plugs or those complying with IEC 60309 are considered suitable for this purpose. Using common power outlet strips for the server is not recommended.

Rack warnings and cautions

-
-  **WARNING:** When all components are removed, the server weighs 13.04 - 16.27 kg (28.74 - 35.86 lb). When all components are installed, the server can weigh up to 13.77 - 16.78 kg (30.36 - 37.00 lb).

Before configuring your rack solution, be sure to check the rack manufacturer weight limits and specifications. Failure to do so can result in physical injury or damage to the equipment and the facility.

-  **WARNING:** The server is heavy. To reduce the risk of personal injury or damage to the equipment, do the following:

- Observe local occupational health and safety requirements and guidelines for manual material handling.
 - Get help to lift and stabilize the product during installation or removal, especially when the product is not fastened to the rails. The server weighs more than 13.04 - 16.27 kg (28.74 - 35.86 lb), so at least two people must lift the server into the server together. An additional person may be required to help align the server if the server is installed higher than chest level.
 - Use caution when installing the server in or removing the server from the server.
 - Adequately stabilized the server before extending a component outside the server. Extend only one component at a time. A server may become unstable if more than one component is extended.
 - Do not stack anything on top of rail-mounted component or use it as a work surface when extended from the rack.
-



WARNING: To reduce the risk of personal injury or damage to the equipment, be sure that:

- The rack has anti-tip measures in place. Such measures include floor-bolting, anti-tip feet, ballast, or a combination as specified by the rack manufacturer and applicable codes.
 - The leveling jacks (feet) are extended to the floor.
 - The full weight of the rack rests on the leveling jacks (feet).
 - The stabilizing feet are attached to the rack if it is a single-rack installation.
 - The racks are coupled together in multiple rack installations.
-



WARNING: To reduce the risk of personal injury or equipment damage when unloading a rack:

- At least two people are needed to safely unload the rack from the pallet. An empty 42U rack can weigh as much as 115 kg (253 lb), can stand more than 2.1 m (7 ft) tall, and might become unstable when being moved on its casters.
 - Never stand in front of the rack when it is rolling down the ramp from the pallet. Always handle the rack from both sides.
-



CAUTION: Always plan the rack installation so that the heaviest item is on the bottom of the rack. Install the heaviest item first, and continue to populate the rack from the bottom to the top.



CAUTION: Before installing the server in a server, be sure to properly scope the limitations of the server. Before proceeding with the installation, consider the following:

- You must fully understand the static and dynamic load carrying capacity of the server and be sure that it can accommodate the weight of the server.
 - Be sure sufficient clearance exists for cabling, installation and removal of the server, and movement of the rack doors.
-

Server warnings and cautions



WARNING: To reduce the risk of personal injury, electric shock, or damage to the equipment, disconnect the power cord to remove power from the server. Pressing the Power On/Standby button does not shut off system power completely. Portions of the power supply and some internal circuitry remain active until AC power is removed.



WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.



WARNING: To reduce the risk of fire or burns after removing the energy pack:

- Do not disassemble, crush, or puncture the energy pack.
- Do not short external contacts.
- Do not dispose of the energy pack in fire or water.
- Do not expose the energy pack to low air pressure as it might lead to explosion or leakage of flammable liquid or gas.
- Do not expose the energy pack to temperatures higher than 60°C (140°F).

After power is disconnected, battery voltage might still be present for 1s to 160s.



CAUTION: Protect the server from power fluctuations and temporary interruptions with a regulating UPS. This device protects the hardware from damage caused by power surges and voltage spikes and keeps the server in operation during a power failure.



CAUTION: To prevent damage to electrical components, properly ground the server before beginning any installation, removal, or replacement procedure. Improper grounding can cause **electrostatic discharge**.



CAUTION: To avoid data loss, **back up all server data** before installing or removing a hardware option, or performing a server maintenance or troubleshooting procedure.



CAUTION: Do not operate the server for long periods with the access panel open or removed. Operating the server in this manner results in improper airflow and improper cooling that can lead to thermal damage.

Electrostatic discharge

Be aware of the precautions you must follow when setting up the system or handling components. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the system or component.

To prevent electrostatic damage:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:
 - Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm ± 10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
 - Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.

- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, have an authorized reseller install the part.

For more information on static electricity or assistance with product installation, contact an authorized reseller.

Operations

Server data backup

To avoid data loss, make sure to back up all server data before installing or removing a hardware option, performing a server maintenance, or a troubleshooting procedure.

Server data in this context refers to information that may be required to return the system to a normal operating environment after completing a hardware maintenance or troubleshooting procedure. This information may include:

- User data files
- User account names and passwords
- Application settings and passwords
- Component drivers and firmware
- TPM recovery key/password
- BIOS configuration settings—Use the backup and restore function in UEFI System Utilities. For more information, contact customer support.
 - Custom default system settings
 - Security passwords including those required for power-on and BIOS admin access and persistent memory
 - Server serial number and the product ID
- iLO-related data—Use the iLO backup and restore function. For more information, contact customer support.
 - iLO license
 - Customer iLO user name, password, and DNS name
 - iLO configuration settings
- Use UCP Advisor to manage your servers.

Power down the server

Before powering down the server for any upgrade or maintenance procedures, perform a backup of critical server data and programs.

 **IMPORTANT:** When the server is in standby mode, auxiliary power is still being provided to the system.

To power down the server, use one of the following methods:

- Press and release the Power On/Standby button.

This method activates a controlled shutdown of applications and the OS before the server enters standby mode. It can also activate a shutdown behavior governed by an OS configuration or policy.

- Press and hold the Power On/Standby button for more than 4 seconds to force the server to enter standby mode.

This method forces the server to enter standby mode without properly exiting applications and the OS. If an application stops responding, you can use this method to force a shutdown.

- Use a virtual power button selection through iLO.

This method initiates a controlled remote shutdown of applications and the OS before the server enters standby mode.

Before proceeding, verify that the server is in standby mode by observing that the system power LED is amber.

Extend the server from the rack

Prerequisites

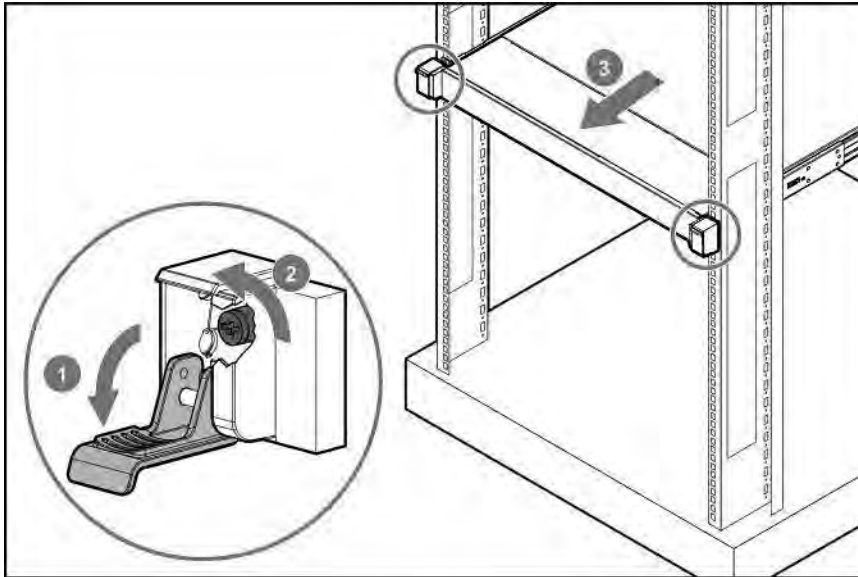
- You might need a T-25 Torx screwdriver to loosen the shipping screws.
- Review the:
 - [Rack warnings and cautions](#)
 - [Server warnings and cautions](#)

Procedure

Extend the server from the rack.



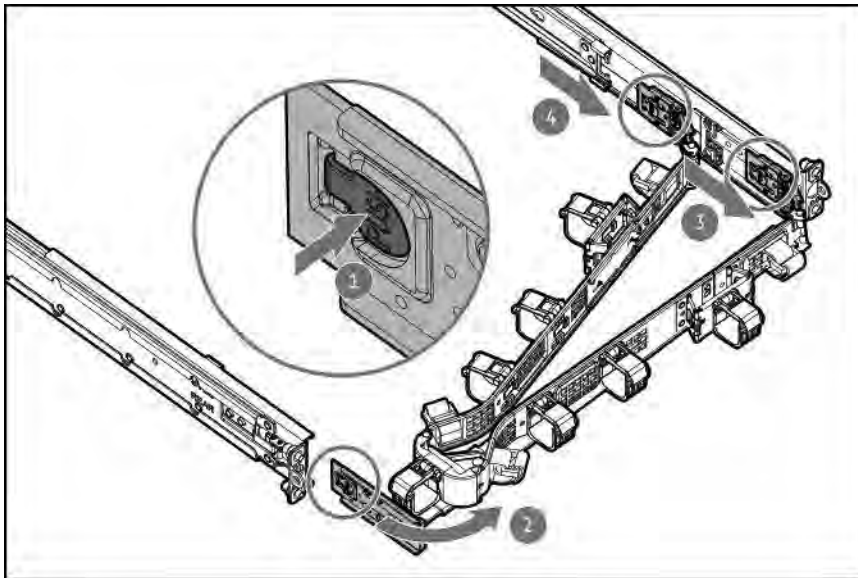
WARNING: To reduce the risk of personal injury or equipment damage, be sure that the rack is adequately stabilized before extending anything from the rack.



Release the cable management arm

Procedure

Release the cable management arm and swing away from the rack.



Remove the server from the rack

Prerequisites

Before you perform this procedure, review the:

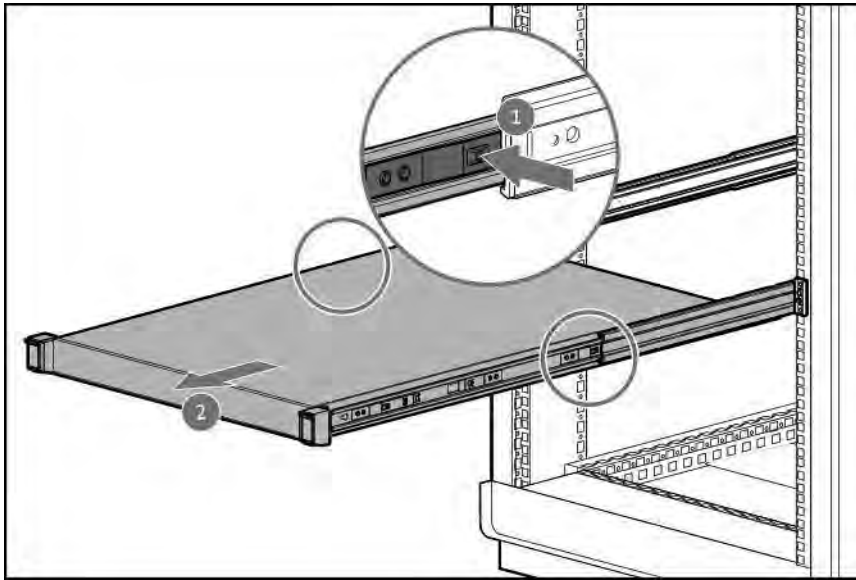
- [Rack warnings and cautions](#)
- [Server warnings and cautions](#)

About this task

⚠ WARNING: To reduce the risk of personal injury or equipment damage, be sure that the rack is adequately stabilized before extending anything from the rack.

Procedure

1. **Power down the server.**
2. **Release the cable management arm.**
3. Disconnect the cabling from the rear panel.
4. **Extend the server from the rack.**
5. Remove the server from the rack:



6. Place the server on a sturdy, level surface.

Remove the access panel

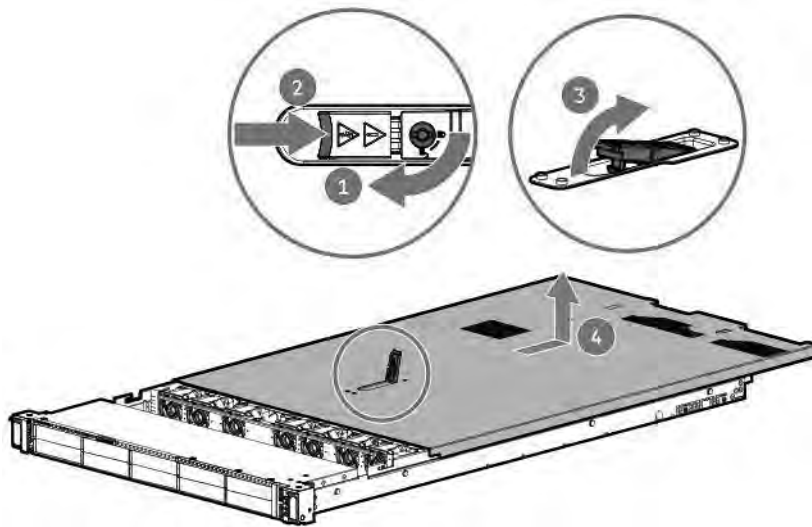
About this task

⚠ WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

⚠ CAUTION: Do not operate the server for long periods with the access panel open or removed. Operating the server in this manner results in improper airflow and improper cooling that can lead to thermal damage.

Procedure

1. **Power down the server.**
2. **Extend the server from the rack.**
3. Open or unlock the locking latch, slide the access panel to the rear of the chassis, and remove the access panel.



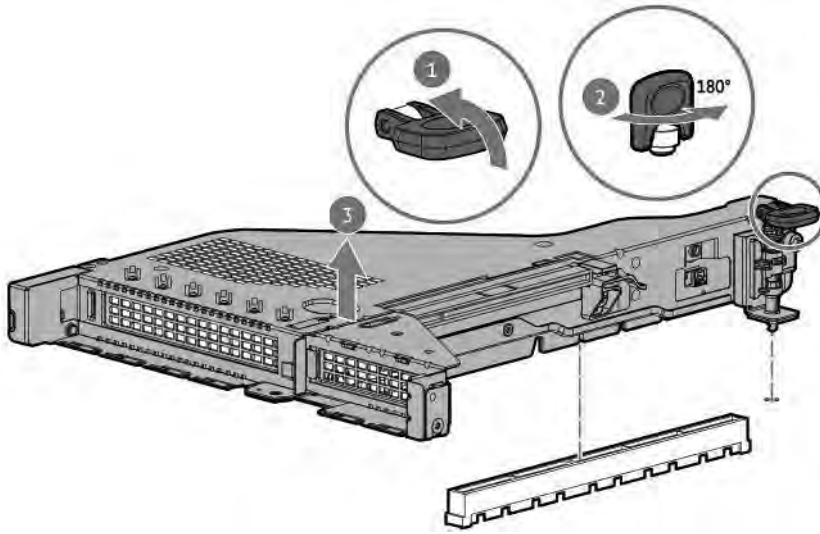
Remove the primary PCIe riser cage

About this task

- ⚠ CAUTION:** To prevent damage to the server or expansion boards, power down the server and remove all AC power cords before removing or installing the PCI riser cage.

Procedure

1. Back up all server data.
2. **Power down the server.**
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Do one of the following:
 - a. **Extend the server from the rack.**
 - b. **Remove the server from the rack.**
5. **Remove the access panel.**
6. Remove the PCI riser cage.

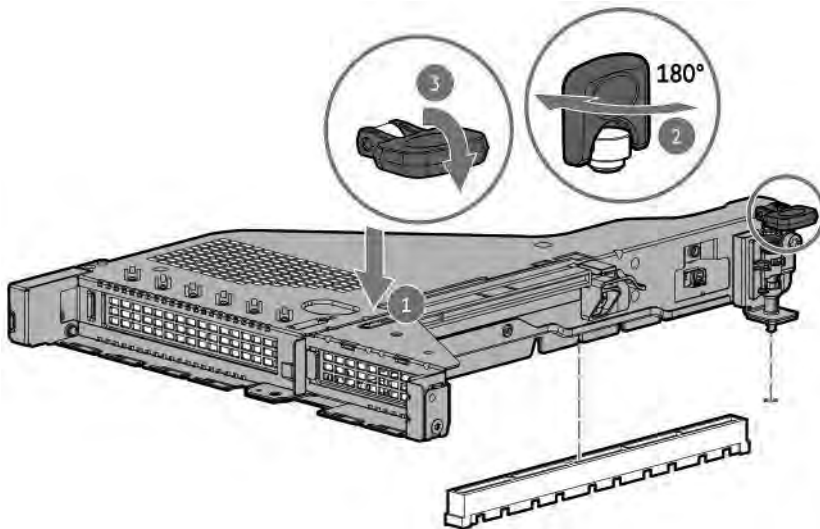


To replace the component, reverse the removal procedure.

Install the primary PCIe riser cage

Procedure

1. Install the PCI riser cage.



2. Install the access panel.
3. Install the server into the rack.
4. Connect each power cord to the server.
5. Connect each power cord to the power source.
6. Power up the server.

Removing a hot-plug SAS/SATA/NVMe drive

⚠ CAUTION: For proper cooling, do not operate the server without the access panel, baffles, expansion slot covers, or blanks installed. If the server supports hot-plug components, minimize the amount of time the access panel is open.

1. Determine the status of the drive from the [hot-plug drive LED definitions](#).
2. Back up all server data on the drive.
3. Remove the drive.

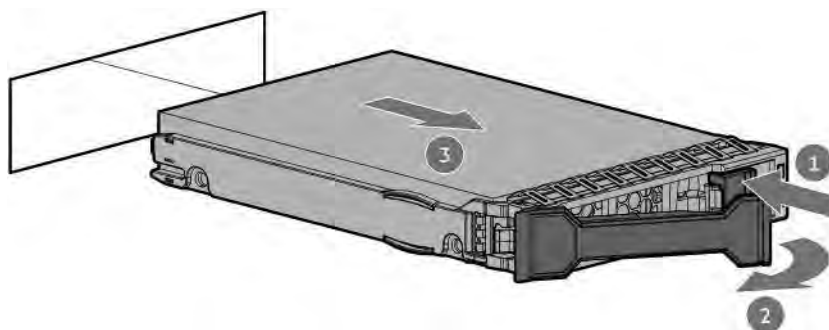


Figure 1: SFF drive

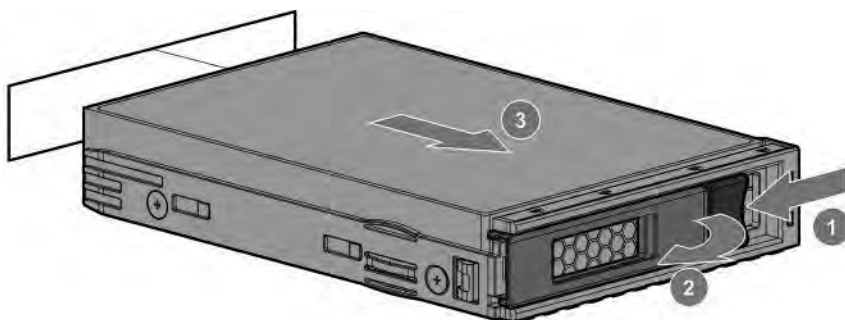


Figure 2: LFF drive

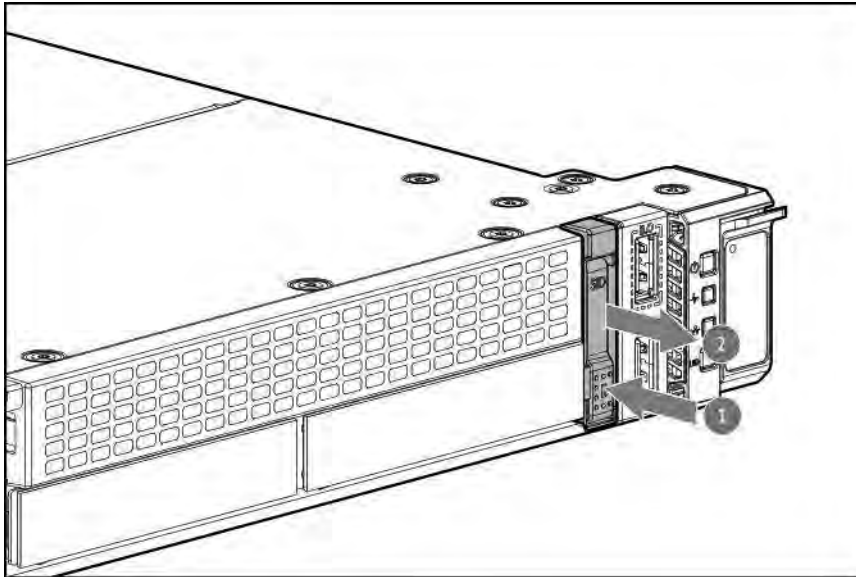
Accessing the Systems Insight Display

About this task

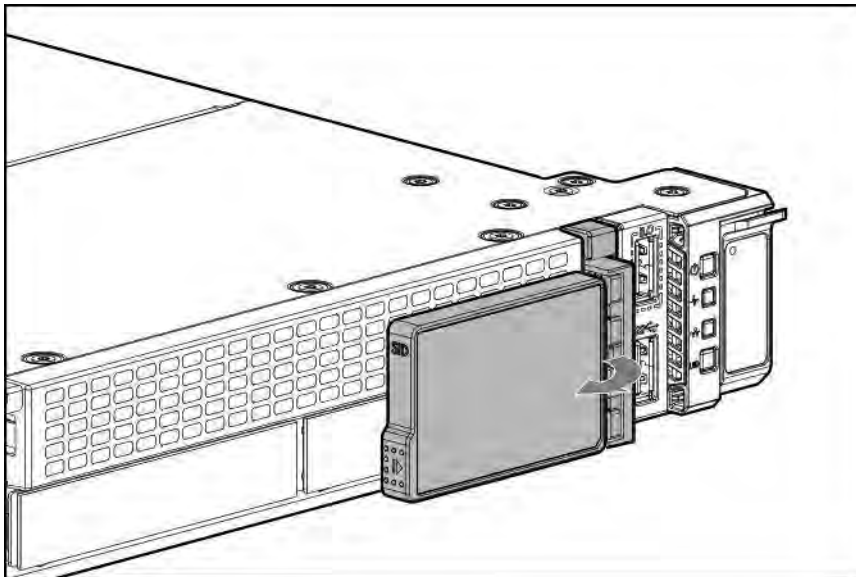
The Systems Insight Display is only available on SFF platforms.

Procedure

1. Press and release the panel.



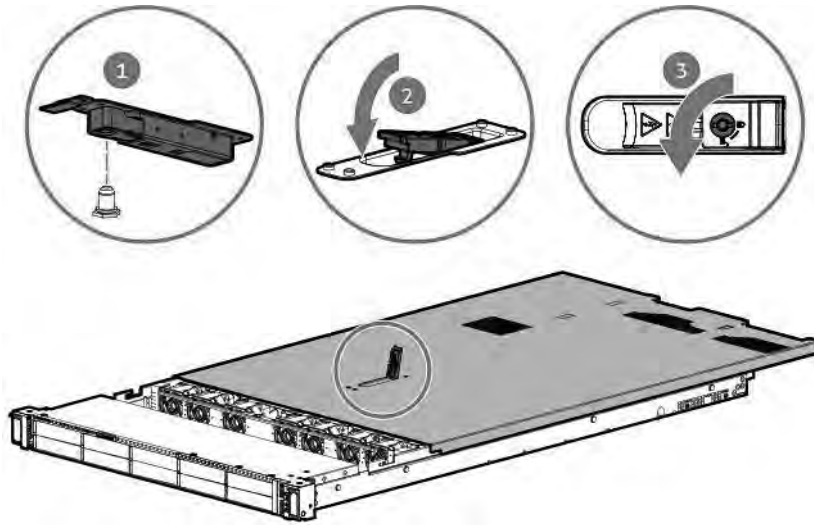
2. After the display ejects, rotate the display to view the LEDs.



Install the access panel

Procedure

1. Place the access panel on top of the server with the latch open.
Allow the panel to extend past the rear of the server approximately 1.25 cm (0.5 in).
2. Push down on the latch.
The access panel slides to a closed position.
3. Tighten the security screw on the latch, if needed.



Power up the server

About this task

To power up the server, use one of the following methods:

- Press the Power On/Standby button.
- Use the virtual power button through iLO.

Hardware options installation

Introduction

Install any hardware options before initializing the server. If multiple options are being installed, read the installation instructions for all the hardware options to identify similar steps and streamline the installation process.



WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

CAUTION: To prevent damage to electrical components, properly ground the server before beginning any installation procedure. Improper grounding can cause electrostatic discharge.

Controllers

Installing a type-p storage controller

Prerequisites

Before installing this option, be sure you that have the following:

- The components included with the hardware option kit
- T-10 Torx screwdriver

Procedure

1. Observe the following alerts:



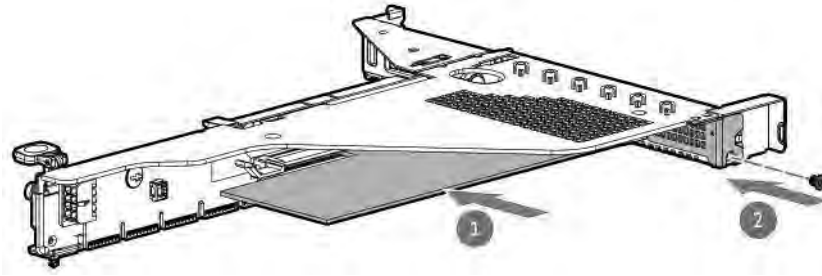
WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.



CAUTION: To prevent damage to electrical components, properly ground the server before beginning any installation procedure. Improper grounding can cause electrostatic discharge.

2. Back up all server data.
3. **Power down the server.**
4. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.

5. Do one of the following:
 - a. Extend the server from the rack.
 - b. Remove the server from the rack.
6. Remove the access panel.
7. Remove the primary riser cage.
8. Install the controller.



9. Install the riser cage.
10. Cable the controller.
11. Install the access panel.
12. Install the server in the rack.
13. Connect each power cord to the server.
14. Connect each power cord to the power source.
15. Power up the server.

The installation is complete.

Installing a type-o storage controller

Prerequisites

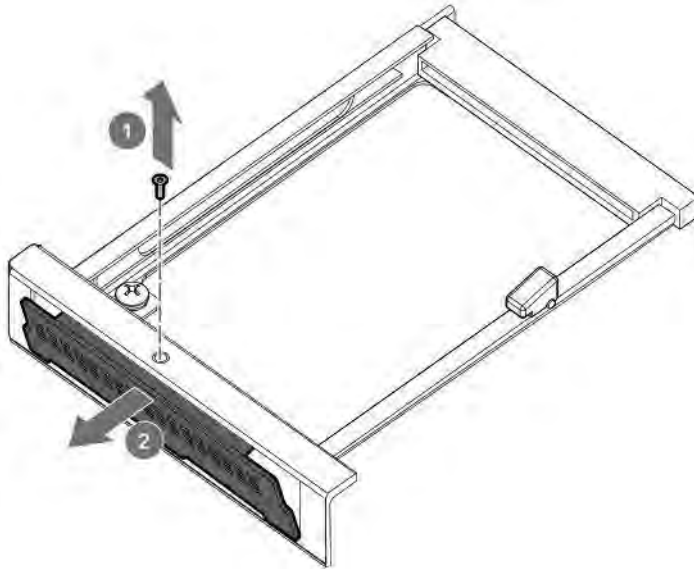
Before installing this option, be sure you that have the following:

- The components included with the hardware option kit
- T-10 Torx screwdriver

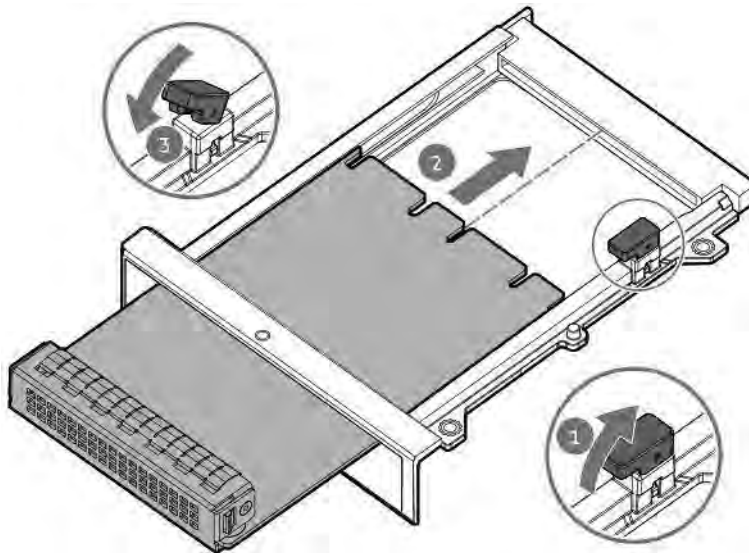
Procedure

1. Power down the server.
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Do one of the following:

- **Extend the server from the rack.**
 - **Remove the server from the rack.**
4. **Remove the access panel.**
 5. Remove the rear wall blank or riser cage.
 6. Remove the OCP adapter blank.



7. Install the storage controller.



8. **Connect the cables.**
9. **Install the access panel.**
10. Slide the server into the rack.
11. Connect each power cord to the server.

12. Connect each power cord to the power source.

13. **Power up the server.**

Cooling

Installing a high-performance fan

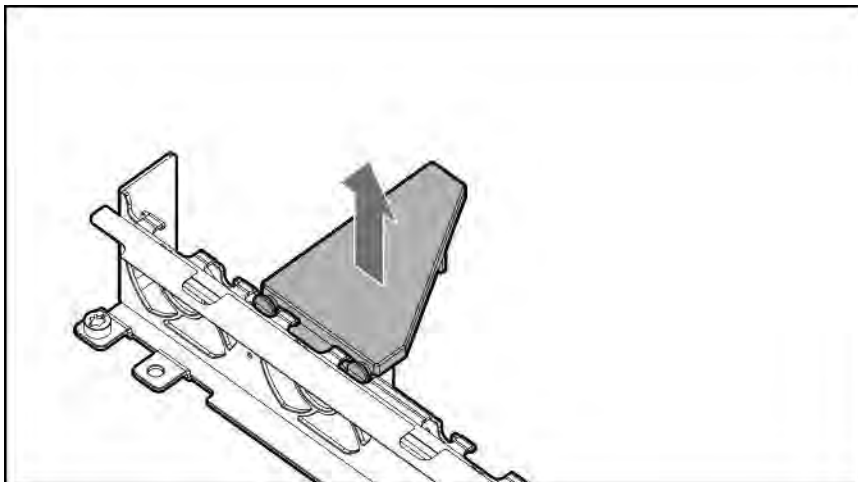
About this task

Certain hardware configurations require high-performance fans.

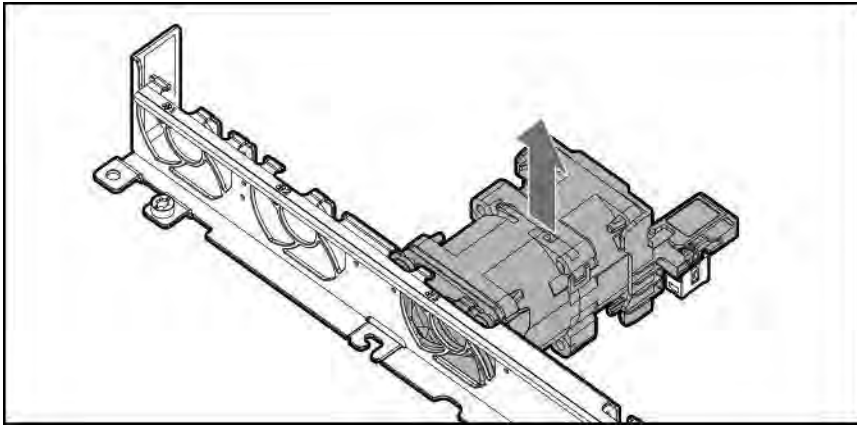
This kit meets extended ambient operating temperatures above 35 degrees Celsius. For more information about extended ambient configurations, contact customer support.

Procedure

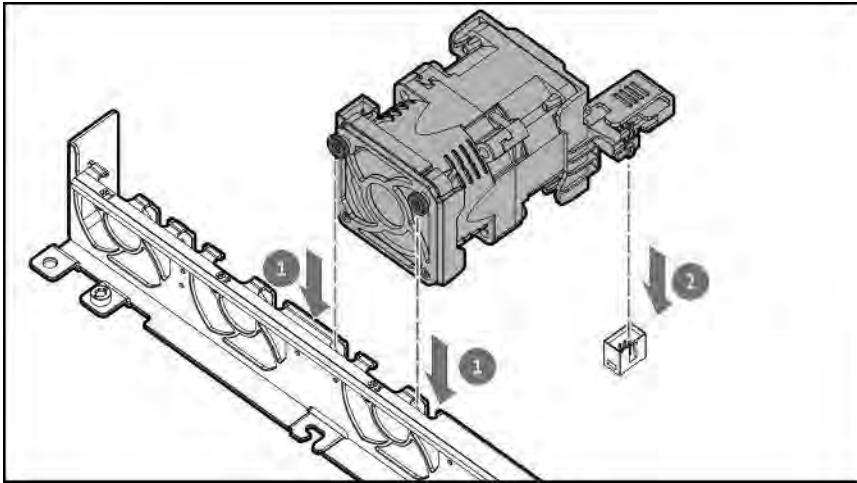
1. **Power down the server.**
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Do one of the following:
 - a. **Extend the server from the rack.**
 - b. **Remove the server from the rack.**
4. **Remove the access panel.**
5. Remove any fan blanks.



6. Remove all standard fans.



7. Install high-performance fans.



8. **Install the access panel.**
9. Return the server to the rack.
10. Connect each power cord to the server.
11. Connect each power cord to the power source.
12. **Power up the server.**

Drive cages

Installing a 2 SFF drive cage

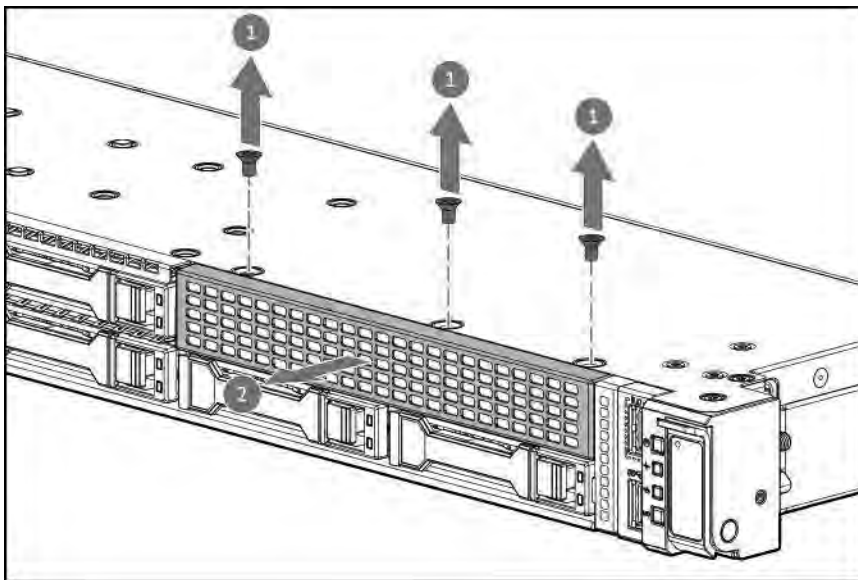
Prerequisites

Be sure you have the following:

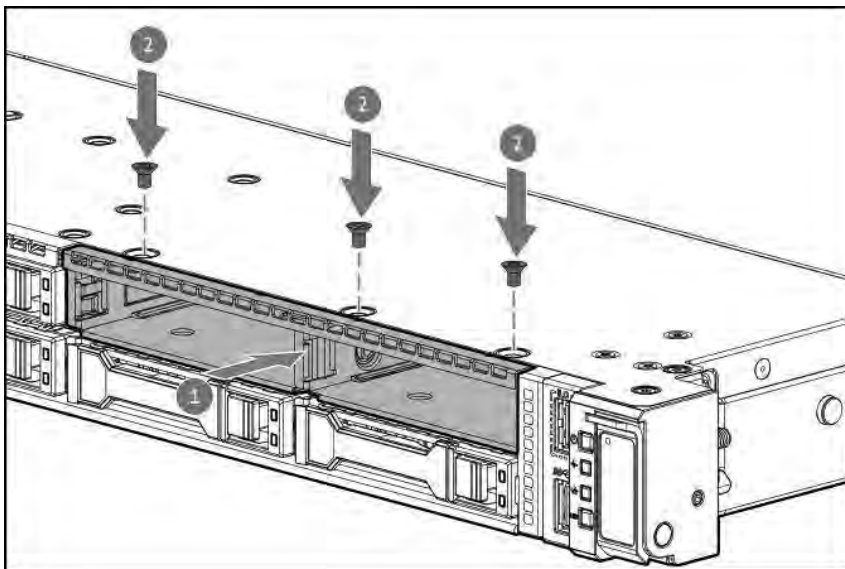
- The components included with the option kit
- T-10 Torx screwdriver
- 2 SFF drives or drive blanks

Procedure

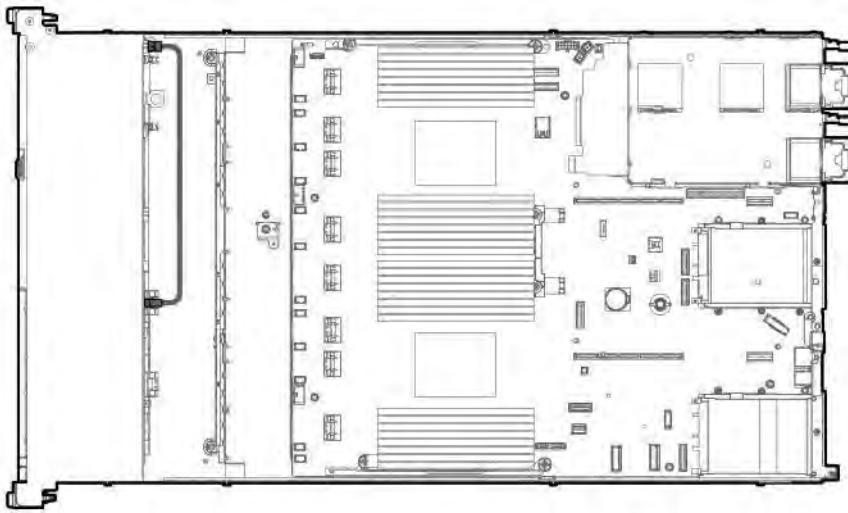
1. Back up all server data.
2. **Power down the server.**
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Do one of the following:
 - a. **Extend the server from the rack.**
 - b. **Remove the server from the rack.**
5. Remove the universal media bay blank.



6. Install the 2 SFF drive cage.



7. **Remove the access panel.**
8. Connect the power cable to the 8SFF drive backplane.



9. **Connect the data cable.**
10. Install drives or drive blanks.
11. **Install the access panel.**
12. Install the server in the rack.
13. Connect each power cord to the server.
14. Connect each power cord to the power source.
15. **Power up the server.**

Energy pack options

If there is an unplanned server power outage, the flash-backed write cache (FBWC) feature of storage controllers requires a centralized backup power source to back up the write cache data in a flash device. This server supports the following power options—collectively known as energy pack:

- **Smart Storage Battery**
- **Smart Storage Hybrid Capacitor**

One energy pack supports multiple devices. After it is installed, the status of the energy pack appears in iLO. For more information, contact customer support.

Minimum firmware versions

Product	Minimum firmware version
Server system ROM	1.20
SR900 series type-p Gen11 controllers	03.01.14.062

Smart Storage Battery

The Smart Storage Battery supports both SR and MR storage controllers. A single 96 W battery can support up to 24 devices.

After the battery is installed, it might take up to two hours to charge. Controller features requiring backup power are not re-enabled until the battery is capable of supporting the backup power.

This server supports the 96 W Smart Storage Battery with the 145 mm cable.

Smart Storage Hybrid Capacitor

The Smart Storage Hybrid Capacitor supports both SR and MR storage controllers. The capacitor pack can support up to two devices.

This server supports the Smart Storage Hybrid Capacitor with the 145 mm cable.

Before installing the Smart Storage Hybrid Capacitor, verify that the system BIOS meets the minimum firmware requirements to support the capacitor pack.

❗ **IMPORTANT:** If the system BIOS or controller firmware is older than the minimum recommended firmware versions, the capacitor pack will only support one device.

The capacitor pack is fully charged after the system boots.

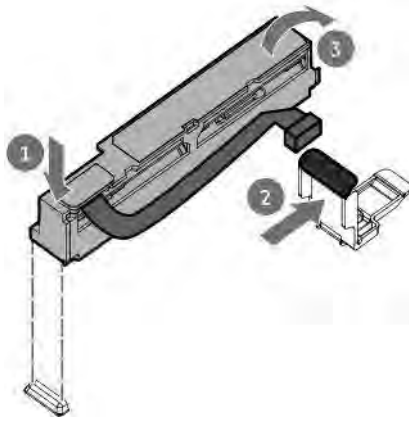
Installing a smart storage battery/capacitor

Prerequisites

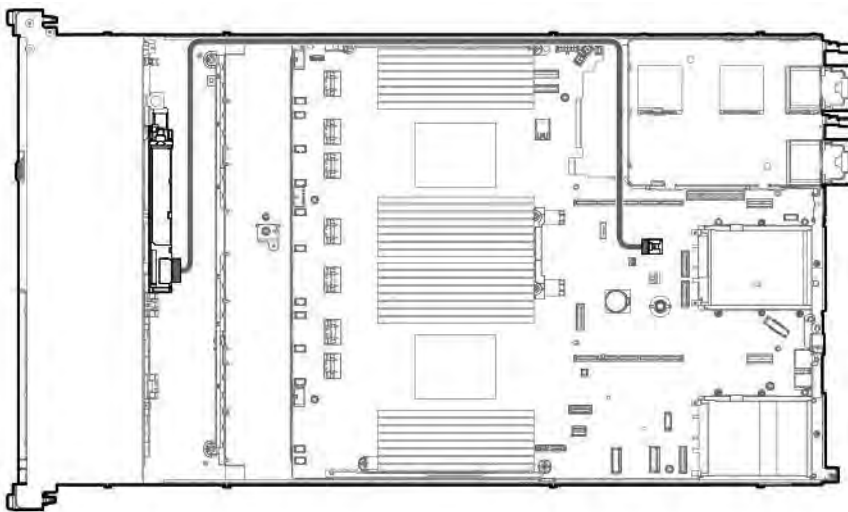
Be sure you have the components included with the hardware option kit.

Procedure

1. **Power down the server.**
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Do one of the following:
 - a. **Extend the server from the rack.**
 - b. **Remove the server from the rack.**
4. **Remove the access panel.**
5. Install the energy pack.



6. If needed, connect the extension cable.
7. Connect the cable to the system board.



8. **Install the access panel.**
9. Install the server in the rack.
10. Connect each power cord to the server.
11. Connect each power cord to the power source.
12. **Power up the server.**

The installation is complete.

Hard drives

Drive guidelines

Observe the following general guidelines:

- The system automatically sets all drive numbers.
- If only one hard drive is used, install it in the bay with the lowest drive number.

For drive numbering, see **Drive bay numbering**.

- The NVMe SSD is a PCIe bus device. Devices attached to a PCIe bus cannot be removed without allowing the device and bus to complete and cease the signal/traffic flow.

Do not remove an NVMe SSD from the drive bay while the Do Not Remove button LED is flashing. The Do Not Remove button LED flashes to indicate that the device is still in use. Removal of the NVMe SSD before the device has completed and ceased signal/traffic flow can cause loss of data.

- Drives with the same capacity provide the greatest storage space efficiency when grouped into the same drive array.

Installing a hot-plug SAS, SATA or NVMe drive

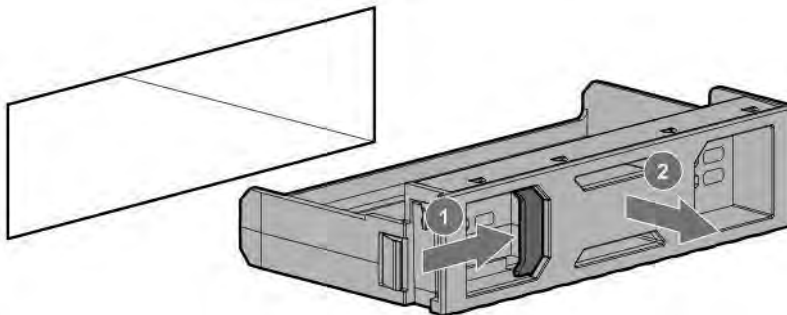
About this task

CAUTION: To prevent improper cooling and thermal damage, do not operate the server unless all drive and device bays are populated with either a component or a blank.

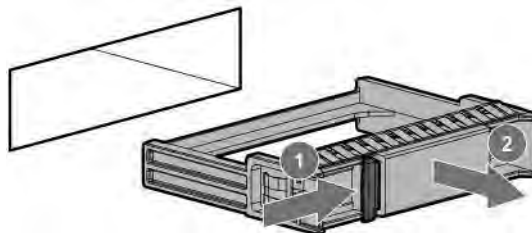
Procedure

1. Remove the drive blank:

- LFF drive blank

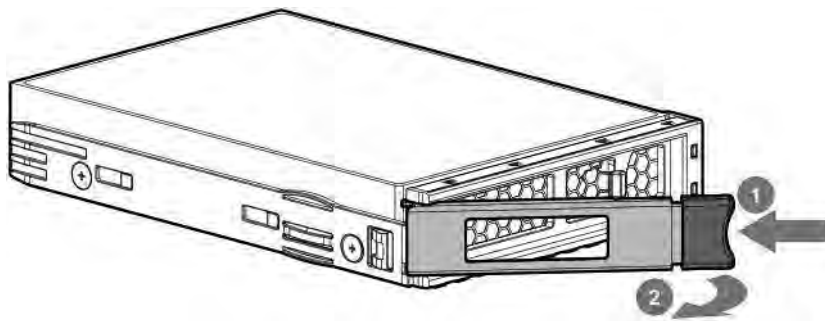


- SFF drive blank

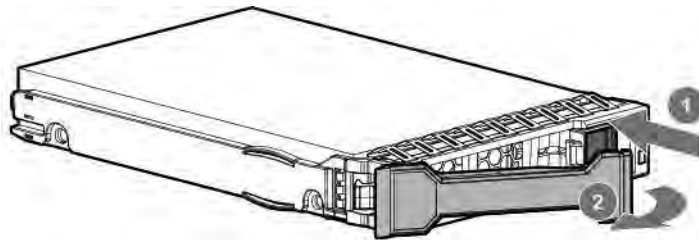


2. Prepare the drive.

- LFF drive

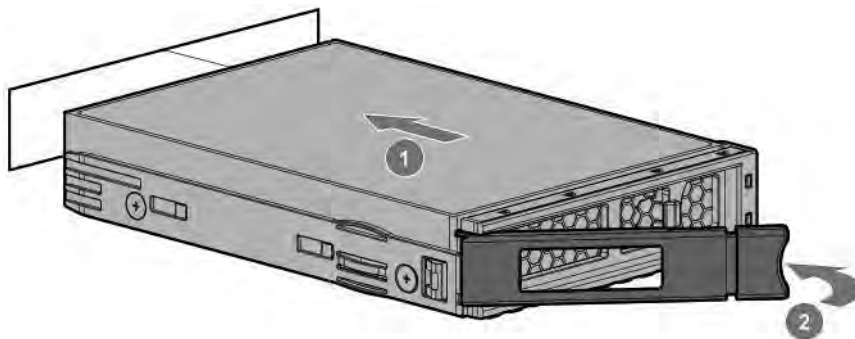


- SFF drive

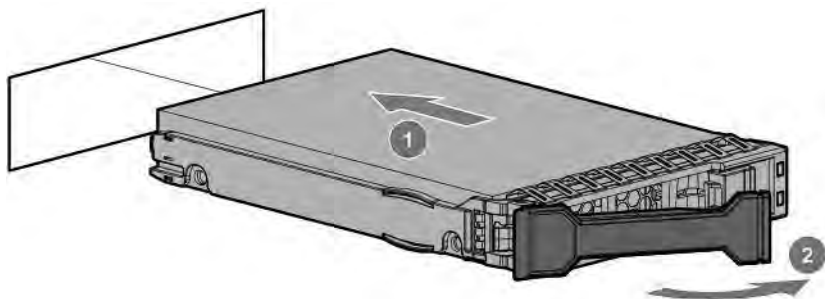


3. Install the drive.

- LFF drive



- SFF drive



4. Determine the status of the drive from the drive LED definitions.

Management

Installing the Systems Insight Display

Prerequisites

Before installing this option, be sure you have the following:

- The components included with the hardware option kit
- T-10 Torx screwdriver

Procedure

1. Observe the following alerts:

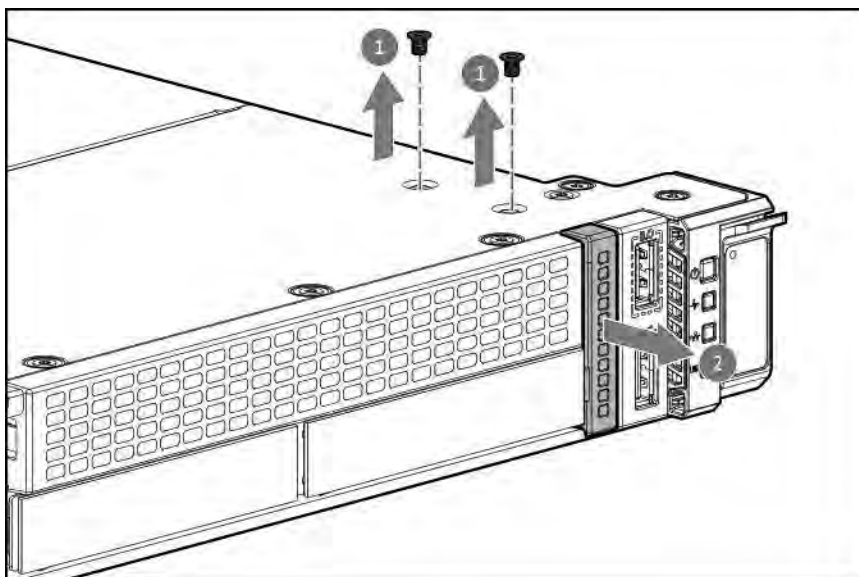


WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

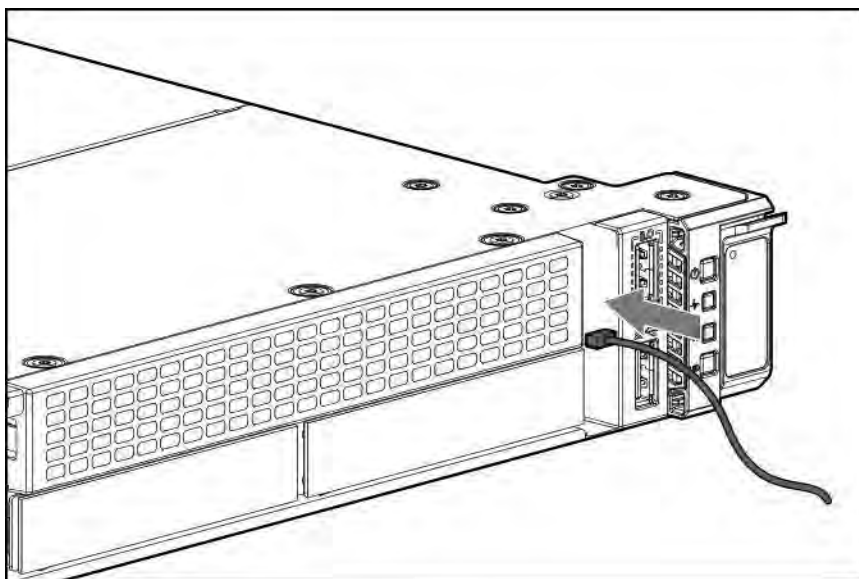


CAUTION: To prevent damage to electrical components, properly ground the server before beginning any installation procedure. Improper grounding can cause electrostatic discharge.

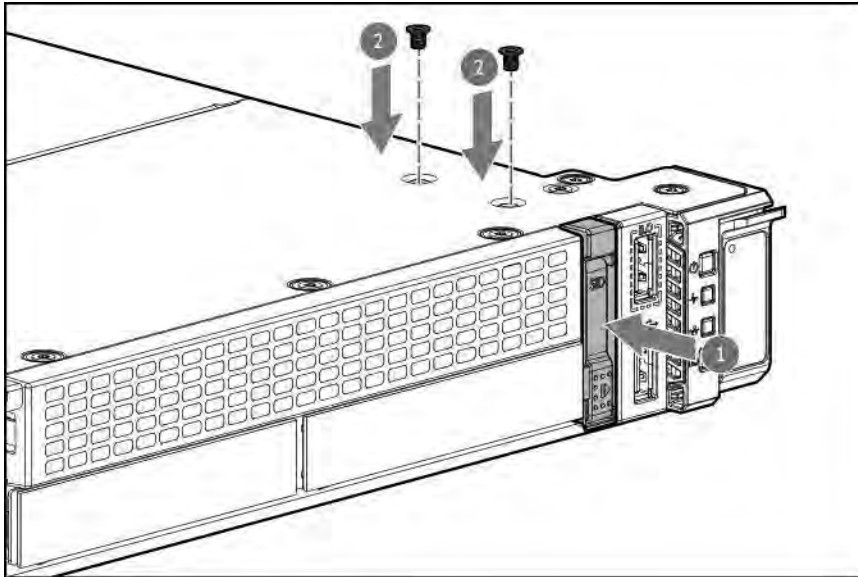
2. Back up all server data.
3. **Power down the server.**
4. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
5. Do one of the following:
 - **Extend the server from the rack.**
 - **Remove the server from the rack.**
6. **Remove the access panel.**
7. Remove the SID blank.



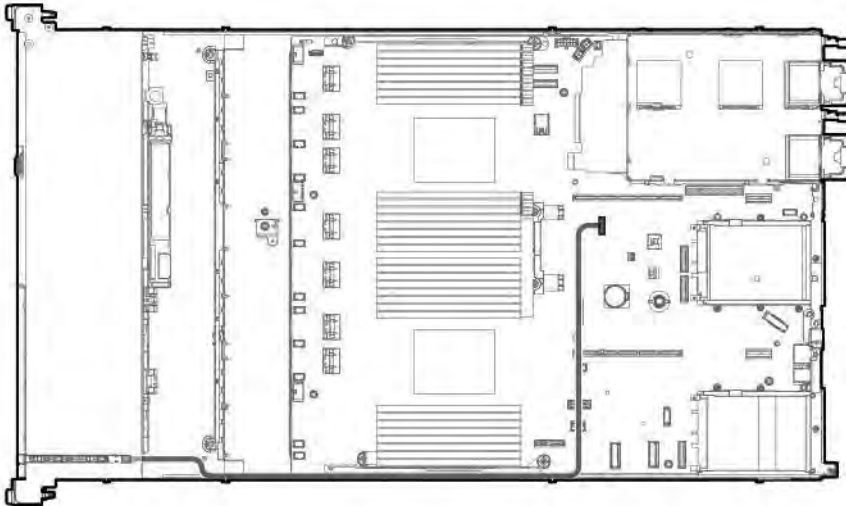
8. Guide the SID cable through the front of the server.



9. Using a T-10 Torx screwdriver, install the SID module .



10. Connect the SID cable to the system board.



11. **Install the access panel.**
12. Slide the server into the rack.
13. Connect each power cord to the server.
14. Connect each power cord to the power source.
15. **Power up the server.**

The installation is complete.

Installing the serial port option

Prerequisites

Before installing this option, be sure you have the following:

- The components included with the hardware option kit
- 5 mm nut driver

Procedure

1. Observe the following alerts:

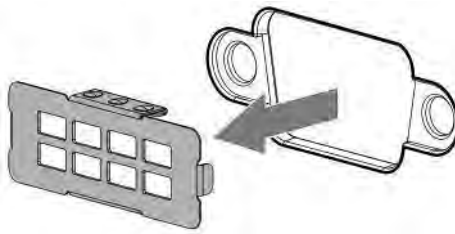


WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

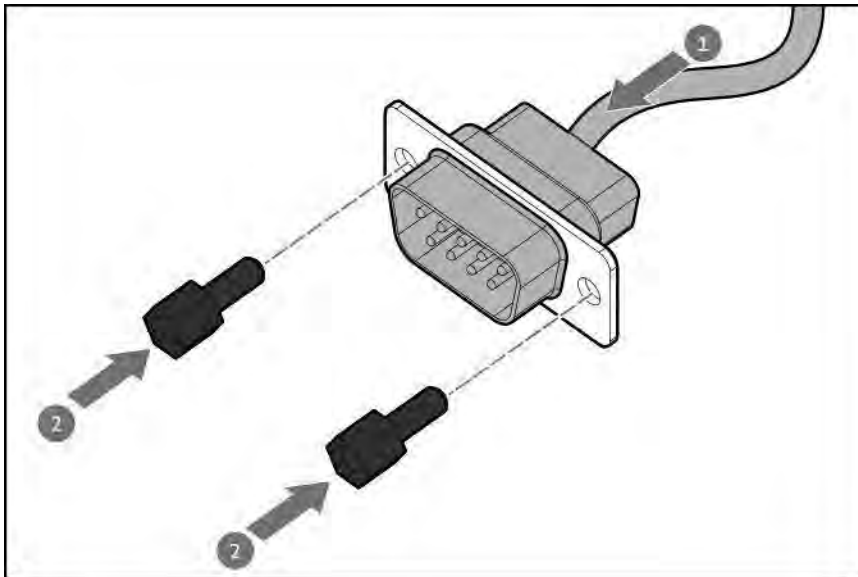


CAUTION: To prevent damage to electrical components, properly ground the server before beginning any installation procedure. Improper grounding can cause electrostatic discharge.

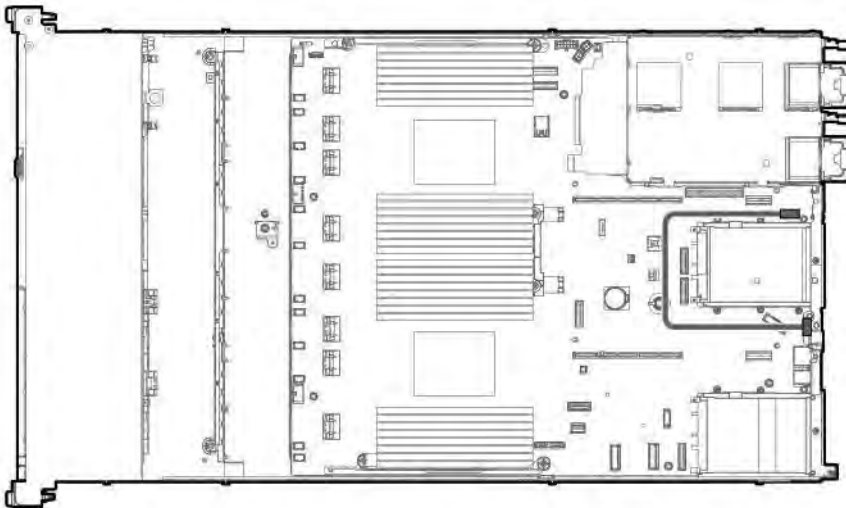
2. Back up all server data.
3. **Power down the server.**
4. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
5. Do one of the following:
 - a. **Extend the server from the rack.**
 - b. **Remove the server from the rack.**
6. **Remove the access panel.**
7. Remove the serial port blank.



8. Using a 5mm nut driver, install the serial cable.



9. Connect the serial cable to the system board.



10. **Install the access panel.**
11. Install the server in the rack.
12. Connect each power cord to the server.
13. Connect each power cord to the power source.
14. **Power up the server.**

The installation is complete.

Memory

Memory population information

For specific memory population information, see the memory population guidelines on the Hitachi Vantara website.

DIMM-processor compatibility

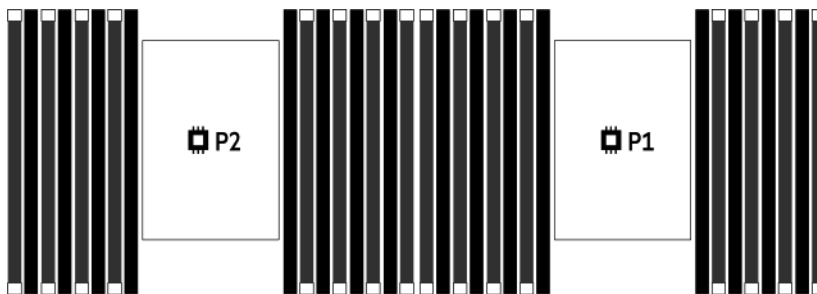
Fourth-generation Intel Xeon Scalable processors support DDR5-4800 DIMMs.

Do not mix DIMMs. Install only the supported DDR5-4800 DIMMs in the server.

Installing a DIMM blank

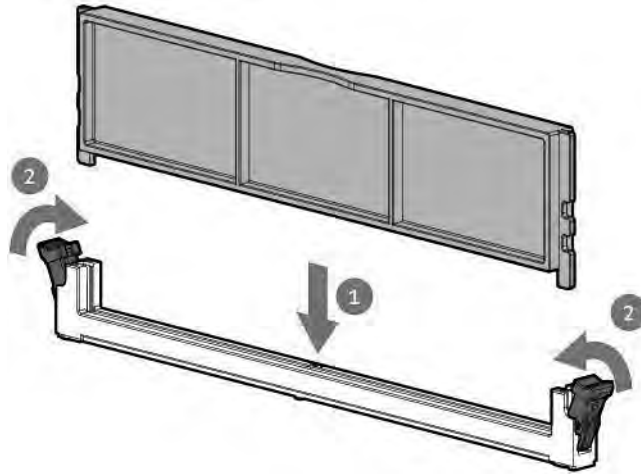
About this task

❗ **IMPORTANT:** This server requires DIMM blanks in all available DIMM slots.



Procedure

1. **Power down the server.**
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Do one of the following:
 - a. **Extend the server from the rack.**
 - b. **Remove the server from the rack.**
4. **Remove the access panel.**
5. Open the DIMM slot latches.
6. Install the DIMM blank.



7. **Install the access panel.**
8. Slide the server into the rack.
9. Connect each power cord to the server.
10. Connect each power cord to the power source.
11. **Power up the server.**

The installation is complete.

Installing a DIMM

Prerequisites

Before installing this option, be sure you have the following:

The components included with the hardware option kit

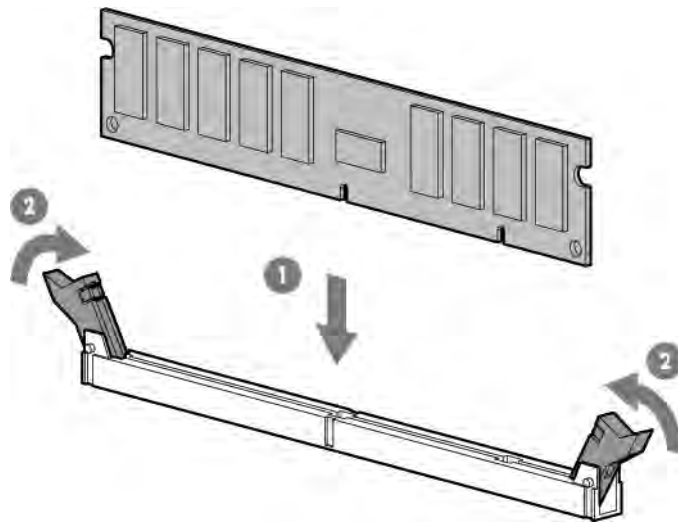
About this task

The server supports up to 32 DIMMs.

Procedure

1. **Power down the server.**
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Do one of the following:
 - a. **Extend the server from the rack.**
 - b. **Remove the server from the rack.**
4. **Remove the access panel.**

5. Open the DIMM slot latches.
6. Install the DIMM.



7. **Install the access panel.**
8. Install the server in the rack.
9. Connect each power cord to the server.
10. Connect each power cord to the power source.
11. **Power up the server.**

Use the BIOS/Platform Configuration (RBSU) in the UEFI System Utilities to configure the memory mode.

For more information about LEDs and troubleshooting failed DIMMs, see **Systems Insight Display combined LED descriptions**.

Networking

Installing an OCP network adapter

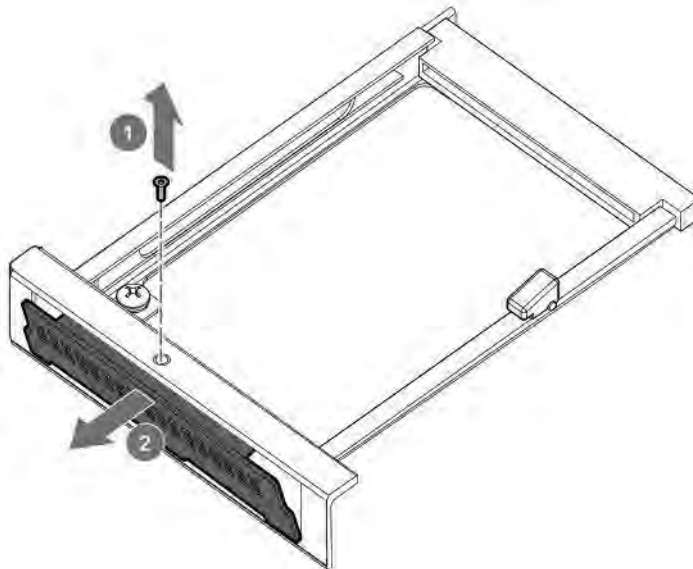
Prerequisites

Before you begin this procedure, make sure that the components included with the hardware option kit are available.

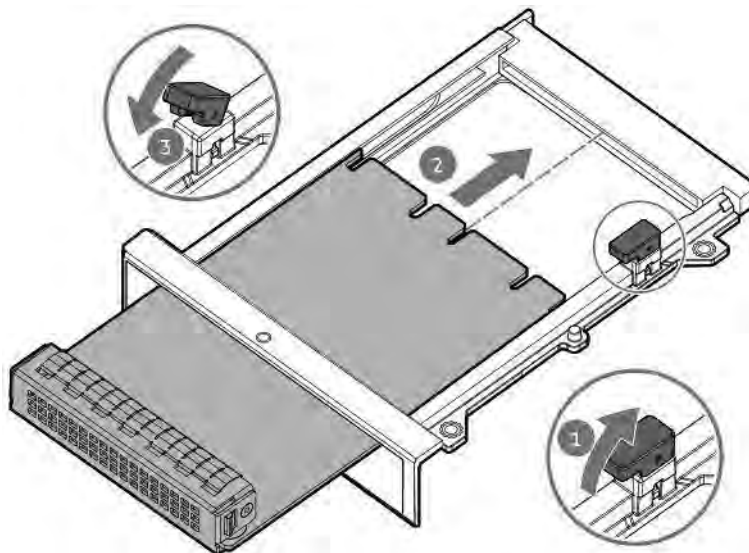
Procedure

1. **Power down the server.**
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Do one of the following:

- **Extend the server from the rack.**
 - **Remove the server from the rack.**
4. **Remove the access panel.**
 5. Remove the rear wall blank or riser cage.
 6. Remove the OCP adapter blank.



7. Install the network adapter.



8. **Connect the cables.**
9. **Install the access panel.**
10. Slide the server into the rack.
11. Connect each power cord to the server.

12. Connect each power cord to the power source.

13. **Power up the server.**

Installing a PCIe network adapter

Prerequisites

Before installing this option, be sure you that have the following:

- The components included with the hardware option kit
- T-10 Torx screwdriver

Procedure

1. Observe the following alerts:



WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.



CAUTION: To prevent damage to electrical components, properly ground the server before beginning any installation procedure. Improper grounding can cause electrostatic discharge.

2. Back up all server data.

3. **Power down the server.**

4. Remove all power:

- a. Disconnect each power cord from the power source.
- b. Disconnect each power cord from the server.

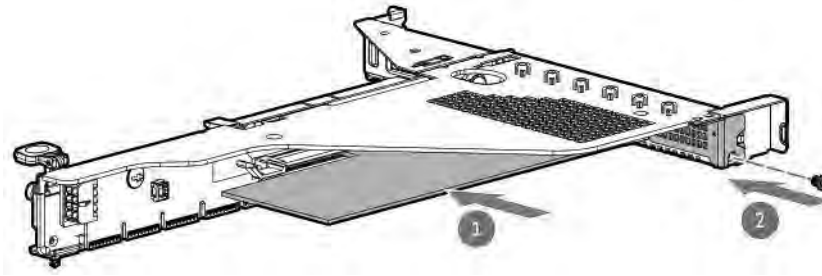
5. Do one of the following:

- a. **Extend the server from the rack.**
- b. **Remove the server from the rack.**

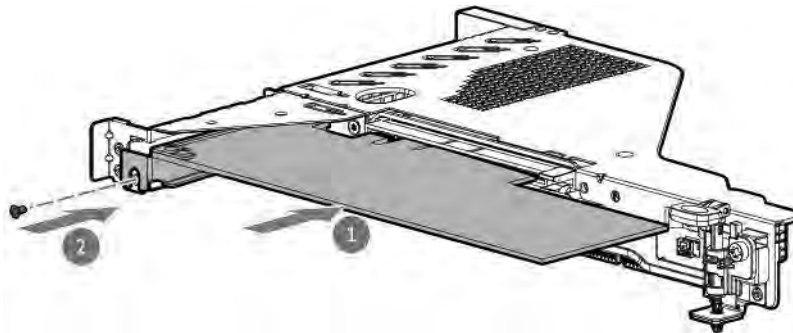
6. **Remove the access panel.**

7. Do one of the following:

- To install an adapter in slot 1 of the primary riser:
 - a. **Remove the primary PCI riser cage.**
 - b. Remove the blank.
 - c. Install the adapter.



- To install an adapter in slot 2 of the primary riser:
 - a. **Remove the primary PCI riser cage**
 - b. Remove the blank.
 - c. Install the adapter.



8. **Install the riser cage.**
9. **Install the access panel.**
10. Install the server in the rack.
11. Connect each power cord to the server.
12. Connect each power cord to the power source.
13. **Power up the server.**

The installation is complete.

Optical drives and media bays

Installing the 8 SFF display port/USB option

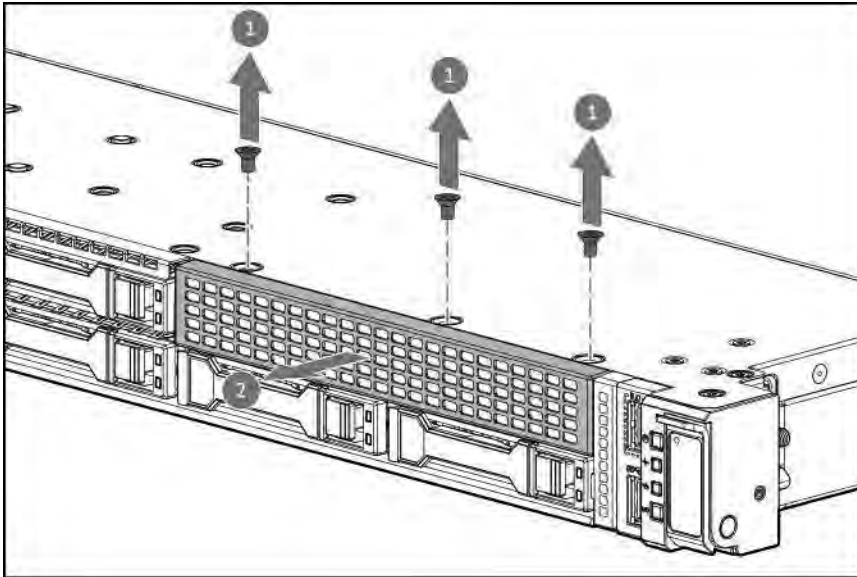
Prerequisites

Before installing this option, be sure that you have the following:

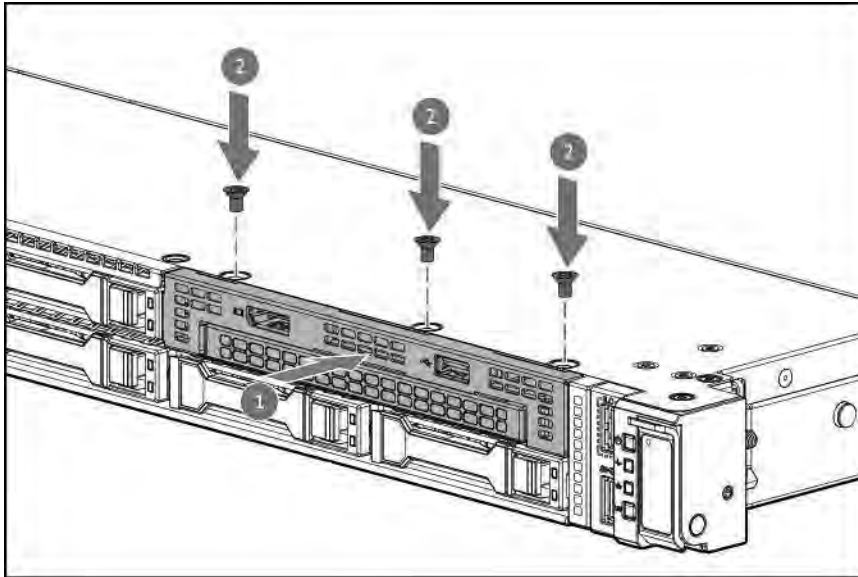
- The components included with the hardware option kit
- T-10 Torx screwdriver

Procedure

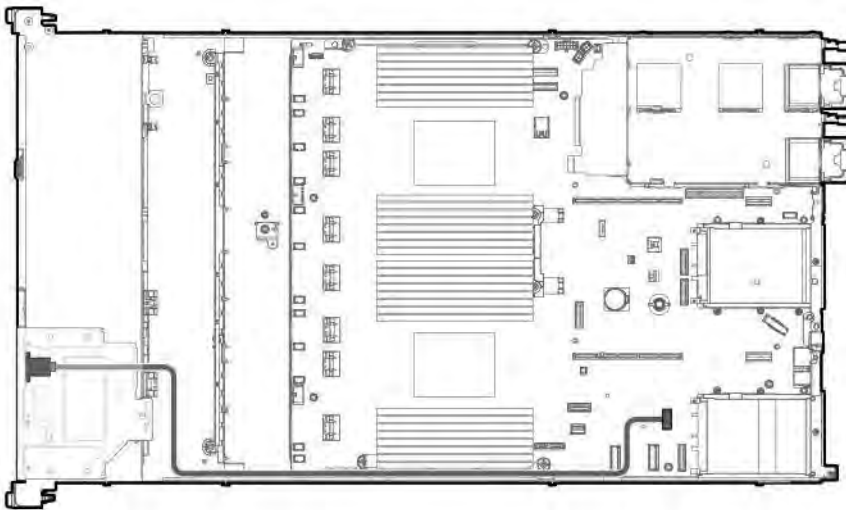
1. Back up all server data.
2. **Power down the server.**
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Do one of the following:
 - a. **Extend the server from the rack.**
 - b. **Remove the server from the rack.**
5. **Remove the access panel.**
6. Remove the bay blank.



7. Install the 8SFF display port/USB/optical option.



8. Connect the cable to the system board.



9. If needed, install the optical drive.
10. Install the access panel.
11. Install the server in the rack.
12. Connect each power cord to the server.
13. Connect each power cord to the power source.
14. Power up the server.

The installation is complete.

Installing an 8SFF optical drive

Prerequisites

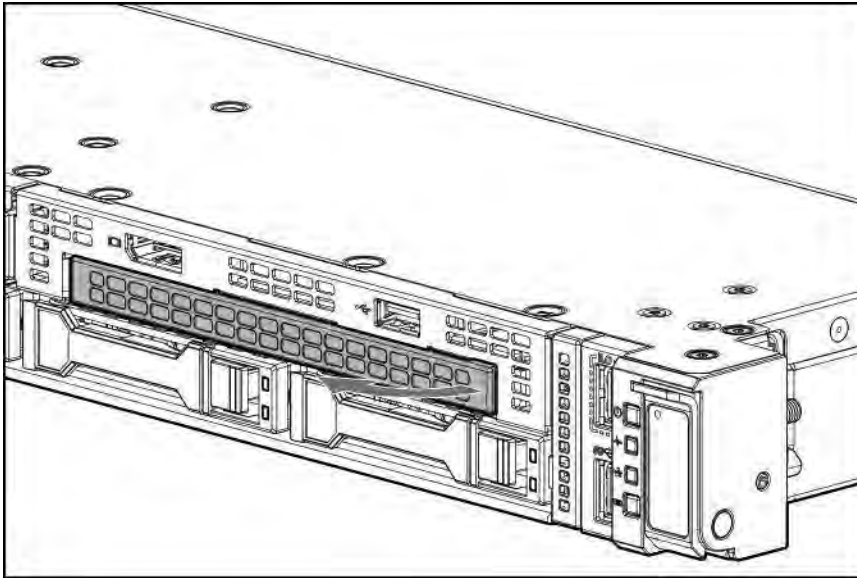
Install the 8SFF display port/USB/optical blank option.

Be sure you have the following:

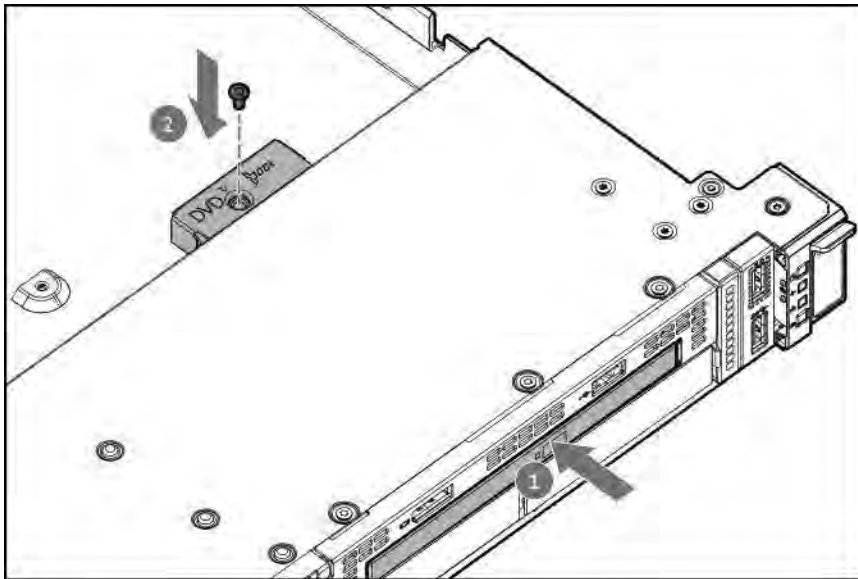
- The components included with the hardware option kit
- T-10 Torx screwdriver

Procedure

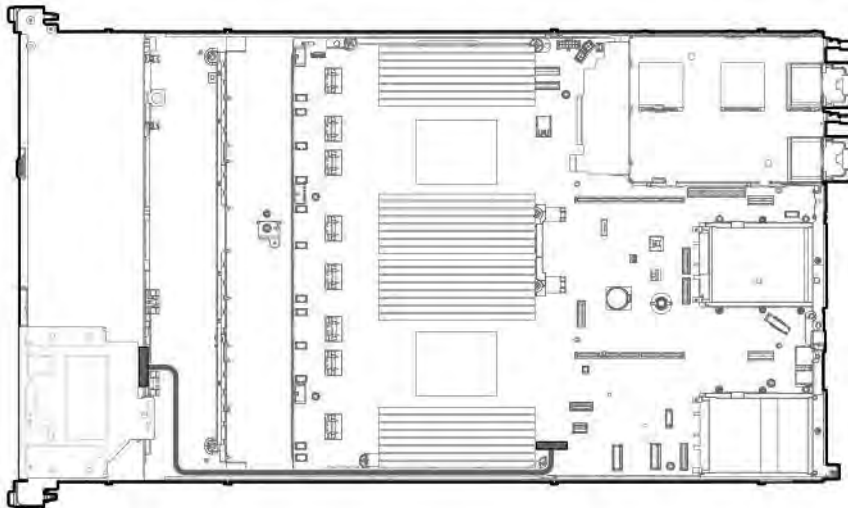
1. **Power down the server.**
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Do one of the following:
 - a. **Extend the server from the rack.**
 - b. **Remove the server from the rack.**
4. **Remove the access panel.**
5. Remove the optical drive blank.



6. Install the optical drive.



7. Connect the optical drive cable.



8. **Install the access panel.**
9. Install the server in the rack.
10. Connect each power cord to the server.
11. Connect each power cord to the power source.
12. **Power up the server.**

The installation is complete.

Installing the 4LFF display port/USB option

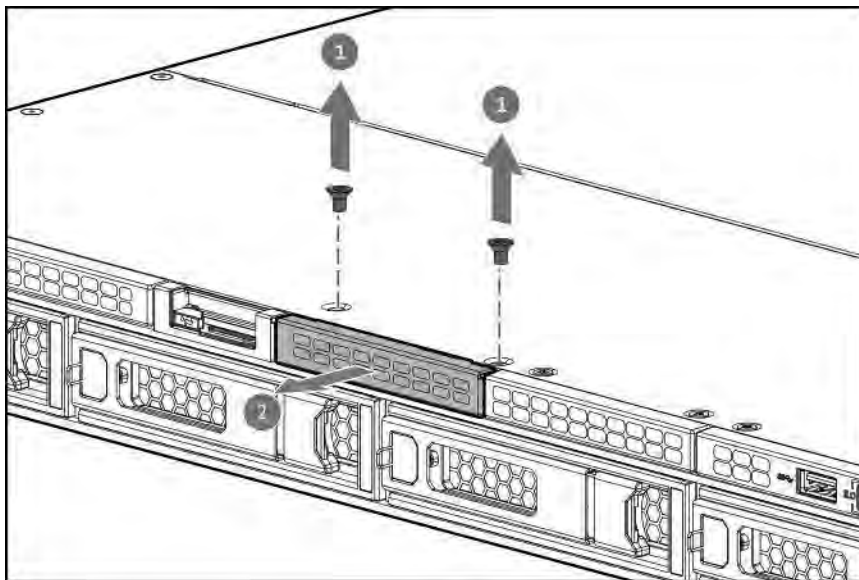
Prerequisites

Be sure you have the following:

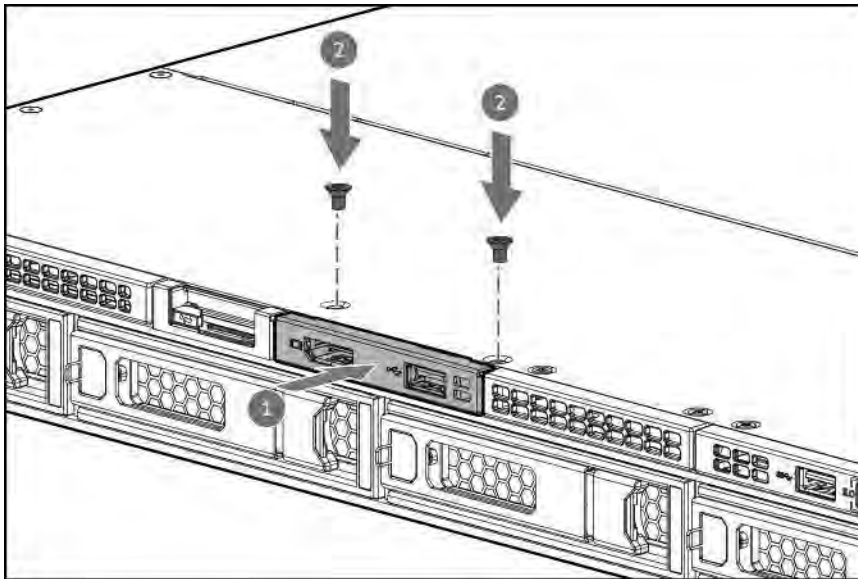
- The components included with the hardware option kit
- T-10 Torx screwdriver

Procedure

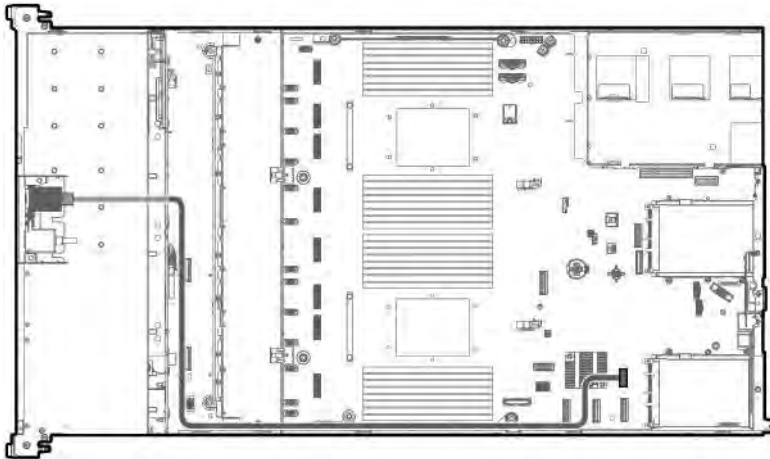
1. **Power down the server.**
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Do one of the following:
 - a. **Extend the server from the rack.**
 - b. **Remove the server from the rack.**
4. Using a Torx T-10 screwdriver, remove the 4LFF display port/USB blank.



5. Install the 4LFF display port/USB module.



6. **Remove the access panel.**
7. Connect the cable to the system board.



8. **Install the access panel.**
9. Install the server in the rack.
10. Connect each power cord to the server.
11. Connect each power cord to the power source.
12. **Power up the server.**

The installation is complete.

Installing the 4LFF optical drive

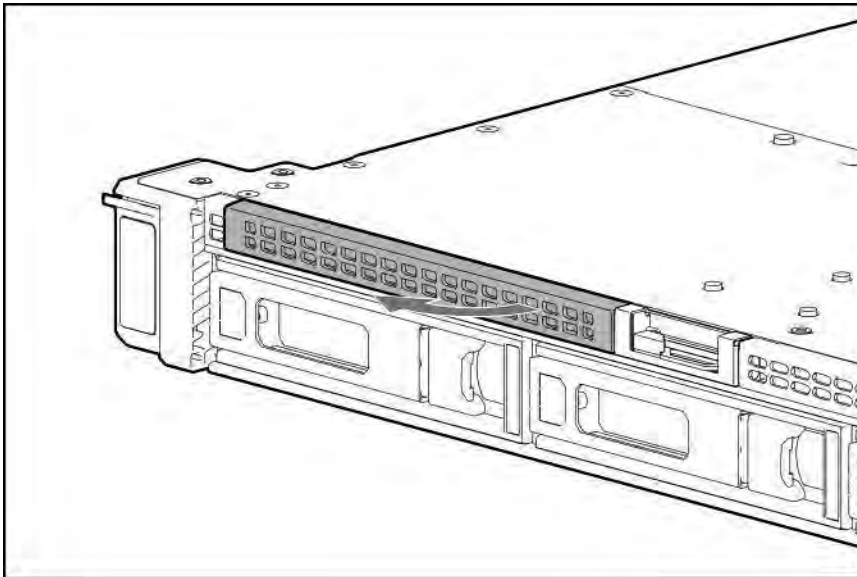
Prerequisites

Before installing this option, be sure that you have the following:

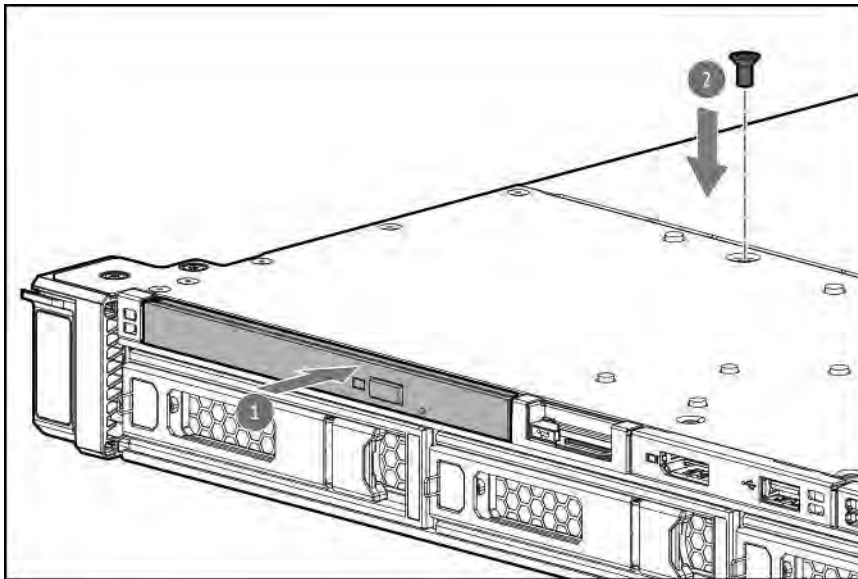
- The components included with the hardware option kit
- T-10 Torx screwdriver
- LFF optical cable option kit
- An optical drive

Procedure

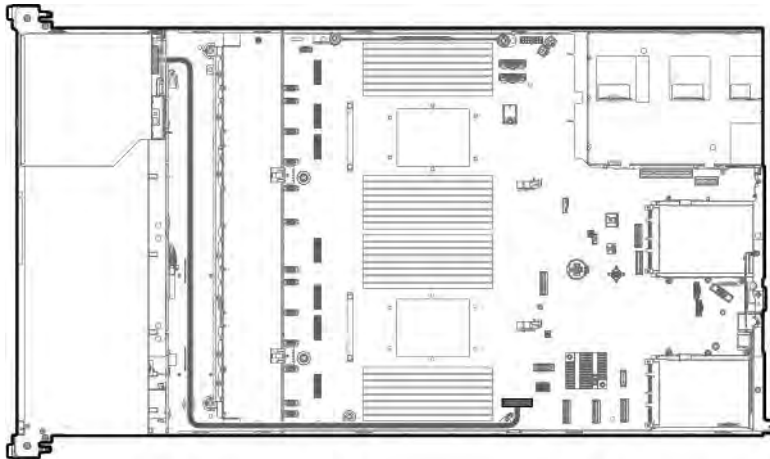
1. Back up all server data.
2. **Power down the server.**
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Do one of the following:
 - a. **Extend the server from the rack.**
 - b. **Remove the server from the rack.**
5. Remove the LFF optical drive bay blank.



6. Install the optical drive.



7. **Remove the access panel.**
8. Connect the cable to the system board.



9. **Install the access panel.**
10. Install the server in the rack.
11. Connect each power cord to the server.
12. Connect each power cord to the power source.
13. **Power up the server.**

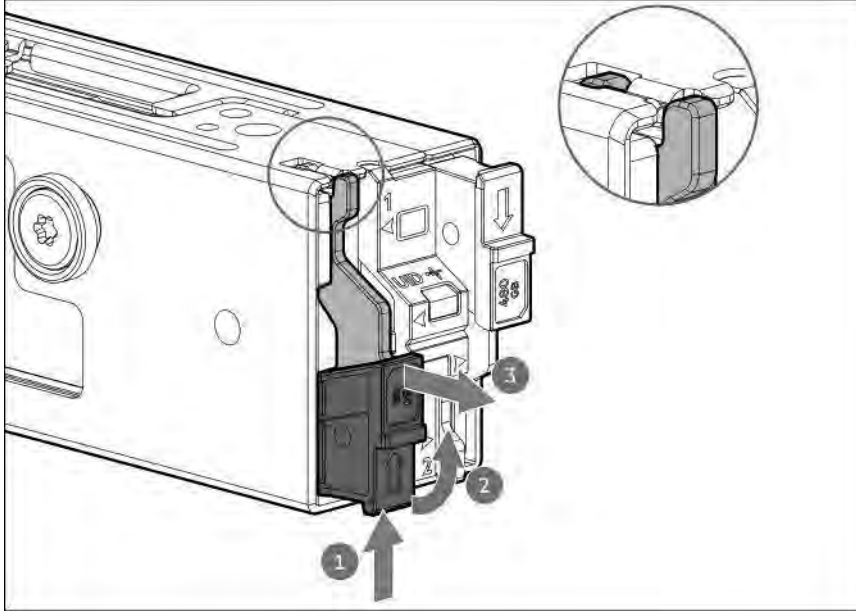
The installation is complete.

OS boot device

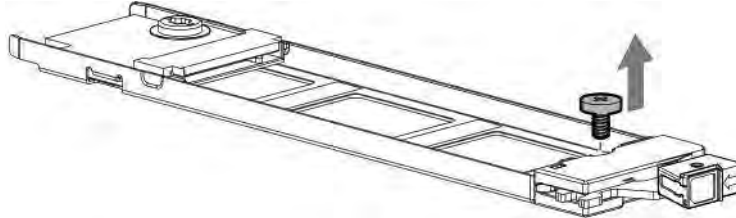
Installing boot device drives

Procedure

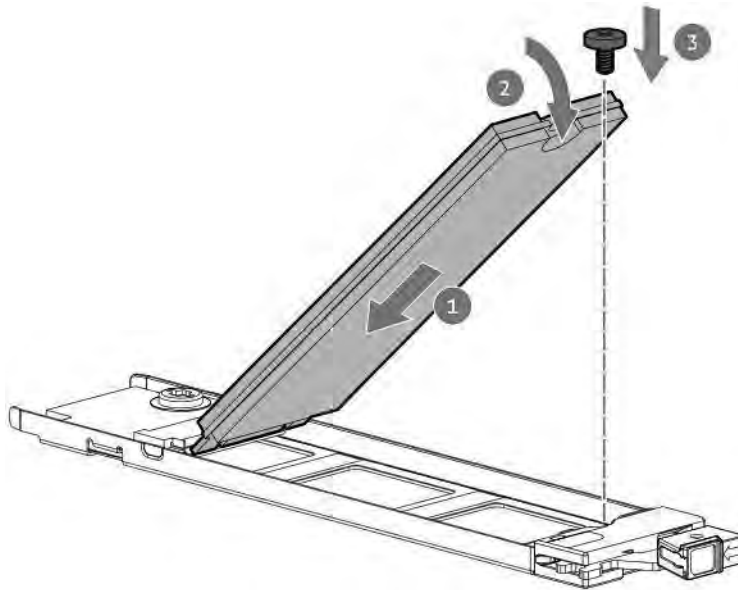
1. Push the button to pull out the carrier.



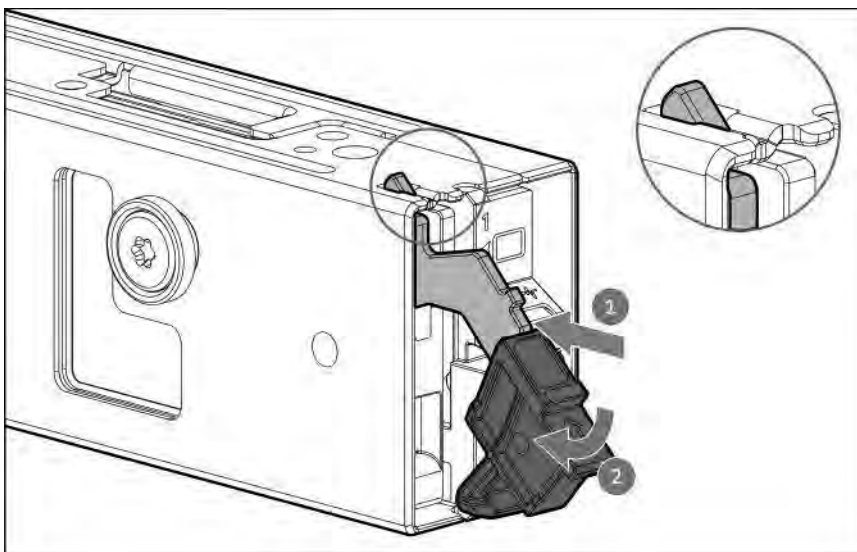
2. Remove the SSD mounting screw.



3. Insert the SSD into the M.2 slot at a 45° angle (callout 1).
4. Carefully press the SSD down to the horizontal position (callout 2).
5. Install the SSD mounting screw (callout 3).



6. If the second M.2 SSD is installed on the carrier assembly, repeat steps 1 and 2.
7. Slide the carrier inside the boot device cage and push the button. There will be an audible click when the latch locks into place. Ensure that the latch is fully engaged.



NOTE: For removal of the drive, follow the same procedure.

Installing the NS204i Boot Device

Prerequisites

- Before beginning installation, make sure that the server is updated with the latest operating system firmware and drivers.
- Before you perform this procedure, make sure that you have a T-10 Torx screwdriver available.

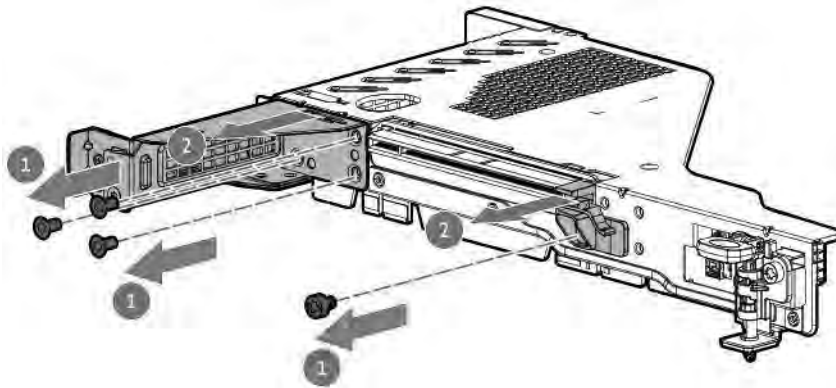
About this task

Note the following:

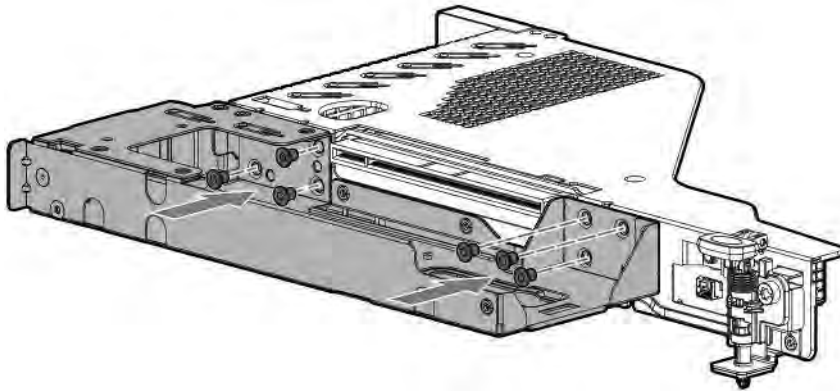
- The NS204i-u Gen11 NVMe Hot Plug Boot Optimized Storage Device is a PCIe3 x4 custom form-factor module that includes two hot pluggable 2280 M.2 NVMe SSDs.
- NS204i-u Boot Device auto-creates a RAID1 volume during boot, therefore does not require configuration.
- **Identify the NS204i Boot Device components.**

Procedure

1. Back up all server data.
2. **Power down the server.**
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Do one of the following:
 - **Extend the server from the rack.**
 - **Remove the server from the rack.**
5. **Remove the access panel.**
6. **Remove the primary riser cage.**
7. Remove the slot 2 bracket from the primary riser cage.



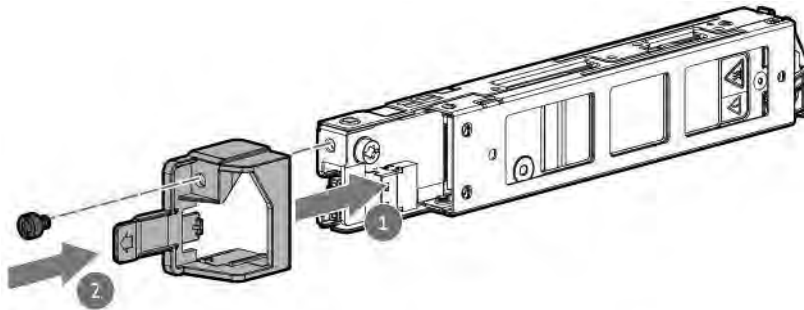
8. Install the boot device cage.



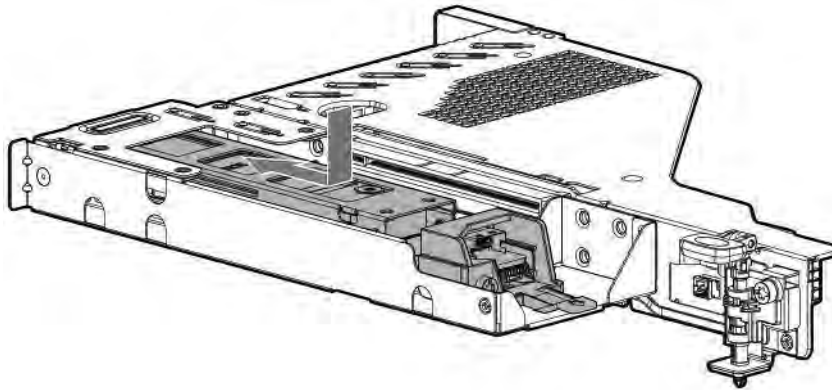
9. Install the boot device drives.

10. Install the boot device.

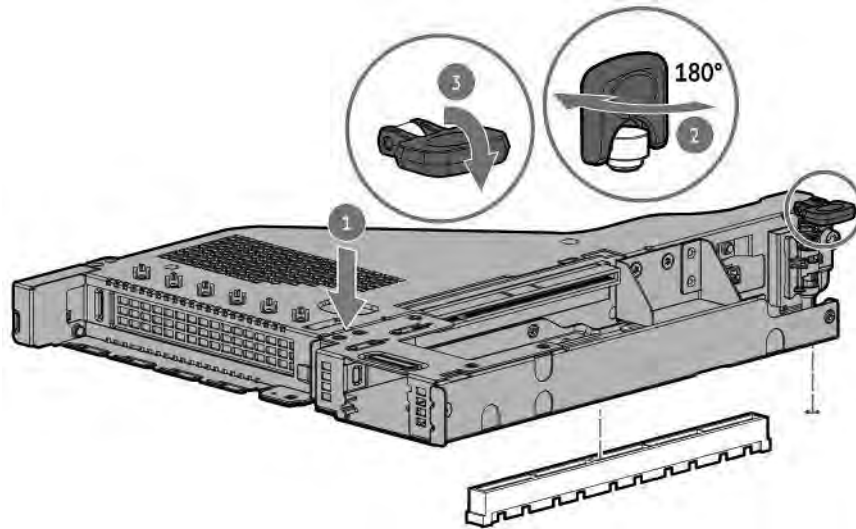
- To install the external boot device:
 - a. Install the latch.



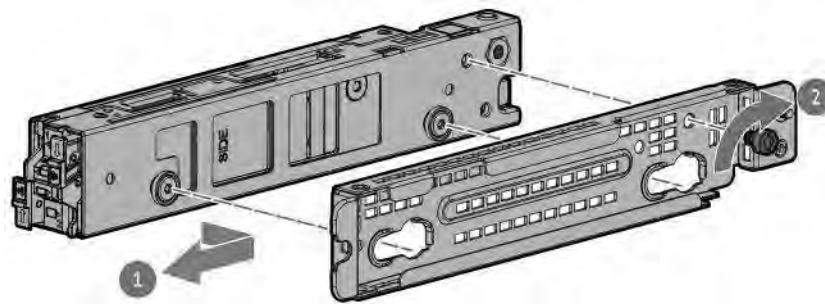
- b. Install the device into the riser cage.



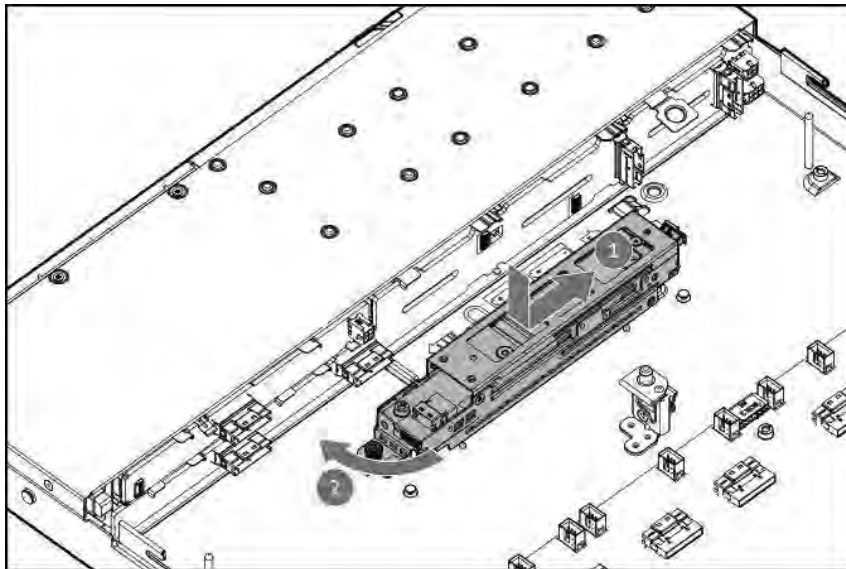
- c. Install the riser cage.



- To install the internal boot device:
 - a. Install the mounting bracket.



- b. Install the boot device in the server.



11. **Connect the power and signal cables to the NS204i Boot Device.**
12. **Install the access panel.**
13. Install the server in the rack.
14. Connect each power cord to the server.
15. Connect each power cord to the power source.
16. **Power up the server.**
17. **Verify the Online/Activity LEDs on the NS204i Boot Device are solid green.**

The installation is complete.

Power supply options

Installing a redundant hot-plug power supply


Prerequisites


Before installing this option, be sure you have the following:

The components included with the hardware option kit

Procedure


1. Observe the following alerts:

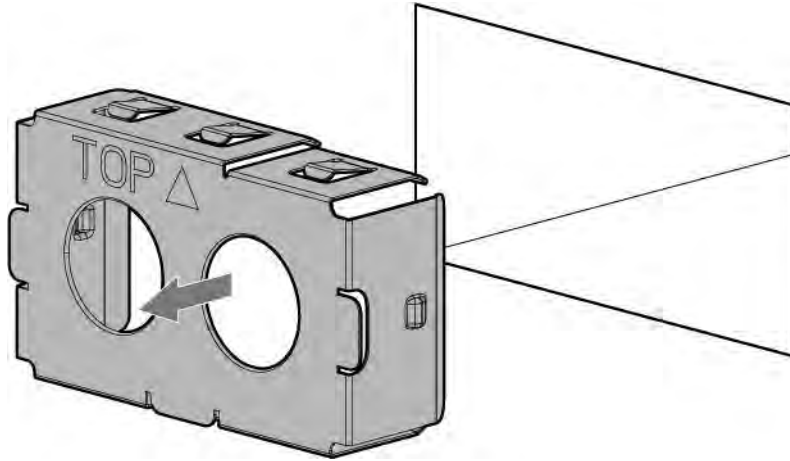
 **CAUTION:** All power supplies installed in the server must have the same output power capacity. Verify that all power supplies have the same part number and label color. The system becomes unstable and may shut down when it detects mismatched power supplies.

 **CAUTION:** To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

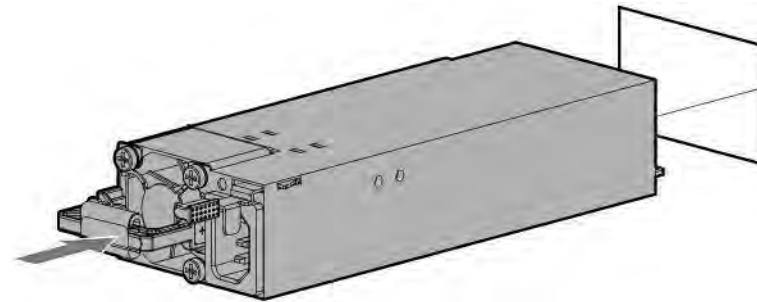
2. **Access the product rear panel.**

3. Remove the blank.

 **WARNING:** To reduce the risk of personal injury from hot surfaces, allow the power supply or power supply blank to cool before touching it.



4. Insert the power supply into the power supply bay until it clicks into place.



5. Connect the power cord to the power supply.
6. Route the power cord. Use best practices when routing power cords and other cables. A cable management arm is available to help with routing. To obtain a cable management arm, contact a Hitachi Vantara authorized reseller.
7. Connect the power cord to the AC power source.
8. **Be sure that the power supply LED is green.**

The installation is complete.

Processor and heatsink options

Processor cautions

-
- ⚠ **CAUTION:** To avoid damage to the processor or system board, only authorized personnel should attempt to replace or install the processor in this server.
-
- ⚠ **CAUTION:** To prevent possible server malfunction and damage to the equipment, multiprocessor configurations must contain processors with the same part number.
-

-
- ⚠ CAUTION:** The pins on the processor socket and on the processor are very fragile and easily damaged. To avoid component damage, **do not touch these pins**. Any damage to them might require replacing the system board and/or processor.
-
- ❗ IMPORTANT:** Processor socket 1 must be populated at all times or the server does not function.
-
- ❗ IMPORTANT:** If installing a processor with a faster speed, update the system ROM before installing the processor. To download firmware, contact customer support.
-

Installing the processor

Prerequisites

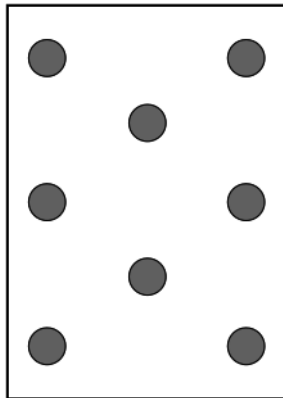
- T-30 Torx screwdriver
- Thermal grease

About this task

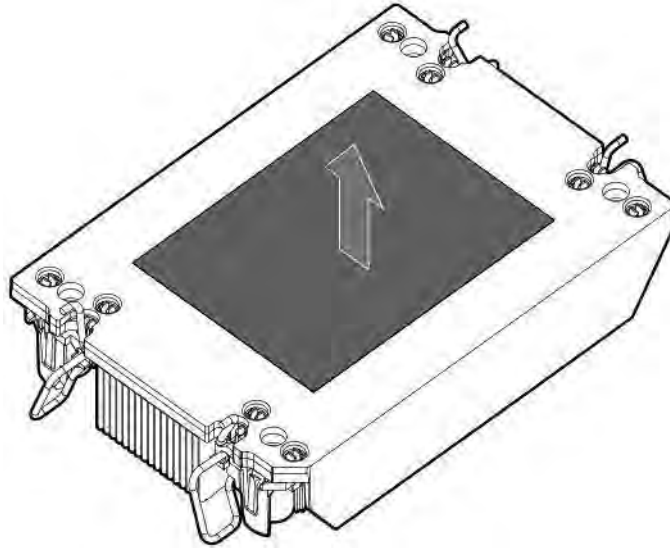
-
- ⚠ CAUTION:** To prevent possible server overheating, always populate each processor socket with a processor socket cover and a processor blank, or a processor and a heatsink.
-

Procedure

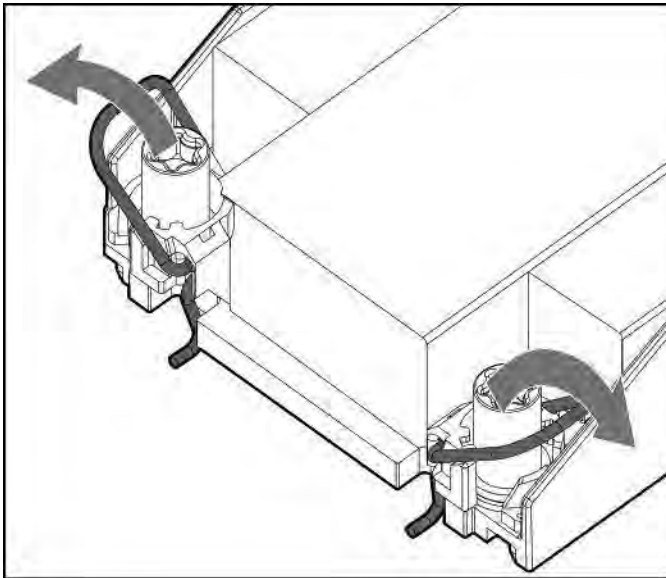
1. If you are using the same heatsink, apply the full content of the thermal grease syringes on top of the processor. Follow the pattern shown in the following image.



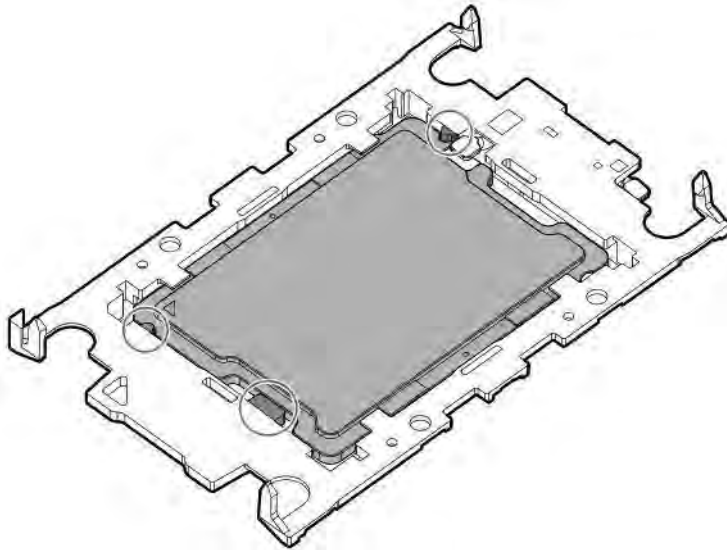
2. If you are using a new heatsink, remove the protective film from the thermal interface material.



3. Set the anti-tilt wires to the locked position.

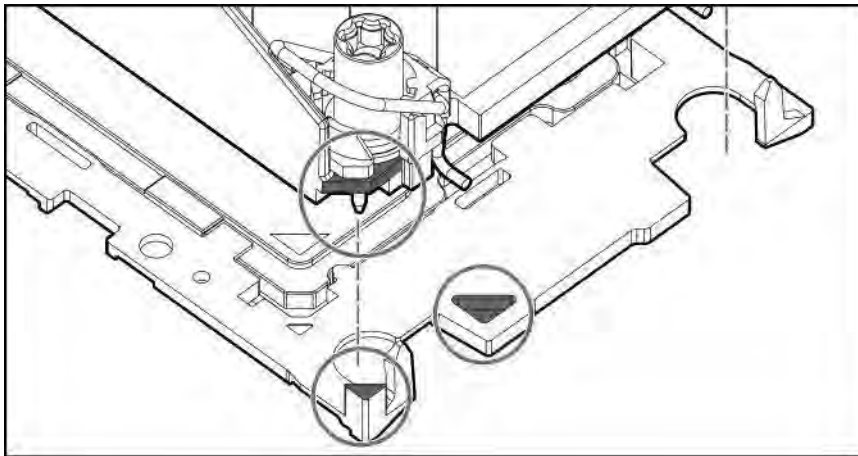


4. Verify that the processor is securely latched to the processor carrier.
The following illustration calls out the keying feature tabs that secure the processor. Different processor carriers will have these tabs in different locations.



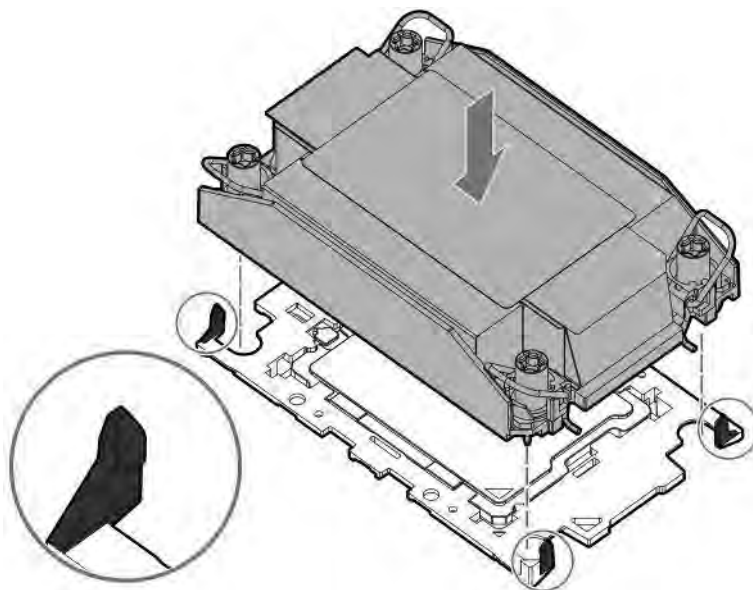
5. Attach the heatsink to the processor carrier:

a. Align the pin 1 indicator on the processor carrier with that on the heatsink.



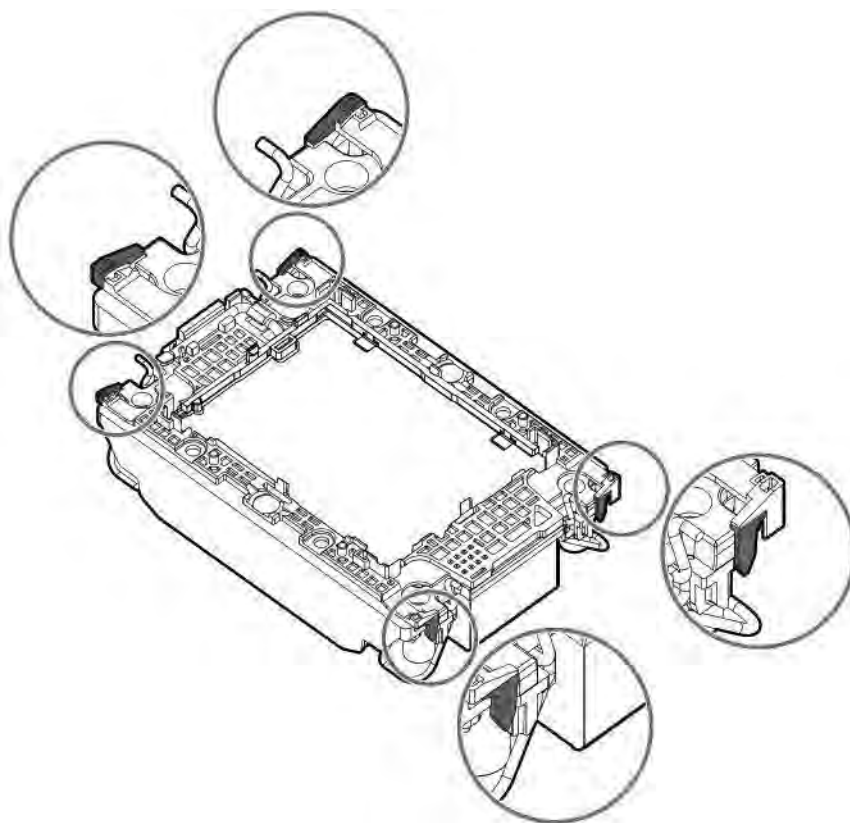
b. Lower the heatsink on the processor carrier until the carrier tabs snap into place.

There will be an audible click to indicate that the heatsink is properly latched on the processor carrier.

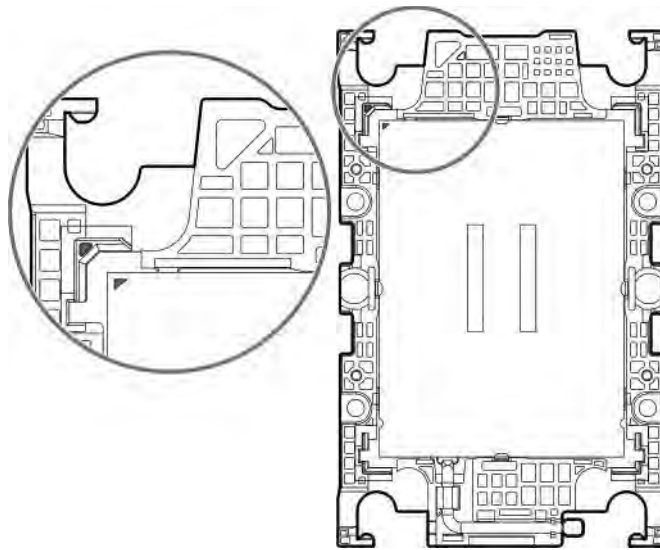


6. Perform the following verification steps:

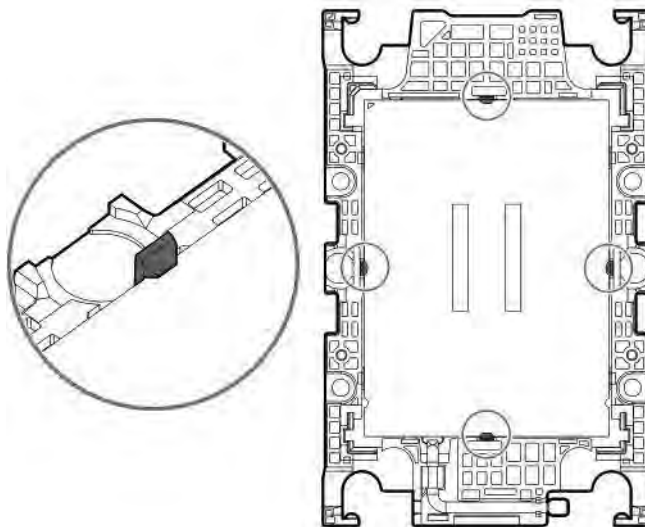
a. Verify that the tabs on the processor carrier are securely latched on the heatsink.



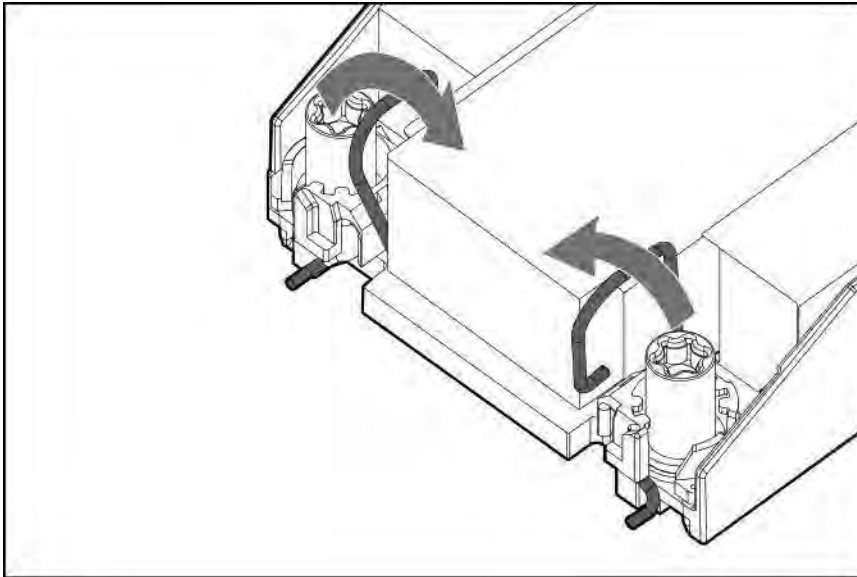
b. Verify that the pin 1 indicators on the processor and processor carrier are aligned.



c. Verify that the processor is properly secured by the carrier snaps.



7. Set the anti-tilt wires to the unlocked position.

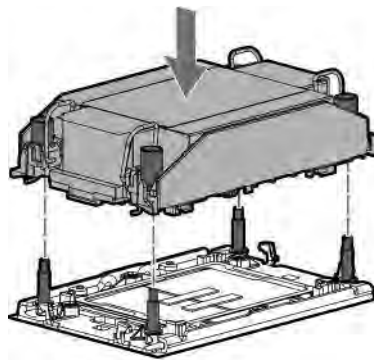


8. **⚠ CAUTION:** To prevent mechanical damage or depositing oil on your hands or other contaminant to the heatsink contact surface, hold the heatsink only by the edge of its base plate. Do not touch the heatsink fins.

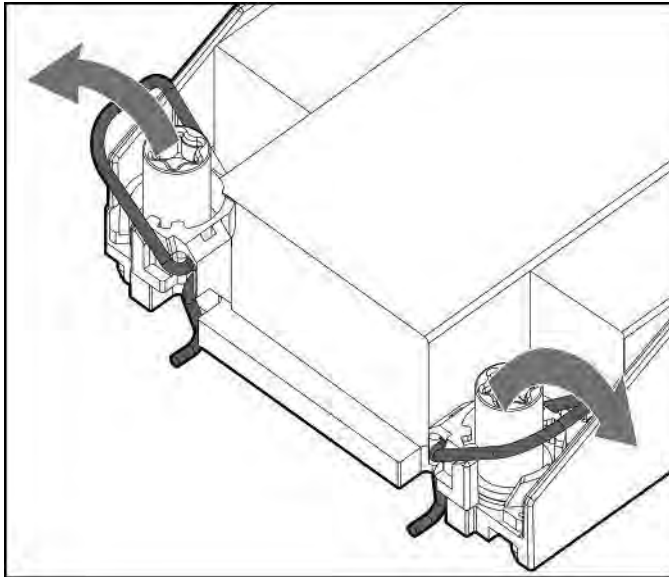
Install the processor-heatsink module:

- a. When using a torque wrench to tighten the heatsink screws, set it to 0.9 N-m (8 in-lb) of torque.
- b. Note the **Front of server** text on the heatsink label to correctly orient the processor-heatsink module over the bolster plate.
- c. Carefully lower the processor-heatsink module onto the bolster plate guide posts.

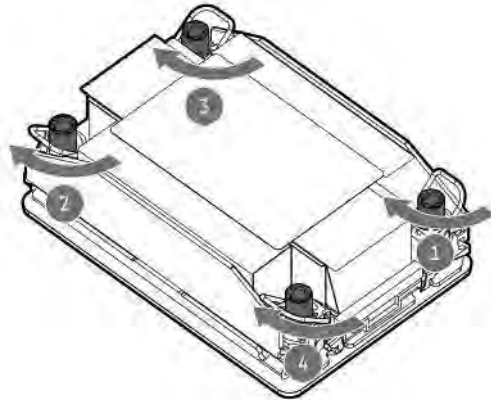
The posts are keyed so that the module can only be installed one way. Make sure that the module is properly seated on the bolster plate before securing the screws.



- d. Set the anti-tilt wires to the locked position.



- e. Use a T-30 Torx screwdriver to tighten one pair of diagonally opposite heatsink screws (callouts 1 to 2), and then tighten the other pair of heatsink screws (callouts 3 to 4).



- 9. Install the air baffle and other removed hardware components.
- 10. Install the access panel.
- 11. If the server was removed from an enclosure or a rack, reinstall it now.
- 12. Connect all peripheral cables to the server.
- 13. Connect each power cord to the server.
- 14. Connect each power cord to the power source.
- 15. Power up the server.

The installation is complete.

Rack mounting options

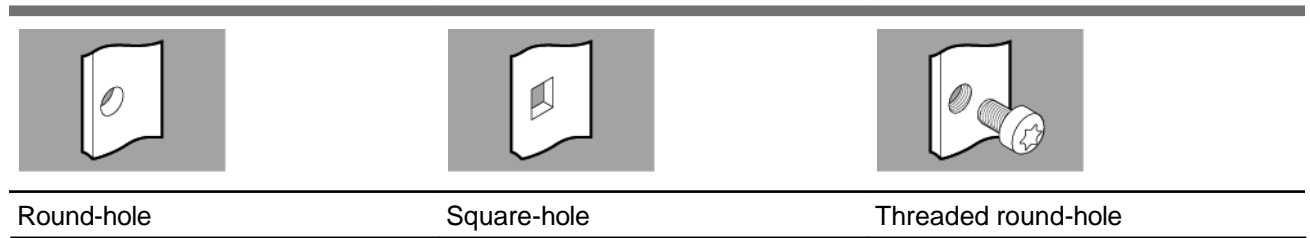
Use the quick-deploy, toolless rack rail option to install the server in a standard four-post server. The rail design supports installation on server of different mounting interfaces.

For cable management, the rack rail kit might include one or both of the following options:

- **Rack rail hoop-and-loop strap**
- **Cable management arm**

Rack mounting interfaces

The server rails can be installed in a rack that has the following mounting interfaces:



The illustrations used in this procedure show an icon on the upper right corner of the image. This icon indicates the type of mounting interface for which the action illustrated in the image is valid.

Rail identification markers

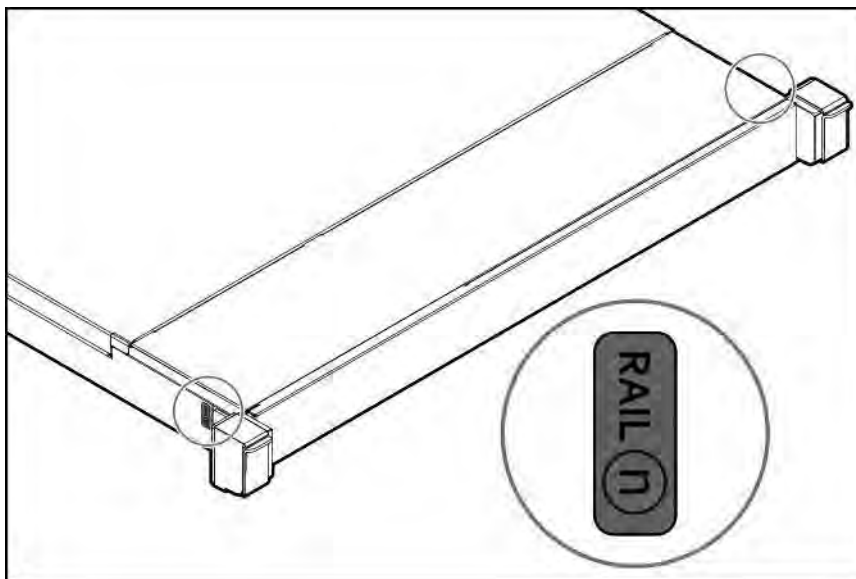
The rack rail option support is dependent on these two factors:

- The height and weight of the chassis as determined by the front- and rear-end server configurations.
- The depth of the chassis as measured from the edge of the front panel (without the front bezel) to the edge of the rear panel.

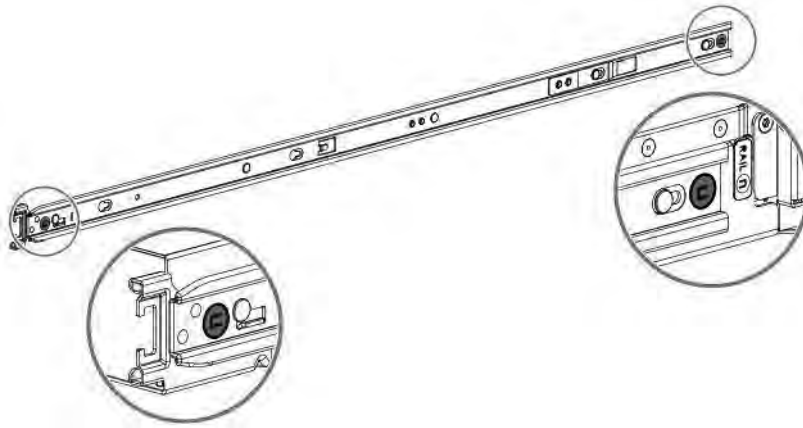
To ensure compatibility between the rack rails and the server, verify that the rail number labels on the chassis match the ones stamped on the rails.

- Rail number labels on the chassis

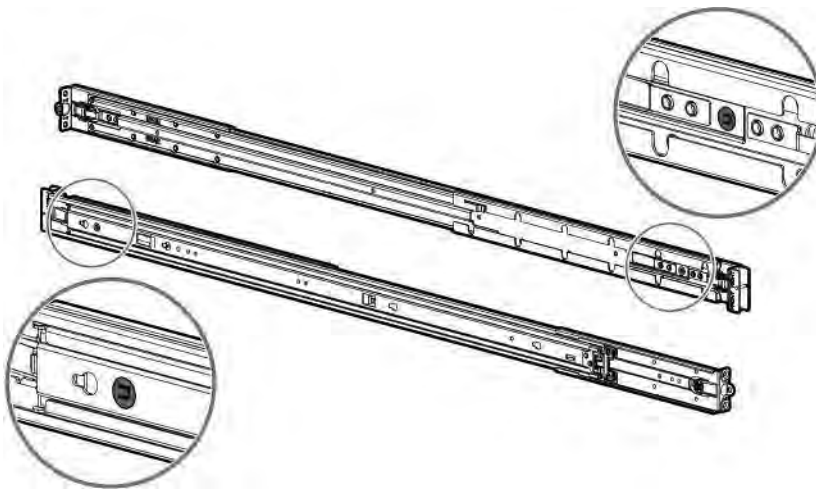
Rail #3 and #5



- Rail identifier stamps on the inner rail of the friction rack rail



- Rail identifier stamps on the mounting rail of the friction rack rail



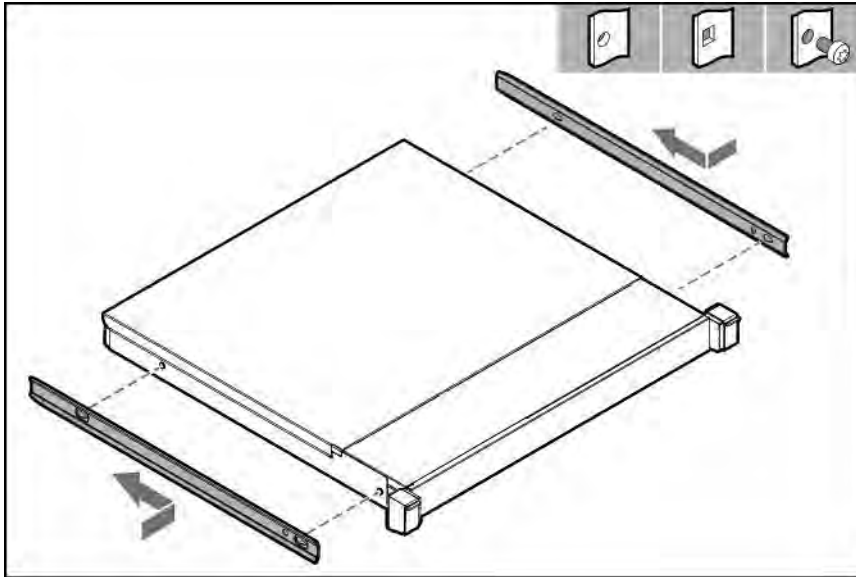
Installing the rack rails

Prerequisites

- **Make sure that the rail option is compatible with the server configuration.**
- If you are installing the server in a threaded round-hole rack, be sure to have a small slotted screwdriver.

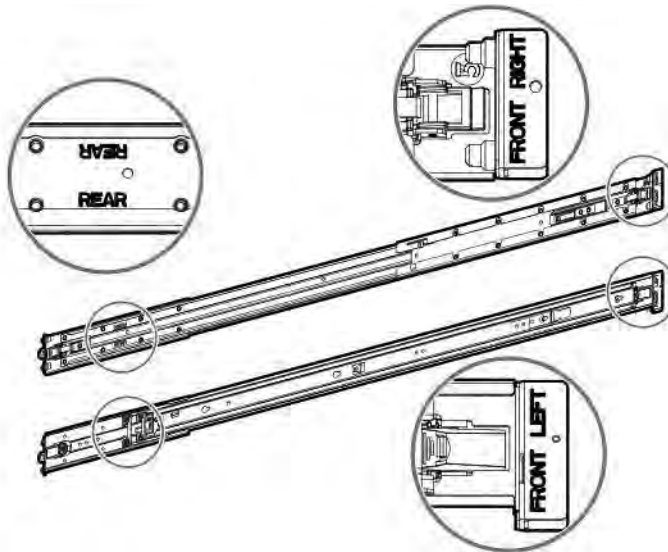
Procedure

1. Install the server rails on the server.



2. Identify the rack rails.

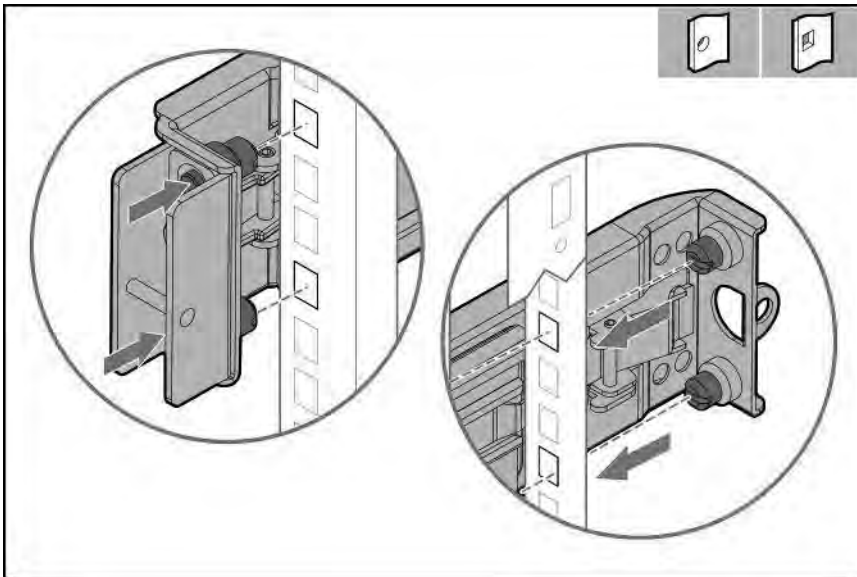
- The front end of the rails is marked as **FRONT LEFT** or **FRONT RIGHT**.
- The other end of the rails is marked as **REAR**.



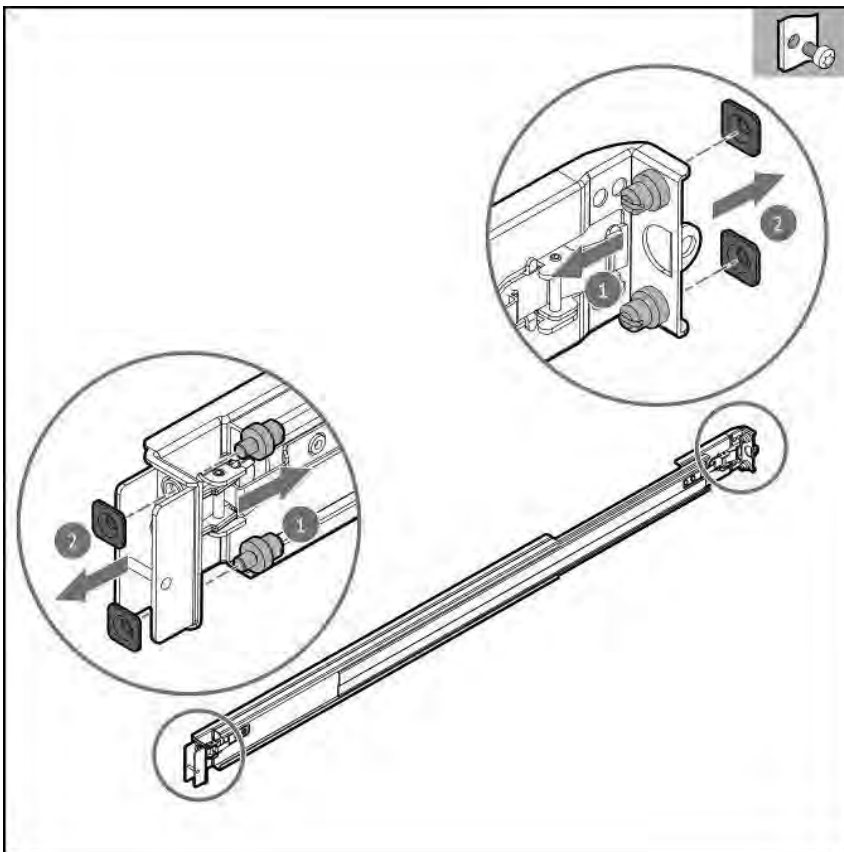
3. Extend the rack rails to align with the depth of the rack.

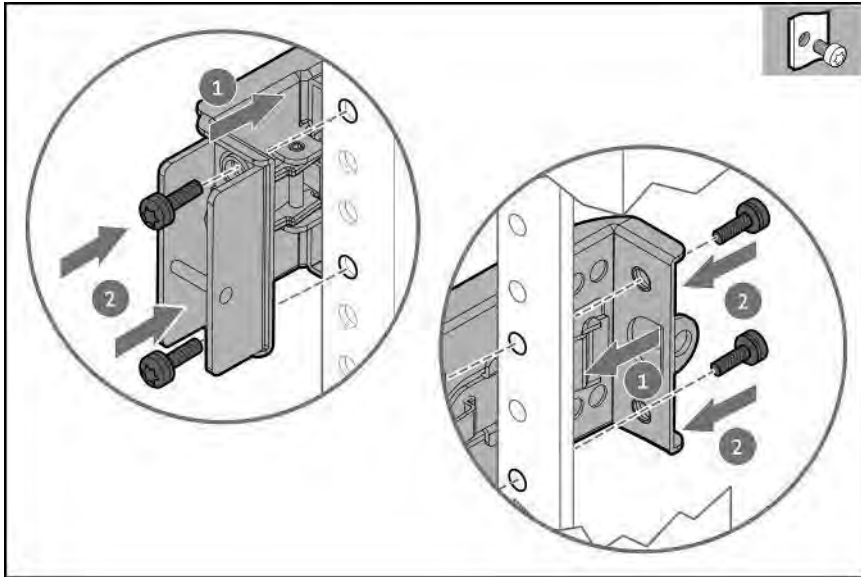
4. Install the rack rails.

- For round-hole or square-hole racks:



- For threaded round-hole racks:





5. Install the server into the rack.

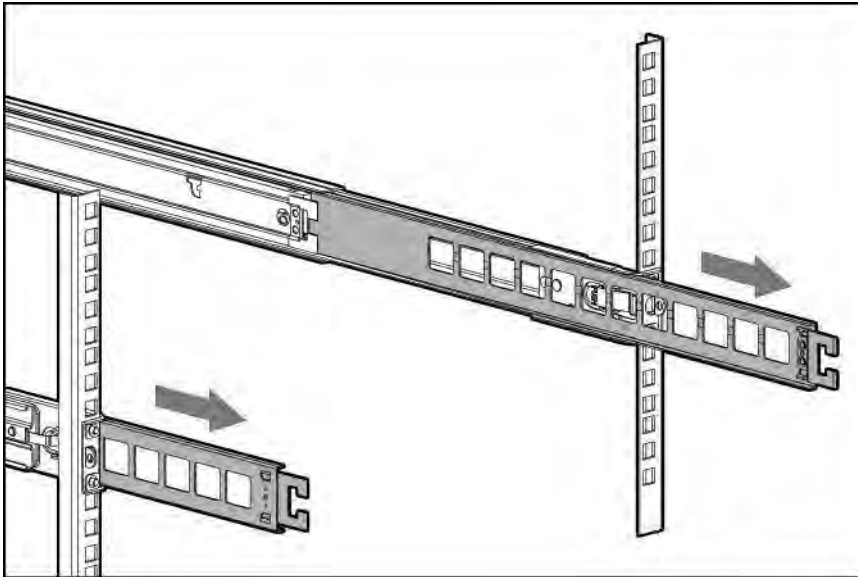
Installing the server into the rack

Prerequisites

- Before you perform this procedure, review the:
 - Rack warnings and cautions
 - Server warnings and cautions
 - Space and airflow requirements
- T-25 Torx screwdriver

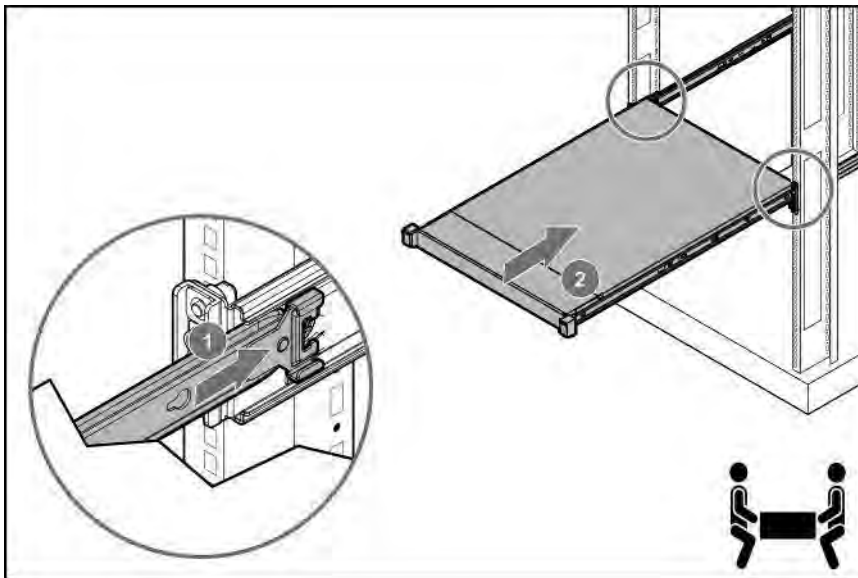
Procedure

1. Extend the slide rails out on the mounting rails until they hit the internal stops and lock into place.

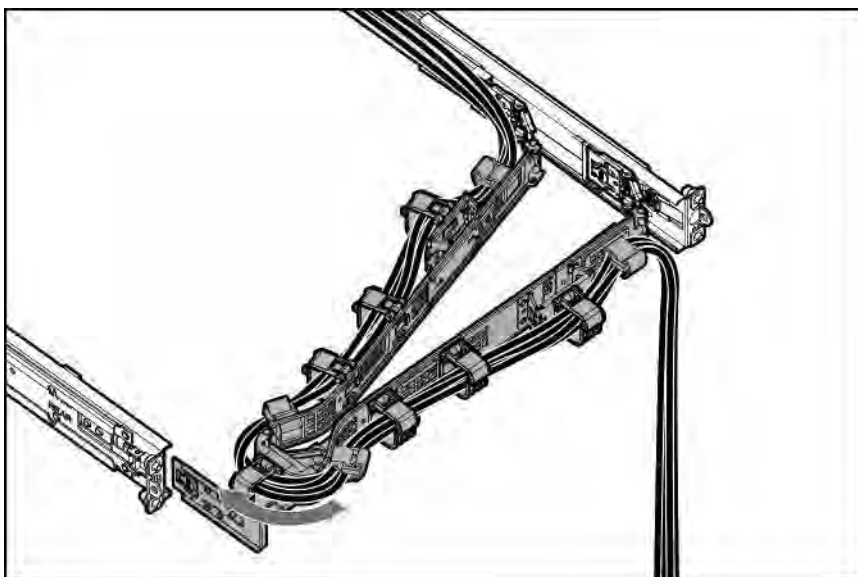


2. Install the server into the rack:

- a.** Insert the inner rails into the slide rails (callout 1).
- b.** Slide the server into the rack until the chassis ears are flush against the rack posts (callout 2).



- 3.** Open the chassis ears (callout 1), and then tighten the shipping screws (callout 2).
- 4.** Connect all peripheral cables to the server.
- 5.** Connect the power cords:
 - a.** Connect each power cord to the server.
 - b.** Connect each power cord to the power source.
- 6.** If installed, close the cable management arm.



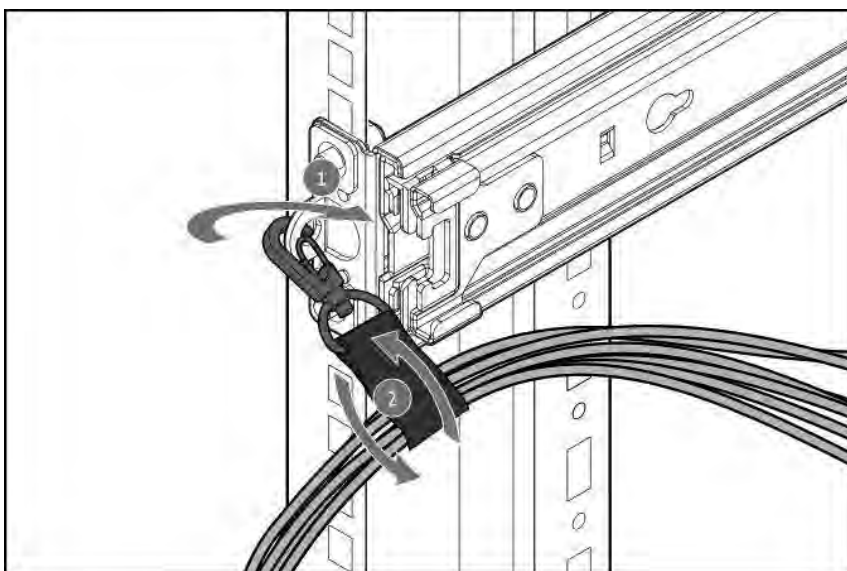
Installing the rack rail hook-and-loop strap

About this task

If you do not require in-rack serviceability for your rack-mounted server, use the rack rail hook-and-loop strap, instead of a CMA, to manage the rear panel cables. The hook-and-loop strap can be installed on either the left or right rack mounting rail.

Procedure

1. Attach the strap carabiner to the rack mounting rail.
2. Bundle the rear panel power cords and peripheral cables, and then wrap the strap around the cables.



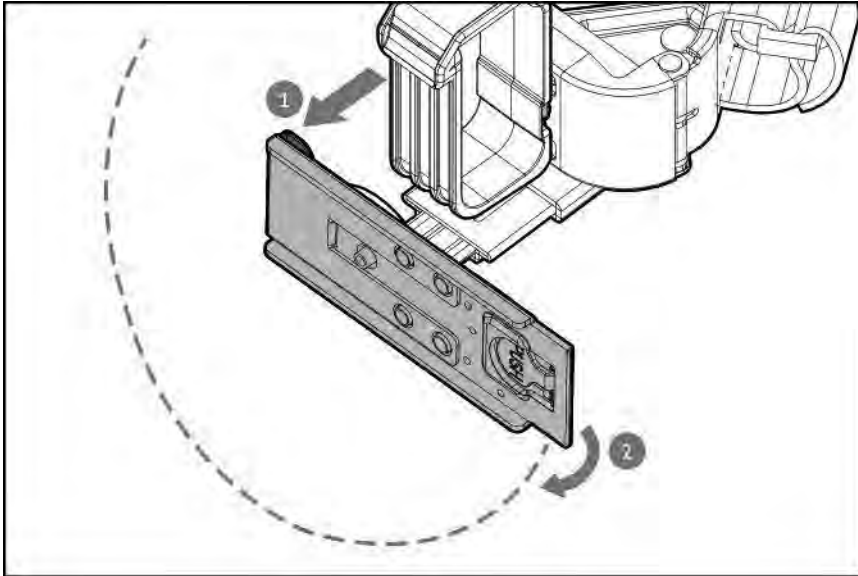
Installing the cable management arm

Prerequisites

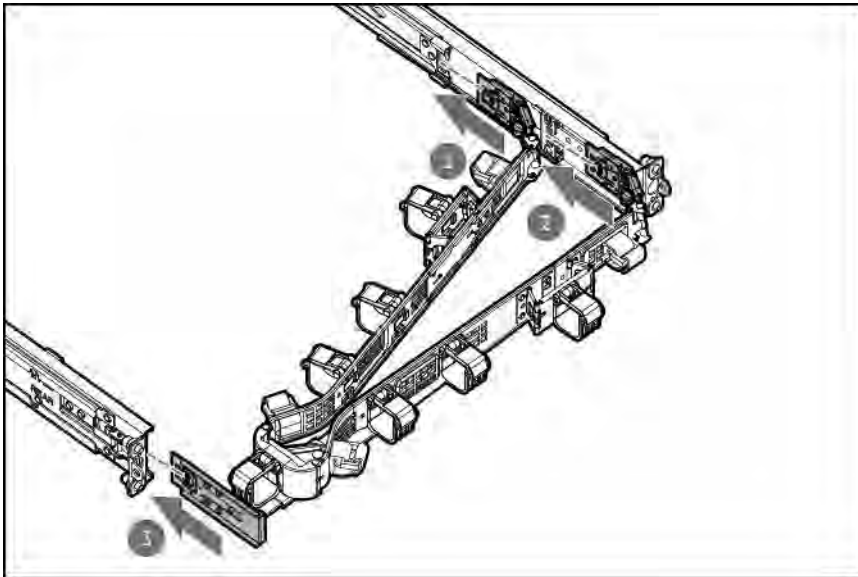
Before you perform this procedure, review the [Rack warnings and cautions](#).

Procedure

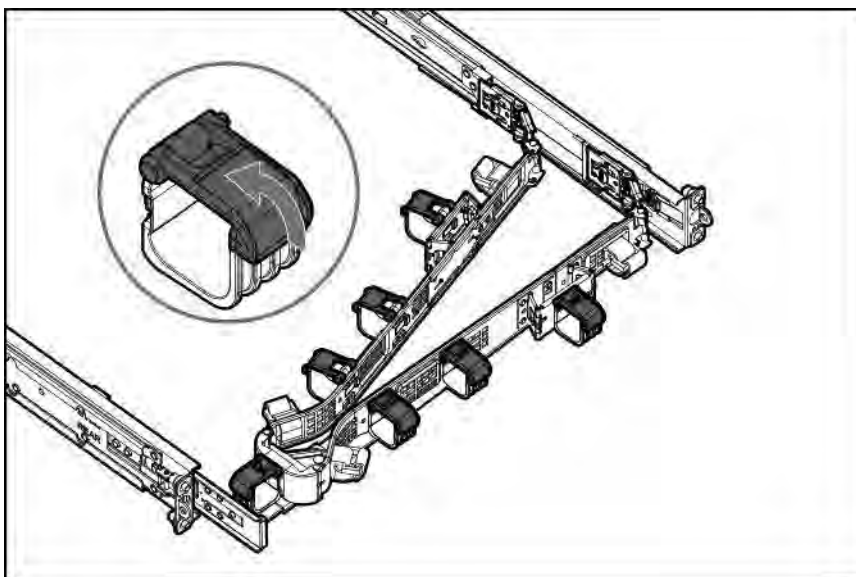
1. Connect and secure all peripheral cables and power cords to the rear panel.
2. (Optional) Rotate the bracket.



3. Install the CMA.

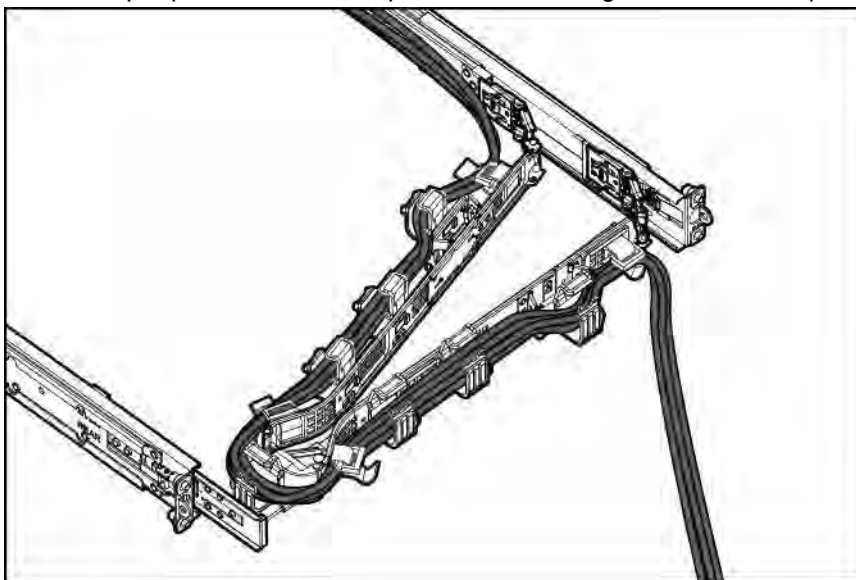


4. Open the cable clamps.

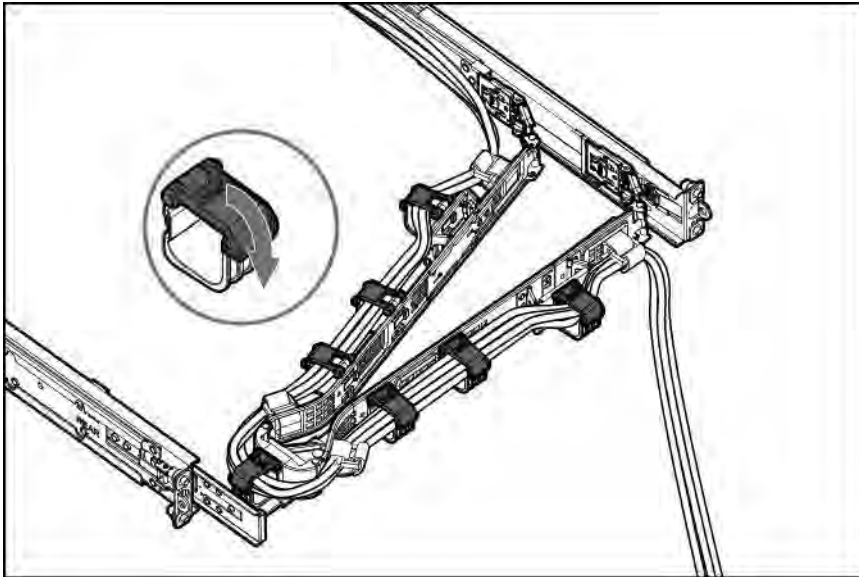


5. **⚠ CAUTION:** Employ industry best practices in managing peripheral cables and power cords secured in the CMA. These are some of the more important points:
- Leave enough cable slack between the rear panel and the CMA to allow the full extension of the CMA when the server is extended out of the server.
 - However, there should be no excess cable slack inside the CMA; this might cause cable binding and could lead to cable damage.
 - Make sure that the cables and power cords do not extend above the top or below the bottom of the server to which they are attached. Otherwise, the cables might snag on other equipment installed in the server when the server is extended from or returned to the server.

Route the peripheral cables and power cords through the cable clamps and/or straps.



6. Close the cable clamps.



Riser and riser cage options

PCIe5 slot description

PCIe slot description			
PCIe5	x16	(16, 8, 4, 1)	
1	2	3	

Item	Description	Definition
1	PCI Express version	<p>Each PCIe version corresponds to a specific data transfer rate between the processor and peripheral devices. Generally, a version update corresponds to an increase in transfer rate.</p> <ul style="list-style-type: none"> • PCIe 1.x • PCIe 2.x • PCIe 3.x • PCIe 4.x • PCIe 5.x <p>The PCIe technology is under constant development. For the latest information, see the PCI-SIG website.</p>
2	Physical connector link width	<p>PCIe devices communicate through a logical connection called an interconnect or link. At the physical level, a link is composed of one or more lanes. The number of lanes is written with an x prefix with x16 being the largest size in common use.</p> <ul style="list-style-type: none"> • x1 • x2 • x4 • x8 • x16
3	Negotiable link width	<p>These numbers correspond to the maximum link bandwidth supported by the slot.</p>

Primary PCI riser cage options

The standard primary riser supports the following:

- Slot 1 - 1x PCIe 5.0 x16 FHHL
- Slot 2 - 1x PCIe 5.0 x16 LP

Installing an expansion board in slot 1

Prerequisites

Before installing this option, be sure you have the following:

- The components included with the hardware option kit
- T-10 Torx screwdriver

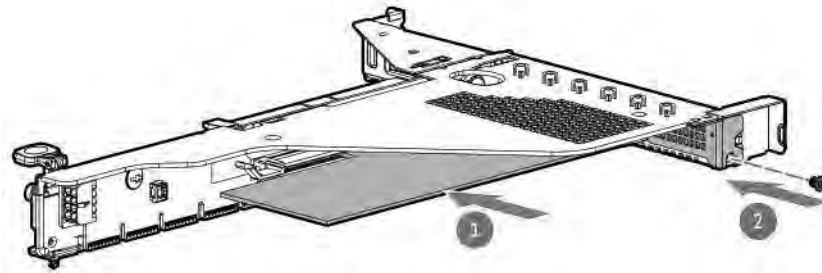
Procedure

1. Observe the following alerts:

⚠ WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

⚠ CAUTION: To prevent damage to electrical components, properly ground the server before beginning any installation procedure. Improper grounding can cause electrostatic discharge.

2. Back up all server data.
3. **Power down the server.**
4. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
5. Do one of the following:
 - a. **Extend the server from the rack.**
 - b. **Remove the server from the rack.**
6. **Remove the access panel.**
7. **Remove the primary PCI riser cage.**
8. Install the expansion board.



9. Connect any required internal or external cables to the expansion board.
10. **Install the primary PCI riser cage.**
11. **Install the access panel.**
12. Install the server in the rack.
13. Connect each power cord to the server.
14. Connect each power cord to the power source.
15. **Power up the server.**

Installing an expansion board in slot 2

Prerequisites

Before installing this option, be sure you have the following:

- The components included with the hardware option kit
- T-10 Torx screwdriver

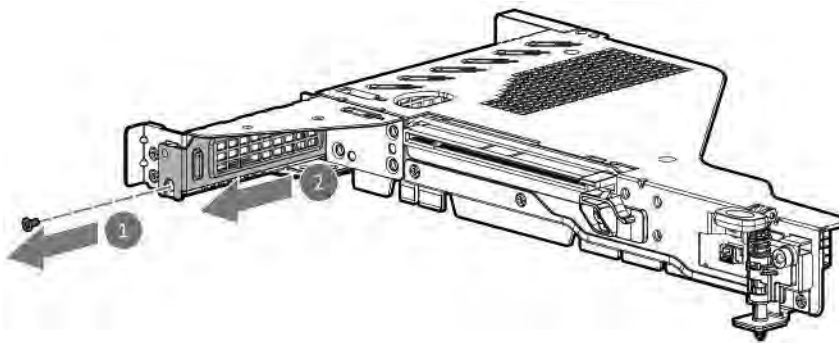
Procedure

1. Observe the following alerts:

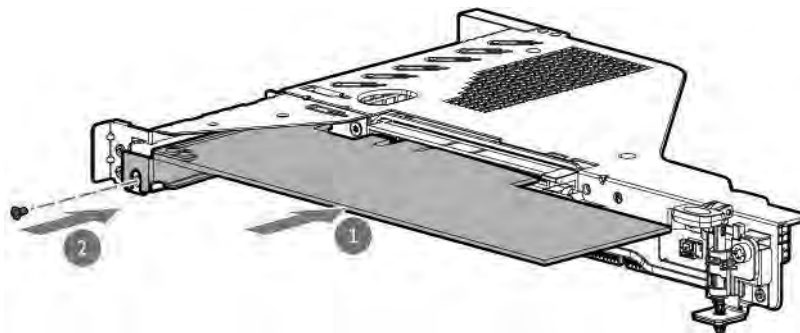
⚠ WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

⚠ CAUTION: To prevent damage to electrical components, properly ground the server before beginning any installation procedure. Improper grounding can cause electrostatic discharge.

2. Back up all server data.
3. **Power down the server.**
4. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
5. Do one of the following:
 - a. **Extend the server from the rack.**
 - b. **Remove the server from the rack.**
6. **Remove the access panel.**
7. **Remove the primary PCIe riser cage.**
8. Remove the expansion slot blank.



9. Use a T-10 Torx screwdriver to install the expansion board.



10. Connect any required internal or external cables to the expansion board.
11. **Install the primary PCIe riser cage.**
12. **Install the access panel.**
13. Install the server in the rack.
14. Connect each power cord to the server.
15. Connect each power cord to the power source.
16. **Power up the server.**

Installing a GPU in the primary riser cage

Prerequisites

This option requires the standard primary PCI riser cage.

Before installing this option, be sure that the power supplies support the installation of this option.

In addition, be sure that you have the components included with the hardware option kit.

Procedure

1. Observe the following alerts:



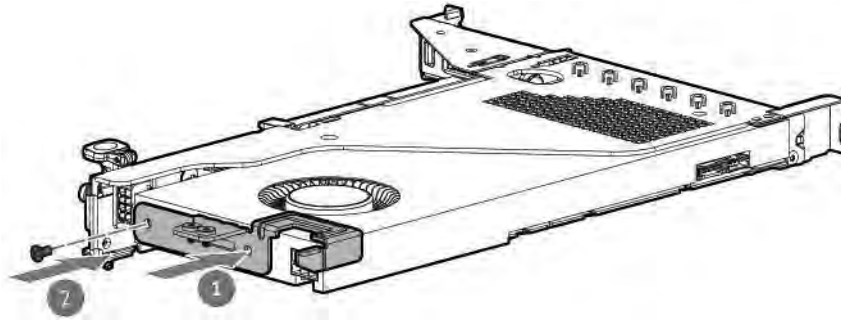
WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.



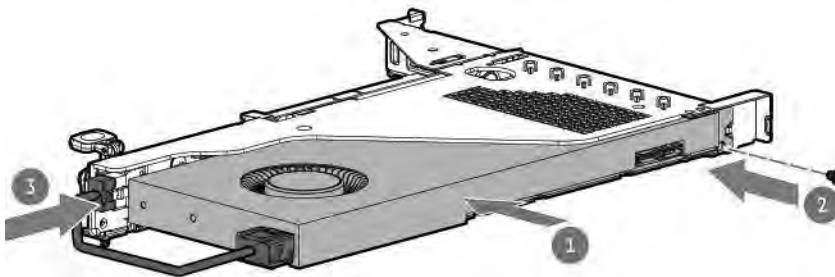
CAUTION: To prevent damage to electrical components, properly ground the server before beginning any installation procedure. Improper grounding can cause electrostatic discharge.

2. Back up all server data.
3. **Power down the server.**
4. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
5. Do one of the following:

- a. Extend the server from the rack.
- b. Remove the server from the rack.
6. Remove the access panel.
7. Remove the primary PCI riser cage.
8. Install the GPU bracket.



9. Install the GPU in the riser cage.
If installing a GPU requiring greater than 75W, connect the power cable to the primary riser power connector.



10. If the card requires rear support, install the GPU support bracket.
11. Install the primary PCI riser cage.
12. Install the access panel.
13. Install the server in the rack.
14. Connect each power cord to the server.
15. Connect each power cord to the power source.
16. Power up the server.

Secondary PCI riser options

The primary PCI riser cage supports the following options:

- x16 full-height riser kit
- x16 low-profile riser kit

Installing a secondary low-profile riser option

Prerequisites

This option requires a dual processor configuration.

Before installing this option, be sure that you have the components included with the hardware option kit.

About this task

When installed, this riser cage provides an additional low profile slot and supports half-length/half-height expansion boards.

Procedure

1. Observe the following alerts:

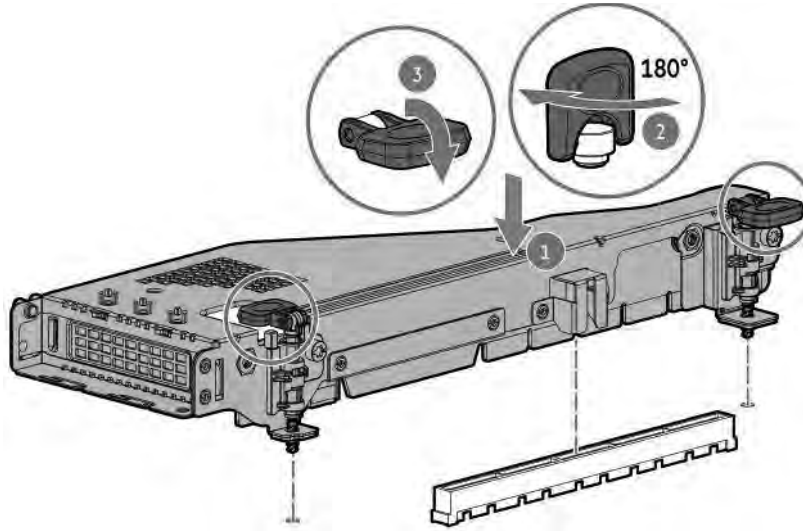


WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.



CAUTION: To prevent damage to electrical components, properly ground the server before beginning any installation procedure. Improper grounding can cause electrostatic discharge.

2. Back up all server data.
3. **Power down the server** .
4. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
5. Do one of the following:
 - a. **Extend the server from the rack.**
 - b. **Remove the server from the rack.**
6. **Remove the access panel.**
7. Install the secondary riser cage.



8. **Install the access panel.**
9. **Install the server into the rack.**
10. Connect each power cord to the server.
11. Connect each power cord to the power source.
12. **Power up the server.**

Installing a secondary full-height riser option

Prerequisites

This option requires a dual processor configuration.

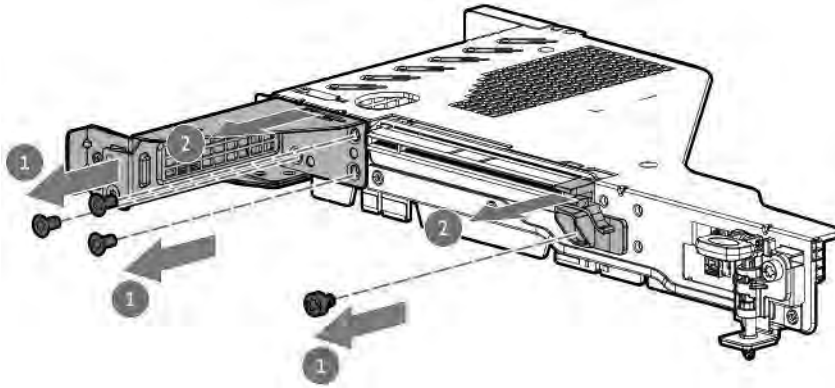
Before installing this option, be sure you have the following:

- The components included with the hardware option kit
- Any expansion boards or controllers you plan to install
- T-10 Torx screwdriver
- T-15 Torx screwdriver

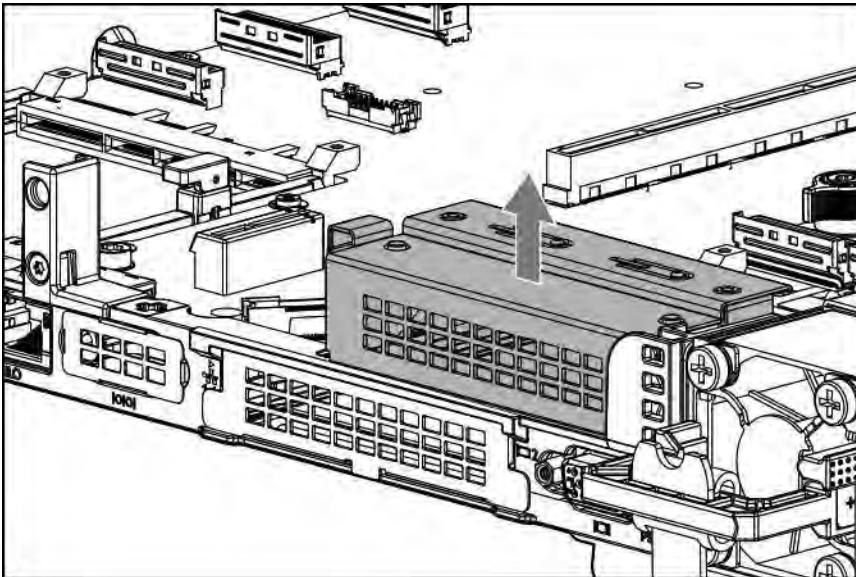
Procedure

1. **Power down the server.**
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Do one of the following:

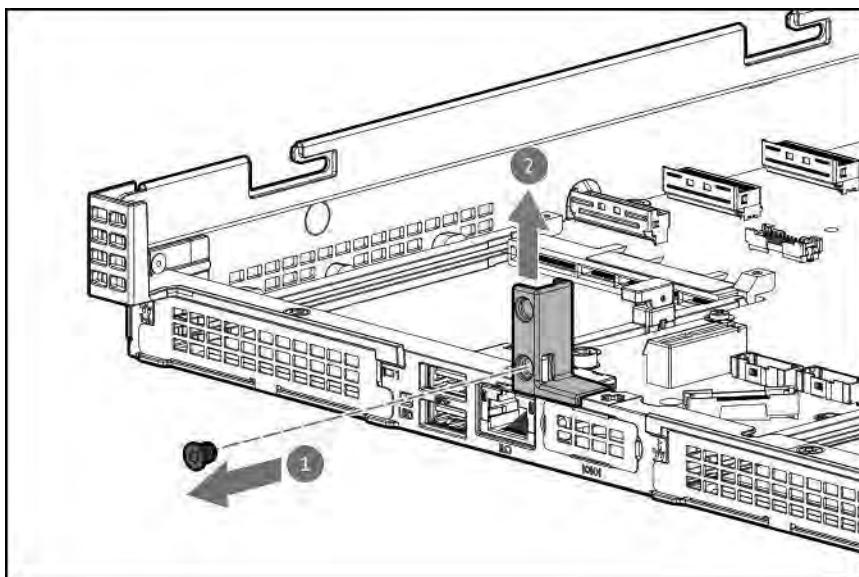
- a. Extend the server from the rack.
- b. Remove the server from the rack.
4. Remove the access panel.
5. Remove the primary PCI riser cage.
6. Use a T-10 Torx screwdriver to remove the slot 2 bracket from the primary riser cage.



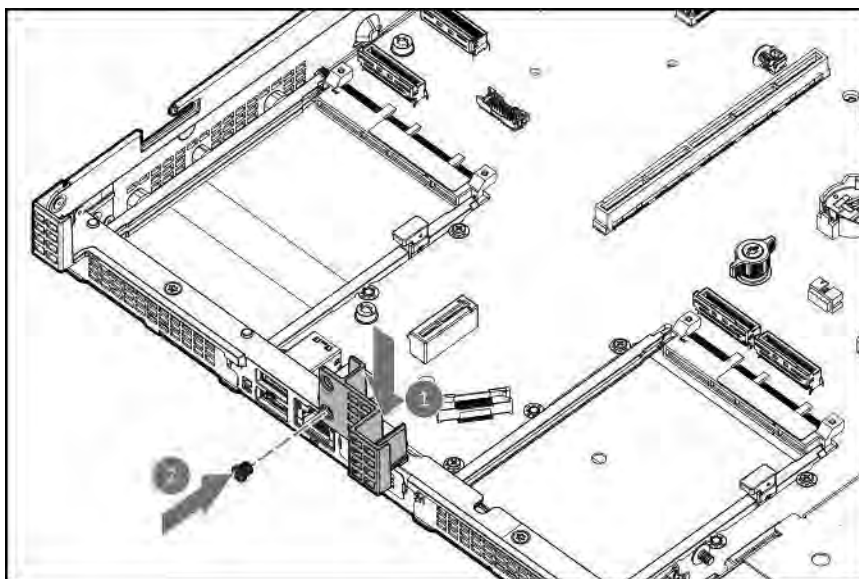
7. Remove the secondary riser blank.



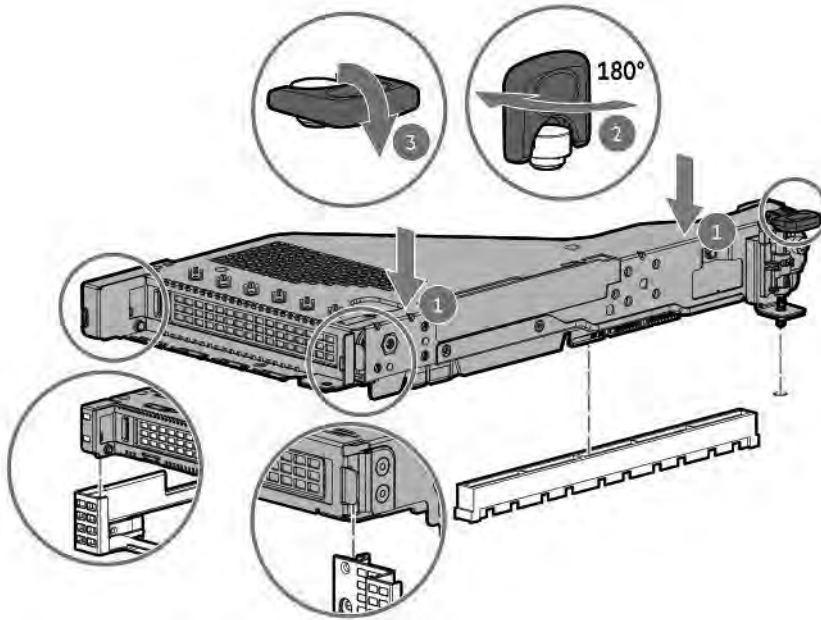
8. Using a T-15 Torx screwdriver, remove the rear riser support bracket.



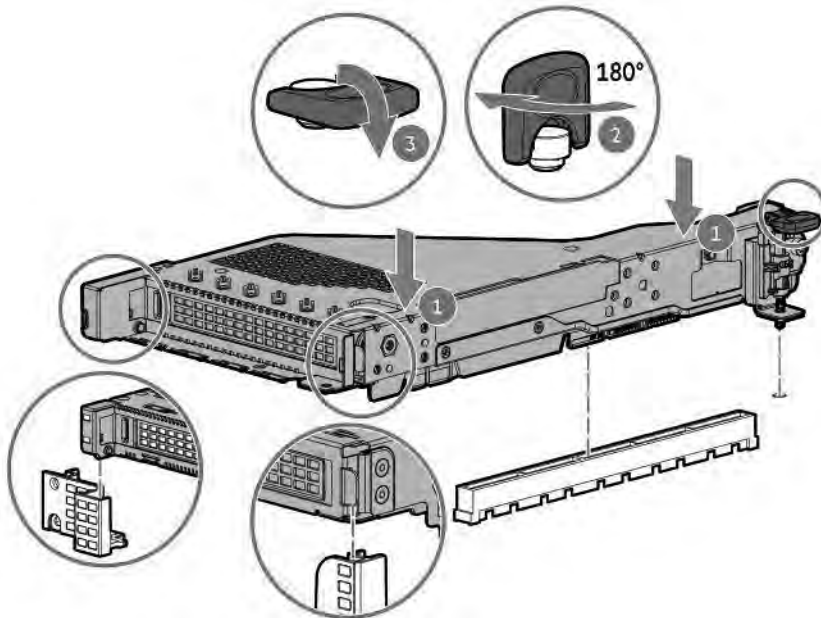
9. Install the full-height riser support bracket.



10. Install the riser cage.
Primary



Secondary



11. **Install the access panel.**
12. Install the server in the rack.
13. Connect each power cord to the server.
14. Connect each power cord to the power source.
15. **Power up the server.**

Installing an expansion board in the secondary riser cage

Prerequisites

Before installing this option, be sure that you have the following:

- The components included with the hardware option kit
- T-10 Torx screwdriver

Procedure

1. Observe the following alerts:

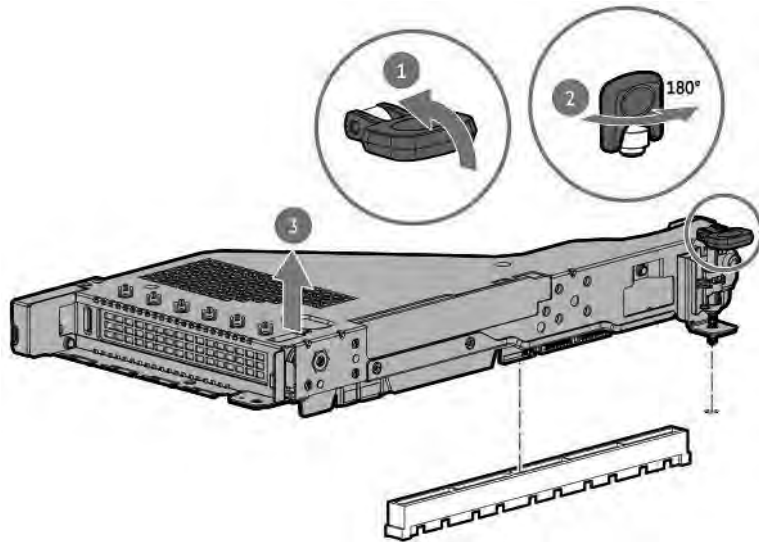


WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

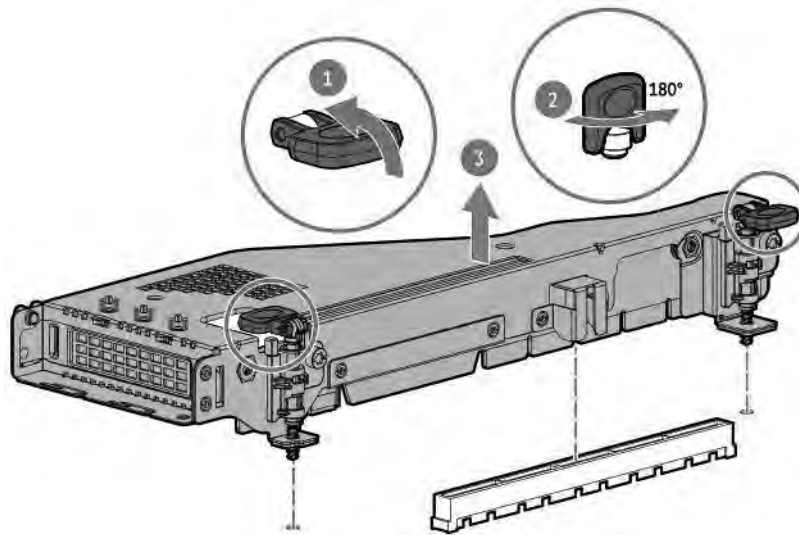


CAUTION: To prevent damage to electrical components, properly ground the server before beginning any installation procedure. Improper grounding can cause electrostatic discharge.

2. Back up all server data.
3. **Power down the server.**
4. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
5. Do one of the following:
 - a. **Extend the server from the rack.**
 - b. **Remove the server from the rack.**
6. **Remove the access panel.**
7. Remove the secondary riser:
 - Secondary full-height

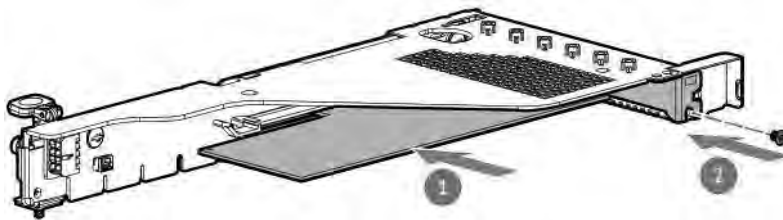


- Secondary low-profile

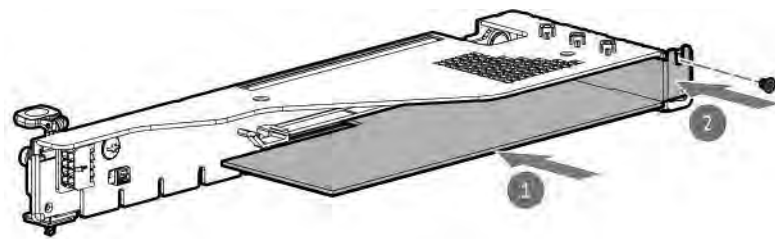


8. Install the expansion board:

- Secondary full-height
 - Remove the blank.
 - Using a Torx T-10 screwdriver, install the controller.



- Secondary half-height:
 - a. Remove the blank.
 - b. Using a Torx T-10 screwdriver, install the controller.



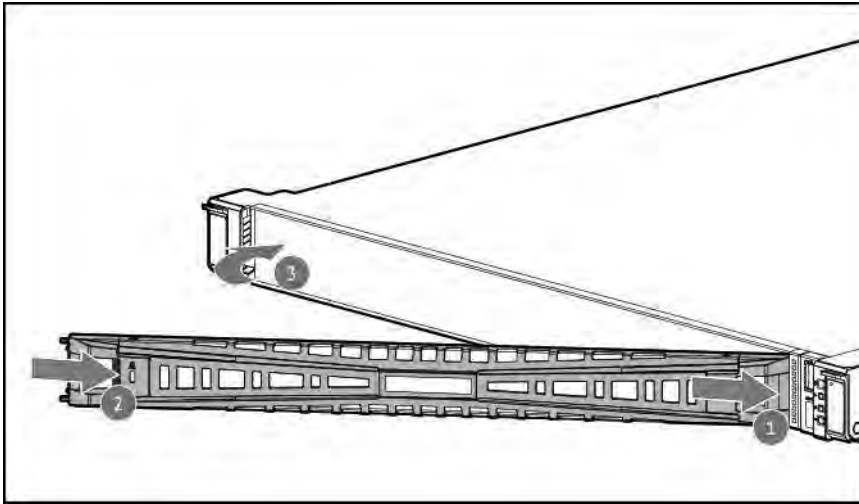
9. Connect any required internal or external cables to the expansion board.
10. **Install the access panel.**
11. Install the server in the rack.
12. Connect each power cord to the server.
13. Connect each power cord to the power source.
14. **Power up the server.**

Security

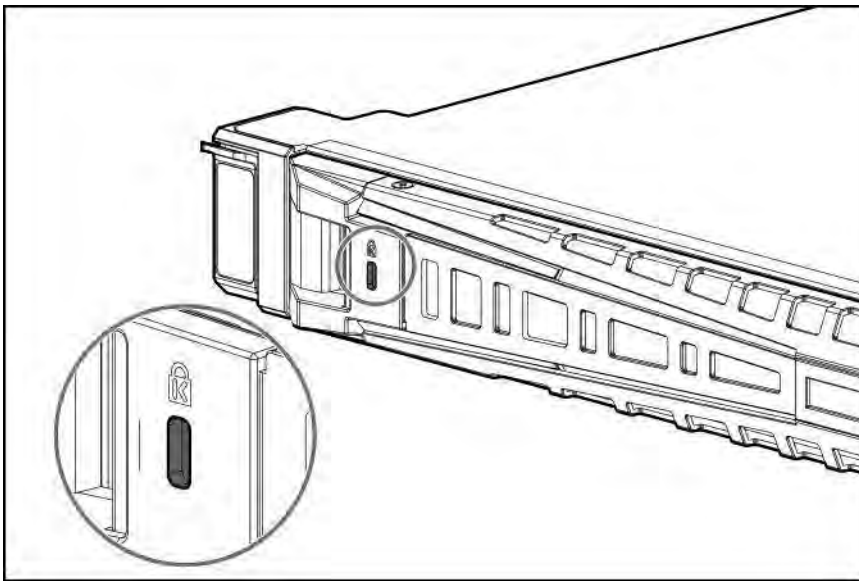
Installing the bezel

Procedure

1. Install the bezel.



2. Using a Kensington security lock, lock the bezel.



Installing the Chassis Intrusion Detection switch option

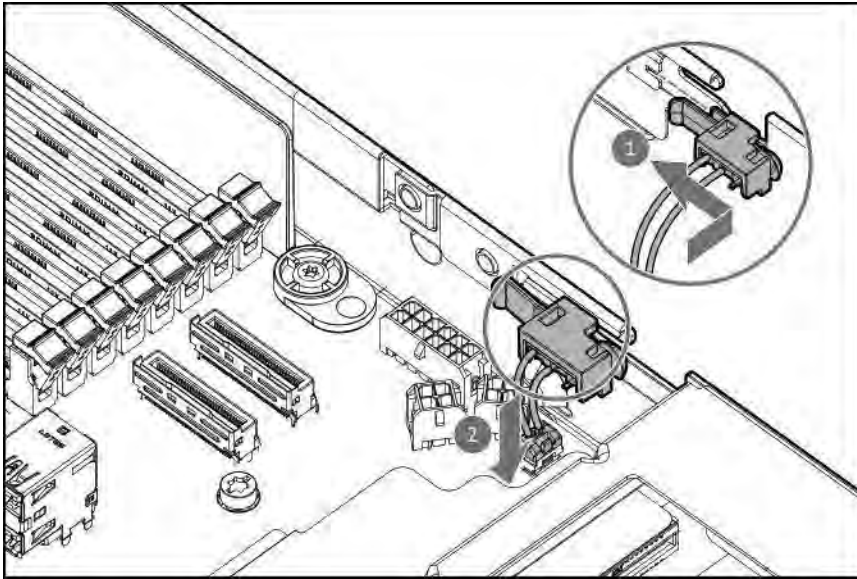
Prerequisites

Be sure you have the components included with the hardware option kit.

Procedure

1. **Power down the server.**
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Do one of the following:

- a. Extend the server from the rack.
 - b. Remove the server from the rack.
4. Remove the access panel.
 5. Install the chassis intrusion detection switch behind the power supply bays.



6. Install the access panel.
7. Install the server in the rack.
8. Connect each power cord to the server.
9. Connect each power cord to the power source.
10. Power up the server.

Trusted Platform Module 2.0 guidelines

⚠ CAUTION:

- Always observe the TPM guidelines in this section. Failure to follow these guidelines can cause hardware damage or halt data access.
- If you do not follow procedures for modifying the server and suspending or disabling the TPM in the OS, an OS that is using TPM might lock all data access. This includes updating system or option firmware, replacing hardware such as the system board and drives, and modifying TPM OS settings.
- Changing the TPM mode after installing an OS might cause problems, including loss of data.

Hitachi Vantara Special Reminder: Before enabling TPM functionality on this system, you must ensure that your intended use of TPM complies with relevant local laws, regulations and policies, and approvals or licenses must be obtained if applicable.

- When the embedded TPM is enabled, the Trusted Platform Module operates in TPM 2.0 mode.
- Use the UEFI System Utilities to configure the TPM. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Trusted Platform Module options**. For more information, contact customer support.
- When using the Microsoft Windows BitLocker Drive Encryption feature, always retain the recovery key or password. The recovery key or password is required to enter Recovery Mode after BitLocker detects a possible compromise of system integrity.
- For operating instructions, see the documentation for the encryption technology feature provided by the operating system.

Cabling

Cabling guidelines

Observe the following:

- Some diagrams show alphabetical callouts A, B, C, etc. These callouts correspond to labels near the connectors on the cable.
- The cable colors in the cabling diagrams used in this chapter are for illustration purposes only.
- Observe all guidelines when working with server cables.

Before connecting cables

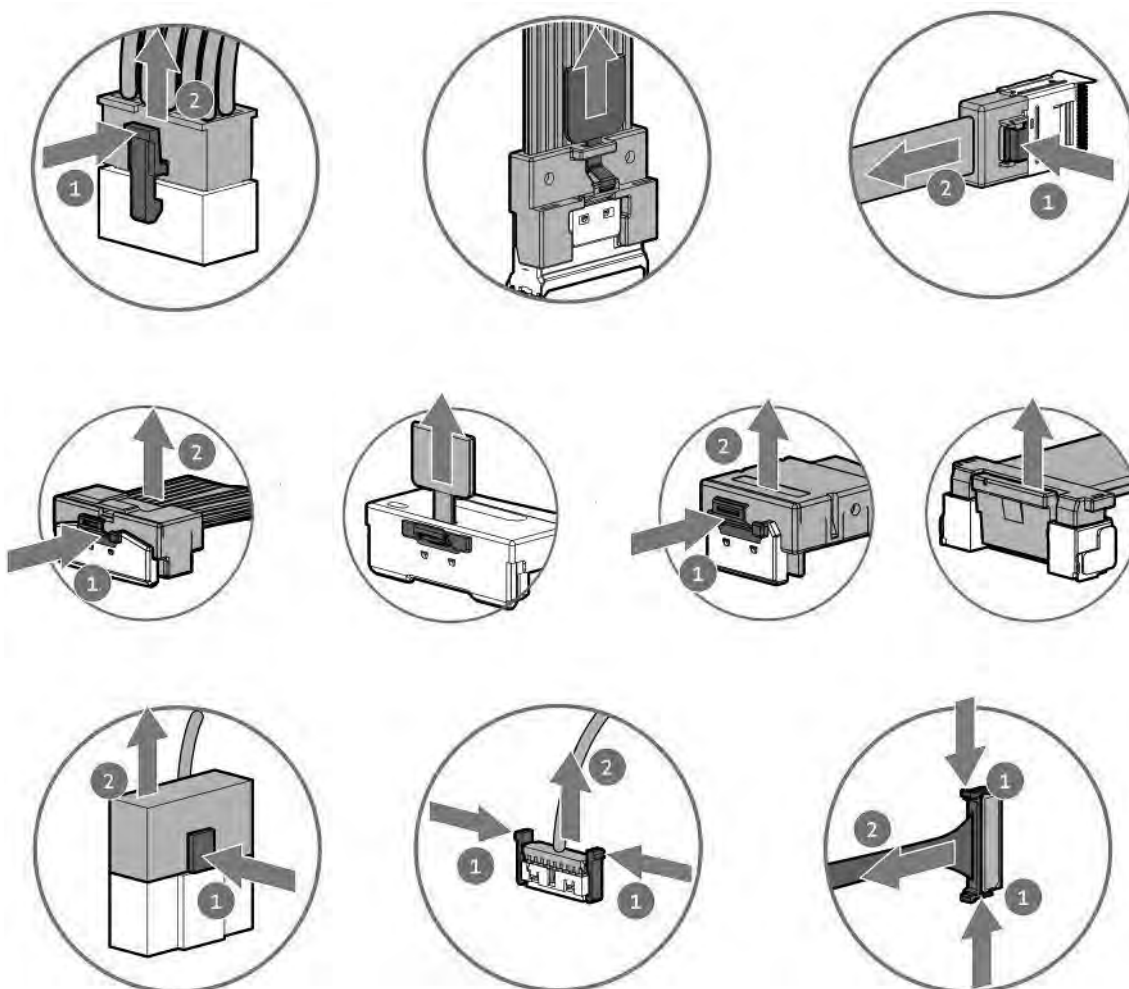
- Note the port labels on the PCA components. Not all these components are used by all servers:
 - System board ports
 - Drive and power supply backplane ports
 - Expansion board ports (controllers, adapters, expanders, risers, and similar boards)
- Note the label near each cable connector. This label indicates the destination port for the cable connector.
- Some data cables are prebent. Do not unbend or manipulate the cables.
- To prevent mechanical damage or depositing oil that is present on your hands, and other contamination, do not touch the ends of the connectors.

When connecting cables

- Before connecting a cable to a port, lay the cable in place to verify the length of the cable.
- Use the internal cable management features to properly route and secure the cables.
- When routing cables, be sure that the cables are not in a position where they can be pinched or crimped.
- Avoid tight bend radii to prevent damaging the internal wires of a power cord or a server cable. Never bend power cords and server cables tight enough to cause a crease in the sheathing.
- Make sure that the excess length of cables is properly secured to avoid excess bends, interference issues, and airflow restriction.
- To prevent component damage and potential signal interference, make sure that all cables are in their appropriate routing position before installing a new component and before closing up the server after hardware installation/maintenance.

When disconnecting cables

- Grip the body of the cable connector. Do not pull on the cable itself because this action can damage the internal wires of the cable or the pins on the port.
- If a cable does not disconnect easily, check for any release latch that must be pressed to disconnect the cable.



- Remove cables that are no longer being used. Retaining them inside the server can restrict airflow. If you intend to use the removed cables later, label and store them for future use.

Cabling diagrams

Observe the following:

- Before cabling components, see the [cabling guidelines](#).
- Use the cable part number or search feature to find your diagram.

Table 2: SFF cables

Component cabling	Cable part number
8SFF drive backplane cabling	<u>P43732-001</u>
	<u>P45610-001</u>
	<u>P43730-001</u>

Table Continued

Component cabling	Cable part number
	<u>P43733-001</u>
	<u>P43731-001</u>
	<u>P45612-001</u>
	<u>P45613-001</u>
	<u>P45614-001</u>
	<u>P45615-001</u>
	<u>P45616-001</u>
	<u>P45617-001</u>
	<u>P48960-001</u>
	<u>P48963-001</u>
	<u>P48964-001</u>
2SFF drive backplane cabling	<u>P43737-001</u>
	<u>P43738-001</u>
	<u>P45607-001</u>
	<u>P45611-001</u>
	<u>P45608-001</u>
	<u>P48961-001</u>
	<u>P48962-001</u>
OCP bandwidth upgrade cabling	<u>P43734-001</u>
	<u>P43734-001</u>
	<u>P43735-001</u>
	<u>P43736-001</u>

Table 3: LFF cables

Component cabling	Cable part number
4LFF drive backplane cabling	<u>P43728-001</u>
	<u>P48958-001</u>
	<u>P48970-001</u>

Table 4: NS204i cables

Component cabling	Cable part number
NS204i-u boot device cabling	<u>P54087-001</u>
	<u>P54092-001</u>
	<u>P54088-001</u>
	<u>P48956-001</u>

Table 5: Power cables

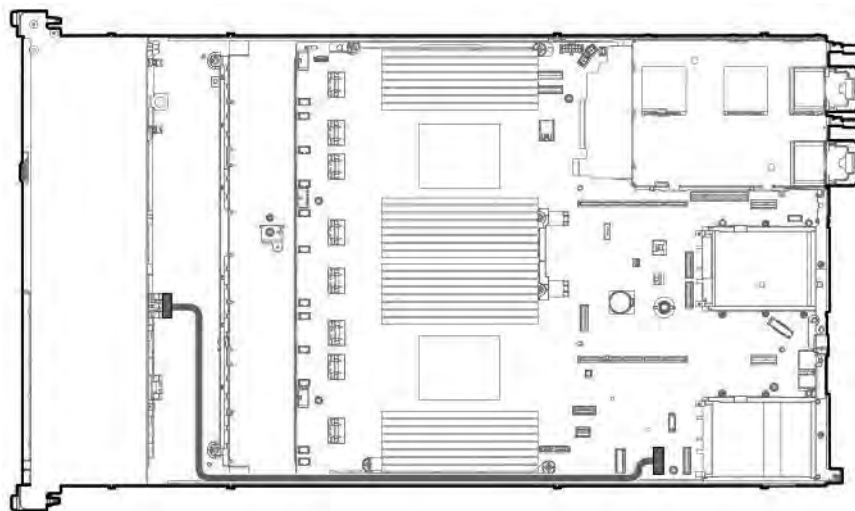
Component cabling	Cable part number
Power cabling	<u>P43726-001</u>
	<u>P43729-001</u>
	<u>869667-001</u>
Right ear power switch cable	<u>P43727-001</u>
Smart storage battery cabling	<u>P45618-001</u>

Table 6: IO cables

Component cabling	Cable part number
LFF display cable	<u>P45619-001</u>
SFF display cable	<u>P45620-001</u>
Serial cable	<u>P45623-001</u>
Intrusion detection cable	<u>P47751-001</u>
Systems Insight Display cable	<u>P48971-001</u>
LFF Optical Disc Display cable	<u>P45621-001</u>
SFF Optical Disc Display cable	<u>P45622-001</u>

8 SFF drive backplane cabling

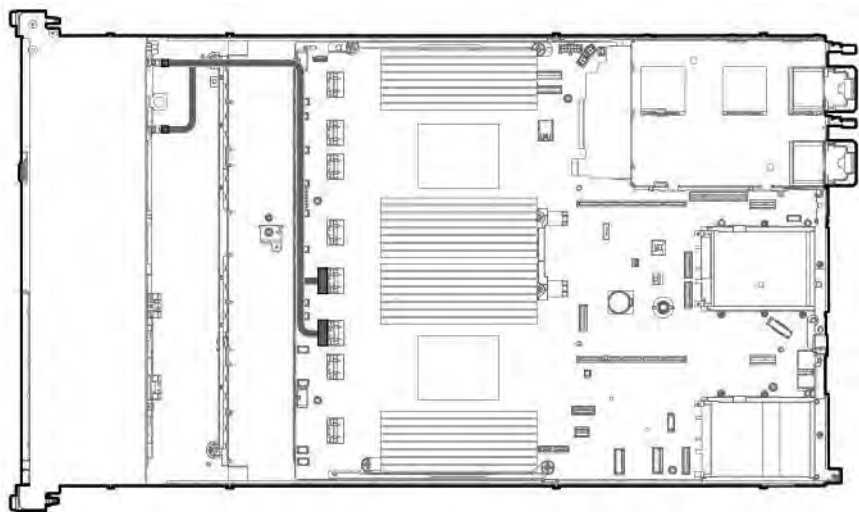
8 SFF box 1: System board



Cable part number	Color	From	To
P43732-001 ¹	Orange	Drive backplane	System board

¹ Option kit: P48895-B21

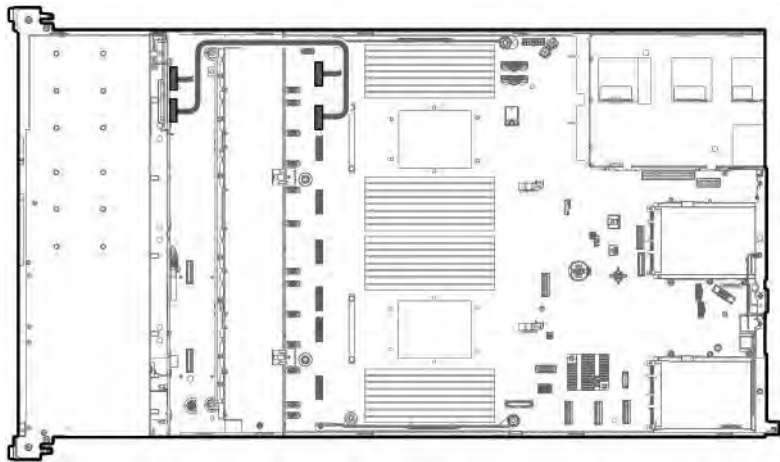
8 SFF box 1: System board (unbalanced, CPU1)



Cable part number	Color	From	To
P43730-001 ¹	Orange	Drive backplane	System board

¹ Option kit: P48897-B21

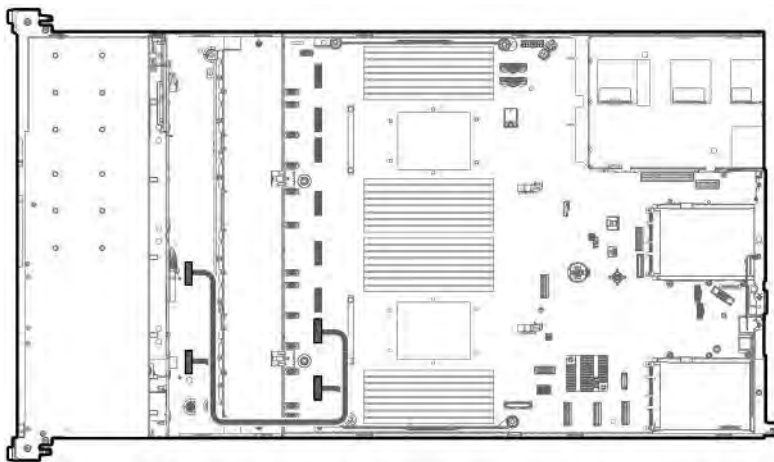
8 SFF box 1: System board (balanced, CPU1/CPU2)



Cable part number	Color	From	To
P43733-001 ¹	Orange	Drive backplane	System board

¹ Option kit: P48896-B21

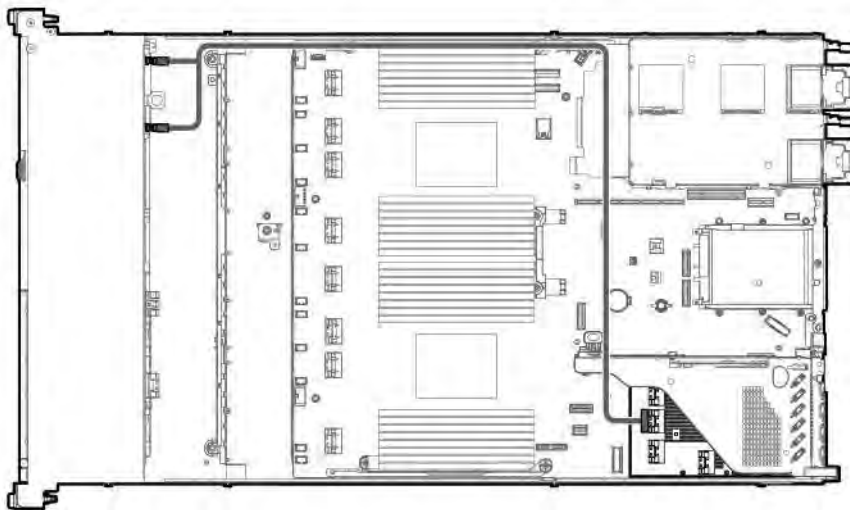
8 SFF box 1: System board



Cable part number	Color	From	To
P43731-001 ¹	Orange	Drive backplane	System board

¹ Option kit: P48896-B21

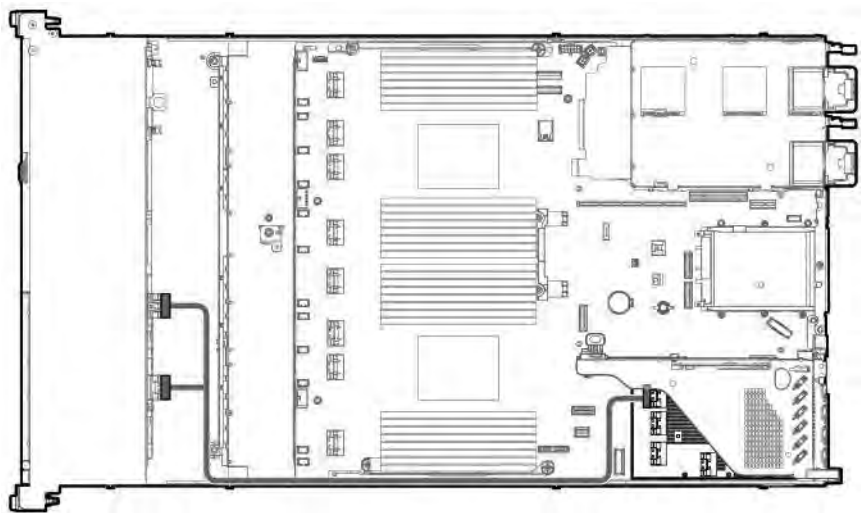
8 SFF box 1: Primary type-p controller



Cable part number	Color	From	To
P45616-001 ¹	Orange	Drive backplane	Primary type-p controller

¹ Option kit: P48909-B21

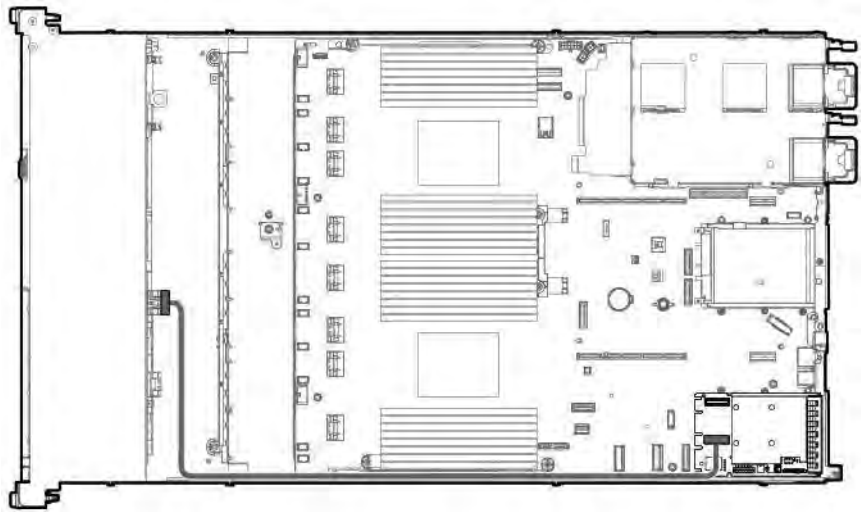
8 SFF box 1: Primary type-p controller



Cable part number	Color	From	To
P45617-001 ¹	Orange	Drive backplane	Primary type-p controller

¹ Option kit: P48909-B21

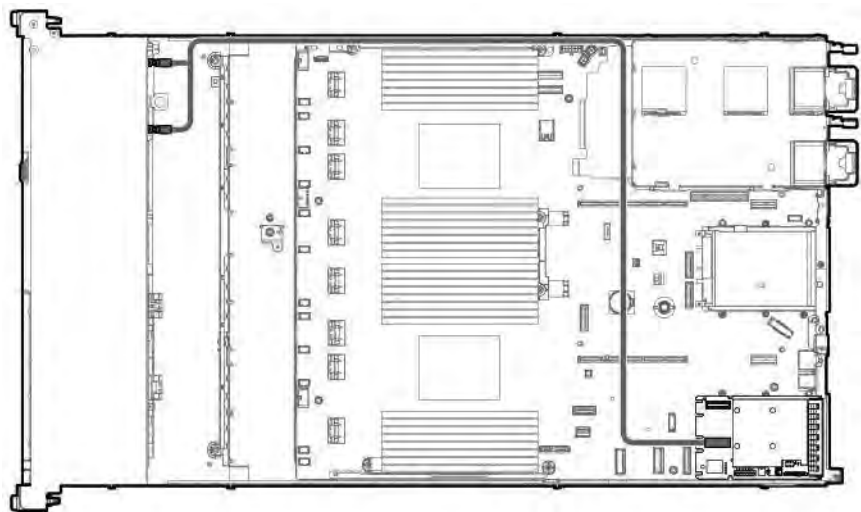
8 SFF box 1: Primary type-o controller



Cable part number	Color	From	To
P48960-001 ¹	Orange	Drive backplane	Primary type-o controller

¹ Option kit: P52416-B21

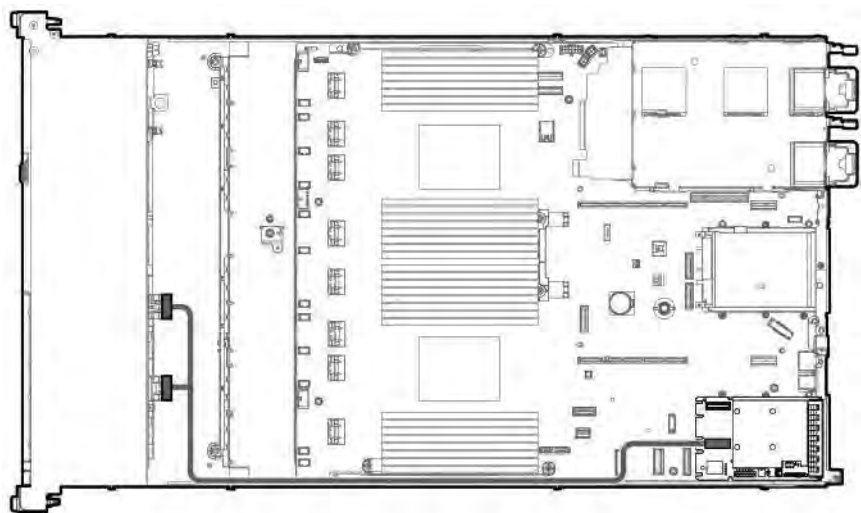
8 SFF box 1: Primary type-o controller



Cable part number	Color	From	To
P48963-001 ¹	Orange	Drive backplane	Primary type-o controller

¹ Option kit: P52416-B21

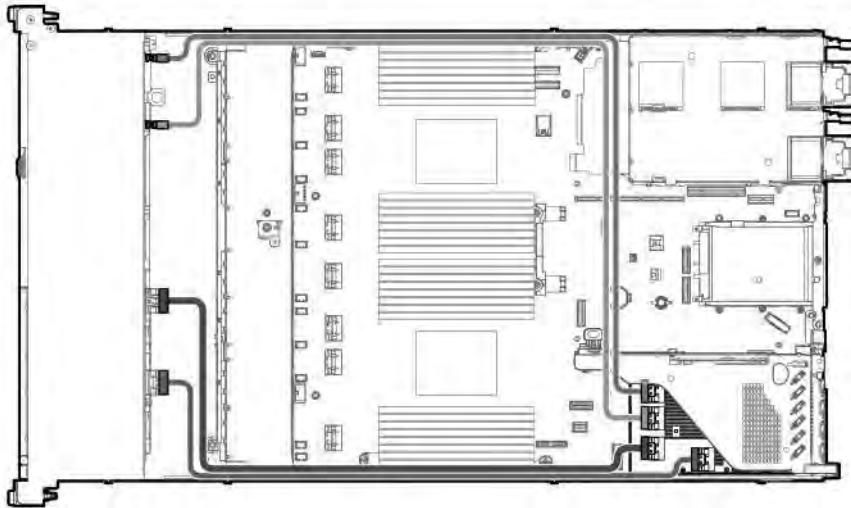
8 SFF box 1: Primary type-o controller



Cable part number	Color	From	To
P48964-001 ¹	Orange	Drive backplane	Primary type-o controller

¹ Option kit: P52416-B21

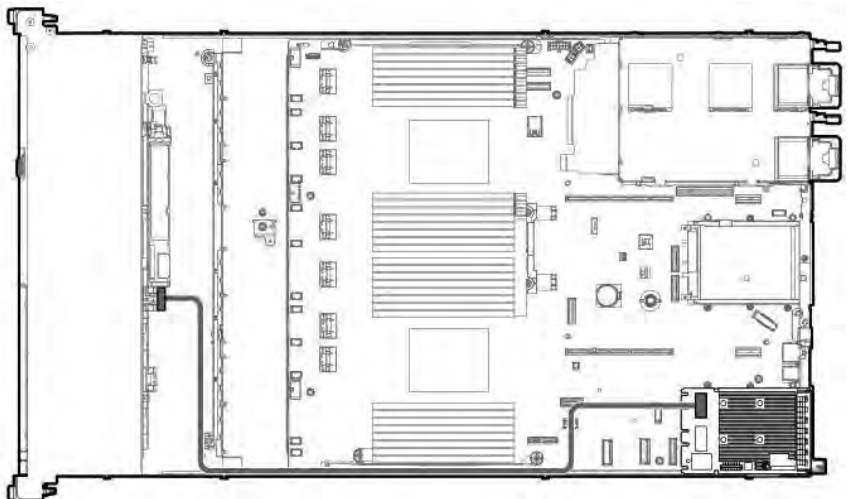
8 SFF box 1: Primary type-p controller



Cable part number	Color	From	To
P45612-001 ¹	Pink	Drive backplane	Primary type-p controller
P45613-001	Yellow	Drive backplane	Primary type-p controller
P45614-001	Blue	Drive backplane	Primary type-p controller
P45615-001	Orange	Drive backplane	Primary type-p controller

¹ Option kit: P48909-B21

8 SFF box 1: Primary type-o controller

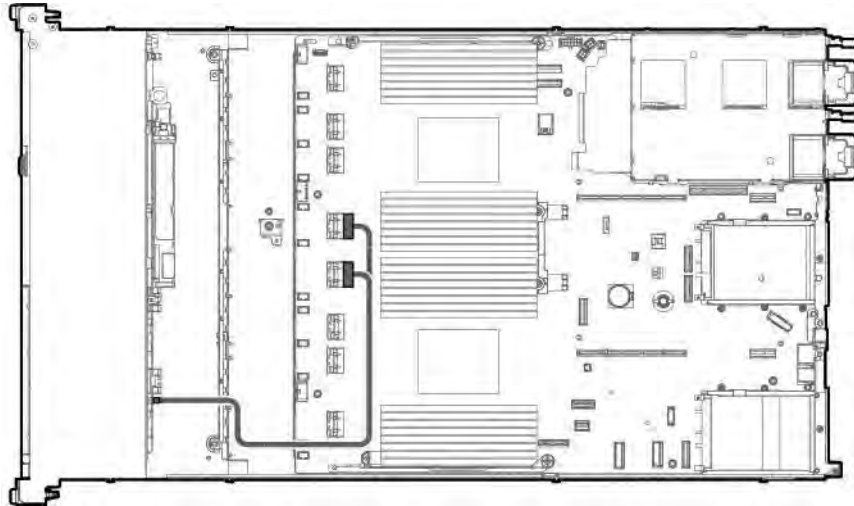


Cable part number	Color	From	To
P45610-001 ¹	Orange	Drive backplane	Primary type-o controller

¹ Option kit: P48909-B21

2 SFF drive backplane cabling

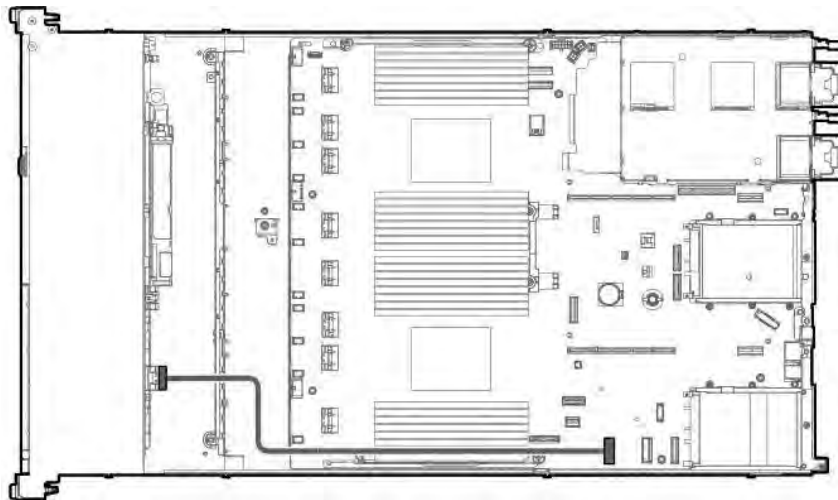
2 SFF side-by-side: System board



Cable part number	Color	From	To
P43737-001 ¹	Orange	2 SFF backplane	System board SlimSAS port

¹ Option kit: P48899-B21

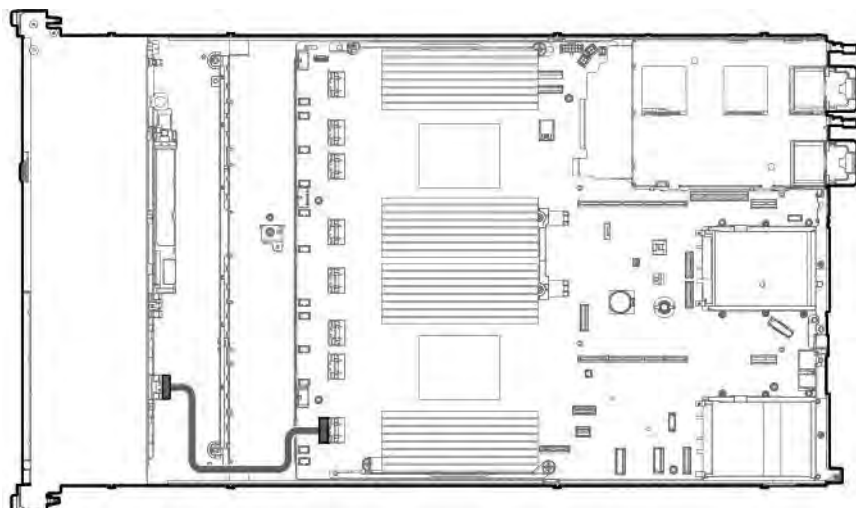
2 SFF side-by-side: System board



Cable part number	Color	From	To
P43738-001 ¹	Orange	2 SFF backplane	System board SlimSAS port 1

¹ Option kit: P48899-B21

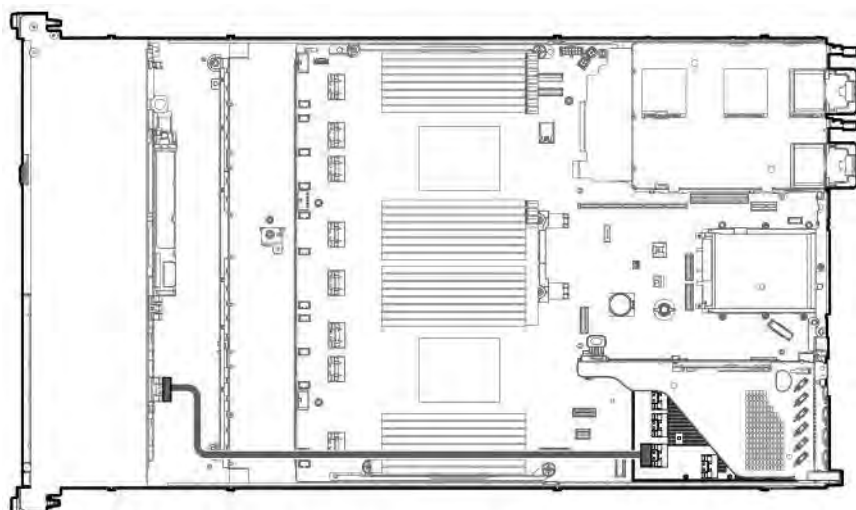
2 SFF side-by-side: System board



Cable part number	Color	From	To
P45607-001 ¹	Orange	2 SFF backplane	System board SlimSAS port

¹ Option kit: P48899-B21

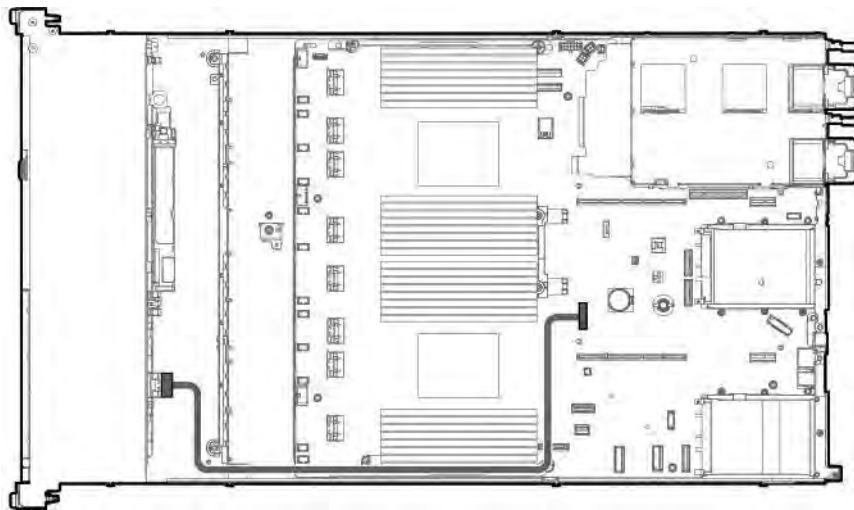
2 SFF side-by-side: Primary type-p controller



Cable part number	Color	From	To
P45611-001 ¹	Orange	2 SFF backplane	Primary type-p controller

¹ Option kit: P48910-B21

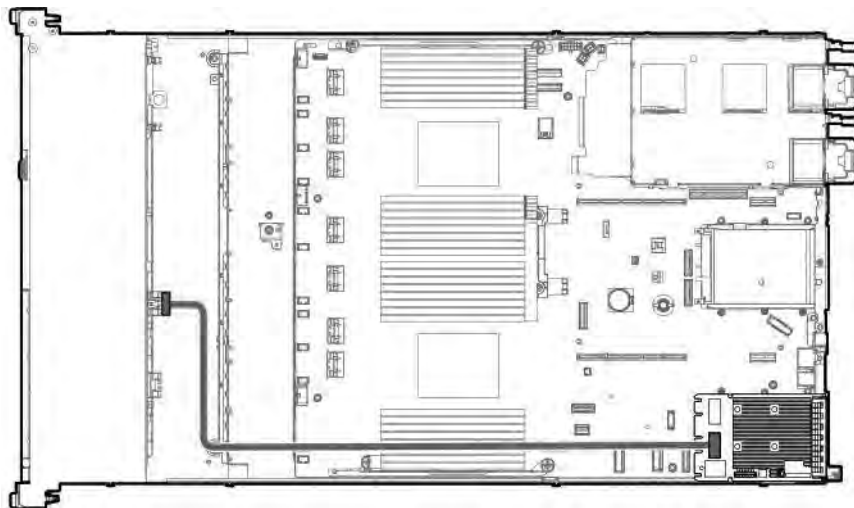
2 SFF side-by-side: Rear MCIO port



Cable part number	Color	From	To
P45608-001 ¹	Orange	2 SFF backplane	CPU1 MCIO port 1

¹ Option kit: P48899-B21

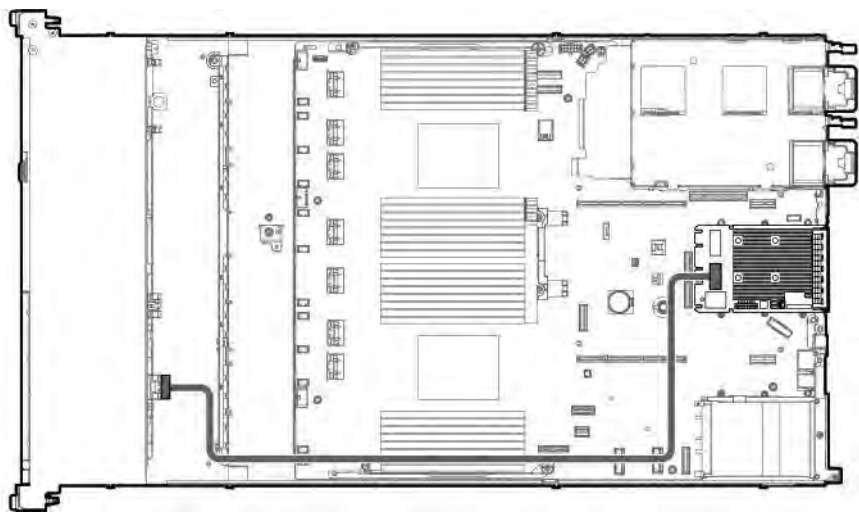
2 SFF side-by-side: Primary type-o controller



Cable part number	Color	From	To
P48962-001 ¹	Orange	2 SFF backplane	OCP slot 14 port 1

¹ Option kit: P48910-B21

2 SFF side-by-side: Secondary type-o controller

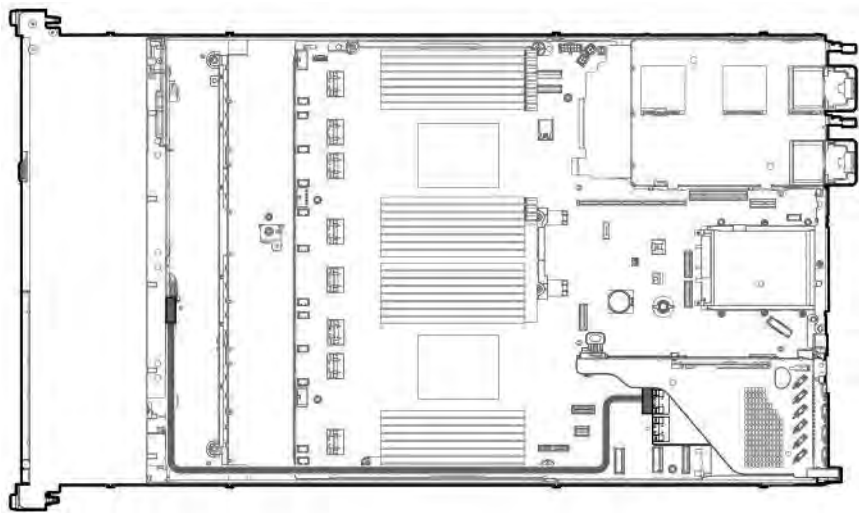


Cable part number	Color	From	To
P48961-001 ¹	Orange	2 SFF backplane	OCP slot 15 port 1

¹ Option kit: P48910-B21

4 LFF drive backplane cabling

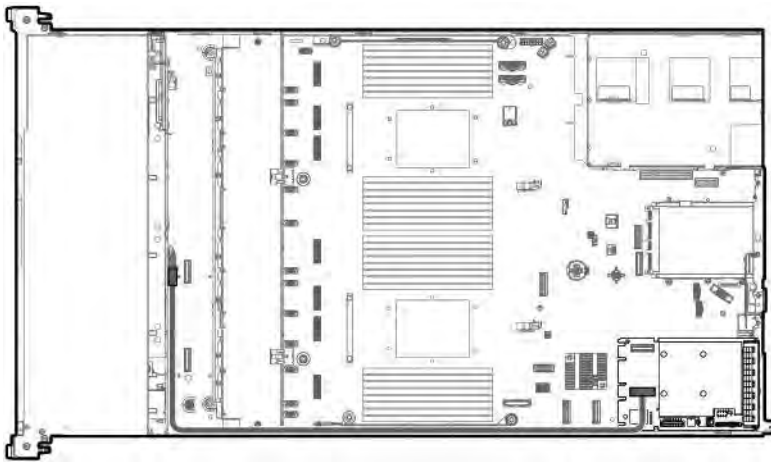
4 LFF box 1: Primary type-p controller



Cable part number	Color	From	To
P48970-001 ¹	Orange	Drive backplane	Primary type-p controller port 1

¹ Option kit: P48913-B21

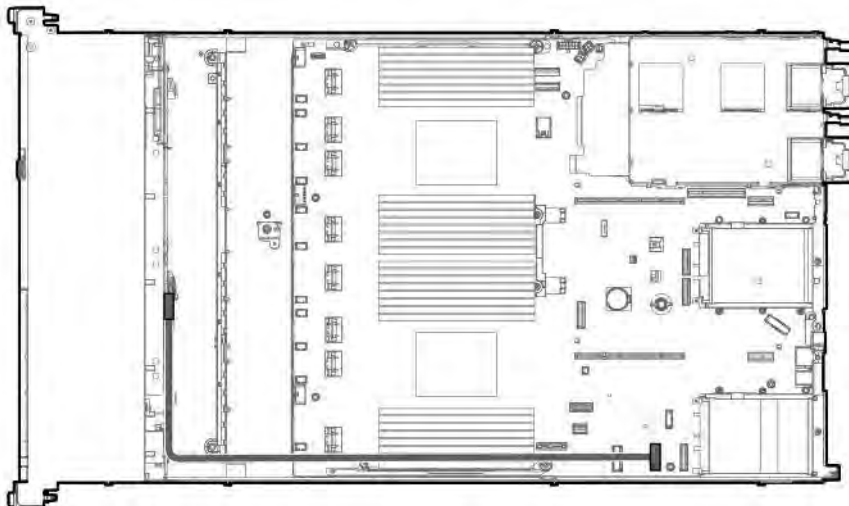
4 LFF box 1: Primary type-o controller



Cable part number	Color	From	To
P48958-001 ¹	Orange	Drive backplane	Primary type-o controller port 1

¹ Option kit: P48913-B21

4 LFF box 1: System board

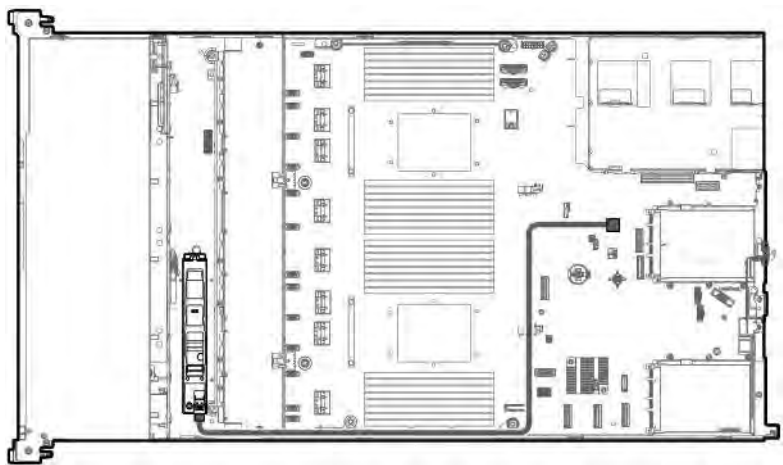


Cable part number	Color	From	To
P43728-001 ¹	Orange	Drive backplane	System board

¹ Option kit: P51897-B21

NS204i-u cabling

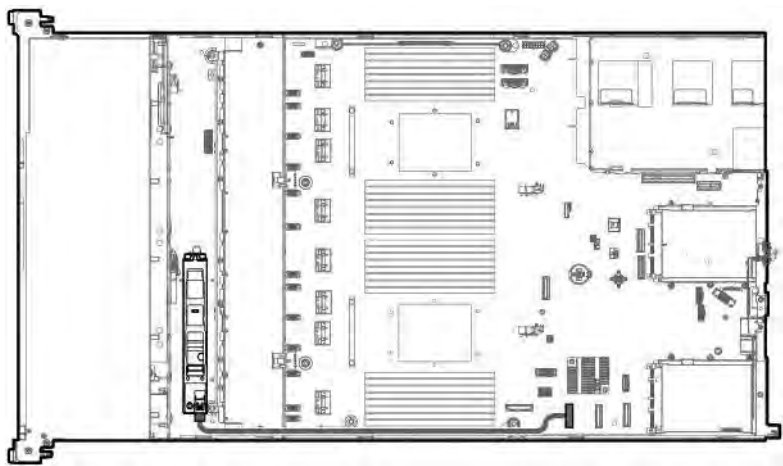
Internal NS204i-u power



Cable part number	Color	From	To
P48956-001 ¹	Orange	NS204i-u boot device	System board

¹ Option kit: P48920-B21

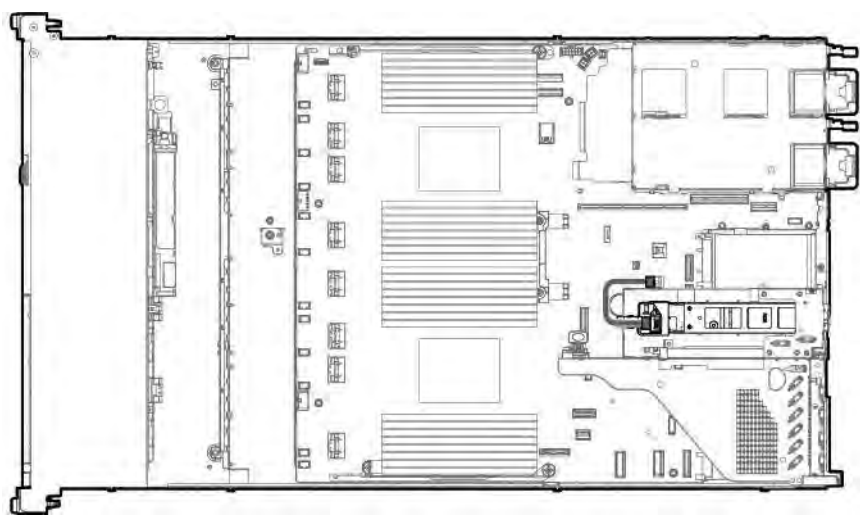
Internal NS204i-u data



Cable part number	Color	From	To
P54092-001 ¹	Orange	NS204i-u boot device	System board

¹ Option kit: P48920-B21

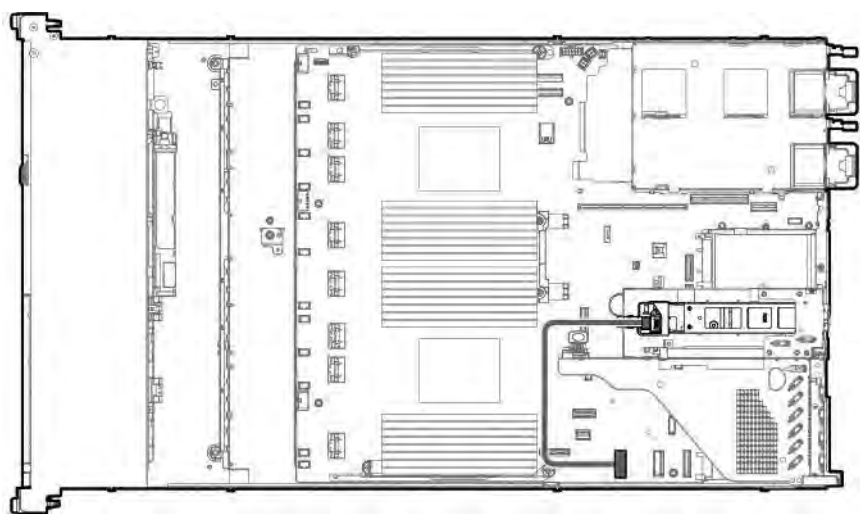
Riser cage NS204i-u power



Cable part number	Color	From	To
P54088-001 ¹	Orange	NS204i-u boot device	System board

¹ Option kit: P54702-B21

Riser cage NS204i-u data

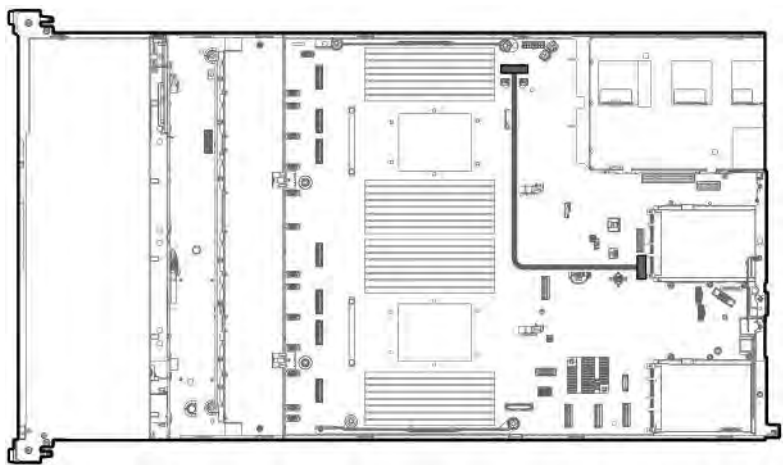


Cable part number	Color	From	To
P54087-001 ¹	Orange	NS204i-u boot device	System board

¹ Option kit: P54702-B21

OCP adapter bandwidth upgrade cabling

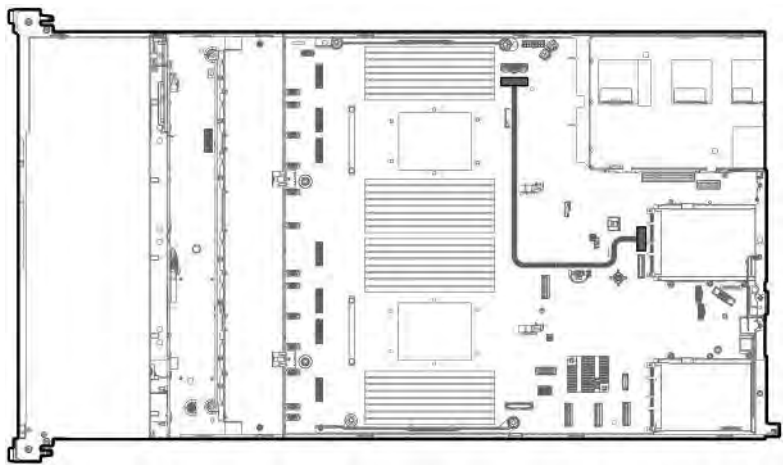
OCP slot 15 port 2



Cable part number	Color	From	To
P43734-001 ¹	Orange	OCP slot 15 port 2	Socket 2 MCIO connector 2

¹ Option kit: P52417-B21

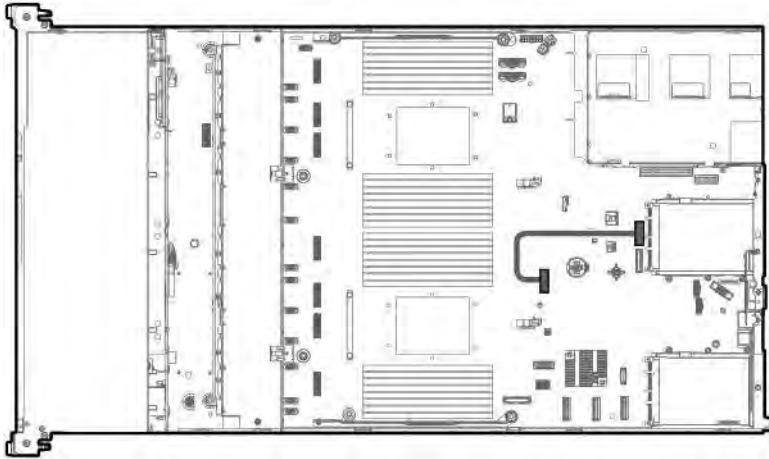
OCP slot 15 port 1



Cable part number	Color	From	To
P43734-001 ¹	Orange	OCP slot 15 port 1	Socket 2 MCIO connector 1

¹ Option kit: P52417-B21

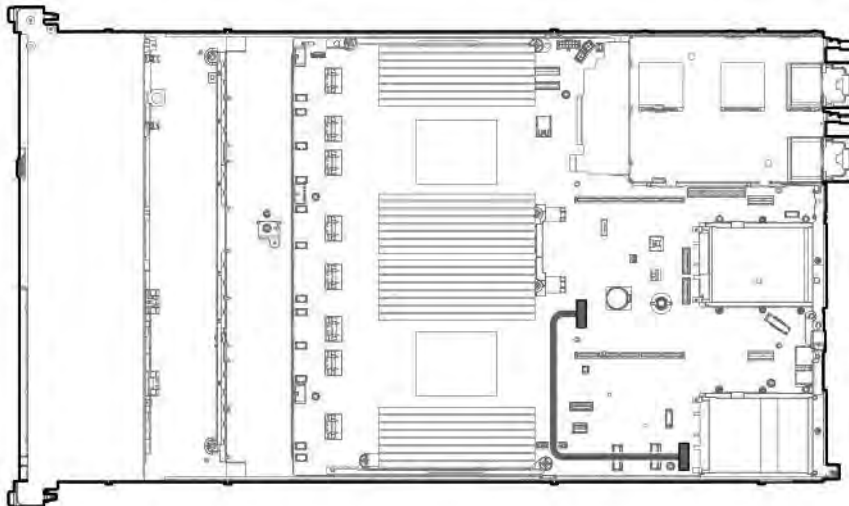
OCP slot 15 port 1



Cable part number	Color	From	To
P43735-001 ¹	Orange	OCP slot 15 port 1	Socket 1 MCIO port 1

¹ Option kit: P52417-B21

OCP slot 14 port 2

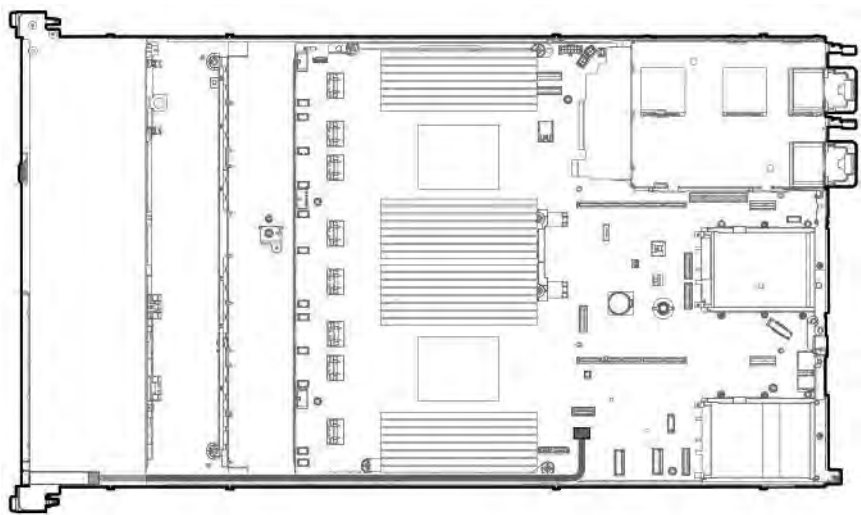


Cable part number	Color	From	To
P43736-001 ¹	Orange	OCP slot 14 port 2	Socket 1 MCIO port 1

¹ Option kit: P52417-B21

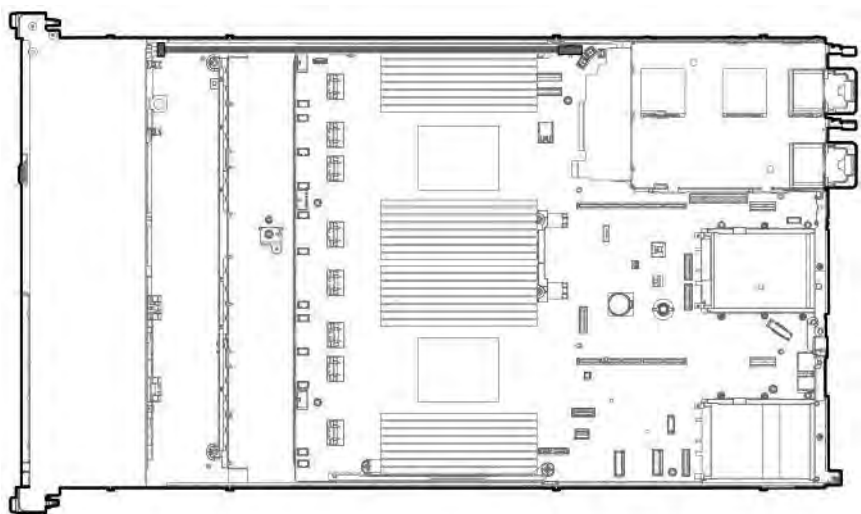
Power cabling

Power switch



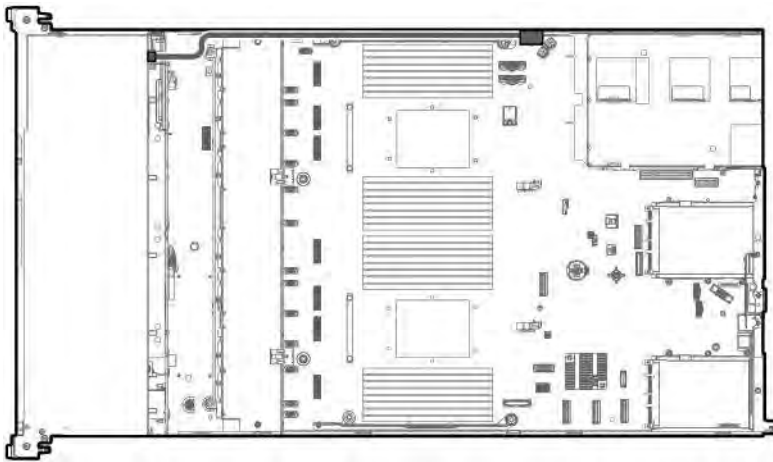
Cable part number	Color	From	To
P43727-001	Orange	Power switch	System board

4 LFF backplane power



Cable part number	Color	From	To
P43726-001	Orange	4 LFF backplane	System board

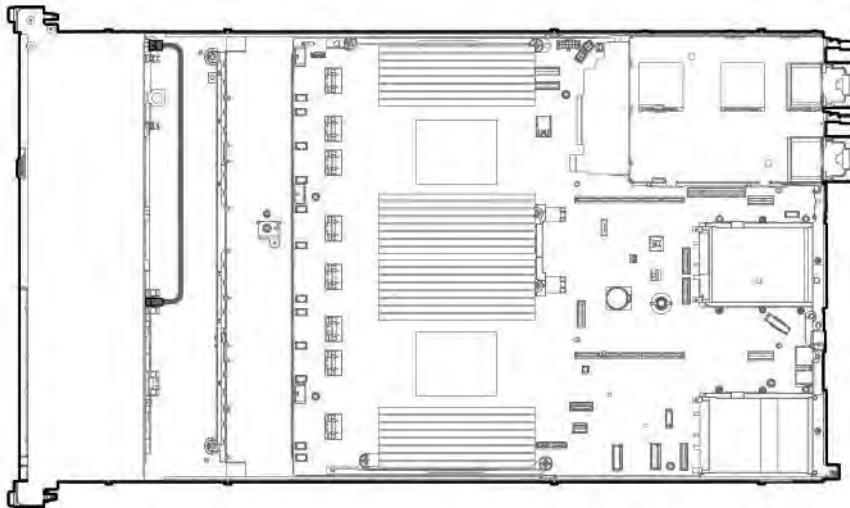
8 SFF backplane power



Cable part number	Color	From	To
P43729-001 ¹	Orange	8 SFF backplane	System board

¹ Option kit: P48895-B21

2 SFF backplane power

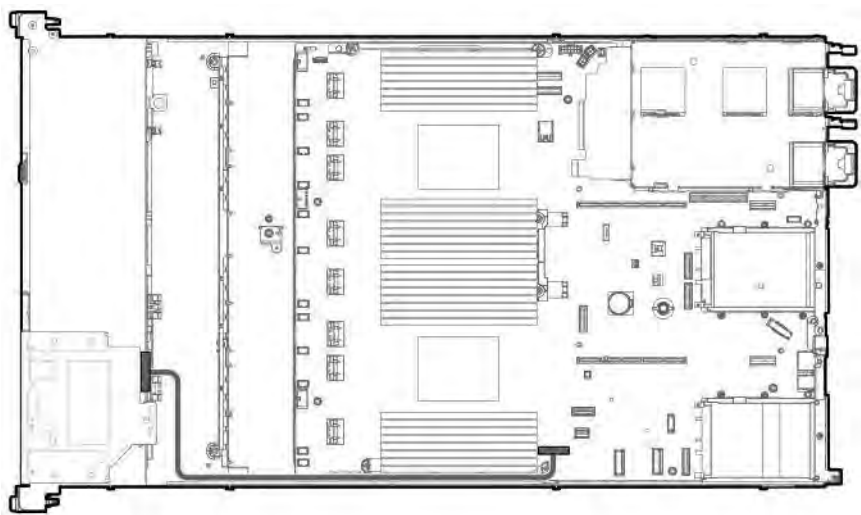


Cable part number	Color	From	To
869667-001 ¹	Orange	2 SFF backplane	8 SFF backplane

¹ Option kit: P48899-B21

IO cabling

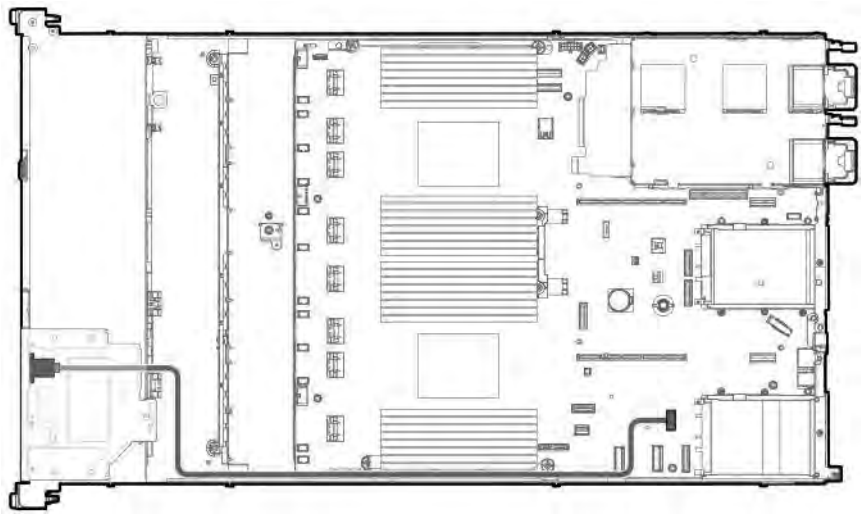
SFF optical disk drive cabling



Cable part number	Color	From	To
P45622-001 ¹	Orange	SFF optical disk drive	System board

¹ Option kit: P48926-B21

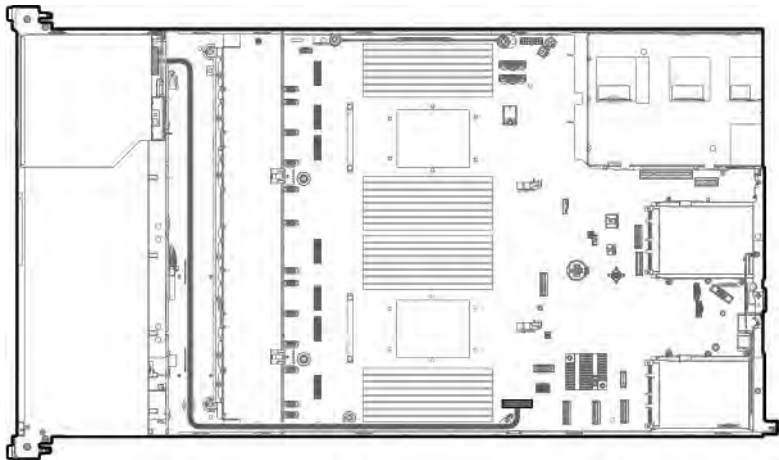
SFF front display cabling



Cable part number	Color	From	To
P45620-001 ¹	Orange	SFF front display	System board

¹ Option kit: P48926-B21

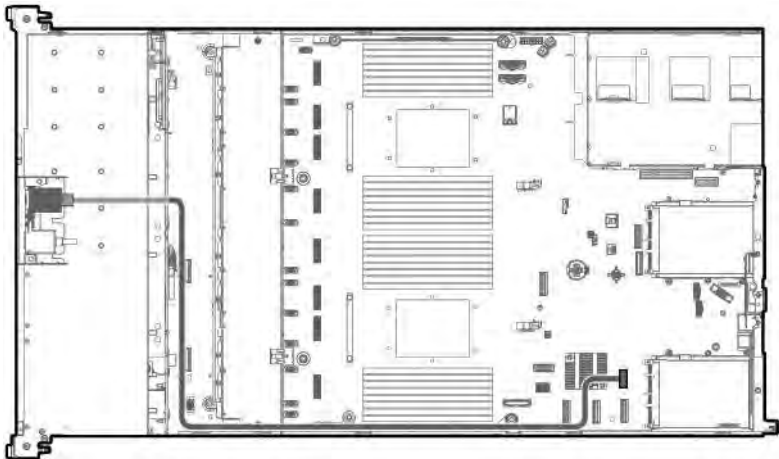
LFF optical disk drive cabling



Cable part number	Color	From	To
P45621-001 ¹	Orange	LFF optical disc drive	System board

¹ Option kit: P48914-B21

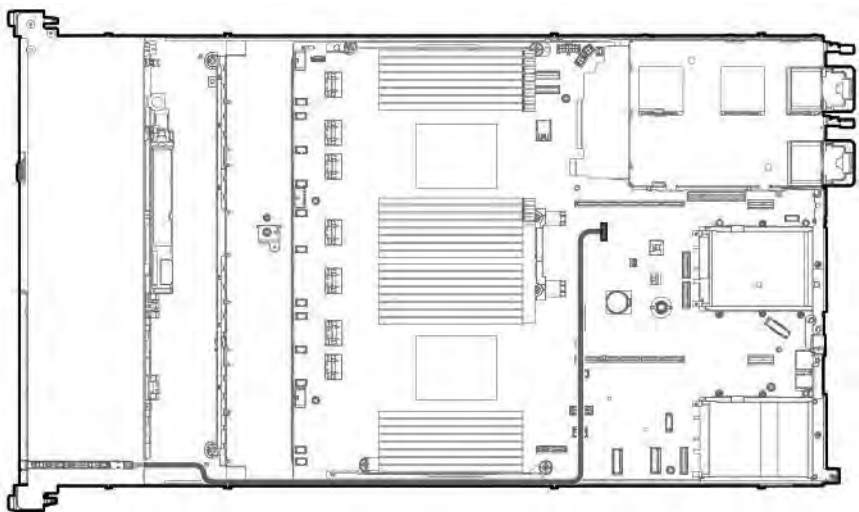
LFF front display port/USB cabling



Cable part number	Color	From	To
P45619-001 ¹	Orange	Display port	System board

¹ Option kit: P48928-B21

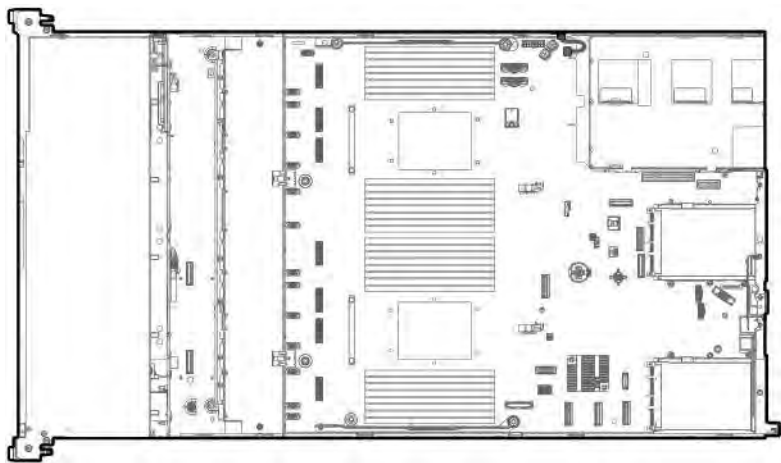
Systems Insight Display cabling



Cable part number	Color	From	To
P48971-001 ¹	Orange	Systems Insight Display module	System board

¹ Option kit: P48927-B21

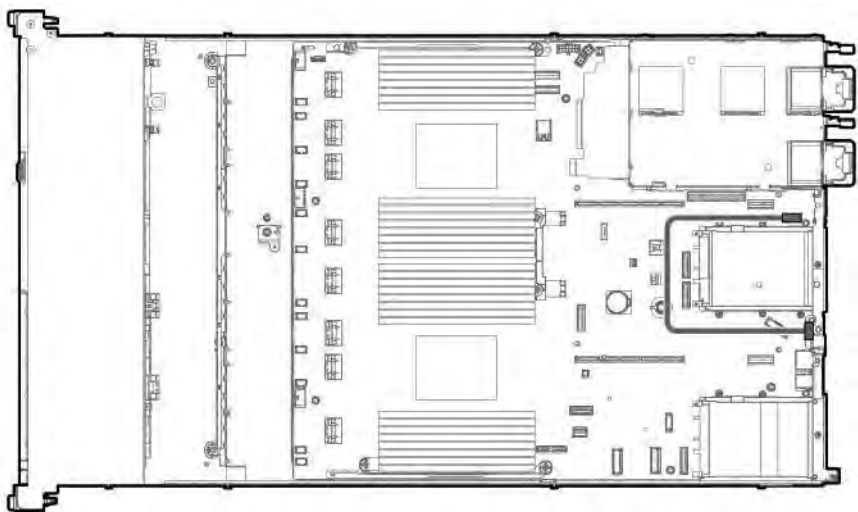
Intrusion detection switch cabling



Cable part number	Color	From	To
P47751-001 ¹	Orange	Intrusion detection switch	System board

¹ Option kit: P48922-B21

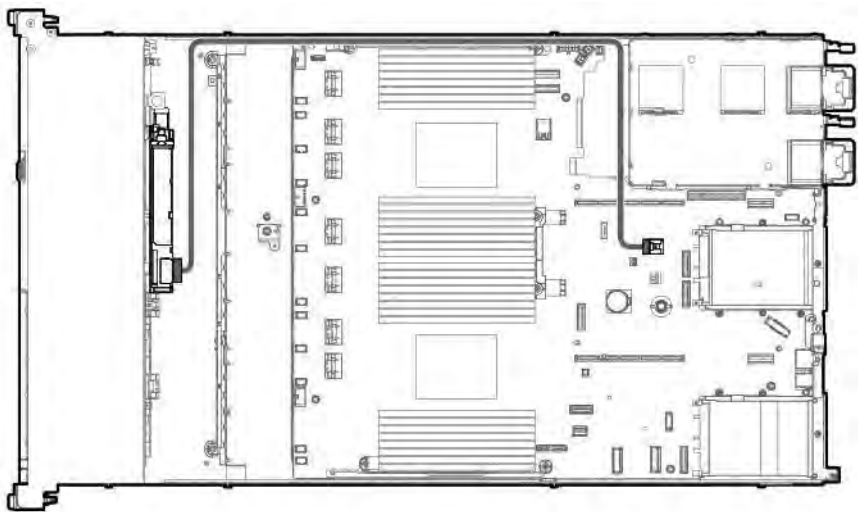
Serial port cabling



Cable part number	Color	From	To
P45623-001 ¹	Orange	Serial port	System board

¹ Option kit: P48921-B21

Smart storage battery/capacitor cabling



Cable part number	Color	From	To
P45618-001 ¹	Orange	Smart storage battery or capacitor	System board

¹ Option kit: P48918-B21

Configuration resources

Use the following resources to find documentation for configuring and managing your server.

- Some utilities might not apply to your server.
- Products ordered from Factory Express might have already been configured with some or all the configurations in this chapter. To determine if any additional setup is required, see your Factory Express order.
- For the most recent changes, feature enhancements, and bug fixes, see the latest product release notes.

Updating firmware or system ROM

To	Use
Download service packs	<ul style="list-style-type: none">• Service Pack for Advanced Server Contact customer support
<ul style="list-style-type: none">• Enable policy-based management of server or server group firmware for distributed server infrastructure• Monitor server compliance with a configured firmware baseline• Receive automatic iLO firmware updates• Receive baseline update alerts	<ul style="list-style-type: none">c Contact customer support

Configuring the server

To configure	Use
Single server (GUI)	<ul style="list-style-type: none">• Intelligent Provisioning• iLO remote console or web interface• UEFI System Utilities• UCP Advisor for Compute Management Contact customer support
Single server (scripting)	<ul style="list-style-type: none">• RESTful Interface Tool• Python iLO Redfish Library (python-ilorest-library)• Scripting Tools for Windows Powershell• iLO RESTful API• UCP Advisor for Compute Management API Contact customer support
Multiple servers (either UI or scripting)	UCP Advisor for Compute Management Contact customer support

Configuring storage controllers

Controller type	Documentation
SR controllers	—
Gen11	<i>Hitachi Advanced Server HA800 G3 Series SR Controller User Guide</i> Contact customer support
G2	<i>Smart Array SR Controller G2 User Guide</i> Contact customer support
MR controllers	—
Gen11	<i>MR Gen11 Controller User Guide</i> Contact customer support

Managing the NS204i Boot Device

For more information on supported features and maintenance information for the NS204i Boot Device, contact customer support.

Deploying an OS

For a list of supported operating systems, contact customer support.

To	See
Configure the server to boot from a SAN	relevant document at https://knowledge.hitachivantara.com/Documents/Servers
Deploy an OS using iLO virtual media	iLO user guide Contact customer support
Deploy an OS using Intelligent Provisioning	Hitachi Advanced Server HA800 G3 Series Intelligent Provisioning 4.0 User Guide Contact customer support

Configuring security

To	See
Implement server security best practices.	<ul style="list-style-type: none">• <i>Compute Security Reference Guide</i>• <i>iLO 6 Security Technology Brief</i> Contact customer support

Optimizing the server

To	See
Optimize server performance through management and tuning features.	<i>Advanced Server model Performance Management and Tuning Guide</i> Contact customer support

Server management

To monitor	See
Single server	iLO Contact customer support
Single or multiple servers	UCP Advisor for Compute Management Contact customer support

Managing Linux-based high performance compute clusters

To	Use
Provision, manage, and monitor clusters.	Performance Cluster Manager Contact customer support
Optimize your applications.	Performance Analysis Tools Contact customer support
Optimize software library for low latency and high bandwidth, both on-node and off-node, for point-to-point and collective communications.	<i>Cray Programming Environment User Guide</i> Contact customer support

Troubleshooting

NMI functionality

An NMI crash dump enables administrators to create crash dump files when a system is not responding to traditional debugging methods.

An analysis of the crash dump log is an essential part of diagnosing reliability problems, such as hanging operating systems, device drivers, and applications. Many crashes freeze a system, and the only available action for administrators is to cycle the system power. Resetting the system erases any information that could support problem analysis, but the NMI feature preserves that information by performing a memory dump before a hard reset.

To force the OS to initiate the NMI handler and generate a crash dump log, the administrator can use the iLO Generate NMI feature.

Specifications

Environmental specifications

Specification	Value
Temperature range¹	—
Operating	10°C to 35°C (50°F to 95°F)
Nonoperating	-30°C to 60°C (-22°F to 140°F)
Relative humidity (noncondensing)	—
Operating	Minimum to be the higher (more moisture) of -12°C (10.4°F) dew point or 8% relative humidity Maximum to be 24°C (75.2°F) dew point or 90% relative humidity
Nonoperating	5% to 95% 38.7°C (101.7°F), maximum wet bulb temperature

¹ All temperature ratings shown are for sea level. An altitude derating of 1.0°C per 304.8 m (1.8°F per 1000 ft) to 3048 m (10,000 ft) is applicable. No direct sunlight allowed. Maximum rate of change is 20°C per hour (36°F per hour). The upper limit and rate of change might be limited by the type and number of options installed.

For certain approved hardware configurations, the supported system inlet temperature range is extended:

- 5°C to 10°C (41°F to 50°F) and 35°C to 40°C (95°F to 104°F) at sea level with an altitude derating of 1.0°C per every 175 m (1.8°F per every 574 ft) above 900 m (2953 ft) to a maximum of 3048 m (10,000 ft).
- 40°C to 45°C (104°F to 113°F) at sea level with an altitude derating of 1.0°C per every 125 m (1.8°F per every 410 ft) above 900 m (2953 ft) to a maximum of 3048 m (10,000 ft).

For information about approved hardware configurations, contact customer support.

Mechanical specifications

Specification	Value
Height	4.29 cm (1.69 in)
Depth, SFF	75.31 cm (29.65 in)
Depth, LFF	77.30 cm (30.43 in)
Width	43.46 cm (17.11 in)
Weight, SFF minimum	14.50 kg (32 lb)
Weight, SFF maximum	21 kg (46 lb)
Weight, LFF minimum	14.50 kg (32 lb)
Weight, LFF maximum	22 kg (48 lb)

Power supply specifications

Depending on the installed options and the regional location where the server was purchased, the server can be configured with one of the following power supplies:

- **800 W Flex Slot Platinum Hot-plug Low Halogen Power Supply**
- **1000 W Flex Slot Titanium Hot-plug Power Supply**
- **1600 W Flex Slot Platinum Hot-plug Low Halogen Power Supply**

800 W Flex Slot Platinum Hot-plug Low Halogen Power Supply

Specification	Value
Input requirements	—
Rated input voltage	100 VAC to 127 VAC 200 VAC to 240 VAC 240 VDC for China only
Rated input frequency	50 Hz to 60 Hz Not applicable to 240 VDC
Rated input current	9.1 A at 100 VAC 4.4 A at 200 VAC 3.6 A at 240 VDC for China only
Maximum rated input power	899 W at 100 VAC 867 W at 200 VAC 864 W at 240 VDC for China only
BTUs per hour	3067 at 100 VAC 2958 at 200 VAC 2949 at 240 VAC for China only
Power supply output	—
Specification	Value
Rated steady-state power	800 W at 100 VAC to 127 VAC input 800 W at 100 VAC to 240 VAC input 800 W at 240 VDC input for China only
Maximum peak power	800 W at 100 VAC to 127 VAC input 800 W at 100 VAC to 240 VAC input 800 W at 240 VDC input for China only

1000 W Flex Slot Titanium Hot-plug Power Supply

Specification	Value
Input requirements	—
Rated input voltage	100 VAC to 127 VAC 200 VAC to 240 VAC
Rated input frequency	240 VDC for China only 50 Hz to 60 Hz
Rated input current	11.3 A at 100 VAC 6.1 A at 200 VAC
Maximum rated input power	1103 W at 100 VAC 1064 W at 200 VAC
BTUs per hour	3764 at 100 VAC 3629 at 200 VAC
Power supply output	—
Rated steady-state power	1000 W at 100 VAC to 127 VAC 1000 W at 200 VAC to 240 VAC input
Maximum peak power	1000 W at 100 VAC to 127 VAC 1000 W at 200 VAC to 240 VAC

1600 W Flex Slot Platinum Hot-plug Low Halogen Power Supply

Specification	Value
Input requirements	—
Rated input voltage	200 VAC to 240 VAC 240 VDC for China only
Rated input frequency	50 Hz to 60 Hz
Rated input current	8.7 A at 200 VAC 7.5 A at 230 VAC
Maximum rated input power	1734 W at 200 VAC 1727 W at 230 VAC
BTUs per hour	5918 at 200 VAC 5891 at 230 VAC
Power supply output	—
Rated steady-state power	1600 W at 200 VAC to 240 VAC input 1600 W at 240 VDC input
Maximum peak power	2200 W for 1 ms (turbo mode) at 200 VAC to 240 VAC input

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