Hitachi Advanced Server HA840 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

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Accessing product documentation

Product user documentation is available on Hitachi Vantara Support Connect: https://knowledge.hitachivantara.com/Documents. Check this site for the most current documentation, including important updates that may have been made after the release of the product.

Getting help

Hitachi Vantara Support Connect is the destination for technical support of products and solutions sold by Hitachi Vantara. To contact technical support, log on to Hitachi Vantara Support Connect for contact information: https://support.hitachivantara.com/en_us/contact-us.html.

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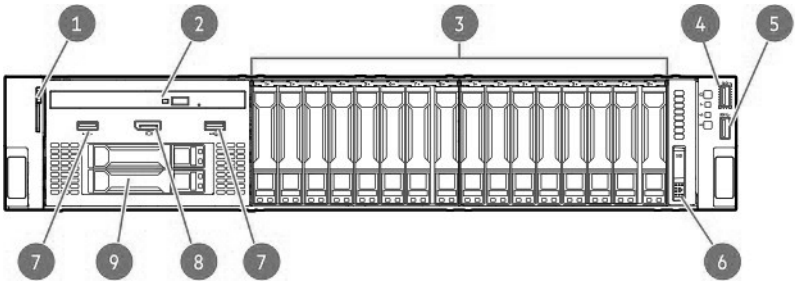
Thank you!

Component identification

This chapter describes the external and internal server features and components.

Front panel components

16 SFF drive configuration



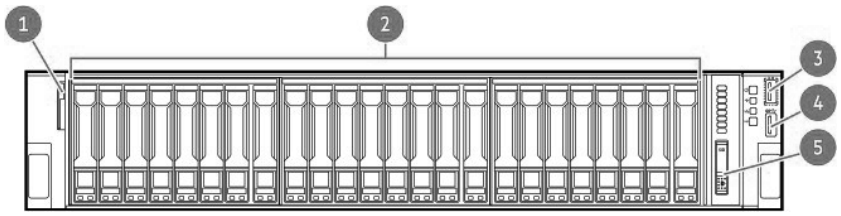
Item	Description
1	Serial number/iLO information pull tab[1]
2	Optical drive (optional)
3	SFF drives[2]
4	**iLO service port**
5	USB 3.2 Gen 1 port
6	System Insight Display (optional)
7	USB 2.0 ports
8	**DisplayPort 1.1a** (optional)
9	2 SFF stacked drives (optional)[3]

1 The serial number/iLO information pull tab is double-sided. One side shows the server serial number and the customer asset tag label. The other side shows the default iLO account information.

2 Depending on the **type of drive backplane installed**, the front-end SFF drive boxes supports SAS, SATA, or U.3 NVMe drives.

3 The 2 SFF stacked drive cage option supports SAS, SATA, or U.3 NVMe drives.

24 SFF drive configuration



Item	Description
1	Serial number/iLO information pull tab[1]
2	SFF drives[2]
3	**iLO service port**
4	USB 3.2 Gen 1 ports
5	System Insight Display (optional)

1 The serial number/iLO information pull tab is double-sided. One side shows the server serial number and the customer asset tag label. The other side shows the default iLO account information.

2 Depending on the **type of drive backplane installed**, the server supports SFF SAS, SATA, or U.3 NVMe drives.

iLO Service Port

When you have physical access to a server, you can use the Service Port to do the following:

- Download the Active Health System Log to a supported USB flash drive.

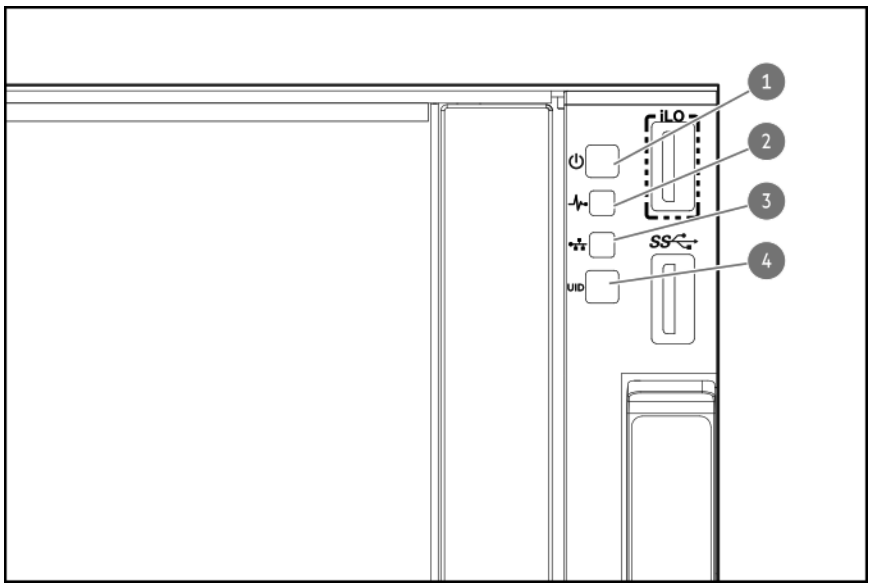
  When you use this feature, the connected USB flash drive is not accessible by the host operating system.
- Connect a client (such as a laptop) with a supported USB to Ethernet adapter to access the following:
  - iLO web interface
  - Remote console
  - iLO RESTful API
  - CLI

When you use the iLO Service Port:

- Actions are logged in the iLO event log.
- The server UID flashes to indicate the Service Port status.

  You can also retrieve the Service Port status by using a REST client and the iLO RESTful API.
- You cannot use the Service Port to boot any device within the server, or the server itself.
- You cannot access the server by connecting to the Service Port.
- You cannot access the connected device from the server.

Front panel LEDs and buttons



Item	Description	Status	Definition
1	Power On/Standby button and system power LED[1]	Solid green	System on
		Flashing green	Performing power-on sequence
		Solid amber	System in standby
		Off	No power present[2]
2	Health LED[1]	Solid green	Normal
		Flashing green	iLO is rebooting
		Flashing amber	System degraded[3]
		Flashing red	System critical[3]
3	NIC status LED[1]	Solid green	Linked to network
		Flashing green	Network active
		Off	No network activity
4	UID button/LED[1]	Solid blue	Activated

Table Continued

Item	Description	Status	Definition
		Flashing blue	• 1 flash per second—Remote management or firmware upgrade in progress • 4 flashes per second—iLO manual reboot sequence initiated • 8 flashes per second—iLO manual reboot sequence in progress
		Off	Deactivated

1 When all LEDs flash simultaneously, a power fault has occurred. For more information, see **Front panel LED power fault codes**.

2 Facility power is not present, power cord is not attached, no power supplies are installed, power supply failure has occurred, or the front I/O cable is disconnected.

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

Server UID LED

The UID LED is used to locate a particular server when it is deployed in a dense rack with other equipment. Activating the UID LED helps an on-site technician to quickly identify a server for maintenance tasks.

Using the UID button to view the Server Health Summary

Prerequisites

- An external monitor is connected.
- In the iLO web interface, the **Show Server Health on External Monitor** feature is enabled on the **Access Settings** page.

About this task

Use the UID button to display the iLO **Server Health Summary** screen on an external monitor. This function works when the server is powered on or off. Use this feature for troubleshooting if the server will not start up.

CAUTION: Press and release the UID button. Holding it down at any time for more than five seconds initiates a graceful iLO reboot or a hardware iLO reboot. Data loss or NVRAM corruption might occur during a hardware iLO reboot.

Procedure

1. Press and release the UID button.

   The **Server Health Summary** screen is displayed on the external monitor. For more information, see the iLO troubleshooting guide:

   docs.hitachivantara.com

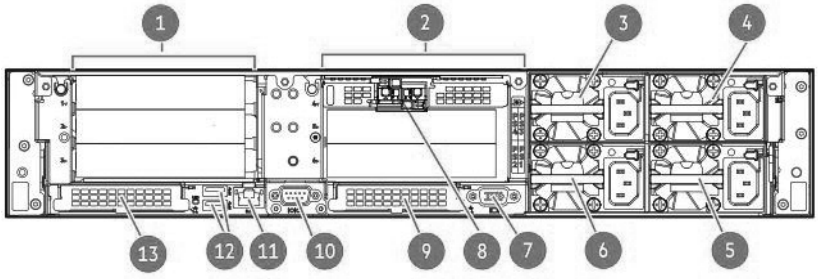
2. Press the UID button again to close the **Server Health Summary** screen.

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
FlexibleLOM	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

Rear panel components



Item	Description
1	Primary riser slots 1–3 top to bottom[1]
2	Secondary riser slots 4–6 top to bottom
3	Power supply 4 (PS4)
4	Power supply 3 (PS3)
5	Power supply 1 (PS1)
6	Power supply 2 (PS2)
7	**VGA port**
8	NS204i-u boot device (optional)

Table Continued

Item	Description
9	Slot 15 OCP
10	Serial port (optional)
11	iLO management port
12	USB 3.2 Gen 1 ports
13	Slot 14 OCP

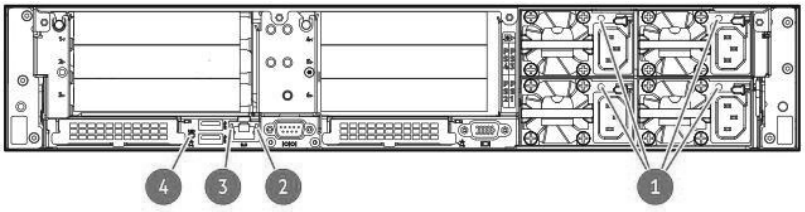
[1] When installing a single riser board, install it on the primary riser cage.

Display device setup

This server supports both VGA port and DisplayPort 1.1a. Before connecting a display device to this server, review the following information:

- Whenever possible, use the same display connection type. For example, if your PC or monitor only has a VGA output, connect it to the server VGA port. Use of any kind of adapter or converter cable or dongle might lead to decreased display quality or a lag over the connection.
- DisplayPort connection: When connecting an HDMI or DVI display to the DisplayPort, use an active type adapter. Passive type adapter—marked with the DP++ symbol—is not supported.
- Display output modes:
  - If you connect two display devices to the VGA port and DisplayPort, the same image is shown on both devices—screen mirroring mode.
  - The embedded video controller in the iLO 6 chipset does not support dual display or screen extension mode. To enable dual display mode, install a compatible PCIe graphics card that supports this feature in the expansion slot.

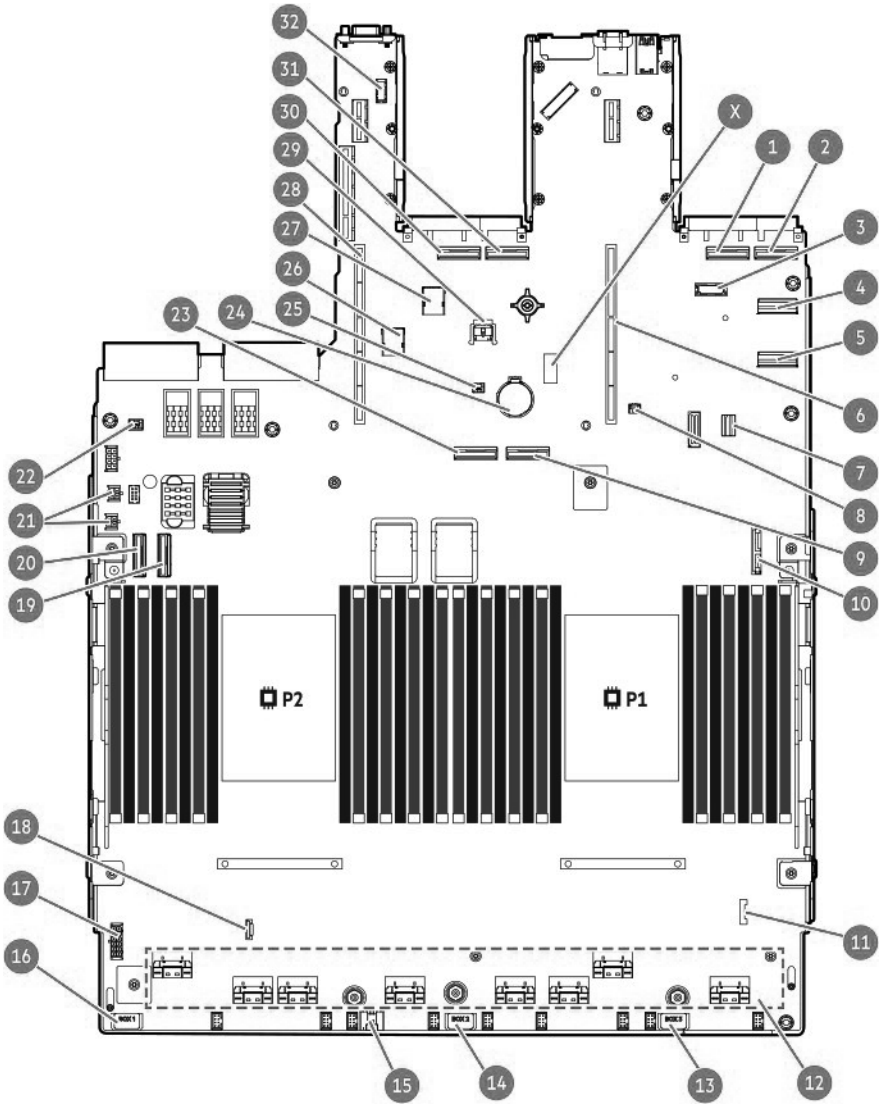
Rear panel LEDs



Item	LED	Status	Definition
1	Power supply	Solid green	The power supply is operating normally.
		Off	One or more of the following conditions exists: • Power is unavailable • Power supply failure • Power supply is in standby mode • Power supply error • The front I/O cable is disconnected.
2	iLO status	Solid green	Lined to network
		Flashing green	Network active
		Off	No network activity
3	iLO link	Solid green	Network link
		Off	No network link
4	UID	Solid blue	Activated
		Flashing blue	• 1 flash per sec—Remote management or firmware upgrade in progress • 4 flashes per sec—iLO manual reboot sequence • 8 flashes per sec—iLO manual reboot sequence in progress
		Off	Deactivated

System board components

The grayed out components in the system board image are not for use in this server.



Item	Description
1	Slot 14 OCP port 1
2	Slot 14 OCP port 2
3	Front DisplayPort/USB 2.0 connector
4	PCH LP SlimSAS connector 2
5	PCH LP SlimSAS connector 1
6	Primary riser connector
7	Front I/O connector and USB 3.2 Gen1 port connector
8	Slot 14 OCP storage backup power connector
9	Socket 1 MCIO connector 1
10	SATA optical port

Table Continued

Item	Description
11	SID connector
12	x8 SlimSAS ports 1–8 (from right to left)
13	Drive box 3 power connector
14	Drive box 2 power connector
15	Energy pack connector
16	Drive box 1 power connector
17	Drive box 2 power connector 2
18	Cooling module connector
19	Socket 2 MCIO connector 1
20	Socket 2 MCIO connector 2
21	SmartNIC power connectors
22	Chassis intrusion detection connector
23	Socket 1 MCIO connector 2
24	System battery
25	Slot 15 OCP storage backup power connector
26	USB 3.2 Gen 1 port
27	USB 2.0 port
28	Secondary riser connector
29	NS204i-u power connector
30	OCP slot 15 port 1
31	OCP slot 15 port 2
32	Serial port connector
X	**System maintenance switch**

System maintenance switch descriptions

Position	Default	Function
S1[1]	Off	• Off—iLO 6 security is enabled. • On—iLO 6 security is disabled.
S2	Off	Reserved
S3	Off	Reserved
S4	Off	Reserved

Table Continued

Position	Default	Function
S5[1]	Off	• Off—Power-on password is enabled. • On—Power-on password is disabled.
S6 [1,2,3]	Off	• 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.

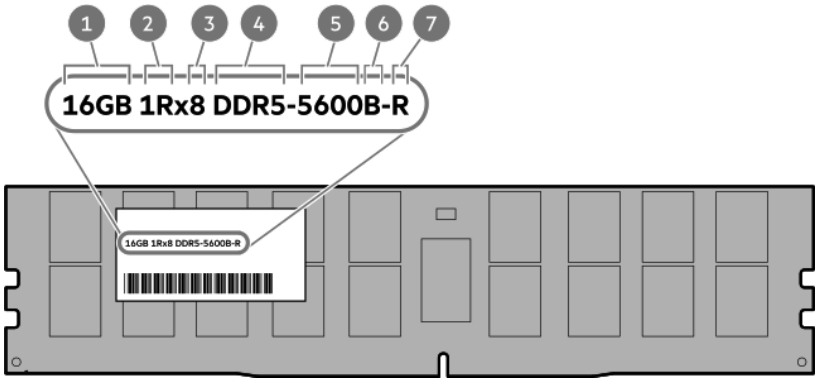
2 When the system maintenance switch position 6 is set to the On position, the system is prepared to restore all configuration settings to their manufacturing defaults.

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.

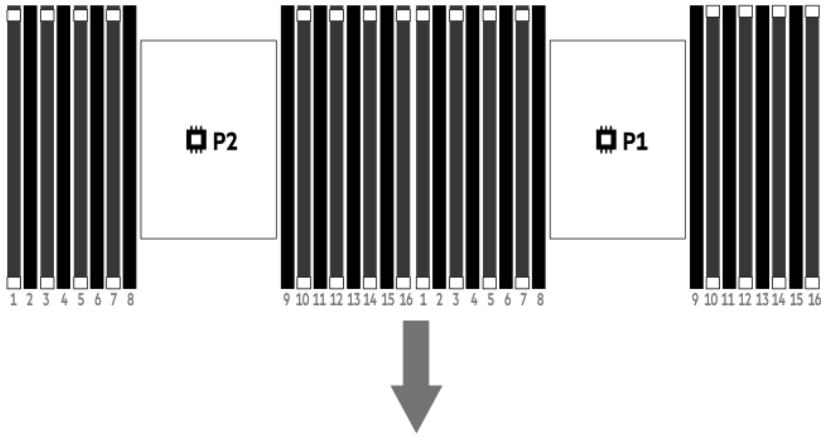
Formore information about product features, specifications, options, configurations, and compatibility, contact customer support.



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 5600 MT/s
6	CAS latency	B—42-42-42 B—50-42-42 (for 128 GB and 256 GB capacities)
7	DIMM type	E—UDIMM (unbuffered with ECC) R—RDIMM (registered)

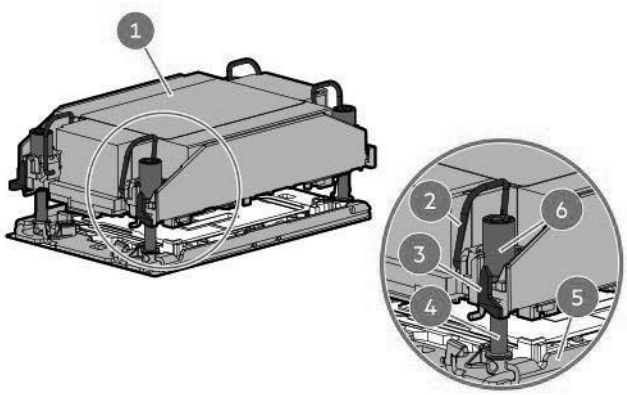
DIMM slot numbering

The arrow points to the front of the server.



Heatsink and processor socket components

A standard heatsink is shown. Your heatsink might look different.



Item	Description
1	Processor-heatsink module[1]
2	Anti-tilt wires
3	Processor carrier release tabs
4	Bolster plate guide posts
5	Bolster plate
6	Heatsink screws

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

Liquid cooling options

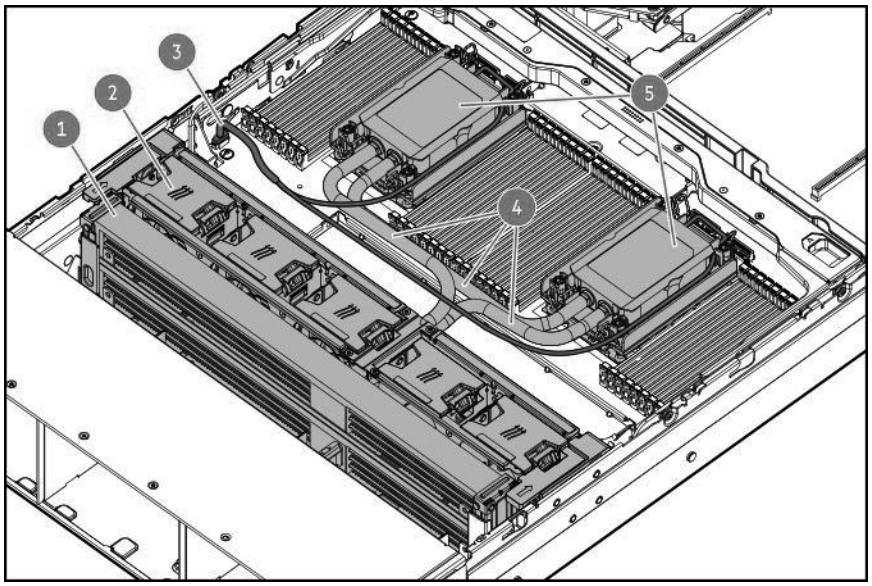
When four 4th Gen Intel Xeon Scalable Processors with a TDP of 270 W–350 W are installed, the closed-loop liquid cooling heatsinks and liquid cooling fans options are required.

- The pump-cold plate of the liquid cooling heatsink picks up heat from the processor.
- Heat is transferred to the radiator through the coolant tubes.
- The coolant tubes and liquid cooling fans work together to cool down the system. The coolant is a mixture of purified water and ethylene glycol with additional additives for corrosion resistance.

Liquid cooling components

IMPORTANT:

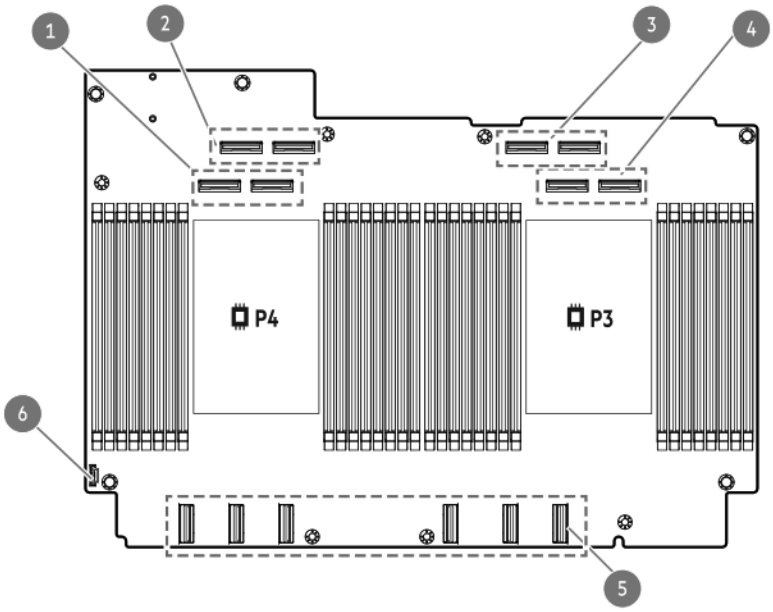
- **Maximum Usage Limitation Reminder**: The closed-loop liquid cooling heatsink used in this server is subject to a Maximum Usage Limitation not to exceed five (5) years of operation. After reaching this five (5) years limit, it is required that the liquid cooling heatsink be replaced. Parts and components 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 customer support.
- 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 *Server coolant spill response* of the server maintenance guide: **docs.hitachivantara.com**



Item	Description
1	Radiator
2	Liquid cooling fans (5, single-rotor)
3	Pump signal cable
4	Coolant tubes
5	Pump-cold plate[1]

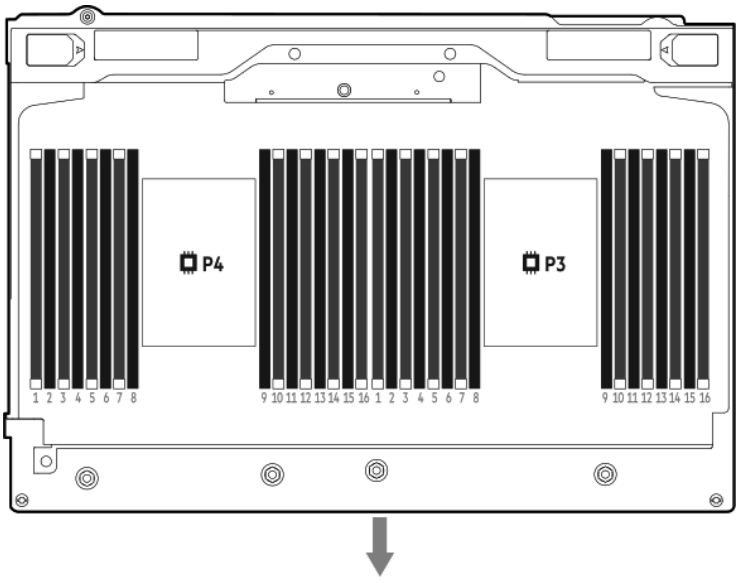
[1] The liquid cooling heatsink has two pumps for redundancy.

Processor mezzanine board components



Item	Description
1	Socket 4 MCIO connectors 7–8 (from left to right)
2	Socket 4 MCIO connectors 9–10 (from left to right)
3	Socket 3 MCIO connectors 11–12 (from left to right)
4	Socket 3 MCIO connectors 13–14 (from left to right)
5	x8 SlimSAS ports 1–6 (from right to left)
6	Liquid cooling power connector

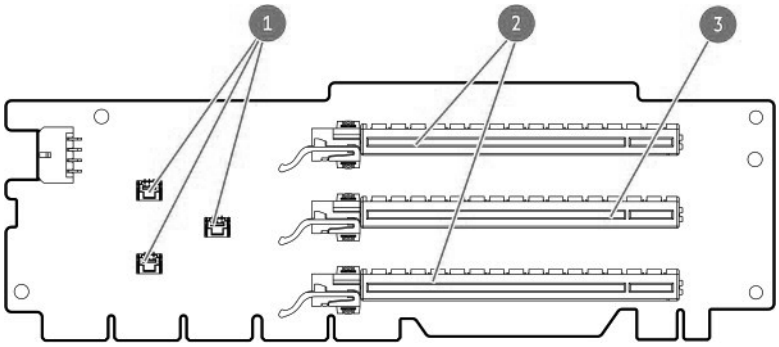
Processor mezzanine board DIMM slot numbering



The arrow points to the front of the server.

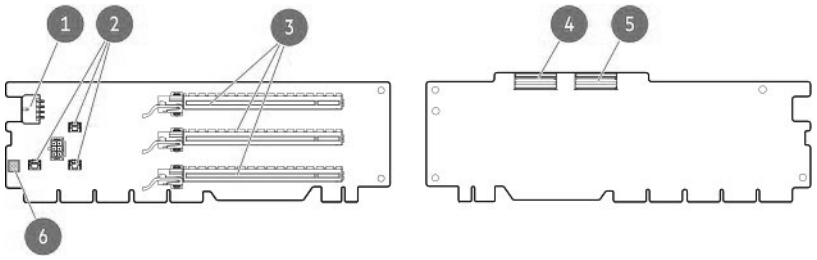
Riser board components

PCIe5 x8/x16/x8 riser components



Item	Description
1	Storage controller backup power connectors
2	PCIe5 x16 (8, 4, 1) slots
3	PCIe5 x16 (16, 8, 4, 1) slot

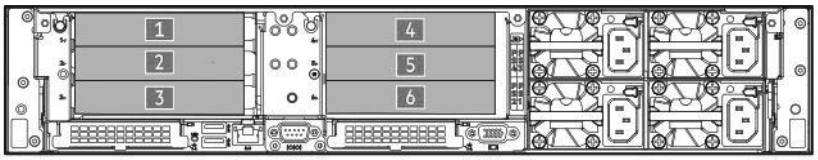
PCIe5 3 x16 riser components



Item	Description
1	GPU auxiliary power connector
2	Storage controller backup power connectors
3	PCIe5 x16 (16, 8, 4, 1) slots
4	LP SlimSAS connector 1
5	LP SlimSAS connector 2
6	GPU signal connector

Riser slot numbering

All riser slots are PCIe5 x16 (16, 8, 4, 1) and are rated for a maximum power draw of 75 W each.



Slot number	Location	Supported form factors
1	Primary riser cage	• Full-height, ¾-length[1] • Half-height, half-length (low-profile)
2		
3		• Full-height, half-length • Half-height, half-length (low-profile)[2]
4	Secondary riser cage	• Full-height, ¾-length[1] • Half-height, half-length (low-profile)[2]
5		
6		• Full-height, half-length • Half-height, half-length (low-profile)[2]

1 These slots also support the 10.5-inch length of double-width accelerators.

2 The low-profile bracket is required when installing the low-profile expansion card.

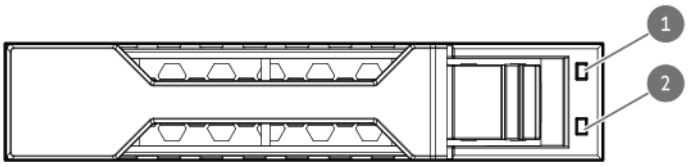
Basic Drive LED definitions

The Hitachi Vantara 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.

SFF basic drive carrier

The SFF basic drive carrier supports hot-plug SAS, SATA, and U.3 PCIe4 NVMe drives.



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.
		Flashing green (1 flash per second)	The drive is doing one of the following: • 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.

Drive bay numbering

CAUTION: When a server is purchased without any drive installed, some drive bays might be empty while other drive bays might be populated with drive blanks. To maintain proper system cooling, do not operate the server without a drive or a drive blank installed.

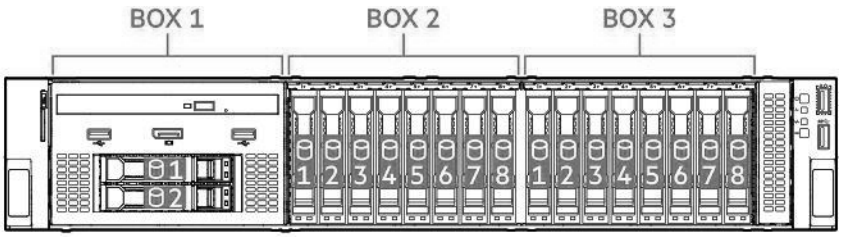
SFF drive bay numbering

The following drive backplane options are supported in SFF drive configurations:

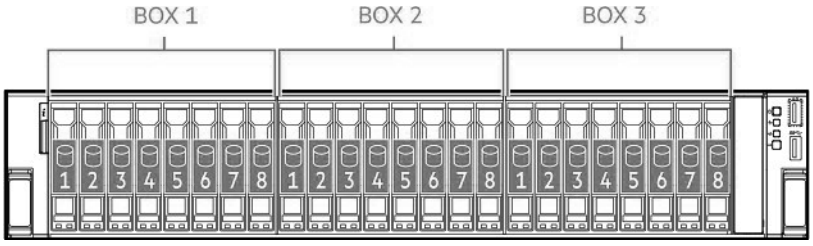
- 2 SFF stacked drive backplanes:
  - 24G x4 U.3 NVMe / SAS UBM3 BC
  - 24G x4 U.3 NVMe / SAS UBM6 BC
- 8 SFF drive backplanes:
  - 8 SFF 24G x1 U.3 NVMe / SAS UBM3 BC
  - 8 SFF 24G x1 U.3 NVMe / SAS UBM6 BC
  - 8 SFF 24G x4 U.3 NVMe / SAS UBM3 BC
  - 8 SFF 24G x4 U.3 NVMe / SAS UBM6 BC

For more information on the drive backplane description, see **Drive backplane naming**.

16 SFF + 2 SFF drive bay numbering



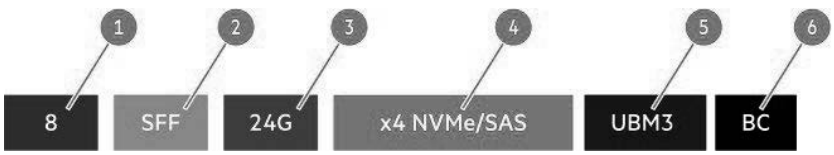
24 SFF drive bay numbering



Drive backplane naming

This topic explains the features represented in the drive backplane naming. This naming convention was adopted starting in the Hitachi Vantara G3 server release. Your server might not support all the features listed in this topic. For server-specific support information, see the server guides:

- Drive backplane support, see **Drive bay numbering**.
- Drive backplane cabling, see **Storage cabling**.

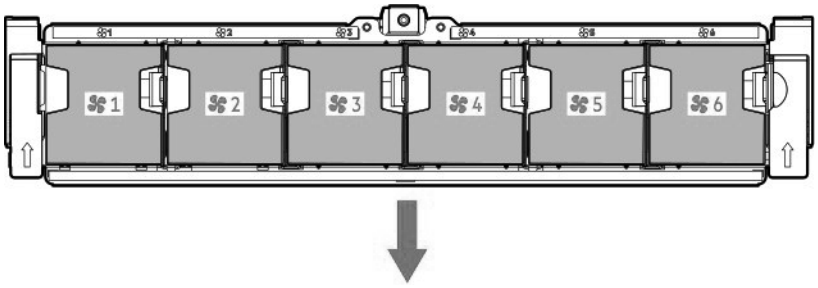


Item	Description	Values
1	Drive bay count	Number of drive bays supported by the backplane.
2	Drive form factor	LFF—Large Form Factor
		SFF—Small Form Factor
3	Maximum link rate per lane (GT/s)	12G
		16G
		24G
		32G
4	Port link width and interface	x1 NVMe/SAS—U.3 NVMe, SAS, or SATA
		x4 NVMe/SAS—U.3 NVMe, SAS, or SATA
		x4 NVMe—U.2 NVMe
5	Universal backplane manager (UBM) options	UBM2—Segregated SAS/SATA
		UBM3 or UBM6—Converged
		UBM4 or UBM6—Segregated U.2 NVMe
6	Drive carrier type	BC—Basic carrier (SFF)
		LP—Low-profile carrier (LFF)

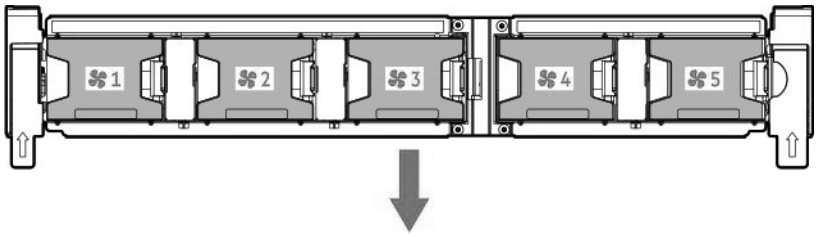
Fan numbering

This server supports two cooling configurations:

- The server in the air cooling configuration is by default populated by six dual-rotor fans.



- The server in the liquid cooling configuration is by default populated by five single-rotor fans



The arrow points to the front of the server.

Fan mode behavior

To provide sufficient airflow to the system, the server is by default populated by either six dual-rotor fans in the air cooling configuration, or five single-rotor fans in the liquid cooling configuration. Both air cooling and liquid cooling configurations with full-load fans provide redundant fan support:

- In the air cooling, redundant fan mode, if a fan rotor fails:
  - The system switches to nonredundant fan mode. The system continues to operate in this mode.
  - The system health LED flashes amber.

  If a second fan rotor failure or a missing fan occurs, the operating system gracefully shuts down.
- In the liquid cooling, redundant fan mode, if a fan fails or is missing:
  - The system switches to nonredundant fan mode. The system continues to operate in this mode.
  - The system health LED flashes amber.

  If a second fan failure or two missing fans occurs, the operating system gracefully shuts down.

Trusted Platform Module 2.0

The Trusted Platform Module 2.0 (TPM) is a hardware-based system security feature that securely stores artifacts used to authenticate the platform. These artifacts can include passwords, certificates, and encryption keys.

The TPM 2.0 is embedded on the server system board.

The TPM 2.0 is supported with specific operating system support such as Microsoft Windows Server 2012 R2 and later. For more information about operating system support, contact customer support. For more information about Microsoft Windows BitLocker Drive Encryption feature, see the Microsoft website (**https://www.microsoft.com**).

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.

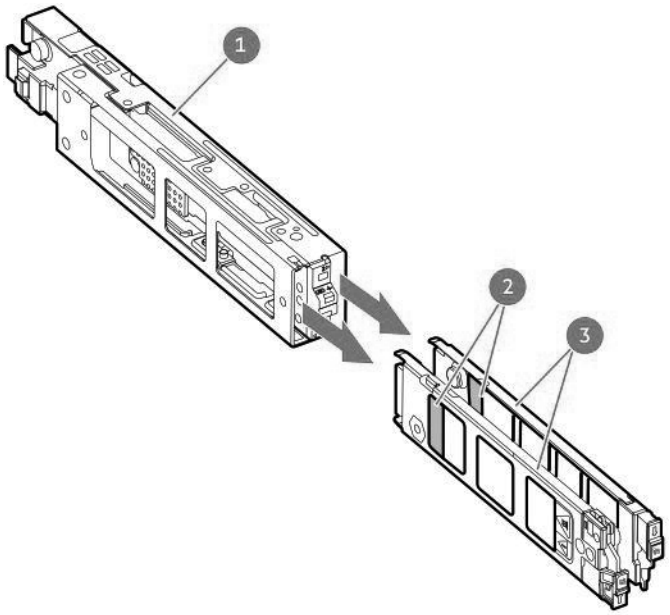
BitLocker recovery key/password retention guidelines

The recovery key/password is generated during BitLocker setup, and can be saved and printed after BitLocker is enabled. When using BitLocker, always retain the recovery key/password. The recovery key/password is required to enter Recovery Mode after BitLocker detects a possible compromise of system integrity.

To help ensure maximum security, observe the following guidelines when retaining the recovery key/password:

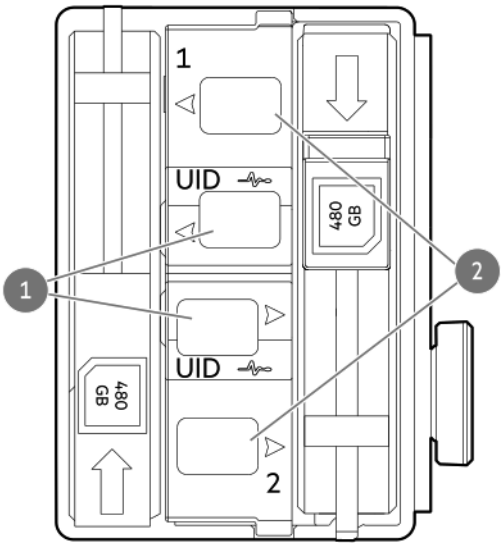
- Always store the recovery key/password in multiple locations.
- Always store copies of the recovery key/password away from the server.
- Do not save the recovery key/password on an encrypted drive.

NS204i-u Boot Device components



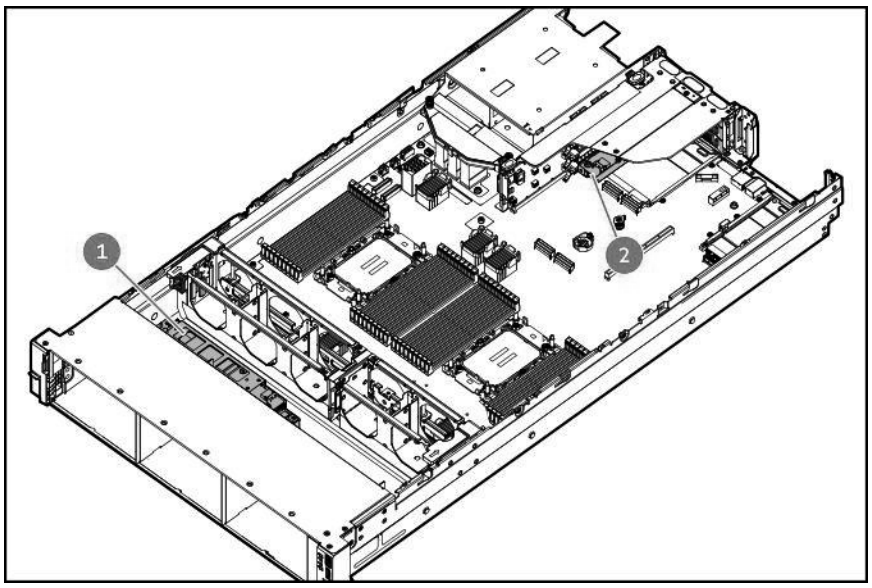
Item	Description
1	Boot device cage
2	M.2 slots
3	Boot device carriers

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: • 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.

NS204i-u Boot Device locations



Item	Description
1	Front boot device
2	Rear boot device[1]

[1] This is located on the secondary riser cage Slot 4.

Setup

This chapter describes general operational requirements and safety reminders, as well as the initial setup procedure for the server.

Setting up the server

Prerequisites

- As a best practice, Hitachi Vantara recommends installing the latest firmware, drivers, and system software before using the server for the first time. You have these options:
  - UCP Advisor for Compute Management is an advanced software-as-a-service platform that securely streamlines operations from edge-to-cloud and automates key life cycle tasks through a unified single browser-based interface. For more information on using UCP Advisor for Compute Management, see **docs.hitachivantara.com**.
  - Use the **Firmware Update** option in Intelligent Provisioning—Intelligent Provisioning is a server deployment tool embedded in Hitachi Vantara ProLiant servers. To access Intelligent Provisioning, during the server boot process, press **F10**. For more information, contact customer support.
  - Download the Service Pack for Vantara (SPV)—SPV is a comprehensive system software and firmware update solution that is delivered as a single ISO image. This solution uses Smart Update Manager (SUM) as the deployment tool.
    - The method for downloading an SPV is by creating an SPV custom download **docs.hitachivantara.com**. This option reduces the size of the SPV by excluding firmware and drivers for OS and server models that are not needed.
- Verify that your OS or virtualization software is supported.

- Read the **Operational requirements** for the server.
- Take note of the iLO hostname and default login credentials on the **serial number/ iLO information pull tab**.

Procedure

1. Unbox the server and verify the contents:
   - Server
   - Power cord
   - Rack-mounting hardware (optional)
   - Printed setup documentation

   The server does not ship with OS media. All system software and firmware is preloaded on the server.
2. (Optional) **Install the hardware options**.
3. **Installing the server into the rack**.
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 and run a remote console:
     a. Verify the following:
        - iLO is licensed to use the remote console feature.

          If iLO is not licensed, visit the Hitachi Vantara website:

          docs.hitachivantara.com
        - 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:
        - 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.

     c. Enter the iLO login name and password, and then click **Log In**.

     d. In the navigation tree, 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.
6. **Configure the initial server setup**.

7. **Set up the storage**.
8. **Set the server power supply requirements**.
9. **Deploy an OS or virtualization software**.
10. After the OS is installed, **update the drivers**.

Adjusting the server power supply redundancy setting

Prerequisites

- To verify that the server is cabled properly for power redundancy, see **Power supply redundancy**.
- To determine the power draw of the system and verify that the server will continue to operate redundantly in the default configuration, contact customer support.

Procedure

1. To access the UEFI System Utilities, press **F9** during POST.
2. From the **System Utilities** screen, select **System Configuration** > **BIOS/Platform Configuration (RBSU)** > **Advanced Options**.
3. Select the appropriate redundancy configuration from the **Power Supply Requirements** menu, and then press **Enter**.
4. Press **F10** to Save or **F12** to Save and Exit.

Operational requirements

When preparing the site and planning the installation for the Hitachi Advanced Server HA840 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 .

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 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, Hitachi Vantara recommends the use of 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 21.08 kg (46.75 lb). When all components are installed, the server can weigh up to 36.93 kg (81.67 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 21.08 kg (46.75 lb), so at least two people must lift the server into the rack 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 rack.
- Adequately stabilized the rack before extending a component outside the rack. Extend only one component at a time. A rack 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 rack, be sure to properly scope the limitations of the rack. Before proceeding with the installation, consider the following:

- You must fully understand the static and dynamic load carrying capacity of the rack 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, Hitachi Vantara recommends that you **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

This chapter describes the hardware operations carried out prior to and after installing or removing a hardware component, or performing a server maintenance or troubleshooting procedure. Before performing these hardware operations, review the:

- **Rack warnings and cautions**
- **Server warnings and cautions**

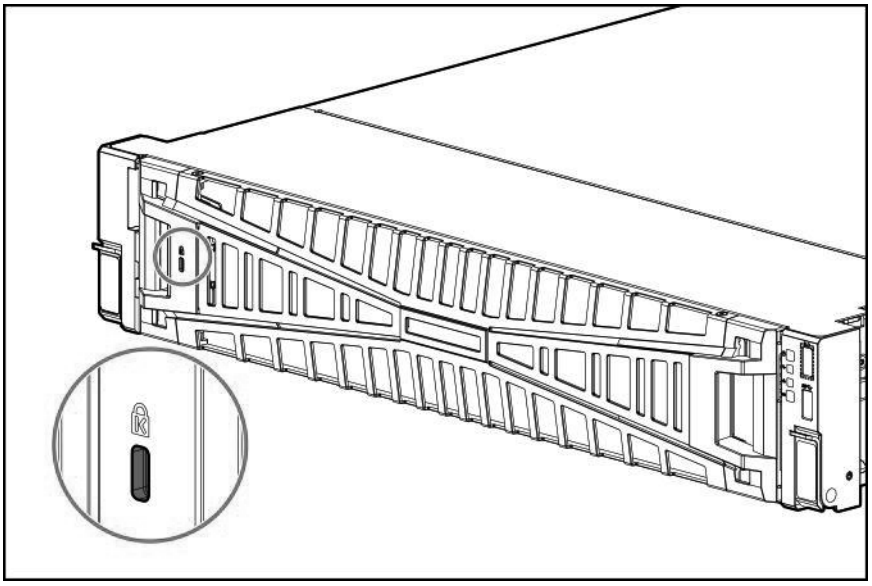
Remove the front bezel

About this task

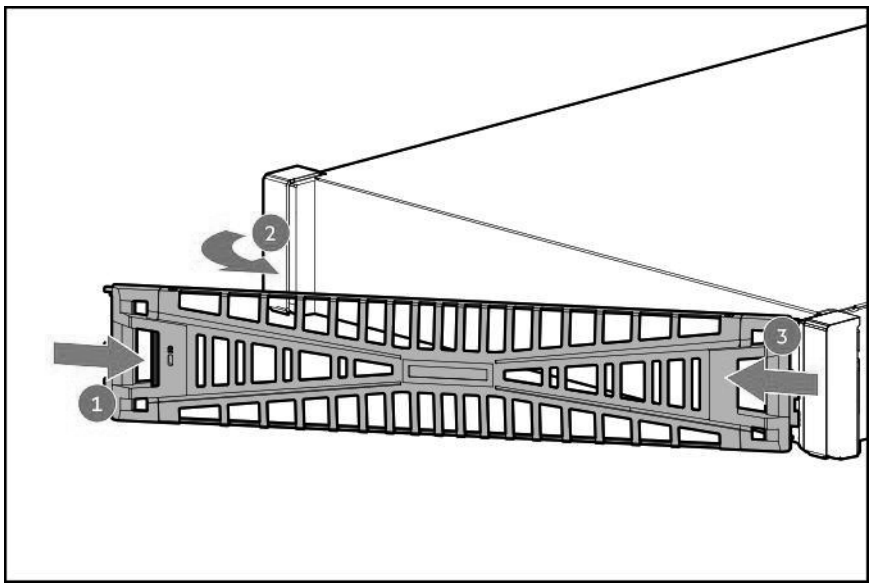
If you are using the iLO virtual power button to power the server on/off, you do not need to remove the front bezel. Remove the front bezel only if you need to access the front panel components.

Procedure

1. If installed, remove the Kensington security lock.
   For more information, see the lock documentation.



2. Press the bezel release latch, and then pivot the bezel open.
3. Release the right side of the bezel from the front panel.



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 6.

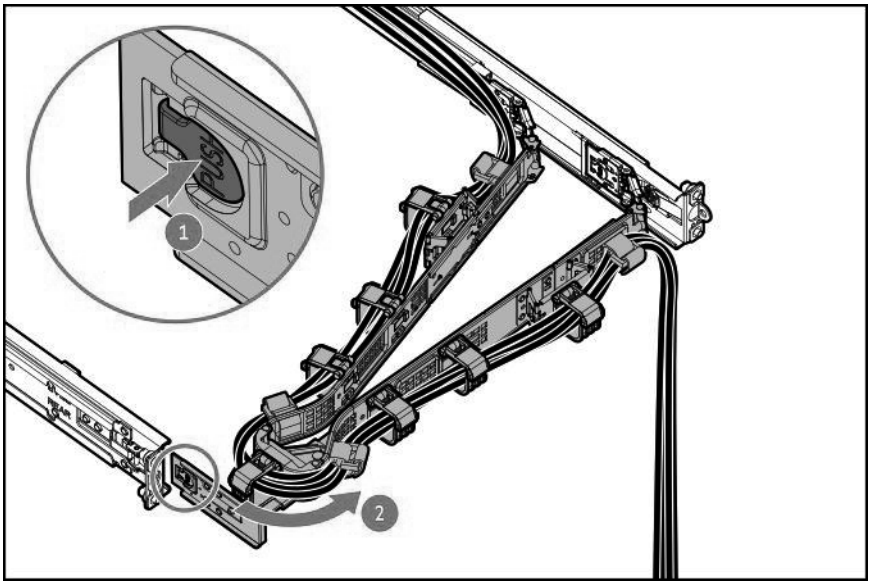
  This method initiates a controlled remote shutdown of applications and the OS before the server enters standby mode.

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

Open the cable management arm

Procedure

1. Press and hold the blue **PUSH** button on the retention bracket.
2. Swing the arm away from the rear panel.



Extend the server out of the rack

Prerequisites

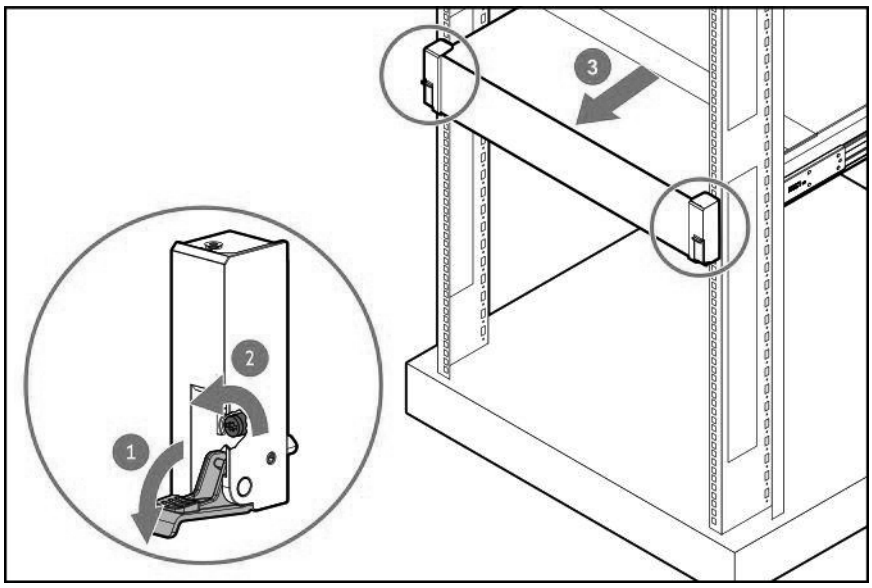
- Before you perform this procedure, review the **Rack warnings and cautions**.
- T-25 Torx screwdriver—This tool is required if the shipping screws located inside the chassis ears are secured.

About this task

WARNING: To reduce the risk of personal injury, be careful when pressing the server rail-release latches. The inner rails could pinch your fingers.

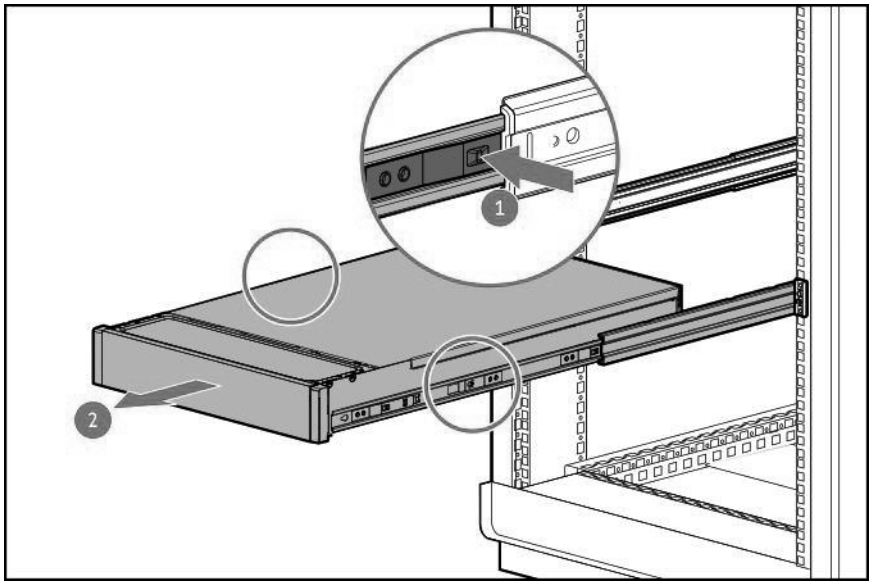
Procedure

1. If needed, loosen the shipping screws, and then use the chassis ear latches to slide the server out of the rack until the rail-release latches are engaged.



2. **WARNING:** To reduce the risk of personal injury, be careful when pressing the server rail-release latches. The inner rails could pinch your fingers.

   Press and hold the rear-end rail-release latches, and then slide the server out of the rack until it is fully extended.



Remove the server from the rack

Prerequisites

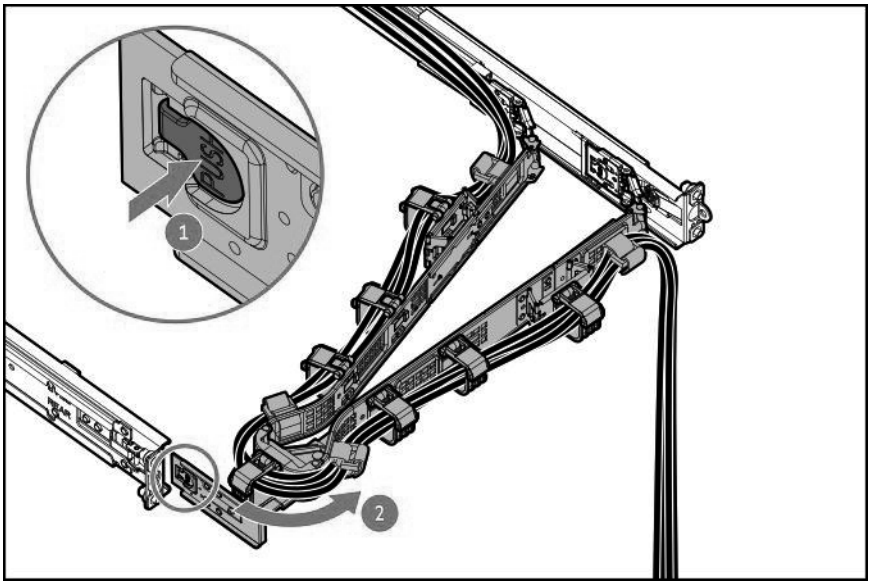
- Get help to lift and stabilize the server during removal from the rack. **If the server is installed higher than chest level, an additional person might be required to help remove the server:** One person to support the server weight, and the other to slide the server out of the rack.
- Before you perform this procedure, review the:

- **Rack warnings and cautions**
- **Server warnings and cautions**

- A fully populated server is heavy. Hitachi Vantara recommends removing the external server components before removing the server from the rack.
- Before you perform this procedure, make sure that you have a T-25 Torx screwdriver available.

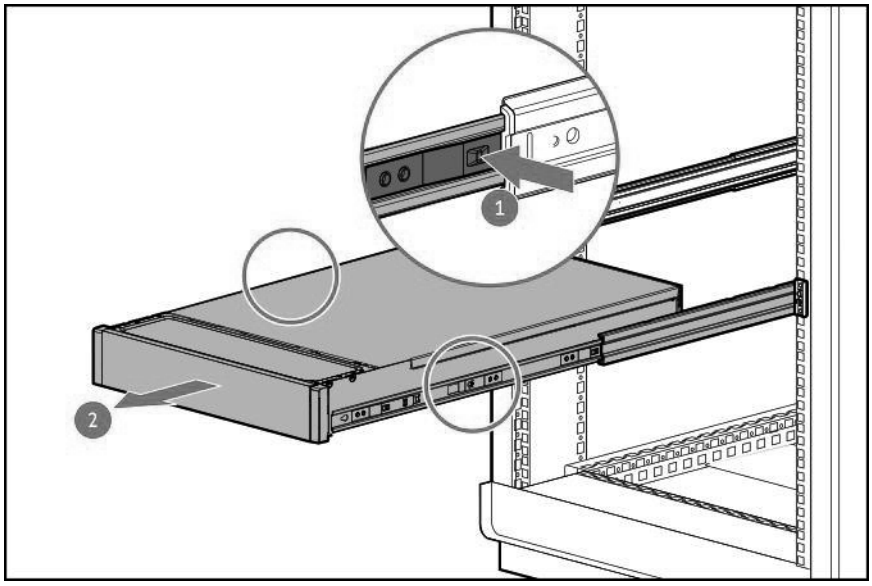
Procedure

1. **Power down the server**.
2. If installed, open the cable management arm.

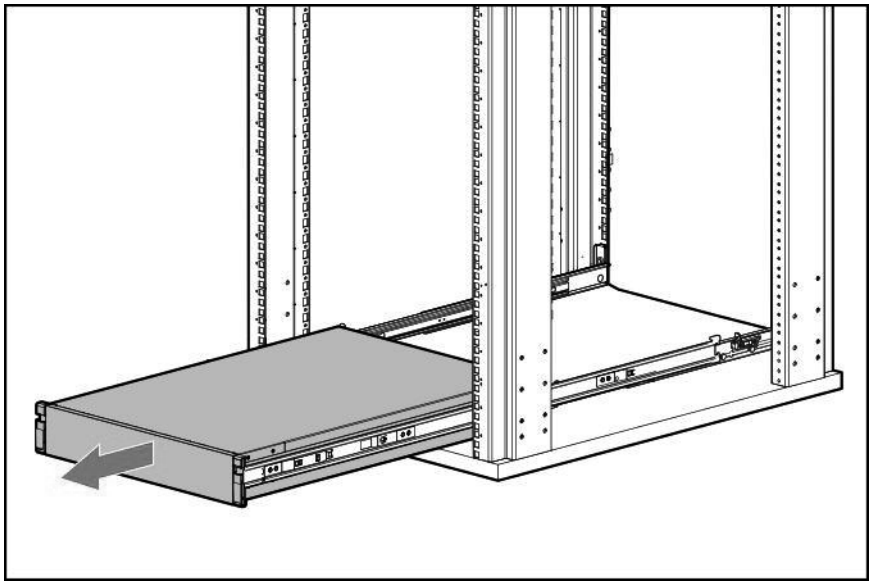


3. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. **WARNING:** To reduce the risk of personal injury, be careful when pressing the server rail-release latches. The inner rails could pinch your fingers.

   Press and hold the rear-end rail-release latches, and then slide the server out of the rack until it is fully extended.



6. Slide the server completely out of the rack.



7. Place the server on a flat, level work surface.

Remove the access panel

Prerequisites

Before you perform this procedure, make sure that you have a T-15 Torx screwdriver available.

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.

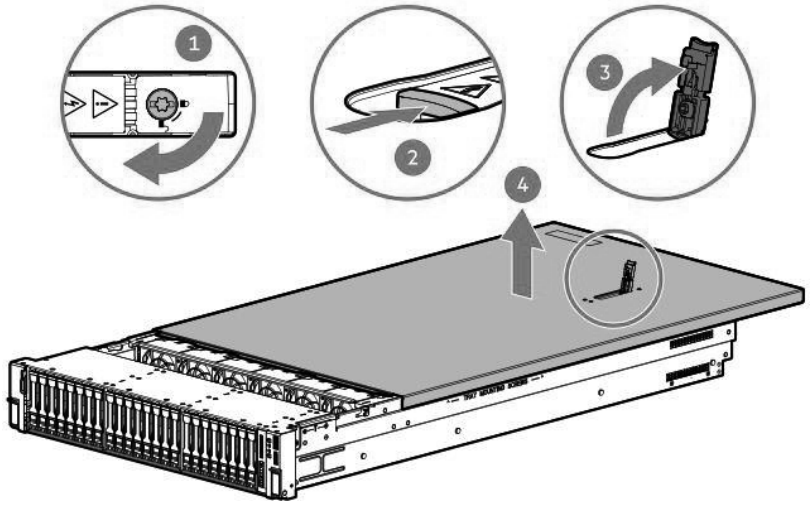
CAUTION: To prevent damage to electrical components, properly ground the server before beginning any installation, removal, or replacement procedure. Improper grounding can cause **electrostatic discharge**.

CAUTION: To maintain proper system cooling, do not operate the server for long period with the access panel open or removed. Operating the server in this manner results in an improper system airflow. For internal hot-plug component procedures, complete the procedure within 60 seconds. Failure to do so can cause the system temperature to increase and trip the safety threshold. When this happens:

- The health LED flashes amber.
- The operating system gracefully shuts down.

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. Disconnect all peripheral cables 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:
   a. If necessary, unlock the access panel latch.
   b. To disengage the access panel from the chassis, press the release button and pull up the latch.
   c. Lift the access panel.



Remove the air baffle

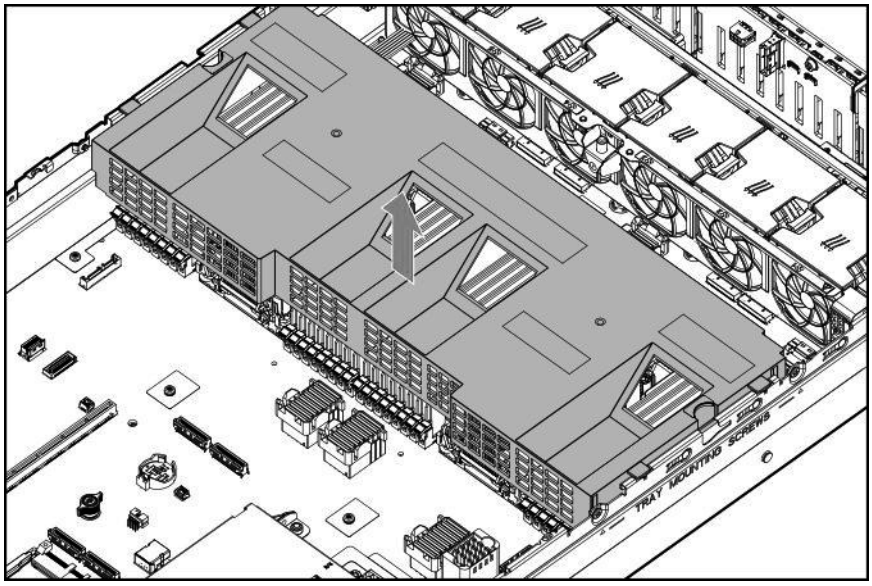
About this task

The air baffle must be installed in the dual-processor configuration.

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.

Procedure

1. **Power down the server**.
2. If installed, **open the cable management arm**.
3. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables 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 air baffle.



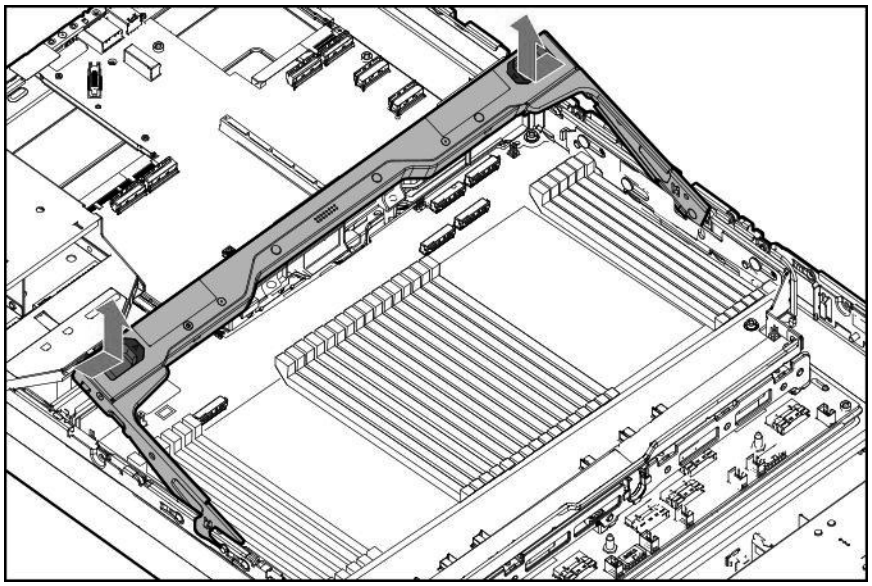
Remove the processor mezzanine tray

Prerequisites

Before you perform this procedure, make sure that you have a T-10 Torx screwdriver available.

Procedure

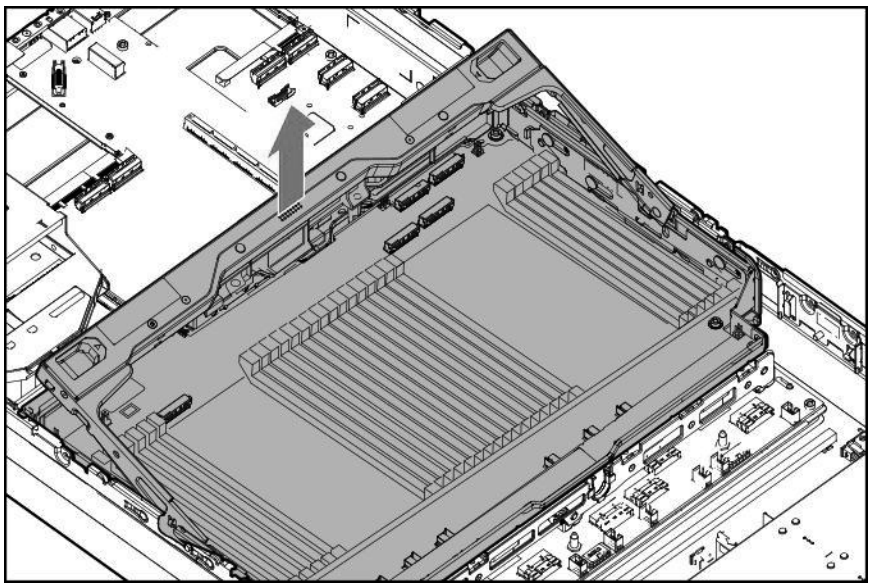
1. **Power down the server**.
2. If installed, **open the cable management arm**.
3. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. **Remove the server from the rack**.
6. Place the server on a flat, level work surface.
7. **Remove the access panel**.
8. Press the buttons to rotate the processor mezzanine tray handle to the fully open position.



9. Disconnect all cables from the processor mezzanine board.

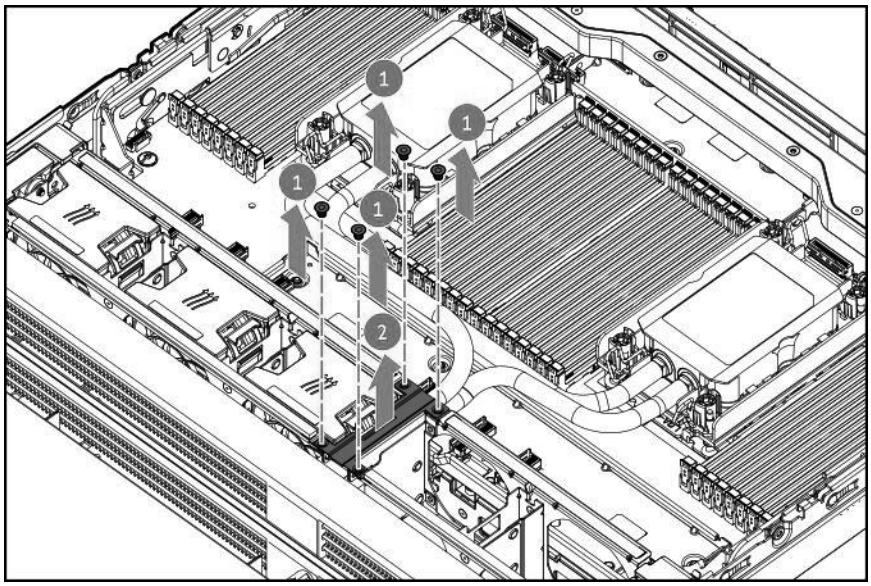
Removing the processor mezzanine tray in the air cooling configuration

10. **Remove the fan cage**.
11. Remove the processor mezzanine tray from the server.

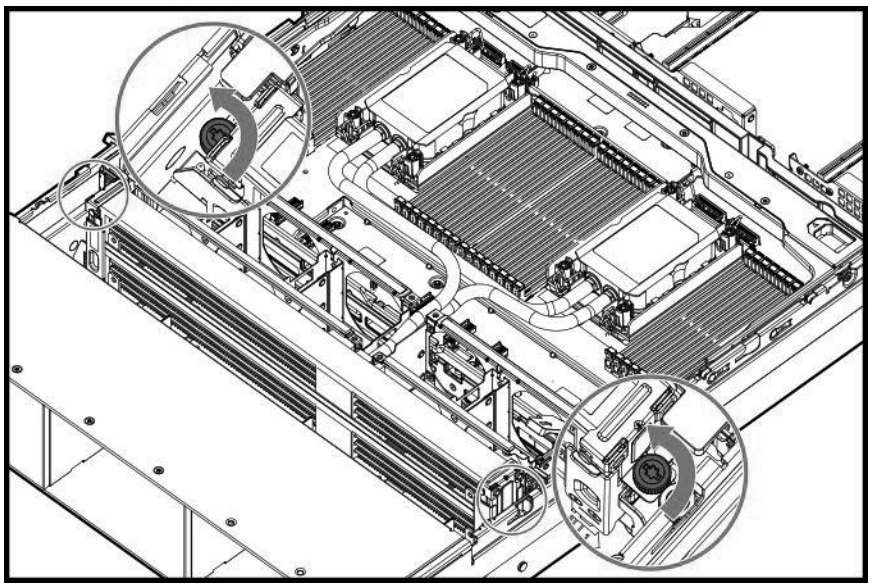


Removing the processor mezzanine tray in the liquid cooling configuration

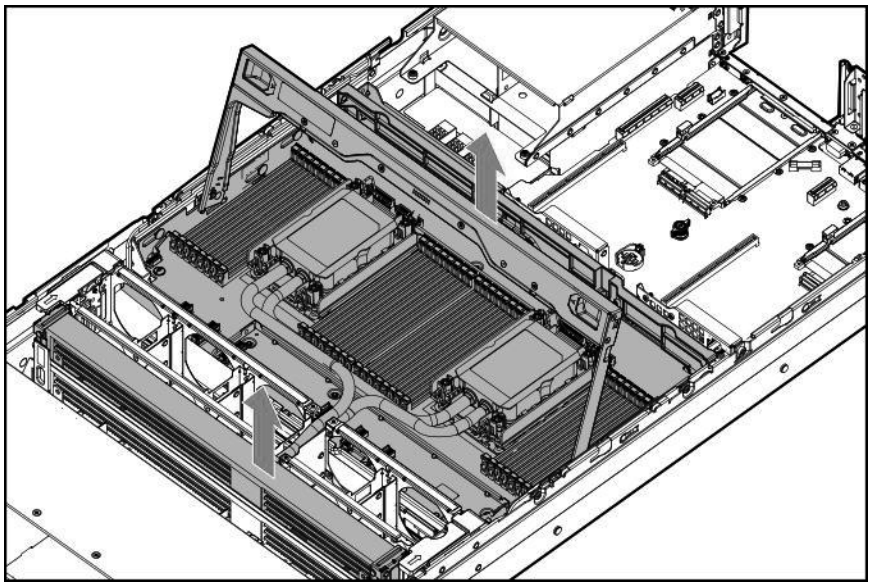
12. Remove the fan cage groove cover.



13. Loosen the radiator bracket screws.



14. Hold the tray handle and the top radiator with the brackets simultaneously to remove the top processor mezzanine tray from the server.



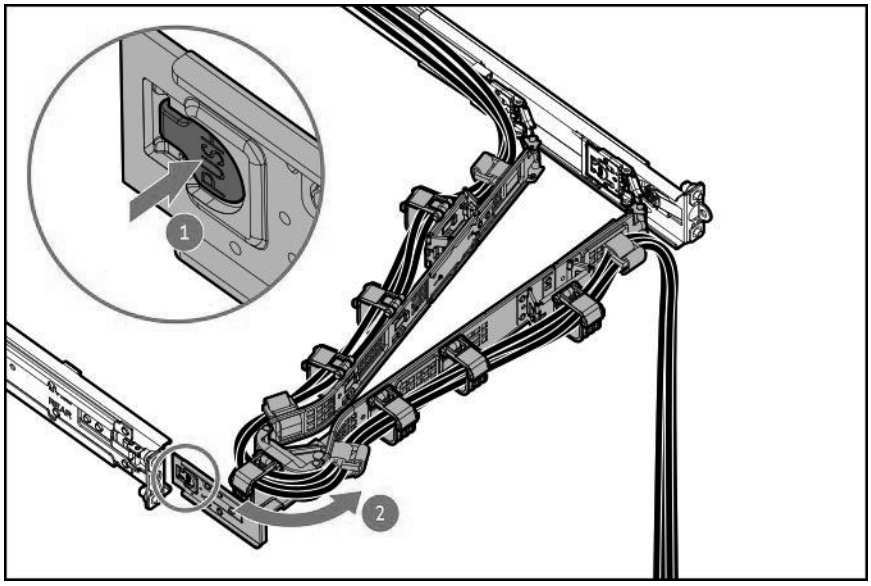
Remove the fan cage

Prerequisites

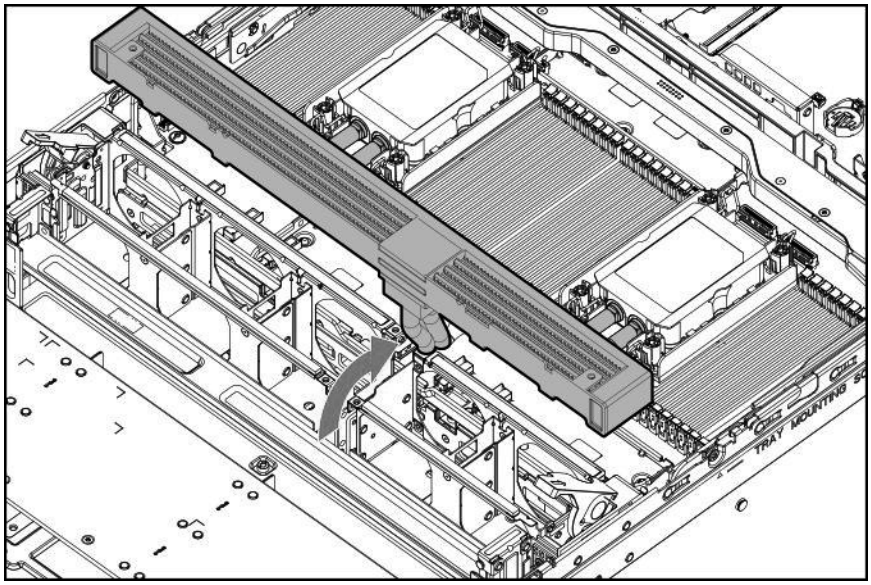
When the server is in the liquid cooling configuration, Hitachi Vantara recommends having at least two people to operate this procedure: One person to remove and hold the top radiator with its brackets to keep the coolant tubes out of the fan cage groove, and the other one to remove the fan cage from the server.

Procedure

1. **Power down the server**.
2. If installed, open the cable management arm.



3. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. **Remove the server from the rack**.
6. Place the server on a flat, level work surface.
7. **Remove the access panel**.
8. If the server is in the liquid cooling configuration, **remove the processor mezzanine tray**.
9. If the server is in the liquid cooling configuration, remove and hold the bottom radiator with its brackets gently to keep the coolant tubes out of the fan cage groove.

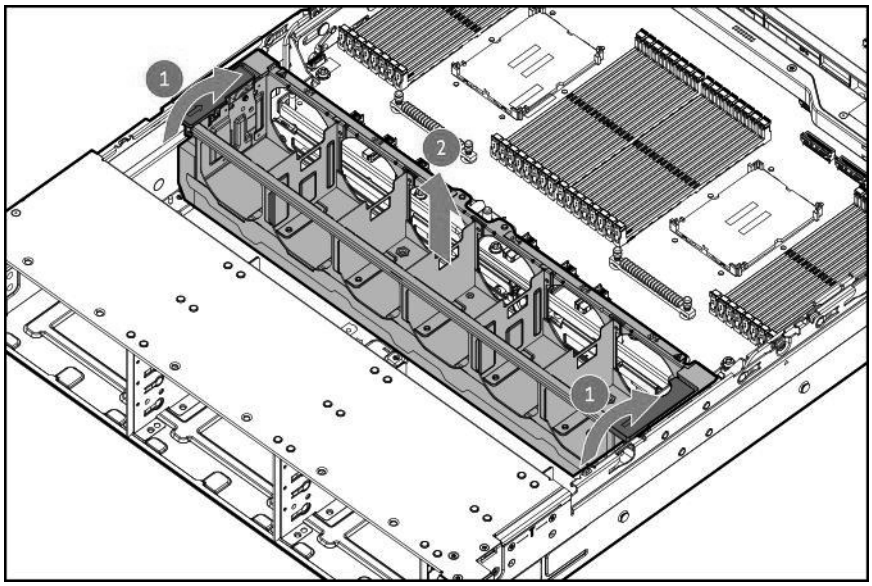


10. Remove the fan cage:

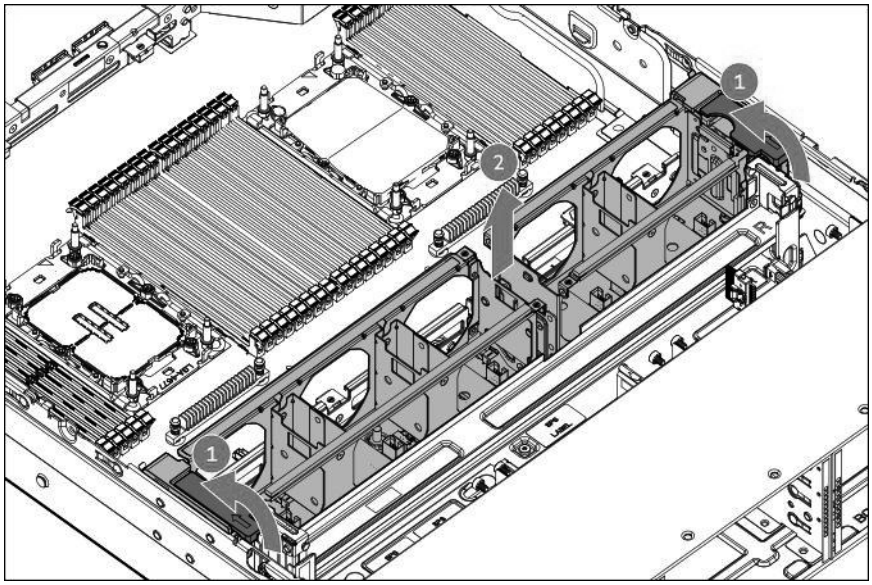
a. Open the fan cage latches (callout 1).

b. Remove the fan cage from the server (callout 2).

- Air cooling fan cage



- Liquid cooling fan cage



Remove the riser cage

Procedure

1. **Power down the server**.
2. If installed, **open the cable management arm**.
3. Remove all power:

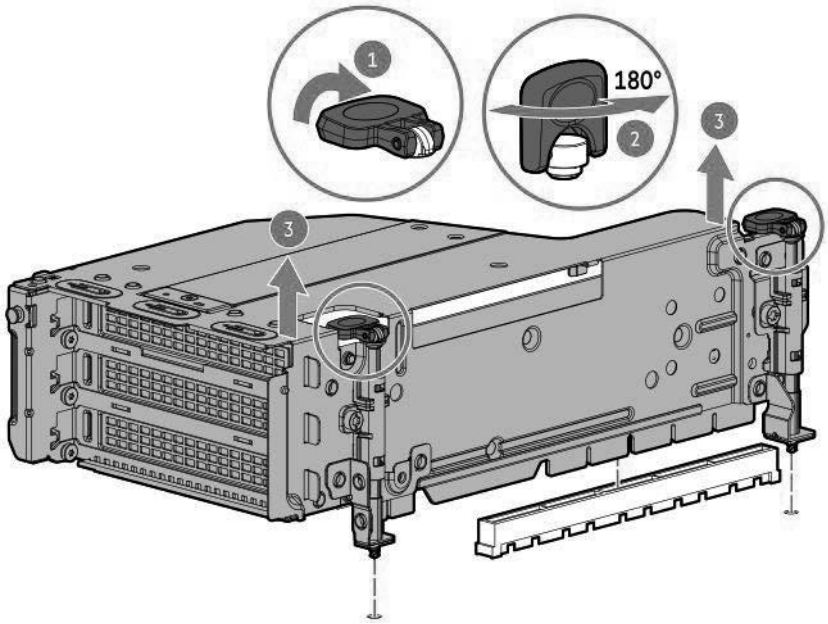
a. Disconnect each power cord from the power source.

b. Disconnect each power cord from the server.

4. Disconnect all peripheral cables from the server.
5. **Remove the server from the rack**.
6. Place the server on a flat, level work surface.
7. If an expansion card with internal cables is installed on the riser, disconnect all cables from the expansion card.
8. Remove the riser cage.

   a. Release the half-turn spring latch (callouts 1 and 2).

   b. Lift the riser cage off the system board (callout 3).



Installing the riser cage

Procedure

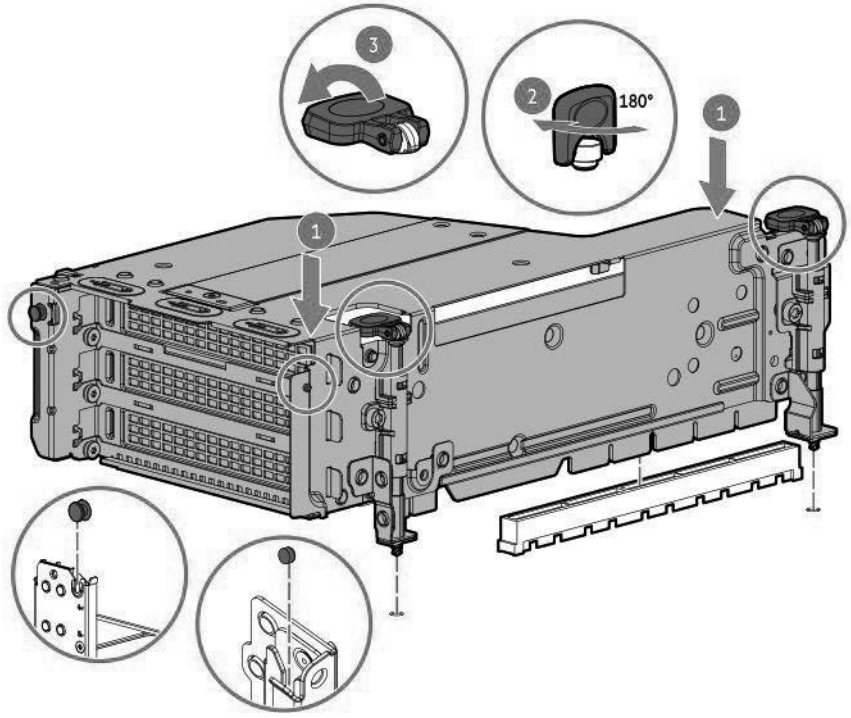
1. Install the riser cage.

   a. Carefully press the riser down on its system board connector (callout 1).
   Make sure that:

   - The riser cage is aligned with the rear chassis.
   - The riser board is firmly seated on the system board.

   b. Simultaneously push and rotate the half-turn spring latch to 180° (callout 2).

   c. Close the spring latch (callout 3).



2. **Install the access panel**.
3. Perform the post-installation or maintenance steps required by the procedure that necessitates the removal of the riser cage.

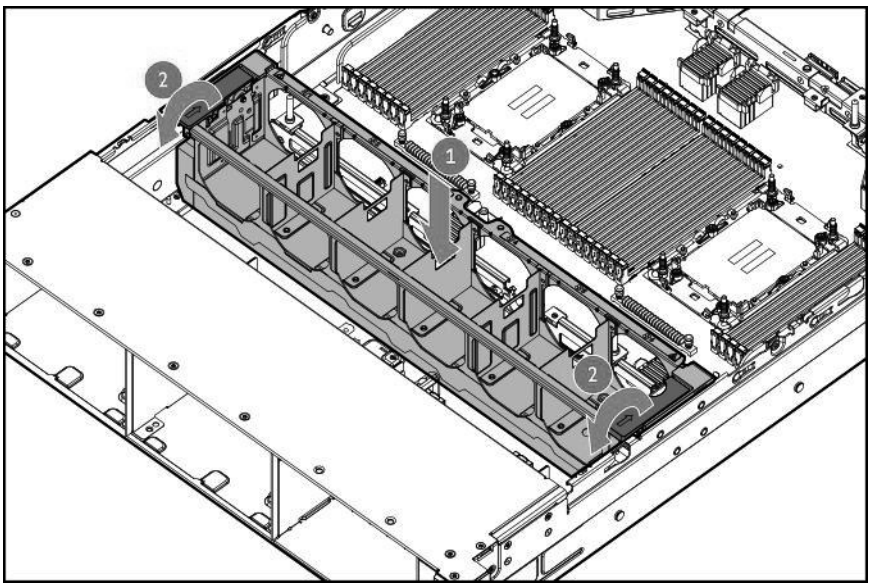
Install the fan cage

Prerequisites

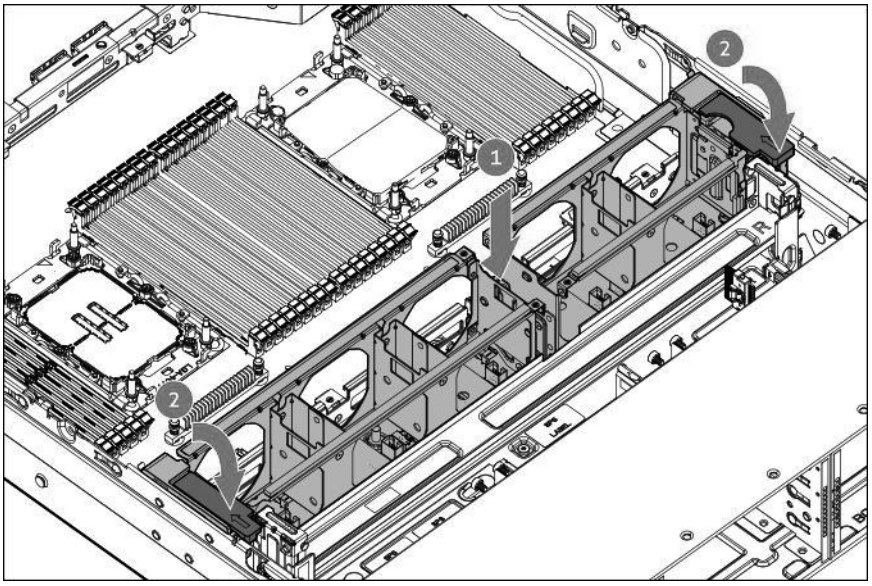
When the server is in the liquid cooling configuration, Hitachi Vantara recommends having at least two people to operate this procedure: One person to install the fan cage in the server, and the other one to hold and install the top radiator with its brackets to place the coolant tubes into the fan cage groove.

Procedure

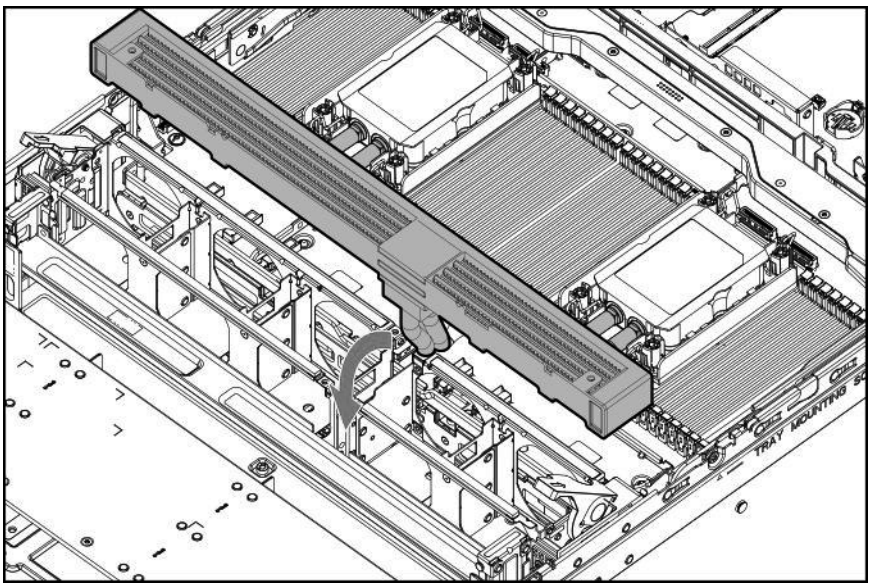
1. Install the fan cage.
   - Air cooling fan cage



- Liquid cooling fan cage



2. If removed, hold and install the bottom radiator with its brackets to place the coolant tubes into the fan cage groove.

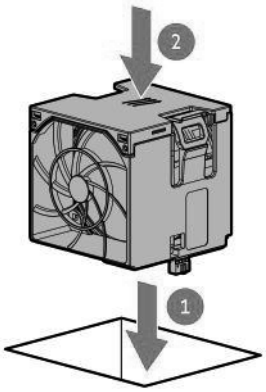


3. Install all fans:

   The installation procedures for air cooling and liquid cooling fans are the same. This procedure shows the installation step for the air cooling fan.

   a. Lower the fan into the bay (callout 1).

   b. Press down on the fan to make sure that it is seated firmly in the bay (callout 2). A click sound indicates that the fan is properly engaged.



4. **Install the processor mezzanine tray**.
5. **Install the access panel**.
6. Perform the post-installation or maintenance steps required by the procedure that necessitates the removal of the fan cage.

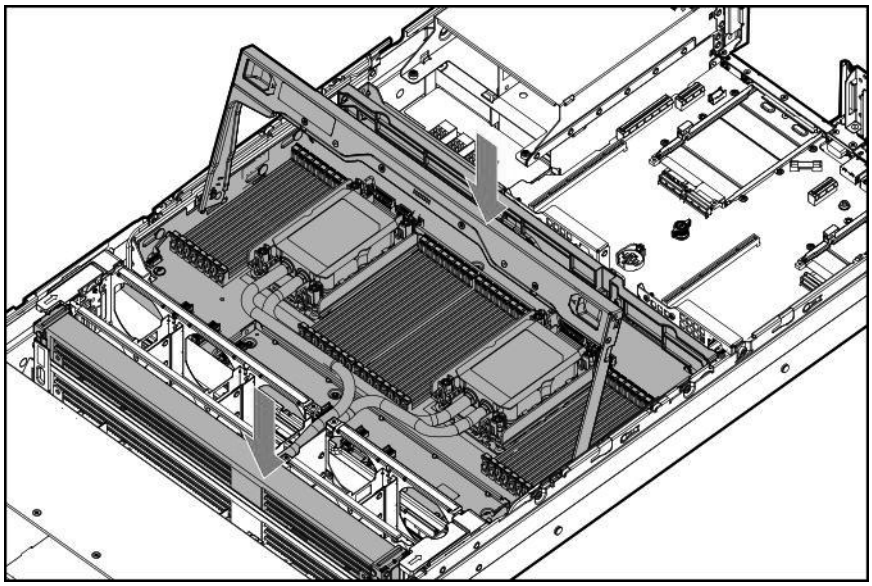
Install the processor mezzanine tray

Prerequisites

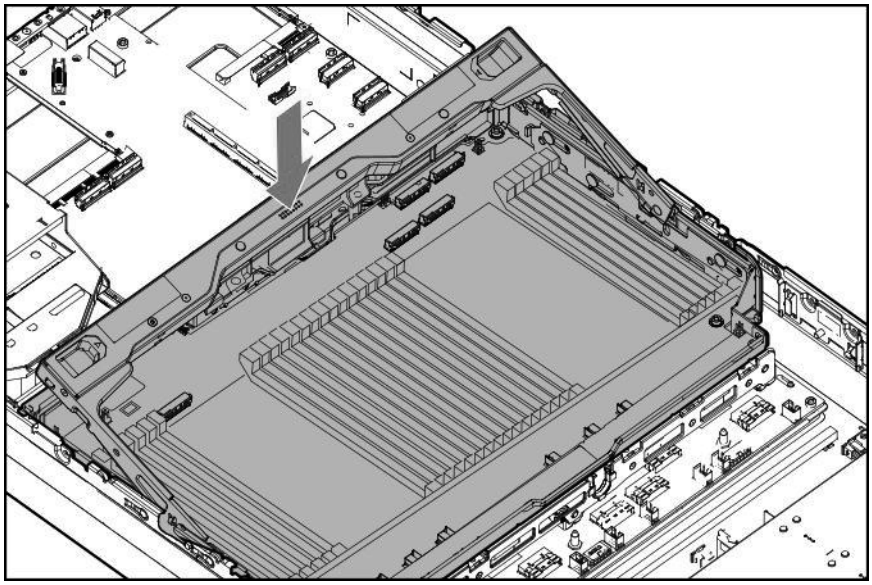
Before you perform this procedure, make sure that you have a T-10 Torx screwdriver available.

Procedure

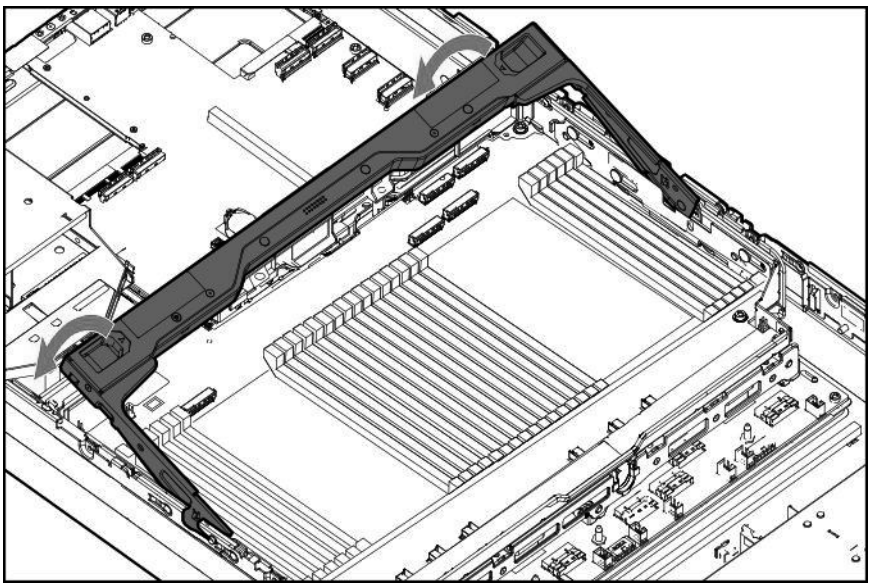
1. If the server is in the liquid cooling configuration, hold the tray handle and the top radiator simultaneously to install the top processor mezzanine tray in the server.



2. If the server is in the air cooling configuration, install the processor mezzanine tray.

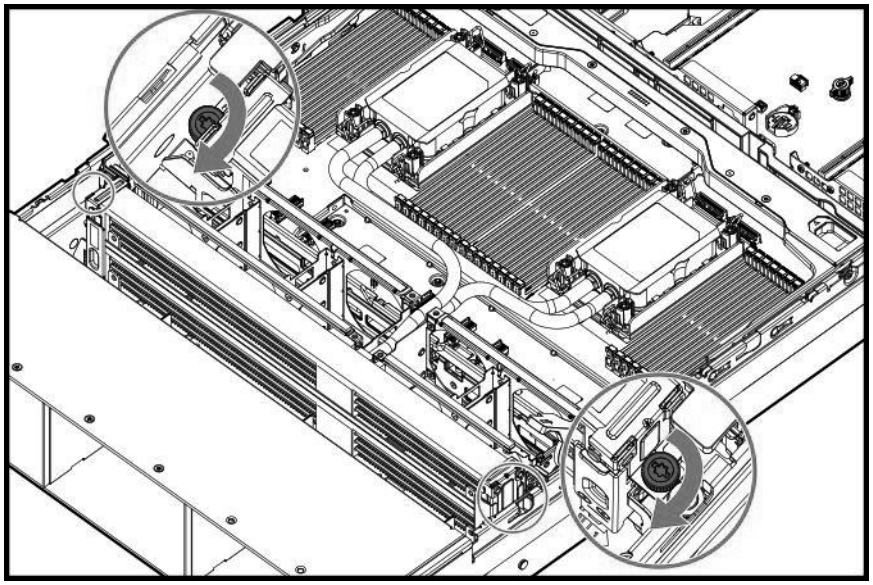


3. Connect all cables to the processor mezzanine board.
4. Press down on the processor mezzanine tray handle until it locks into place.

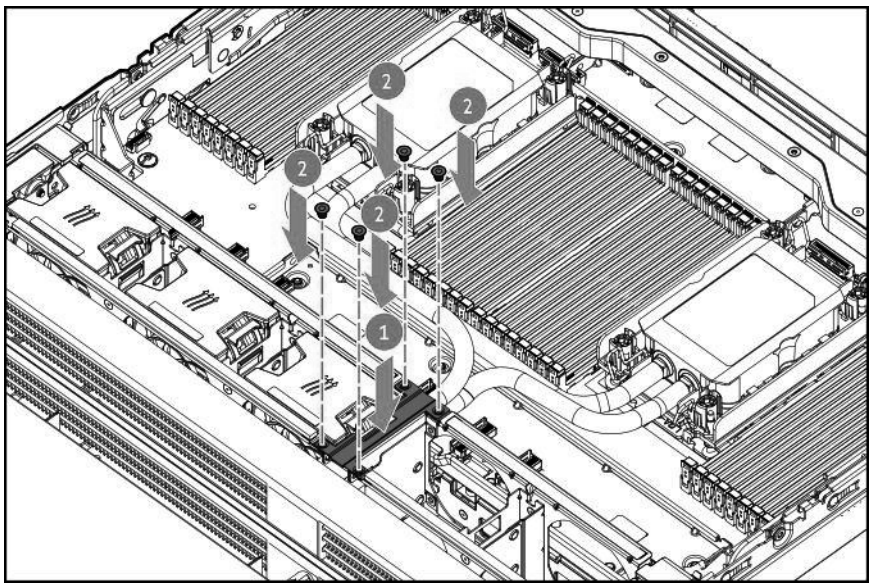


5. If the server is in the liquid cooling configuration:

   a. Install the radiator bracket screws.



   b. Install the fan cage groove cover.



6. **Install the access panel**.
7. Perform the post-installation or maintenance steps required by the procedure that necessitates the removal of the processor mezzanine tray.

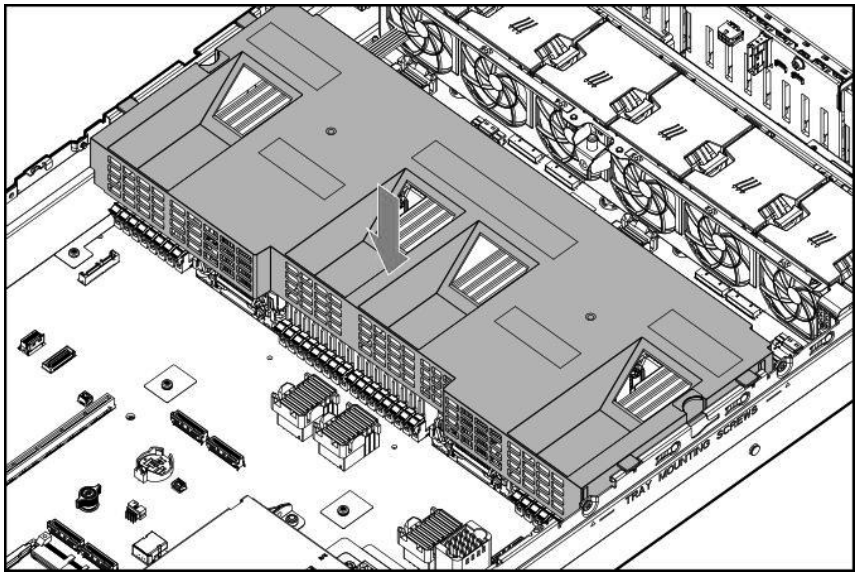
Install the air baffle

About this task

The air baffle must be installed in the dual-processor configuration.

Procedure

1. Make sure that all internal cables have been properly routed and will not interfere with the air baffle installation.
2. Lower the air baffle into the chassis and make sure that it fits properly into place.



3. **Install the access panel**.
4. Perform the post-installation or maintenance steps required by the procedure that necessitates the removal of the air baffle.

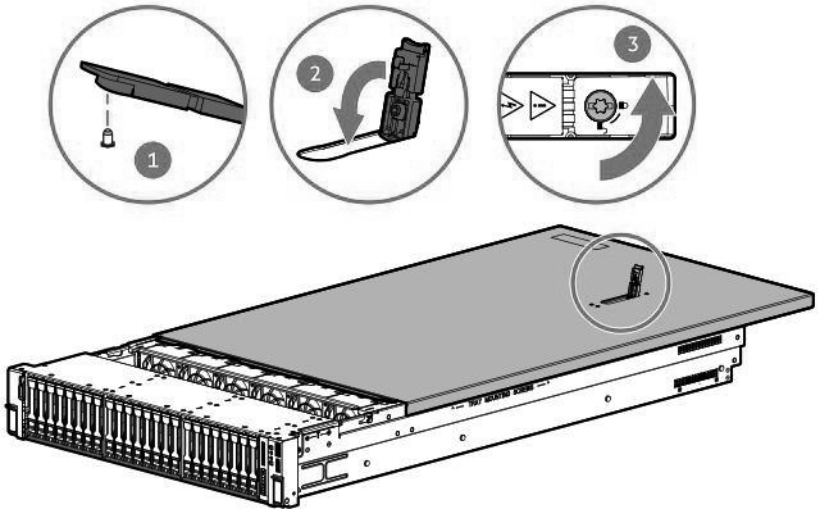
Install the access panel

Prerequisites

Before you perform this procedure, make sure that you have a T-15 Torx screwdriver available.

Procedure

1. With the access panel latch open, insert the guide pin on the chassis through the hole on the bottom side of the latch.
2. Close the access panel latch.
   The access panel slides to the closed position.
3. Lock the access panel latch.



4. Perform the post-installation or maintenance steps required by the procedure that necessitates the removal of the access panel.

Install the server into the rack

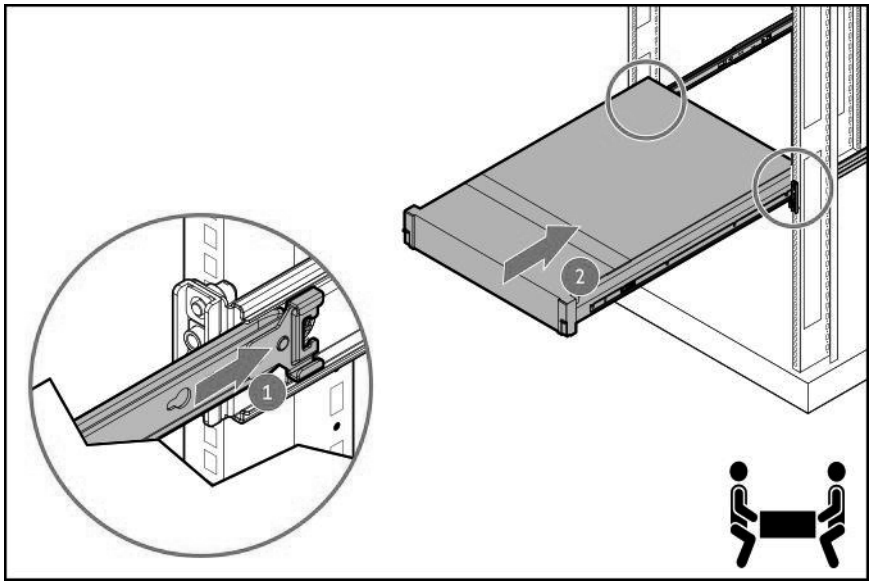
Prerequisites

- Get help to lift and stabilize the server during rack installation. **If the server is installed higher than chest level, an additional person might be required to help install the server:** One person to support the server weight, and the other to slide the server into the rack.
- Before you perform this procedure, review the:
  - **Rack warnings and cautions**
  - **Server warnings and cautions**

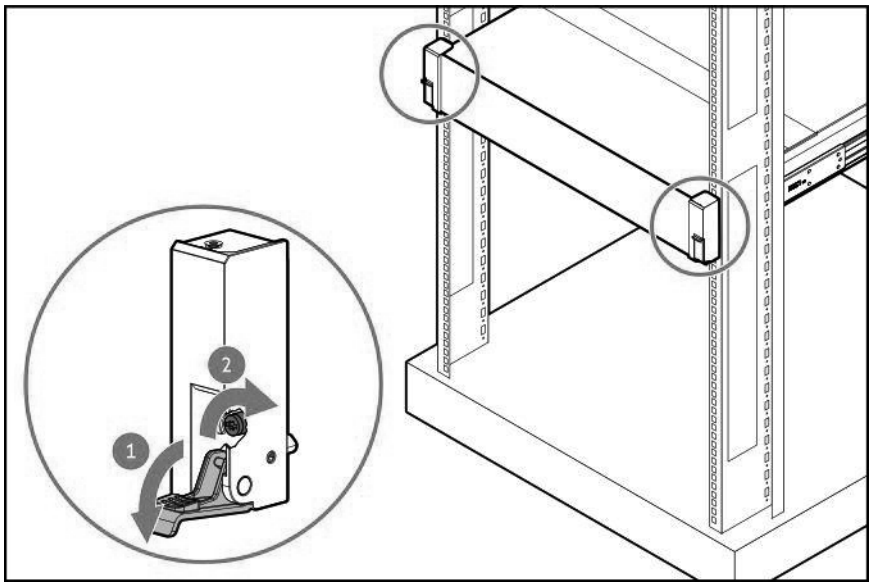
- A fully populated server is heavy. Hitachi Vantara recommends removing the external chassis components before removing the server from the rack.
- T-25 Torx screwdriver—This tool is required if you intend to lock the shipping screws located inside the chassis ears.

Procedure

1. Install the server into the rack:
   a. Insert the inner rails into the slide rails.
   b. Slide the server into the rack until the chassis ears are flush against the rack posts.



2. Open the chassis ears, and then tighten the shipping screws.



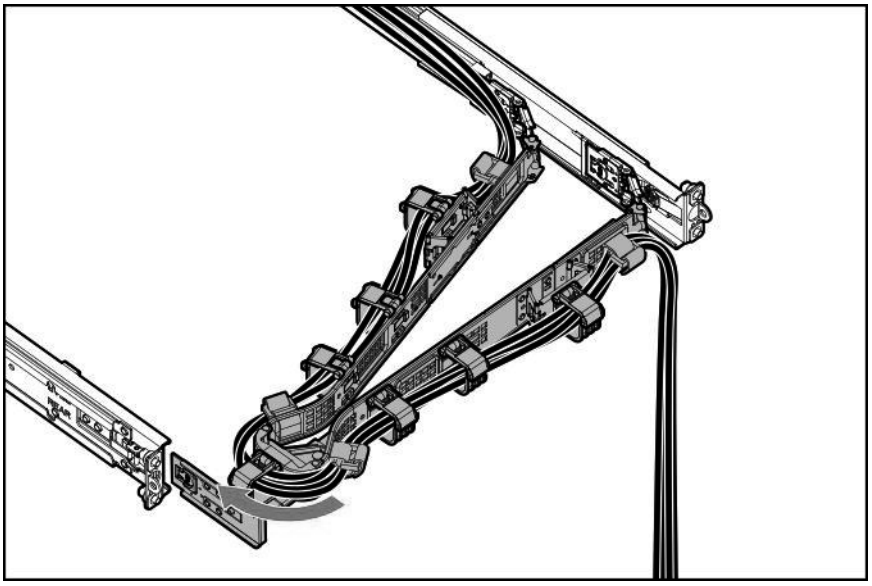
3. Connect all peripheral cables to the server.
4. Connect the power cords:

a. Connect each power cord to the server.

b. Connect each power cord to the power source.

5. If the cable management arm was opened, swing the arm back into the closed position and insert the CMA retention bracket to the mounting rail.

   Make sure that an audible click to indicate that the bracket is locked into place.



Power up the server

Procedure

- Press the Power On/Standby button.
- Use the virtual power button through iLO 6.

Hardware options installation

This chapter provides instructions for installing supported hardware options. To ensure proper server deployment and operation, Hitachi Vantara recommends installing only Hitachi Vantara-validated hardware options. To see the list of validated options for this server, contact customer support.

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, see the UEFI user guide (**docs.hitachivantara.com)**).
  - 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,the Hitachi Advanced Server HA800 G3 Series iLO 5 User Guide (**docs.hitachivantara.com**).
  - iLO license
  - Customer iLO user name, password, and DNS name
  - iLO configuration settings
- For servers managed by UCP Advisor for Compute Management, make sure that you have your account ID. For more information, contact customer support.

Hardware option installation guidelines

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 avoid data loss, Hitachi Vantara recommends that you **back up all server data** before installing or removing a hardware option, or performing a server maintenance or troubleshooting procedure.

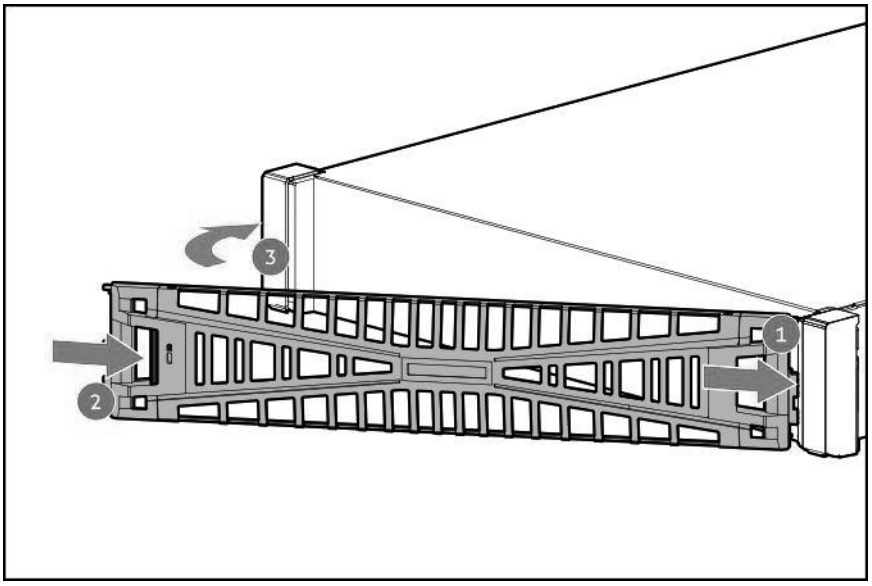
CAUTION: To prevent damage to electrical components, properly ground the server before beginning any installation, removal, or replacement procedure. Improper grounding can cause **electrostatic discharge**.

- 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.
- If the hardware option installation involves internal cabling, review the **Cabling guidelines**.

Installing the front bezel option

Procedure

1. Attach the front bezel to the right chassis ear.
2. Press and hold the front bezel release latch.
3. Close the front bezel.



4. (Optional) Install the Kensington security lock.
   For more information, see the lock documentation.

The installation is complete.

Drive options

Depending on the drive backplane installed, the server supports the following drive types:

Hot-plug SFF SAS, SATA, and U.3 PCIe4 NVMe drives

To support hardware RAID, **install a storage controller option**.

Drive installation guidelines

Observe the following general guidelines:

- The system automatically sets all drive numbers.

  CAUTION: When a server is purchased without any drive installed, some drive bays might be empty while other drive bays might be populated with drive blanks. To maintain proper system cooling, do not operate the server without a drive or a drive blank installed.

- If only one drive is used, install it in the bay with the lowest drive number.

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

- This server does not support mixed drive types in the same drive box.
- When installing NVMe drives, install all U.3 drives. Mixed NVMe type installation is not supported.
- All drives grouped into the same drive array must meet the following criteria:
  - They must be either all hard drives or all solid-state drives.
  - Drives must be the same capacity to provide the greatest storage space efficiency.

Installing a SAS, SATA or NVMe drive

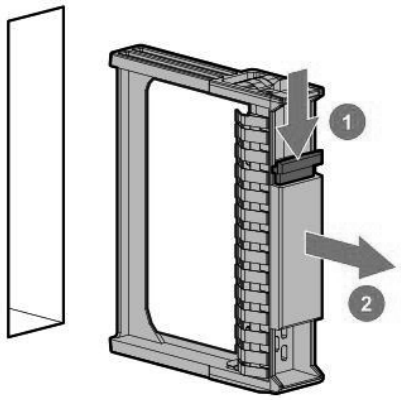
About this task

CAUTION: A discharge of static electricity from a finger or other conductor might damage system boards or other static-sensitive devices. To prevent damage, observe **antistatic precautions**.

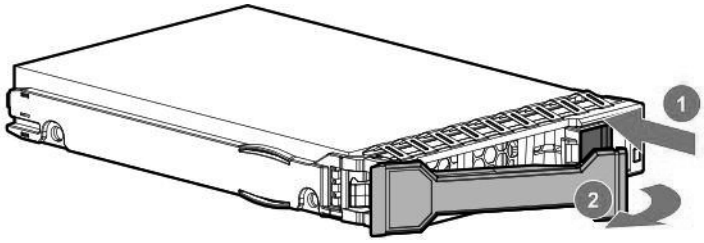
CAUTION: To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

Procedure

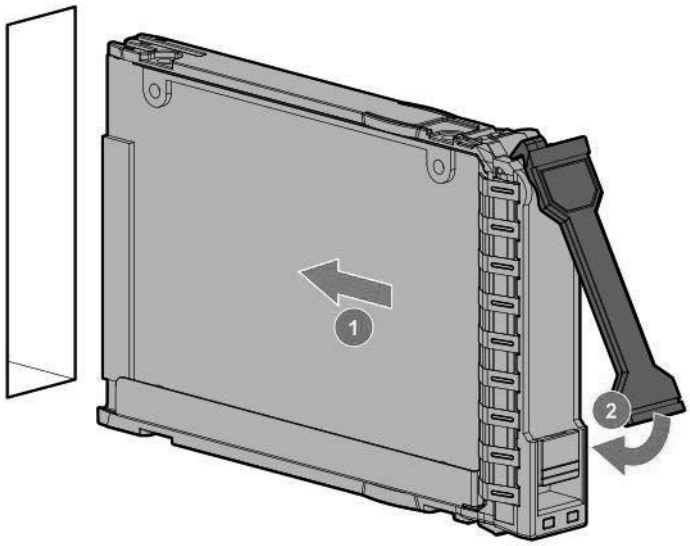
1. If installed, **remove the front bezel**.
2. Remove the drive blank.
   Retain the blank for future use.



3. Prepare the drive.



4. Install the drive.



5. **Determine the status of the drive from the drive LED definitions**.
6. If removed, **install the front bezel**
7. To configure drive arrays, see the **relevant storage controller guide**.

The installation is complete.

Rack mounting options

Use the quick-deploy, toolless Hitachi Vantara rack rail option to install the server in a standard four-post rack. The rail design supports installation on rack 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**

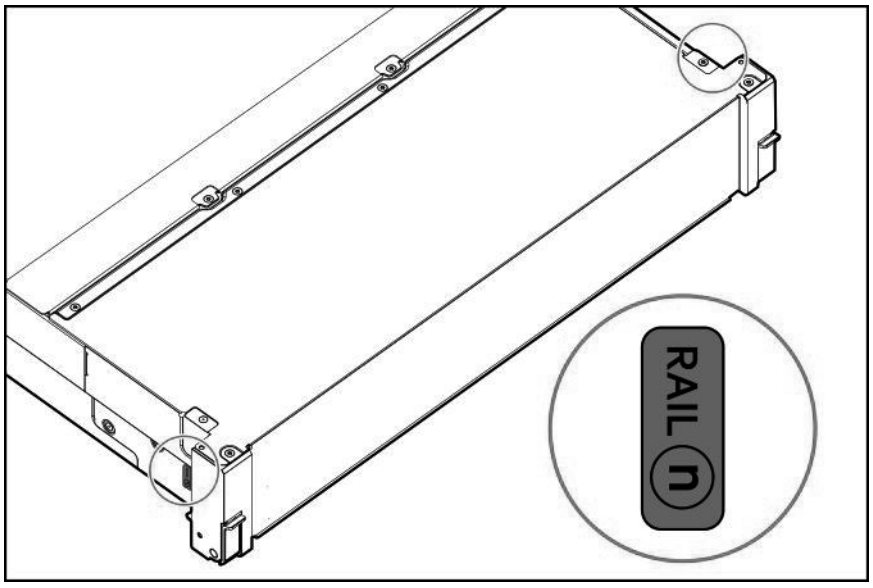
Rail identification markers

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

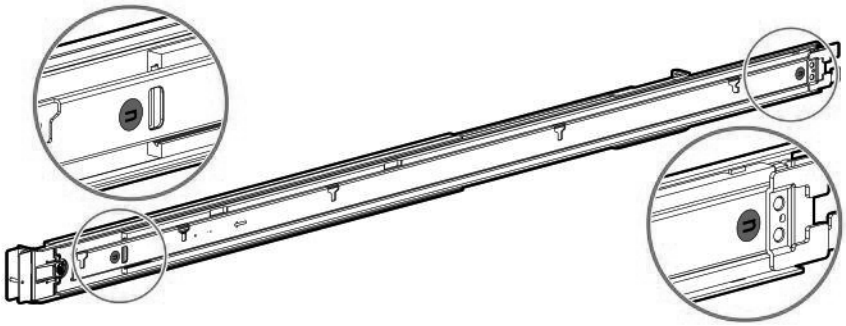
- The height and weight of the chassis as determined by the front- and rear-end server configurations.
- The depth of the chassis as measured from the edge of the front panel (without the front bezel) to the edge of the rear panel.

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.

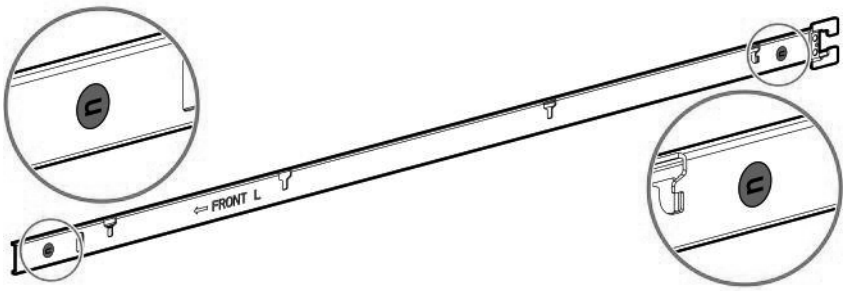
- Rail number labels on the chassis



- Rail identifier stamps on the short ball-bearing rail

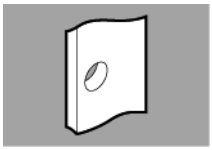
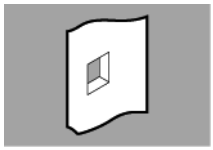
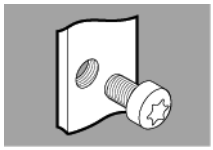


- Rail identifier stamps on the long ball-bearing rail



Rack mounting interfaces

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

		
Round-hole	Square-hole	Threaded round-hole

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.

Rack rail option

This server supports the rack rail option #8.

For more information, see **installing the ball-bearing rack rail**.

Installing the ball-bearing rack rail

Prerequisites

- **Make sure that the rail option is compatible with the server configuration**.
- Small slotted screwdriver—This tool is required if you intend to install the server in a threaded round-hole rack.

About this task

WARNING: To reduce the risk of personal injury or equipment damage, do one of the following:

- Use two or more people to lift and stabilize the product pieces during assembly.
- Use a lift that can handle the load of the product.

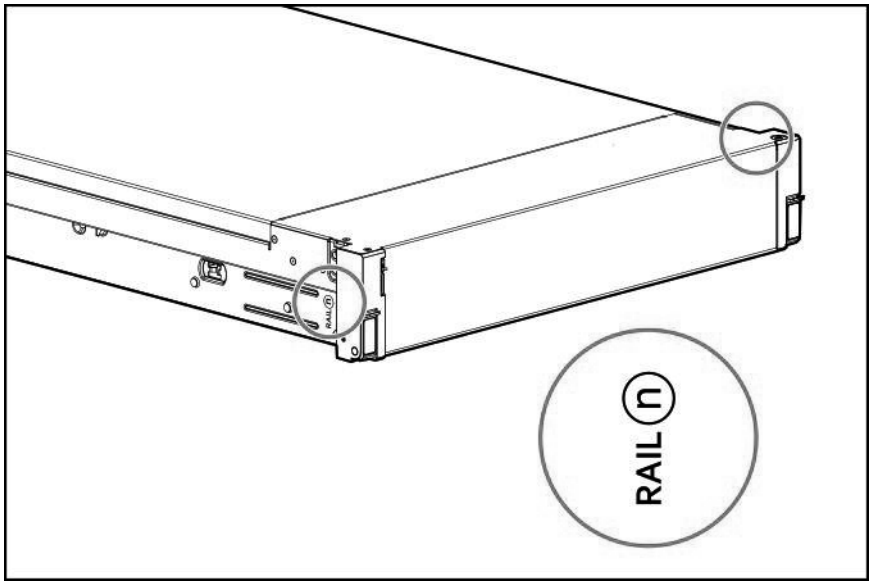
WARNING: To reduce the risk of personal injury or equipment damage, be sure that the rack is adequately stabilized before installing the rack.

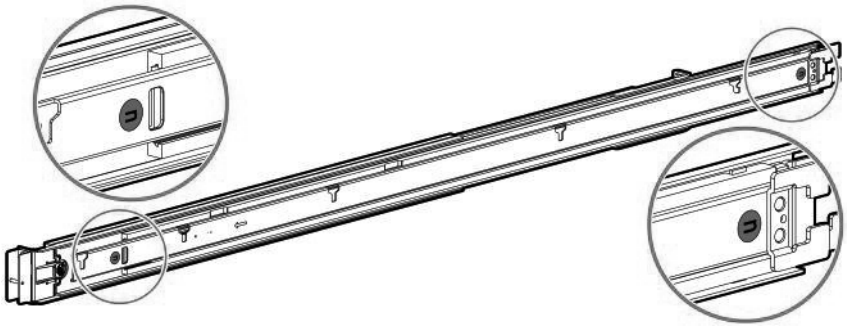
CAUTION: Always plan the rack installation so that the heaviest item is on the bottom of the rack. Install the heaviest item first, and continue to populate the rack from the bottom to the top.

CAUTION: Be sure to keep the product parallel to the floor when installing the rack. Tilting the product up or down could result in damage to the slides.

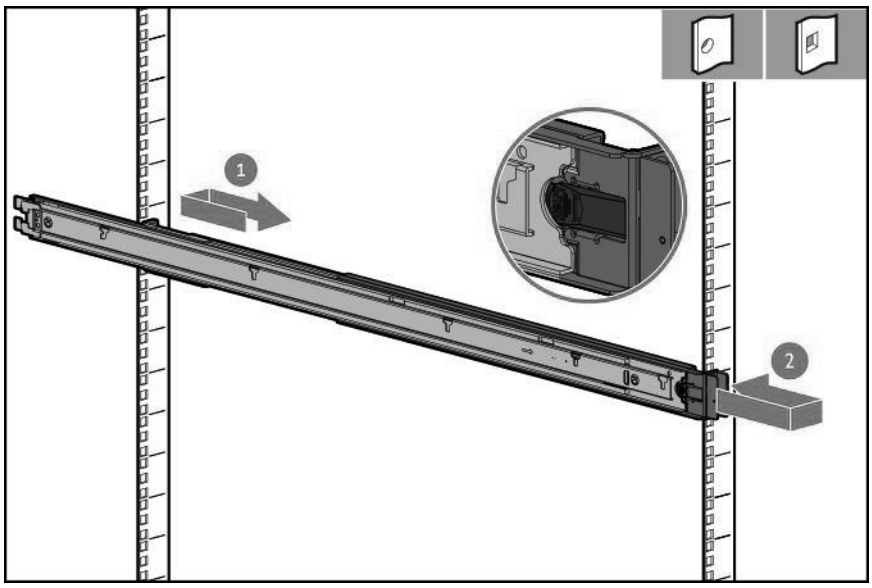
Procedure

1. Verify the rail identifiers match on the server and rails.

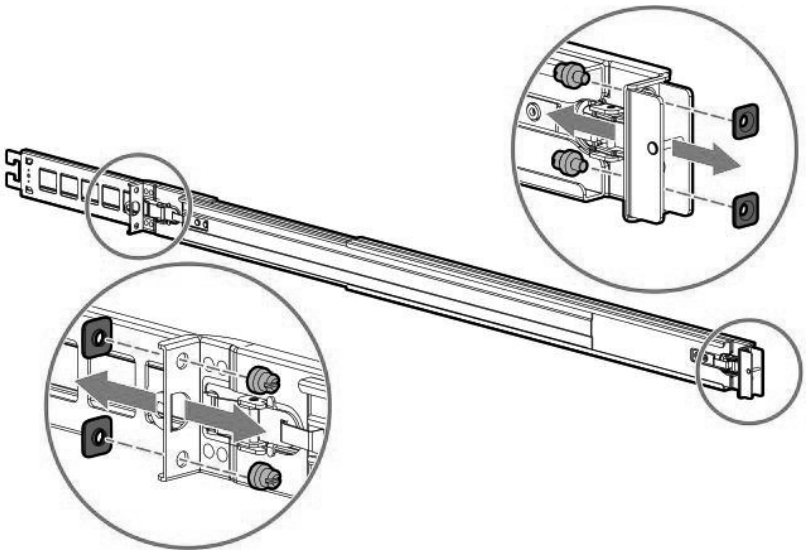


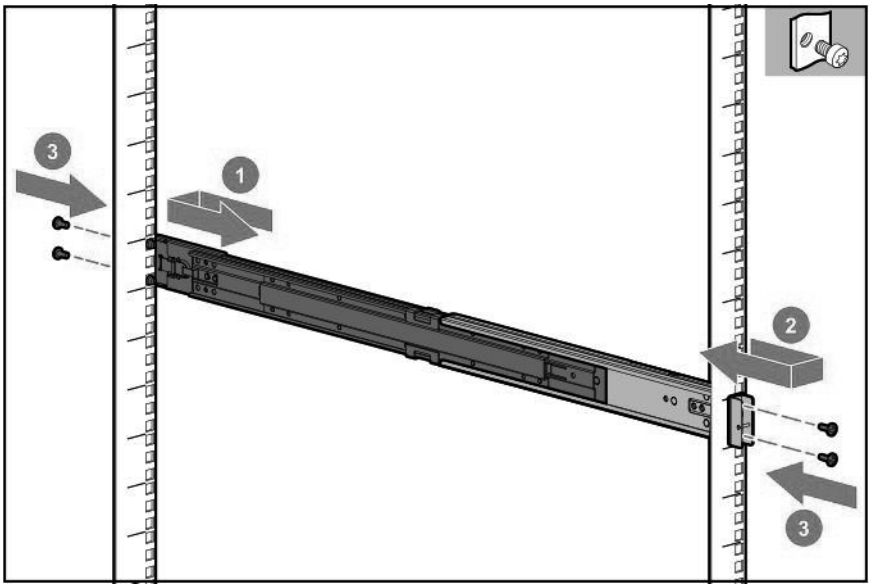


2. Install the rack rails.
   - For round and square-hole racks

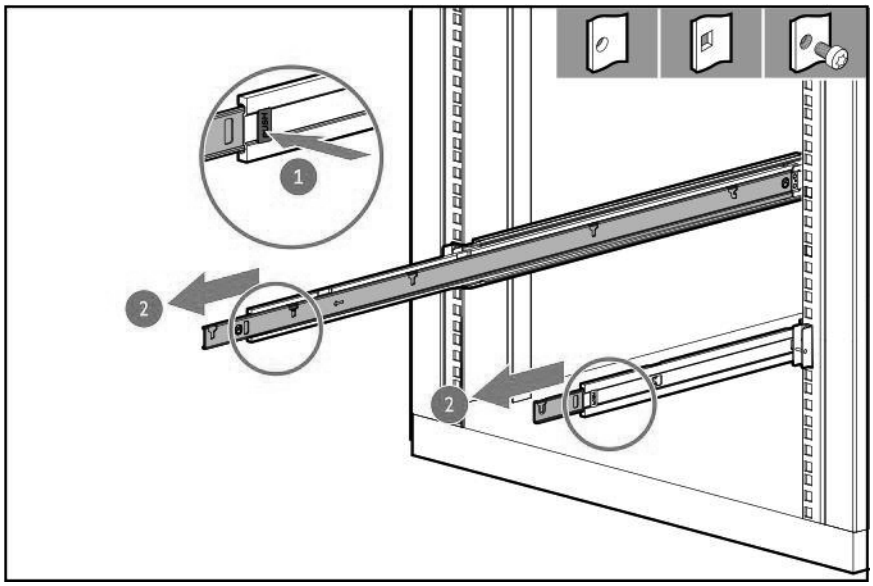


- For threaded-hole racks





3. Fully extend the rails to the locked position.



Installing the server into the rack

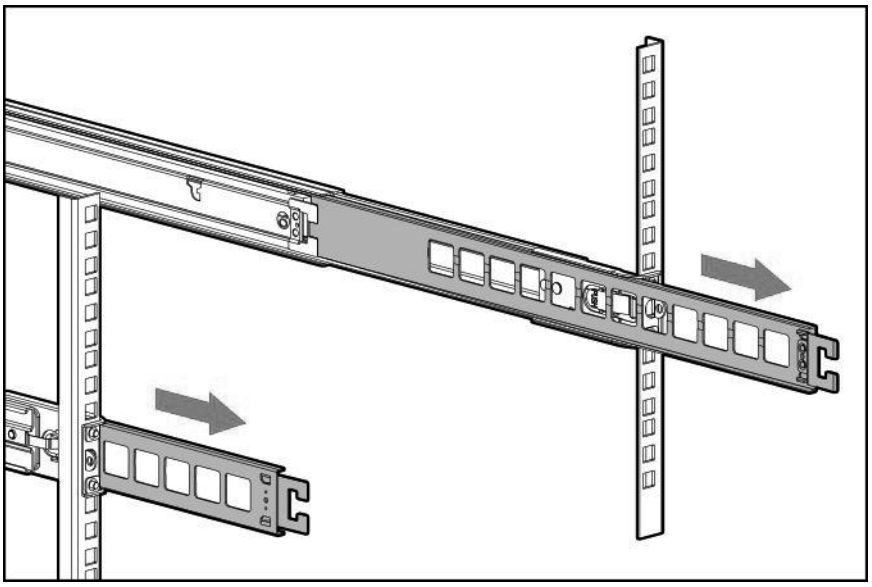
Prerequisites

- Get help to lift and stabilize the server during rack installation. **If the server is installed higher than chest level, an additional person might be required to help install the server:** One person to support the server weight, and the other to slide the server into the rack.
- Before you perform this procedure, review the:
  - **Space and airflow requirements**
  - **Rack warnings and cautions**
  - **Server warnings and cautions**

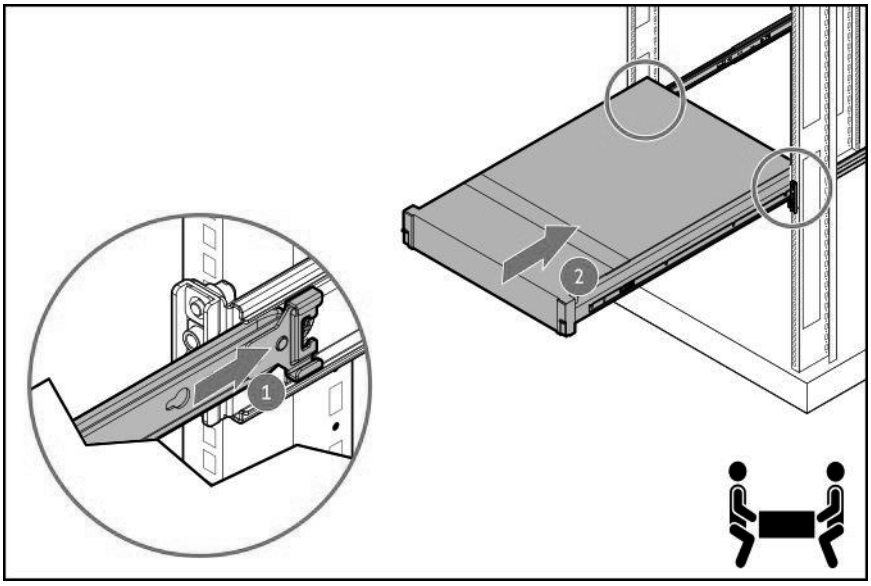
- A fully populated server is heavy. Hitachi Vantara recommends removing the external chassis components before installing the server into a rack.
- Before you perform this procedure, make sure that you have a T-25 Torx screwdriver available.

Procedure

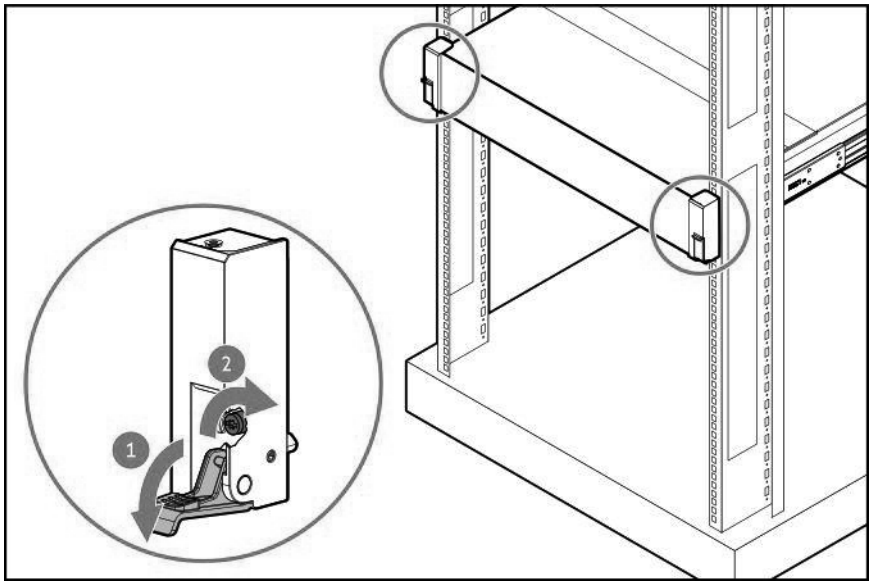
1. Extend the slide rails out on the mounting rails until they hit the internal stops and lock into place.



2. Install the server into the rack:
   a. Insert the inner rails into the slide rails.
   b. Slide the server into the rack until the chassis ears are flush against the rack posts.



3. Open the chassis ears, and then tighten the shipping screws.



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.

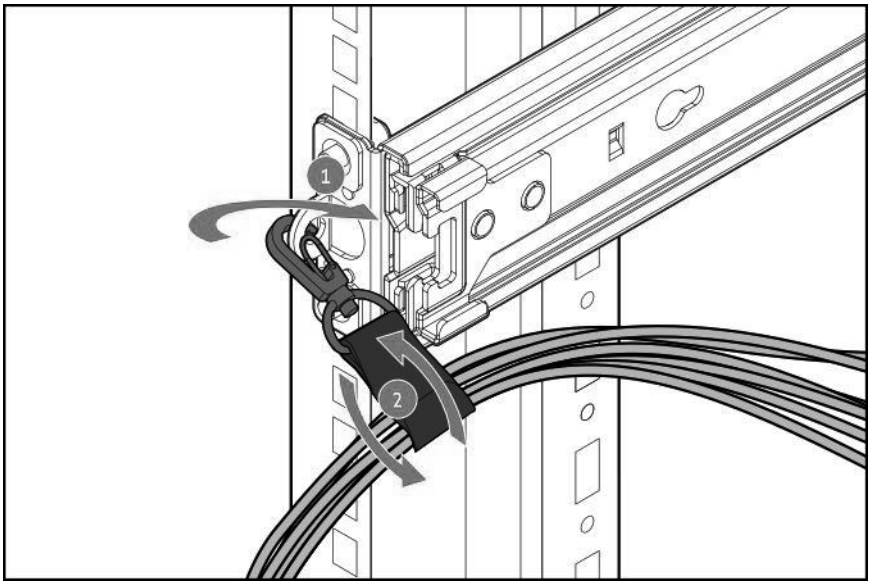
Installing the rack rail hook-and-loop strap

About this task

If you do not require in-rack serviceability for your rackmounted 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 rackmounting rail.

Procedure

1. Attach the strap carabiner to the rackmounting 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**.
- T-25 Torx screwdriver—This tool is required if the shipping screws located inside the chassis ears need to be loosened or tightened.

About this task

The cable management arm (CMA) allows the server to be fully extended from the rack without the need to power off the system or disconnect any rear panel cables. This CMA is designed for ambidextrous implementation.

For the purpose of this procedure, left and right terminology is from the perspective of a user facing the front of the rack.

CAUTION: Support the CMA during the removal and replacement procedures. Do not allow the CMA to hang by its own weight during the procedure.

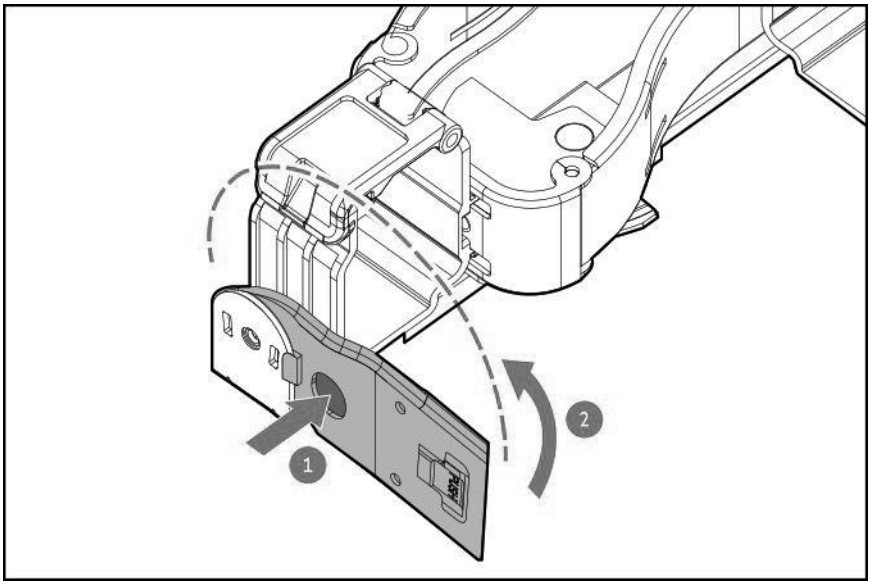
Procedure

1. Connect and secure all peripheral cables and power cords to the rear panel.
2. (Optional) The CMA retention bracket can be rotated to fit a left- or right-hand CMA operation. Press and hold the rotate mechanism, and then rotate the bracket 180°.

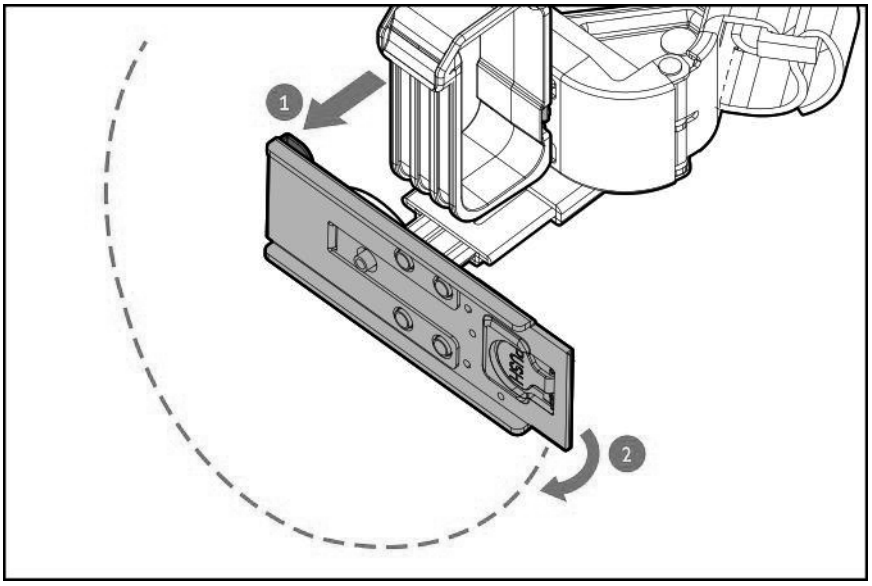
   There will be an audible click to indicate that the bracket is locked in its adjusted position.

   The direction of the bracket rotation will differ depending on the CMA moduel that you are using:

   - CMA with a rotate button



- CMA with a rotate latch

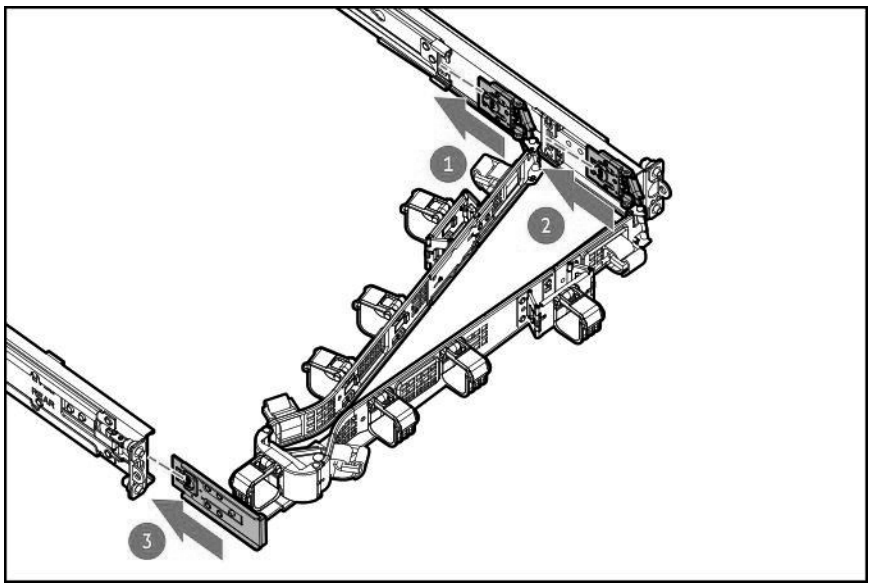


3. Connect the CMA hinged tabs and retention bracket to the rack rails:

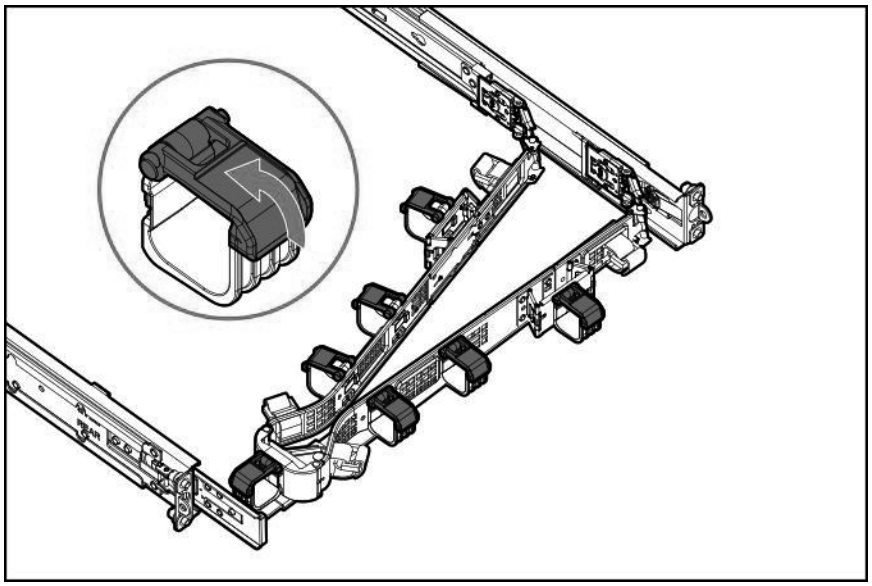
a. Insert the inner tab into the slide rail.

b. Insert the outer tab into the mounting rail.

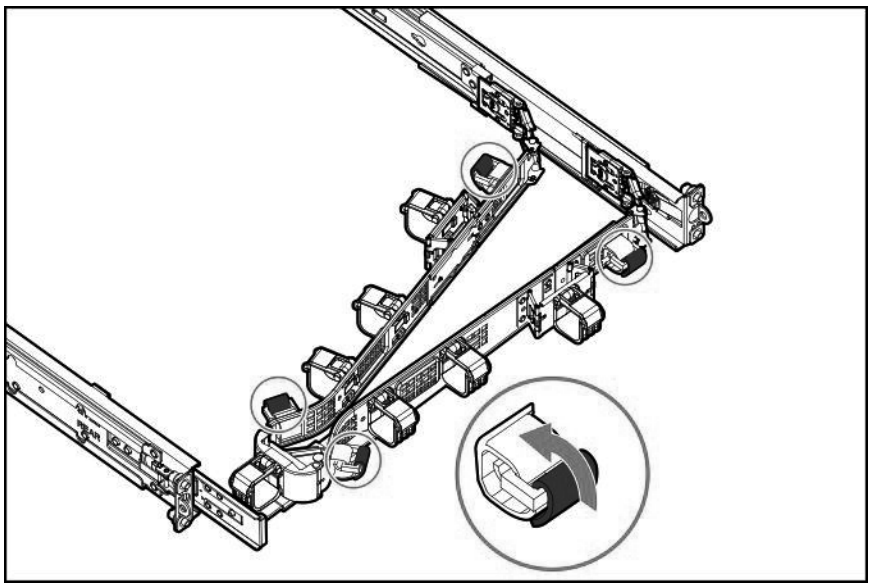
c. Insert the retention bracket into the opposite mounting rail.
There will be an audible click to indicate that the tabs and bracket are locked into place.



4. Open the cable clamps.



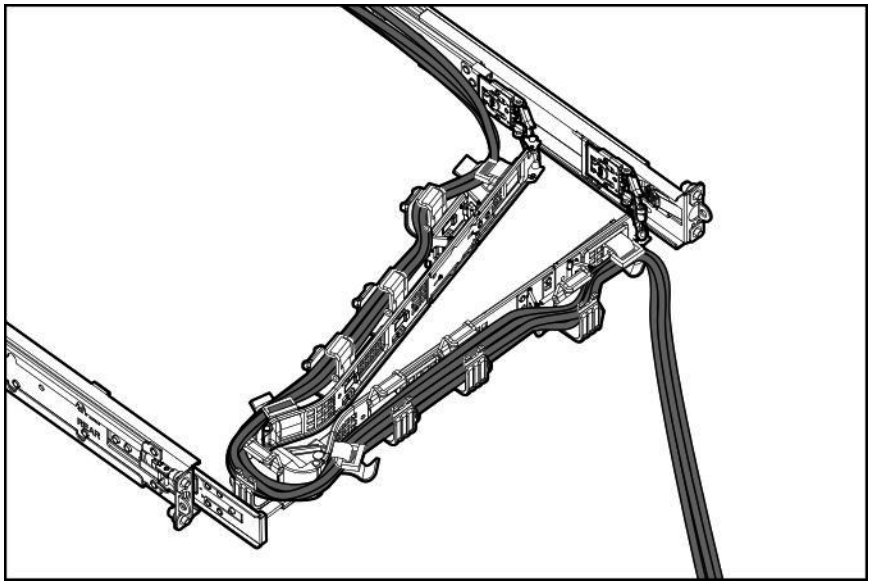
5. (Optional) If your CMA has cable straps for additional cable strain relief, unwrap the straps.



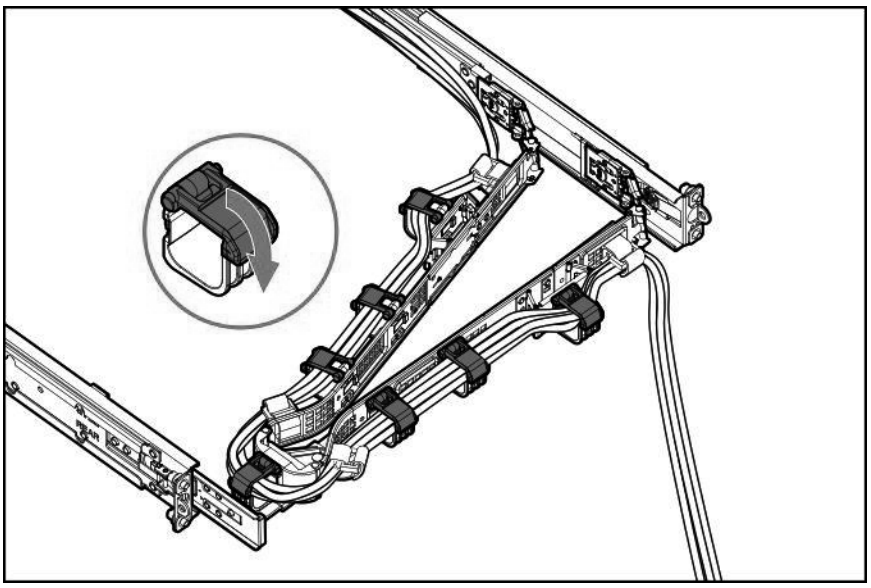
6. **CAUTION:** Employ industry best practices in managing peripheral cables and power cords secured in the CMA. These are some of the more important points:

   - 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 rack.
   - 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 rack when the server is extended from or returned to the rack.

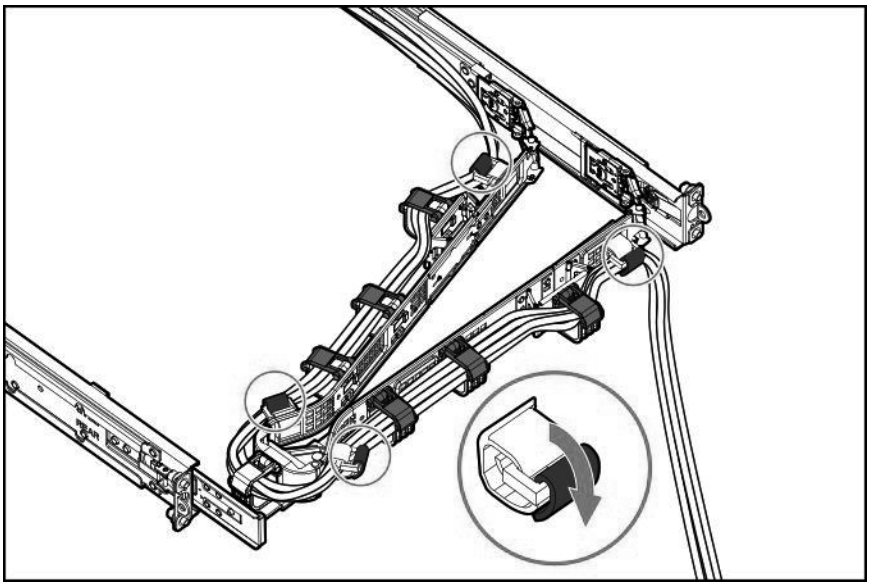
   Route the peripheral cables and power cords through the cable clamps and/or straps.



7. Close the cable clamps.



8. (Optional) If your CMA has cable straps, fasten the straps.



9. Verify the operation of the rack rails:

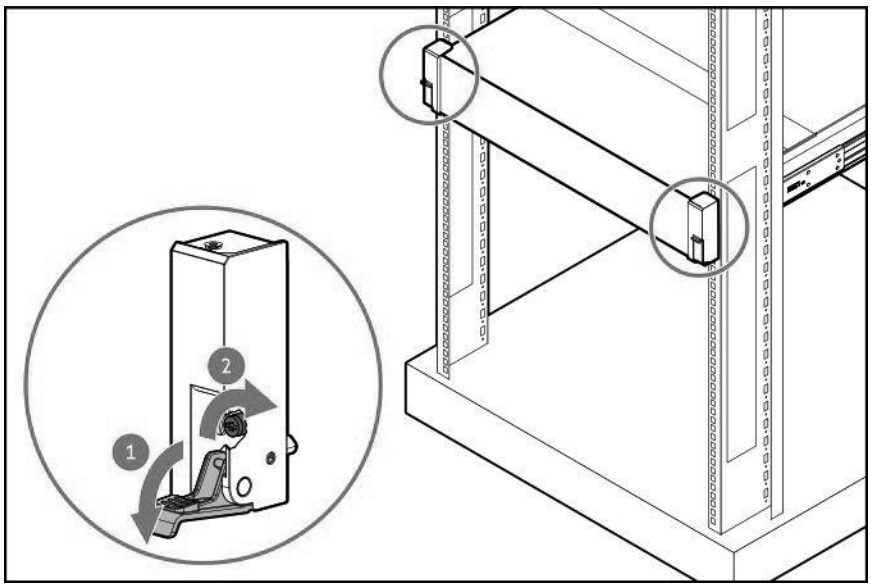
   a. **Fully extend the chassis out of the rack**.

   b. Check that there is enough slack in the cables and cords for full extension of the chassis. Make sure that there is no cable binding or crimping.

   c. To ensure that the cables and cords are secured properly, slide the chassis in and out of the rack. Make sure that there is no risk of accidental disconnection of the peripheral cables and power cords.

10. Slide the server into the rack until the chassis ears are flushed against the rack posts.

11. (Optional) Open the chassis ear latches, and then tighten the shipping screws.



The installation is complete.

Power supply options

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

Power supply warnings and cautions

WARNING: To reduce the risk of electric shock or damage to the equipment:

- Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.
- Unplug the power cord from the power supply to disconnect power to the equipment.
- Do not route the power cord where it can be walked on or pinched by items placed against it. Pay particular attention to the plug, electrical outlet, and the point where the cord extends from the server.

WARNING: To reduce the risk of injury from electric shock hazards, do not open power supplies. Refer all maintenance, upgrades, and servicing to qualified personnel

CAUTION: Mixing different types of power supplies in the same server might:

- Limit or disable some power supply features including support for power redundancy.
- Cause the system to become unstable and might shut down.

To ensure access to all available features, all power supplies in the same server should have the same output and efficiency ratings. Verify that all power supplies have the same part number and label color.

DC power supply warnings and cautions

WARNING: To reduce the risk of electric shock, be sure that the cable grounding kit is properly installed and connected to a suitable protective earth terminal before connecting the power source to the rack.

CAUTION: This equipment is designed to permit the connection of the earthed conductor of the DC supply circuit to the earthing conductor at the equipment. If this connection is made, all the following must be met:

- This equipment must be connected directly to the DC supply system earthing electrode conductor or to a bonding jumper from an earthing terminal bar or bus to which the DC supply system earthing electrode conductor is connected.
- This equipment must be located in the same immediate area (such as adjacent cabinets) as any other equipment that has a connection between the earthed conductor of the same DC supply circuit and the earthing conductor, and also the point of earthing of the DC system. The DC system must be earthed elsewhere.
- The DC supply source is to be located within the same premises as the equipment.
- Switching or disconnecting devices must not be in the earthed circuit conductor between the DC source and the point of connection of the earthing electrode conductor.

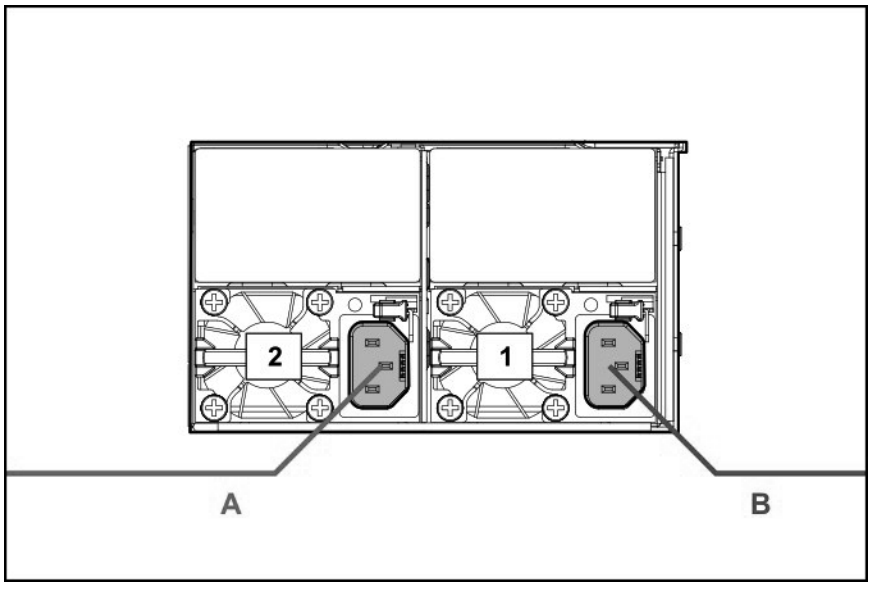
Power supply redundancy

The server supports installation of two or four power supplies.

Two-power supply configuration

The server supports 1 + 1 Redundancy in the two-power supply configuration. In this power redundancy, the server will continue to operate if one power supply fails.

In the two-power supply configuration, the server is by default configured for 1 + 1 power redundancy. The power supply 1 (blue) and power supply 2 (orange) are supported horizontally for redundancy.

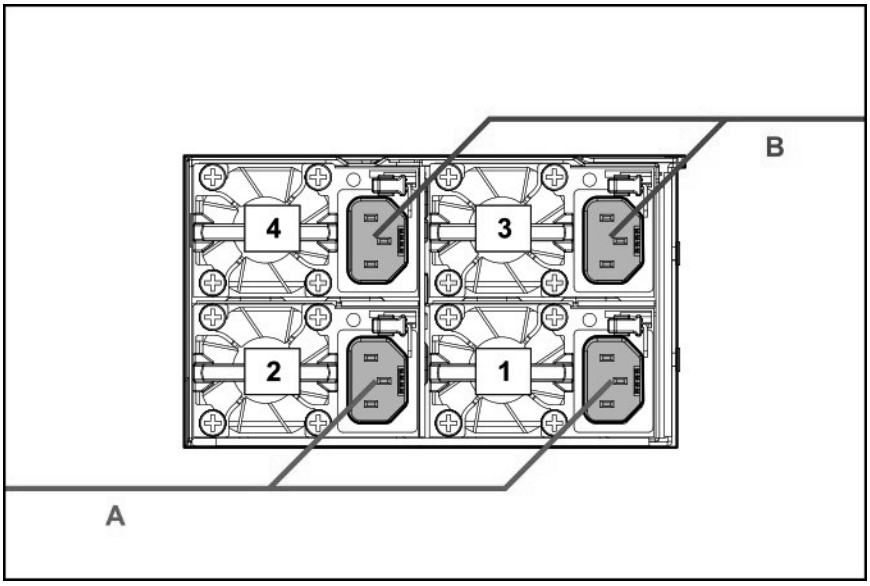


Four-power supply configuration

The server supports the following power supply redundancy modes in the four-power supply configuration:

- 2 + 2 Redundancy—The server will continue to operate if two power supplies fail or if one power supply feed loses power.
- 3 + 1 Redundancy—The server will continue to operate if a single power supply fails. The server will initiate operating system shutdown if two power supplies fail. No power redundancy is possible.
- 4 + 0 Redundancy—There is no power supply redundancy. The server consumes more power than what redundancy can supply, and will initiate operating system shutdown if one or more power supplies fail.

In a four-power supply configuration, the server is by default configured for 2 + 2 power redundancy. The power supplies 1–2 (orange), and power supplies 3–4 (blue) are supported horizontally for redundancy.



To review or update the power redundancy setting in UEFI System Utilities, see **Adjusting the server power supply redundancy setting**.

Installing an AC power supply

Prerequisites

Before installing a power supply option, review the following:

- **Power supply warnings and cautions**
- **Power supply redundancy**

About this task

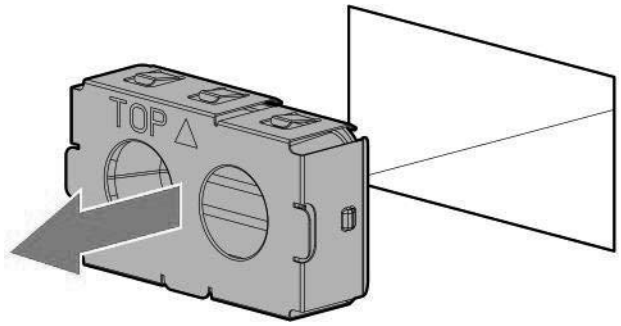
WARNING: To reduce the risk of personal injury from hot surfaces, allow the power supply, power supply blank, or dual slot power supply adapter to cool before touching it.

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.

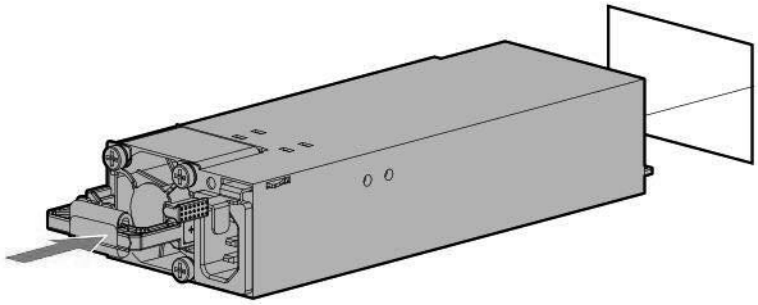
Procedure

1. If installed, **open the cable management arm**.
2. If you are installing a power supply in the power supply bay 2, remove the power supply blank.

Retain the blank for future use.



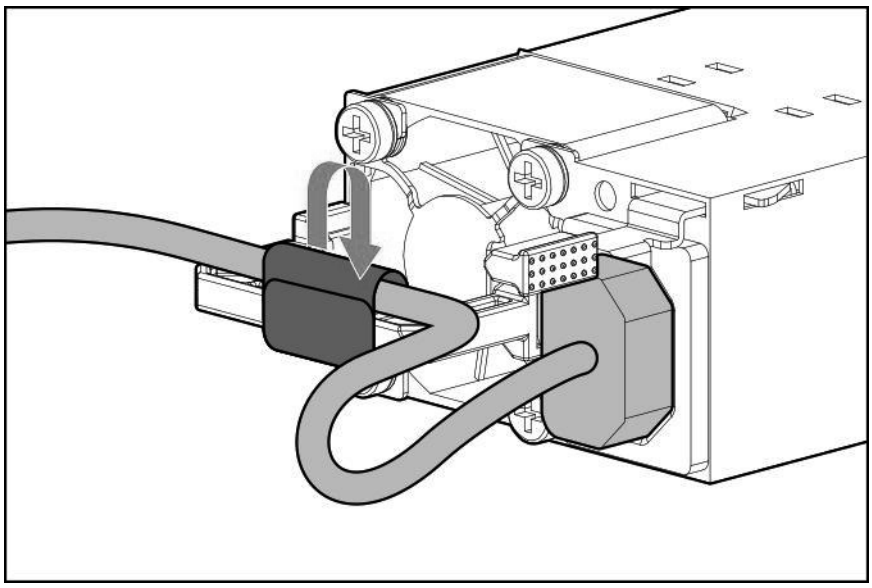
3. Immediately slide the power supply into the bay until it clicks into place.



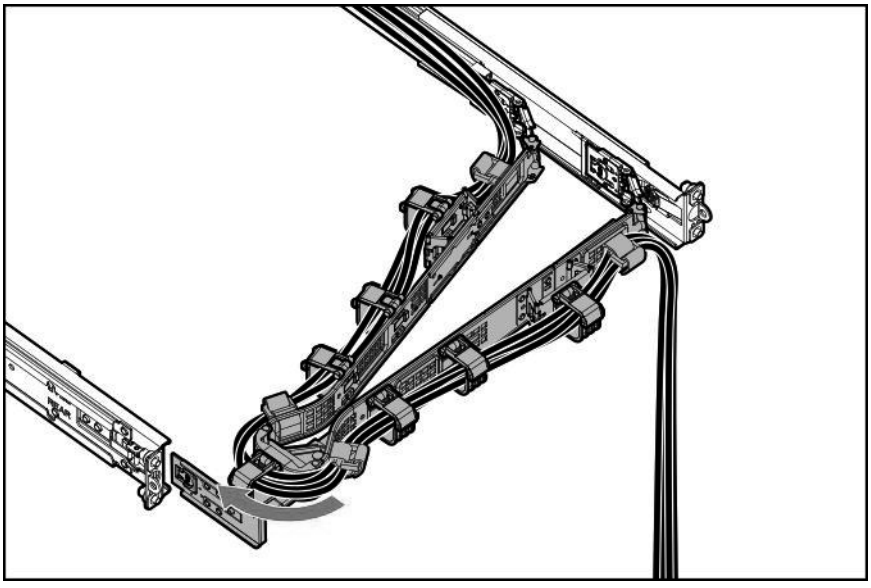
4. Connect the power cord to the power supply.
5. Secure the power cord in the strain relief strap attached to the power supply handle:
   a. Unwrap the strain relief strap from the power supply handle.

      CAUTION: 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.

   b. Secure the power cord with the strain relief strap. Roll the extra length of the strap around the power supply handle.



6. Connect the power cords:
   a. Connect each power cord to the server.
   b. Connect each power cord to the power source.
7. Make sure that the power supply LED is green.
8. If installed, close the cable management arm.



The installation is complete.

Installing a DC power supply

Prerequisites

- Before installing a power supply, review the following:

- **Power supply warnings and cautions**
- **DC power supply warnings and cautions**
- **Power supply redundancy**

- Make sure that you have a Phillips No.2 screwdriver available.
- Identify the wire color and corresponding wire slots on the DC power supply:

Wire color	Description	Wire slot
Red	Positive return wire	RTN
Black	Negative input wire	-48V
Green + Yellow	Ground wire	Safety ground

Before you install this option, make sure that you have the following items available:

- If you are not using an input power cord option, the power supply cabling must be made in consultation with a licensed electrician and be compliant with local code.
- Optional P36877-B21 lug kit can be purchased from a Hitachi Vantara authorized reseller for use with customer-supplied power cables. (The power cable and lug kit listed below can only be used with the 1600 W -48 VDC power supply.)
- If you are using an input power cord option, the P22173-B21 Hitachi Vantara 1600 W DC PSU power cable kit can be purchased from an authorized Hitachi Vantara reseller. (The power cable and lug kit listed below can only be used with the 1600 W -48 VDC power supply.)

About this task

The DC power supply option kits do not ship with a Power Supply DC cable Kit and may not include a Power Supply Cable Lug kit. The optional DC Cable kit or the optional DC Cable Lug Kit may be purchased directly from Hitachi Vantara or an authorized Hitachi Vantara reseller. For additional information, contact customer support.

WARNING: To reduce the risk of electric shock, fire, and damage to the equipment, you must install this product in accordance with the following guidelines:

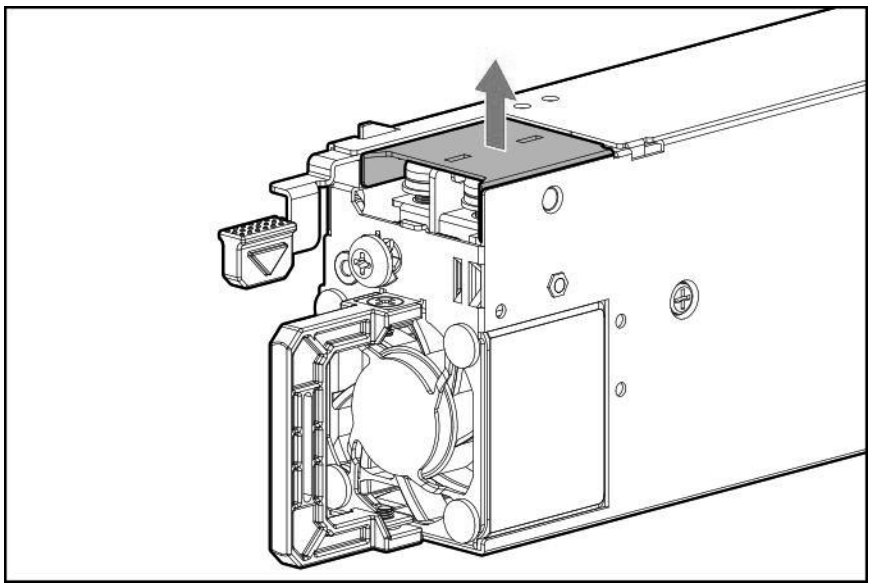
- The 1600 W Flex Slot -48 VDC hot-plug power supply is intended only for installation in servers located in a restricted access location.
- The 1600 W Flex Slot -48 VDC hot-plug power supply is not intended for direct connection to the DC supply branch circuit. Only connect this power supply to a power distribution unit (PDU) that provides an independent overcurrent-protected output for each DC power supply. Each output overcurrent-protected device in the PDU must be suitable for interrupting fault current available from the DC power source and must be rated no more than 45 A.
- The PDU output must have a shut-off switch or a circuit breaker to disconnect power for each power supply. To completely remove power from the power supply, disconnect power at the PDU. The end product may have multiple power supplies. To remove all power from the product, disconnect the power for each power supply.
- In accordance with applicable national requirements for Information Technology Equipment and Telecommunications Equipment, this power supply only connects to DC power sources that are classified as SELV or TNV. Generally, these requirements are based on the International Standard for Information Technology Equipment, IEC 60950-1/IEC 62368-1. In accordance with local and regional electric codes and regulations, the DC source must have one pole (Neutral/Return) reliably connected to earth ground.
- You must connect the power supply ground screw located on the front of the power supply to a suitable ground (earth) terminal. In accordance with local and regional electric codes and regulations, this terminal must be connected to a suitable building ground (earth) terminal. Do not rely on the rack or cabinet chassis to provide adequate ground (earth) continuity.

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

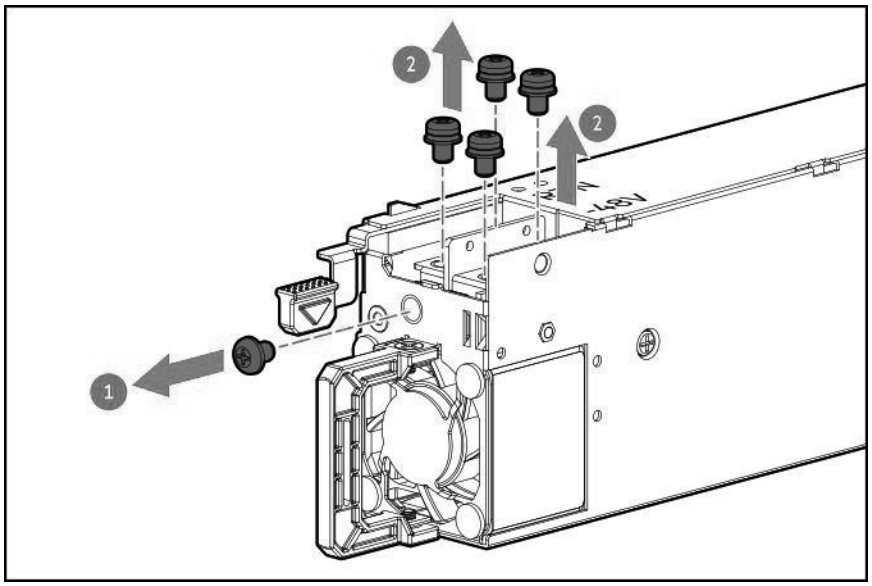
CAUTION: To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

Procedure

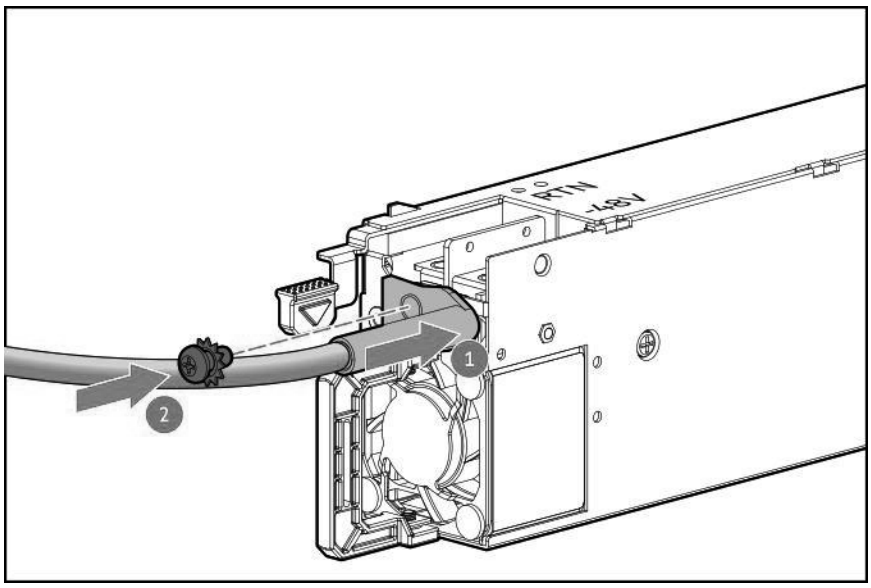
1. Remove the protective cover from the power supply.



2. Remove the ground wire screw (callout 1), and then remove the positive return wire and negative input wire screws (callout 2).



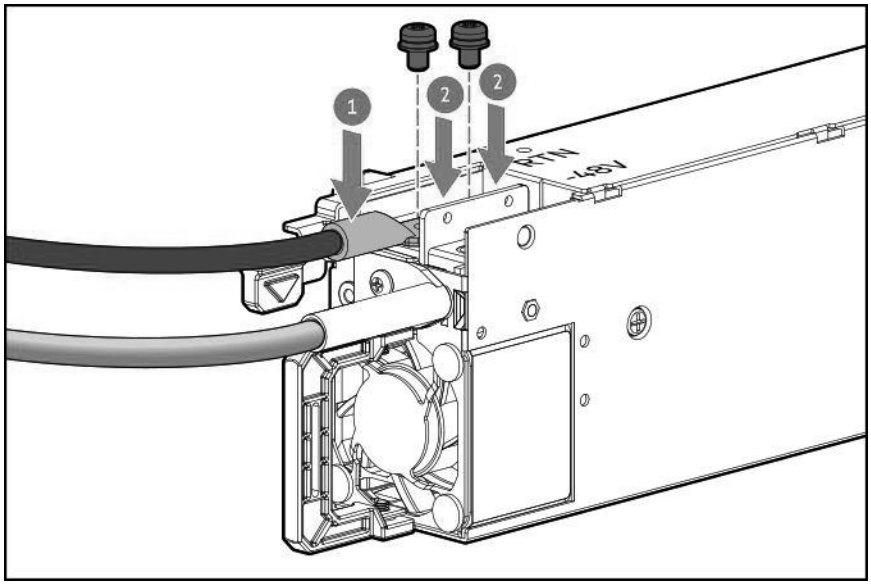
3. Attach the ground wire (green and yellow) to the DC power supply (callout 1) and tighten the screw and washer with 1.47 N-m (13 lbf-in) (callout 2).



4. Install the positive return wire (red):

   a. Insert the positive return wire (red) into the RTN slot on the DC power supply (callout 1).

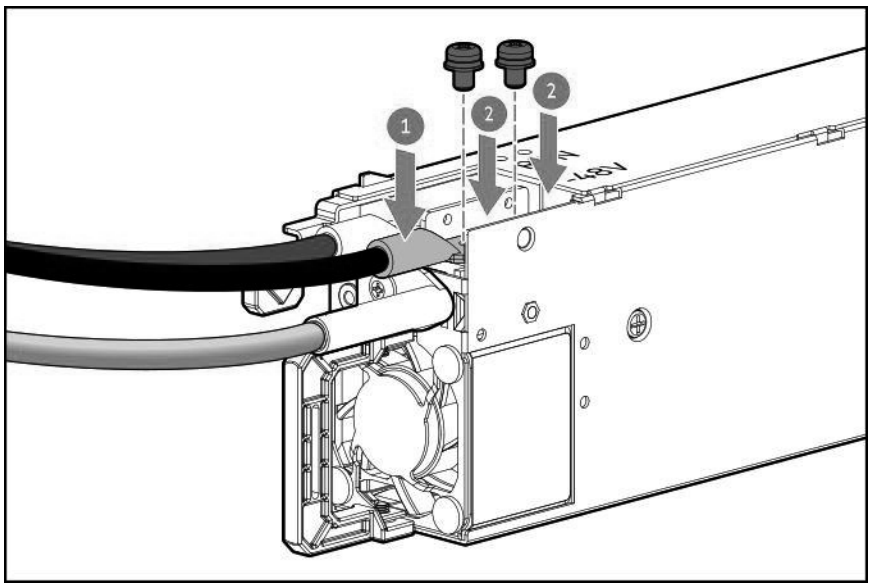
   b. Tighten the screw with 0.98 N-m (8.68 lbf-in) (callout 2).



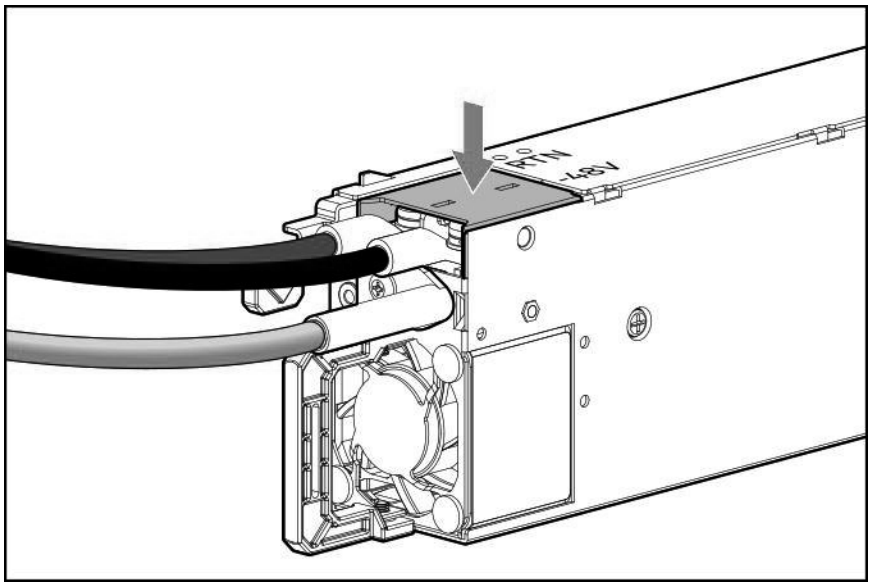
5. Install the negative input wire (black):

   a. Insert the negative input wire into the -48V slot on the DC power supply (callout 1).

   b. Tighten the screw to 0.98 N-m (8.68 lbf-in) (callout 2).

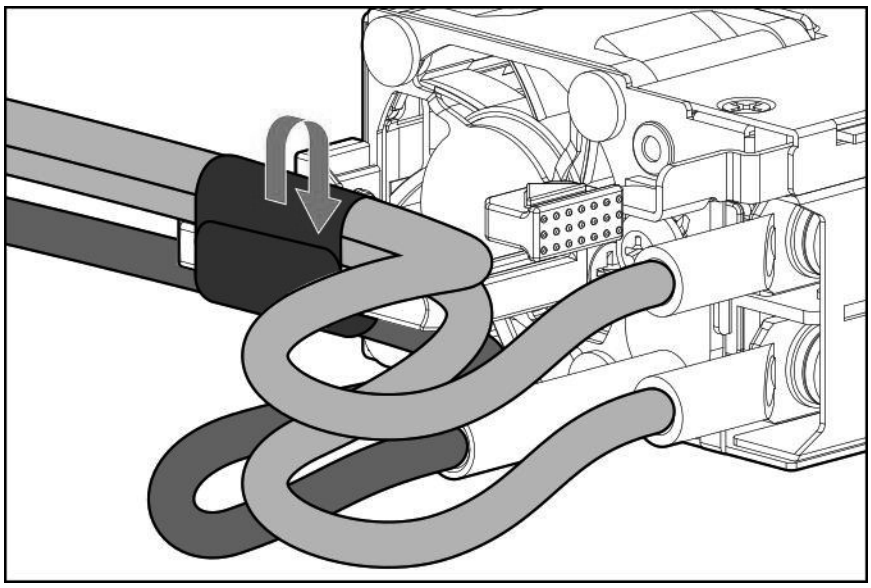


6. Install the protective cover on the DC power supply.
   Make sure that the protective cover is locked.

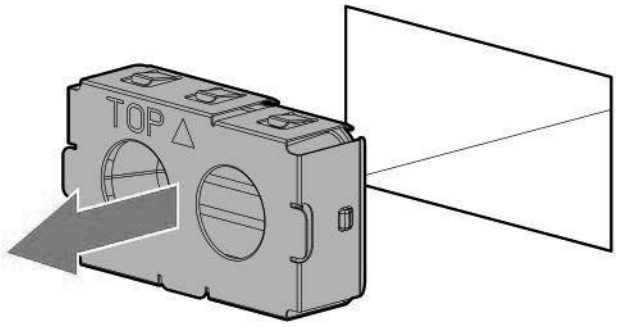


7. Secure the ground, positive return, and negative input wires in the strain relief strap.

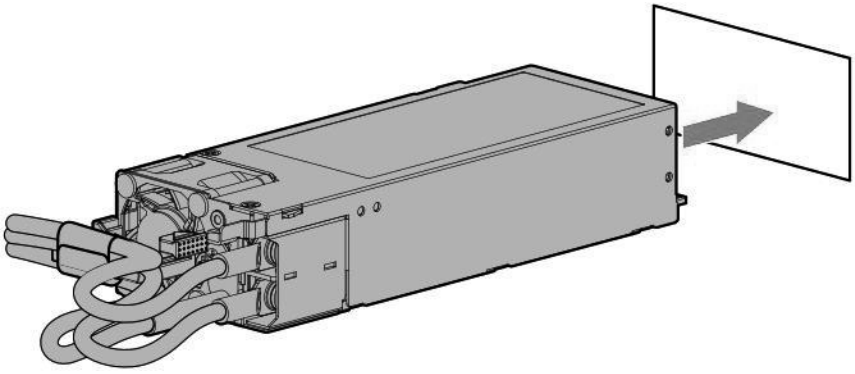
CAUTION: Avoid tight bend radii to prevent damaging the internal wires of a power cord or a server cable. Never bend power cords and server cables tight enough to cause a crease in the sheathing.



8. If you are installing a power supply in the power supply bay 2, remove the power supply blank.
   Retain the blank for future use.



9. Immediately slide the power supply into the bay until it clicks into place.



10. Make sure the -48 V DC power source is off or the PDU breaker is in the off position, and then connect the power cord to the -48 V DC power source or PDU.
11. Turn on the -48 V power source or switch the PDU breaker to the on position to supply -48 V to the power supply.

12. **Connecting a DC power cable to a DC power source**
13. Make sure that the power supply LED is green.

The installation is complete.

Connecting a DC power cable to a DC power source

About this task

WARNING: To reduce the risk of electric shock or energy hazards:

- This equipment must be installed by trained service personnel, as defined by the NEC and IEC 60950-1/IEC 62368-1, the standard for Safety of Information Technology Equipment.
- Connect the equipment to a reliably grounded secondary circuit source. A secondary circuit has no direct connection to a primary circuit and derives its power from a transformer, converter, or equivalent isolation device.
- The overcurrent protection for the DC source must not exceed 45 A.

WARNING: When installing a DC power supply, the ground wire must be connected before the positive or negative leads.

WARNING: Remove power from the power supply before performing any installation steps or maintenance on the power supply.

CAUTION: The server equipment connects the earthed conductor of the DC supply circuit to the earthing conductor at the equipment. For more information, see the documentation that ships with the power supply.

CAUTION: If a DC connection exists between the earthed conductor of the DC supply circuit and the earthing conductor at the server equipment, the following conditions must be met:

- This equipment must be connected directly to the DC supply system earthing electrode conductor or to a bonding jumper from an earthing terminal bar or bus to which the DC supply system earthing electrode conductor is connected.
- Locate the equipment in the same immediate area (such as adjacent cabinets) as any other equipment that has a connection between the earthed conductor of the same DC supply circuit and the earthing conductor, and also the point of earthing of the DC system. The DC system must be earthed elsewhere.
- The DC supply source is to be located within the same premises as the equipment.
- Switching or disconnecting devices should not be in the earthed circuit conductor between the DC source and the point of connection of the earthing electrode conductor.

Procedure

1. Cut the DC power cord ends no shorter than 150 cm (59.06 in).

IMPORTANT: The ring terminals must be UL approved and accommodate 12 gauge wires.

IMPORTANT: The minimum nominal thread diameter of a pillar or stud type terminal must be 3.5 mm (0.138 in). The diameter of a screw type terminal must be 5.0 mm (0.197 in).

2. If the power source requires ring tongues, use a crimping tool to install the ring tongues on the power cord wires.
3. Stack each same-colored pair of wires and then attach them to the same power source. The power cord consists of three wires (black, red, and green).

   For more information, see the documentation that ships with the power supply.

Transceiver option

Transceivers serve as the connection between the adapter and the network cable for maintaining high-speed performance.

Transceiver warnings and cautions

WARNING: Fiber-optic transceivers and fiber-optic cables connected to transceivers emit laser light that can damage your eyes. To avoid eye injuries, avoid direct eye exposure to the beam from the fiber-optic transceiver or into the ends of fiber-optic cables when they are powered-up.

CAUTION: The presence of dust in transceiver ports can cause poor cable connectivity. To prevent dust from entering, install a dust plug in an unused transceiver port.

CAUTION: Supported transceivers can be hot-swapped—removed and installed while the server is powered-on. However, to prevent potential damage to the transceiver or the fiber-optic cable, disconnect the cable from the transceiver before hot-swapping it.

CAUTION: Do not remove and install transceivers more often than is necessary. Doing so can shorten the useful life of the transceiver.

IMPORTANT: When you replace a transceiver with another of a different type, the server might retain selected port-specific configuration settings that were configured for the replaced transceiver. Be sure to validate or reconfigure port settings as required.

Installing a transceiver

Prerequisites

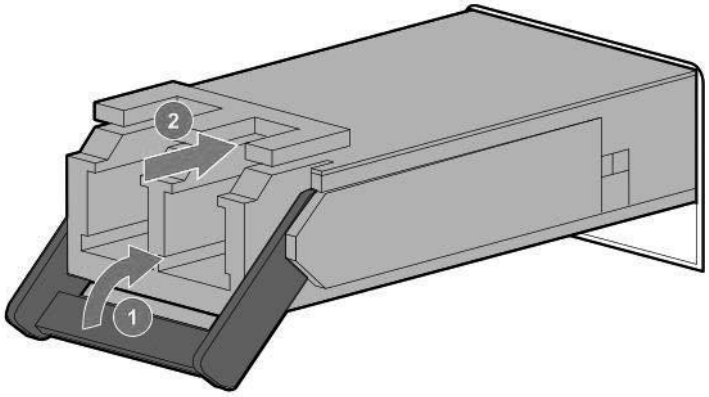
Before installing a transceiver option, review the following:

- **Transceiver warnings and cautions**
- Transceiver documentation for specific operational and cabling requirements

Procedure

1. Hold the transceiver by its sides and gently insert it into the network adapter port until it clicks into place.

   Transceivers are keyed so that they can only be inserted in the correct orientation. If the transceiver does not fit easily into the port, you might have positioned it incorrectly. Reverse the orientation of the transceiver and insert it again.



2. Remove the dust plug or protective cover from the transceiver.
3. Connect a compatible LAN segment cable to the transceiver.
4. Make sure that the NIC link LED on the port is solid green.

   For more information on the port LED behavior, see the documentation that ships with the transceiver.
5. If needed, see the transceiver documentation for the model-specific fastening mechanism applicable to the transceiver.

The installation is complete.

Installing the System Insight Display module

Prerequisites

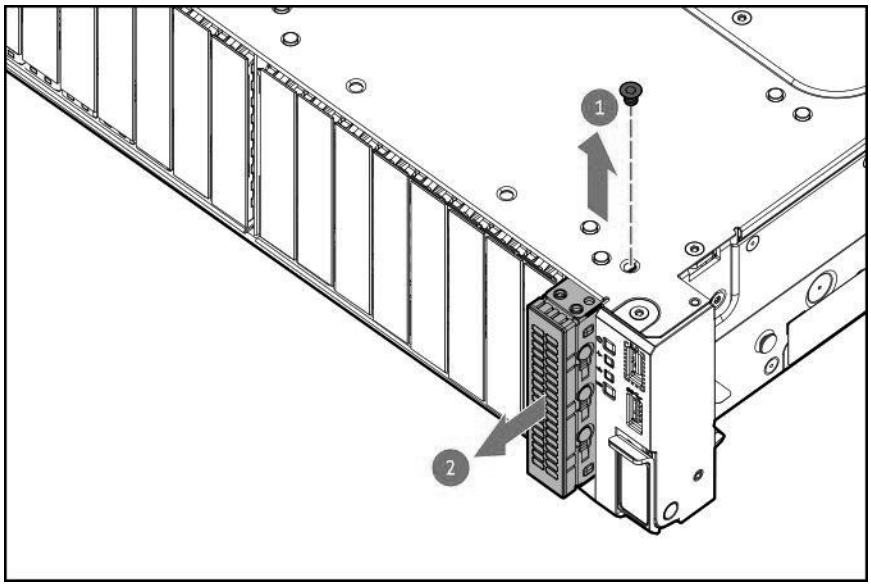
Before you perform this procedure, make sure that you have a T-10 Torx screwdriver available.

Procedure

1. If installed, **remove the front bezel**.
2. **Power down the server**.
3. If installed, **open the cable management arm**.
4. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
5. Disconnect all peripheral cables from the server.
6. **Remove the server from the rack**.
7. Place the server on a flat, level work surface.
8. **Remove the access panel**.
9. Do one of the following:

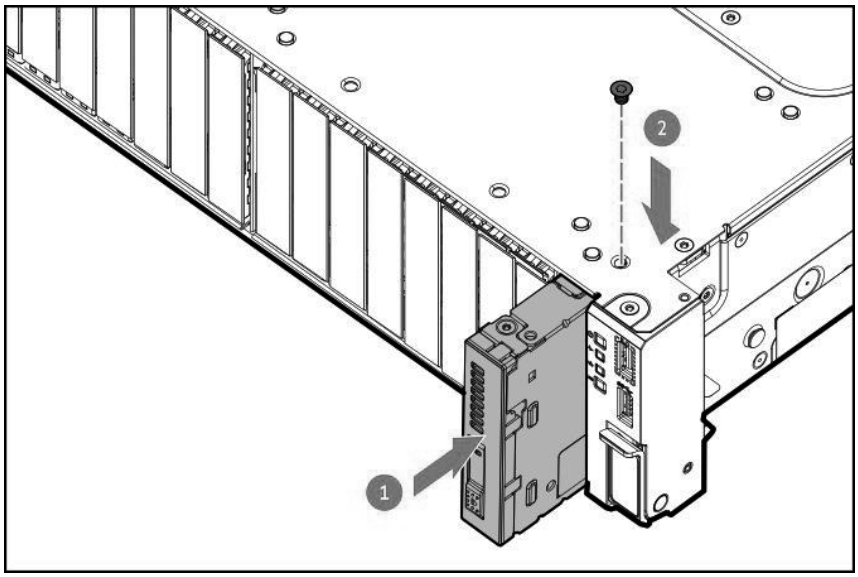
- **Remove the air baffle**.
- **Remove the processor mezzanine tray**.

10. **Remove the fan cage**.
11. Disconnect the blank from the power switch/SID module connector.
    The SID module cable will be connected to this same connector.
12. Remove the SID blank.
    Retain the T-10 screw for later use.

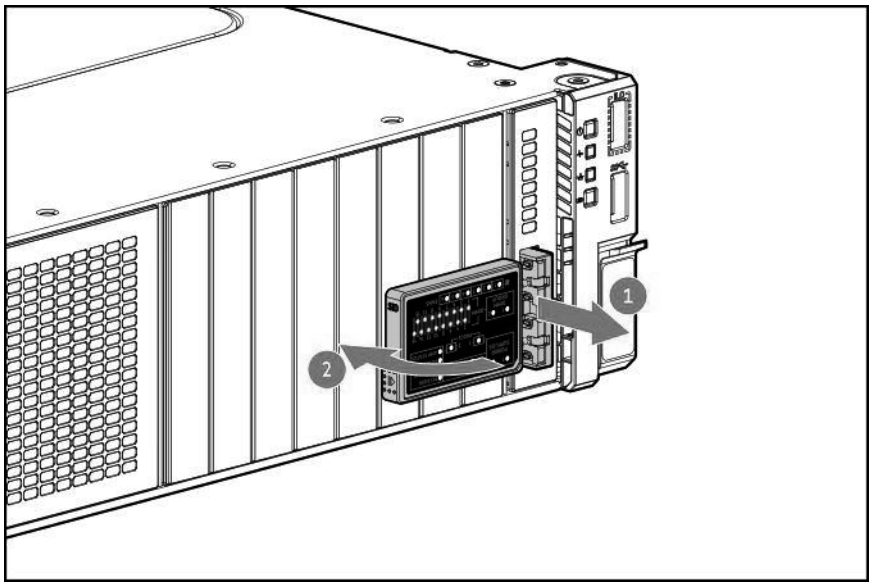


13. **CAUTION:** When routing cables, always be sure that the cables are not in a position where they can be pinched or crimped.

    Route the SID cable through the opening in the front of the server, and then install the SID module.
    Secure the module using the removed T-10 screw.



14. **Cable the SID module**.
15. **Install the fan cage**.
16. Do one of the following:
    - **Install the air baffle**.
    - **Install the processor mezzanine tray**.
17. **Install the access panel**.
18. **Installing the server into the rack**.
19. Connect all peripheral cables to the server.
20. Connect each power cord to the power source.
21. Connect each power cord to the server.
22. **Power up the server**.
23. If removed, **install the front bezel**.
24. To access the SID, do the following:
    a. Press and release the panel (callout 1).
    b. After the display fully ejects, rotate the display to view the LEDs (callout 2).



The installation is complete.

Universal media bay option

The universal media bay is populated in Box 1.

Installing the universal media bay

Prerequisites

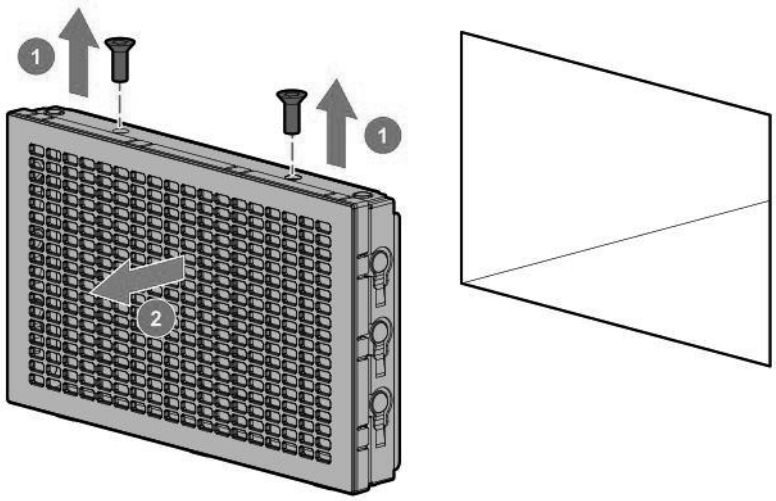
Before you perform this procedure, make sure that you have a T-10 Torx screwdriver available.

About this task

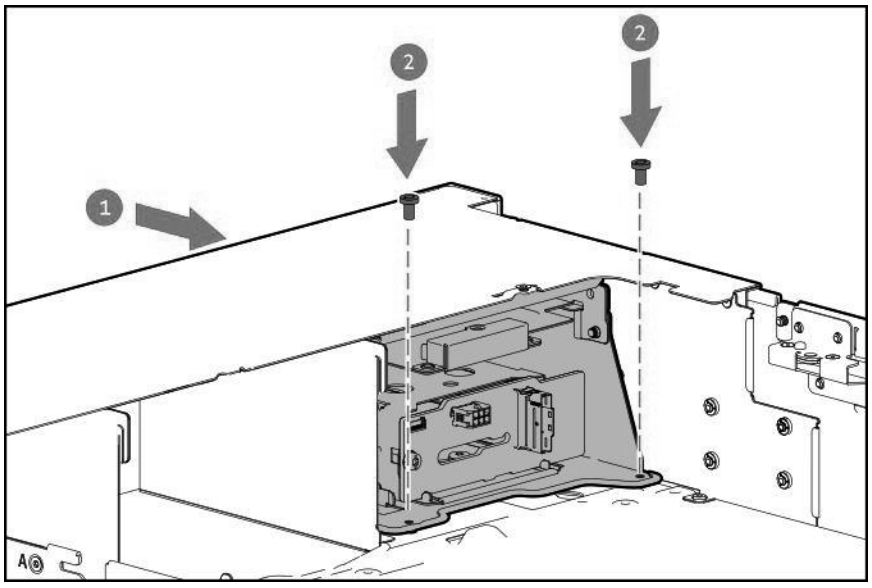
This server supports the universal media bay with an optical drive bay, two USB 2.0 ports, DisplayPort 1.1a, and 2 SFF stacked drive cage.

Procedure

1. Back up all server data on the drive.
2. If installed, **remove the front bezel**.
3. **Power down the server**.
4. If installed, **open the cable management arm**.
5. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
6. Disconnect all peripheral cables from the server.
7. **Remove the server from the rack**.
8. Place the server on a flat, level work surface.
9. **Remove the access panel**.
10. Do one of the following:
    - **Remove the air baffle**.
    - **Remove the processor mezzanine tray**.
11. **Remove the fan cage**.
12. Remove the drive box blank:
    a. Remove the drive box blank screws.
    b. Remove the drive box blank.



13. (Optional) **Install the 2 SFF stacked drive cage in the universal media bay**.
14. Install the universal media bay:
    a. Install the universal media bay in the server.
    b. Install the universal media bay screws.



15. Connect the following cables:
    - **USB 2.0 / DisplayPort Y-cable**
    - **USB 2.0 port cable**
16. (Optional) **Install the optical drive into the universal media bay**.
17. **Install the fan cage**.
18. Do one of the following:

- **Install the air baffle**.
- **Install the processor mezzanine tray**.

19. **Install the access panel**.
20. **Installing the server into the rack**.
21. Connect all peripheral cables to the server.
22. Connect each power cord to the power source.
23. Connect each power cord to the server.
24. **Power up the server**.
25. If removed, **install the front bezel**.

The installation is complete.

Optical drive option

The server supports a slim-type SATA optical drive.

Installing the optical drive in the universal media bay

Prerequisites

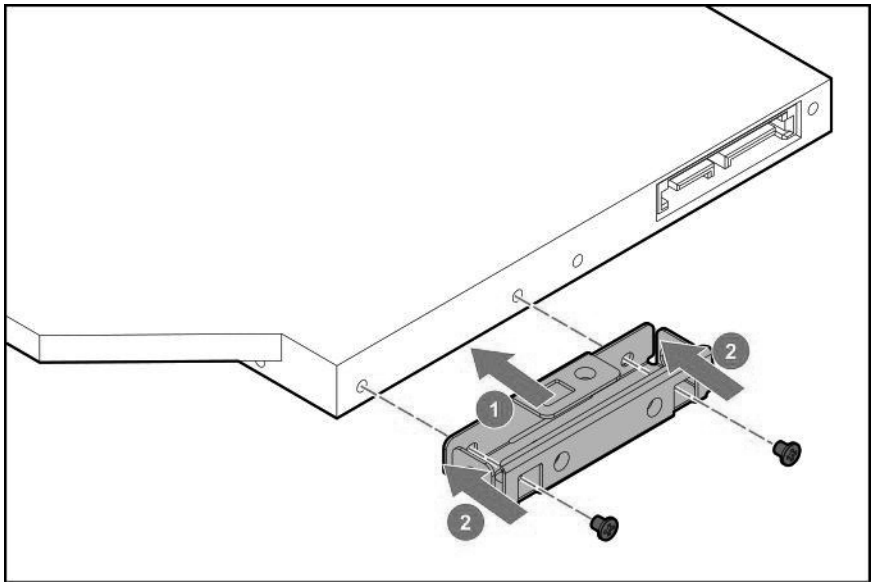
- The optical drive installation requires the optical drive power cable (P55376-001) in the universal media bay option kit (P60500-B21).
- Before you perform this procedure, make sure that you have the following items available:
  - T-10 Torx screwdriver
  - Phillips No. 1 screwdriver

Procedure

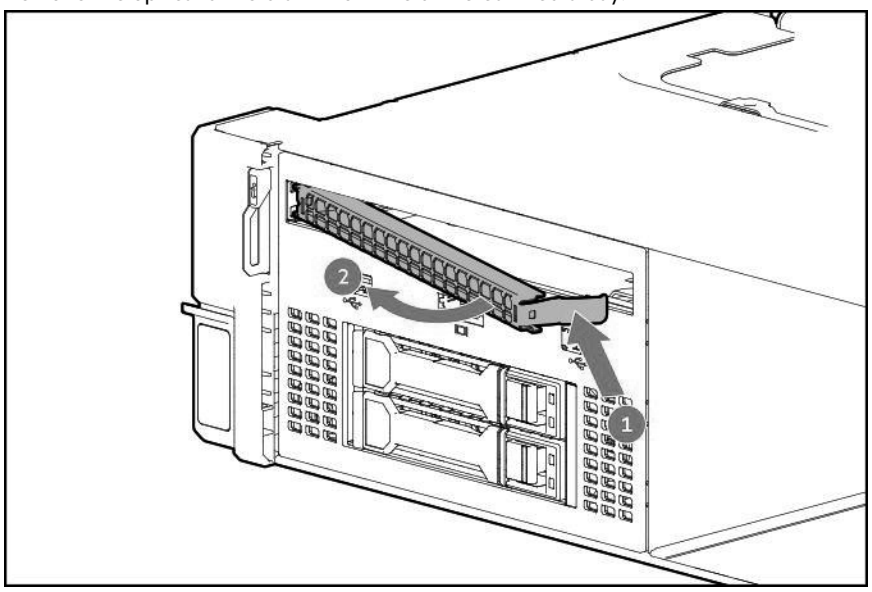
1. If installed, **remove the front bezel**.
2. **Power down the server**.
3. If installed, **open the cable management arm**.
4. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
5. Disconnect all peripheral cables from the server.
6. **Remove the server from the rack**.
7. Place the server on a flat, level work surface.
8. **Remove the access panel**.
9. Do one of the following:

- **Remove the air baffle**.
- **Remove the processor mezzanine tray**.

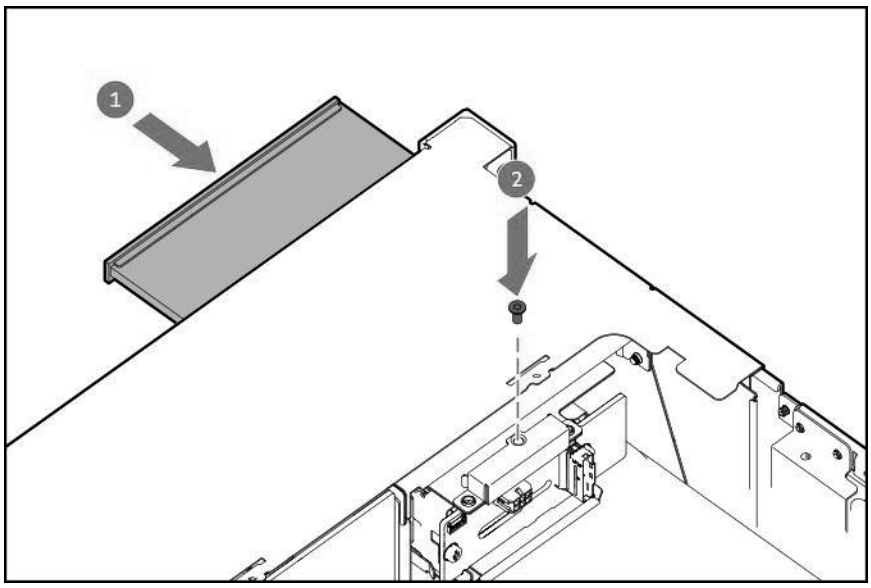
10. **Remove the fan cage**.
11. **Install the universal media bay in the server**.
12. Install the optical drive bracket.



13. Remove the optical drive blank from the universal media bay.



14. Install the optical drive in the universal media bay, and then install the screw.



15. **Connect the optical drive power cable to the optical drive and the system board**.
16. **Install the fan cage**.
17. Do one of the following:
    - **Install the air baffle**.
    - **Install the processor mezzanine tray**.
18. **Install the access panel**.
19. **Installing the server into the rack**.
20. Connect all peripheral cables to the server.
21. Connect each power cord to the power source.
22. Connect each power cord to the server.
23. **Power up the server**.
24. If removed, **install the front bezel**.

The installation is complete.

Drive cage options

The server supports the following drive cage options:

- 8 SFF drive cage
- 2 stacked drive cage

To maintain proper system cooling, install the correct fan and heatsink types required for specific drive configurations. For more information, contact customer support.

Installing a 8 SFF drive cage option

Prerequisites

Before you perform this procedure, make sure that you have the following items available:

- T-10 Torx screwdriver
- T-15 Torx screwdriver

About this task

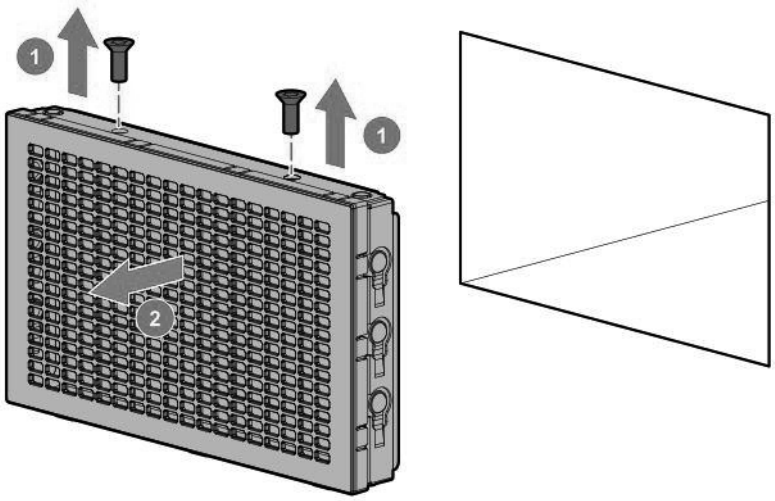
This server supports several 8 SFF drive cage options with **different backplanes**. This drive cage supports SAS, SATA, and U.3 PCIe4 NVMe drives.

CAUTION: A discharge of static electricity from a finger or other conductor might damage system boards or other static-sensitive devices. To prevent damage, observe **antistatic precautions**.

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.

Procedure

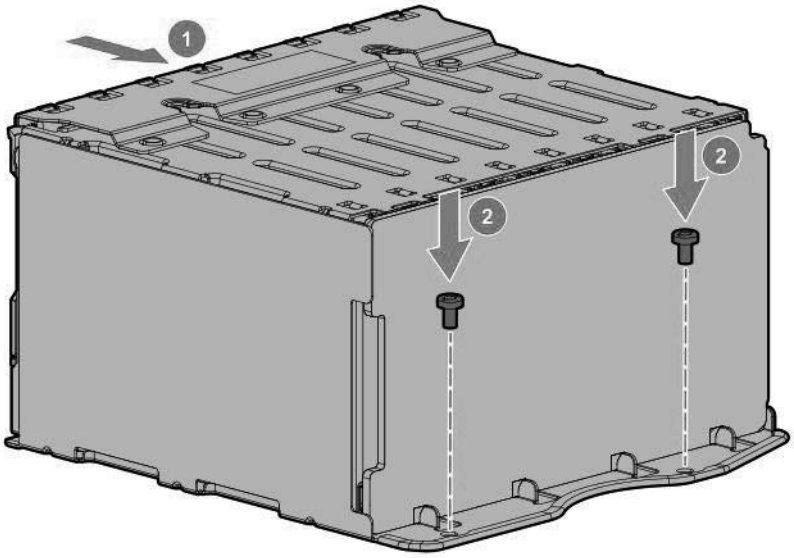
1. If installed, **remove the front bezel**.
2. **Power down the server**.
3. If installed, **open the cable management arm**.
4. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
5. Disconnect all peripheral cables from the server.
6. **Remove the server from the rack**.
7. Place the server on a flat, level work surface.
8. **Remove the access panel**.
9. Do one of the following:
   - **Remove the air baffle**.
   - **Remove the processor mezzanine tray**.
10. **Remove the fan cage**.
11. Remove the drive box blank:
    a. Remove the drive box blank screws.
    b. Remove the drive box blank.



12. Install the 8 SFF drive cage:

a. Install the 8 SFF drive cage in the server.

b. Install the drive cage screws.



13. Cable the 8 SFF drive cage:

- **Drive power cable**
- **Storage controller cable**

14. **Install the fan cage**.

15. Do one of the following:

- **Install the air baffle**.
- **Install the processor mezzanine tray**.

16. **Install the access panel**.

17. **Installing the server into the rack**.
18. Connect all peripheral cables to the server.
19. Connect each power cord to the power source.
20. Connect each power cord to the server.
21. **Power up the server**.
22. If removed, **install the front bezel**.

The installation is complete.

Installing the 2 SFF stacked drive cage

Prerequisites

Before you perform this procedure, make sure that you have a T-10 Torx screwdriver available.

About this task

The 2 SFF stacked drive cage in the universal media bay supports SAS, SATA, and U.3 PCIe4 NVMe drives.

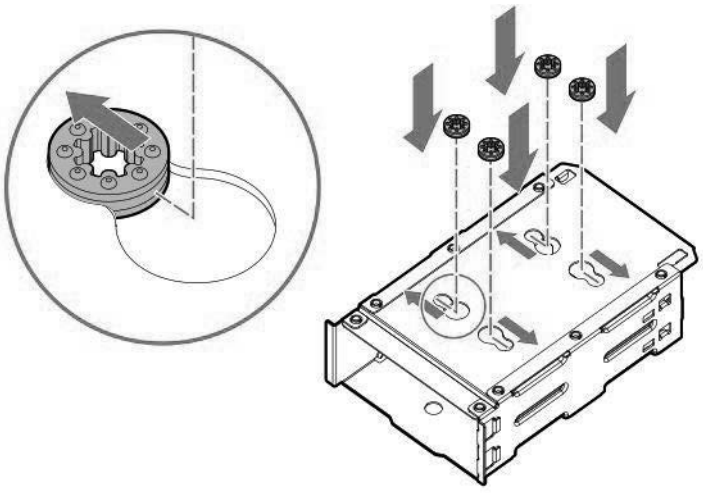
CAUTION: A discharge of static electricity from a finger or other conductor might damage system boards or other static-sensitive devices. To prevent damage, observe **antistatic precautions**.

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.

Procedure

Installing the 2 SFF stacked drive cage in the universal media bay

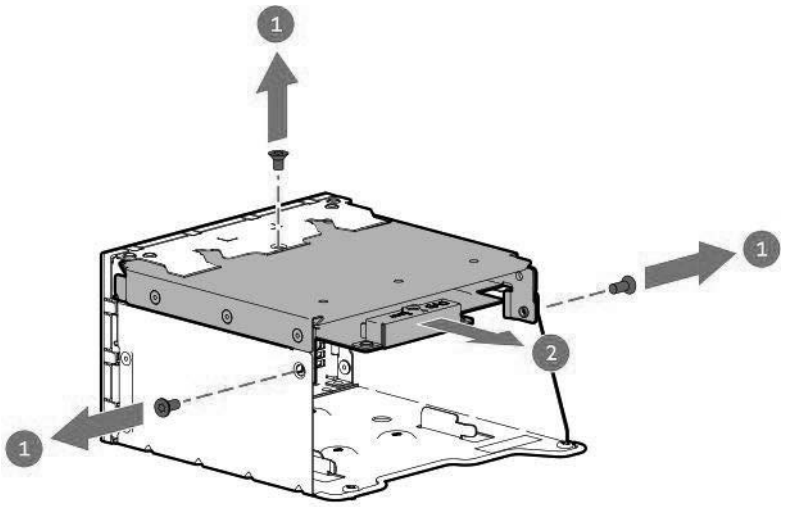
1. Install the grommets onto the underside of the stacked drive cage.



2. Remove the optical drive tray:

a. Remove the optical drive tray screws.

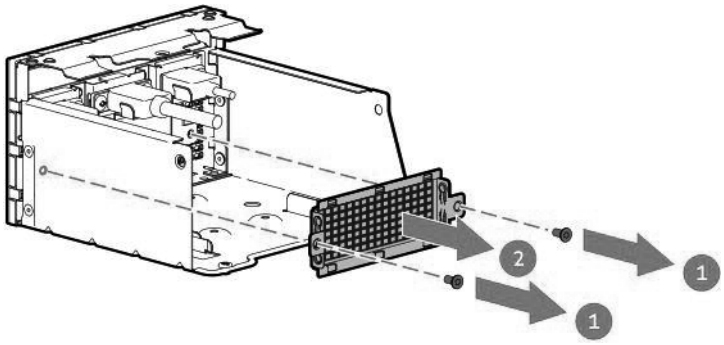
b. Remove the optical drive tray from universal media bay.



3. Remove the 2 SFF drive blank:

a. Remove the blank screws.

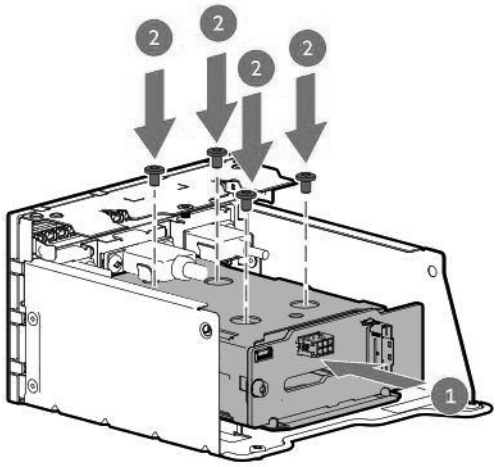
b. Remove the drive blank from universal media bay.



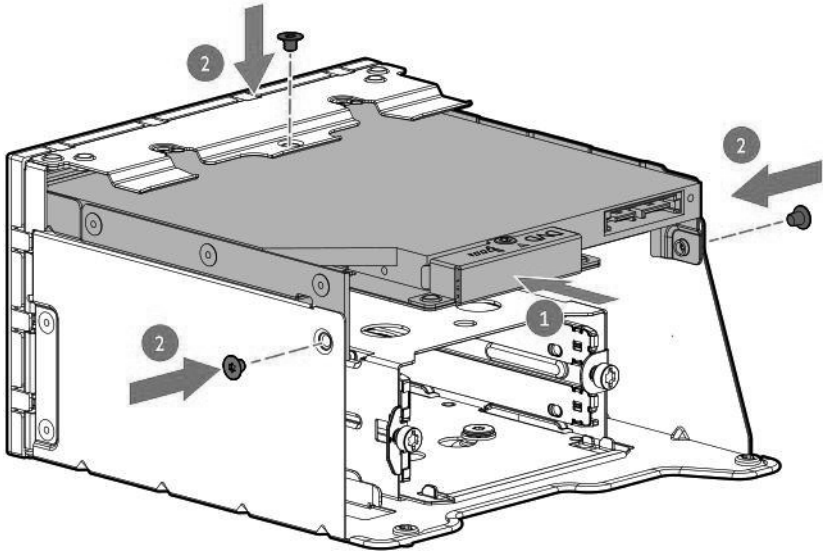
4. Install the front 2 SFF stacked drive cage:

a. Install the 2 SFF stacked drive cage in the universal media bay.

b. Install the stacked drive cage screws.



5. Install the optical drive tray:
   a. Install the optical drive bay on the universal media bay.
   b. Install the optical drive bay screws.



Installing the universal media bay in the server

6. If installed, **remove the front bezel**.
7. **Power down the server**.
8. If installed, **open the cable management arm**.
9. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.

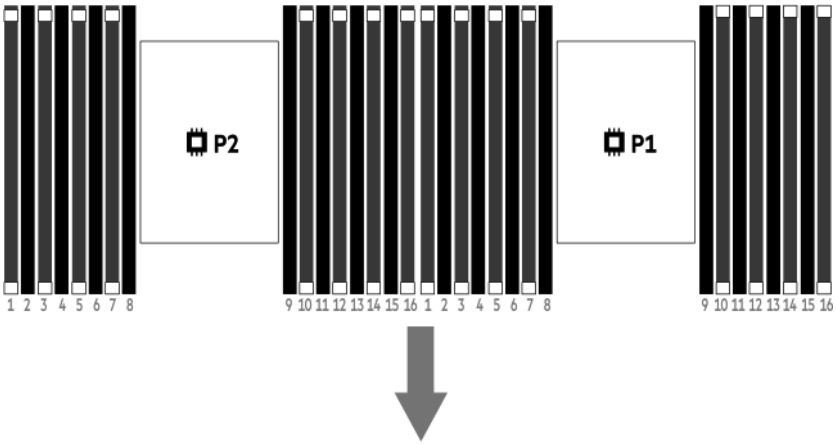
10. Disconnect all peripheral cables from the server.
11. **Remove the server from the rack**.
12. Place the server on a flat, level work surface.
13. **Remove the access panel**.
14. Do one of the following:
    - **Remove the air baffle**.
    - **Remove the processor mezzanine tray**.
15. **Remove the fan cage**.
16. **Install the universal media bay in the server**.
17. Cable the 2 SFF stacked drive cage:
    - **Drive power cable**
    - **Storage controller cable**
18. **Connect the universal media bay cables to the system board**.
19. **Install the fan cage**.
20. Do one of the following:
    - **Install the air baffle**.
    - **Install the processor mezzanine tray**.
21. **Install the access panel**.
22. **Installing the server into the rack**.
23. Connect all peripheral cables to the server.
24. Connect each power cord to the power source.
25. Connect each power cord to the server.
26. **Power up the server**.
27. If removed, **install the front bezel**.

The installation is complete.

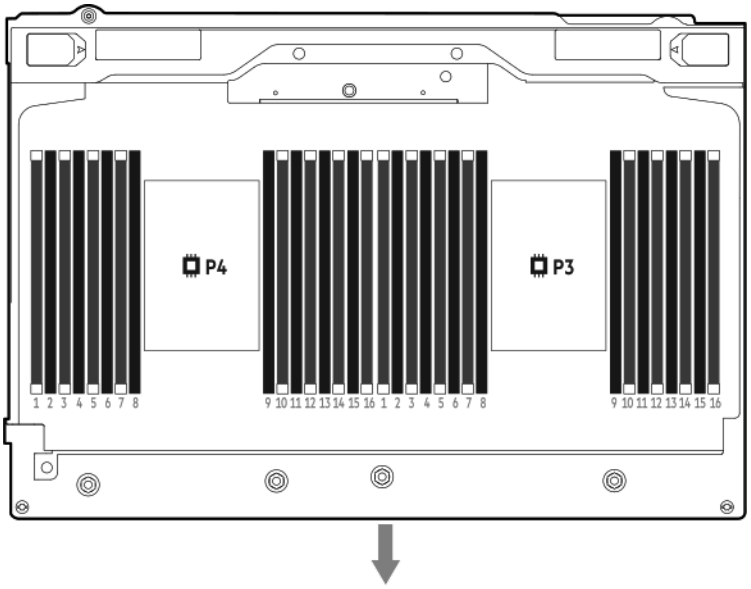
Memory option

The server has either 32 DIMM slots in the dual-processor configuration, or 64 DIMM slots in the quad-processor configuration with the processor mezzanine board installed. All DIMM slots support DDR5-4800 DIMM.

DIMM slots on the system board



DIMM slots on the processor mezzanine board



The arrow points to the front of the server.

Memory speed and population information

For information about memory speed and server-specific DIMM population rules, see the relevant memory guidelines:

docs.hitachivantara.com

DIMM installation guidelines

When handling a DIMM, observe the following:

- Observe **antistatic precautions**.
- Handle the DIMM only along the edges.
- Do not touch the components on the sides of the DIMM.
- Do not touch the connectors on the bottom of the DIMM.

- Never wrap your fingers around a DIMM.
- Never bend or flex the DIMM.

When installing a DIMM, observe the following:

- To align and seat the DIMM, use two fingers to hold the DIMM along the side edges.
- To seat the DIMM, use two fingers to apply gentle pressure along the top of the DIMM.

For more information, contact customer support.

Installing a DIMM

Prerequisites

To meet the system thermal requirements, some DIMMs require specific processors and drive configuration. Contact customer support for these requirement.

About this task

CAUTION: Do not install ×4 and ×8 DRAM widths in the same server. All memory installed in the server must be of the same type. Installing different DIMM types can cause the server to halt during BIOS initialization.

CAUTION: To prevent improper cooling and thermal damage, do not operate the server unless all DIMM slots have either a DIMM or a DIMM blank installed.

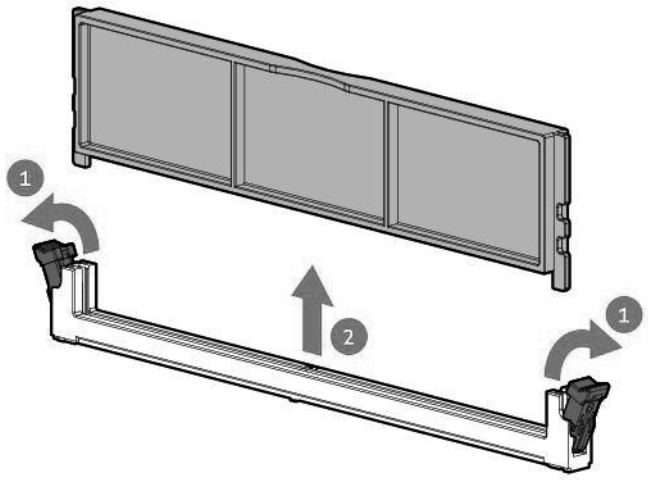
CAUTION: A discharge of static electricity from a finger or other conductor might damage system boards or other static-sensitive devices. To prevent damage, observe **antistatic precautions**.

Procedure

1. **Power down the server**.
2. If installed, **open the cable management arm**.
3. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables 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. Do one of the following:

- **Remove the air baffle**.
- **Remove the processor mezzanine tray**.

8. Remove the DIMM blank.

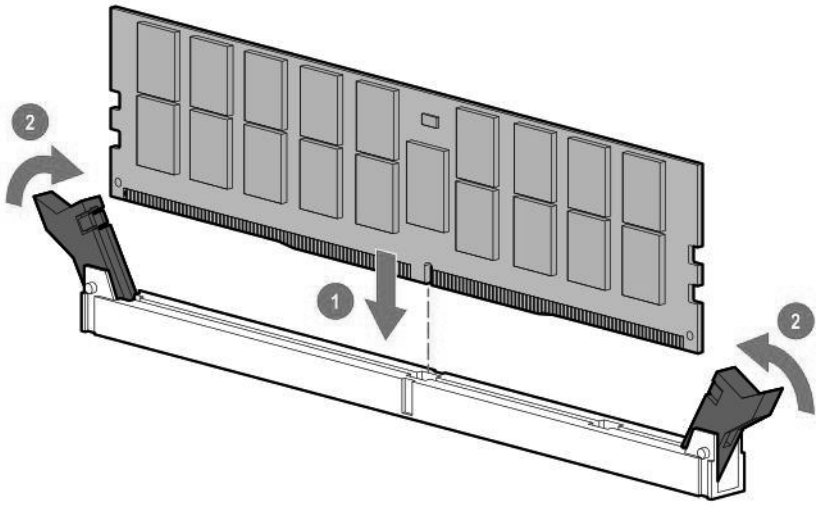


9. Install the DIMM:

   a. Open the DIMM slot latches.

   b. Align the notch on the bottom edge of the DIMM with the keyed surface of the DIMM slot, and then fully press the DIMM into the slot until the latches snap back into place.

      The DIMM slots are structured to ensure proper installation. If you try to insert a DIMM but it does not fit easily into the slot, you might have positioned it incorrectly. Reverse the orientation of the DIMM and insert it again.



10. Do one of the following:

    - **Install the air baffle**.
    - **Install the processor mezzanine tray**.

11. **Install the access panel**.

12. **Installing the server into the rack**.
13. Connect all peripheral cables to the server.
14. Connect each power cord to the power source.
15. Connect each power cord to the server.
16. **Power up the server**.
17. To configure the memory settings:
    a. From the boot screen, press **F9** to access the UEFI System Utilities.
    b. From the **System Utilities** screen, select **System Configuration** > **BIOS/Platform Configuration (RBSU)** > **Memory Options**.

The installation is complete.

Riser board options

The server supports two preinstalled PCIe riser cages that can be configured with different riser boards. Both primary and secondary riser cages support installation of the following riser boards:

- 3-slot riser board with 2 x8 and 1 x16 connections
- 3-slot riser board with 3 x16 connections

Installing the riser board

Prerequisites

Before you perform this procedure, make sure that you have a T-15 Torx screwdriver available.

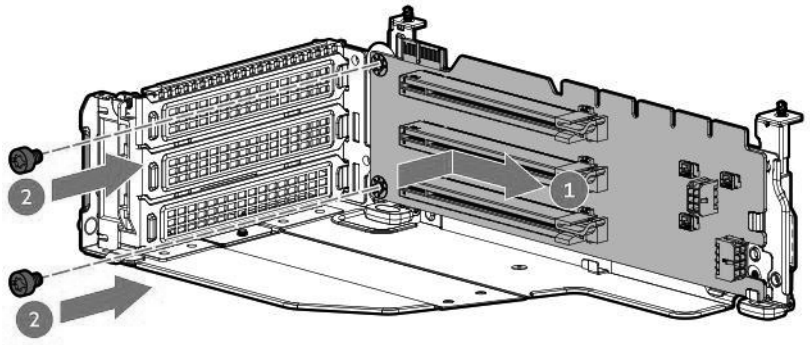
About this task

CAUTION: A discharge of static electricity from a finger or other conductor might damage system boards or other static-sensitive devices. To prevent damage, observe **antistatic precautions**.

Procedure

1. **Power down the server**.
2. If installed, **open the cable management arm**.
3. Remove all power:
    a. Disconnect each power cord from the power source.
    b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. **Remove the server from the rack**.
6. Place the server on a flat, level work surface.
7. **Remove the access panel**.

8. **Remove the riser cage**.
9. Install the riser board on the cage.



10. (Optional) **Install the expansion card**.
11. **Install the riser cage**.
12. If a PCIe5 3 x16 riser is installed, **connect the riser enablement cables**.
13. **Install the access panel**.
14. **Installing the server into the rack**.
15. Connect all peripheral cables to the server.
16. Connect each power cord to the power source.
17. Connect each power cord to the server.
18. **Power up the server**.

The installation is complete.

Storage controller options

The server supports the following storage controllers:

- MR type-o and type-p G3 controllers
- SR type-p G3 controllers

For more information on drive array and storage controller configuration, see **Configuring storage controllers**.

Preparing the server for storage controller installation

Prerequisites

Before beginning this procedure, download the Service Pack for Vantara (SPV) from the Hitachi Vantara website (**https://support.hitachivantara.com/en/user/answers/downloads.html#hardware-download**).

Procedure

1. If the server was previously configured:
   a. **Back up data on the system**.
   b. Close all applications.
   c. Ensure that users are logged off and that all tasks are completed on the server.

> **CAUTION:** In systems that use external data storage, be sure that the server is the first unit to be powered down and the last to be powered back up. Taking this precaution ensures that the system does not erroneously mark the drives as failed when the server is powered up.

2. If the server firmware is not the latest revision, **update the firmware**.
3. If the new controller is the new boot device, **install the controller drivers**.

Installing a type-o storage controller

Prerequisites

Before you perform this procedure, make sure that you have the following items available:

- **Compatible controller cable**
- T-10 Torx screwdriver

About this task

Both OCP Slots 14 and 15 support the type-o storage controller installation.

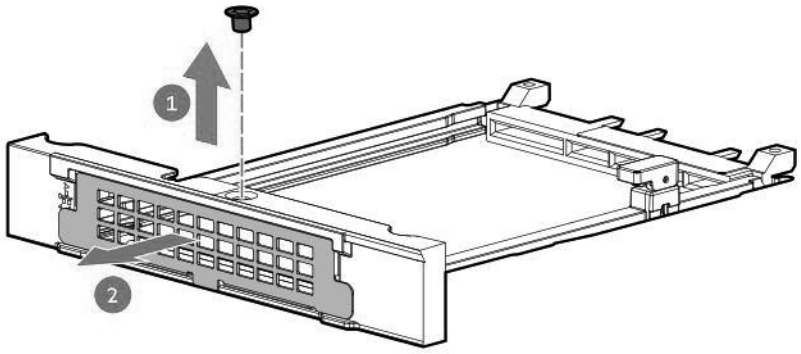
> **CAUTION:** A discharge of static electricity from a finger or other conductor might damage system boards or other static-sensitive devices. To prevent damage, observe **antistatic precautions**.

> **CAUTION:** The port blank provides EMI shielding and helps maintain proper thermal status inside the server. Do not operate the server when a port blank is removed without the corresponding I/O port option installed.

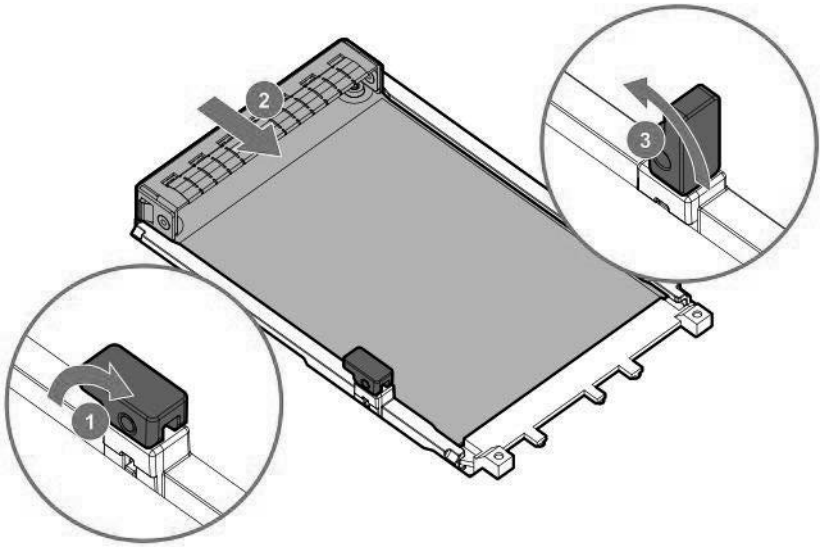
Procedure

1. **Power down the server**.
2. If installed, **open the cable management arm**.
3. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. **Remove the server from the rack**.
6. Place the server on a flat, level work surface.
7. **Remove the access panel**.

8. **Remove the riser cage**.
9. Remove the OCP slot blank:
   a. Remove the blank screw.
   b. Remove the blank.
      Retain the screw and blank for future use.



10. Install the type-o storage controller:
    a. Rotate the locking pin to the open (vertical) position.
    b. Slide the controller into the bay until it clicks into place.
       Make sure that the controller is seated firmly in the slot.
    c. Rotate the locking pin to the close (horizontal) position.



11. **Cable the type-o storage controller**.
12. **Install the riser cage**.
13. **Install the access panel**.

14. **Install the server into the rack**.
15. Connect all peripheral cables to the server.
16. Connect each power cord to the server.
17. Connect each power cord to the power source.
18. **Power up the server**.
19. Before using the controller for the first time, **update the server and controller firmware if they are not the latest revision**.
20. To configure the controller, see the **relevant controller guide**.

The installation is complete.

Installing a type-p storage controller

Prerequisites

- To enable the flash-backed write cache (FBWC) feature of a storage controller option, **install an energy pack**.
  For more information on the controller caching feature, contact customer support.
- Before you perform this procedure, make sure that you have the following items available:
  - **Compatible controller cable**
  - T-10 Torx screwdriver

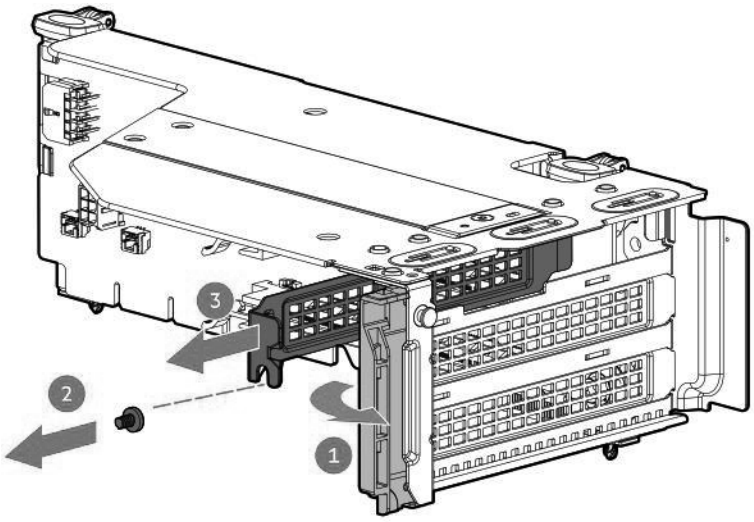
About this task

CAUTION: A discharge of static electricity from a finger or other conductor might damage system boards or other static-sensitive devices. To prevent damage, observe **antistatic precautions**.

Procedure

1. **Power down the server**.
2. If installed, **open the cable management arm**.
3. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. **Remove the server from the rack**.
6. Place the server on a flat, level work surface.
7. **Remove the access panel**.
8. **Remove the riser cage**.
9. (Optional) **Install the riser board**.

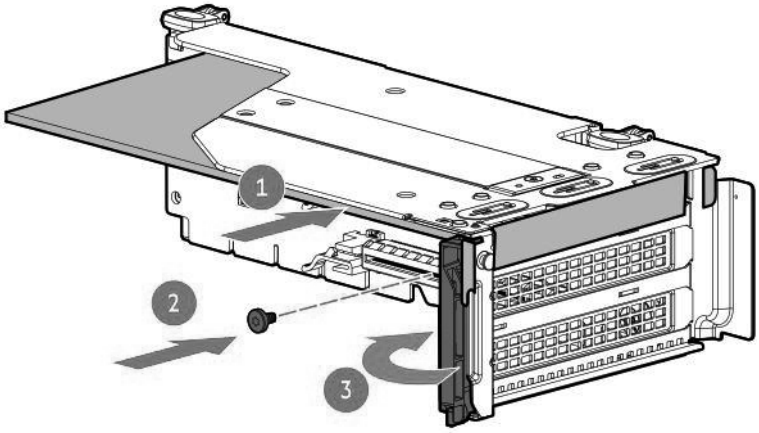
10. Remove the riser slot blank.



11. Install the type-p storage controller.

    a. Install the type-p storage controller (callout 1), and install the screw (callout 2). Make sure that the controller is seated firmly in the slot.

    b. Close the riser cage latch (callout 3).



12. **Install the riser cage**.
13. **Cable the type-p storage controller**.
14. To enable the FBWC feature of the storage controller, **install an energy pack**.
15. **Install the access panel**.
16. **Installing the server into the rack**.
17. Connect all peripheral cables to the server.
18. Connect each power cord to the power source.
19. Connect each power cord to the server.

20. **Power up the server**.
21. Before using the controller for the first time, **update the server and controller firmware if they are not the latest revision**.
22. To configure the controller, see the **relevant controller guide**.

The installation is complete.

Energy pack options

If there is an unplanned server power outage, the flash-backed write cache (FBWC) feature of Hitachi Vantara 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, see Hitachi Advanced Server HA800 G3 Series iLO 6 User Guide:

docs.hitachivantara.com

Smart Storage Battery

The Smart Storage Battery supports both Hitachi Vantara 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 260 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 260 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.

Minimum firmware versions

Product	Minimum firmware version
Server system ROM	1.20
MR type-o and type-p Gen11 controllers	52.22.3-4650
SR900 series type-p Gen11 controllers	03.01.14.062

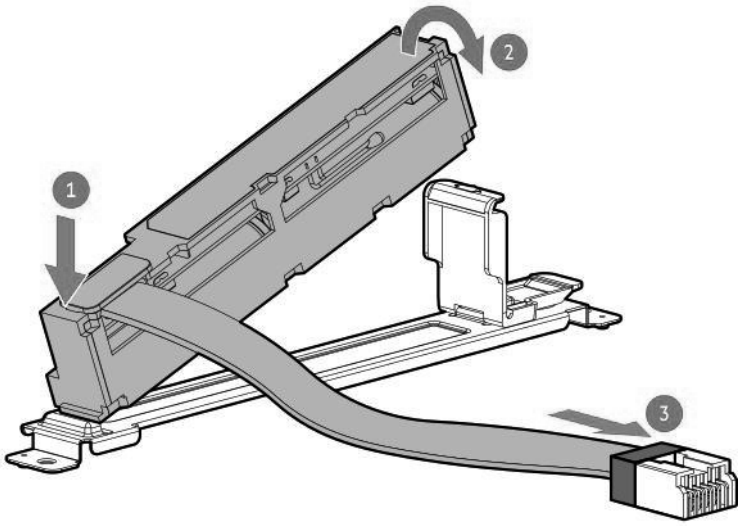
Installing an energy pack

Prerequisites

- **Make sure that a compatible type-p storage controller is installed**.
- Make sure that you have the storage controller backup power cable that ships with the storage controller.
- If you are installing the Hitachi Vantara Smart Storage Hybrid Capacitor, **verify that the system meets the minimum firmware requirements**.

Procedure

1. **Power down the server**.
2. If installed, **open the cable management arm**.
3. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. **Remove the server from the rack**.
6. Place the server on a flat, level work surface.
7. **Remove the access panel**.
8. Do one of the following:
   - **Remove the air baffle**.
   - **Remove the processor mezzanine tray**.
9. **Remove the fan cage**.
10. Install the energy pack:
    a. Insert the energy pack at an angle (callout 1).
    b. Pivot the energy pack downward (callout 2).
       Make sure that the energy pack is locked in the retention latch.
    c. Connect the energy pack cable (callout 3).



11. **Connect the storage backup power cable**.
12. **Install the fan cage**.
13. Do one of the following:
    - **Install the air baffle**.
    - **Install the processor mezzanine tray**.
14. **Install the access panel**.
15. **Installing the server into the rack**.
16. Connect all peripheral cables to the server.
17. Connect each power cord to the power source.
18. Connect each power cord to the server.
19. **Power up the server**.

The installation is complete.

Expansion card options

The server supports the installation of full-height, full-length, and full-height, half-length PCIe expansion / add-in (AIC) cards such as:

- Type-p storage controller
- Ethernet adapter
- HDR InfiniBand adapter
- Fibre channel host bus adapter (FC HBA)

For more information on the expansion options validated for this server, contact customer support.

Accelerator options

This server supports various accelerator options to meet your computational and graphics workload requirements. For a list of supported accelerator models, contact customer support.

Accelerator installation guidelines

- To support high power accelerators (TDP > 75 W), the following options are required:
  - **PCIe5 3 x16 riser option (P54780-B21) in the primary or secondary locations**.

    Up to one accelerator is supported in each riser cage.
  - GPU enablement option (P54816-B21):
    - GPU support bracket
    - GPU auxiliary power cable
- This server does not support the installation of different accelerator models in the same system.
- High performance double-width accelerators are not supported in the liquid cooling configuration.
- The limited operating inlet ambient temperatures required for accelerators vary based on the model and the server drive configuration. For more information, contact customer support.

IMPORTANT: Workloads for high performance accelerators with passive cooling can cause the fans to operate at high speeds to maintain optimum system cooling. Hitachi Vantara does not recommend installing accelerators with passive cooling in or near a site where there is a reasonable expectation for a quiet environment.

Installing an expansion card

Prerequisites

- Depending on the drive configurations in the different cooling configurations, some Ethernet adapters and InfiniBand cards require specific system ambient temperature. Contact customer support for these requirement.
- When installing an accelerator, review the **Accelerator installation guidelines**.
- Before you perform this procedure, make sure that you have the following items available:
  - T-10 Torx screwdriver
  - T-15 Torx screwdriver
  - Phillips No. 1 screwdriver

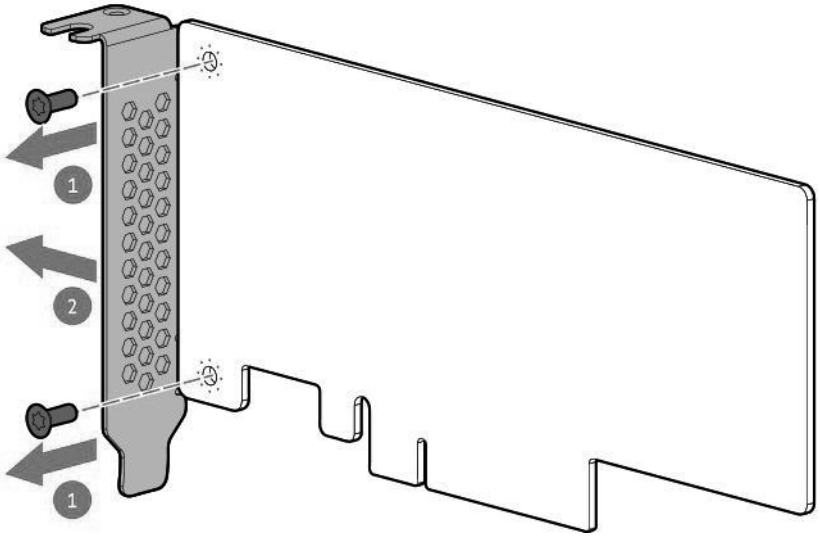
About this task

CAUTION: A discharge of static electricity from a finger or other conductor might damage system boards or other static-sensitive devices. To prevent damage, observe **antistatic precautions**.

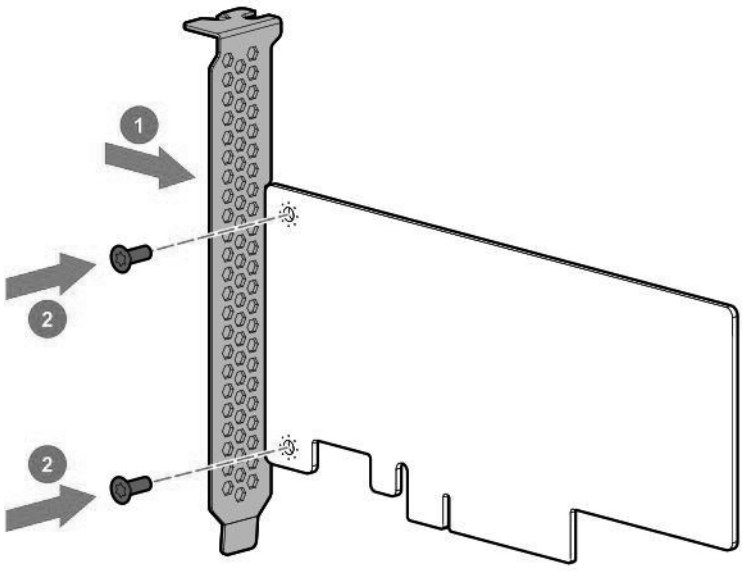
CAUTION: To prevent improper cooling and thermal damage, do not operate the server unless all PCIe slots have either a riser slot blank or an expansion card installed.

Procedure

1. **Power down the server**.
2. If installed, **open the cable management arm**.
3. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. **Remove the server from the rack**.
6. Place the server on a flat, level work surface.
7. **Remove the access panel**.
8. **Remove the riser cage**.
9. (Optional) **Install the riser board**.
10. If you are installing a low-profile expansion card:
    a. Remove the half-height bracket from the expansion card.

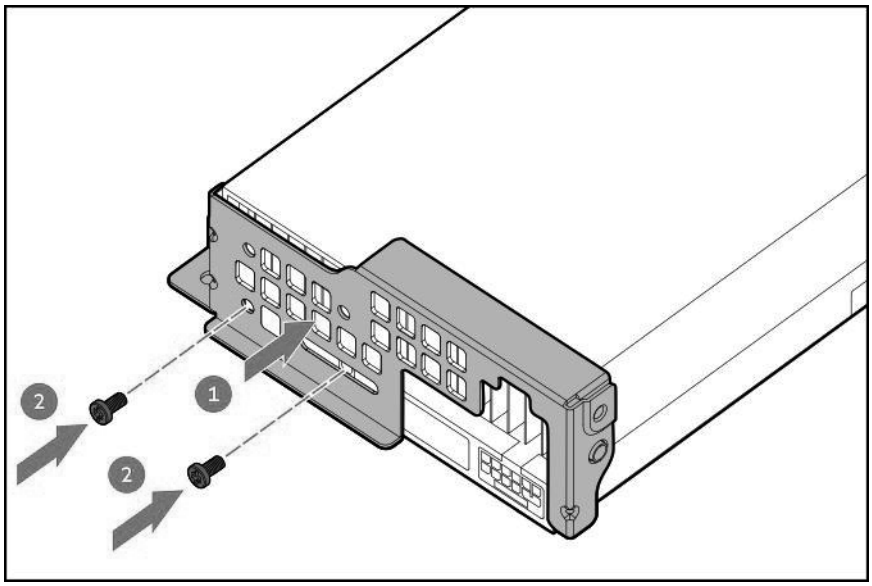


    b. Install the full-height bracket on the expansion card.

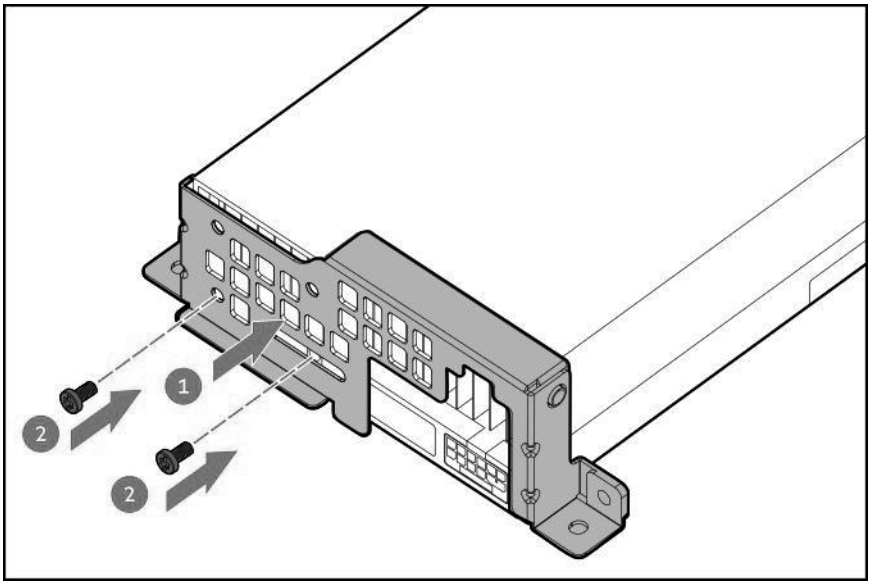


11. If installing a double-width accelerator, install the GPU support bracket on the accelerator.

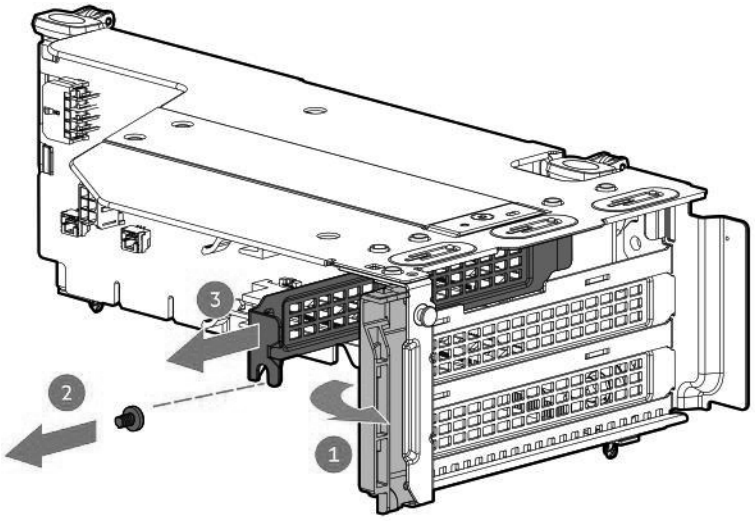
- Accelerator on the primary riser cage



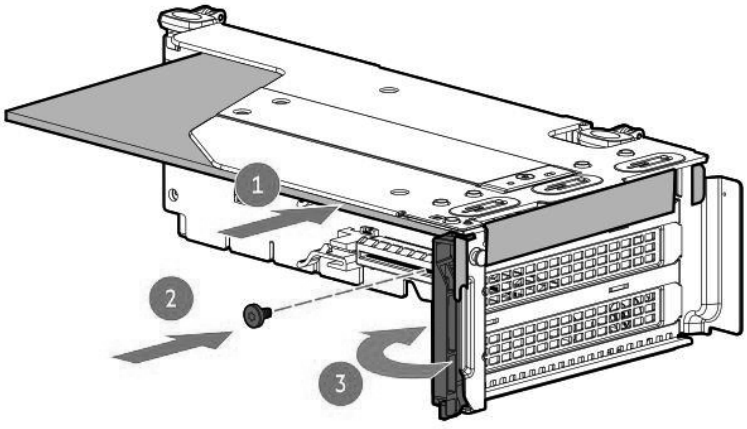
- Accelerator on the secondary riser cage



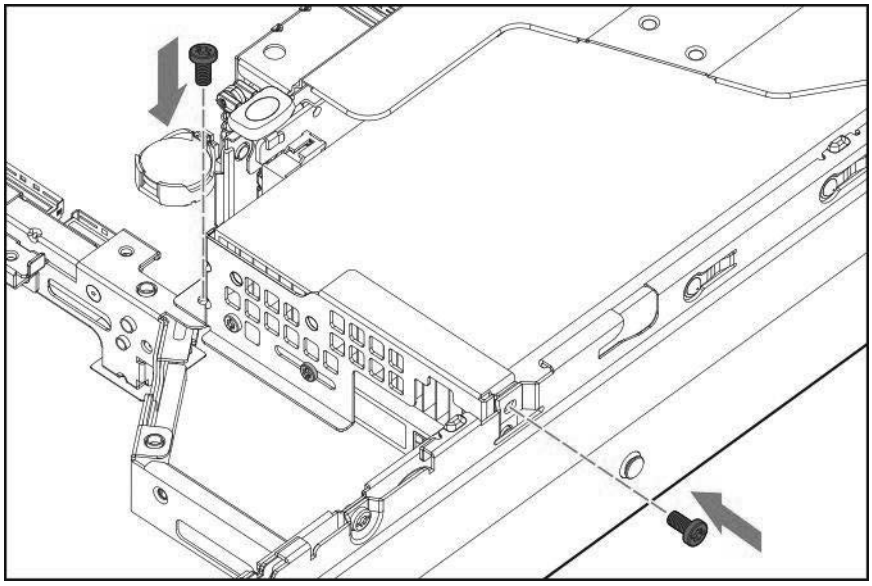
12. Remove the riser slot blank.



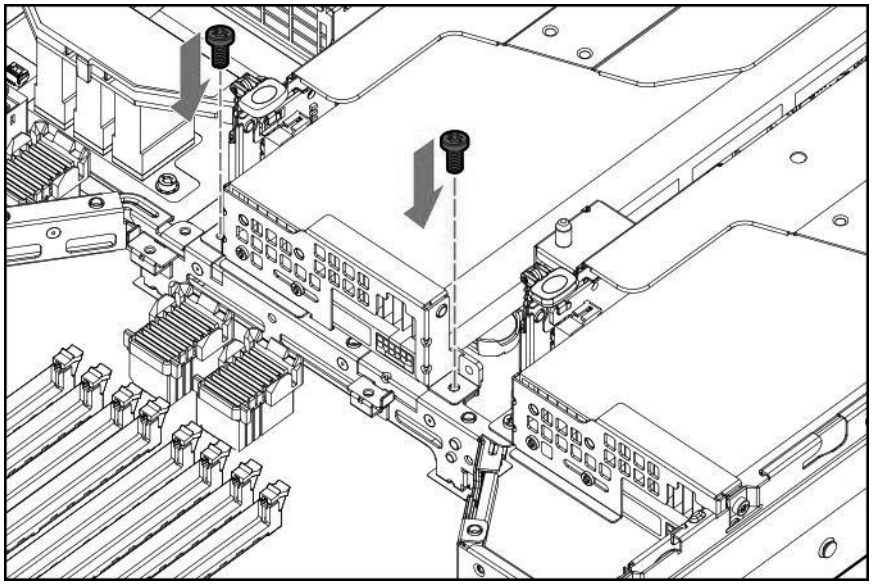
13. Install the expansion card.



14. Connect all necessary internal cabling to the expansion card.
    If a high power accelerator is installed, **connect the GPU auxiliary power cable**.
15. **Install the riser cage**.
16. If a double-width accelerator is installed, install the GPU support bracket screws to secure the accelerator.
    - Accelerator on the primary riser cage



    - Accelerator on the secondary riser cage



17. **Install the access panel**.
18. **Installing the server into the rack**.
19. Connect all peripheral cables to the server.
20. Connect each power cord to the power source.

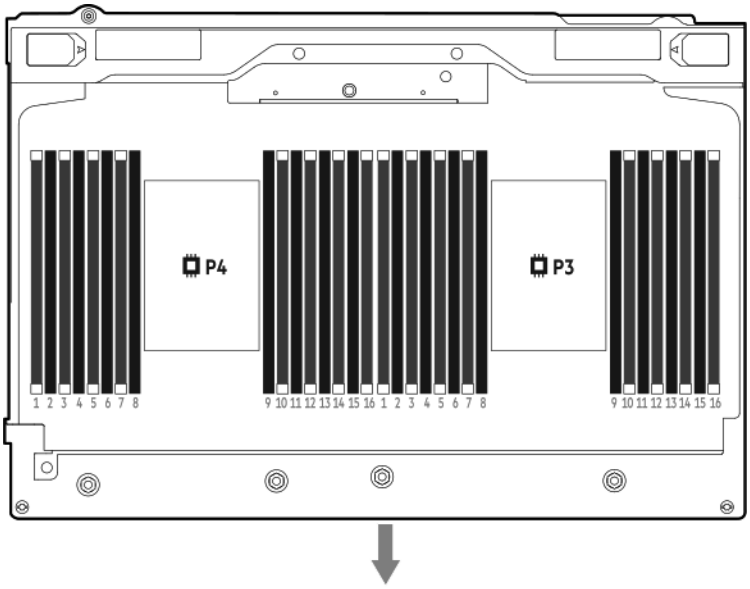
21. Connect each power cord to the server.
22. **Power up the server**.

The installation is complete.

Processor mezzanine tray option

Only the air cooling configuration supports the installation of processor mezzanine tray to upgrade the server from dual- to quad-processor configuration. In the liquid cooling configuration, the processor mezzanine tray with the **liquid cooling options** is by default in the server.

The processor mezzanine board on the tray has 32 DIMM slots supporting DDR5-4800 DIMM.



The arrow points to the front of the server.

Upgrading from the dual- to quad-processor configuration

Prerequisites

Before you perform this procedure, make sure that you have the following items available:

- T-30 Torx screwdriver
- T-10 Torx screwdriver
- Processor option
- Standard heatsink option (P48905-B21)
- Processor mezzanine tray option (P54803-B21)

About this task

Only the server in the air cooling configuration can be upgraded from the dual- to quad-processor configuration. For the processors that support the liquid cooling, quad-processor configuration, contact customer support.

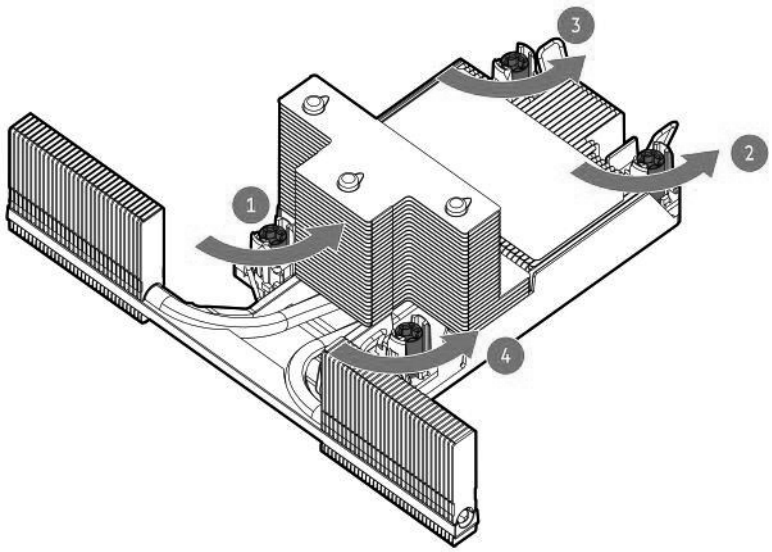
Procedure

1. **Power down the server**.
2. If installed, **open the cable management arm**.
3. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. **Remove the server from the rack**.
6. Place the server on a flat, level work surface.
7. **Remove the access panel**.
8. **Remove the air baffle**.

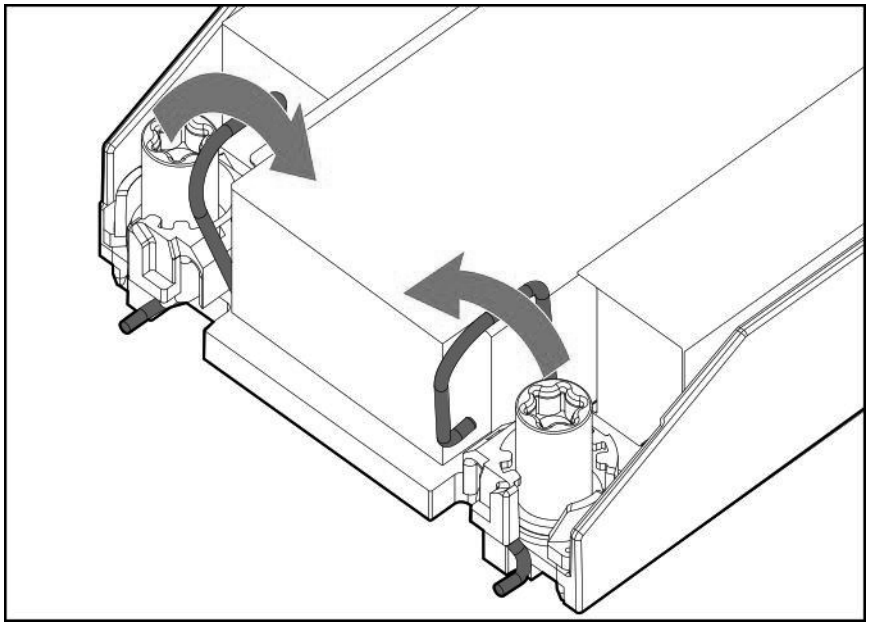
Removing all high performance heatsinks

9. Allow all internal system components to cool before continuing.
10. **CAUTION:** Heatsink screws must be tightened and loosened in alternating sequence. Do not overtighten the screws as this might damage the system board or the processor socket.

    Loosen one pair of diagonally opposite heatsink screws, and then loosen the other pair of heatsink screws.

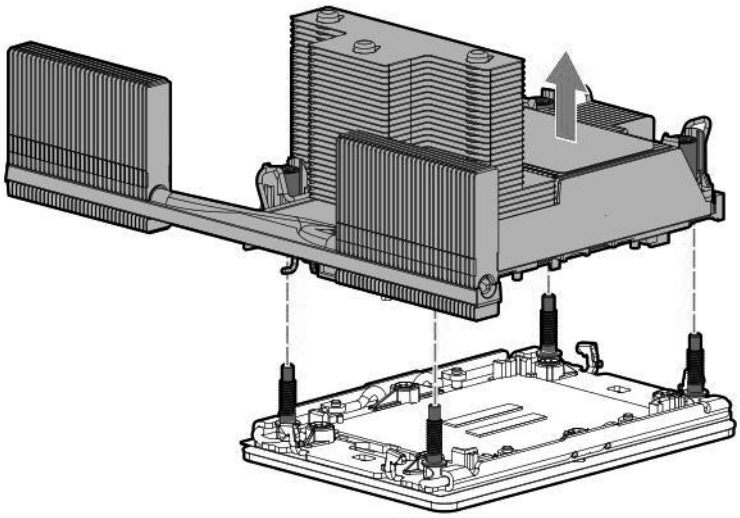


11. Set the anti-tilt wires to the unlocked position.



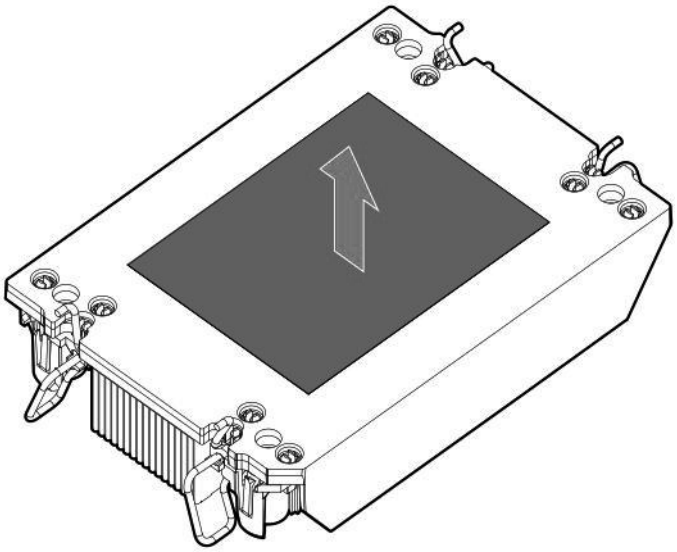
12. **CAUTION:** To prevent mechanical damage or depositing oil on your hands or other contaminants to the heatsink contact surface, hold the heatsink only by the edge of its base plate. Do not touch the heatsink fins.

    Lift the high performance processor-heatsink module straight up from the system board.

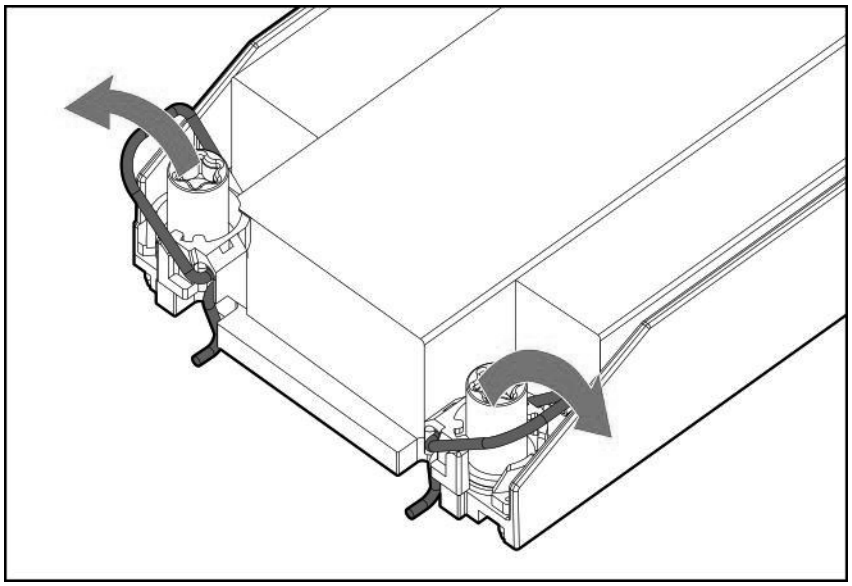


Installing the standard heatsinks on the system board and the mezzanine tray

13. Remove the protective film from the thermal interface material.

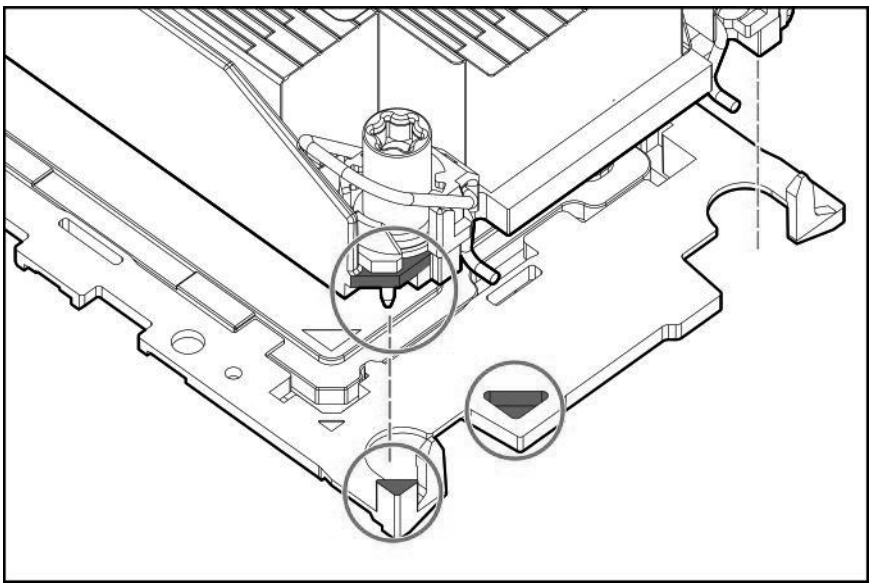


14. Set the anti-tilt wires to the locked position.

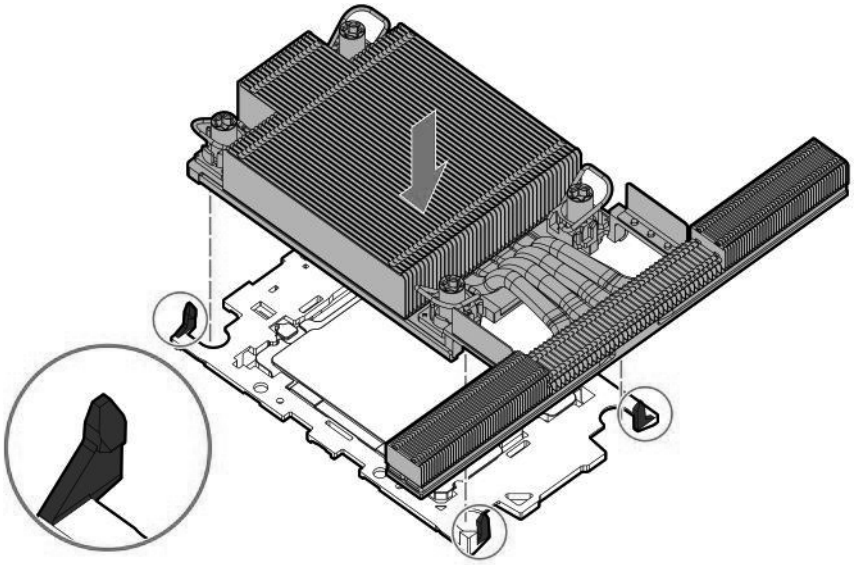


15. Attach the heatsink to the processor carrier:

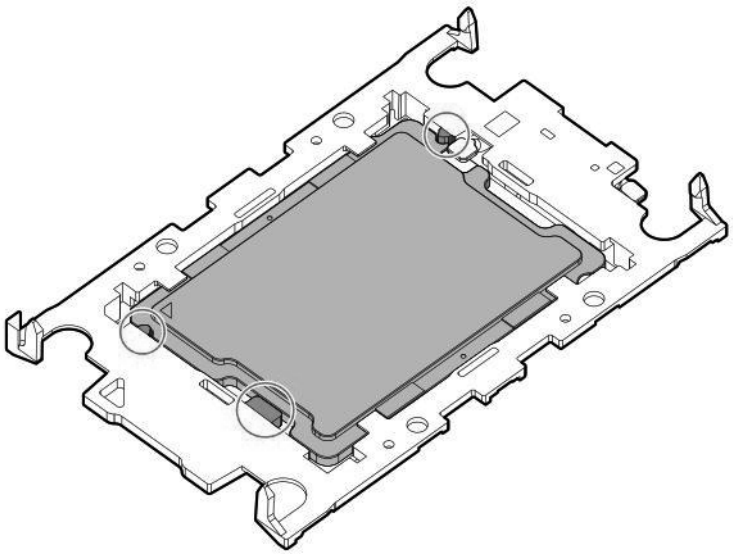
a. Align the pin 1 indicator on the processor carrier with that on the heatsink.



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.

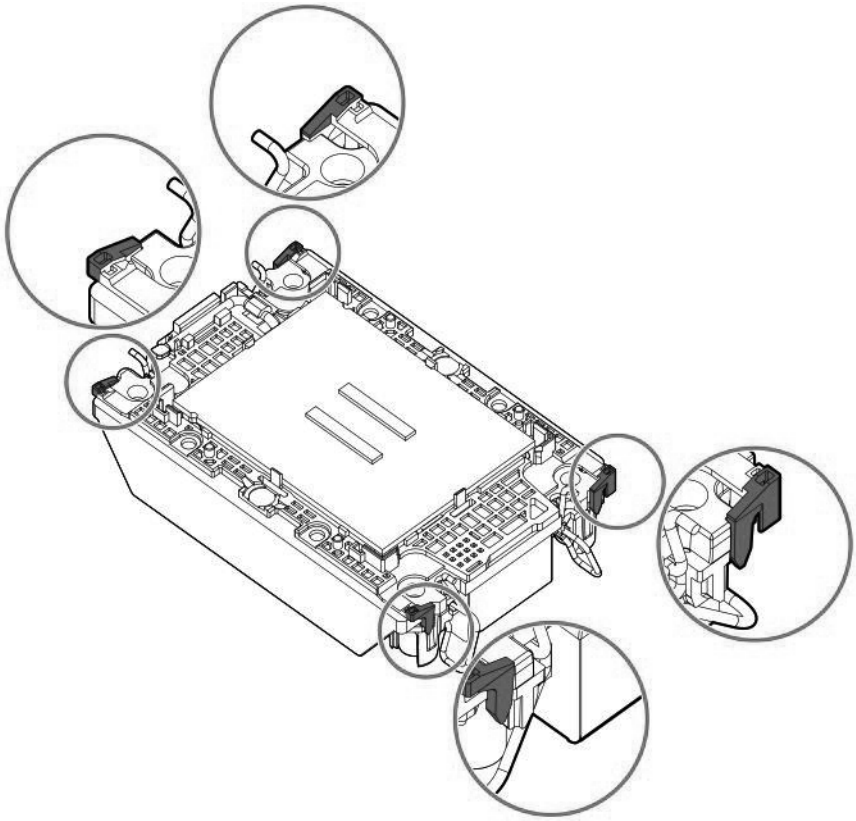


16. Verify that the processor is securely latched to the processor carrier.
The following illustration calls out the keying feature tabs that secure the processor. Different processor carriers will have these tabs in different locations.

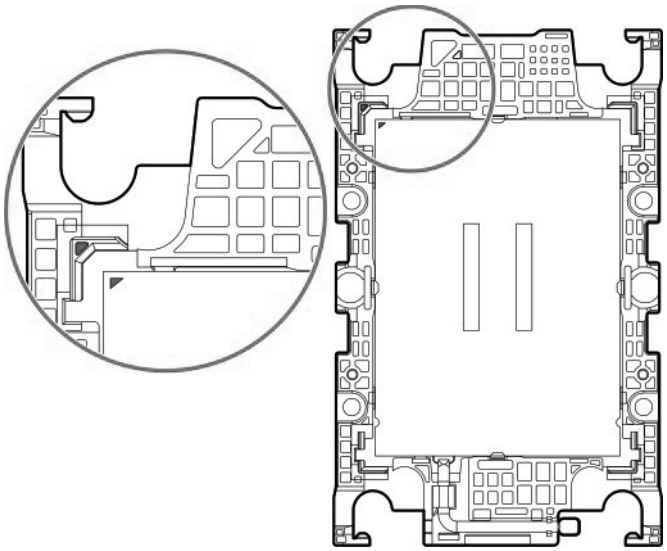


17. Perform the following verification steps:

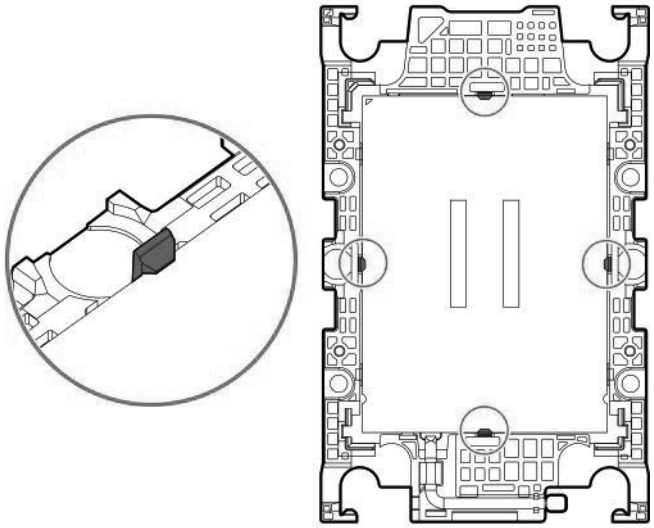
a. Verify that the tabs on the processor carrier are securely latched on the heatsink.



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



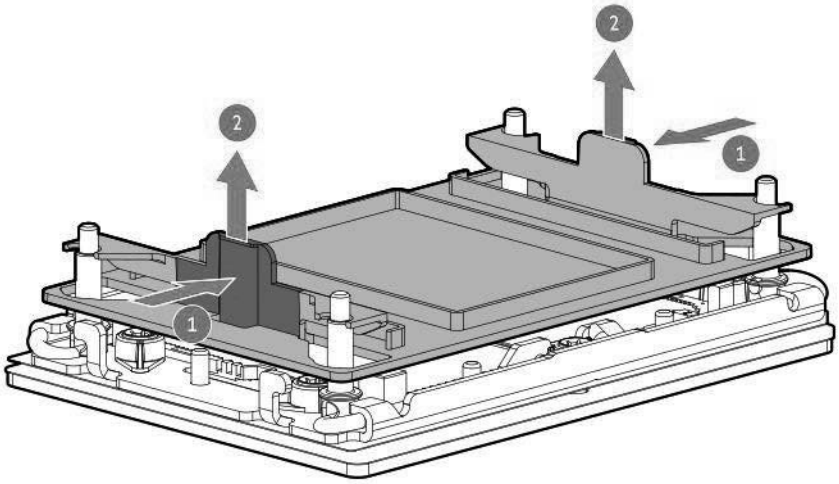
c. Verity that the processor is properly secured by the carrier snaps.



18. Remove the dust cover from the processor socket:

a. Press and hold the grip tabs on the dust cover.

b. Lift the dust cover away from the bolster plate.
Retain the cover for future use.



19.

CAUTION: To prevent thermal failure or component damage, do not move the heatsink once the bottom of its base plate touches the top of the processor. Excessive heatsink movement can cause the thermal grease to smear and become uneven. Voids in the compound can adversely impact the transfer of heat away from the processor.

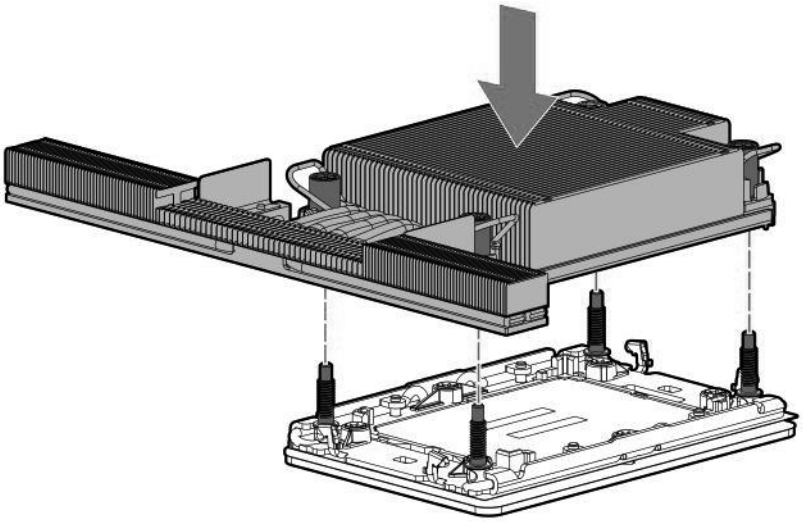
Install the processor-heatsink module:

a. When using a torque wrench to tighten the heatsink screws, set it to 0.9 N-m (8 in-lb) of torque.

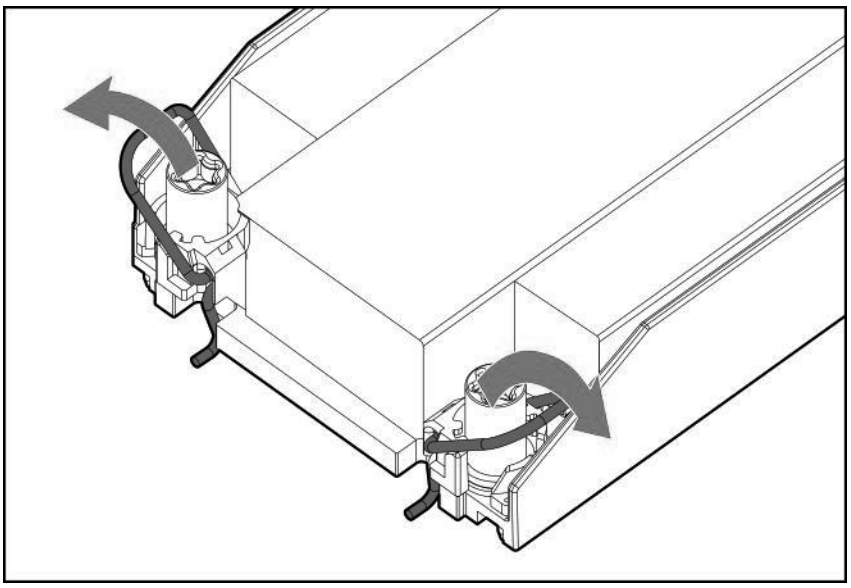
b. Note the **Front of server** text on the heatsink label to correctly orient the processor-heatsink module over the bolster plate.

c. Carefully lower the processor-heatsink module onto the bolster plate guide posts.

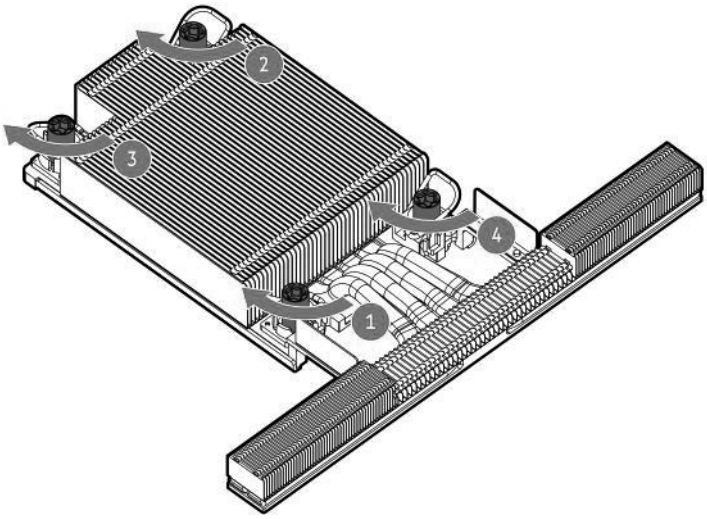
The posts are keyed so that the module can only be installed one way. Make sure that the module is properly seated on the bolster plate before securing the screws.



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

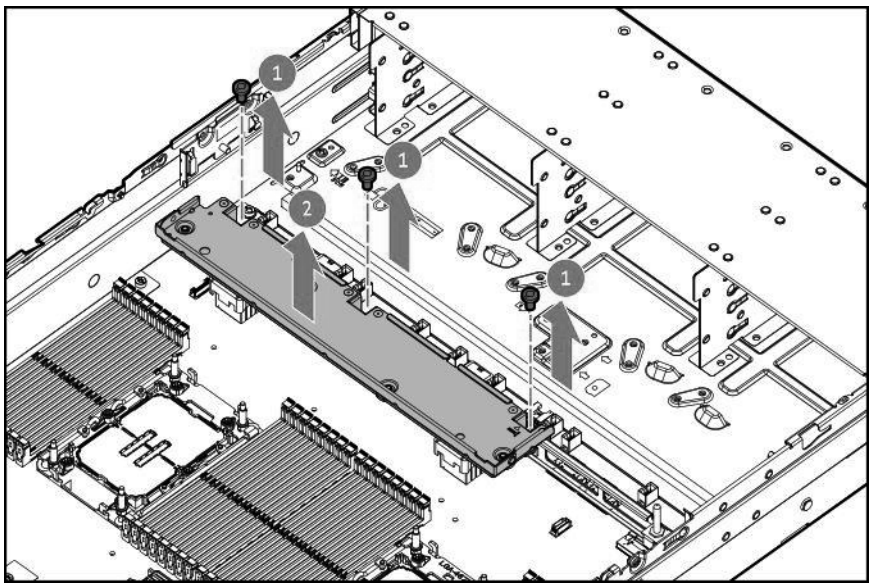


e. Tighten one pair of diagonally opposite heatsink screws, and then tighten the other pair of heatsink screws.

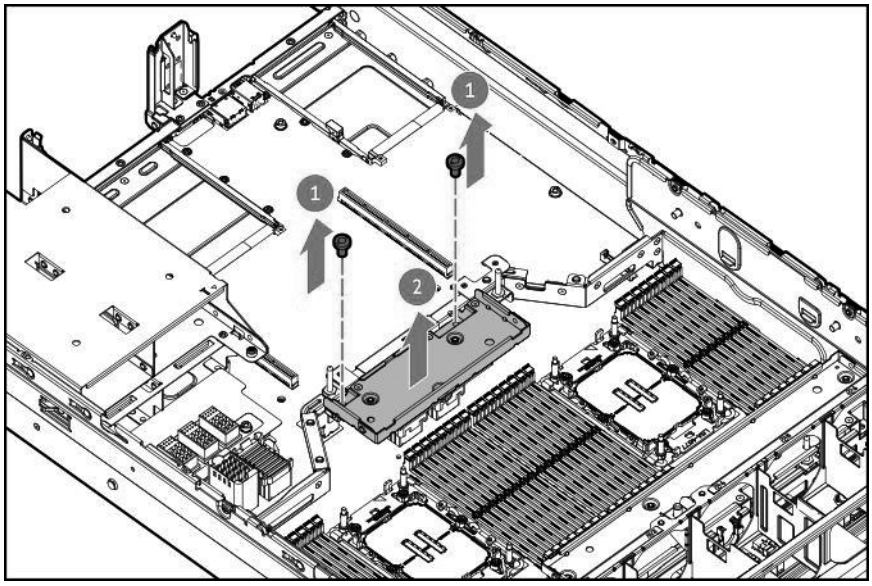


20. Remove the pass through modules.

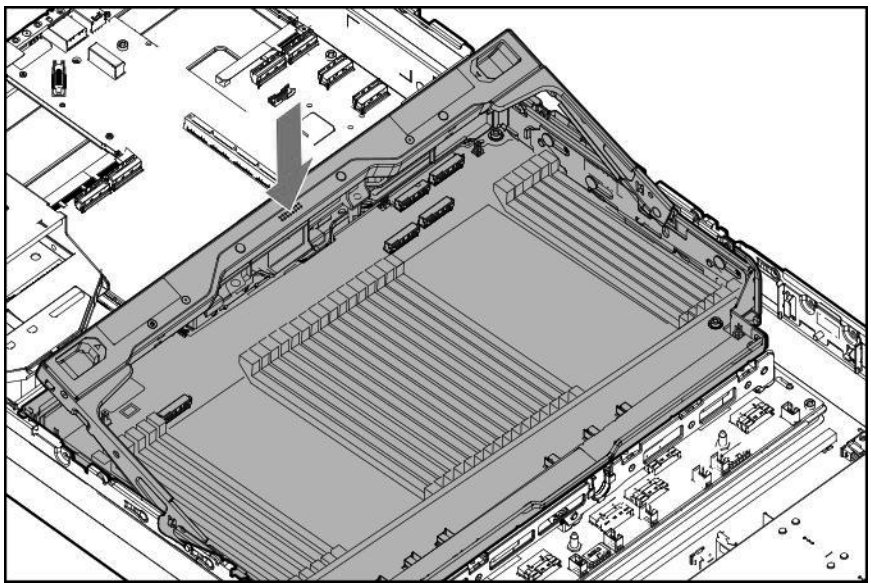
- Front pass through module



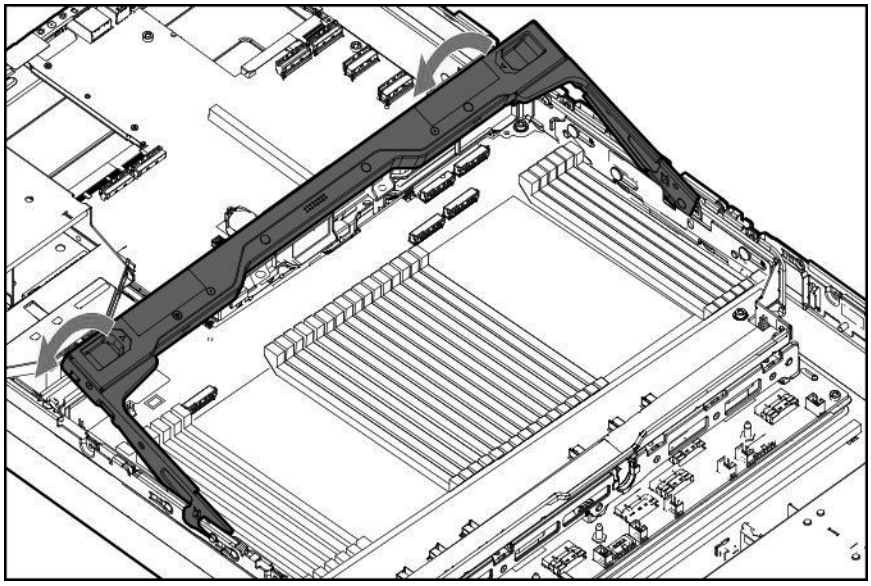
- Rear pass through module



21. Install the processor mezzanine tray in the server.



22. Connect all cables to the processor mezzanine board.
23. Press down on the processor mezzanine tray handle until it locks into place.



24. **Install the access panel**.
25. **Install the server into the rack**.
26. Connect all peripheral cables to the server.
27. Connect each power cord to the server.
28. Connect each power cord to the power source.
29. **Power up the server**.

The installation is complete.

Processor heatsink assembly option

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, see **Updating firmware or system ROM**.

IMPORTANT: After removing a processor from the system board, the server resets the date and time. For information on reconfiguring these settings, see **Reconfiguring the system date and time settings**.

Installing the processor heatsink assembly

Prerequisites

Before you perform this procedure, make sure that you have the following items available:

- T-30 Torx screwdriver
- Processor option

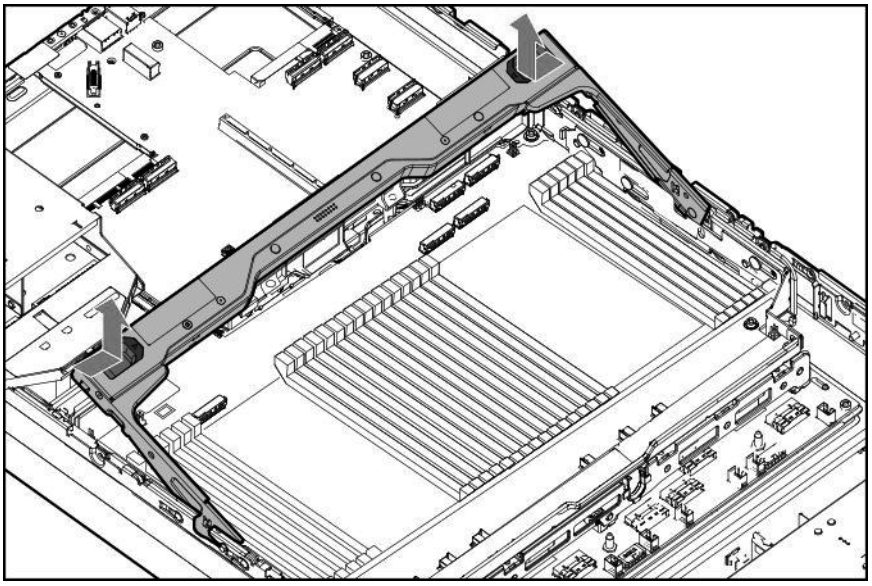
About this task

This procedure only shows the installation steps for the standard and high performance heatsink options. In the liquid cooling configuration, the **liquid cooling options** with the heatsinks are by default In the server.

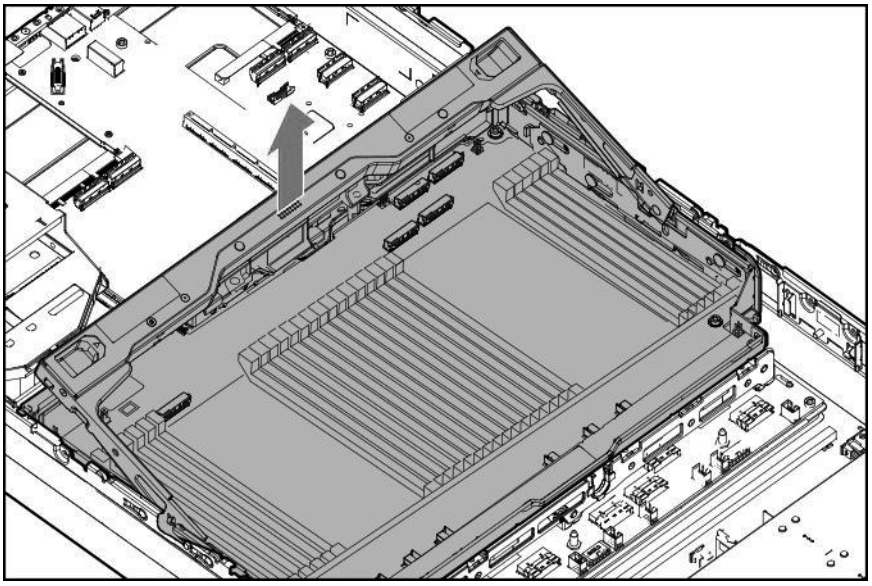
Procedure

1. **Power down the server**.
2. If installed, **open the cable management arm**.
3. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. **Remove the server from the rack**.
6. Place the server on a flat, level work surface.

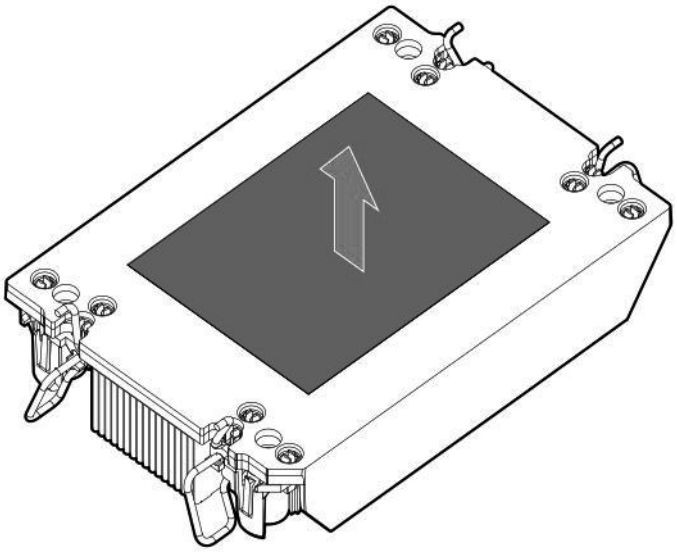
7. **Remove the access panel**.
8. If the server is in a dual-processor configuration, **remove the air baffle**.
9. If the server is in a quad-processor configuration:
   a. Press the buttons to rotate the processor mezzanine tray handle to the fully open position.



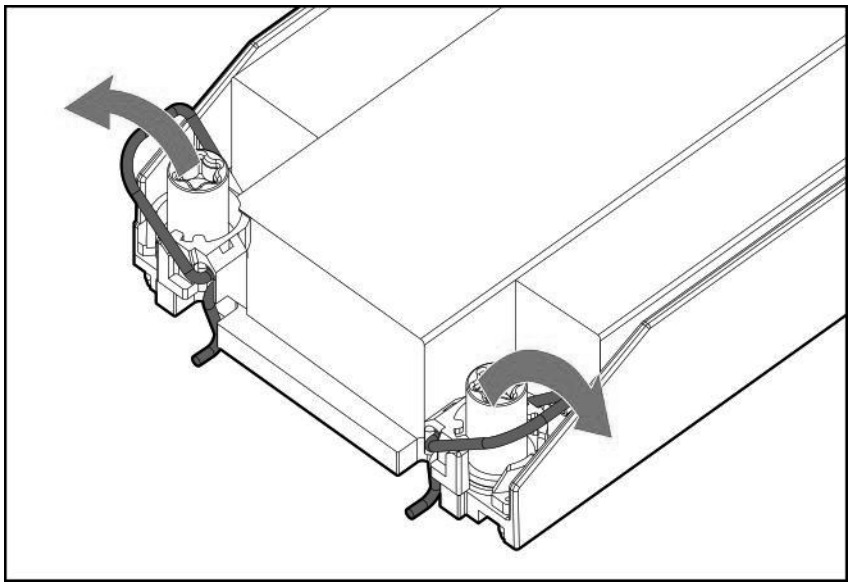
   b. Disconnect all cables from the processor mezzanine board.
   c. Remove the processor mezzanine tray.



10. Remove the protective film from the thermal interface material.

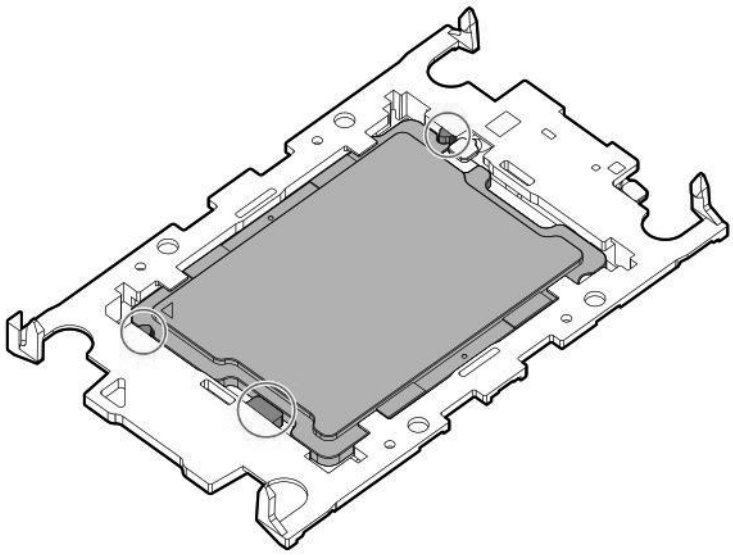


11. Set the anti-tilt wires to the locked position.



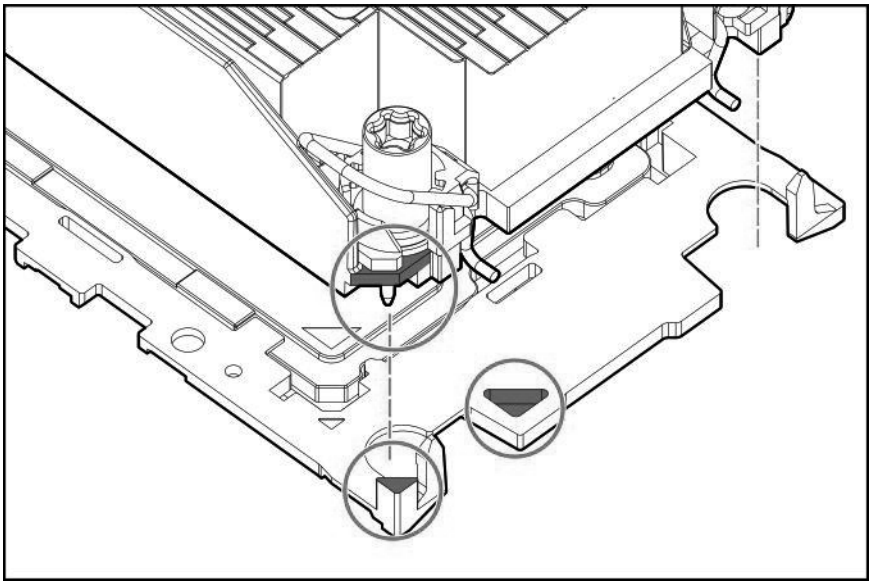
12. Verify that the processor is securely latched to the processor carrier.

The following illustration calls out the keying feature tabs that secure the processor. Different processor carriers will have these tabs in different locations.



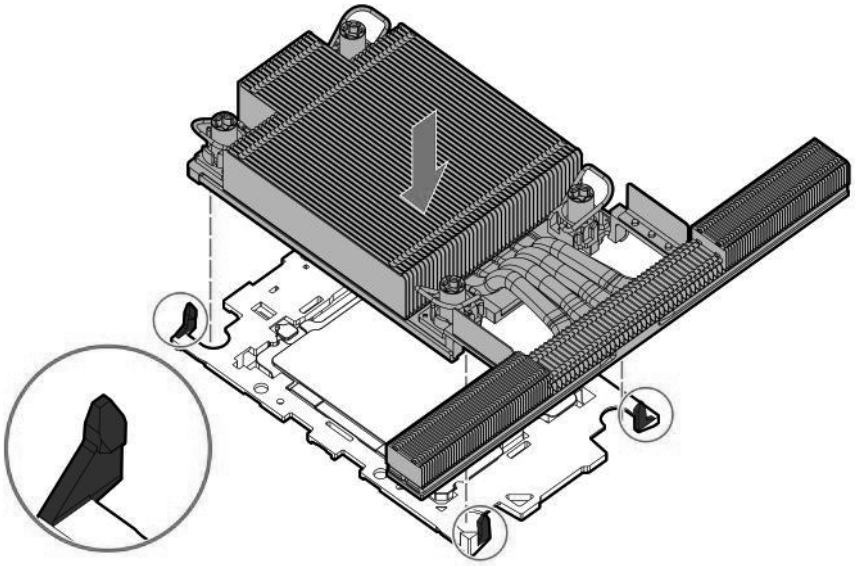
13. Attach the heatsink to the processor carrier:

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

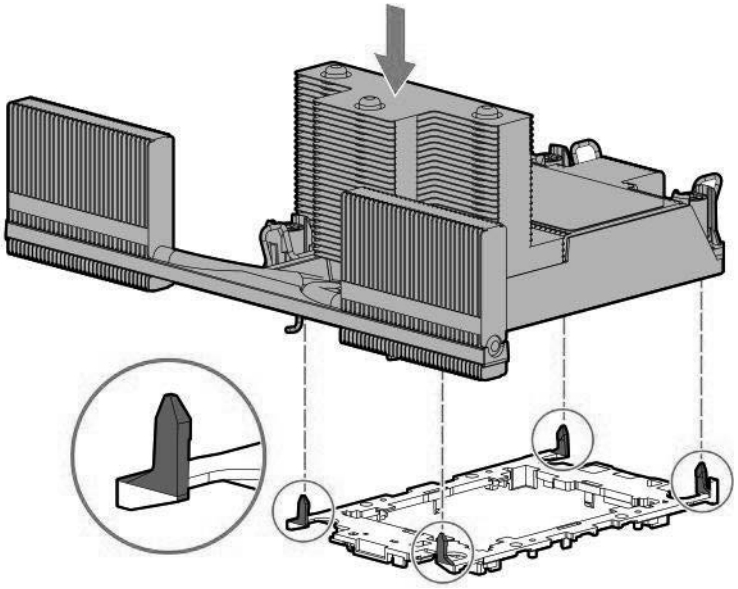


b. Lower the heatsink on the processor carrier until the carrier tabs snap into place.
There will be an audible click to indicate that the heatsink is properly latched on the processor carrier.

- Standard heatsink

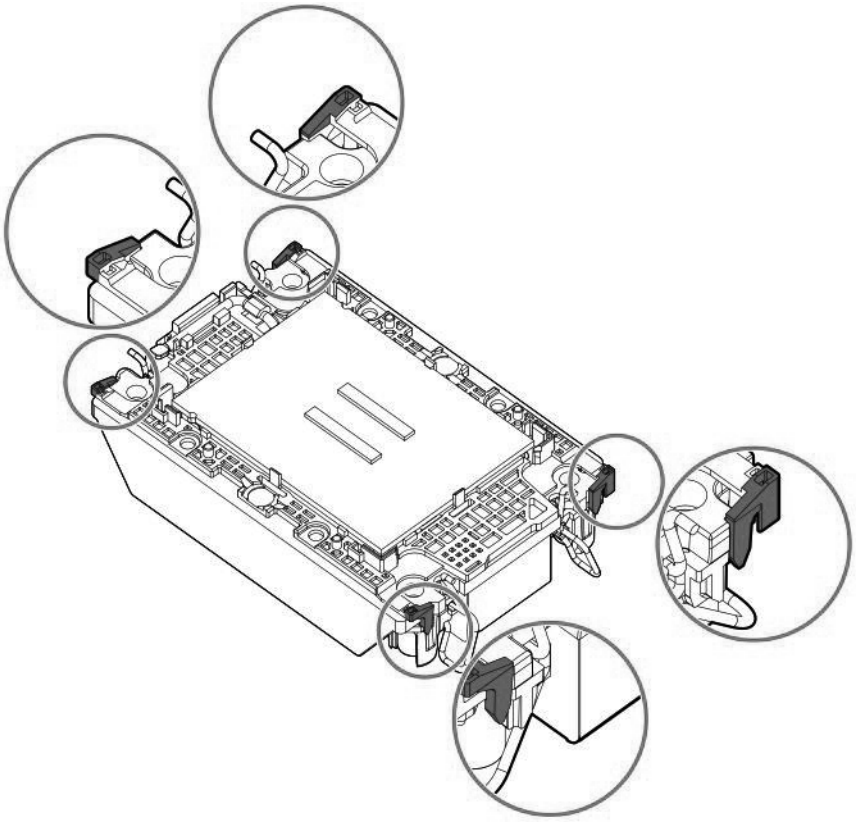


- High performance heatsink

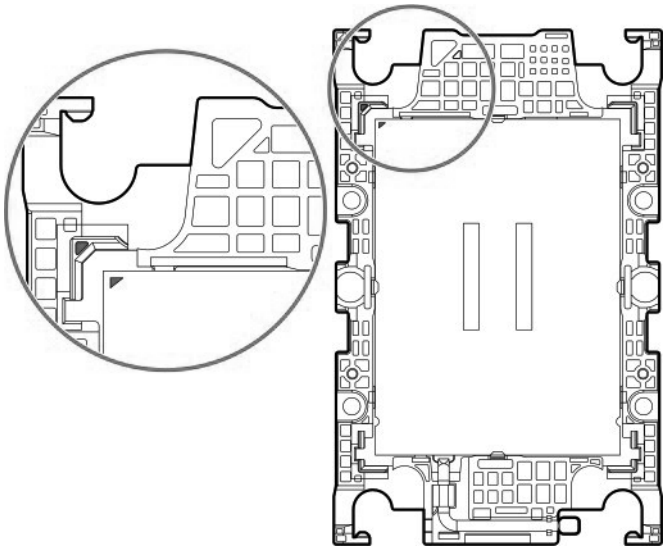


14. Perform the following verification steps:

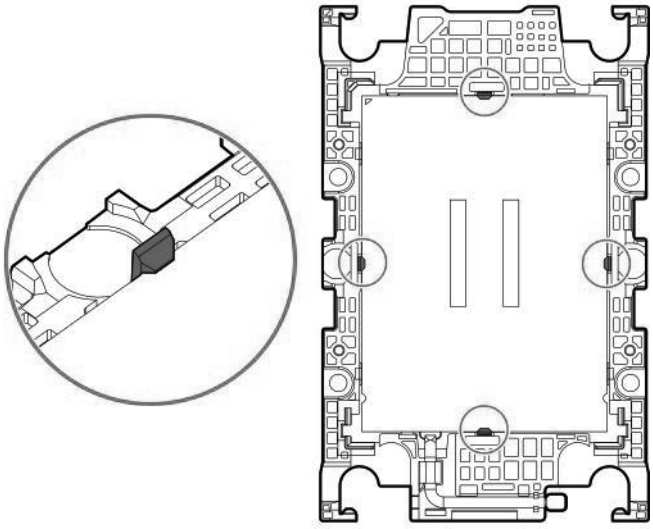
a. Verify that the tabs on the processor carrier are securely latched on the heatsink.



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



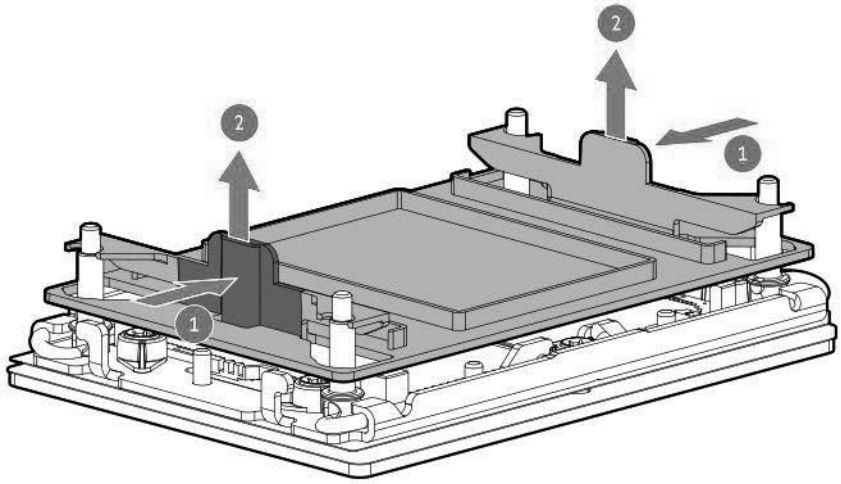
c. Verity that the processor is properly secured by the carrier snaps.



15. Remove the dust cover from the processor socket:

    a. Press and hold the grip tabs on the dust cover.

    b. Lift the dust cover away from the bolster plate.
    Retain the cover for future use.



16. **CAUTION:** To prevent thermal failure or component damage, do not move the heatsink once the bottom of its base plate touches the top of the processor. Excessive heatsink movement can cause the thermal grease to smear and become uneven. Voids in the compound can adversely impact the transfer of heat away from the processor.

    Install the processor-heatsink module:

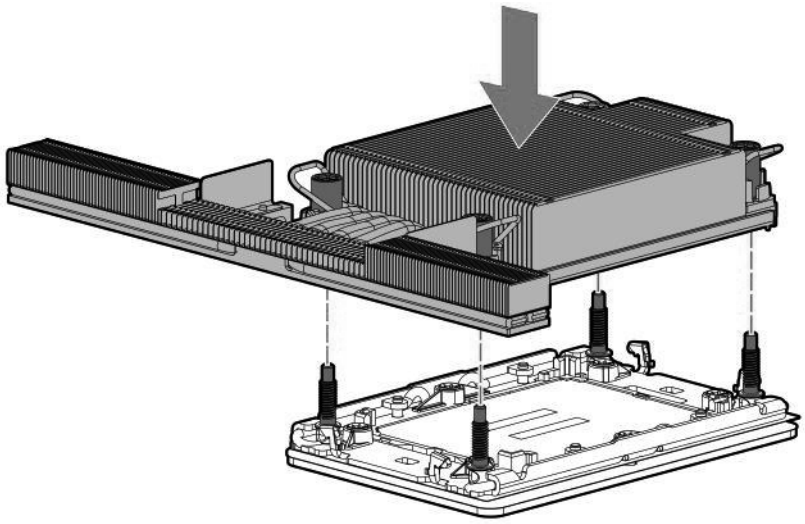
    a. When using a torque wrench to tighten the heatsink screws, set 0.9 N-m (8 in-lb) of torque.

    b. Note the **Front of server** text on the heatsink label to correctly orient the processor-heatsink module over the bolster plate.

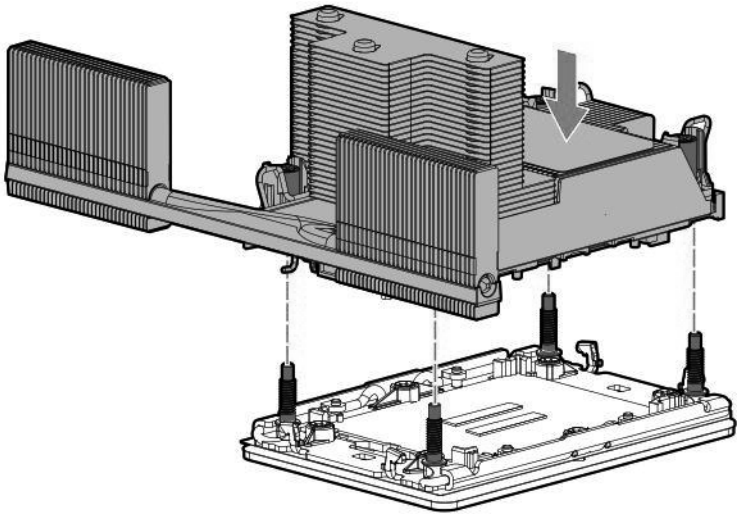
    c. Carefully lower the processor-heatsink module onto the bolster plate guide posts.

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.

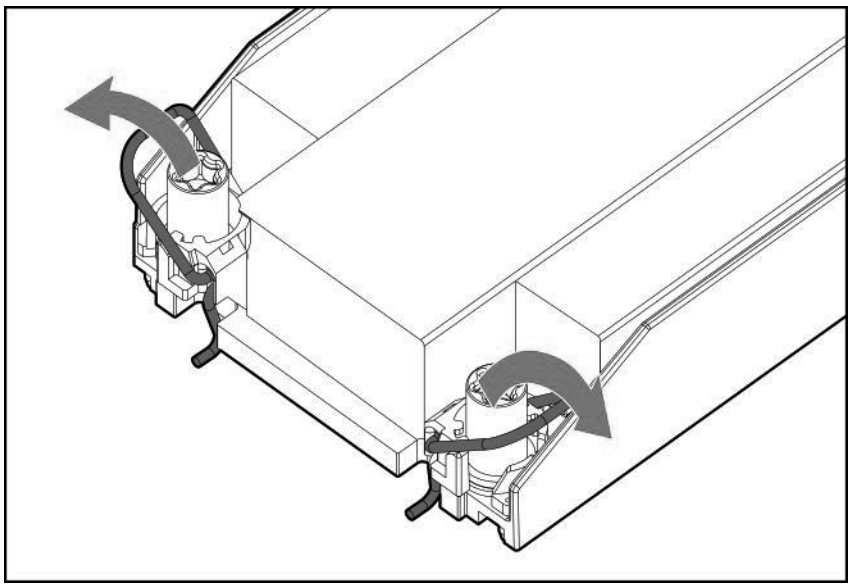
- Standard heatsink



- High performance heatsink

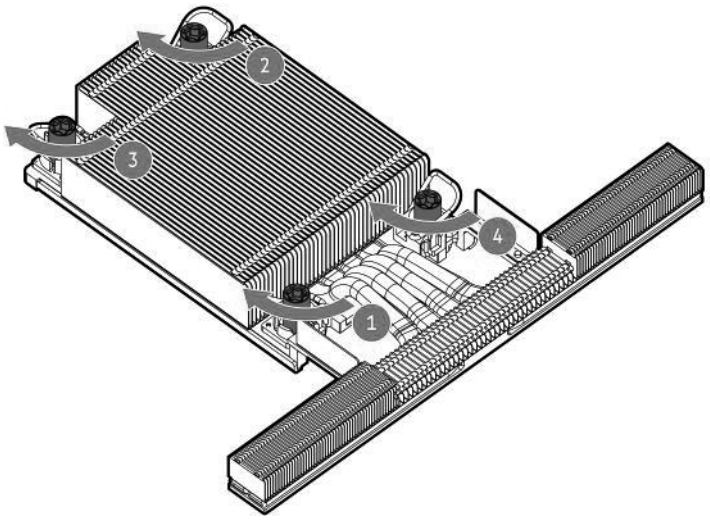


d. Set the anti-tilt wires to the locked position.

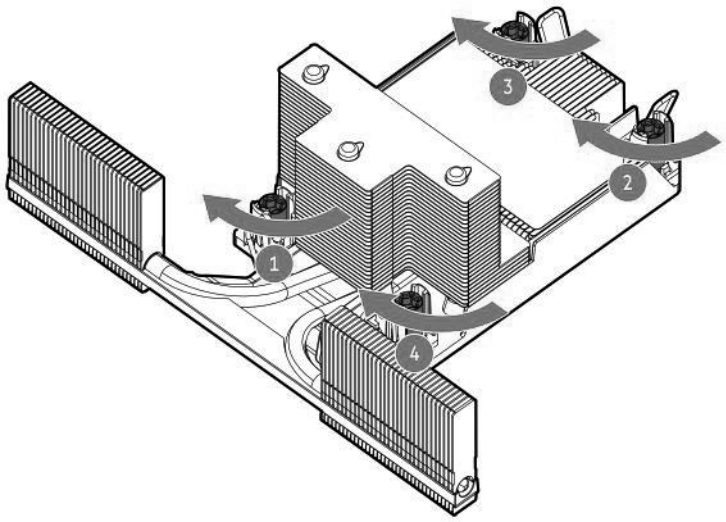


e. Tighten one pair of diagonally opposite heatsink screws, and then tighten the other pair of heatsink screws.

- Standard heatsink

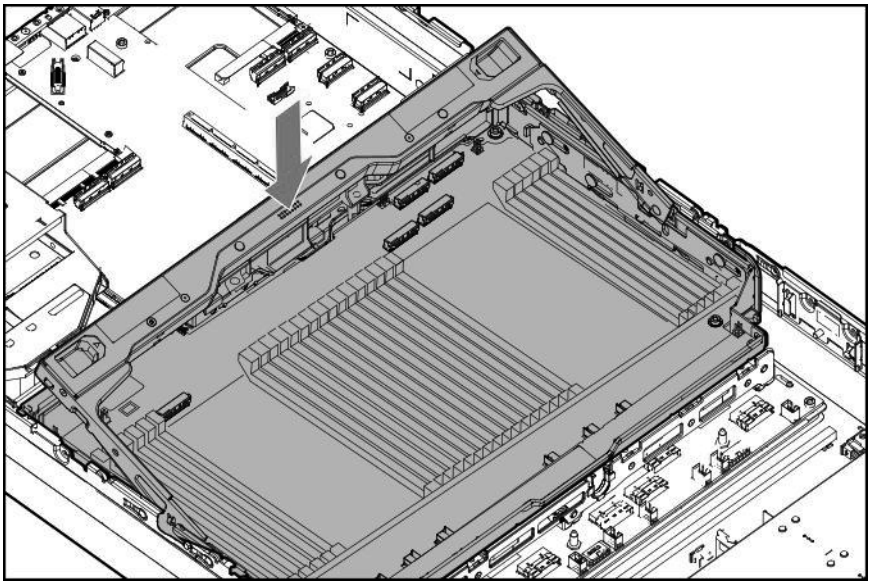


- High performance heatsink



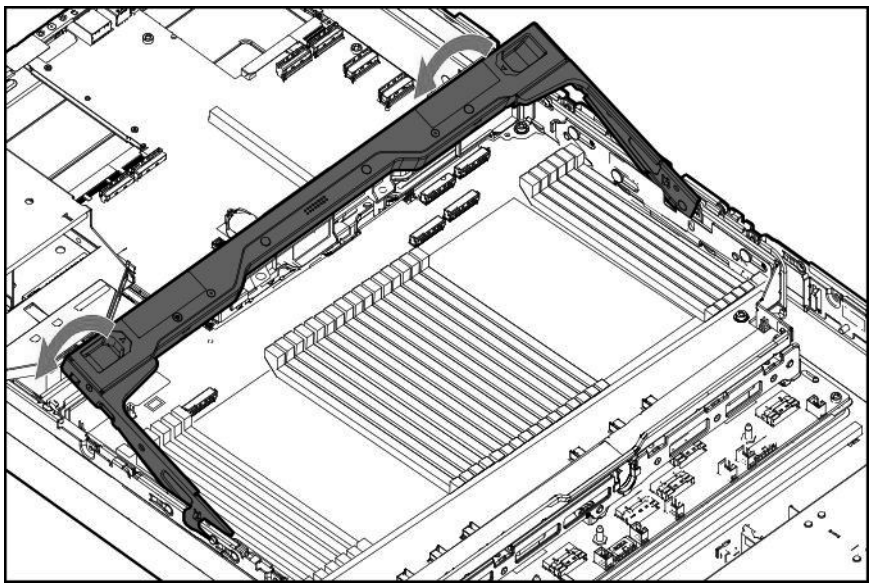
17. If removed, do the following:

a. Install the processor mezzanine tray.



b. Connect all cables to the processor mezzanine board.

c. Press down on the processor mezzanine tray handle until it locks into place.



18. If removed, **install the air baffle**.
19. **Install the access panel**.
20. **Install the server into the rack**.
21. Connect all peripheral cables to the server.
22. Connect each power cord to the server.
23. Connect each power cord to the power source.
24. **Power up the server**.

The installation is complete.

NS204i-u Boot Device option

Note the following information about the NS204i-u Boot Device option:

- The NS204i-u Gen3 NVMe Hot Plug Boot Optimized Storage Device is a PCIe custom form factor module that includes two hot-pluggable 2280 M.2 NVMe SSDs.
- This boot device enables the deployed OS to be mirrored through a dedicated hardware RAID 1.
- The boot device auto-creates a RAID1 volume during boot. This means the boot device does not require further RAID configuration.
- This boot device is compatible with the following native OS:
  - Windows
  - Linux
  - VMware
- This boot device uses native inbox OS NVMe drivers.

The NS204i-u boot device can be installed in **different locations**:

- To prevent hot-plug access to the SSDs on the boot device, **install the front boot device in the server**.
- To allow hot-plug access to the SSDs on the boot device, **install the rear boot device on the secondary riser cage**.

Installing the front NS204i-u Boot Device

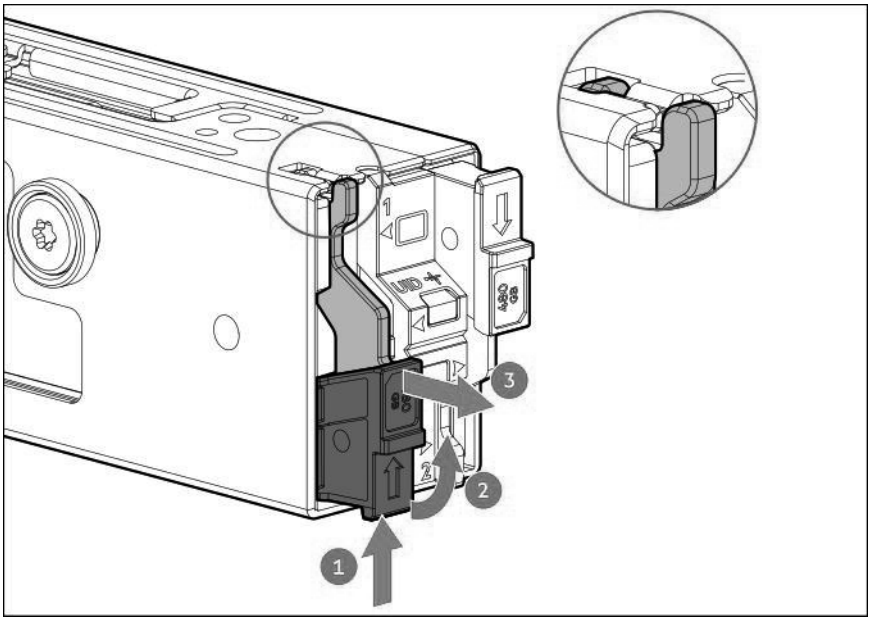
Prerequisites

- If the server is in the quad-processor configuration, contact customer support for specific system operating temperature requirement.
- Make sure that the server is updated with the latest operating system firmware and drivers.
- **Identify the NS204i-u Boot Device components**.
- Before you perform this procedure, make-sure that you have the following items available:
  - T-10 Torx screwdriver
  - Phillips No. 1 screwdriver—This tool is required only if the M.2 SSDs are not preinstalled on the boot device carriers.

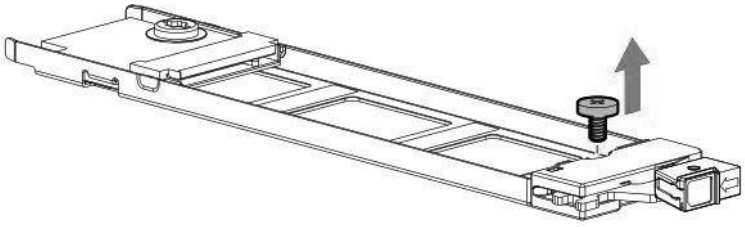
Procedure

Installing drives onto the boot device

1. Remove the boot device carrier:
   a. Press and hold the carrier latch.
   b. Pivot the latch to open.
   c. Slide the carrier out from the boot device cage.



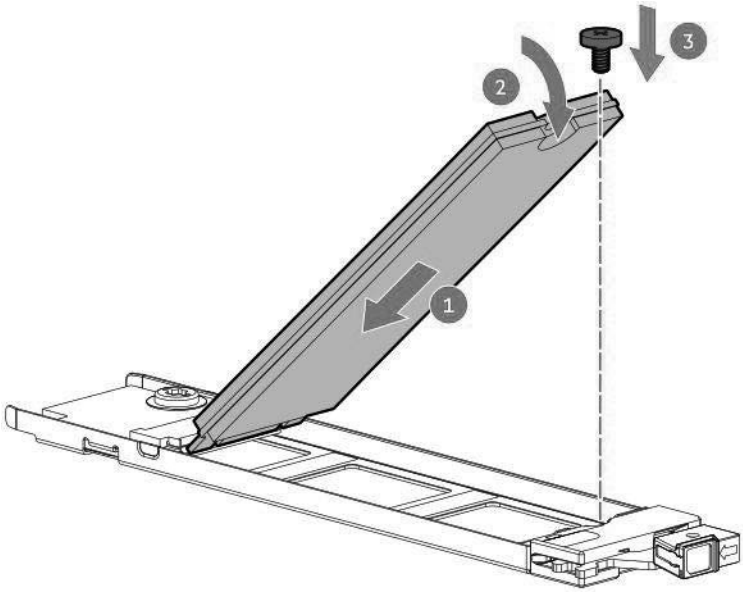
2. Install the SSD on the boot device carrier:
   a. Remove the SSD mounting screw.



b. Insert the SSD into the M.2 slot at a 45° angle.

c. Carefully press the SSD down to the horizontal position.

d. Install the SSD mounting screw.



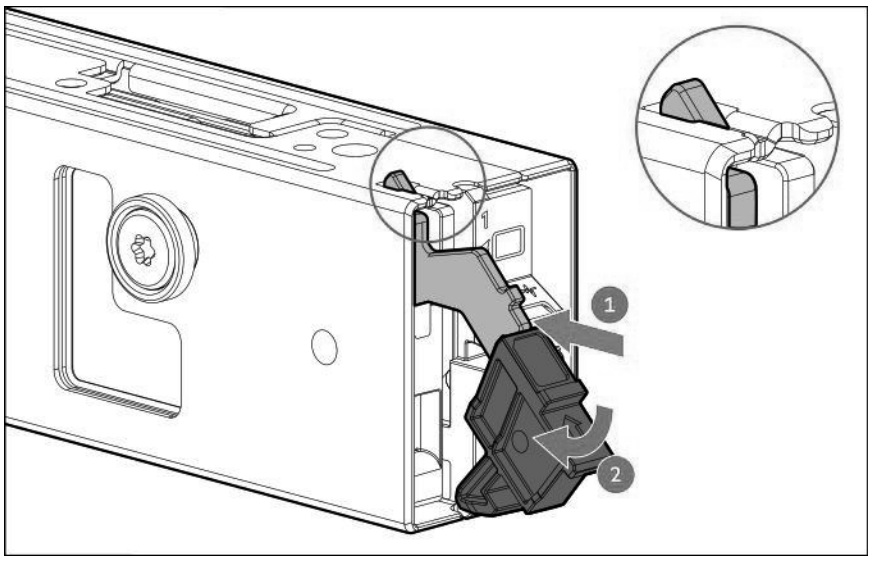
3. Install the boot device carriers:

a. If closed, pivot the carrier latch to open.

b. Slide the carrier into the boot device cage.

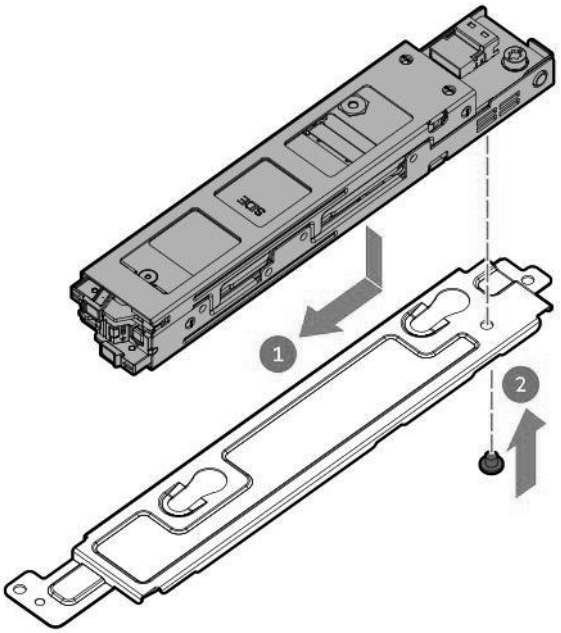
c. Pivot the latch to close.

Make sure that the carrier latch is locked on the boot device cage.

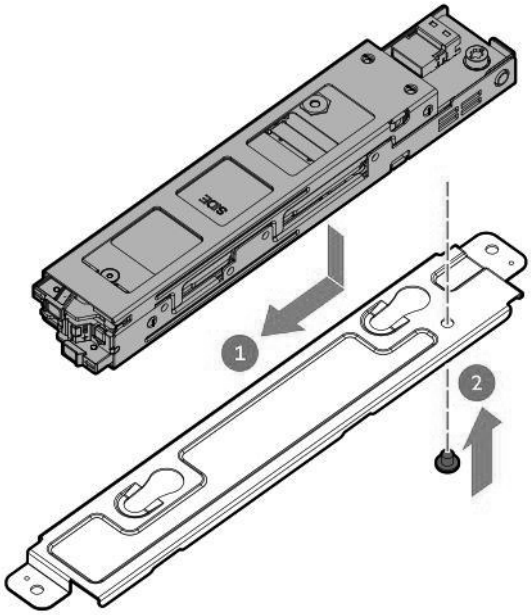


Installing the boot device

4. **Power down the server**.
5. If installed, **open the cable management arm**.
6. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
7. Disconnect all peripheral cables from the server.
8. **Remove the server from the rack**.
9. Place the server on a flat, level work surface.
10. **Remove the access panel**.
11. Do one of the following:
    - **Remove the air baffle**.
    - **Remove the processor mezzanine tray**.
12. **Remove the fan cage**.
13. Install the boot device on the bracket.
    - Air cooling configuration

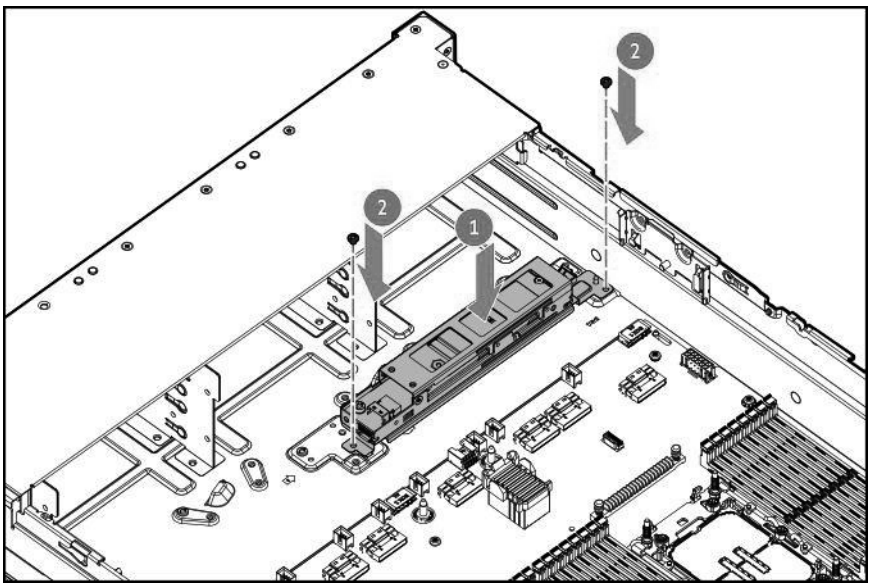


- Liquid cooling configuration

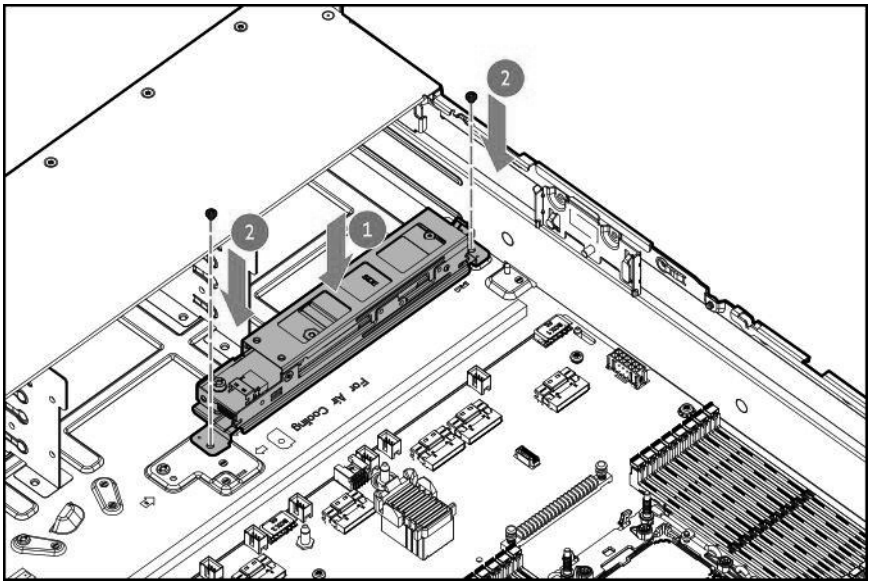


14. Install the boot device in the server.

- Air cooling configuration



- Liquid cooling configuration



15. **Connect the boot device signal and power cables to the system board**.
16. **Install the fan cage**.
17. Do one of the following:
    - **Install the air baffle**.
    - **Install the processor mezzanine tray**.
18. **Install the access panel**.
19. **Installing the server into the rack**.
20. Connect all peripheral cables to the server.
21. Connect each power cord to the power source.

22. Connect each power cord to the server.
23. **Power up the server**.

The installation is complete.

Installing the rear NS204i-u Boot Device

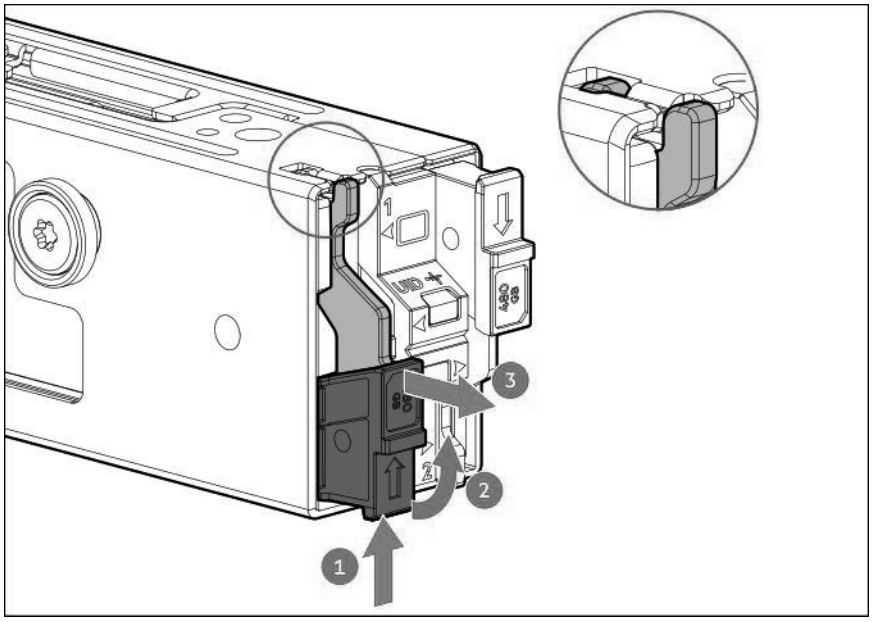
Prerequisites

- If the server is in the quad-processor configuration, contact customer support for special specific system operating temperature requirement.
- Make sure that the server is updated with the latest operating system firmware and drivers.
- **Identify the NS204i-u Boot Device components**.
- Before you perform this procedure, make sure that you have the following items available:
  - T-10 Torx screwdriver
  - Phillips No. 1 screwdriver—This tool is required only if the M.2 SSDs are not preinstalled on the boot device carriers.

Procedure

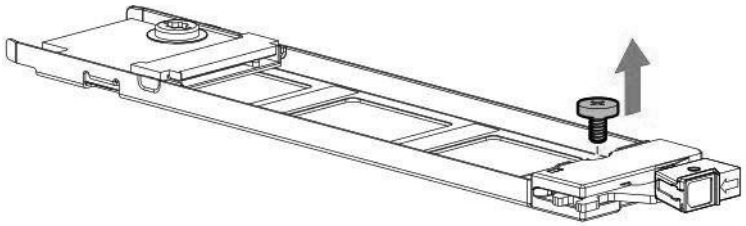
Installing drives onto the boot device

1. Remove the boot device carrier:
   a. Press and hold the carrier latch.
   b. Pivot the latch to open.
   c. Slide the carrier out from the boot device cage.



2. Install the SSD on the boot device carrier:

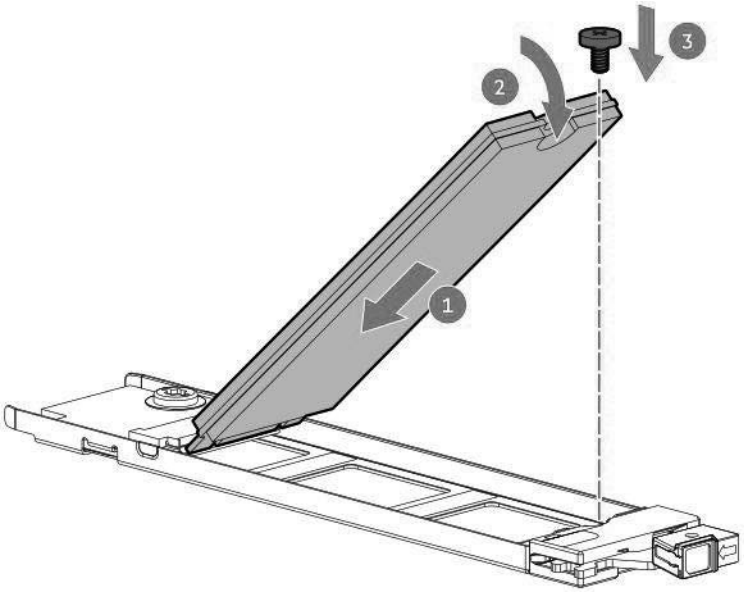
a. Remove the SSD mounting screw.



b. Insert the SSD into the M.2 slot at a 45° angle.

c. Carefully press the SSD down to the horizontal position.

d. Install the SSD mounting screw.

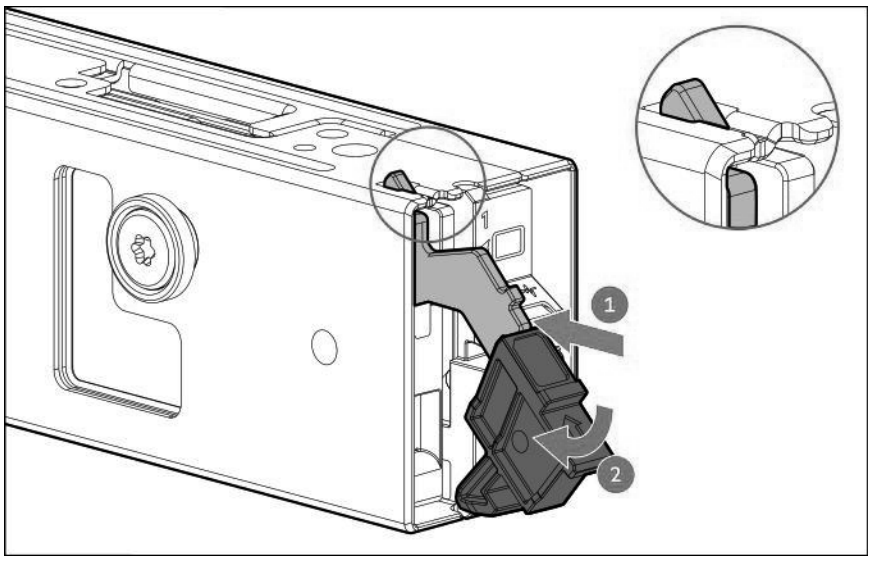


3. Install the boot device carriers:

a. If closed, pivot the carrier latch to open.

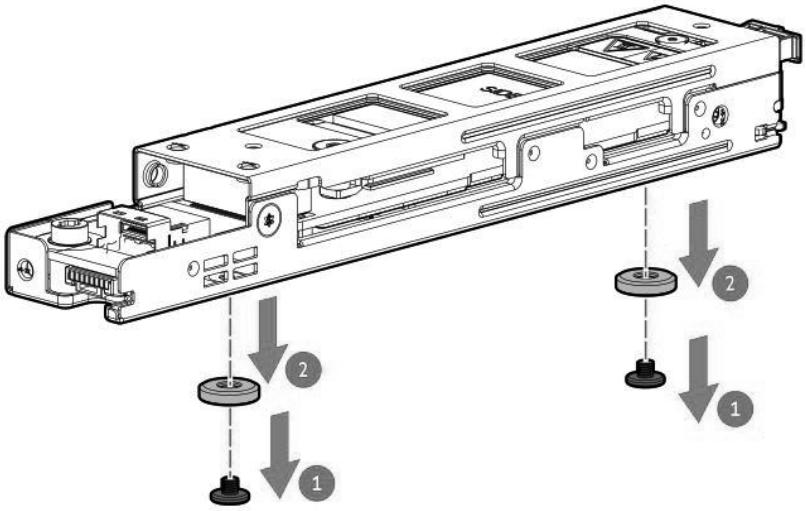
b. Slide the carrier into the boot device cage.

c. Pivot the latch to close.
Make sure that the carrier latch is locked on the boot device cage.

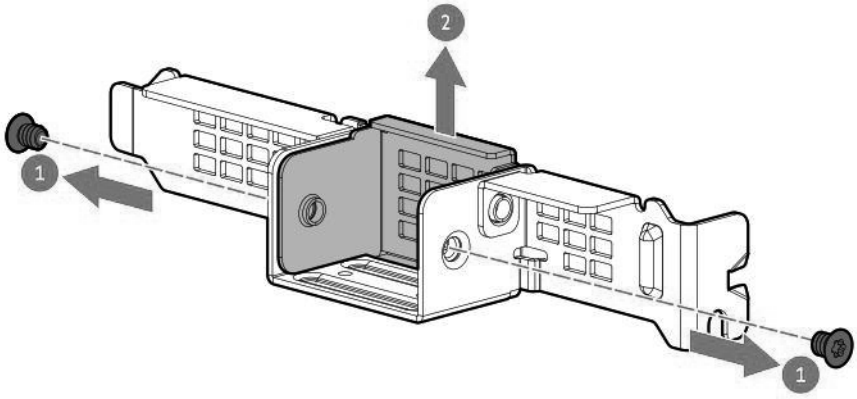


Installing the boot device

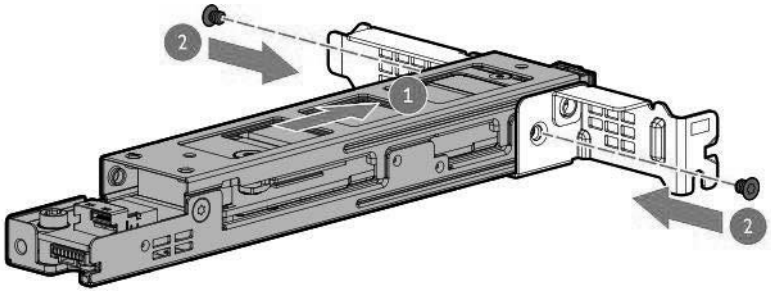
4. **Power down the server**.
5. If installed, **open the cable management arm**.
6. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
7. Disconnect all peripheral cables from the server.
8. **Remove the server from the rack**.
9. Place the server on a flat, level work surface.
10. **Remove the access panel**.
11. **Remove the secondary riser cage**.
12. Remove the boot device screws and spools.



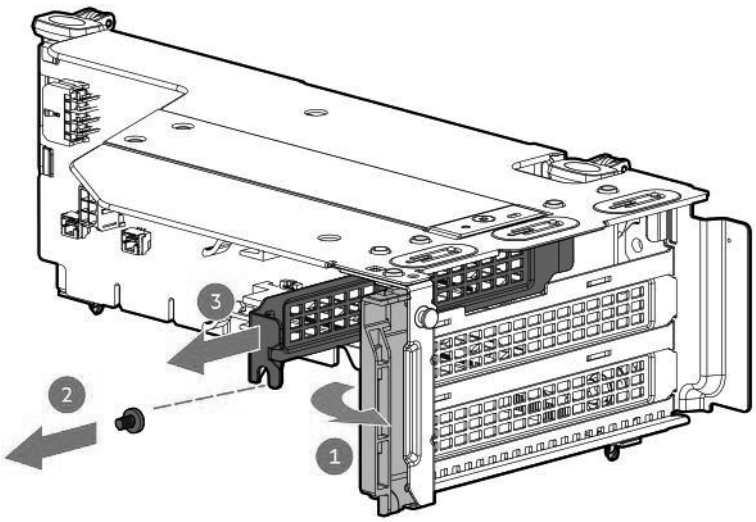
13. Remove the security cover from the boot device bracket.
    Retain the screws for the boot device installation.



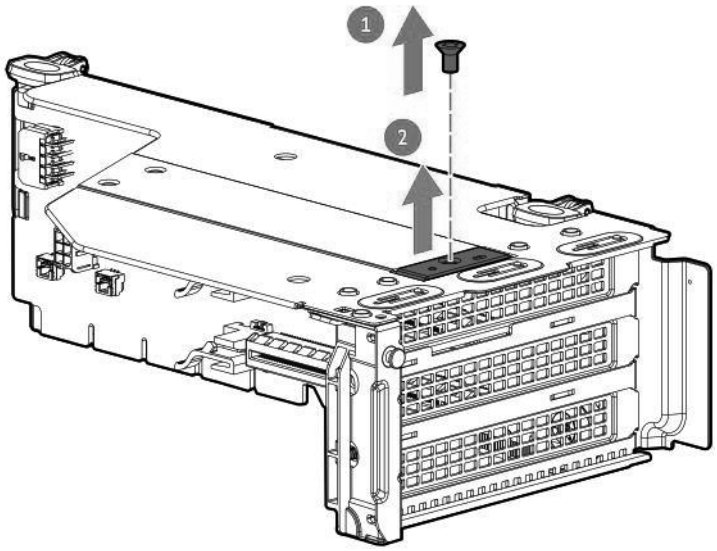
14. Install the boot device onto the bracket:
    a. Slide the boot device onto the bracket (callout 1).
    b. Install the screws on the side (callout 2).



15. Connect the signal and power cables to a boot device.
16. Remove the first secondary riser slot blank:
    a. Open the riser cage latch (callout 1).
    b. Remove the scrwe and the riser slot blank (callouts 2 and 3).
    Retain the screw. This screw will be used to secure the boot device.

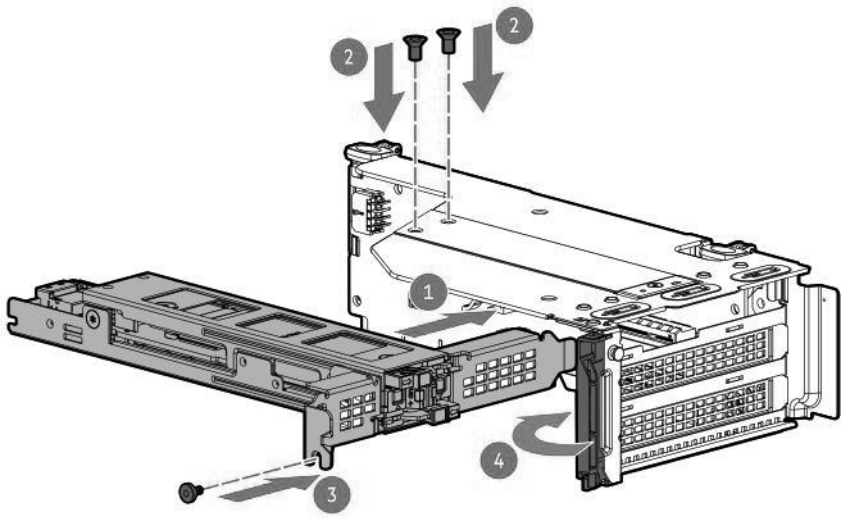


17. Remove the boot device cover on the top of the riser cage.



18. Install the boot device on the secondary riser cage:

- **a.** Install the boot device on the first slot (callout 1).
- **b.** Install the screw on the top of the secondary riser cage (callout 2).
- **c.** Install the boot device bracket screw (callout 3), and then close the riser cage latch (callout 4).



19. **Install the secondary riser cage**.
20. **Connect the boot device signal and power cables to the system board**.
21. **Install the access panel**.
22. **Installing the server into the rack**.
23. Connect all peripheral cables to the server.
24. Connect each power cord to the power source.
25. Connect each power cord to the server.
26. **Power up the server**.

The installation is complete.

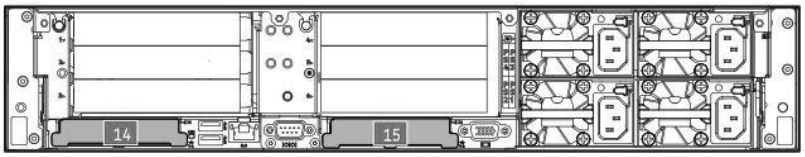
OCP NIC 3.0 adapter option

The server supports SFF dual-port and quad-port OCP NIC 3.0 adapter options with various interfaces and advanced interconnect features for high-bandwidth applications.

OCP slot population rules

Both Slot 14 and 15 OCP PCIe5 x8 support type-o storage controllers and OCP NIC adapters.

For some specific InfiniBand adapters that require to be installed in Slot 15 OCP, contact customer support.



Installing the OCP NIC 3.0 adapter

Prerequisites

- Review the **OCP slot population rules**.
- Depending on the drive configurations in the different cooling cooling configurations, some OCP 3.0 adapters require specific system ambient temperature. Contact customer support for these requirement.
- Before you perform this procedure, make sure that you have the following items available:
  - T-10 Torx screwdriver
  - OCP bandwidth upgrade cable kit—Depending on which processor the OCP NIC 3.0 adapter is connecting to, the server has two OCP bandwidth upgrade cable kits:
    - P55322-B21—To the processor 1 or 2
    - P55324-B21—To the processor 3 or 4

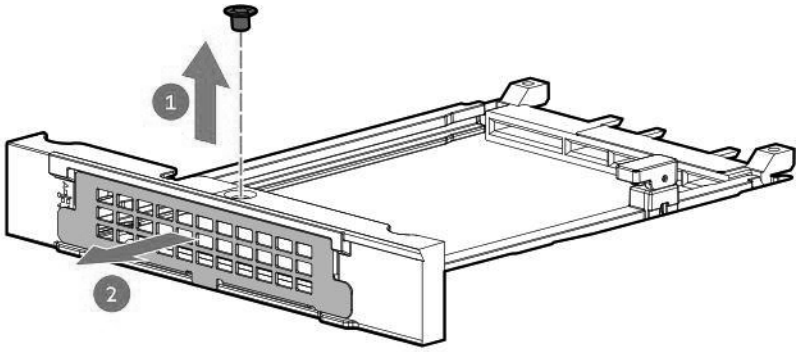
About this task

CAUTION: A discharge of static electricity from a finger or other conductor might damage system boards or other static-sensitive devices. To prevent damage, observe **antistatic precautions**.

CAUTION: The port blank provides EMI shielding and helps maintain proper thermal status inside the server. Do not operate the server when a port blank is removed without the corresponding I/O port option installed.

Procedure

1. **Power down the server**.
2. If installed, **open the cable management arm**.
3. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. **Remove the server from the rack**.
6. Place the server on a flat, level work surface.
7. **Remove the access panel**.
8. **Remove the riser cage**.
9. Remove the OCP slot blank:
   a. Remove the blank screw.
   b. Remove the blank.
      Retain the screw and blank for future use.

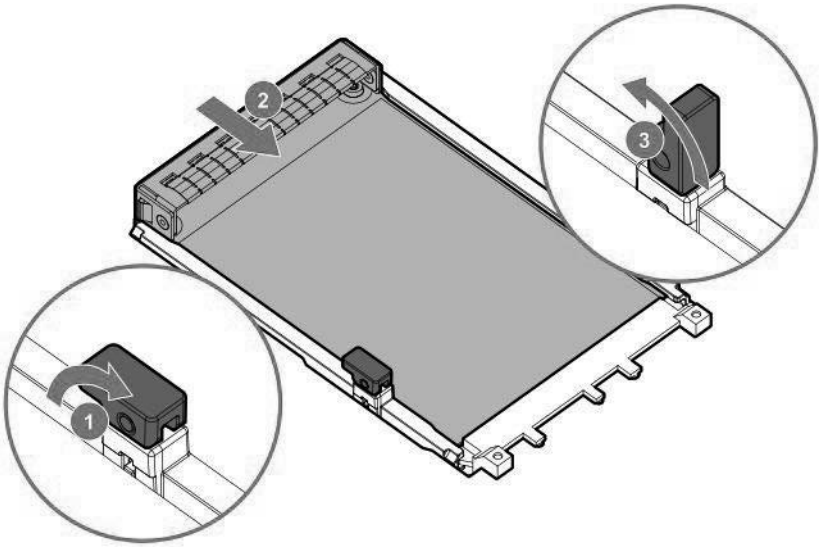


10. Install the OCP NIC 3.0 adapter:

a. Rotate the locking pin to the open (vertical) position.

b. Slide the adapter into the bay until it clicks into place.
Make sure that the adapter is seated firmly in the slot.

c. Rotate the locking pin to the close (horizontal) position.



11. **Connect the OCP bandwidth upgrade cables**.

12. **Install the riser cage**.

13. **Install the access panel**.

14. **Install the server into the rack**.

15. Connect all peripheral cables to the server.

16. Connect each power cord to the server.

17. Connect each power cord to the power source.

18. **Power up the server**.

The installation is complete.

Power distribution board

The power distribution board (PDB) supports the installation of power supplies 3 and 4.

Installing the PDB

Prerequisites

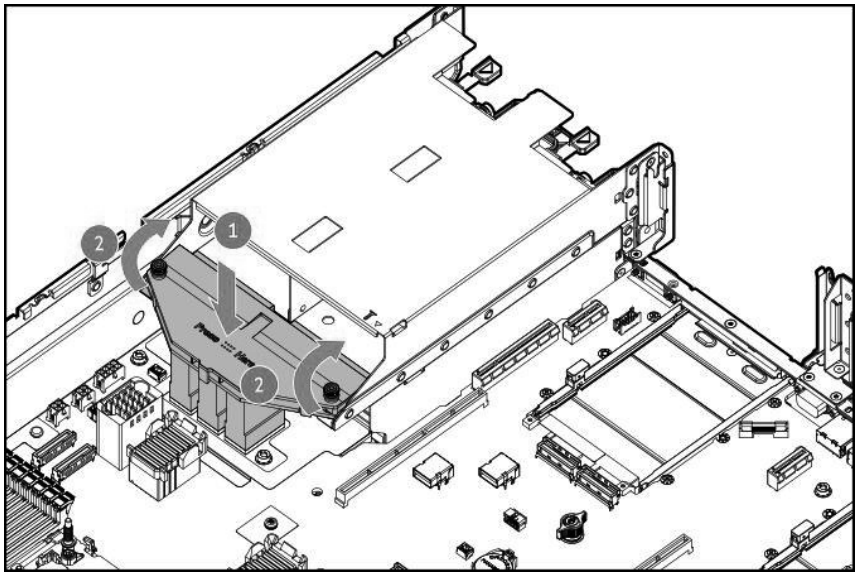
Before you perform this procedure, make sure that you have a T-10 Torx screwdriver available.

About this task

CAUTION: A discharge of static electricity from a finger or other conductor might damage system boards or other static-sensitive devices. To prevent damage, observe **antistatic precautions**.

Procedure

1. **Power down the server**.
2. If installed, **open the cable management arm**.
3. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. **Remove the server from the rack**.
6. Place the server on a flat, level work surface.
7. **Remove the access panel**.
8. Install the PDB.



9. **Install the power supplies 3 and 4**.
10. **Install the access panel**.
11. **Installing the server into the rack**.
12. Connect all peripheral cables to the server.
13. Connect each power cord to the power source.
14. Connect each power cord to the server.
15. **Power up the server**.

The installation is complete.

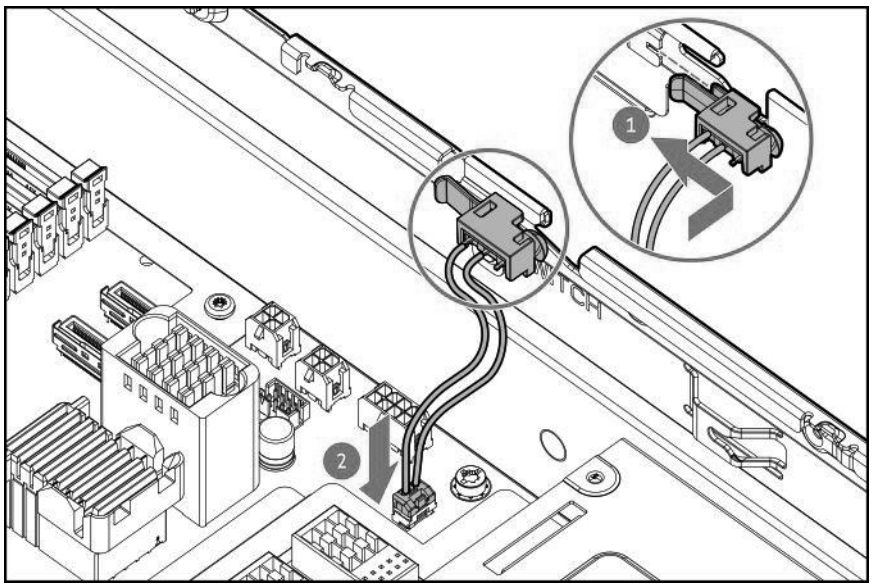
Chassis intrusion detection switch option

The chassis intrusion detection switch enables iLO to record an event in the systrem log whenever the access panel is physically opened or removed. An alert is also sent to the BIOS whenever a chassis intrusion is detected. The chassis intrusion detection occurs as long as the server is plugged in, regardless of whether the server is powered on or off.

Installing the chassis intrusion detection switch

Procedure

1. **Power down the server**.
2. If installed, **open the cable management arm**.
3. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. **Remove the server from the rack**.
6. Place the server on a flat, level work surface.
7. **Remove the access panel**.
8. Do one of the following:
   - **Remove the air baffle**.
   - **Remove the processor mezzanine tray**.
9. Install the chassis intrusion detection switch:
   a. Insert the switch tab into the chassis slot until the switch clicks into place (callout 1).
   b. Connect the switch cable (callout 2).



10. Do one of the following:
    - **Install the air baffle**.
    - **Install the processor mezzanine tray**.
11. **Install the access panel**.
12. **Installing the server into the rack**.
13. Connect all peripheral cables to the server.
14. Connect each power cord to the server.
15. Connect each power cord to the power source.
16. **Power up the server**.

The installation is complete.

Serial port option

Install the serial port option to enable communication to physical serial devices. You can also use the serial connection to remotely access the system BIOS and view POST error messages.

Installing the serial port

Prerequisites

Before you perform this procedure, make sure that you have a hex screwdriver available.

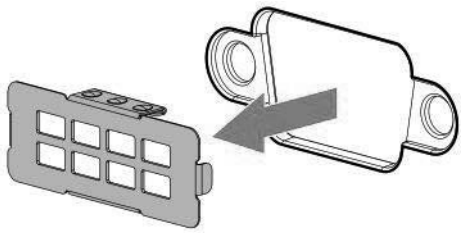
About this task

CAUTION: A discharge of static electricity from a finger or other conductor might damage system boards or other static-sensitive devices. To prevent damage, observe **antistatic precautions**.

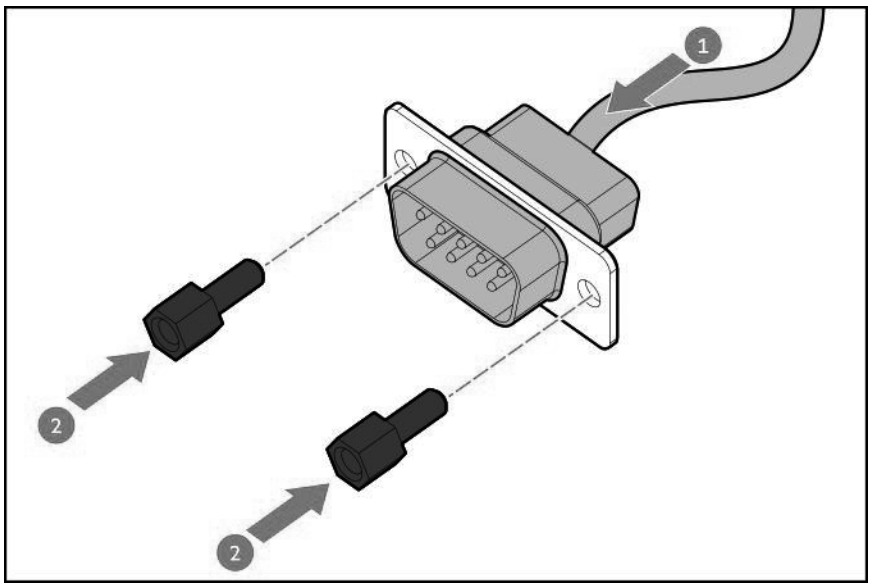
CAUTION: The port blank provides EMI shielding and helps maintain proper thermal status inside the server. Do not operate the server when a port blank is removed without the corresponding I/O port option installed.

Procedure

1. **Power down the server**.
2. If installed, **open the cable management arm**.
3. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. **Remove the server from the rack**.
6. Place the server on a flat, level work surface.
7. **Remove the access panel**.
8. **Remove the secondary riser cage**.
9. Remove the serial port blank.



10. Install the serial port cable:
    a. Insert the serial port into the rear panel opening.
    b. Install the hex screws.



11. **Connect the serial port cable to the system board**.
12. **Install the secondary riser cage**.
13. **Install the access panel**.
14. **Installing the server into the rack**.
15. Connect all peripheral cables to the server.
16. Connect each power cord to the power source.
17. Connect each power cord to the server.
18. **Power up the server**.

Configuring the serial port

19. To configure the serial port setting:
    a. From the boot screen, press **F9** to access the UEFI System Utilities.
    b. From the **System Utilities** screen, select **System Configuration** > **BIOS/Platform Configuration (RBSU)** > **System Options** > **Serial Port Options** > **Embedded Serial Port**.
    c. Select a setting.
    d. Press **F12** key to save your selection.
    e. Click **Yes-Save Changes**.
    f. Click **Reboot**.

The installation is complete.

Internal USB device options

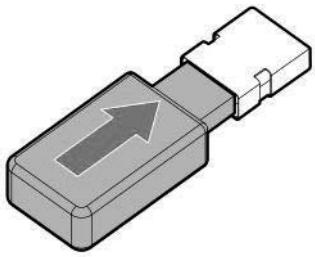
The server has one internal USB 2.0 port and one USB 3.2 Gen 1 port that you can use to install an internal USB flash media device for:

- booting up from flash solution
- data backup/redundancy

Installing an internal USB device

Procedure

1. **Power down the server**.
2. If installed, **open the cable management arm**.
3. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. **Remove the server from the rack**.
6. Place the server on a flat, level work surface.
7. **Remove the access panel**.
8. If the expansion card is installed on the secondary riser cage, **remove the secondary riser cage**.
9. Plug in the USB device into the USB port.



10. If removed, **install the secondary riser cage**.
11. **Install the access panel**.
12. **Installing the server into the rack**.
13. Connect all peripheral cables to the server.
14. Connect each power cord to the power source.
15. Connect each power cord to the server.
16. **Power up the server**.

The installation is complete.

Cabling

This chapter includes cabling guidelines and diagrams for internal component 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

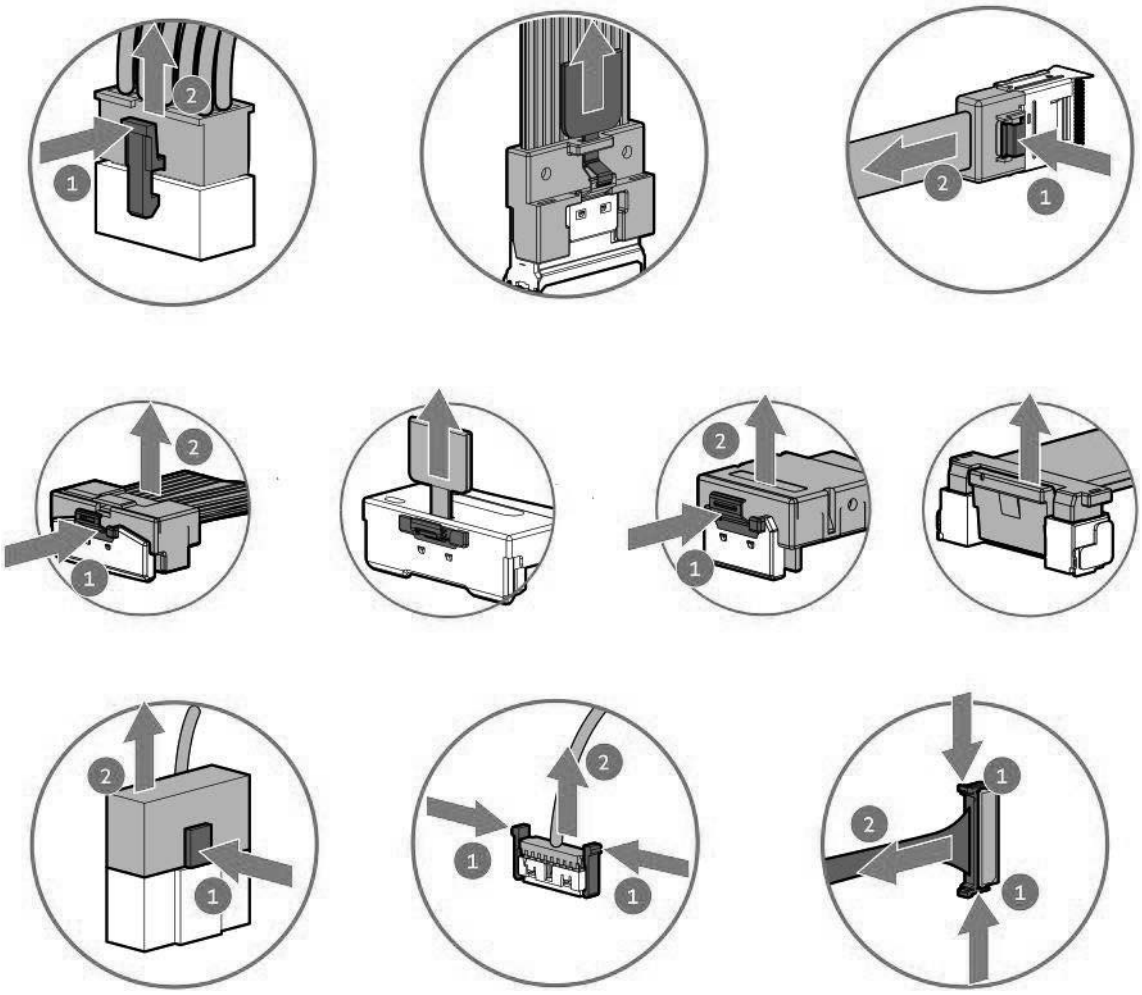
- Note the port labels on the PCA components. Not all these components are used by all servers:
  - System board ports
  - Drive and power supply backplane ports
  - Expansion board ports (controllers, adapters, expanders, risers, and similar boards)
- Note the label near each cable connector. This label 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.

Component cabling	Cable part number
Drive box 1 cabling	—
8 SFF x4 NVMe direct attach cabling for the processors 2 and 4	**P55344-001** **P55341-001** (For air cooling configuration) **P61769-001** (For liquid cooling configuration)
2 SFF stacked drive: Onboard NVMe cable	**P55343-001**
8 SFF x1 SAS storage controller cable: Type-o controller in Slot 15	**P55357-001**
8 SFF x2 NVMe drive controller cable: Type-o controller in Slot 15	**P48963-001**
8 SFF x1 SAS drive controller cable: Type-p controller in the primary riser	**P55362-001**
8 SFF x4 NVMe drive controller cable: Type-p controller in the secondary riser	**P55362-001**
2 stacked drive controller cable: Type-o controller in Slot 15	**P55357-001**
2 stacked drive controller cable: Type-p controller in the secondary riser	**P55362-001**
Drive box 2 cabling	—
8 SFF x4 NVMe direct attach cable (for dual-processor, air cooling configuration only)	**P55345-001**
8 SFF x4 NVMe direct attach cables for the processors 2 and 4	When box 1 is the universal media bay: • **P55347-001** • **P55346-001** (For air cooling configuration) • **P61772-001** (For liquid cooling configuration) When box 1 is 8 SFF drive cage: • **P55348-001** • **P55342-001** (For air cooling configuration only)
8 SFF x1 SAS drive controller cable: Type-o controller in Slot 14	**P55357-001**
8 SFF x2 NVMe drive controller cabling: Type-o controller in Slot 15	**P48963-001**
8 SFF x1 SAS drive controller cabling: Type-p controller in the primary riser	**P55362-001**

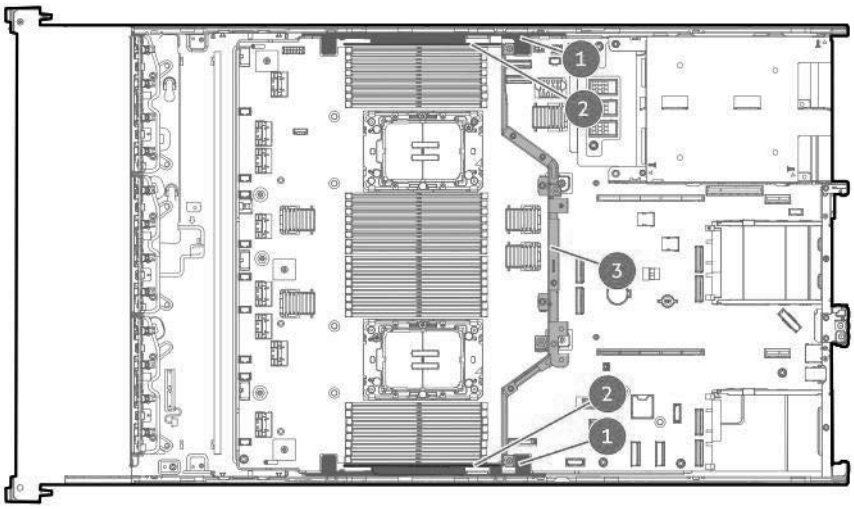
Table Continued

Component cabling	Cable part number
8 SFF x1 SAS drive controller cabling: Type-p controller in the secondary riser	**P55362-001**
8 SFF x4 NVMe drive controller cabling: Type-p controller in the secondary riser	**P55362-001**
8 SFF x4 NVMe drive controller cabling: Type-o controller in Slot 15 and type-p controller in the secondary riser	**P55362-001** **P55358-001**
Drive box 3 cabling	—
8 SFF x1 SAS drive: Onboard SATA cable	**P14337-001**
8 SFF x4 NVMe direct attach cable	**P55350-001**
8 SFF x4 NVMe direct attach cables for the processors 1 and 3	**P55352-001** **P55353-001**
8 SFF x1 SAS drive controller cabling: Type-o controller in Slot 14	**P55356-001**
8 SFF x2 NVMe drive controller cabling: Type-o controller in Slot 14	**P48964-001**
8 SFF x1 SAS drive controller cabling: Type-p controller in the primary riser	**P55364-001**
8 SFF x4 NVMe drive controller cable: Type-p controller in the primary riser	**P55364-001**
8 SFF x4 NVMe drive controller cable: Type-o controller in Slot 14 and type-p controller in the primary riser	**P55364-001**
24 SFF drive power cable	**869825-001**
Energy pack cabling	**876851-001** **P02378-001**
Optical drive cabling	**P55376-001**
Universal media bay cabling	—
Universal media bay USB 2.0 port cable	**P55373-001**
Universal media bay USB 2.0 / DisplayPort Y-cable	**P14314-001**
NS204i-u Boot Device cabling	—
Front NS204i-u Boot Device power cable	**P48956-001**
Rear NS204i-u Boot Device power cable	**P54088-001**
NS204i-u Boot Device signal cable	**P54092-001**

Table Continued

Component cabling	Cable part number
OCP bandwidth upgrade cabling	**P55366-001** **P55367-001**
Miscellaneous component cabling	—
Serial port cable	**P45623-001**
Chassis intrusion detection switch cable	**P47751-001**
Power switch module / SID module cable	**P55374-001**
Front I/O cable	**P43727-001**

Internal cabling management



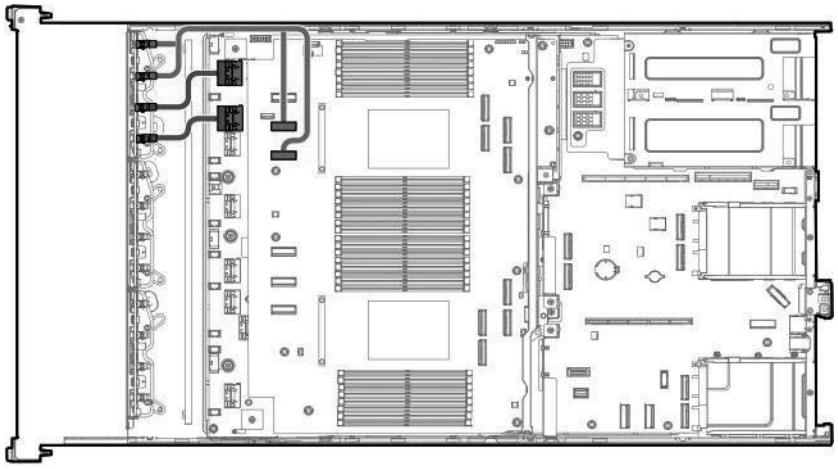
Item	Description
1	Cable guards
2	DIMM guards
3	Processor mezzanine tray support bracket

Storage cabling

Storage controller cabling

Drive box 1 cabling

8 SFF x4 NVMe direct attach cabling for the processors 2 and 4

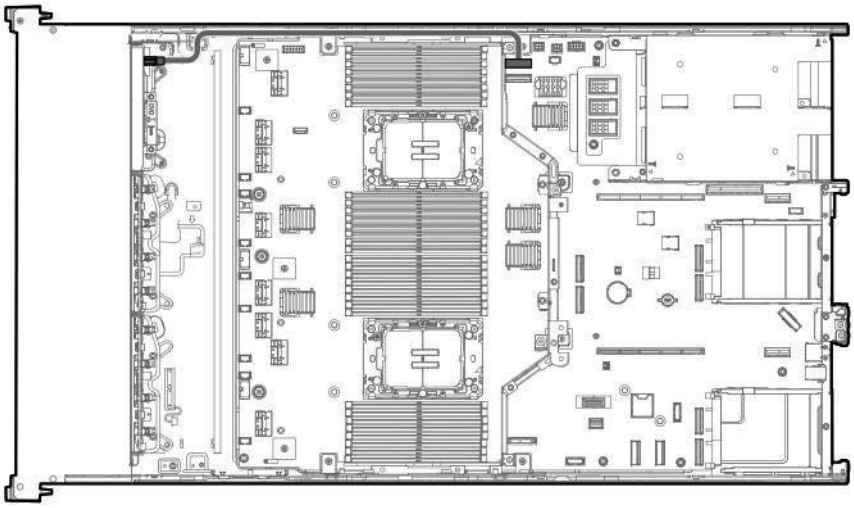


Cable part number	Color	From	To
P55344-001[1]	Orange	Box 1 ports 1–2	x8 SlimSAS ports 4–5 (from bottom to top) on the processor mezzanine board
Air cooling configuration: P55341-001[1] Liquid cooling configuration: P61769-001[2]	Blue	Box 1 ports 3–4	x8 SlimSAS ports 7–8 (from bottom to top) on the system board

1 Option kit: P55321-B21

2 Option kit: P61767-B21

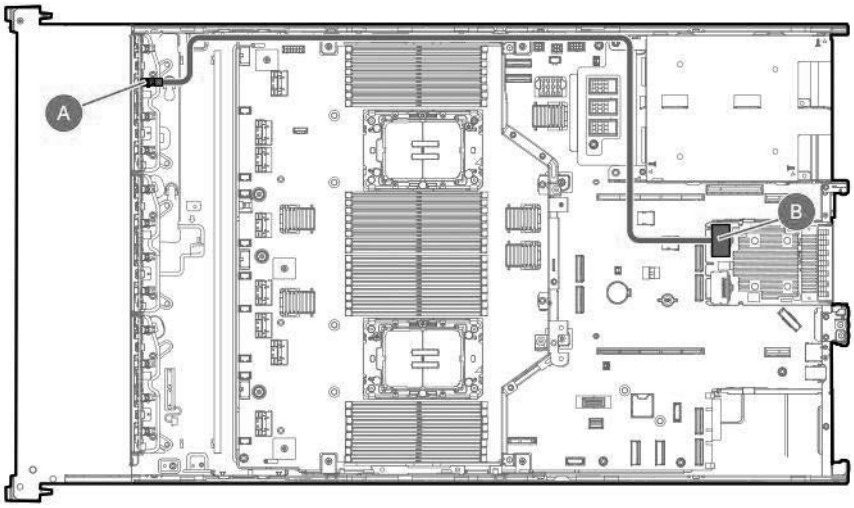
2 SFF stacked drive: Onboard NVMe cabling



Cable part number	Color	From	To
P55343-001[1]	Orange	Box 1 port 1	Socket 2 MCIO connector 2

1 Option kit: P54801-B21

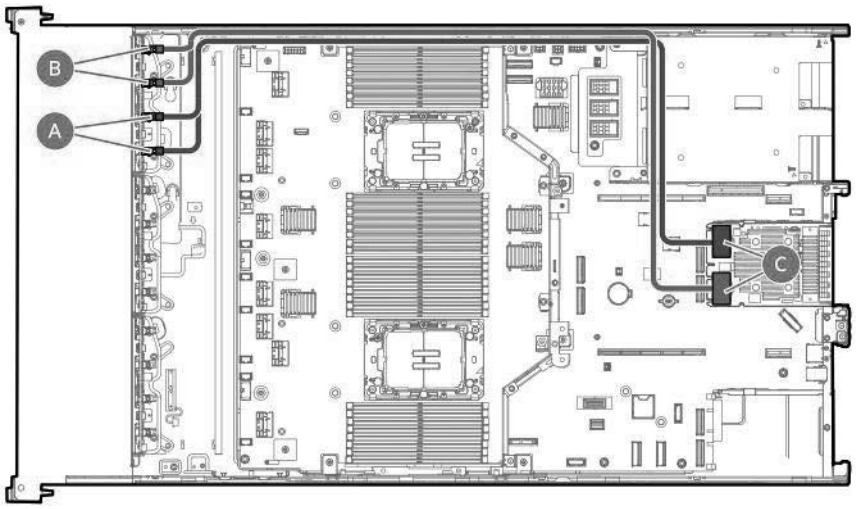
8 SFF x1 SAS storage controller cabling: Type-o controller in Slot 15



Cable part number	Color	From	To
P55357-001[1]	Orange	Box 1 port 1	Type-o storage controller port 2 in Slot 15

1 Option kit: P60009-B21

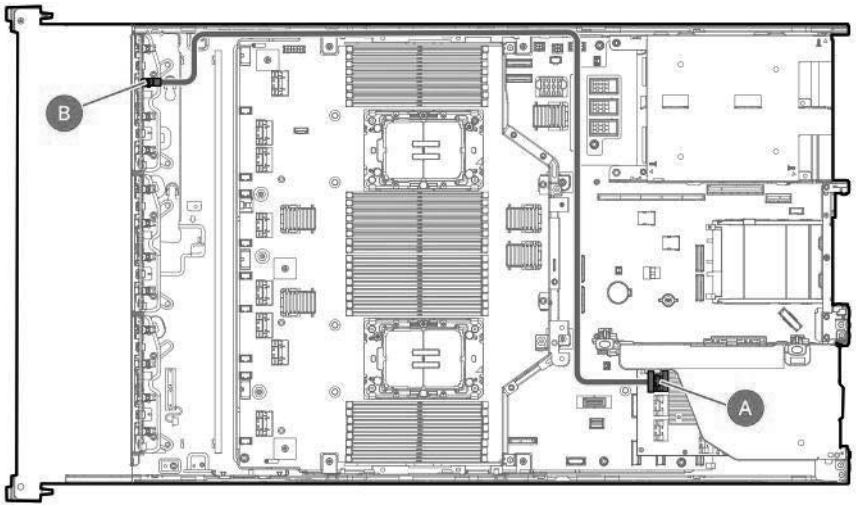
8 SFF x2 NVMe drive controller cabling: Type-o controller in Slot 15



Cable part number	Color	From	To
P48963-001[1]	Orange	Box 1 ports 1–2	Type-o storage controller port 1 in Slot 15
	Blue	Box 1 ports 3–4	Type-o storage controller port 2 in Slot 15

1 Option kit: P61602-B21

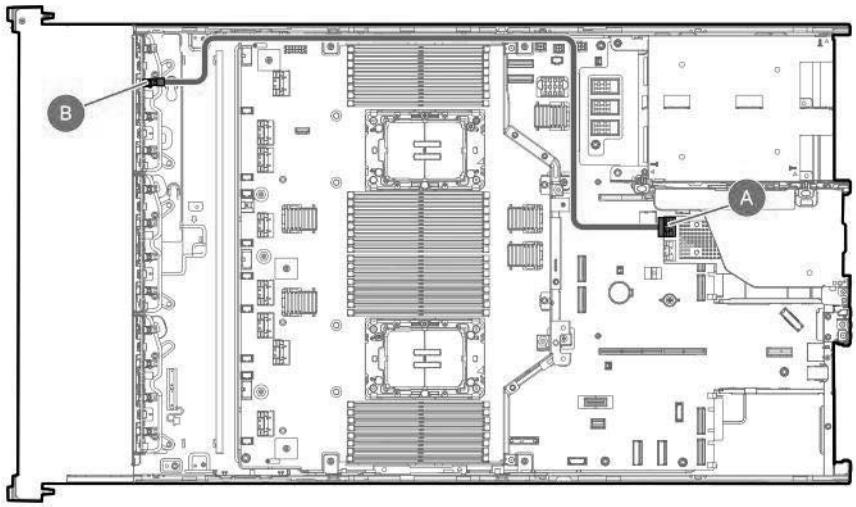
8 SFF x1 SAS drive controller cabling: Type-p controller in the primary riser



Cable part number	Color	From	To
P55362-001[1]	Orange	Box 1 port 1	Primary type-p storage controller port 4

[1] Option kit: P55320-B21

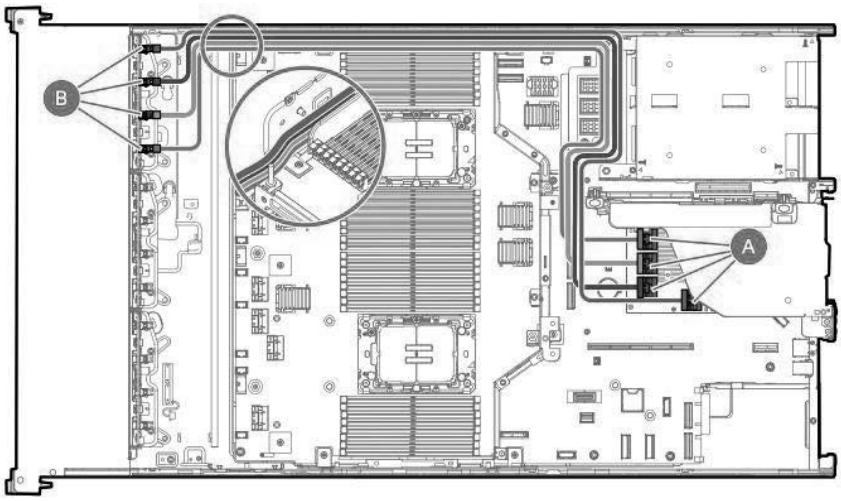
8 SFF x1 SAS drive controller cabling: Type-p controller in the secondary riser



Cable part number	Color	From	To
P55362-001[1]	Orange	Box 1 port 1	Secondary type-p storage controller port 2

[1] Option kit: P55320-B21

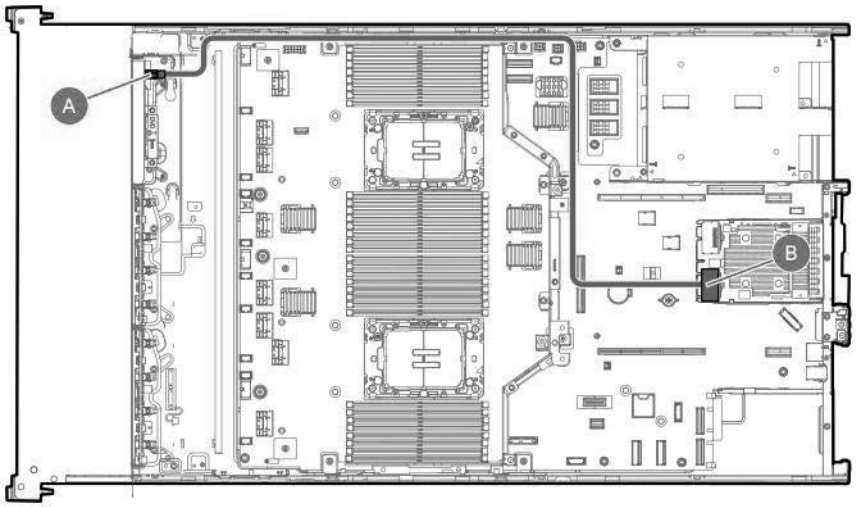
8 SFF x4 NVMe drive controller cabling: Type-p controller in the secondary riser



Cable part number	Color	From	To
P55362-001[1]	Orange	Box 1 port 1	Secondary type-p storage controller port 1
	Blue	Box 1 port 2	Secondary type-p storage controller port 2
	Gold	Box 1 port 3	Secondary type-p storage controller port 3
	Pink	Box 1 port 4	Secondary type-p storage controller port 4

1 Option kit: P55320-B21

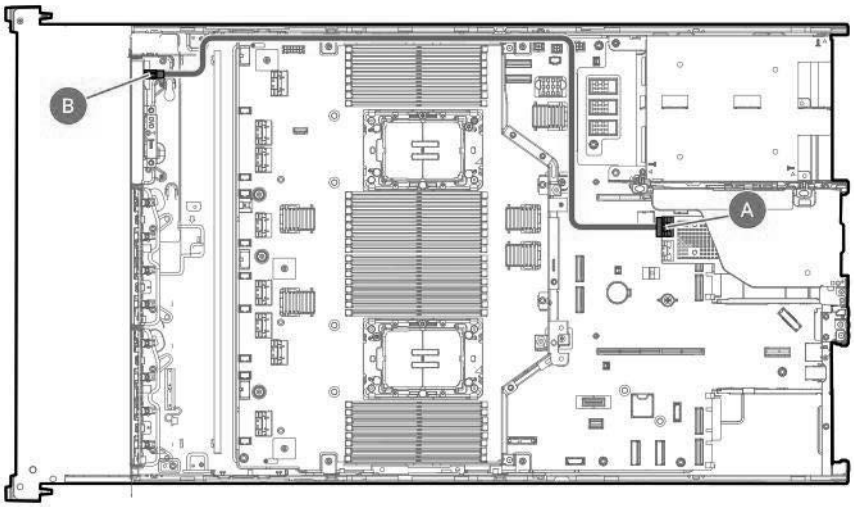
2 stacked drive controller cabling: Type-o controller in Slot 15



Cable part number	Color	From	To
P55357-001[1]	Orange	Box 1 port 1	Type-o storage controller port 1 in Slot 15

1 Option kit: P60009-B21

2 stacked drive controller cabling: Type-p controller in the secondary riser



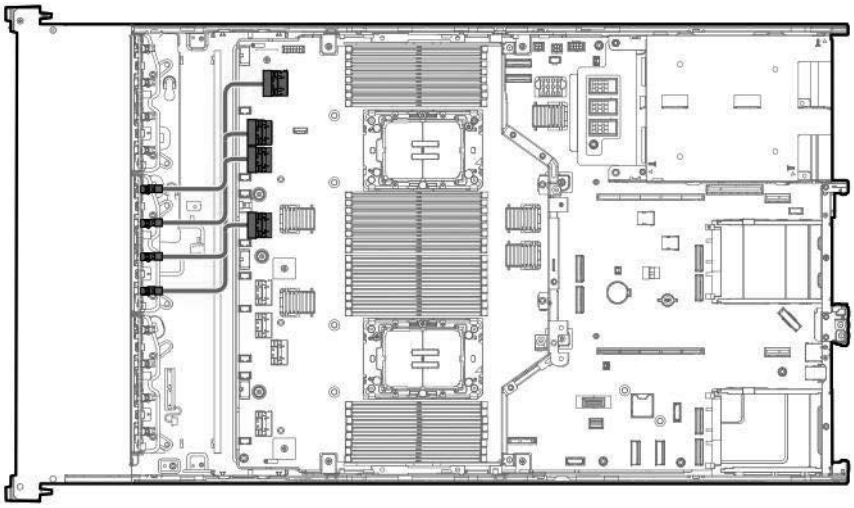
Cable part number	Color	From	To
P55362-001[1]	Orange	Box 1 port 1	Type-p storage controller port 2 in Slot 15

[1] Option kit: P55320-B21

Drive box 2 cabling

8 SFF x4 NVMe direct attach cabling

This is for dual-processor, air cooling configuration only.

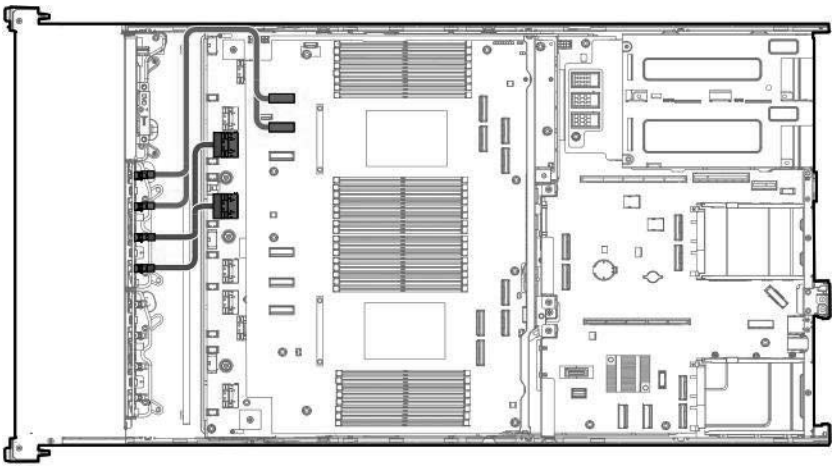


Cable part number	Color	From	To
P55345-001[1]	Orange	Box 2 ports 1–4	x8 SlimSAS ports 5–8 (from bottom to top)

[1] Option kit: P60005-B21

8 SFF x4 NVMe direct attach cabling for the processors 2 and 4

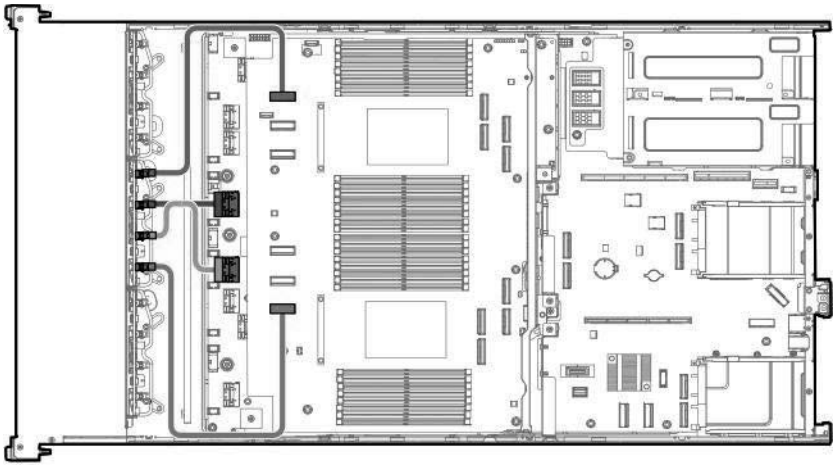
- When box 1 is the universal media bay



Cable part number	Color	From	To
P55347-001	Orange	Box 2 ports 1–2	x8 SlimSAS ports 5–6 (from bottom to top) on the processor mezzanine board
Air cooling configuration: P55346-001 Liquid cooling configuration: P61772-001[1]	Blue	Box 2 ports 3–4	x8 SlimSAS ports 5–6 (from bottom to top) on the system board

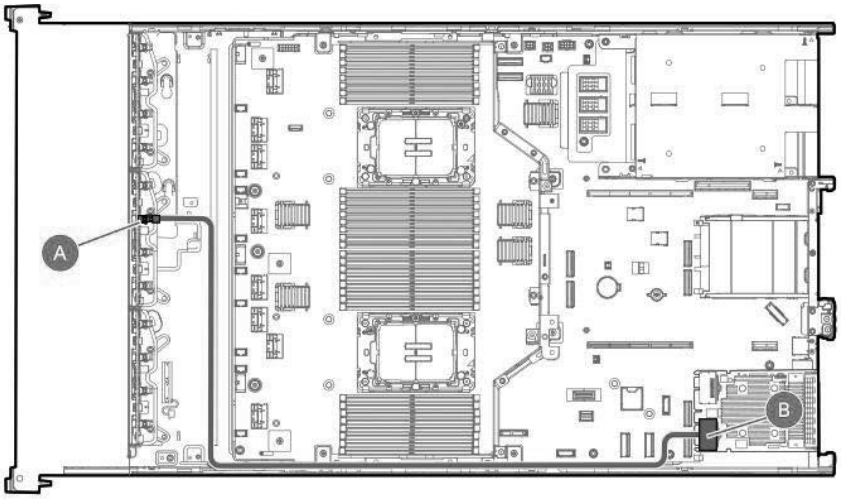
[1] Option kit: P61770-B21

- When box 1 is the 8 SFF drive cage



Cable part number	Color	From	To
P55348-001	Orange	Box 2 port 1	x8 SlimSAS port 6 on the processor mezzanine board
Air cooling configuration: P55342-001	Blue	Box 2 port 2	x8 SlimSAS port 5 on the system board
	Gold	Box 2 port 3	x8 SlimSAS port 4 on the system board
P55349-001	Pink	Box 2 port 4	x8 SlimSAS port 1 on the processor mezzanine board

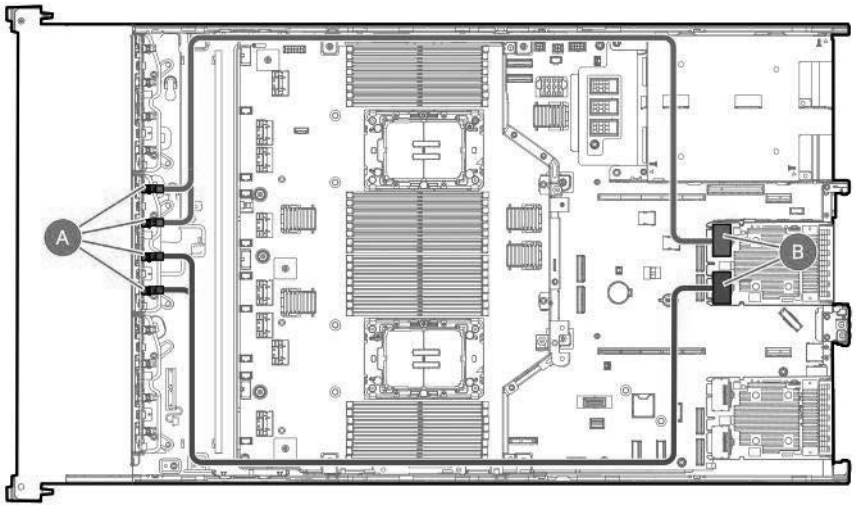
8 SFF x1 SAS drive controller cabling: Type-o controller in Slot 14



Cable part number	Color	From	To
P55357-001[1]	Orange	Box 2 port 1	Type-o storage controller port 1 in Slot 14

[1] Option kit: P60009-B21

8 SFF x2 NVMe drive controller cabling: Type-o controller in Slot 15

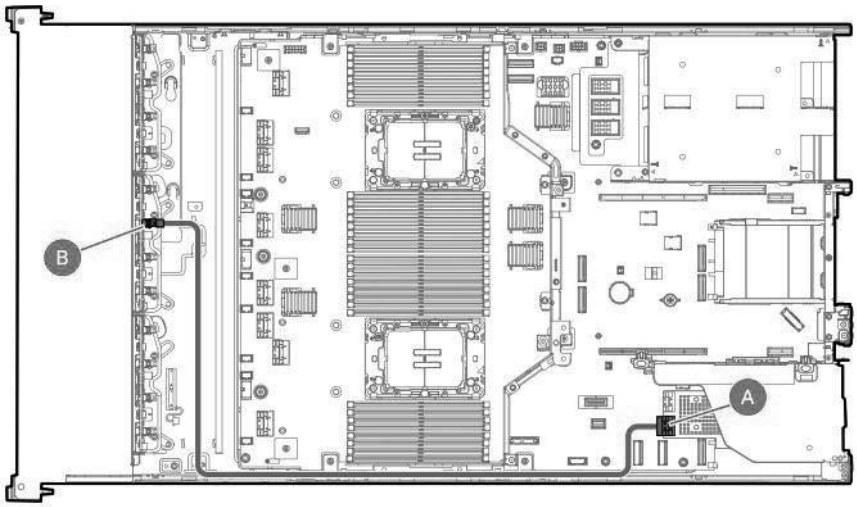


Cable part number	Color	From	To
P48963-001[1]	Orange	Box 2 ports 1–2	Type-o storage controller port 2 in Slot 15
	Blue	Box 2 ports 3–4	Type-o storage controller port 1 in Slot 15

[1] Option kit: P61602-B21

8 SFF x1 SAS drive controller cabling: Type-p controller in the primary riser

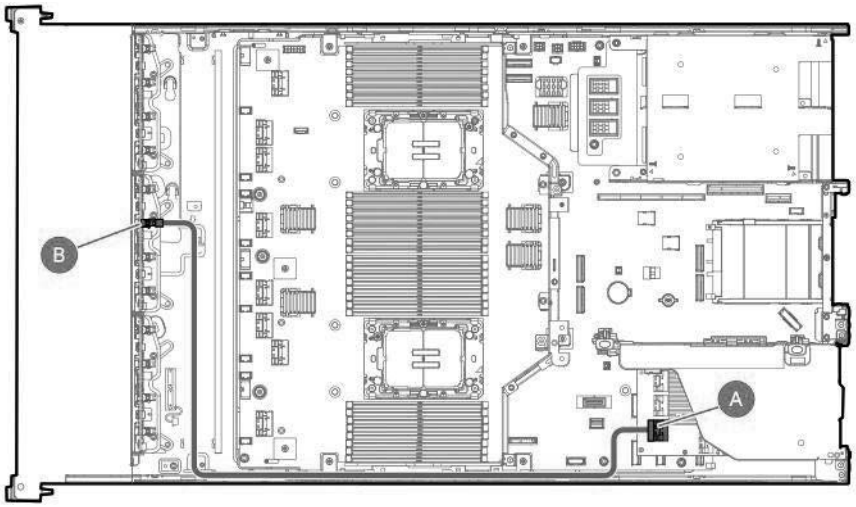
- MR416i-p



Cable part number	Color	From	To
P55362-001[1]	Orange	Box 2 port 1	Primary type-p storage controller port 1

1 Option kit: P55320-B21

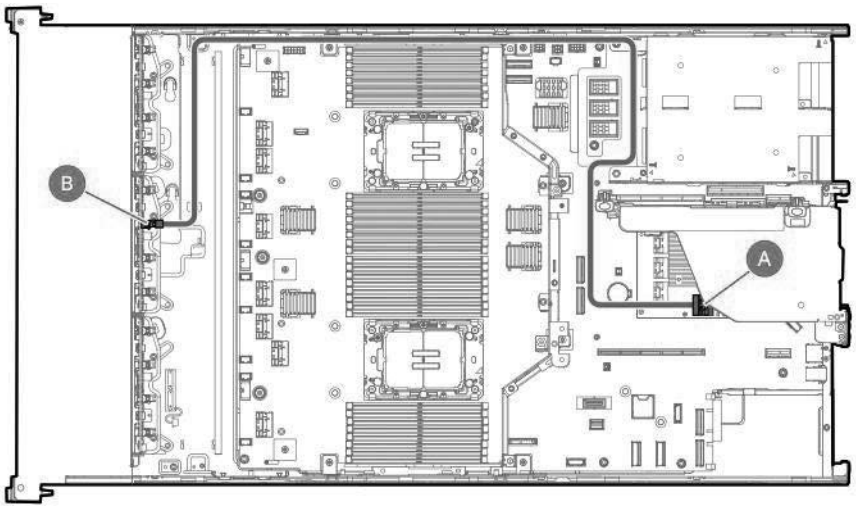
- SR932i-p



Cable part number	Color	From	To
P55362-001[1]	Orange	Box 2 port 1	Primary type-p storage controller port 2

1 Option kit: P55320-B21

8 SFF x1 SAS drive controller cabling: Type-p controller in the secondary riser

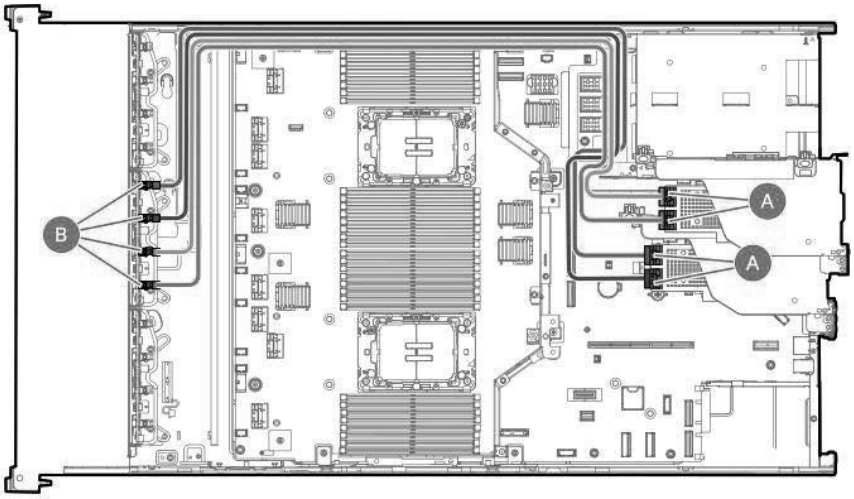


Cable part number	Color	From	To
P55362-001[1]	Orange	Box 2 port 1	Primary type-p storage controller port 1

[1] Option kit: P55320-B21

8 SFF x4 NVMe drive controller cabling: Type-p controller in the secondary riser

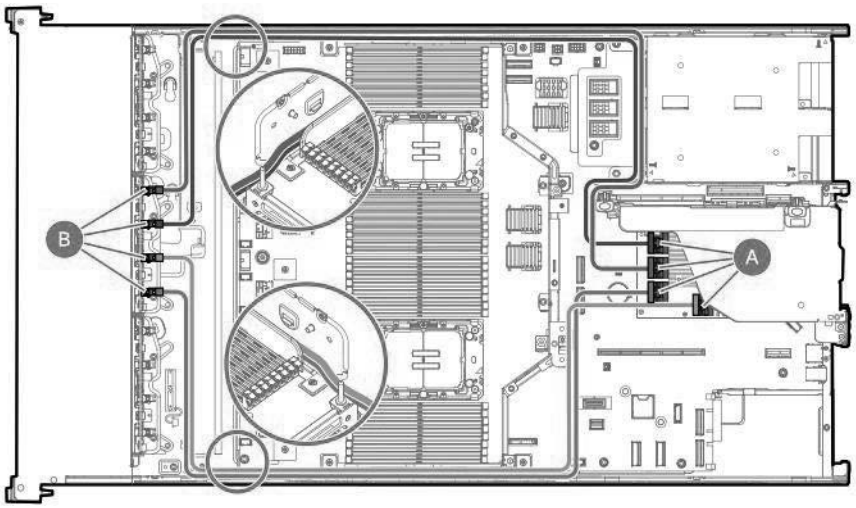
- Two MR416i-p controllers in the secondary riser when the box 1 is the universal media bay



Cable part number	Color	From	To
P55362-001[1]	Orange	Box 2 port 1	Secondary type-p storage controller port 1
	Blue	Box 2 port 2	Secondary type-p storage controller port 2
	Gold	Box 2 port 3	Secondary type-p storage controller port 1
	Pink	Box 2 port 4	Secondary type-p storage controller port 2

[1] Option kit: P55320-B21

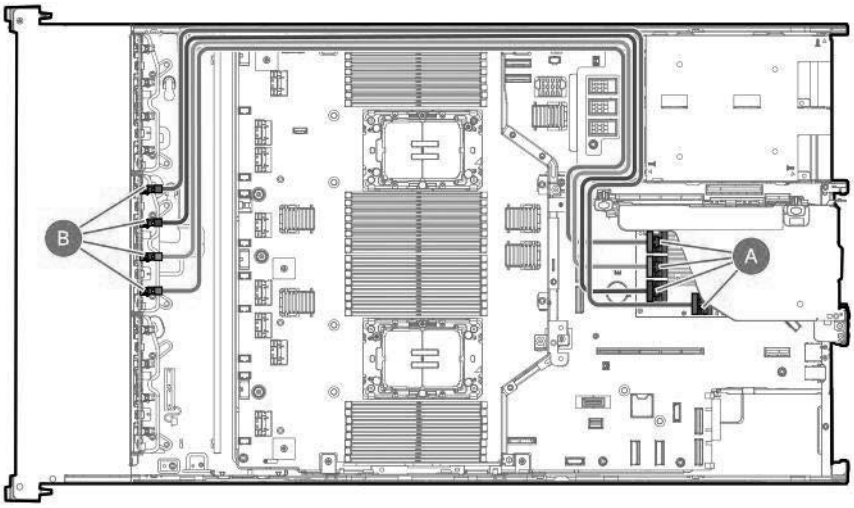
- SR932i-p controller in the secondary riser when the box 1 is the 8 SFF drive cage



Cable part number	Color	From	To
P55362-001[1]	Orange	Box 2 port 1	Secondary type-p storage controller port 3
	Blue	Box 2 port 2	Secondary type-p storage controller port 4
	Gold	Box 2 port 3	Secondary type-p storage controller port 1
	Pink	Box 2 port 4	Secondary type-p storage controller port 2

[1] Option kit: P55320-B21

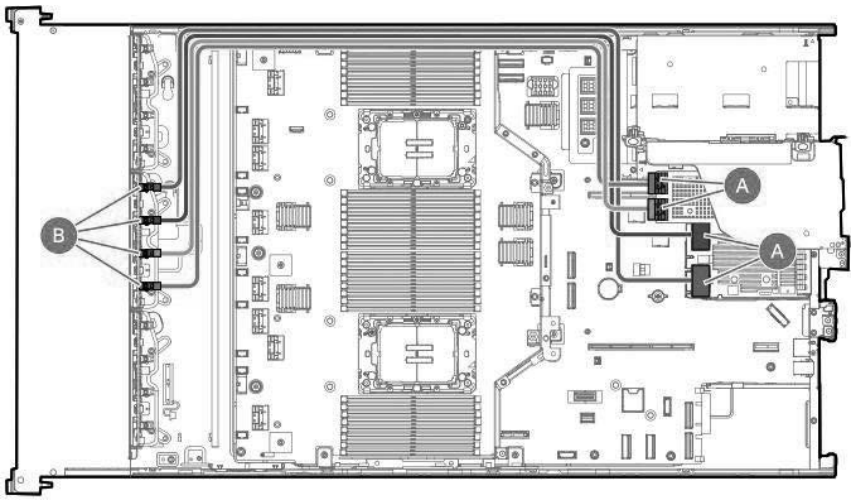
- SR932i-p controller in the secondary riser when the box 1 is the universal media bay



Cable part number	Color	From	To
P55362-001[1]	Orange	Box 2 port 1	Secondary type-p storage controller port 1
	Blue	Box 2 port 2	Secondary type-p storage controller port 2
	Gold	Box 2 port 3	Secondary type-p storage controller port 3
	Pink	Box 2 port 4	Secondary type-p storage controller port 4

[1] Option kit: P55320-B21

8 SFF x4 NVMe drive controller cabling: Type-o controller in Slot 15 and type-p controller in the secondary riser



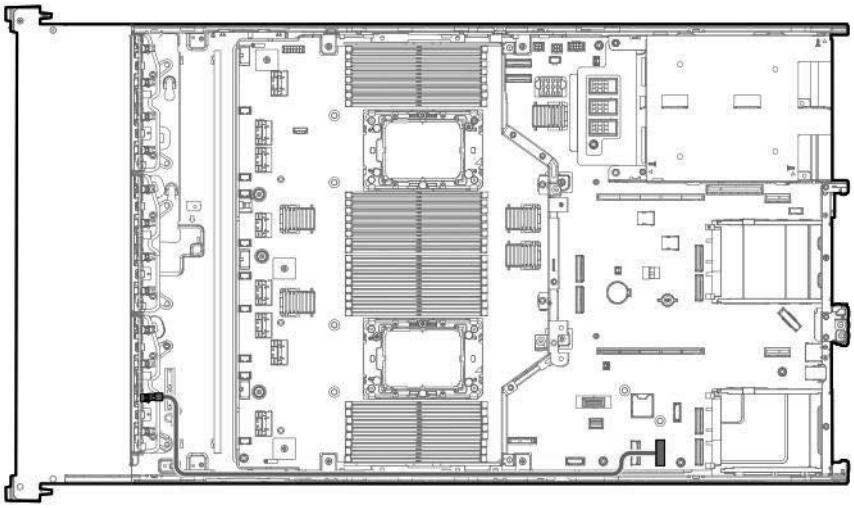
Cable part number	Color	From	To
P55358-001[1]	Orange	Box 2 port 1	Type-o storage controller port 1 in Slot 15
	Blue	Box 2 port 2	Type-o storage controller port 2 in Slot 15
P55362-001 [2]	Gold	Box 2 port 3	Secondary type-p storage controller port 1
	Pink	Box 2 port 4	Secondary type-p storage controller port 2

1 Option kit: P59142-B21

2 Option kit: P55320-B21

Drive box 3 cabling

8 SFF x1 SAS drive: Onboard SATA cabling

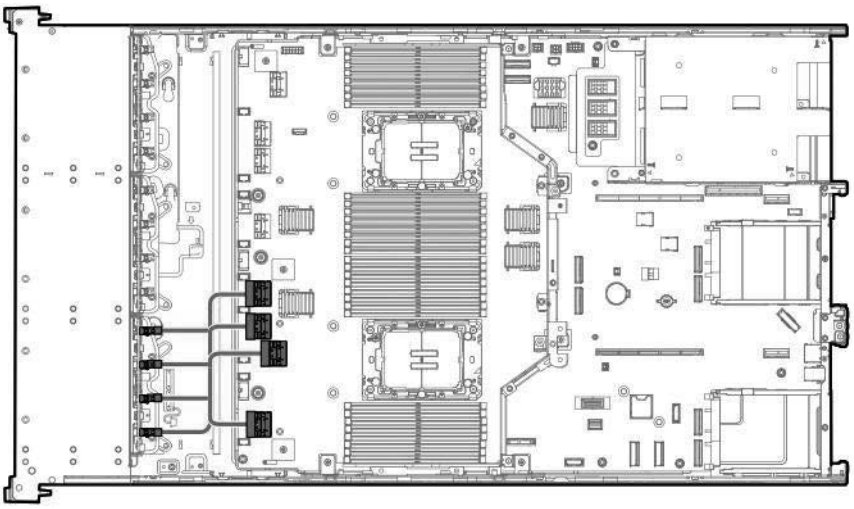


Cable part number	Color	From	To
P14337-001[1]	Orange	Box 3 port 1	PCH LP SlimSAS connector 2

1 Option kit: P59141-B21

8 SFF x4 NVMe direct attach cabling cabling

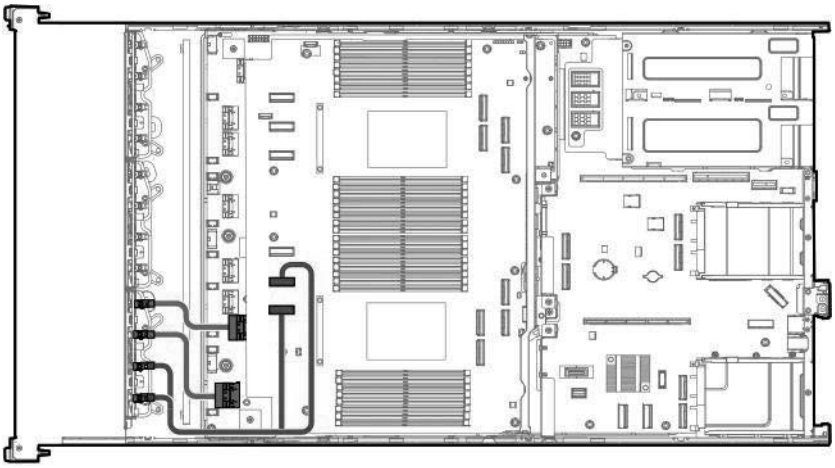
This is for the dual-processor configuration, air cooling configuration only.



Cable part number	Color	From	To
P55350-001[1]	Orange	Box 3 ports 1–4	x8 SlimSAS ports 1–4 (from bottom to top)

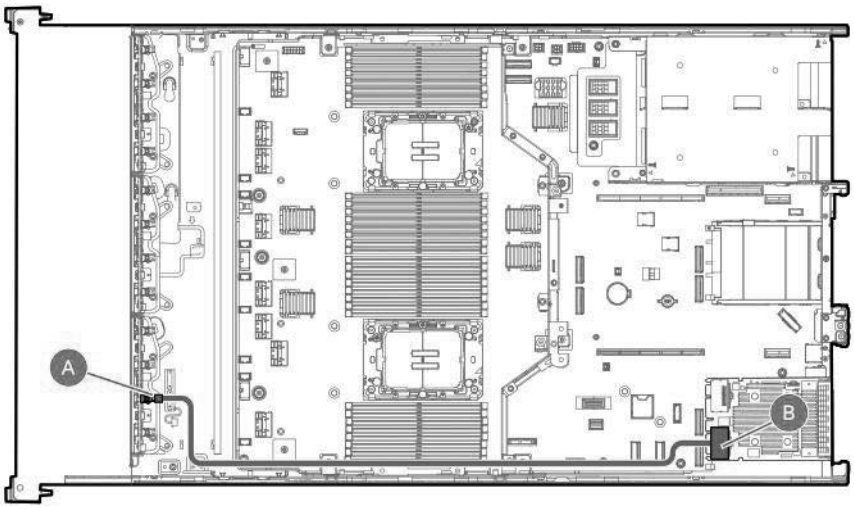
1 Option kit: P60007-B21

8 SFF x4 NVMe direct attach cabling for the processors 1 and 3



Cable part number	Color	From	To
P55352-001	Orange	Box 3 ports 1–2	x8 SlimSAS ports 1–2 (from bottom to top) on the system board
P55353-001	Blue	Box 3 ports 3–4	x8 SlimSAS ports 1–2 (from bottom to top) on the processor mezzanine board

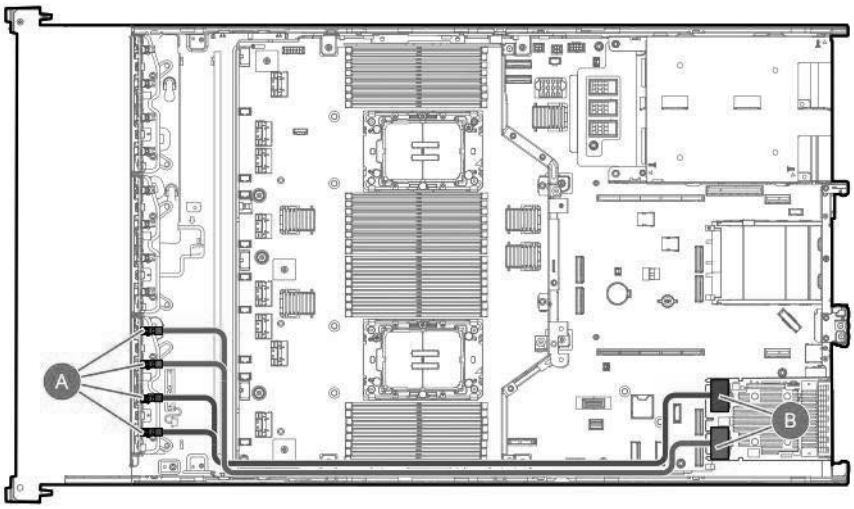
8 SFF x1 SAS drive controller cabling: Type-o controller in Slot 14



Cable part number	Color	From	To
P55356-001[1]	Orange	Box 3 port 1	Type-o storage controller port 1 in Slot 14

[1] Option kit: P55318-B21

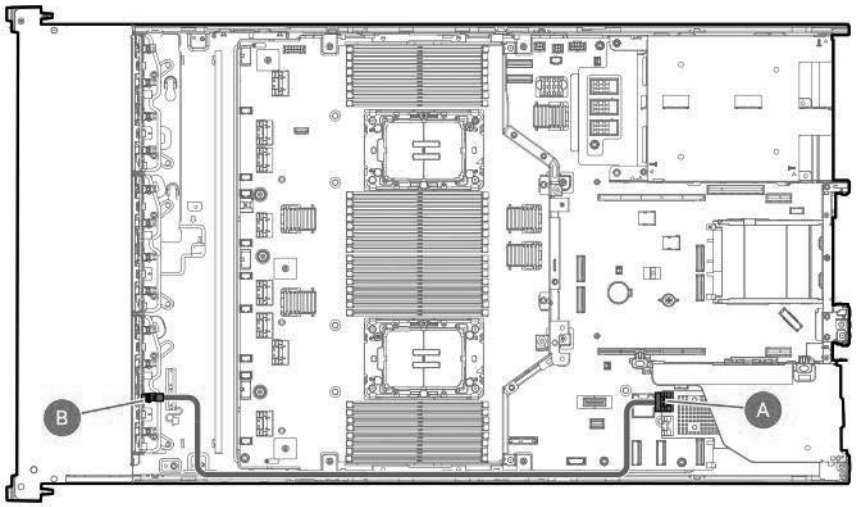
8 SFF x2 NVMe drive controller cabling: Type-o controller in Slot 14



Cable part number	Color	From	To
P48964-001[1]	Orange	Box 3 ports 1–2	Type-o storage controller port 1 in Slot 14
	Blue	Box 3 ports 3–4	Type-o storage controller port 2 in Slot 14

[1] Option kit: P61603-B21

8 SFF x1 SAS drive controller cabling: Type-p controller in the primary riser

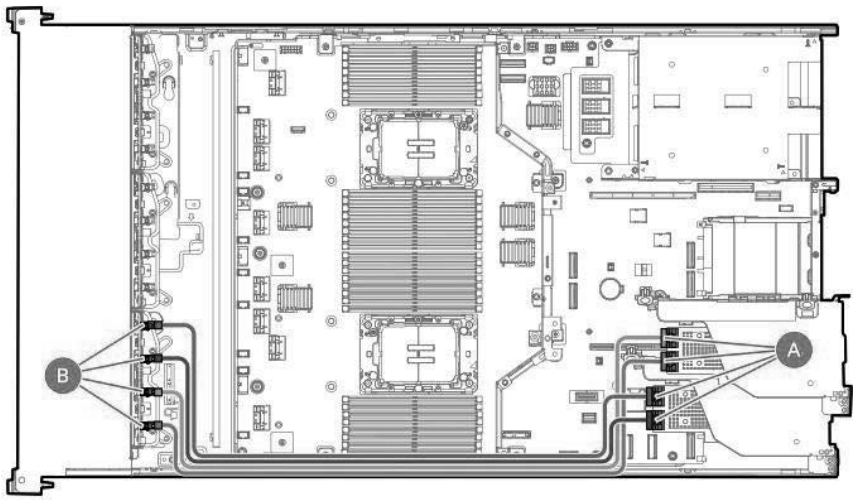


Cable part number	Color	From	To
P55364-001[1]	Orange	Box 3 port 1	Primary type-p storage controller port 2

[1] Option kit: P59144-B21

8 SFF x4 NVMe drive controller cabling: Type-p controller in the primary riser

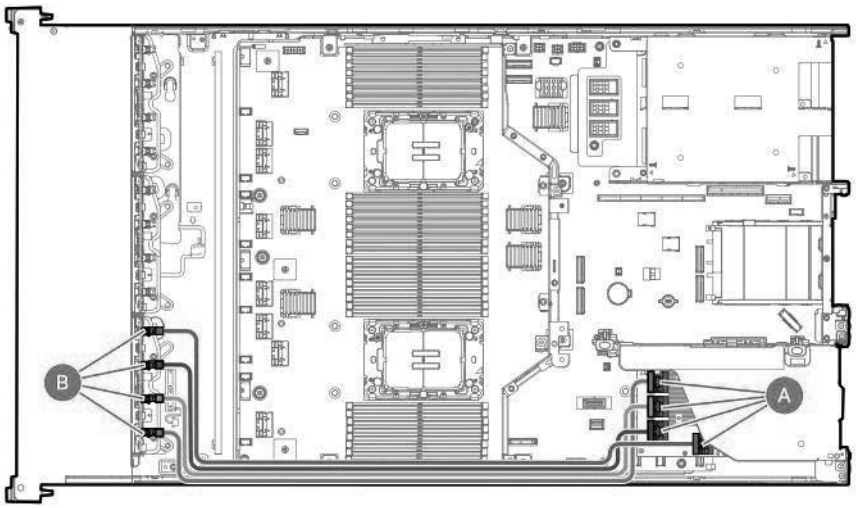
- Two MR416i-p controllers in the primary riser



Cable part number	Color	From	To
P55364-001[1]	Orange	Box 3 port 1	Primary type-p storage controller port 1
	Blue	Box 3 port 2	Primary type-p storage controller port 2
	Gold	Box 3 port 3	Primary type-p storage controller port 1
	Pink	Box 3 port 4	Primary type-p storage controller port 2

[1] Option kit: P59144-B21

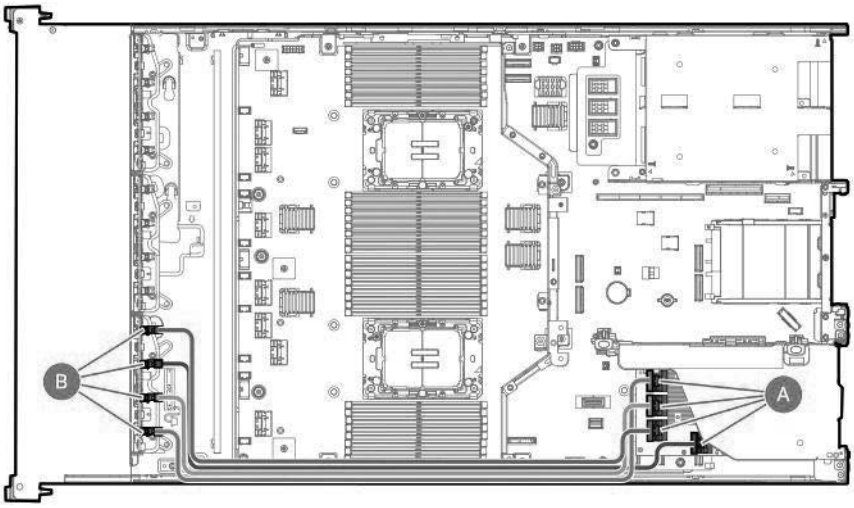
- SR932i-p controller in the primary riser (air cooling configuration)



Cable part number	Color	From	To
P55364-001[1]	Orange	Box 3 port 1	Primary type-p storage controller port 1
	Blue	Box 3 port 2	Primary type-p storage controller port 2
	Gold	Box 3 port 3	Primary type-p storage controller port 3
	Pink	Box 3 port 4	Primary type-p storage controller port 4

[1] Option kit: P59144-B21

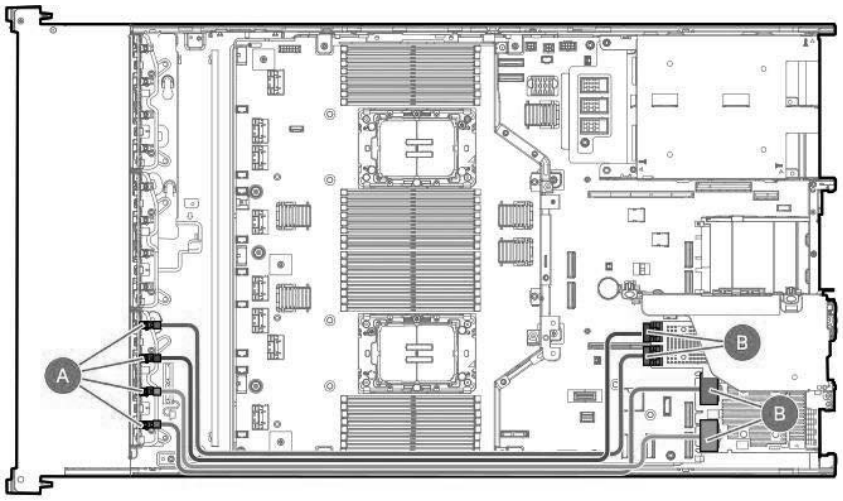
- SR932i-p controller in the primary riser (liquid cooling configuration)



Cable part number	Color	From	To
P55364-001[1]	Orange	Box 3 port 1	Primary type-p storage controller port 2
	Blue	Box 3 port 2	Primary type-p storage controller port 1
	Gold	Box 3 port 3	Primary type-p storage controller port 3
	Pink	Box 3 port 4	Primary type-p storage controller port 4

[1] Option kit: P59144-B21

8 SFF x4 NVMe drive controller cabling: Type-o controller in Slot 14 and type-p controller in the primary riser



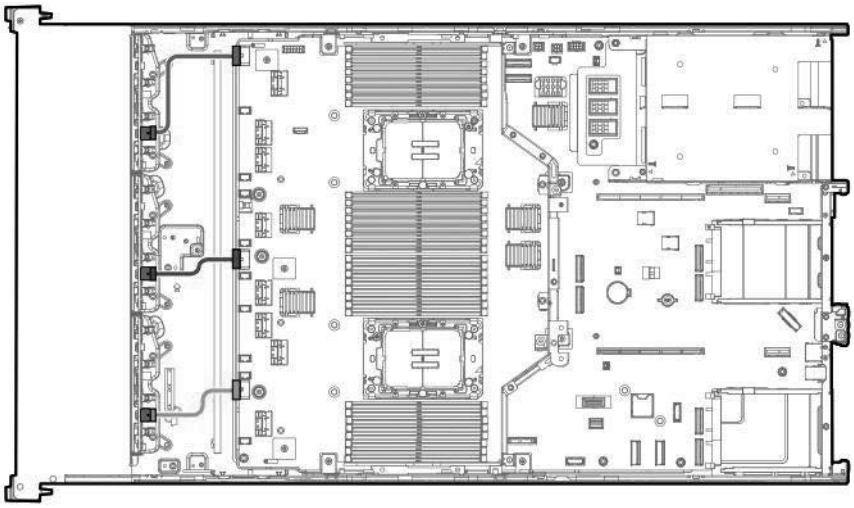
Cable part number	Color	From	To
P55364-001[1]	Orange	Box 3 port 1	Primary type-p storage controller port 1
	Blue	Box 3 port 2	Primary type-p storage controller port 2
	Gold	Box 3 port 3	Type-o storage controller port 1 in Slot 14
	Pink	Box 3 port 4	Type-o storage controller port 2 in Slot 14

[1] Option kit: P59144-B21

Drive power cabling

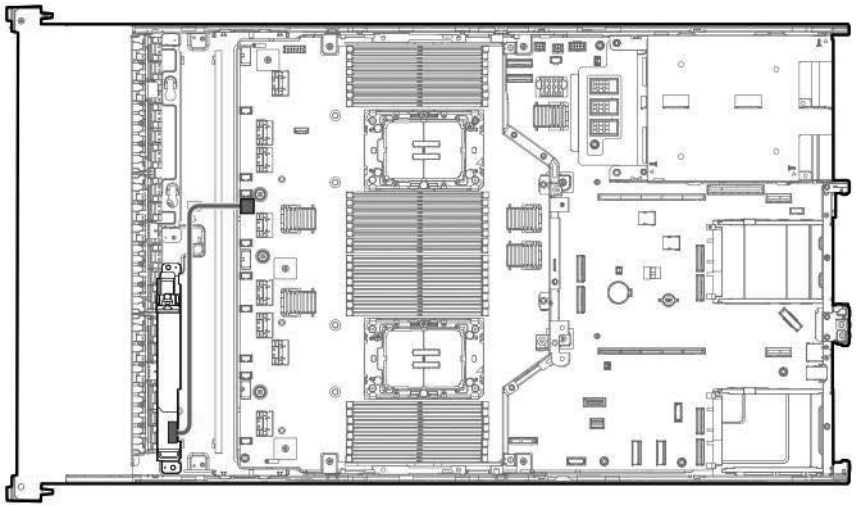
24 SFF drive power cabling

Drive power cables are either preinstalled in the server or structured under the relevant drive cage option kit.



Cable part number	Color	From	To
869825-001	Orange	Box 1 power connector	Drive box 1 power connector
	Blue	Box 2 power connector	Drive box 2 power connector
	Gold	Box 3 power connector	Drive box 3 power connector

Energy pack cabling



Cable part number	Color	From	To
876851-001[1]	Orange	Energy pack	Energy pack connector
P02378-001[2]			

1 96W Smart Storage Battery. Option kit: P01367-B21

2 Smart Hybrid Capacitor. Option kit: P02381-B21

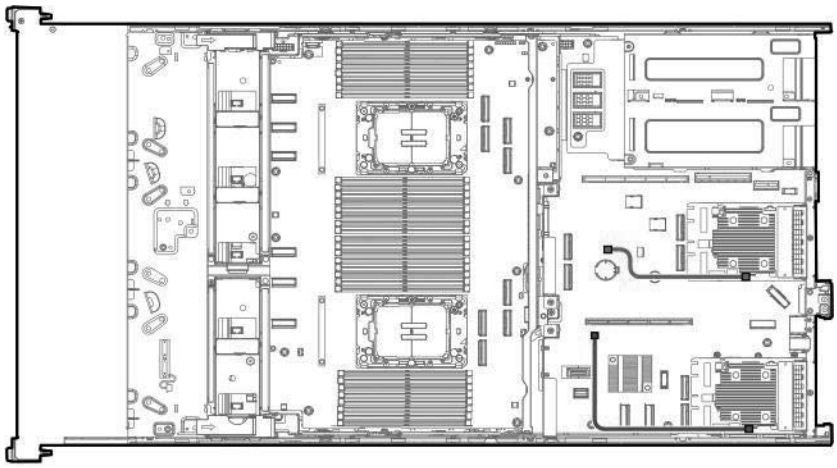
Storage controller backup power cabling

The exact route of the storage controller backup power cabling will depend on:

- The riser slot where the controller is installed
- The location of the storage controller backup power connector on the controller

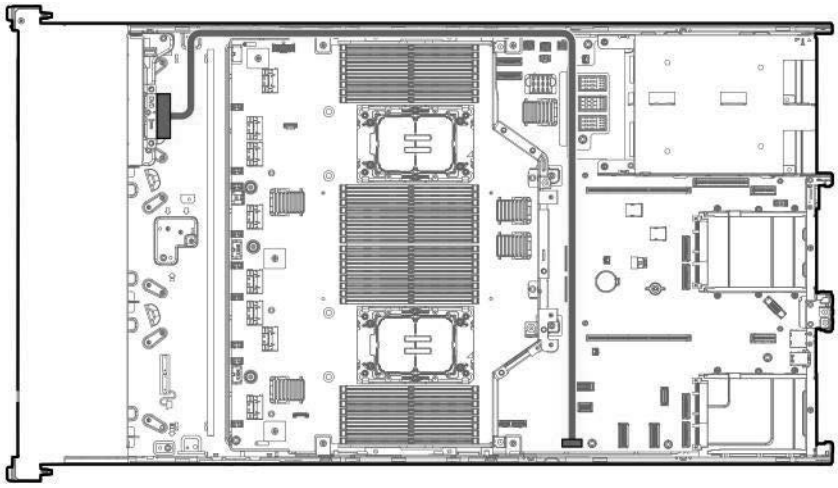
Use the following diagrams for reference only.

Storage controller backup power cabling from type-o storage controllers



Color	From	To
Orange	Type-o controller in Slot 15	OCP slot 15 backup power connector
Blue	Type-o controller in Slot 14	OCP slot 14 backup power connector

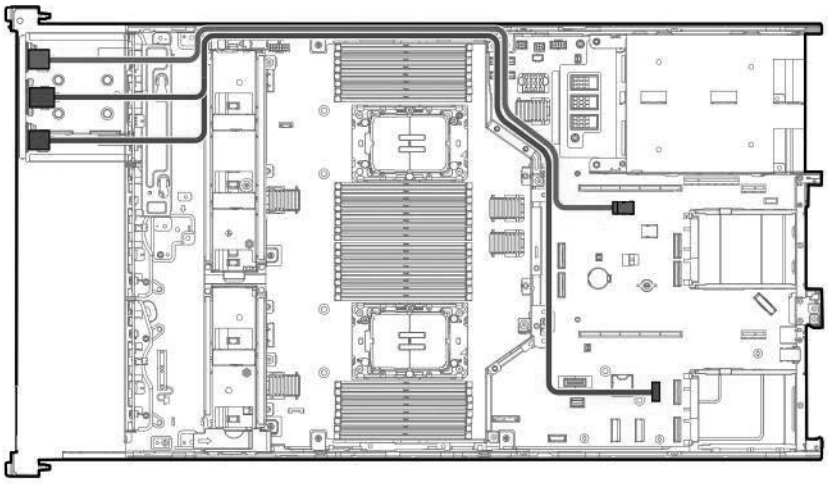
Optical drive cabling



Cable part number	Color	From	To
P55376-001[1]	Orange	Universal media bay	SATA optical port

1 Option kit: P60500-B21

Universal media bay cabling

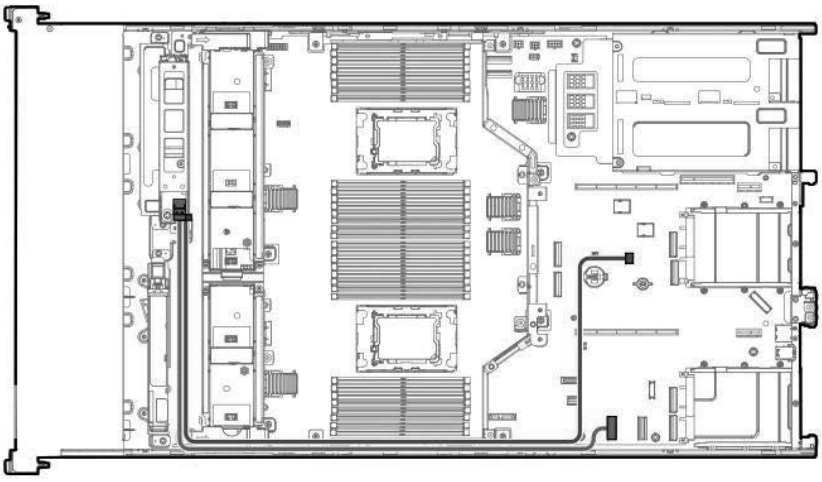


Cable part number	Color	From	To
P55373-001[1]	Orange	Universal media bay	Single port USBs
P14314-001[1]	Blue		Front DisplayPort/USB 2.0 connector

1 Option kit: P60500-B21

NS204i-u Boot Device cabling

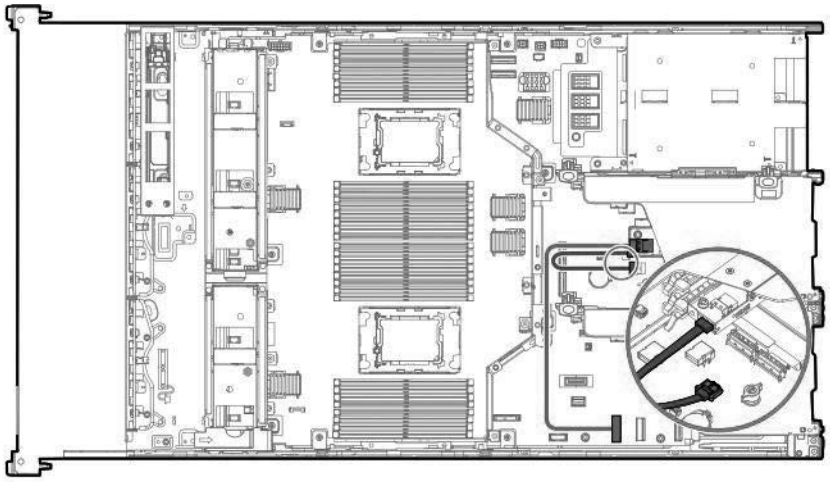
Front NS204i-u Boot Device



Cable part number	Color	From	To
P54092-001[1]	Orange	Boot device signal connector	PCH LP SlimSAS connector 1
P48956-001[1]	Blue	Boot device power connector	NS204i-u power connector

1 Option kit: P55549-B21

Rear NS204i-u Boot Device

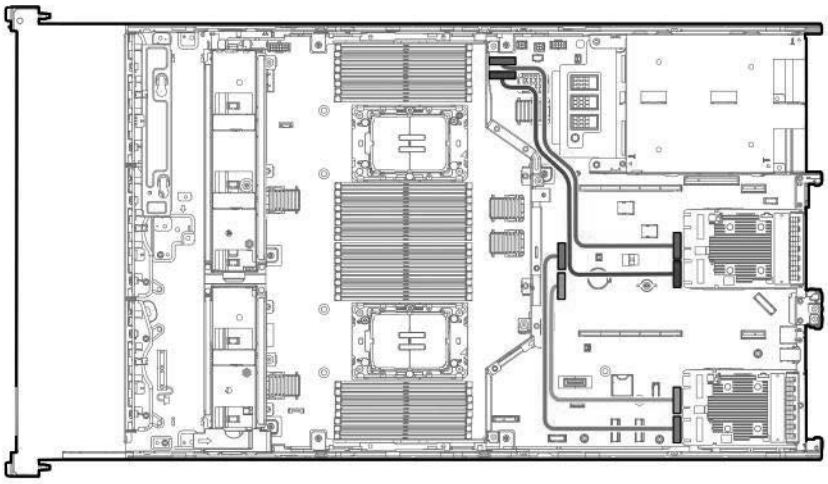


Cable part number	Color	From	To
P54092-001[1]	Orange	Boot device signal connector	PCH LP SlimSAS connector 1
P54088-001[1]	Blue	Boot device power connector	NS204i-u power connector

1 Option kit: P55710-B21

OCP bandwidth upgrade cabling

From the OCP NIC 3.0 adapter to the processor 1 or 2

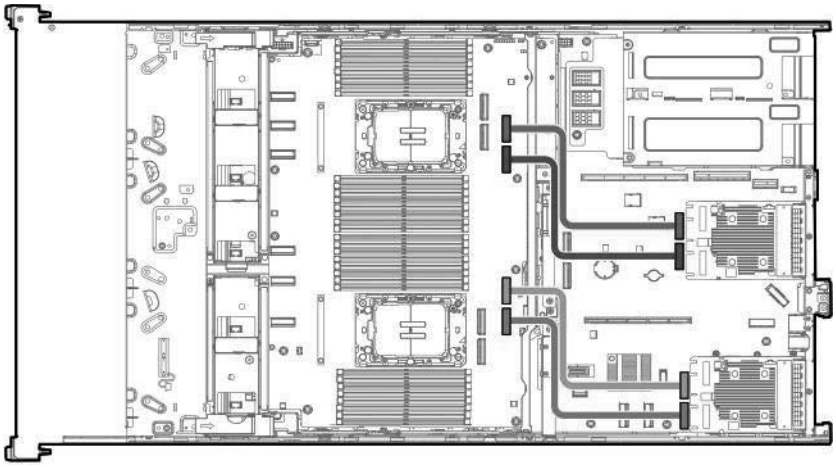


Cable part number	Color	From	To
P55366-001[1]	Orange	Slot 15 OCP port 1	Socket 2 MCIO connector 2
	Blue	Slot 15 OCP port 2	Socket 2 MCIO connector 1
	Pink	Slot 14 OCP port 1	Socket 1 MCIO connector 2
	Gold	Slot 14 OCP port 2	Socket 1 MCIO connector 1

1 Option kit: P55322-B21

From the OCP NIC 3.0 adapter to the processor 3 or 4

The processor 3 and 4 are located on the processor mezzanine board.



Cable part number	Color	From	To
P55367-001[1]	Orange	Slot 15 OCP port 1	Socket 4 MCIO connector 9
	Blue	Slot 15 OCP port 2	Socket 4 MCIO connector 10
	Pink	Slot 14 OCP port 1	Socket 3 MCIO connector 11
	Yellow	Slot 14 OCP port 2	Socket 3 MCIO connector 12

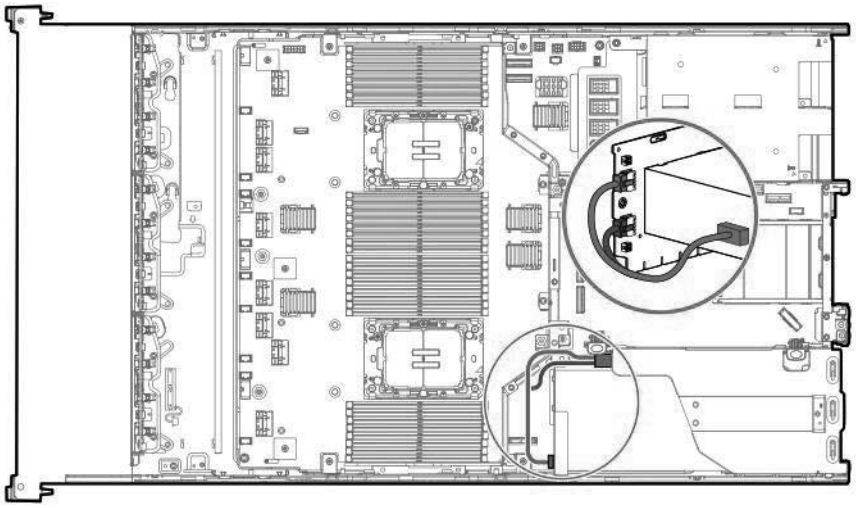
1 Option kit: P55324-B21

GPU auxiliary power cabling

The exact route of the GPU auxiliary power cabling will depend on the:

- The riser cage where the accelerator is installed.
- The location of the power connector on the accelerator.

Use the following diagrams for reference only.



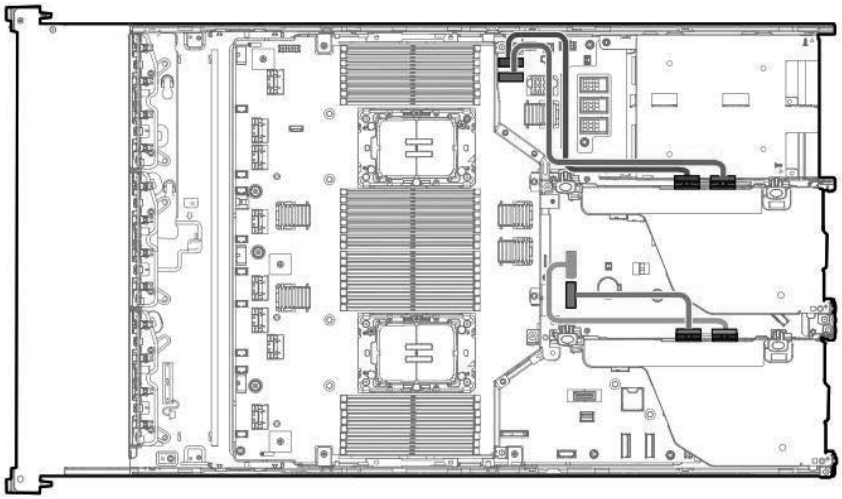
Cable part number	Color	From	To
P58422-001[1]	Orange	Accelerator power connector	**GPU auxiliary power connector**
	Blue		**GPU signal connector**

1 Option kit: P54816-B21

Riser enablement cabling

When the PCIe5 3 x16 riser is installed, connecting the riser enablement cables is required to enable all the risers.

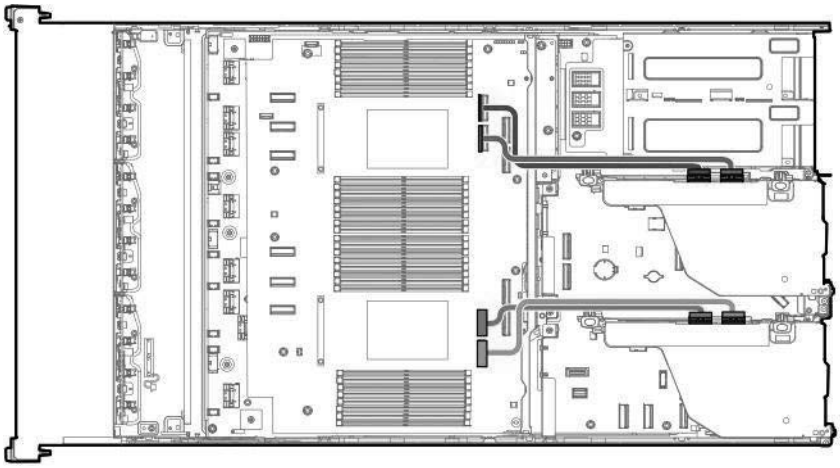
For the processors 1 and 2



Cable part number	Color	From	To
P46034-001[1]	Orange	LP SlimSAS connector 1 on the secondary riser	Socket 2 MCIO connector 1
	Blue	LP SlimSAS connector 2 on the secondary riser	Socket 2 MCIO connector 2
	Gold	LP SlimSAS connector 1 on the primary riser	Socket 1 MCIO connector 2
	Pink	LP SlimSAS connector 2 on the primary riser	Socket 1 MCIO connector 1

[1] Option kit: P55315-B21

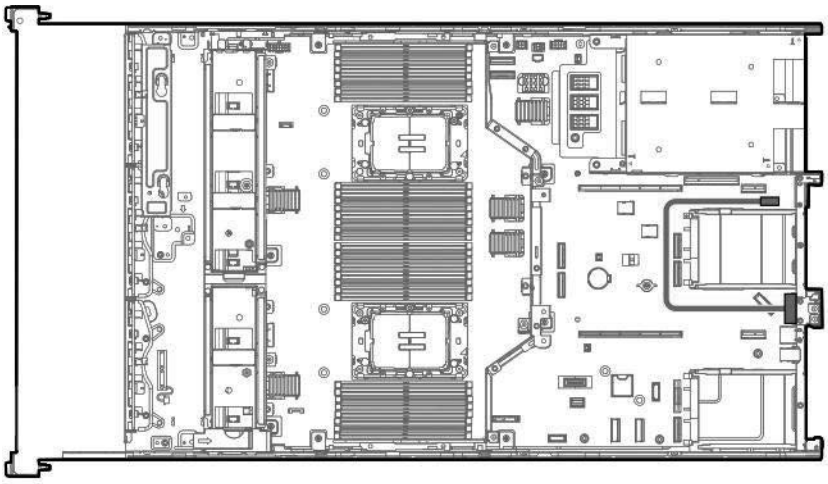
For the processors 3 and 4



Cable part number	Color	From	To
P55340-001[1]	Orange	LP SlimSAS connector 1 on the secondary riser	Socket 4 MCIO connector 8
	Blue	LP SlimSAS connector 2 on the secondary riser	Socket 4 MCIO connector 7
	Gold	LP SlimSAS connector 1 on the primary riser	Socket 3 MCIO connector 14
	Pink	LP SlimSAS connector 2 on the primary riser	Socket 3 MCIO connector 13

[1] Option kit: P55319-B21

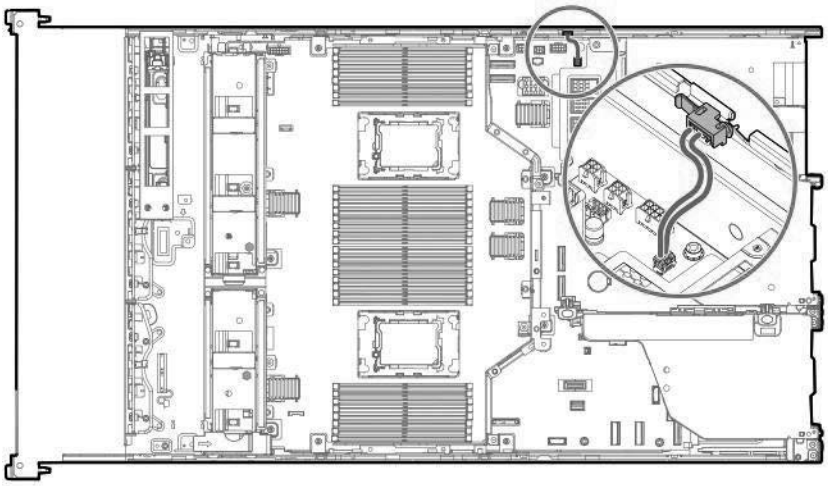
Serial port cabling



Cable part number	Color	From	To
P45623-001[1]	Orange	Serial port	Serial port connector

1 Option kit: P48824-B21

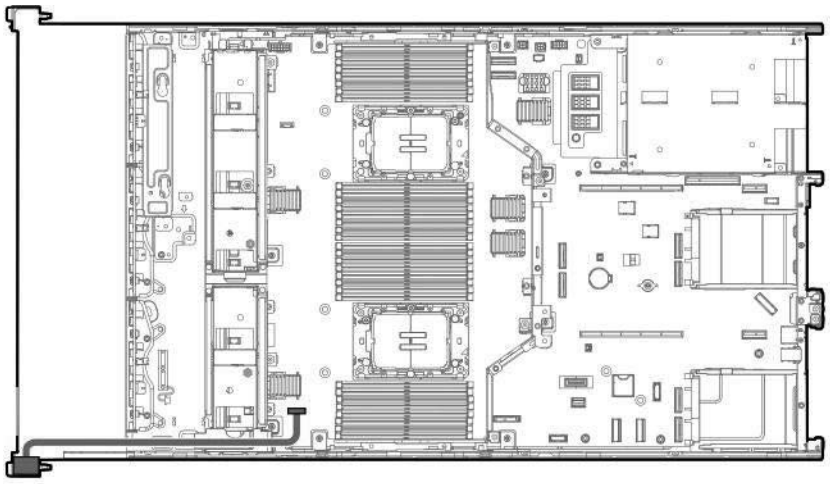
Chassis intrusion detection switch cabling



Cable part number	Color	From	To
P47751-001[1]	Orange	Chassis intrusion detection switch	Chassis intrusion detection switch connector

1 Option kit: P51917-B21

Power switch module / SID module cabling

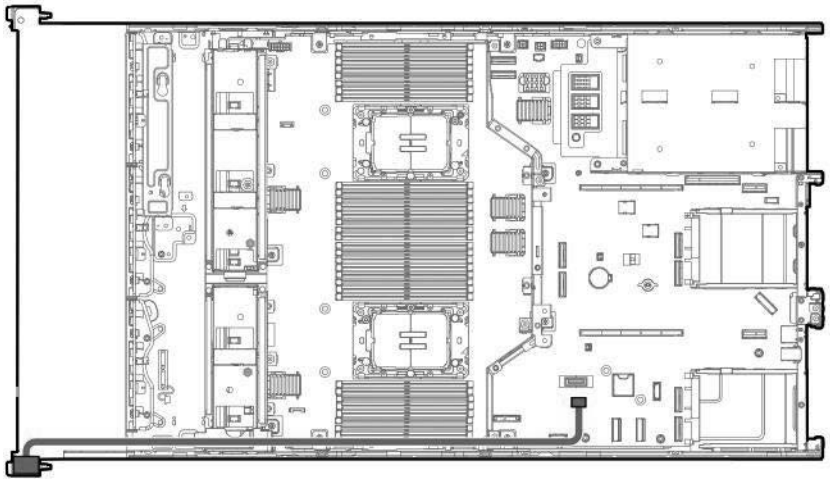


Cable part number	Color	From	To
P55374-001[1]	Orange	Right chassis ear	SID connector

1 Option kit: P54810-B21

Front I/O cabling

Front I/O cable is preinstalled in the server.



Cable part number	Color	From	To
P43727-001	Orange	Right chassis ear	Front I/O connector and USB 3.2 Gen1 port connector

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	Service Pack for Advance Server Contact customer support
• 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	UCP Advisor for Compute Management Contact customer support

Configuring the server

To configure	Use
Single server (GUI)	• Intelligent Provisioning • iLO remote console or web interface • UEFI System Utilities • UCP Advisor for Compute Management Contact customer support
Single server (scripting)	• RESTful Interface Tool • Python iLO Redfish Library (python-ilorest-library) • Scripting Tools for Windows Powershell • iLO RESTful API • UCP Advisor for Compute Management Contact customer support
Multiple servers (either UI or scripting)	• UCP Advisor for Compute Management Contact customer support ◦ **Server settings:** Define server-specific parameters such as firmware baselines, and then apply them to server groups. ◦ **Server groups:** Organize servers into custom-defined sets with associated server settings, and then apply group-specific policies to create a consistent configuration across the servers in the group.

Configuring storage controllers

Controller type	Documentation
SR G3 Gen11 controllers	*SR G3 Controller User Guide* Contact customer support
MR G3 Gen11 controllers	*MR G3 Controller User Guide* 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: **docs.hitachivantara.com**
Configure the server to boot from a PXE server	Relevant document at: **docs.hitachivantara.com**
Deploy an OS using iLO virtual media	*Hitachi Advanced Server HA800 G3 Series iLO 6 User Guide* Contact customer support
Deploy an OS using Intelligent Provisioning	*Hitachi Advanced Server HA840 G3 Series Intelligent Provisioning 4.0 User Guide* Contact customer support

Configuring security

To	See
Implement server security best practices.	• *Compute Security Reference Guide* • *iLO 6 Security Technology Brief* Contact customer support

Optimizing the server

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

Server management

To monitor	See
Single server	iLO Contact customer support
Single or multiple servers	*Unified Compute Platform (UCP) Advisor Administration Guide* 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.	*Cray Programming Environment User Guide* 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.

System battery replacement

If the server no longer automatically displays the correct date and time, then replace the battery that provides power to the real-time clock. Under normal use, battery life is 5–10 years.

System battery information

The server contains an internal lithium manganese dioxide, a vanadium pentoxide, or an alkaline battery that provides power to the real-time clock.

WARNING: If this battery is not properly handled, a risk of fire or burning exists. To reduce the risk of personal injury:

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

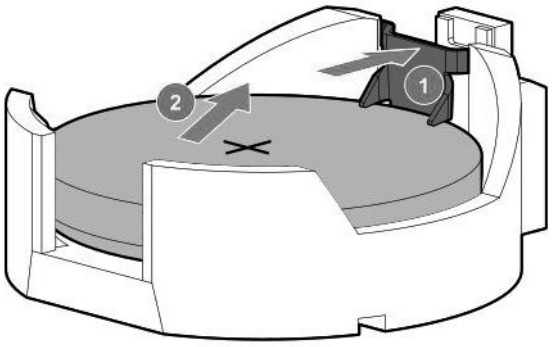
Removing and replacing the system battery

About this task

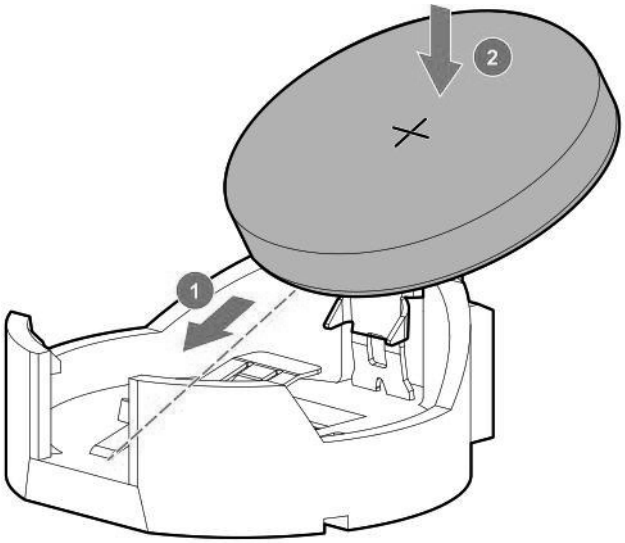
Before you perform this procedure, make sure that you have a small flat-bladed, nonconductive tool available.

Procedure

1. **Power down the server**.
2. If installed, **open the cable management arm**.
3. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. **Remove the server from the rack**.
6. Place the server on a flat, level work surface.
7. **Remove the access panel**.
8. **Locate the battery on the system board**.
9. If the expansion card is installed, **remove the secondary riser cage**.
10. Remove the system battery:
    a. Use a small flat-bladed, nonconductive tool to press the battery latch.
    b. Remove the system battery from the socket.



11. Install the system battery:
    a. With the side of the battery showing the "+" sign facing up, insert the battery into the socket.
    b. Press the system battery down until it clicks into place.



12. If removed, install the secondary riser cage.
13. Install the access panel.
14. Install the server into the rack.
15. Connect all peripheral cables to the server.
16. Connect each power cord to the server.
17. Connect each power cord to the power source.
18. Power up the server.
19. Properly dispose of the old battery.
    For more information about proper battery disposal, contact an authorized reseller or an authorized service provider.

The installation is complete.

Specifications

Environmental specifications

Specifications	Value
Temperature range*	—
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	8% to 90% 28°C (82.4°F) maximum wet bulb temperature, noncondensing
Nonoperating	5% to 95% 38.7°C (101.7°F) maximum wet bulb temperature, noncondensing
Altitude	—
Operating	3050 m (10,000 ft) This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1,500 ft/min).
Nonoperating	9144 m (30,000 ft) Maximum allowable altitude change rate is 457 m/min (1,500 ft/min).

Standard operating support

10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1,000 ft) above sea level to a maximum of 3,050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 20°C/hr (36°F/hr). The upper limit and rate of change may be limited by the type and number of options installed.

System performance during standard operating support might be reduced if operating above 30°C (86°F).

Extended ambient operating support

For approved hardware configurations, the supported system inlet range is extended to be:

- 5° to 10°C (41° to 50°F) and 35° to 40°C (95° 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 (2,953 ft) to a maximum of 3050 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 3,050 m (10,000 ft).

For more information about approved hardware configurations for this system, contact customer support.

Mechanical specifications

Specification	Value
Dimensions	—
Height	8.75 cm (3.44 in)
Depth	80.66 cm (31.76 in)
Width	43.31 cm (17.05 in)
Weight, approximate values	—
Minimum, air cooling configuration	21.08 kg (46.47 lb)
Maximum, air cooling configuration	38.02 kg (83.82 lb)
Minimum, liquid cooling configuration	26.83 kg (59.15 lb)
Maximum, liquid cooling configuration	36.93 kg (81.42 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. For detailed power supply specifications, contact customer support.

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	9.4 A at 100 VAC 4.5 A at 200 VAC 3.8 A at 240 VDC for China only
Maximum rated input power	940 W at 100 VAC 900 W at 200 VAC 897 W at 240 VDC for China only

Table Continued

Specification	Value
BTUs per hour	3067 at 100 VAC 2958 at 200 VAC 2949 at 240 VAC for China only
Power supply output	—
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 240 VDC for China
Rated input frequency	50 Hz to 60 Hz
Rated input current	11.3 A at 100 VAC 6.1 A at 200 VAC
Maximum rated input power	1130 W at 100 VAC 1090 W at 200 VAC
BTUs per hour	3764 at 100 VAC 3629 at 200 VAC
Power supply output	—

Table Continued

Specification	Value
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 7.2 A at 240 VDC
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

1600 W Flex Slot -48 VDC Hot-plug Power Supply

Specification	Value
Input requirements	—
Rated input voltage	-40 VDC to -72 VDC

Table Continued

Specification	Value
Rated input frequency	DC
Nominal input current	45 A DC at -40 VDC input 36.6 A DC at -48 VDC input 24.4 A DC at -72 VDC input
Maximum Rated Input Wattage Rating	1798 W at -40 VDC input 1758 W at -48 VDC input 1755 W at -72 VDC input
BTUs per hour	6026 at -40 VDC input 6000 at -48 VDC input 5989 at -72 VDC input
Power supply output	—
Rated steady-state power	1600 W at -40 VDC to -72 VDC
Maximum peak power	1600 W at -40 VDC to -72 VDC

1800-2200 W Flex Slot Titanium 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	10 A at 200 VAC 10 A at 240 VAC
Maximum rated input power	1946 W at 200 VAC 2375 W at 240 VAC
BTUs per hour	6497 at 200 VAC 7962 at 240 VAC
Power supply output	—

Table Continued

Specification	Value
Rated steady-state power	1799 W at 200 VAC 2200 W at 240 VAC
Maximum peak power	2200 W for 1 ms (turbo mode) at 200 VAC to 240 VAC input

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