

Hitachi Advanced Server HA805 G3 Series

User Guide

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

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Preface

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

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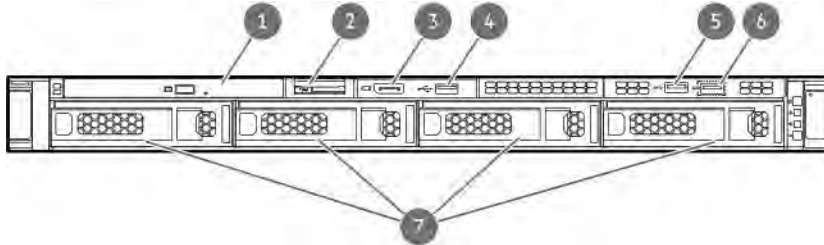
Thank you!

Component identification

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

Front panel components

4 LFF drive configuration



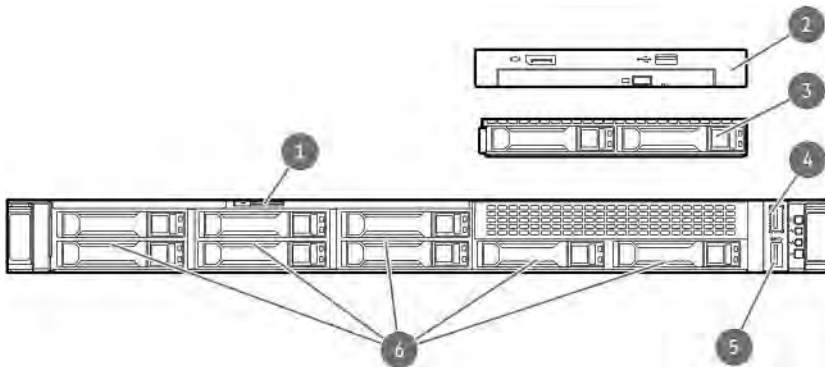
Item	Description
1	Optical drive (optional)
2	Serial number/ iLO information pull tab ¹
3	<u>DisplayPort 1.1a (optional)²</u>
4	USB 2.0 port (optional) ²
5	USB 3.2 Gen1 port
6	<u>iLO Service Port</u>
7	4 LFF drives (optional) ³

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 This port includes in the front USB and DisplayPort assembly option.

³ 4 LFF drive bays support SAS or SATA drives.

8 + 2 SFF drive configuration



Item	Description
1	Serial number/ iLO information pull tab ¹
2	Optical drive cage assembly (optional) ²
3	2 SFF side-by-side drive cage assembly (optional) ³
4	<u>iLO Service Port</u>
5	USB 3.2 Gen1 port
6	8 SFF drives (optional) ³

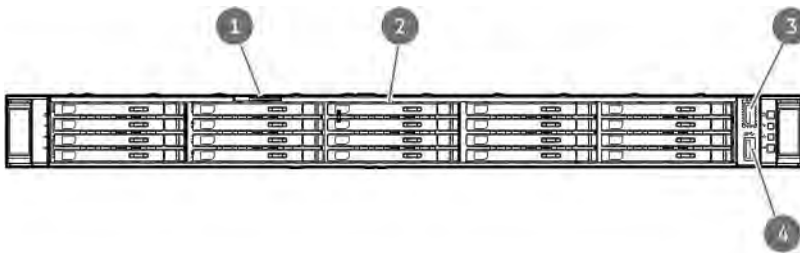
1 serial number/ iLO information pull tab is double-sided. One side shows the server serial number and the customer asset tag label. The other side shows the default iLO account information.

2 assembly includes:

- DisplayPort 1.1a
- USB 2.0 port
- optical drive bay

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

20 E3.S drive configuration



Item	Description
1	Serial number/ iLO information pull tab ¹¹
2	20 E3.S drives (optional)
3	<u>iLO Service Port</u>
4	USB 3.2 Gen1 port

¹¹ 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.

iLO Service Port

The Service Port is a USB port with the label iLO on supported servers.

To find out if your server search_terms supports this feature, see the server specifications document at the following website: .

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

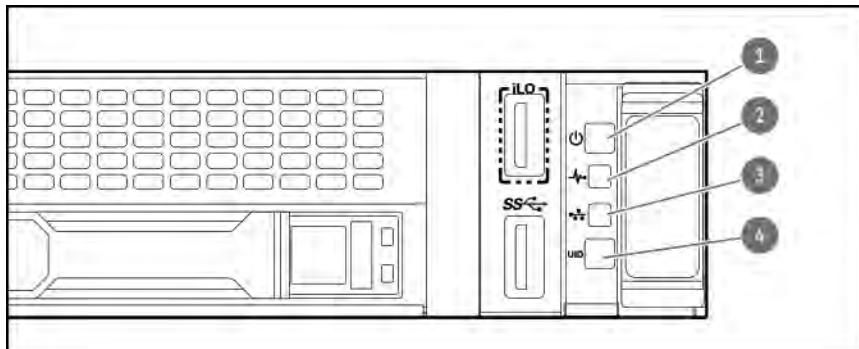
Use the USB to Ethernet Adapter (part number Q7Y55A).

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.

Contact customer support for more information about the iLO Service Port.

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

Table Continued

Item	Description	Status	Definition
		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
		Flashing blue	<ul style="list-style-type: none"> 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, or power supply failure has occurred.

³ If the health LED indicates a degraded or critical state, [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

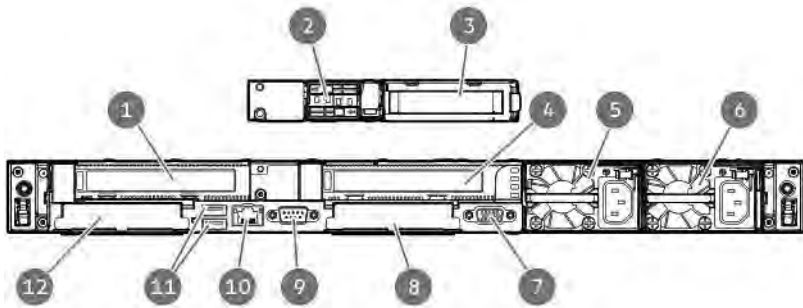
1. Press and release the UID button.
The **Server Health Summary** screen is displayed on the external monitor. For more information, contact customer support.
2. Press the UID button again to close the Server Health Summary screen.

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	Slot 1 PCIe5 x16 ¹
2	NS204i-u boot device (optional) ²
3	Slot 2 PCIe5 x16 (optional) ³
4	Slot 2 PCIe5 x16 (optional) ⁴

Table Continued

Item	Description
5	Flexible Slot power supply 2 (optional)
6	Flexible Slot power supply 1
7	<u>VGA port</u>
8	Slot 22 OCP PCIe x8
9	Serial port (optional)
10	iLO management port
11	USB 3.2 Gen1 ports
12	Slot 21 OCP PCIe x8 ⁵

¹ This riser slot is in the primary riser cage.

² This option is in the NS204i-u + low-profile riser cage.

³ This riser slot locates in the NS204i-u + low-profile riser cage and supports half-height half-length (low-profile) expansion card.

⁴ This riser slot is in the secondary riser cage.

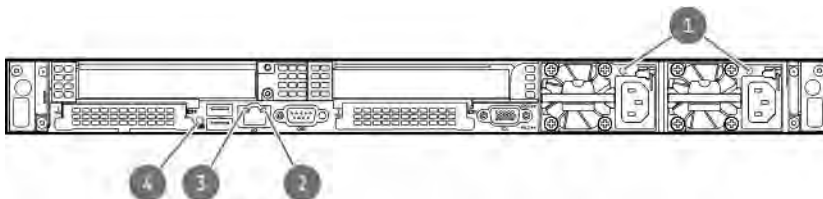
⁵ In Slot 21 OCP, the OCP bandwidth upgrade cable is required to support a x16 OCP expansion option.

Display device setup

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

- 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 PCIe5 graphics card that supports this feature in the slot 1 in the primary riser.

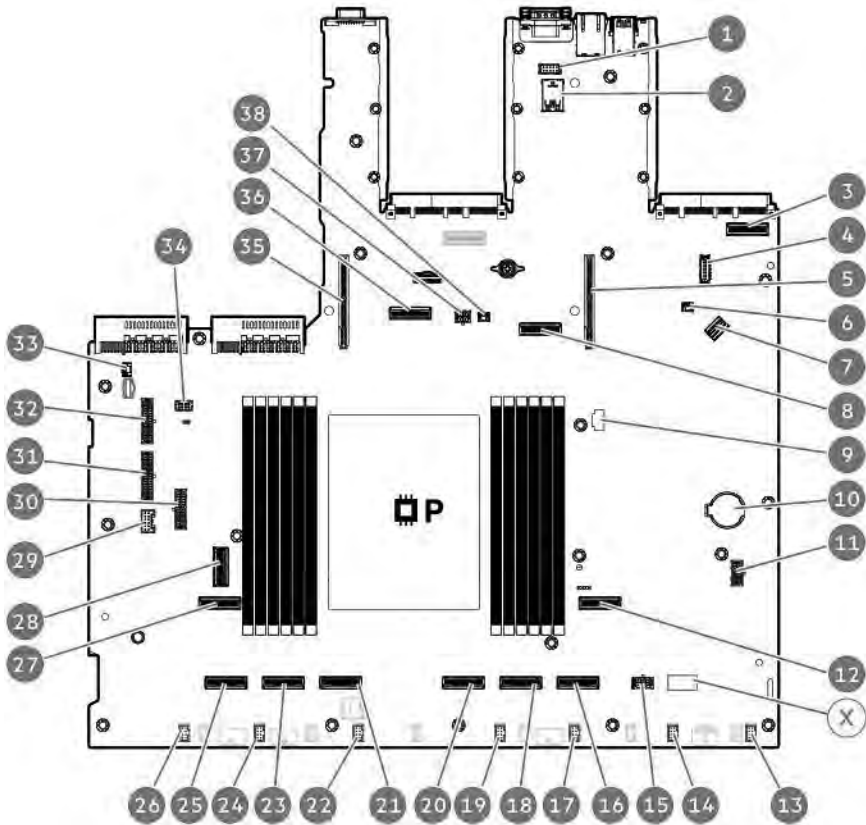
Rear panel LEDs



Item	LED	Status	Definition
1	Power supply	Solid green	The power supply is operating normally.
		Off	One or more of the following conditions exists: <ul style="list-style-type: none"> • Power is unavailable • Power supply failure • Power supply is in standby mode • Power supply error
2	iLO link	Solid green	Network link
		Off	No network link
3	iLO status	Solid green	Linked to network
		Flashing green	Network active
		Off	No network activity
4	UID	Solid blue	Activated
		Flashing blue	<ul style="list-style-type: none"> • 1 flash per sec—Remote management or firmware upgrade in progress • 4 flashes per sec—iLO manual reboot sequence initiated • 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	Serial port connector
2	Stacked, dual USB 3.2 Gen1 ports
3	Slot 21 OCP x16 upgrade connector
4	Front USB and DisplayPort connector
5	Primary riser connector
6	Slot 21 OCP storage backup power connector
7	Front I/O connector
8	NVMe port 9A
9	Pump-cold plate signal connector ¹
10	System battery
11	GPU riser power connector
12	NVMe/SATA port 1A
13	Fan connector 7
14	Fan connector 6
15	Optical drive power connector
16	NVMe/SATA port 2A

Table Continued

Item	Description
17	Fan connector 5
18	NVMe port 3A
19	Fan connector 4
20	NVMe port 4A
21	NVMe port 5A
22	Fan connector 3
23	NVMe port 6A
24	Fan connector 2
25	NVMe port 7A
26	Fan connector 1
27	NVMe port 8A
28	NS204i-u signal connector
29	Energy pack connector
30	Drive backplane / Graphics card power connector C (J9019)
31	Drive backplane/Graphics card power connector A (J9017)
32	Drive backplane/Graphics card power connector B (J9018)
33	Chassis intrusion detection switch connector
34	M.2 SSD power connector ²
35	Secondary riser connector
36	NVMe/SATA port 1B ³
37	SmartNIC auxiliary power connector
38	Slot 22 OCP storage backup power connector
X	<u>System maintenance switch</u>

¹ This connector is for the liquid cooling heatsink.

² This power connector is either for the M.2 SSD pass-through card or the NS204i-u boot device options.

³ This port is for M.2 SSD pass-through card signal cable connection.

System maintenance switch descriptions

Position	Default	Function
S1 ¹	Off	<ul style="list-style-type: none"> Off—iLO 6 security is enabled. On—iLO 6 security is disabled.
S2	Off	Reserved
S3	Off	Reserved

Table Continued

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

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

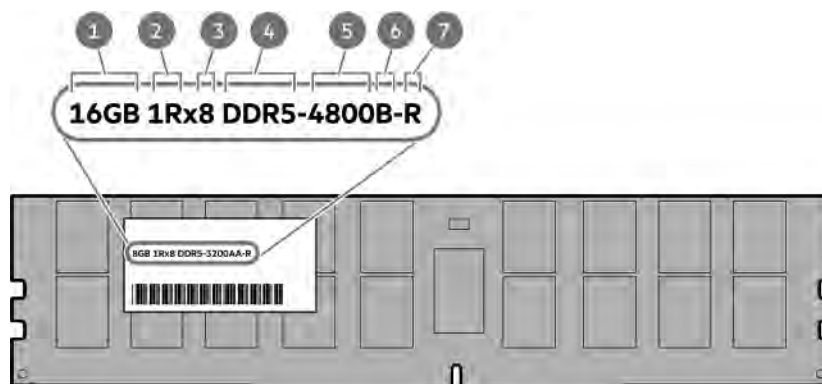
² When the system maintenance switch position 6 is set to the On position, the system is prepared to restore all configuration settings to their manufacturing defaults.

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

DIMM label identification

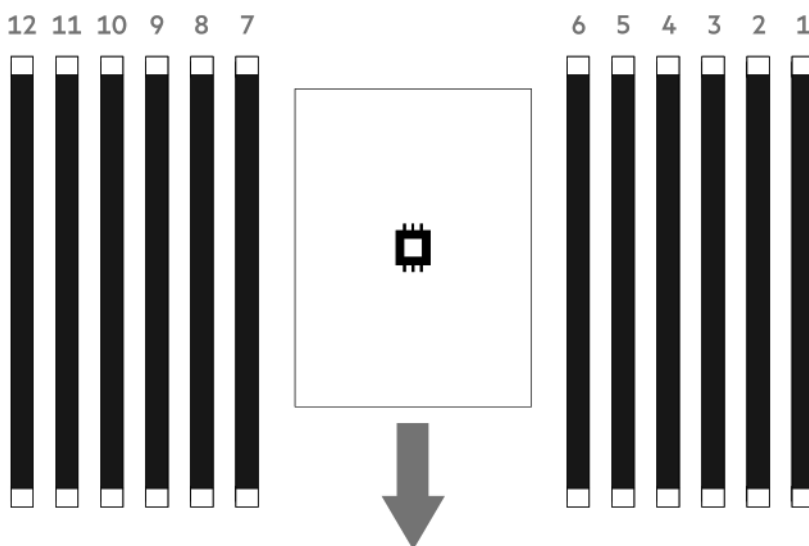
To determine DIMM characteristics, see the label attached to the DIMM. The information in this section helps you to use the label to locate specific information about the DIMM.

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



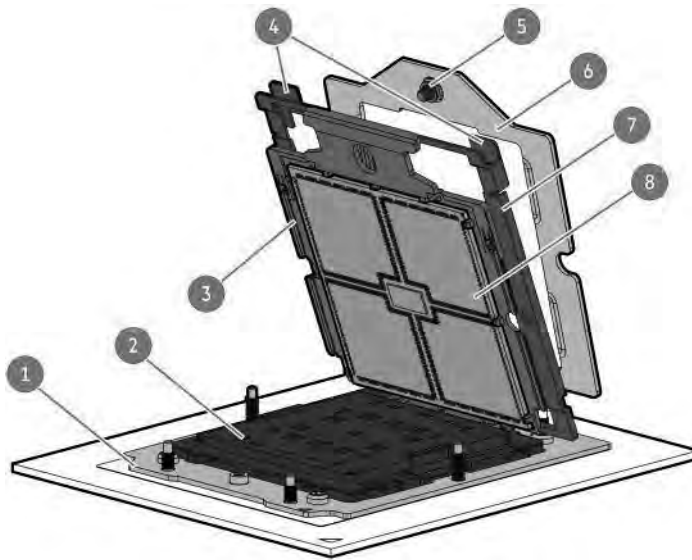
Item	Description	Example
1	Capacity	16 GB 32 GB 64 GB 128 GB 256 GB
2	Rank	1R—Single rank 2R—Dual rank 4R—Quad rank 8R— Octal rank
3	Data width on DRAM	x4—4-bit x8—8-bit
4	Memory generation	PC5—DDR5
5	Maximum memory speed	4800 MT/s
6	CAS latency	B—42-42-42 B—50-42-42 (for 128 GB and 256 GB capacities)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

DIMM slot numbering



The arrow points to the front of the server.

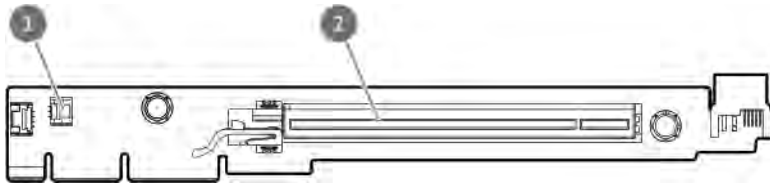
Processor and socket components



Item	Description
1	Processor socket
2	Pin field cover cap
3	Processor carrier
4	Rail frame lift tabs
5	Retention frame screw (T-20)
6	Retention frame
7	Rail frame
8	Processor

Riser board components

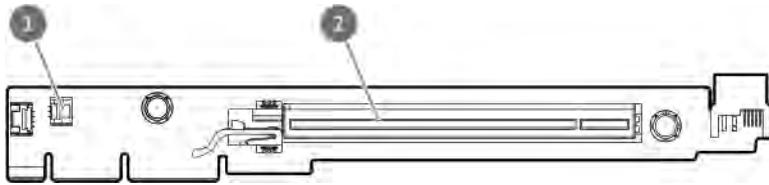
Primary / secondary one-slot PCIe5 x16 riser



Item	Description
1	Controller storage backup power connector

Item	Slot number	Slot type	Slot power	Supported form factors
2	1 / 2	PCIe5 x16 (16, 8, 4, 1) slot	75 W	<ul style="list-style-type: none"> • Full-height, half-length • Half-height, half-length (low-profile)

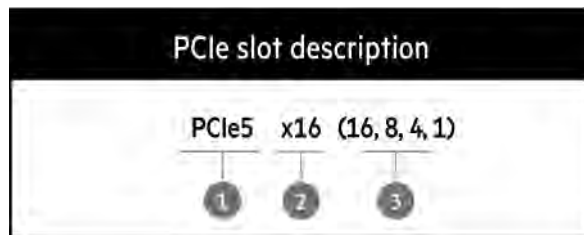
Secondary low-profile one-slot PCIe5 x16 riser



Item	Description
1	Controller storage backup power connector

Item	Slot number	Slot type	Slot power	Supported form factors
2	2	PCIe5 x16 (16, 8, 4, 1) slot	75 W	Half-height, half-length (low-profile)

PCIe5 slot description



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

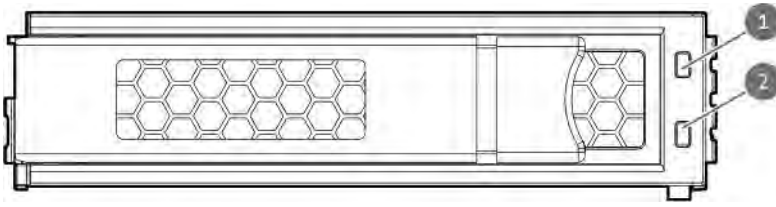
Basic Drive LED definitions

The Basic drive carrier has the following LEDs:

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

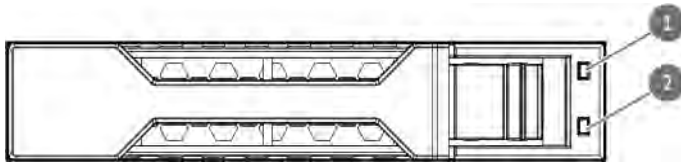
LFF low-profile drive carrier

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



SFF basic drive carrier

The SFF basic drive carrier supports hot-plug SAS, SATA, or U.3 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.
2	Online/Activity	Off	The drive is operating normally and not being identified by a management application.
		Solid green	The drive is online and has no activity.
		Flashing green (1 flash per second)	The drive is doing one of the following: <ul style="list-style-type: none"> • Rebuilding or performing a RAID • Performing a stripe size migration • Performing a capacity expansion • Performing a logical drive extension • Erasing • Spare part activation

Table Continued

Item	LED	State	Definition
		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.

EDSFF SSD LED definitions

This server supports hot-plug Enterprise and Data Center Standard Form Factor (EDSFF) drives. Specifically, E3.S PCIe5 NVMe SSDs. The EDSFF drive carrier has two 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.



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 (4 flashes per second)	The drive is operating normally and has activity.
		Off	No power present

Drive bay numbering

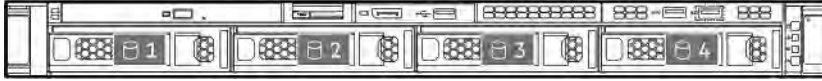
- ⚠ CAUTION:** When a server is purchased without any drive installed, some drive bays might be empty while other drive bays might be populated with drive blanks. To maintain proper system cooling, do not operate the server without a drive or a drive blank installed.

LFF drive bay numbering

The following drive backplane options are supported in the LFF drive configurations:

- 4 LFF 12G x1 SAS UBM2 LP
- 4 LFF 12G x1 SAS UBM6 LP

For more information on the drive backplane description, see [Drive backplane naming](#).



In the LFF drive configuration:

- All drives belong to the same box 1.
- SAS or SATA drives are supported.
- To manage the hot-plug SAS drive, install the MR type-o G3 storage controller (OROC).

SFF drive bay numbering

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

- 2 SFF side-by-side drive backplanes:
 - 2 SFF 16G x4 U.2 NVMe/SAS UBM4 BC
 - 2 SFF 24G x4 U.3 NVMe/SAS UBM3 BC
 - 2 SFF 24G x4 U.3 NVMe/SAS UBM6 BC
- 8 SFF drive backplanes:
 - 8 SFF 16G x4 U.2 NVMe/SAS UBM4 BC
 - 8 SFF 24G x1 U.3 NVMe/SAS UBM3 BC
 - 8 SFF 24G x4 U.3 NVMe/SAS UBM3 BC
 - 8 SFF 24G x1 U.3 NVMe/SAS UBM6 BC
 - 8 SFF 24G x4 U.3 NVMe/SAS UBM6 BC

For more information on the drive backplane description, see [Drive backplane naming](#).



Item	Description
1	Box 1, bays 1–8
2	Box 2, bays 1 and 2

In the SFF drive configuration:

- Drives are assigned to box 1 and optional box 2.
- SAS, SATA, or U.3 NVMe drives are supported.
- To manage the hot-plug SAS drive, install one of following storage controller:
 - SR/MR type-p G3 storage controller
 - MR type-o G3 storage controller (OROC)
- When installing NVMe drives, install either all U.2 or all U.3 drives. Mixed NVMe drive type installation in the same box is not supported.

E3.S drive bay numbering

The 20 E3.S x4 NVMe UBM5 EC1 drive backplane option is supported in the E3.S drive configuration.

For more information on the drive backplane description, see [Drive backplane naming](#).

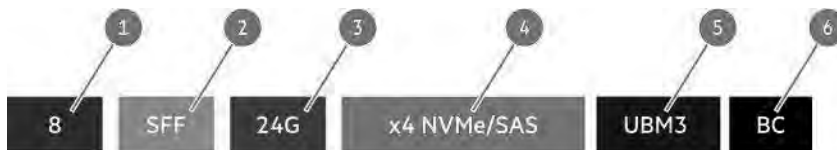


In the E3.S drive configuration, all drives belong to the same box 1.

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 E3.S—Enterprise and Datacenter Standard Form Factor (EDSFF)
3	Maximum link rate per lane (GT/s)	12G 16G

Table Continued

Item	Description	Values
		24G
		32G
4	Port link width and interface	x1 NVMe/SAS—U.3 NVMe, SAS, or SATA ¹
		x4 NVMe/SAS—U.3 NVMe, SAS, or SATA ²
		x4 NVMe—U.2 NVMe ³
		x4 NVMe—E3.S
5	Universal backplane manager (UBM) options	UBM2—Segregated SAS/SATA
		UBM3 or UBM6—Converged
		UBM4 or UBM6—Segregated U.2 NVMe
		UBM5 or UBM7—EDSFF
6	Drive carrier type	BC—Basic carrier (SFF)
		LP—Low-profile carrier (LFF)
		EC1—E3.S carrier

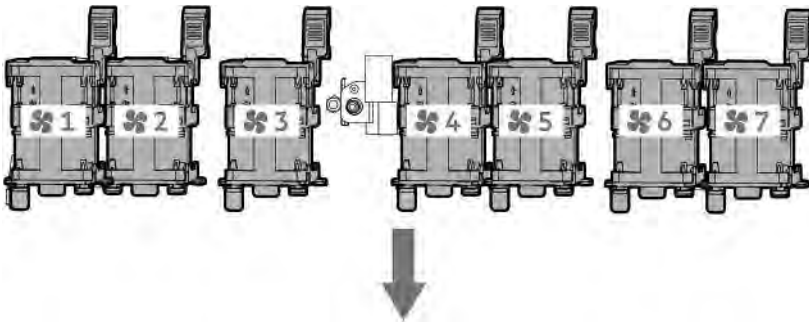
¹ Tri-mode controller support for x1 U.3 NVMe, SAS, and SATA drives. System board connection supports SATA drives only.

² CPU direct attach or tri-mode controller support for x4 U.3 NVMe or x1 SAS and SATA drives.

³ CPU direct attach or tri-mode controller support for x4 U.2 NVMe drives.

Fan numbering

To provide sufficient airflow to the system, the server is by default populated by seven fans. The fans can either be standard fan (P58461-B21) or high performance fan (P58462-B21). Mixed fan configuration is not supported.



The arrow points to the front of the server.

Fan and heatsink requirements

CAUTION: To maintain proper system cooling, install the correct fan and heatsink types required for specific hardware configurations.

⚠ CAUTION: To maintain proper system cooling, when a 25 Gb or faster Ethernet / InfiniBand adapter / Storage Networking NVMe-oF Offload Adapter / NS204i Boot Device is installed in any configuration, make sure to use high performance fans.

The system-operating temperature for most components installed in this server is at standard temperature (10°C to 35°C / 50°F to 95°F). However, system performance during standard operating support may be reduced if operating with above 30°C (86°F). The following table contains the allowed hardware configurations that the system can be run at 30°C (86°F) without system performance degradation.

Drive configurations	Processor TDP	Fan type	Heatsink type
<ul style="list-style-type: none">• 4 LFF drives	200 W–240 W	Standard fan ¹	Standard heatsink ²
<ul style="list-style-type: none">• 8 SFF drives	260 W–300 W	High performance fan ³	High performance heatsink ⁴
<ul style="list-style-type: none">• 10 SFF drives	320 W–400 W	Liquid cooling fan ⁵	Liquid cooling heatsink ⁶

¹ Option kit: P58461-B21

² Option kit: P58456-B21

³ Option kit: P58462-B21

⁴ Option kit: P58457-B21

⁵ Option kit: P59668-B21

⁶ Option kit: P58463-B21

Liquid cooling options

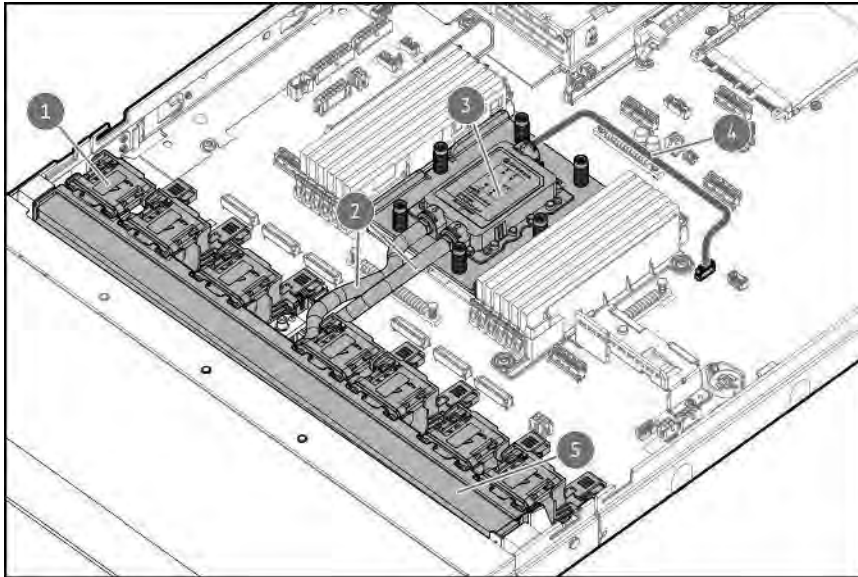
When an AMD EPYC 9004 Series Processor with a TDP of 320 W–400 W is installed, the closed-loop liquid cooling heatsink and liquid cooling fans options are required.

- 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 your local sales representative for additional information.
- The tubes of the liquid cooling heatsink are prefilled with coolant. In the unlikely event of a spill or leak of this server coolant, contact customer support

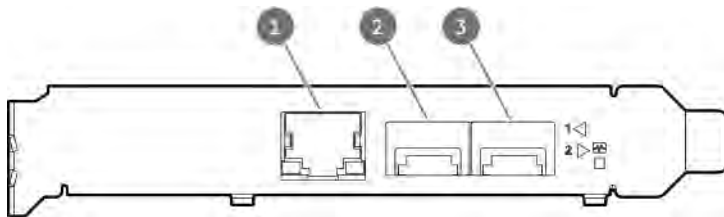


Item	Description
1	Liquid cooling fans (7, single-rotor)
2	Coolant tubes
3	Pump-cold plate ¹
4	Pump signal cable
5	Radiator

¹ The liquid cooling heatsink has two pumps for redundancy.

DSC-25 2-port SFP28 card ports and LEDs

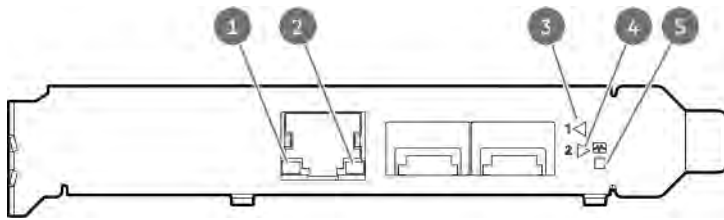
Ports



Item	Port	Description
1	Management port	1GbE RJ45
2	Network interface port	10/25G SFP+ based
3	Network interface port	10/25G SFP+ based

LEDs

The DSP DSC-25 2p SFP28 card is a dual-port, single-slot, half-height, half-length (HHHL) SFP28 network adapter. It has LEDs for Link (L) and Activity (A) for each port. A half-height bracket is shown in the following illustration with SFP28 ports and LEDs.



Item	LED	Status	Description
1	Management Port Activity LED	Off	No activity
		Flashing	Passing traffic; flashing frequency indicates traffic intensity
2	Management Port Link LED	Off	A link has not been established
		Solid green	Valid Ethernet link
3	SFP Port 1 Link/Activity LED	Off	A link has not been established
		Solid green	Valid Ethernet link
		Flashing green	Passing traffic; flashing frequency indicates traffic intensity
		Solid amber	Link fault
4	SFP Port 2 Link/Activity LED	Off	A link has not been established
		Solid green	Valid Ethernet link
		Flashing green	Passing traffic; flashing frequency indicates traffic intensity
		Solid amber	Link fault
5	System status LED	Off	System is not powered
		Solid amber	Power is up, software has not booted yet
		Solid green	System is up and fully operational

Trusted Platform Module 2.0 guidelines

⚠ CAUTION:

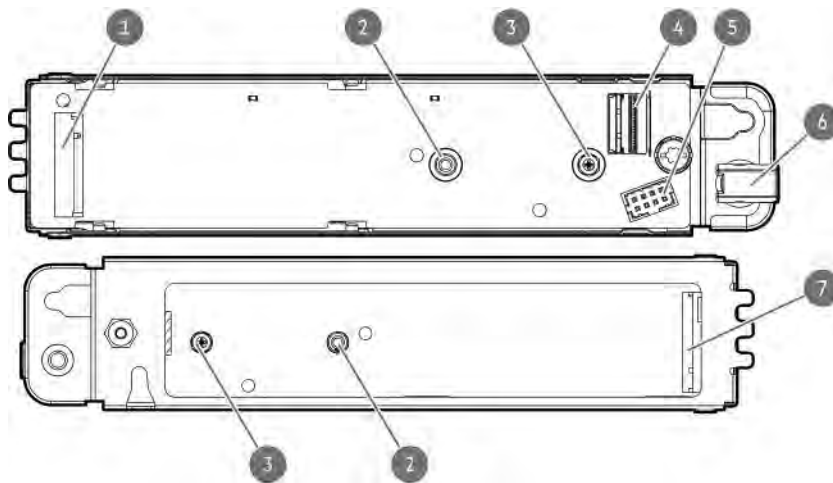
- Always observe the TPM guidelines in this section. Failure to follow these guidelines can cause hardware damage or halt data access.
- If you do not follow procedures for modifying the server and suspending or disabling the TPM in the OS, an OS that is using TPM might lock all data access. This includes 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.
- Hitachi Vantara is not liable for blocked data access caused by improper TPM use. For operating instructions, see the documentation for the encryption technology feature provided by the operating system.

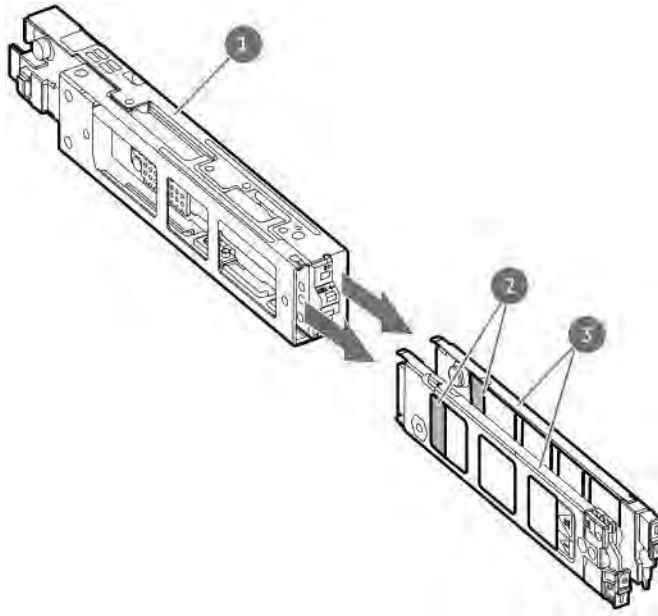
M.2 SSD pass-through card components

The dual-slot M.2 SSD pass-through card option supports both SATA and NVMe SSDs in 2280 and 22110 form factors.



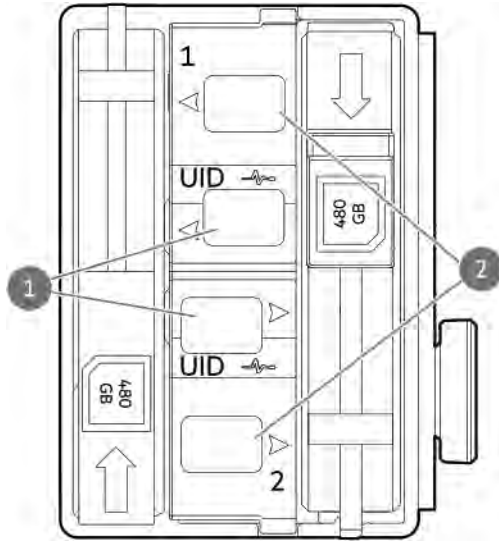
Item	Description
1	M.2 SSD slot 1
2	2280 standoff
3	22110 standoff
4	SlimSAS port
5	Power connector
6	Retaining latch
7	M.2 SSD slot 2

NS204i-u Boot Device components



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

NS204i-u Boot Device LED definitions



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

Setup

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

Initial system installation

Depending on your technical expertise and the complexity of the product, for the initial system installation, select one of the following options:

- [Ordering the Installation Service](#)
- [Setting up the server](#)

Installation Service

Installation Service provides basic installation of Hitachi Vantara branded equipment, software products, as well as-supported products from other vendors that are sold by or by authorized resellers. The Installation Service is part of a suite of deployment services that are designed to give users the peace of mind that comes from knowing that their and Hitachi Vantara-supported products have been installed by a specialist.

The Installation Service provides the following benefits:

- Installation by an authorized technical specialist.
- Verification prior to installation that all service prerequisites are met.
- Delivery of the service at a mutually scheduled time convenient to your organization.
- Allows your IT resources to stay focused on their core tasks and priorities.
- Full coverage during the warranty period for products that require installation by an authorized technical specialist.

For more information on the features, limitations, provisions, and ordering information of the Installation Service, contact customer support.

Setting up the server

Prerequisites

- As a best practice, install 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, see the UCP Advisor documentation.
 - Use the **Firmware Update** option in Intelligent Provisioning—Intelligent Provisioning is a server deployment tool embedded in Hitachi Advanced servers. To access Intelligent Provisioning, during the server boot process, press F10. For

more information, contact customer support.

- Download the Service Pack for Advanced Server (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 preferred method for downloading an SPV is by creating an SPV custom download. Contact customer support for creating an SPV custom download.

This option reduces the size of the SPV by excluding firmware and drivers for OS and server models that are not needed.

- The SPV is also available for download from the SPV download page at <https://support.hitachivantara.com/en/user/answers/downloads.html#hardware-download>.

- Verify that your OS or virtualization software is supported. For more information, contact customer support.
- 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. [Install the server into the rack](#).

4. Decide how to manage the server:

- Locally: Use a KVM switch or 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, contact customer support

- 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. Deploy an OS or virtualization software.
 9. After the OS is installed, update the drivers.

Operational requirements

When preparing the site and planning the installation for the Hitachi Advanced Server HS805 G3, be sure to observe the following general operational requirements:

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


For server-specific environmental requirements, see Environmental specifications.

Space and airflow requirements


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

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


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

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

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

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

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


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

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

Temperature requirements

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


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


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

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

Power requirements

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

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


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

Electrical grounding requirements


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

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


Rack warnings and cautions

 **WARNING:** When all components are removed, the server weighs 13.76 kg (30.33 lb). When all components are installed, the server can weigh up to 14.57 kg (32.12 lb).

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

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

- Observe local occupational health and safety requirements and guidelines for manual material handling.
- Get help to lift and stabilize the product during installation or removal, especially when the product is not fastened to the rails. The server weighs more than 13.76 kg (30.33 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 stabilize 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, 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](#)

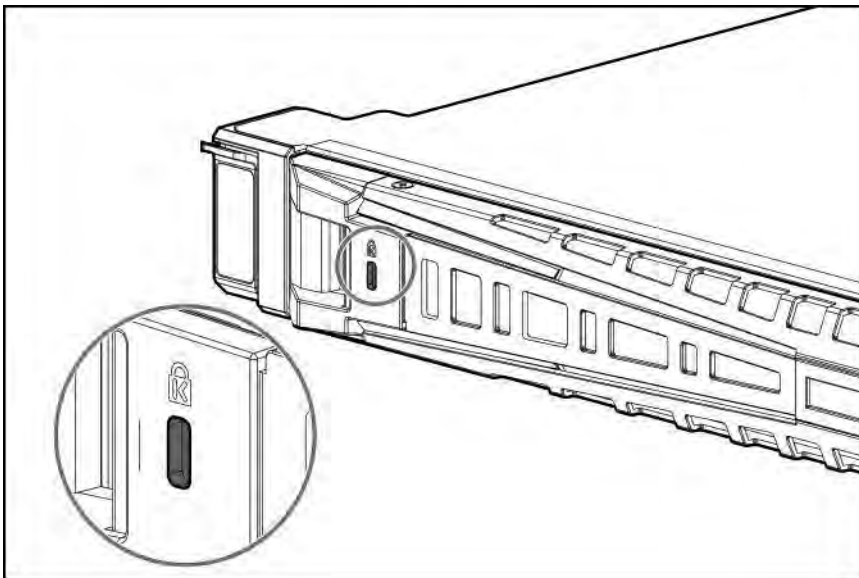
Remove the front bezel

About this task

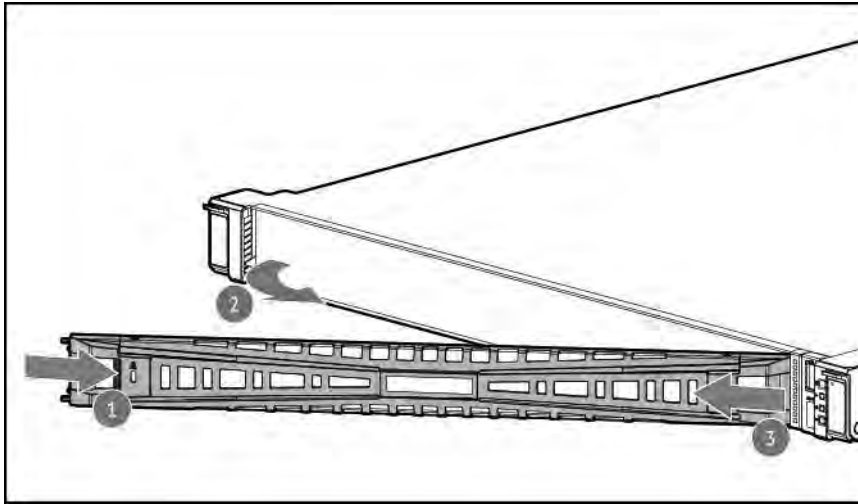
If you are using the iLO virtual power button to power the server on/off, you do not need to remove the front bezel. Remove the front bezel only if you need to access the front panel components.

Procedure

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



2. Press the bezel release latch (callout 1), and then pivot the bezel open (callout 2).
3. Release the right side of the bezel from the front panel (callout 3).



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.

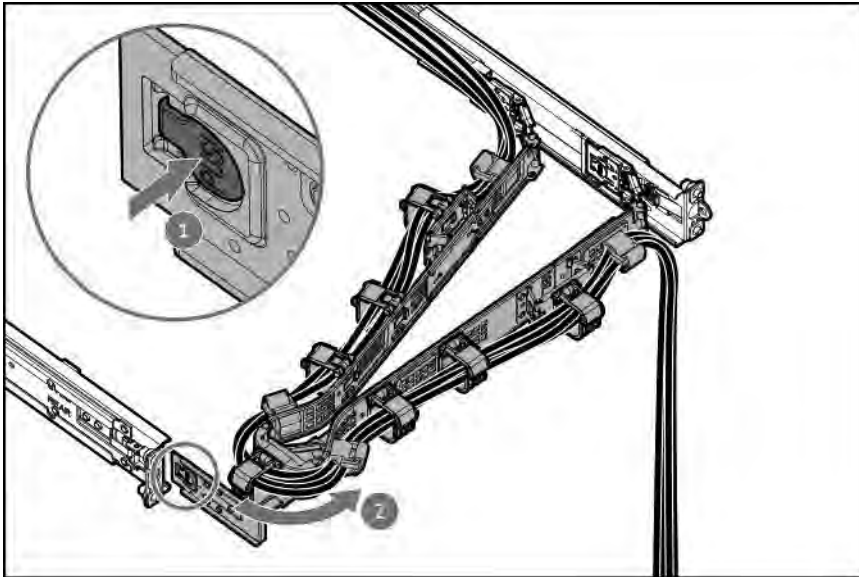
This method initiates a controlled remote shutdown of applications and the OS before the server enters standby mode.

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.

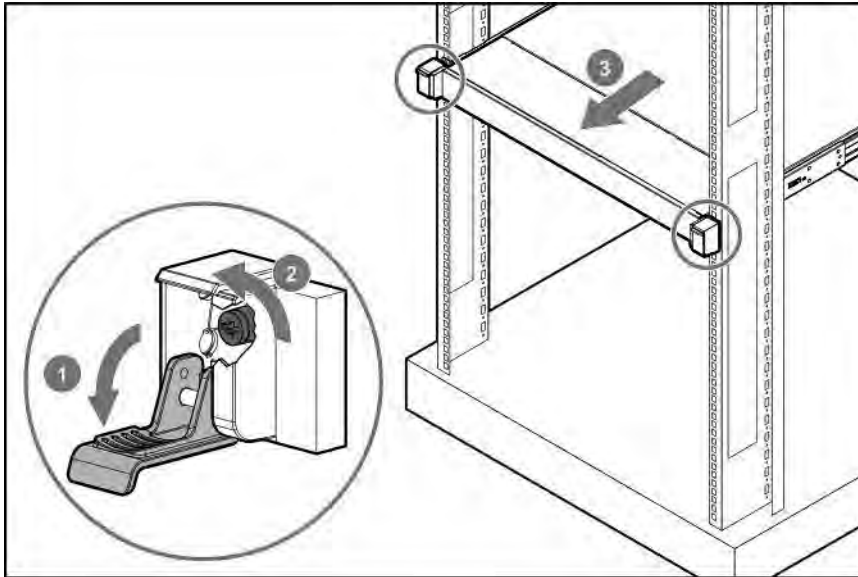
About this task




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

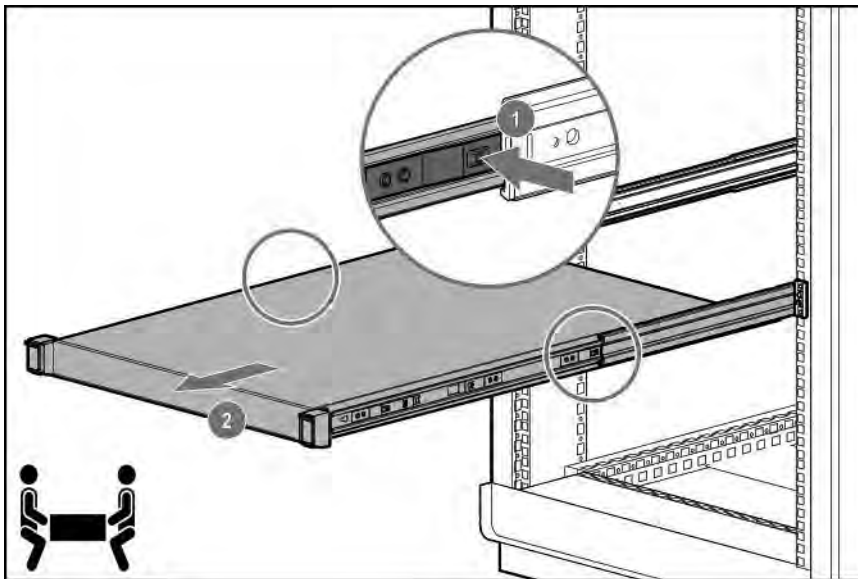
Procedure

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 (callout 1), and then slide the server out of the rack until it is fully extended (callout 2).



Remove the server from the rack

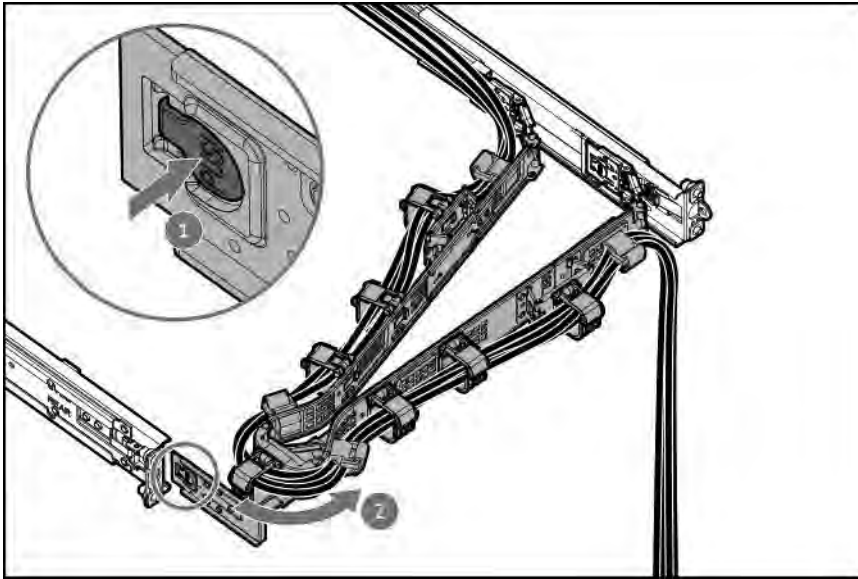
Prerequisites

- 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:

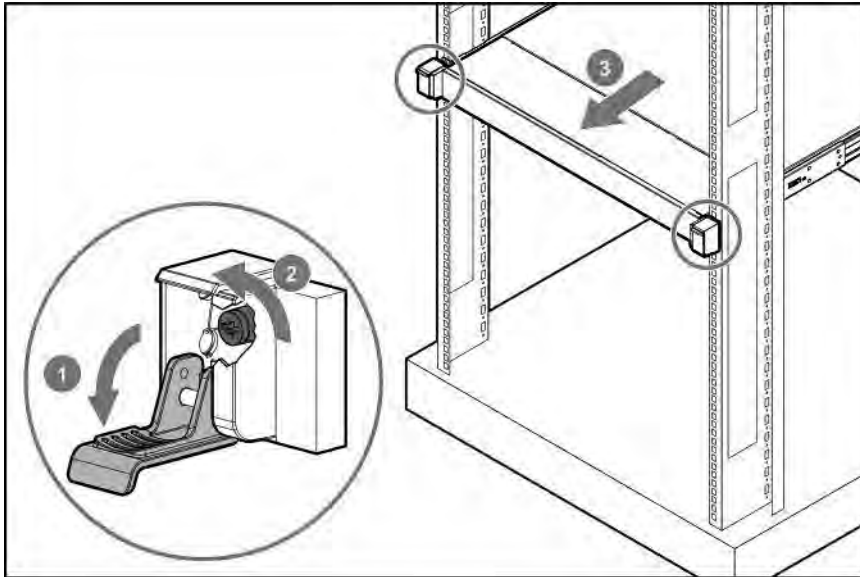
- Rack warnings and cautions
- Server warnings and cautions
- A fully populated server is heavy. Remove the external server components before removing the server from the rack.
- T-25 Torx screwdriver—This tool is required if the shipping screws located inside the chassis ears are secured.


Procedure

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

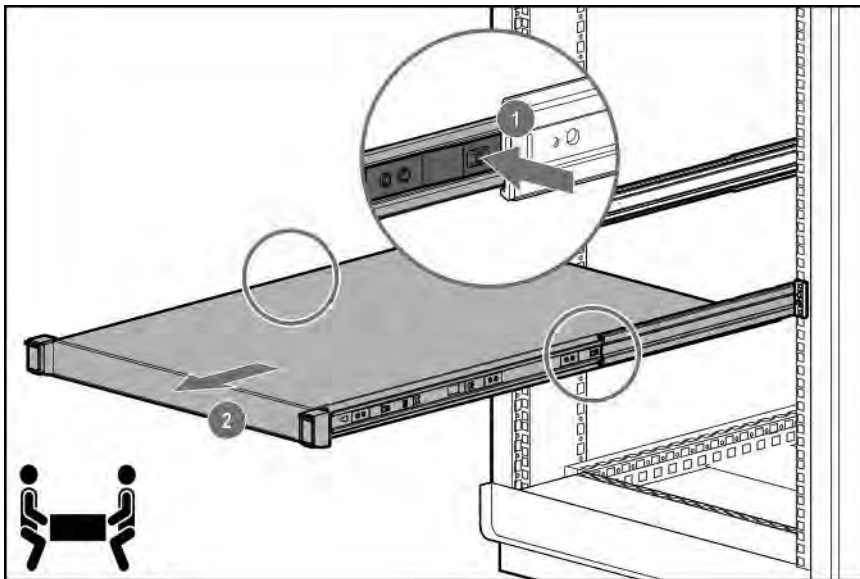


3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. If needed, loosen the shipping screws, and then use the chassis ear latches to slide the server out of the rack until the front-end rail-release latches are engaged.

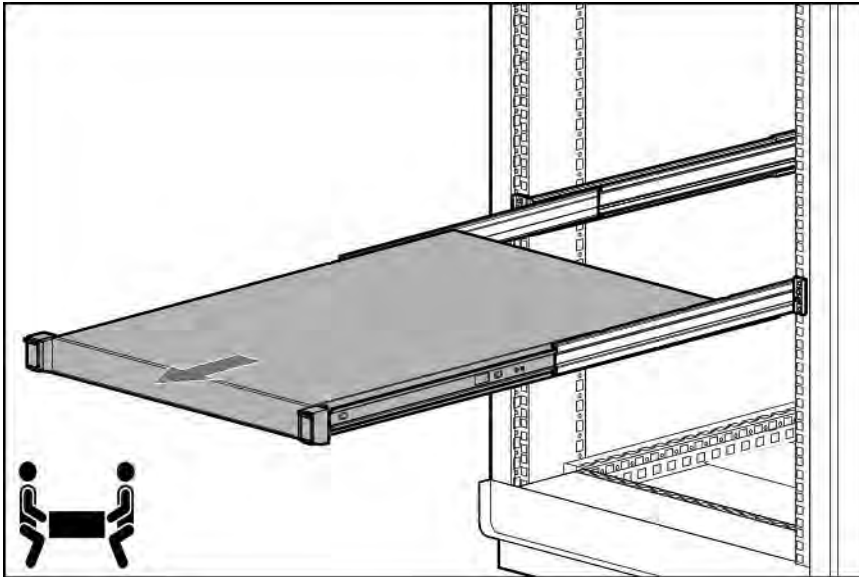


6.  **WARNING:** To reduce the risk of personal injury, be careful when pressing the server rail-release latches. The inner rails could pinch your fingers.

Press and hold the rear-end rail-release latches (callout 1), and then slide the server out of the rack until it is fully extended (callout 2).



7. Slide the server completely out of the rack.



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

Remove the access panel

Prerequisites

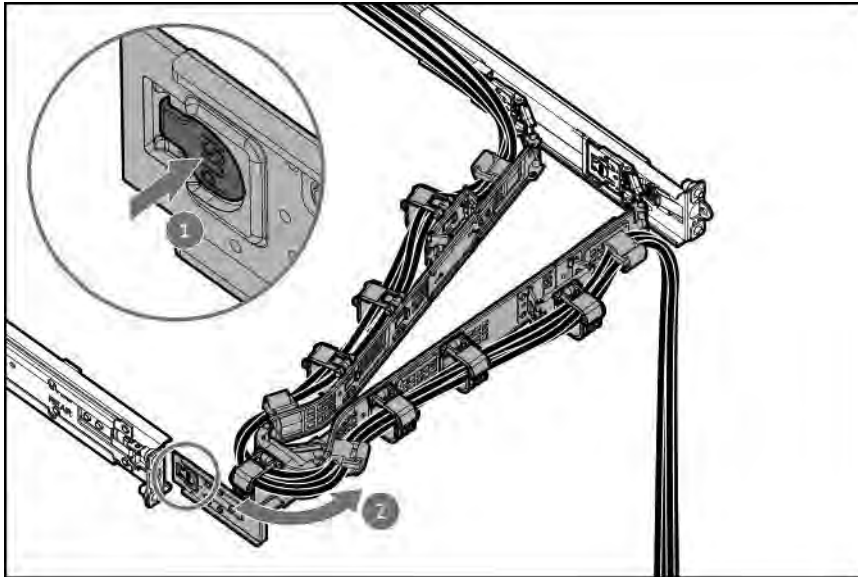
Before you perform this procedure, make sure that you have a T-15 Torx screwdriver available.

About this task

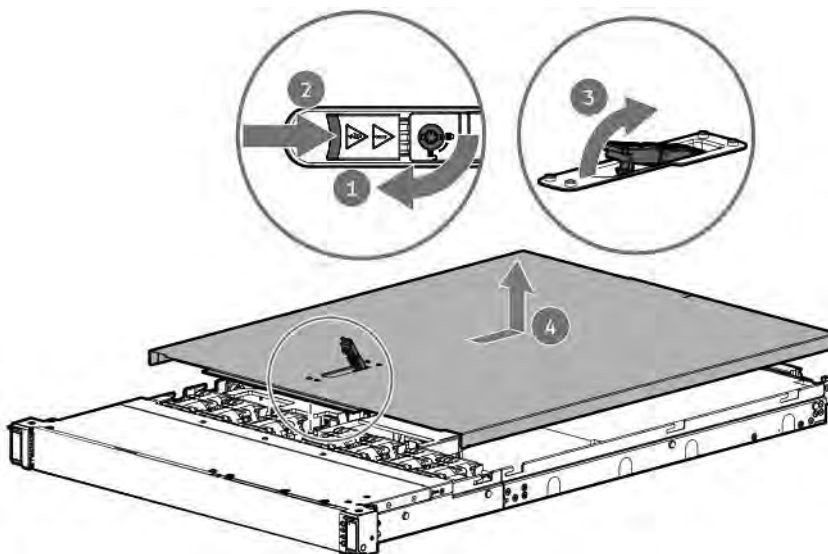
-
- WARNING:** To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.
-
- CAUTION:** To prevent damage to electrical components, properly ground the server before beginning any installation, removal, or replacement procedure. 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. 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:
 - a. If necessary, unlock the access panel latch (callout 1).
 - b. To disengage the access panel from the chassis, press the release button and pull up the latch (callouts 2 and 3).
 - c. Lift the access panel (callout 4).



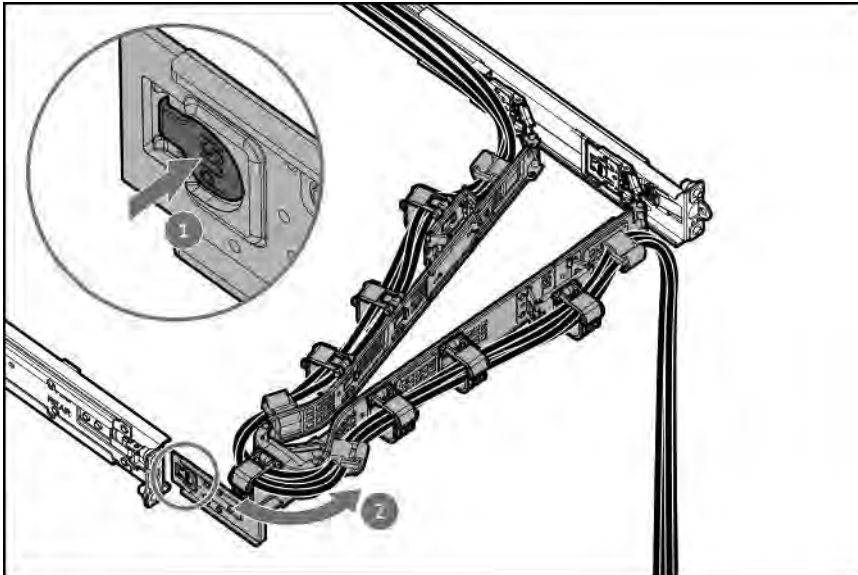
Remove the middle cover

About this task

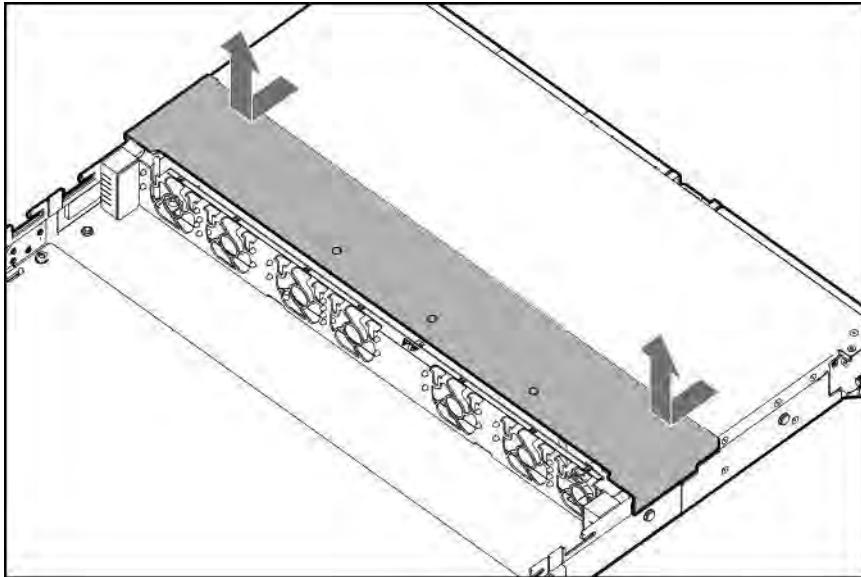
-
- ⚠ CAUTION: For proper cooling, do not operate the server without the access panel, baffles, expansion slot covers, or blanks installed.
-
- ⚠ CAUTION: To prevent damage to electrical components, properly ground the server before beginning any installation, removal, or replacement procedure. Improper grounding can cause electrostatic discharge.

Procedure

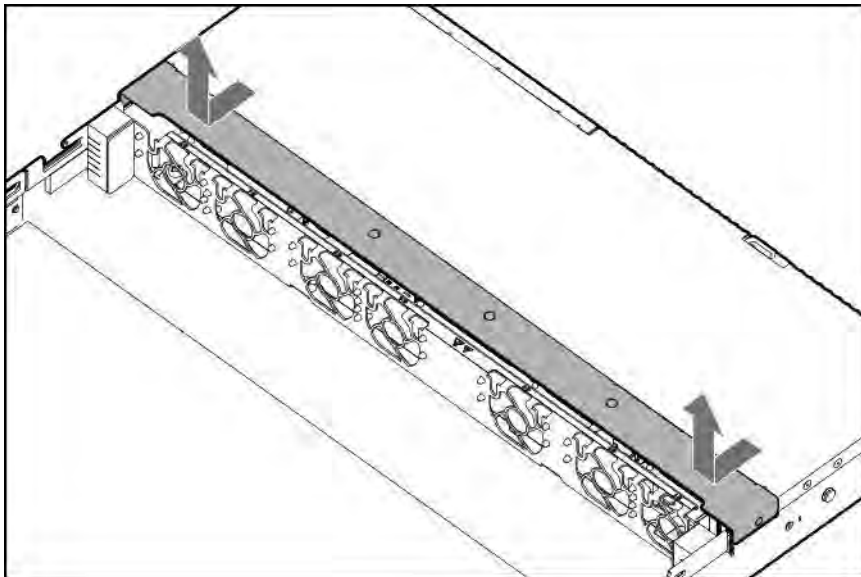
1. Power down the server.
2. If installed, open the cable management arm.



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. Take both sides of the middle cover and detach from the server.
Retain the cover for future use.
 - LFF drive configuration



- SFF drive configuration



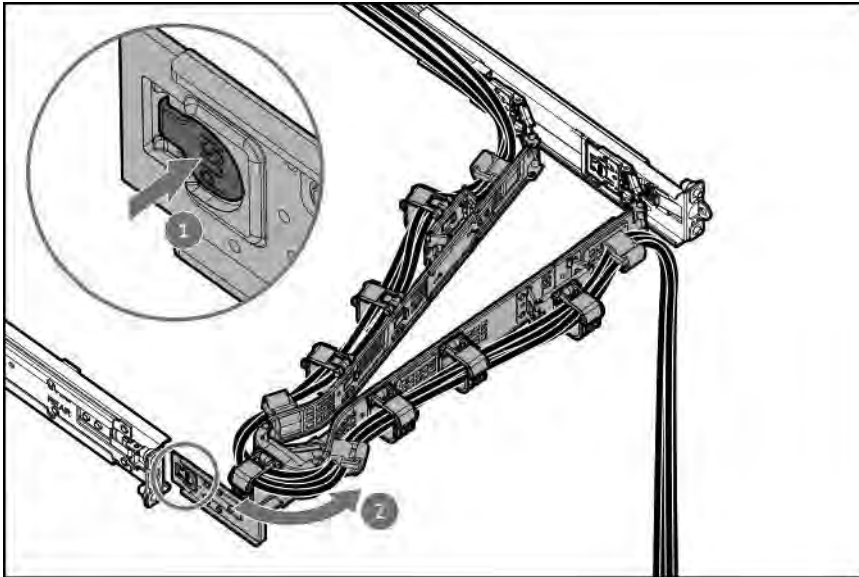
Remove the air baffle

About this task

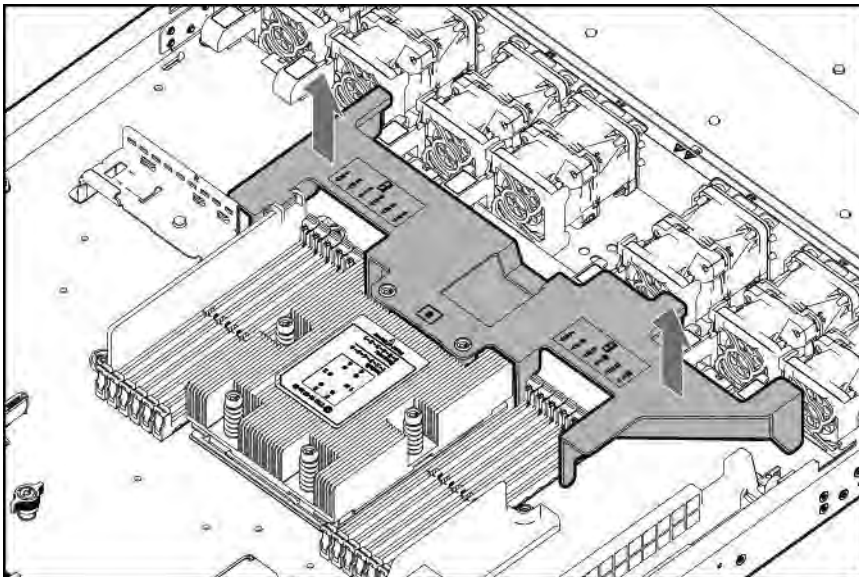
- ⚠ CAUTION:** For proper cooling, do not operate the server without the access panel, baffles, expansion slot covers, or blanks installed. If the server supports hot-plug components, minimize the amount of time the access panel is open.

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. 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.



Remove the fan

About this task

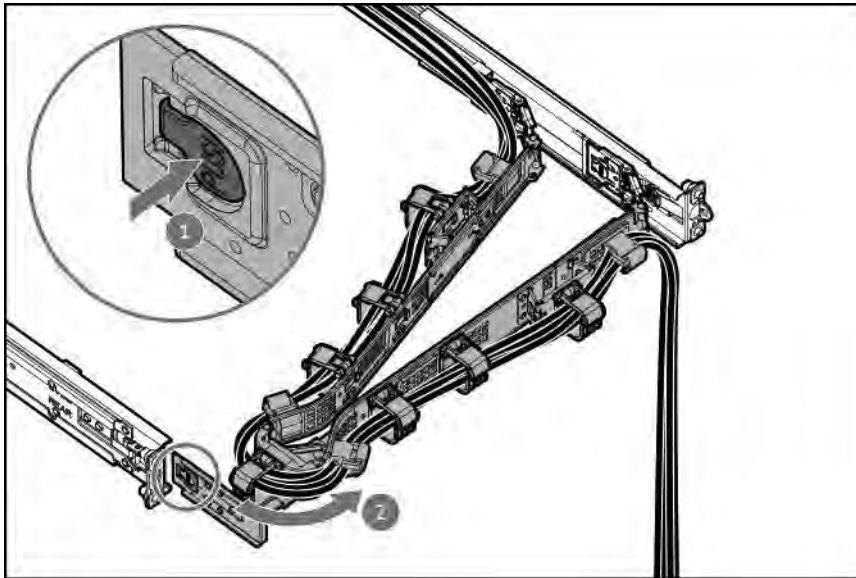
-
- ⚠ **CAUTION:** To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

 - ⚠ **IMPORTANT:** The fan setup can either be standard, single-rotor fans or high-performance, dual-rotor fans. Do not mix fan types in the same server.

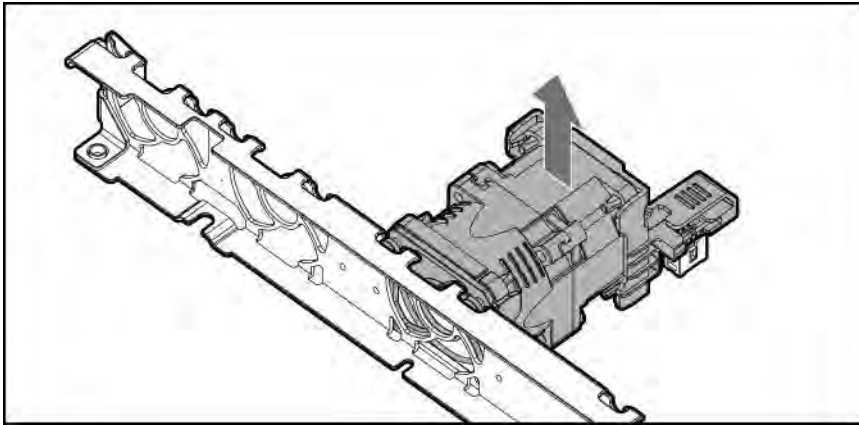
 - ⚠ **CAUTION:** To prevent damage to electrical components, properly ground the server before beginning any installation, removal, or replacement procedure. Improper grounding can cause electrostatic discharge.

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.
9. Remove a standard or high performance fan.



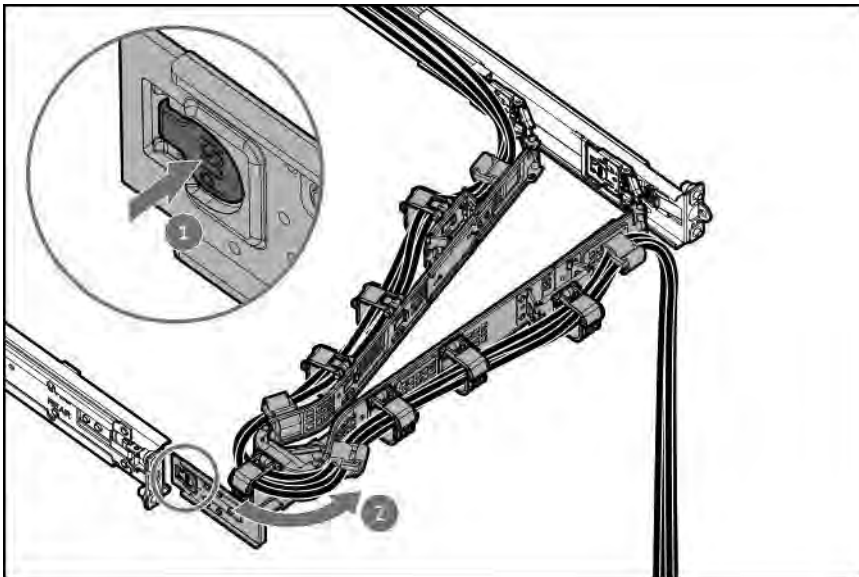
Remove the riser cage

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.

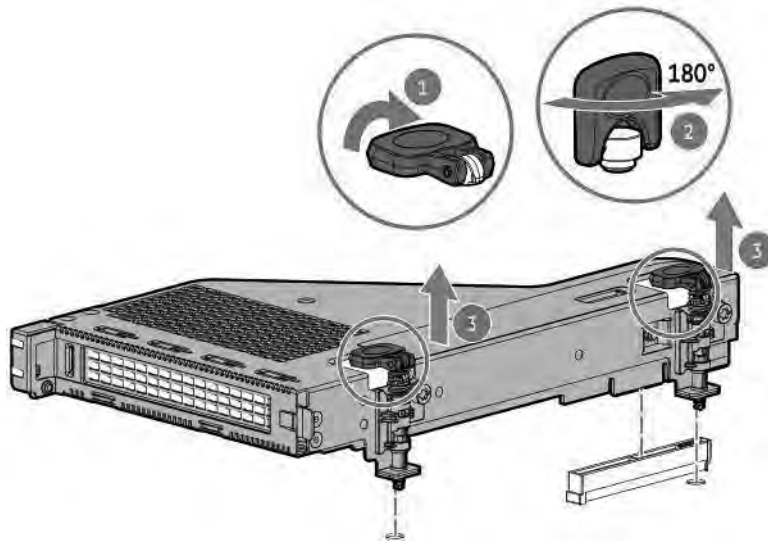
Procedure

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 an expansion card with internal cables is installed on the riser, disconnect the cables from the card.
9. 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).



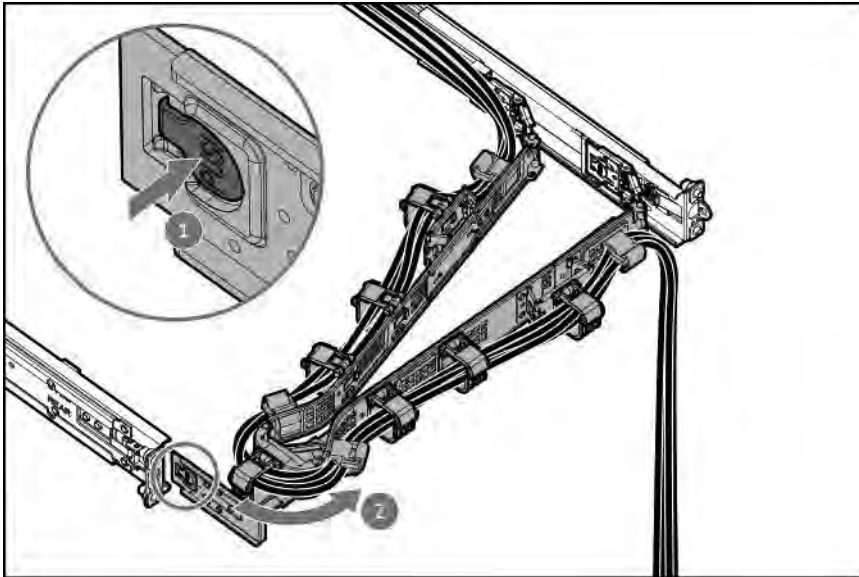
Remove the secondary riser cage blank

About this task

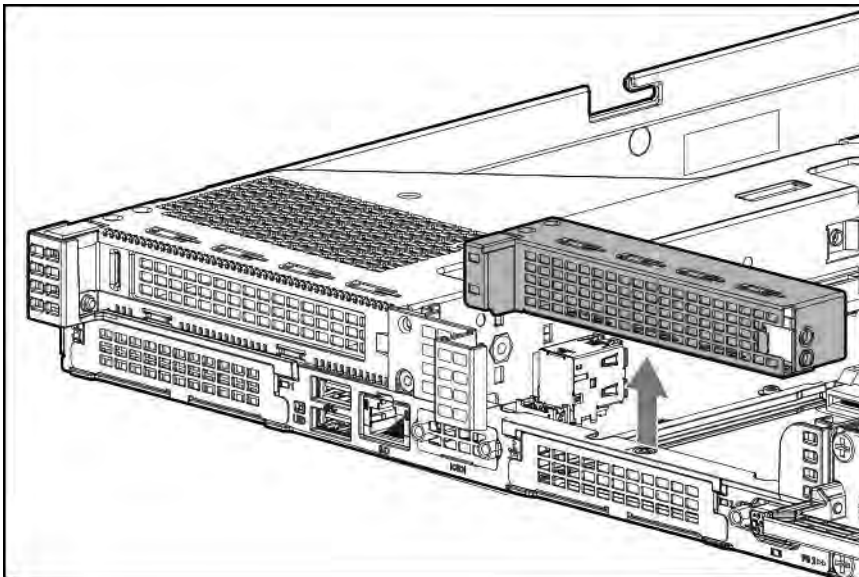
-
- ⚠ CAUTION:** The port blank provides EMI shielding and helps maintain proper thermal status inside the server. Do not operate the server when a port blank is removed without the corresponding I/O port option installed.
-
- ⚠ CAUTION:** To prevent damage to electrical components, properly ground the server before beginning any installation, removal, or replacement procedure. Improper grounding can cause electrostatic discharge.

Procedure

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



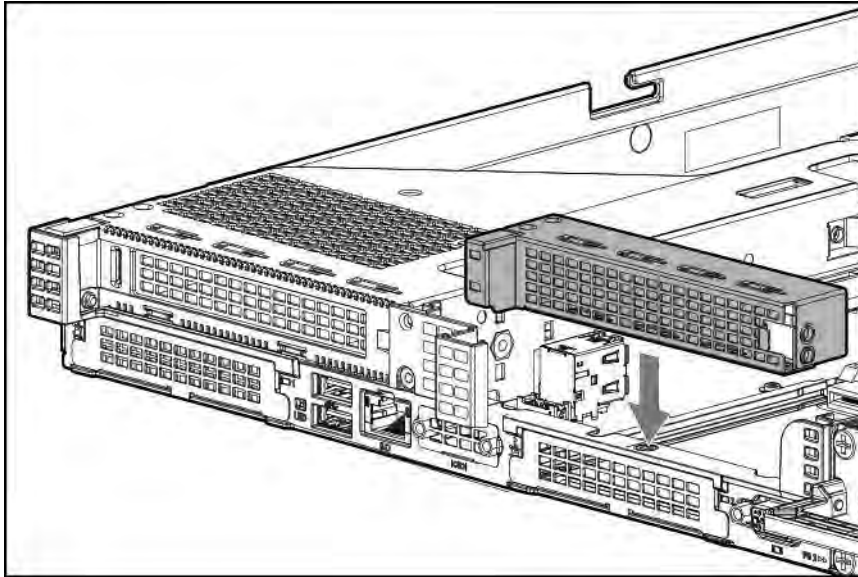
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. Remove the server from the rack.
6. Place the server on a flat, level work surface.
7. Remove the access panel.
8. Remove the secondary riser cage blank.



Install the secondary riser cage blank

Procedure

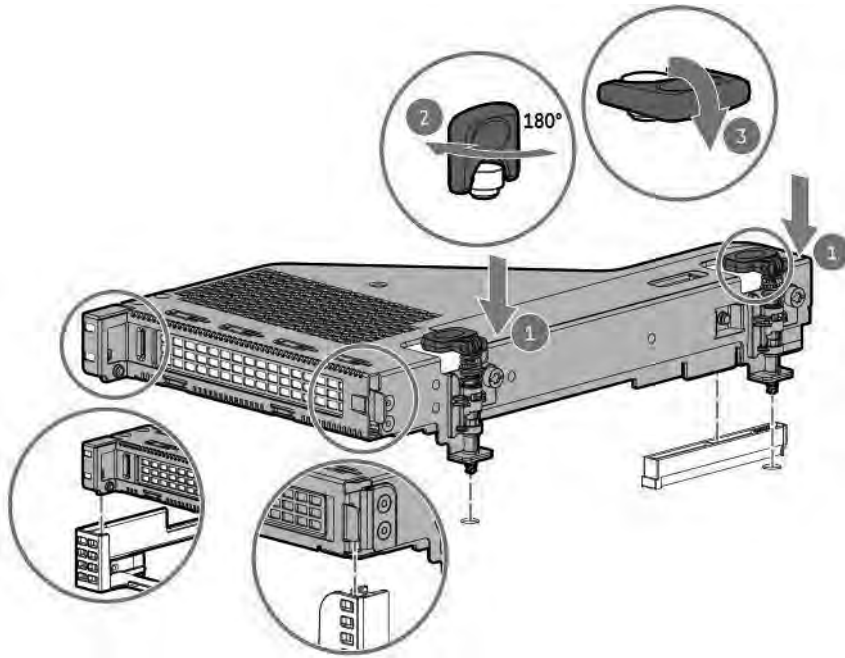
1. Align the secondary riser cage blank to the rear panel.
2. Press down the secondary riser cage blank.
Make sure that the blank is firmly seated.



Install the riser cage

Procedure

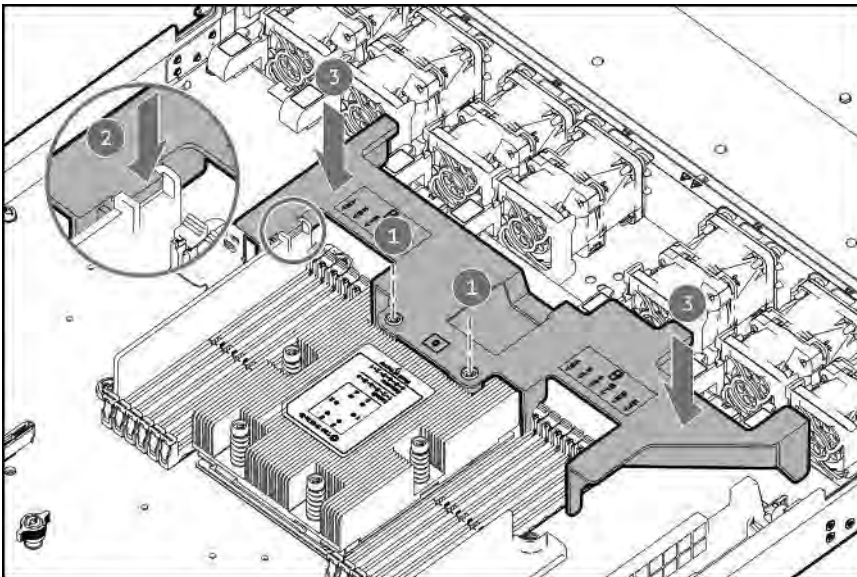
1. If an expansion card or its internal cabling was removed, reinstall these components.
2. Install the riser cage:
 - a. Carefully press the riser down on its system board connector (callout 1).
Make sure that:
 - The riser cage is aligned with the rear chassis.
 - The riser board is firmly seated on the system board.
 - b. Simultaneously push and rotate the half-turn spring latch to 180° (callout 2).
 - c. Close the spring latch (callout 3).



Install the air baffle

Procedure

1. Make sure that all internal cables have been properly routed and will not interfere with the air baffle installation.
2. Install the air baffle:
 - a. Align the air baffle to the 4 and 6 screws on the heatsink (callout 1).
 - b. Align the air baffle to the DIMM guard (callout 2).
 - c. Lower down the air baffle into the chassis (callout 3) and make sure that it fits properly into place.

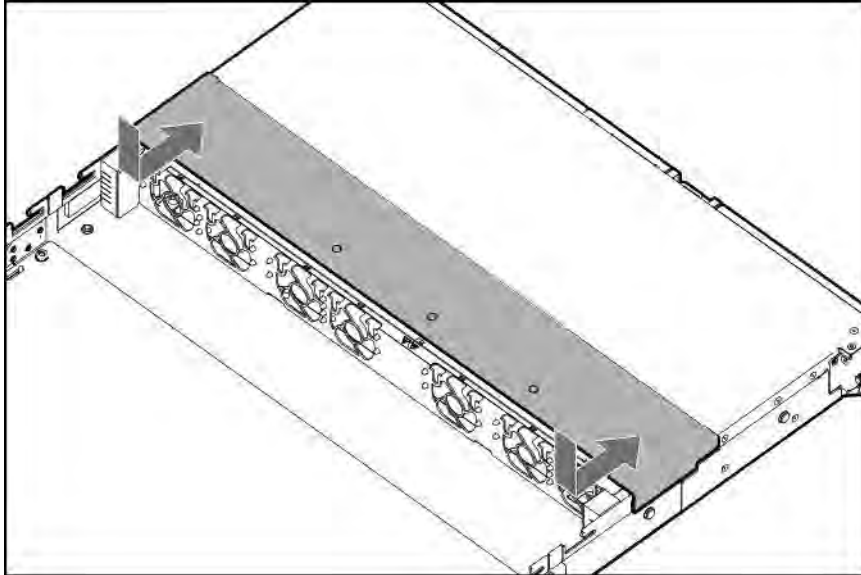


3. Install the access panel.
4. Perform the post-installation or maintenance steps required by the procedure that necessitates the removal of the air baffle.

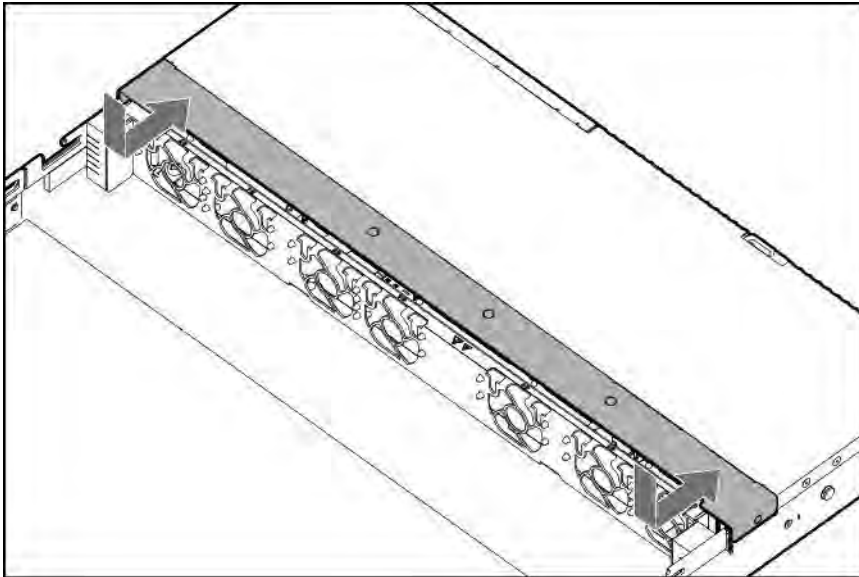
Install the middle cover

Procedure

1. Take both sides of the middle cover and install on the server.
 - LFF drive configuration



- SFF drive configuration



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

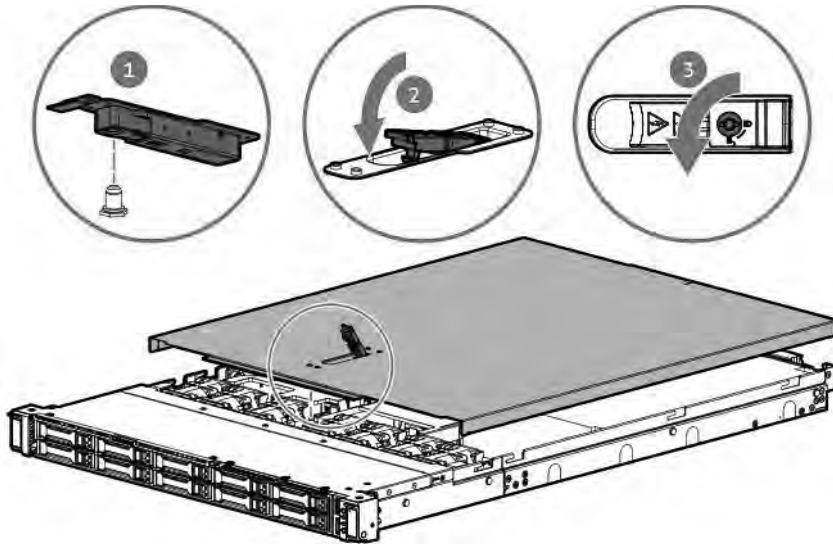
Install the access panel

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.

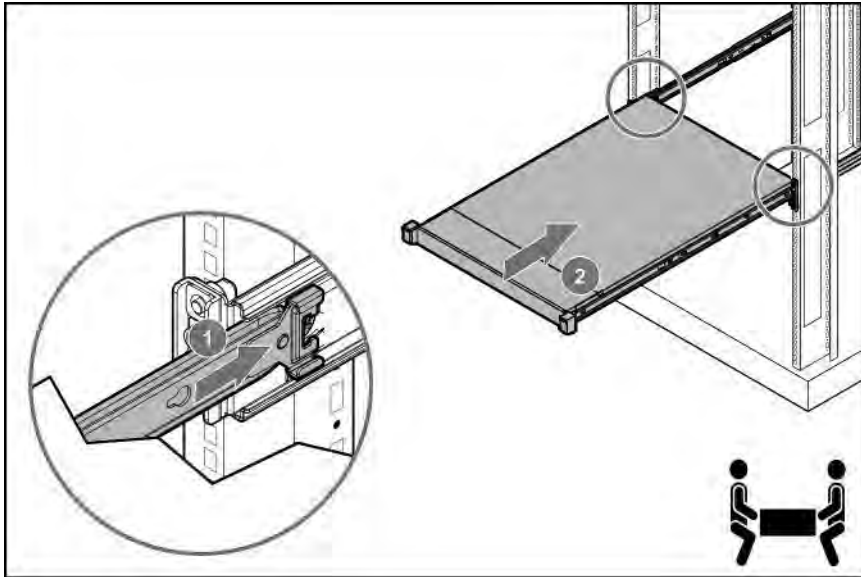
Install the server into the rack

Prerequisites

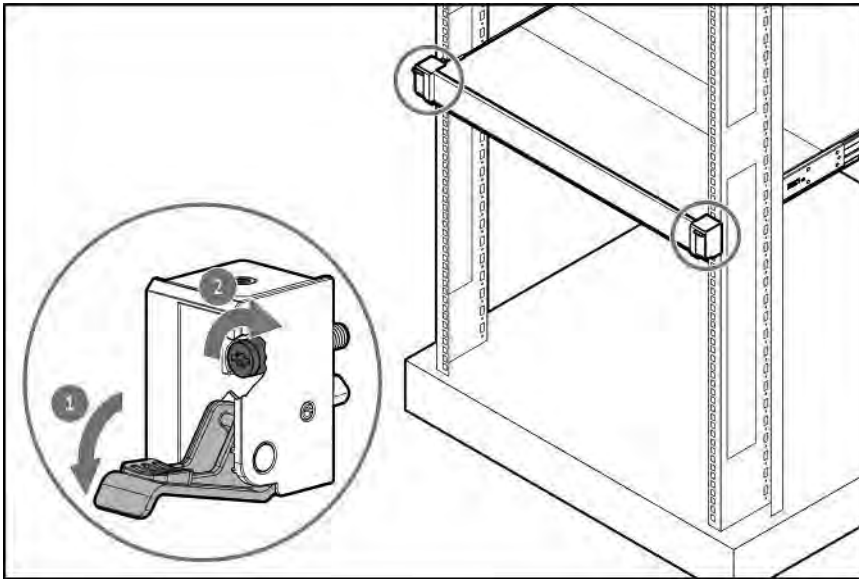
- Get help to lift and stabilize the server during rack installation. If the server is installed higher than chest level, an additional person might be required to help install the server: One person to support the server weight, and the other to slide the server into the rack.
- Before you perform this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

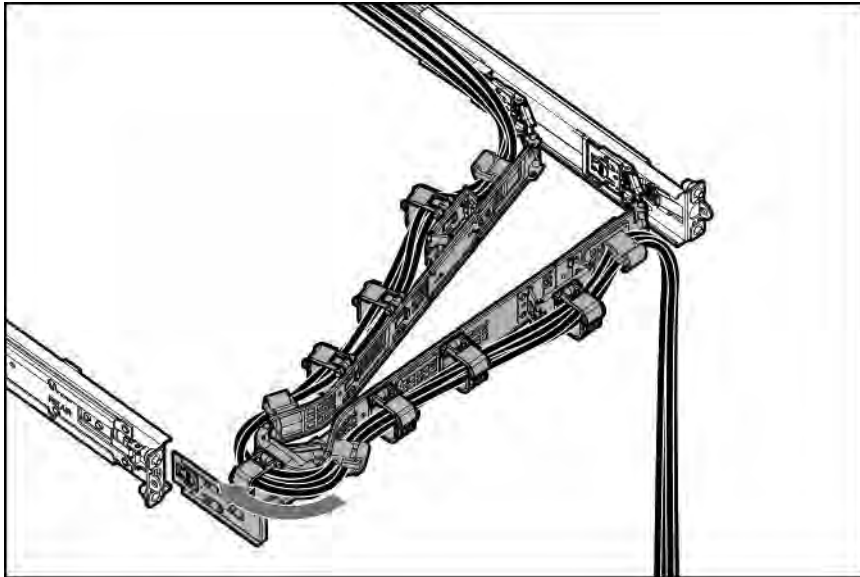
1. Install the server into the rack:
 - a. Insert the inner rails into the slide rails (callout 1).
 - b. Slide the server into the rack until the chassis ears are flush against the rack posts (callout 2).



2. Open the chassis ears (callout 1), and then tighten the shipping screws (callout 2).



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 installed, close the cable management arm.



Power up the server

About this task

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

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

Hardware options installation

This chapter provides instructions for installing supported hardware options. To ensure proper server deployment and operation, install only validated hardware options. To view the warranty for your server and supported options, see [Warranty information](#).

Server data backup

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

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

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

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, 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.

Rack mounting options

Use the quick-deploy, toolless 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

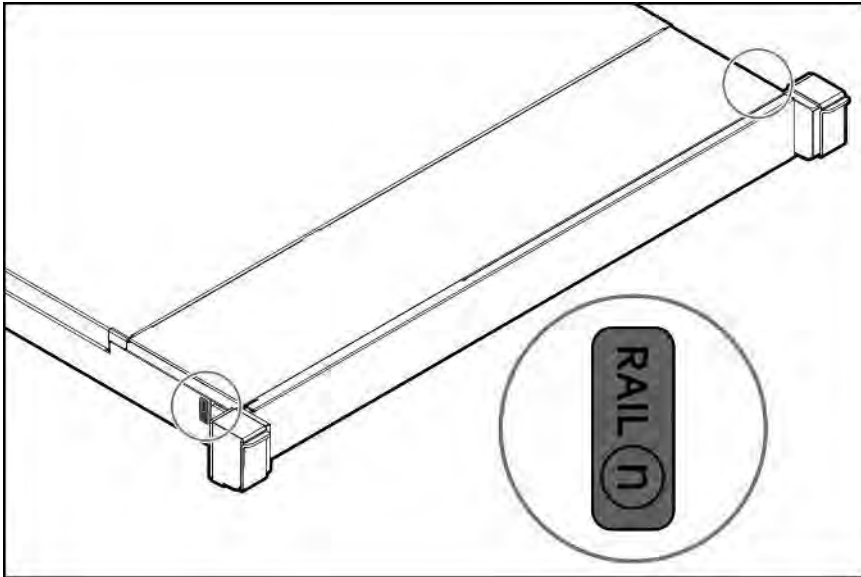
Rail identification markers

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

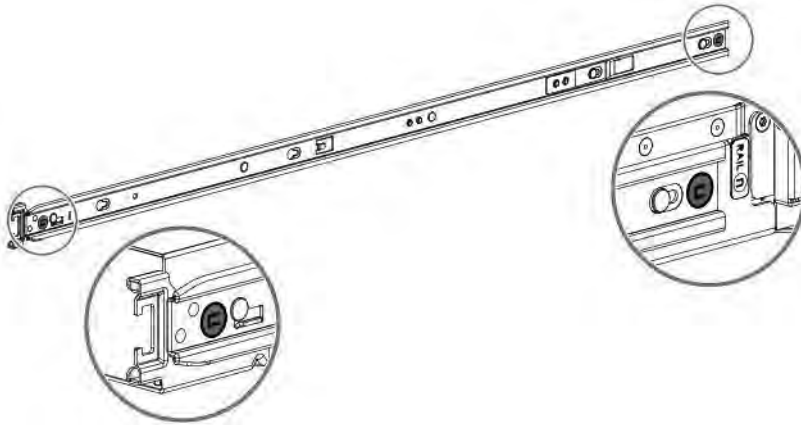
- The height and weight of the chassis as determined by the front- and rear-end server configurations.
- The depth of the chassis as measured from the edge of the front panel (without the front bezel) to the edge of the rear panel.

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.

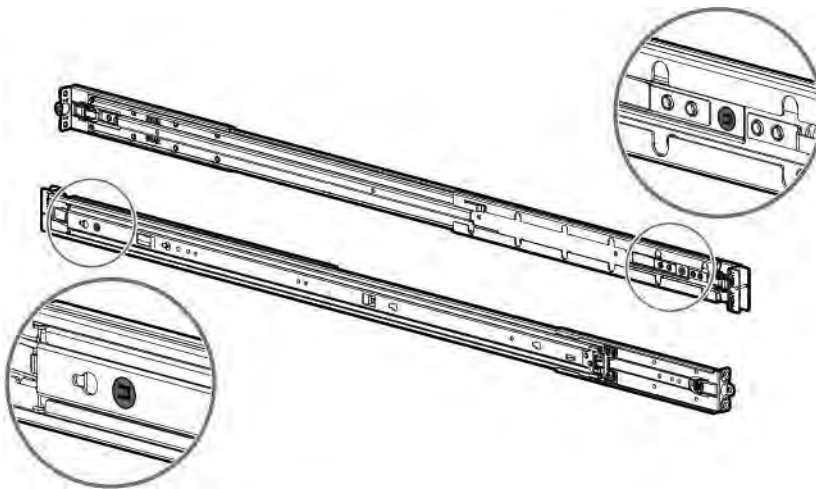
- Rail number labels on the chassis



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

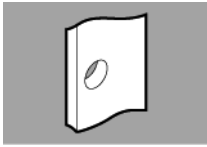


- Rail identifier stamps on the mounting rail of the friction rack rail

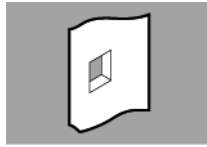


Rack mounting interfaces

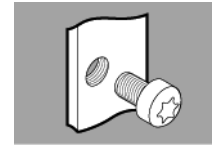
The rack rails can be installed in a rack that has the following mounting interfaces:



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 options

This server supports the following rack rail options:

- Rack rail option #3 for the LFF drive configuration
- Rack rail option #2 for the SFF drive configuration

For more information, see [Installing the friction rack rail](#).

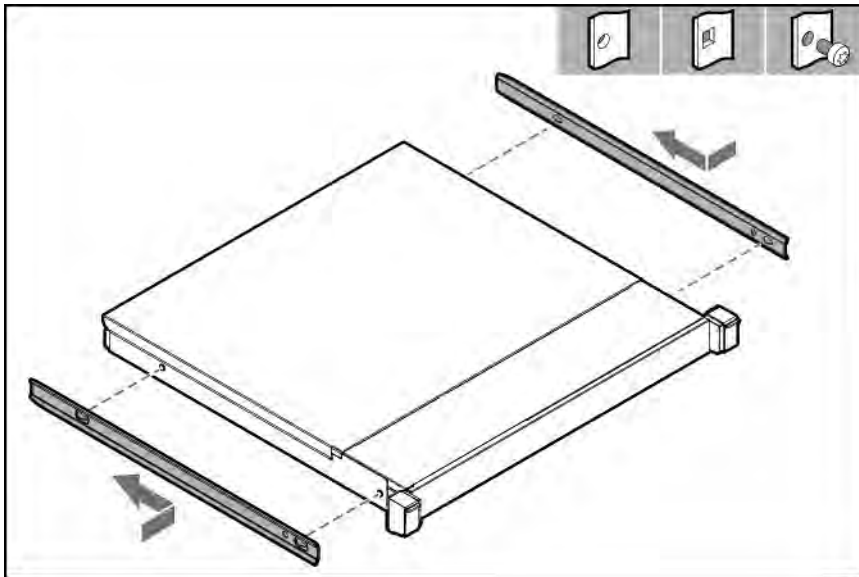
Installing the friction rack rail

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.

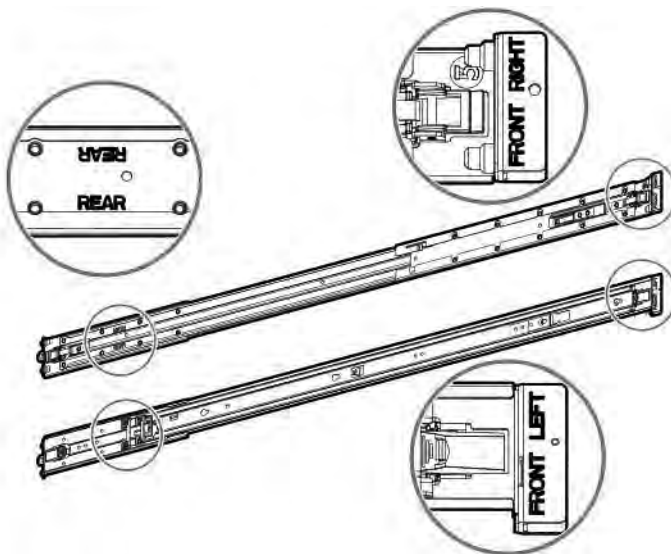
Procedure

1. Attach the inner rails to the server:
 - a. Insert the spools on the sides of the server through the keyed slots on the rails.
 - b. Slide the rail towards the rear panel to lock it into place.



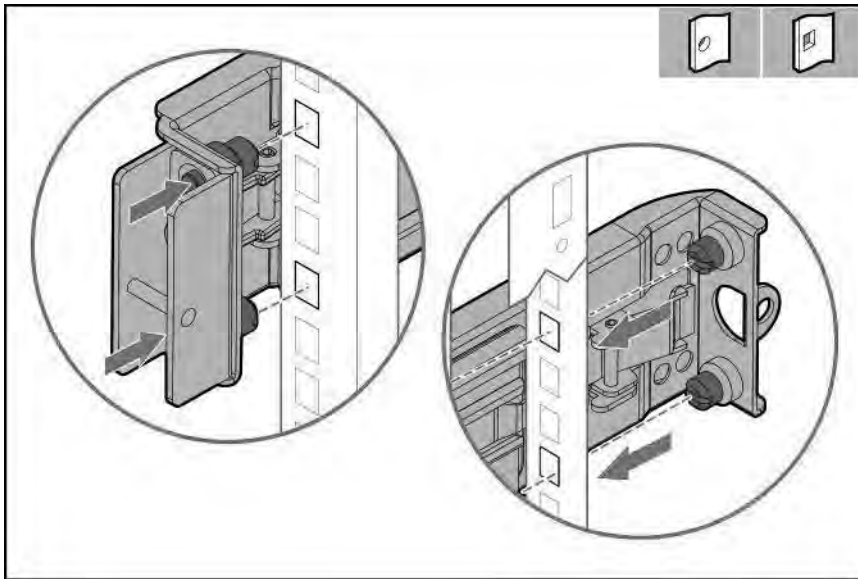
2. Locate the orientation markers on the mounting rails.

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

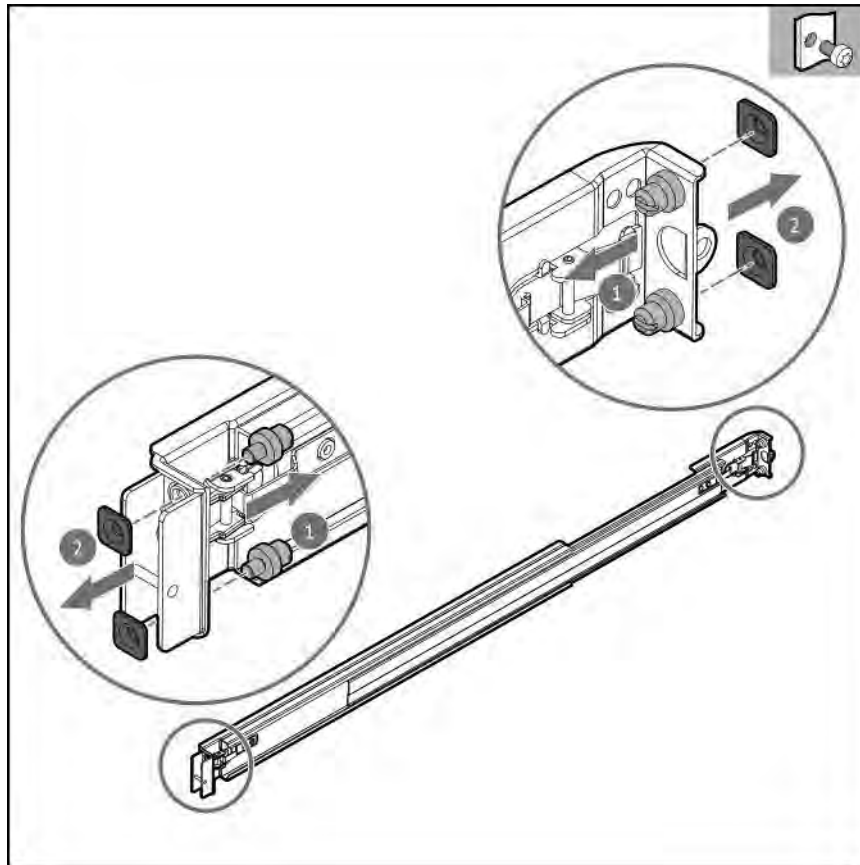


3. Extend the mounting rails to align with the depth of the rack.

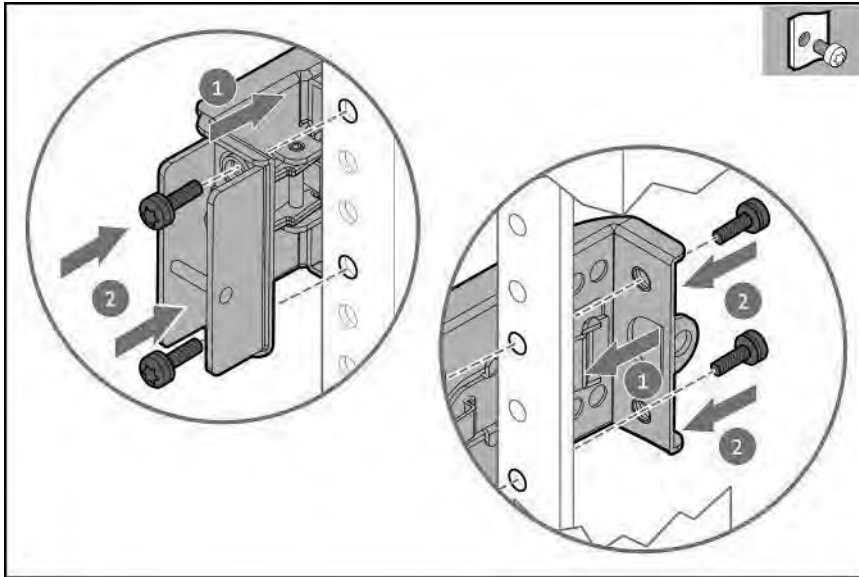
4. To install the mounting rails in a round-hole or square-hole rack, insert the pins on the mounting flanges into the rack post holes.



5. To install the mounting rails in a threaded round-hole rack, do the following:
 - a. Remove the pins and washers from the mounting rails.



- b. Position the holes on the mounting flanges against the threaded holes on the rack post (callout 1).
 - c. Install the rack mounting screws (callout 2).



6. Install the server into the rack.

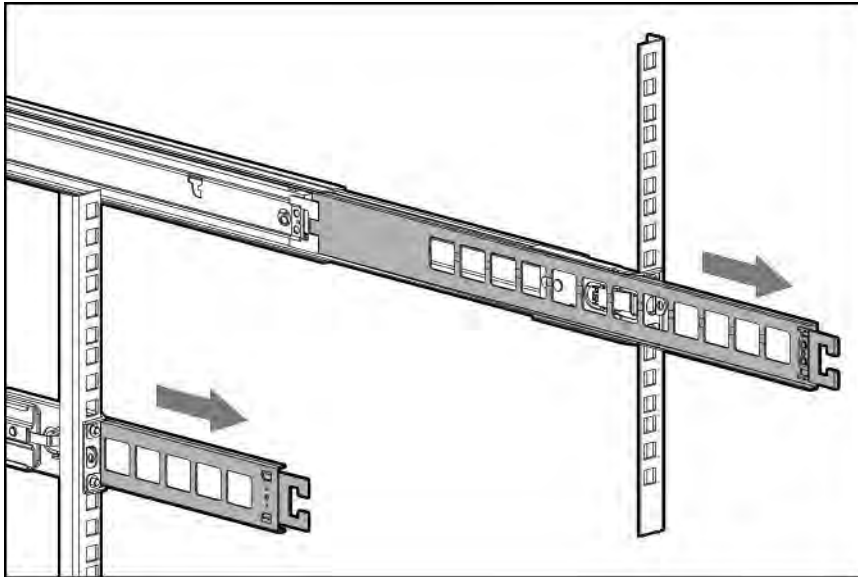
Installing the server into the rack

Prerequisites

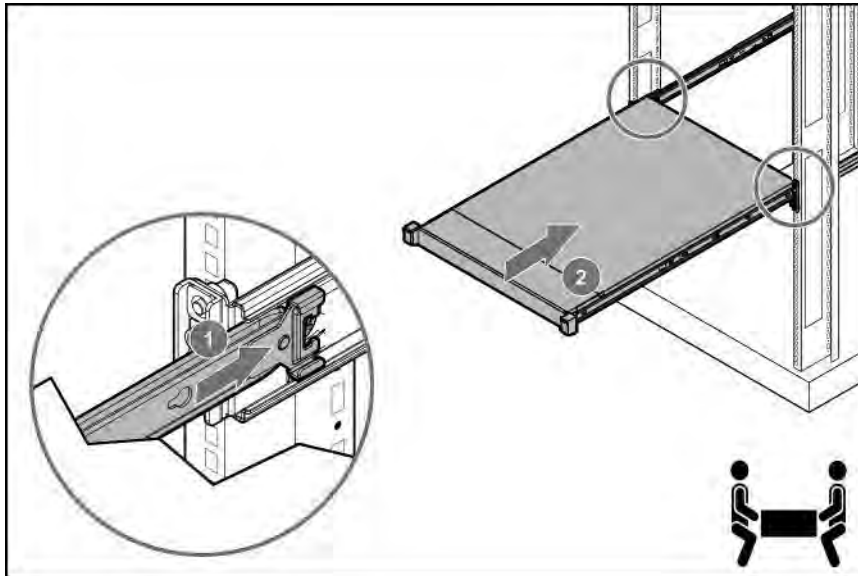
- Before you perform this procedure, review the:
 - Rack warnings and cautions
 - Server warnings and cautions
 - Space and airflow requirements
- T-25 Torx screwdriver

Procedure

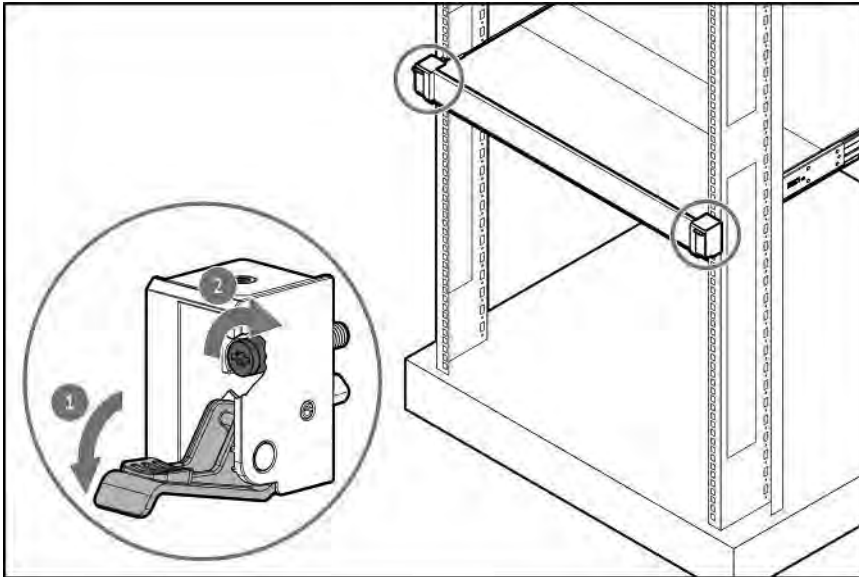
1. Extend the slide rails out on the mounting rails until they hit the internal stops and lock into place.



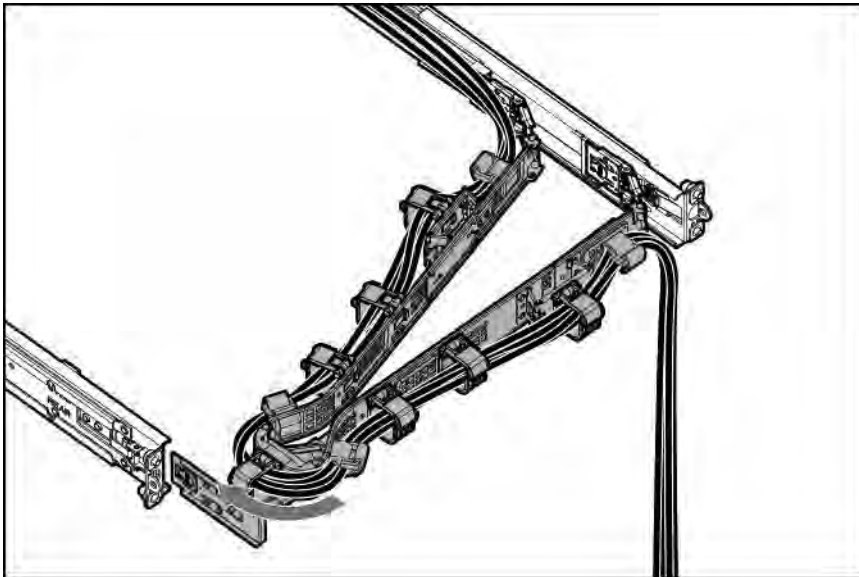
2. Install the server into the rack:
 - a. Insert the inner rails into the slide rails (callout 1).
 - b. Slide the server into the rack until the chassis ears are flush against the rack posts (callout 2).



3. Open the chassis ears (callout 1), and then tighten the shipping screws (callout 2).



4. Connect all peripheral cables to the server.
5. Connect the power cords:
 - a. Connect each power cord to the server.
 - b. Connect each power cord to the power source.
6. If installed, close the cable management arm.



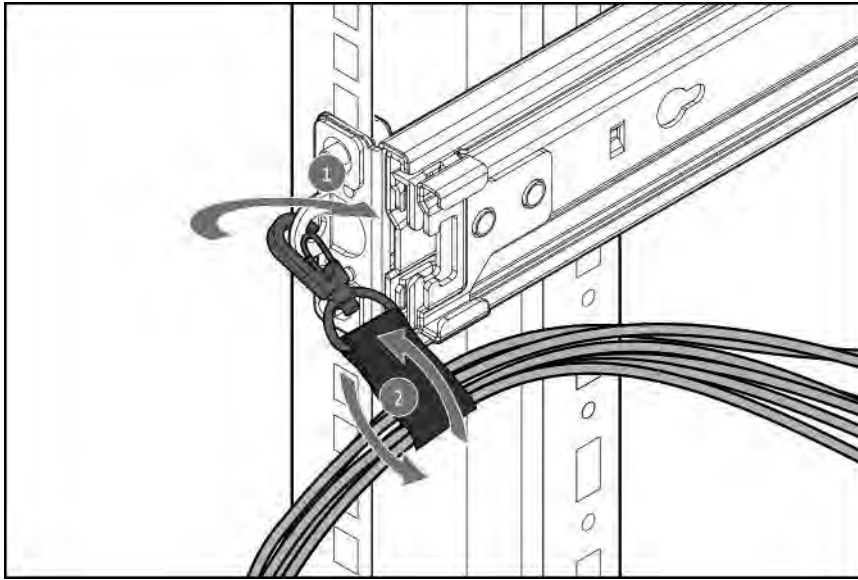
Installing the rack rail hook-and-loop strap

About this task

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

Procedure

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



Installing the cable management arm

Prerequisites

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

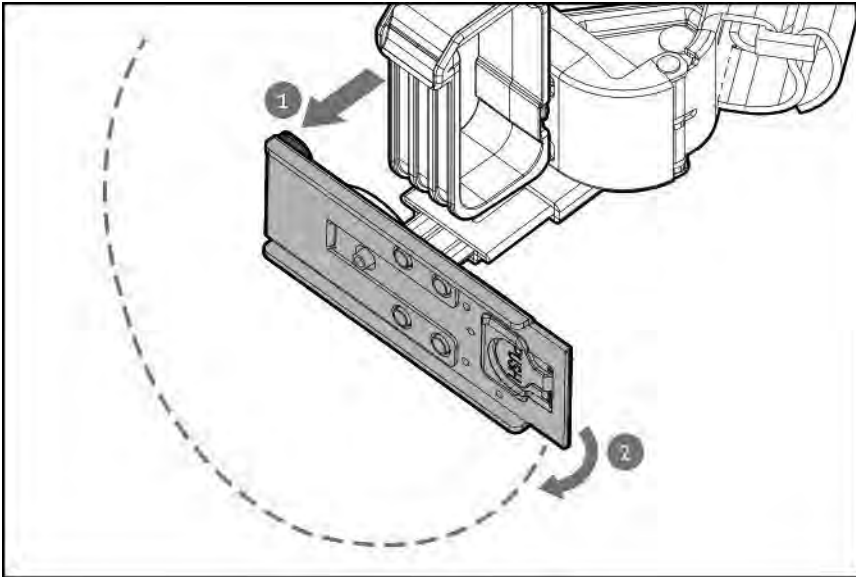
For the purpose of this procedure, left and right terminology is from the perspective of a user facing the front of the rack.

- ⚠ 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

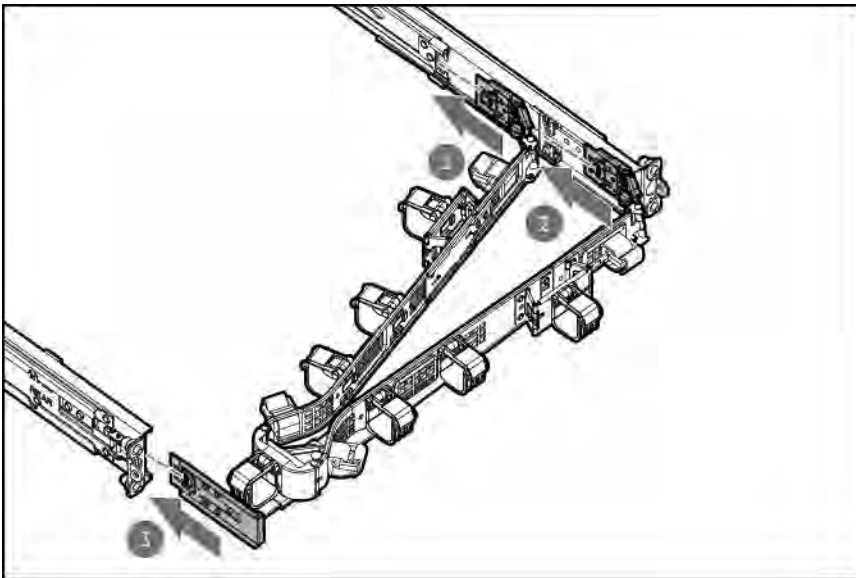
1. Connect and secure all peripheral cables and power cords to the rear panel.
2. (Optional) The CMA retention bracket can be rotated to fit a left- or right-hand CMA operation. Press and hold the rotate mechanism (callout 1), and then rotate the bracket 180° (callout 2).

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

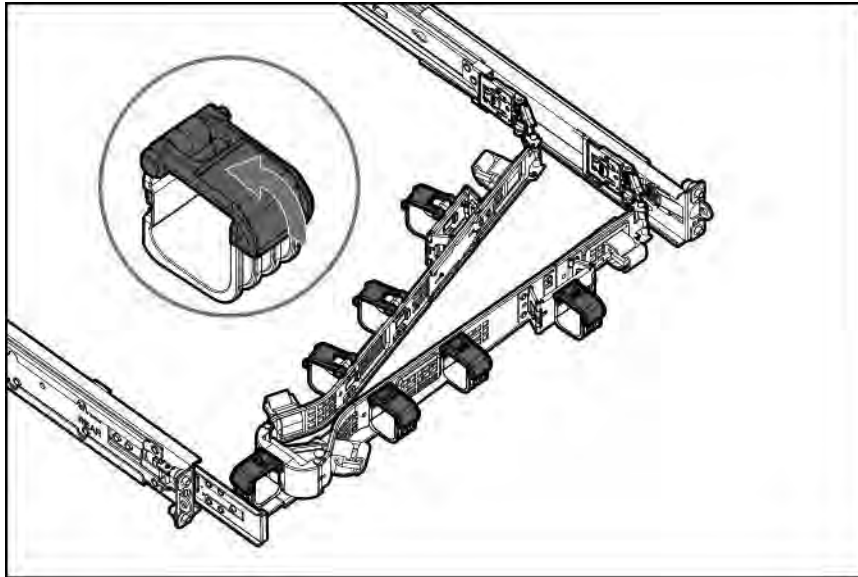


3. Connect the CMA hinged tabs and retention bracket to the rack rails:
 - a. Insert the inner tab into the slide rail (callout 1).
 - b. Insert the outer tab into the mounting rail (callout 2).
 - c. Insert the retention bracket into the opposite mounting rail (callout 3).

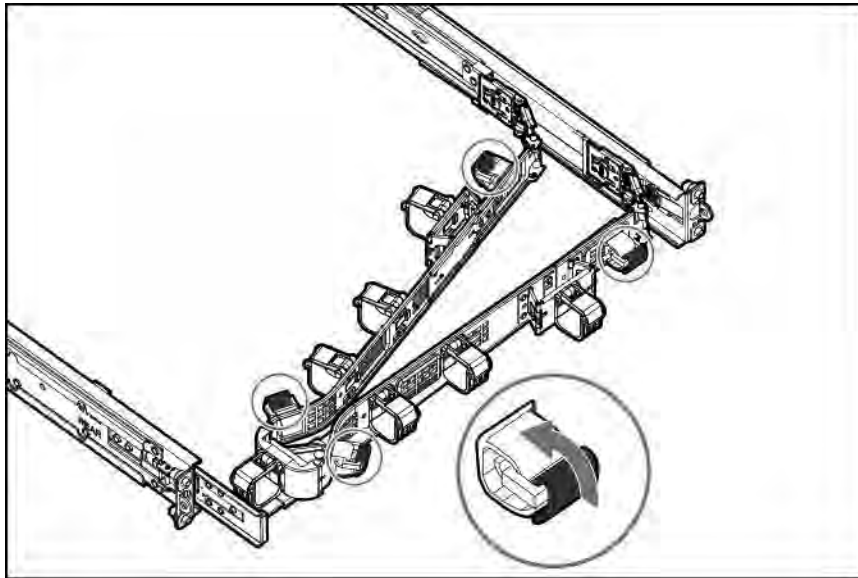
There will be an audible click to indicate that the tabs and bracket are locked into place.



4. Open the cable clamps.

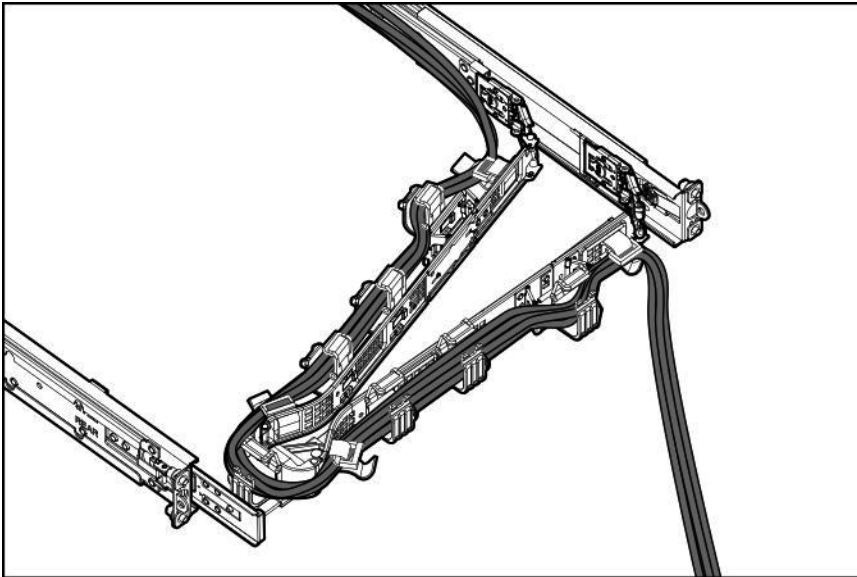


5. (Optional) If your CMA has cable straps for additional cable strain relief, unwrap the straps.

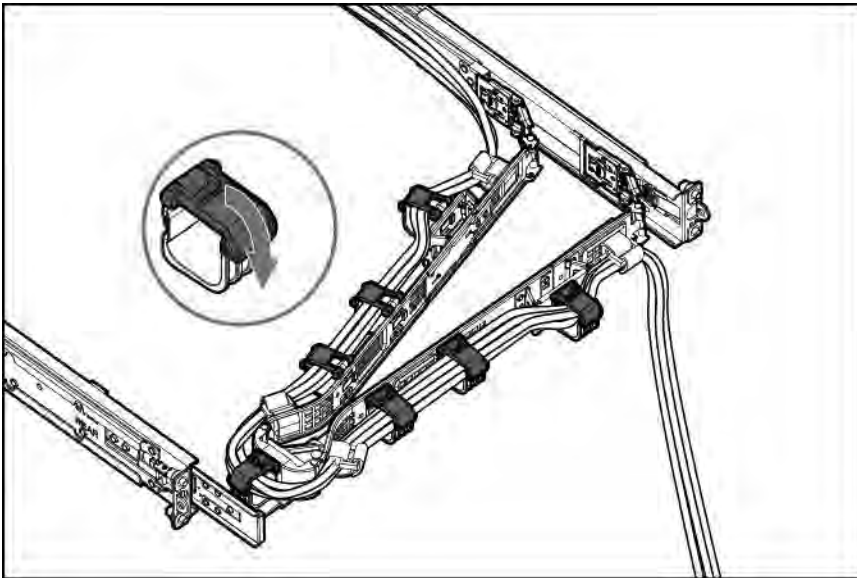


6. **⚠ CAUTION:** Employ industry best practices in managing peripheral cables and power cords secured in the CMA. These are some of the more important points:
- Leave enough cable slack between the rear panel and the CMA to allow the full extension of the CMA when the server is extended out of the rack.
 - 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.

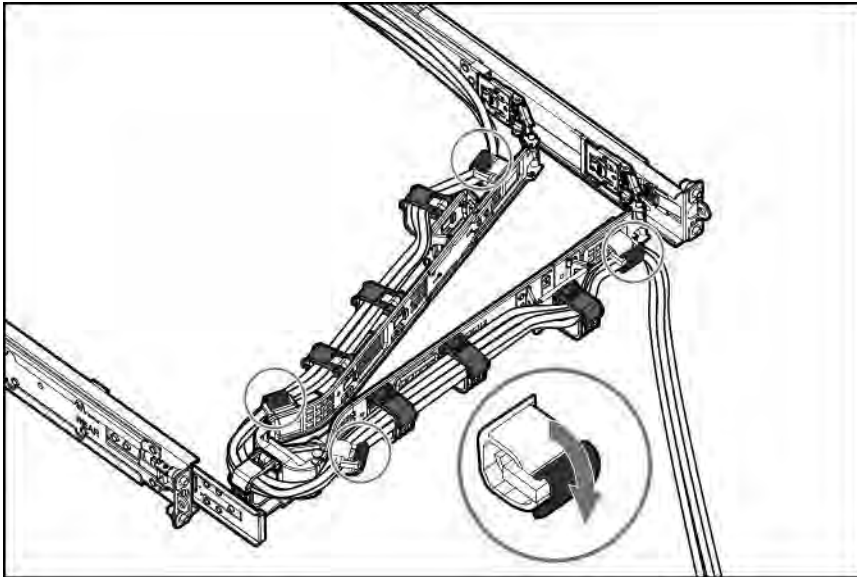
Route the peripheral cables and power cords through the cable clamps and/or straps.



7. Close the cable clamps.



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



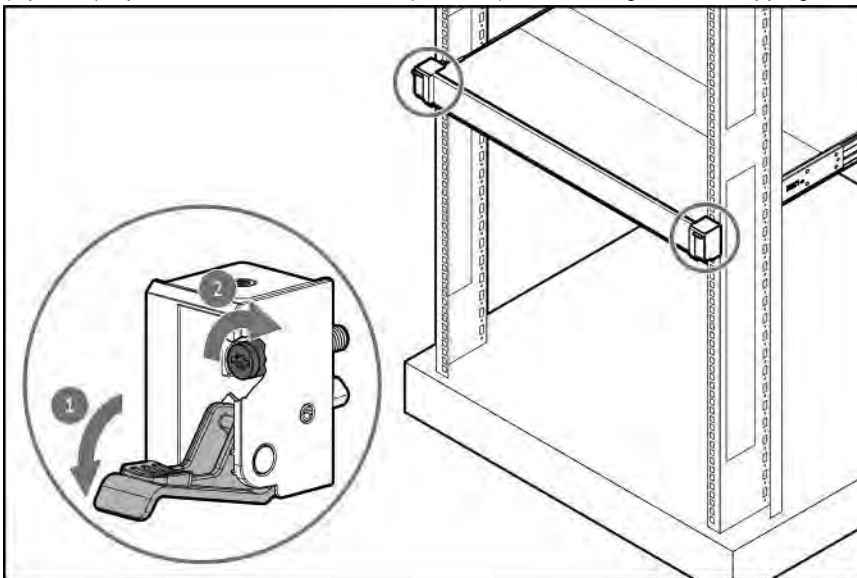
9. Verify the operation of the rack rails:

Two people might be needed for this procedure: one to slide the chassis in and out of the rack, and the other to observe the rear panel cables and power cords.

- 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 (callout 1), and then tighten the shipping screws (callout 2).

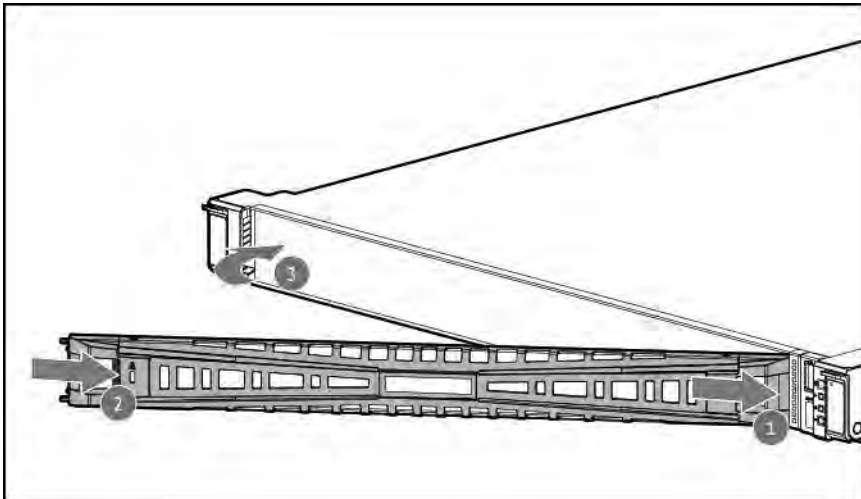


The installation is complete.

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.

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 supply specifications](#).


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.


Installing an AC power supply

Prerequisites

Before installing a power supply option, review the [Power supply warnings and cautions](#).

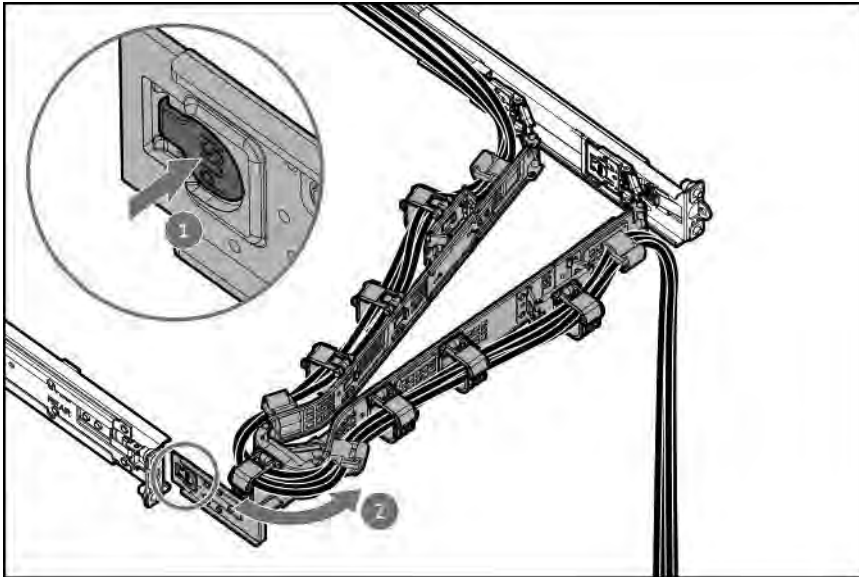
About this task

 **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.

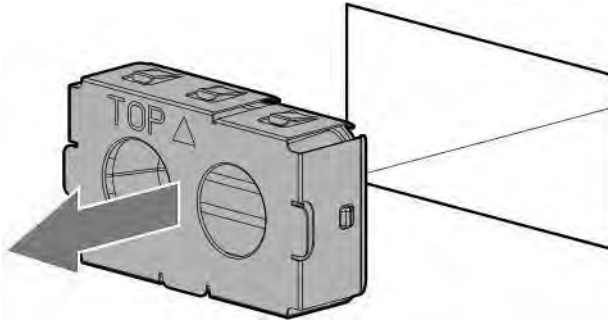
 **CAUTION:** To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

Procedure

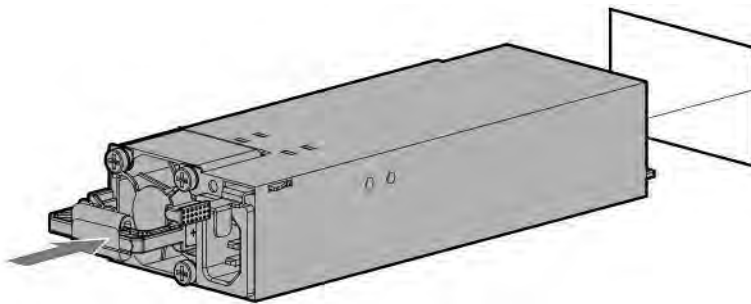
1. If installed, open the cable management arm.



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.



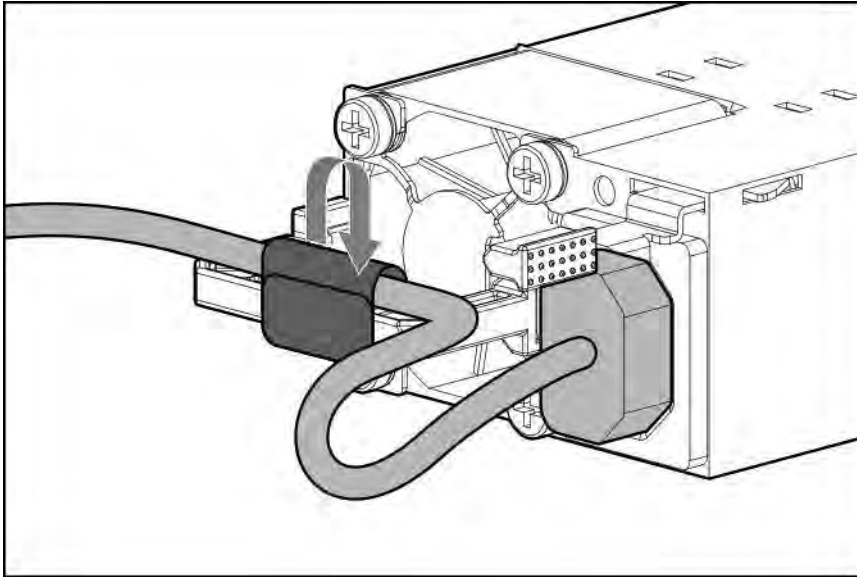
3. Immediately slide the power supply into the bay until it clicks into place.



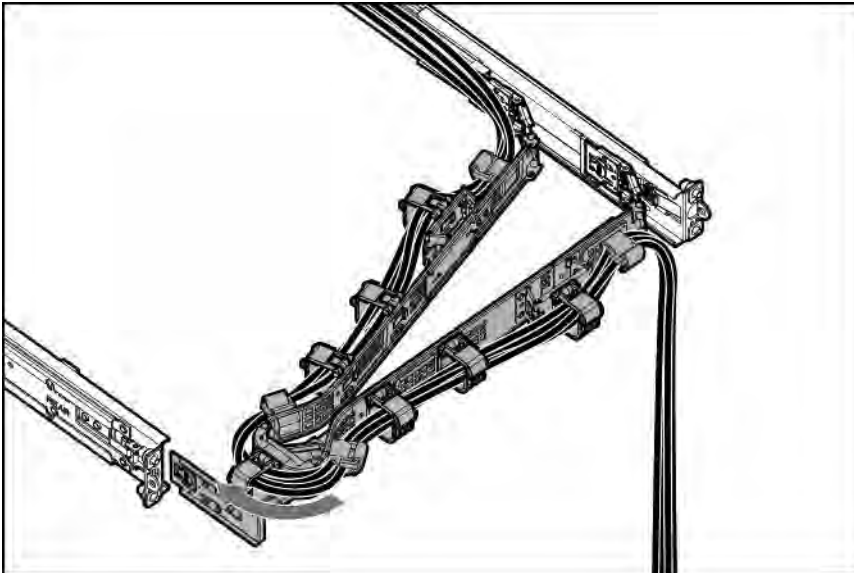
4. Connect the power cord to the power supply.
5. Secure the power cord in the strain relief strap attached to the power supply handle:
 - a. Unwrap the strain relief strap from the power supply handle.

⚠ 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](#)
- If you are installing a DC power supply:
 - 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 an 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 1600 W DC PSU power cable kit can be purchased from an authorized 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 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 Hitachi Advanced Server models 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.



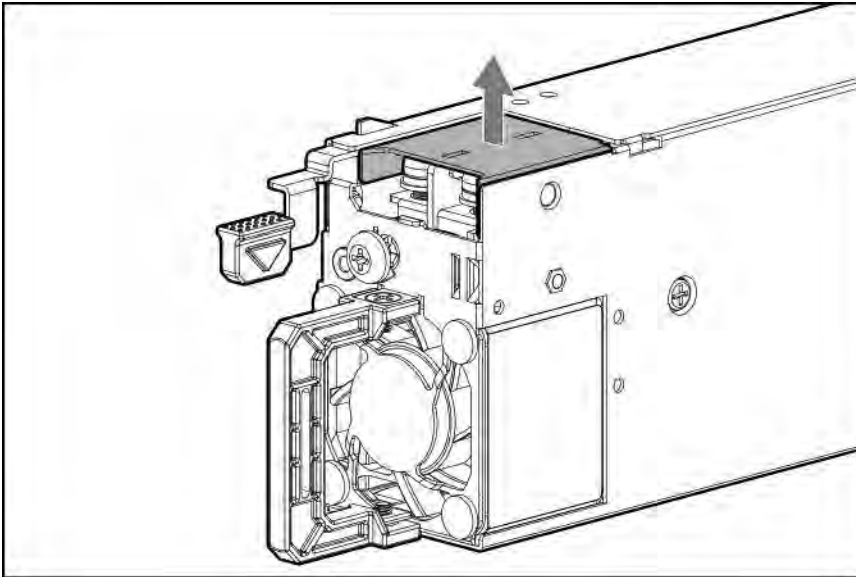
WARNING: To reduce the risk of personal injury from hot surfaces, allow the power supply, power supply blank, or dual slot power supply adapter to cool before touching it.



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.

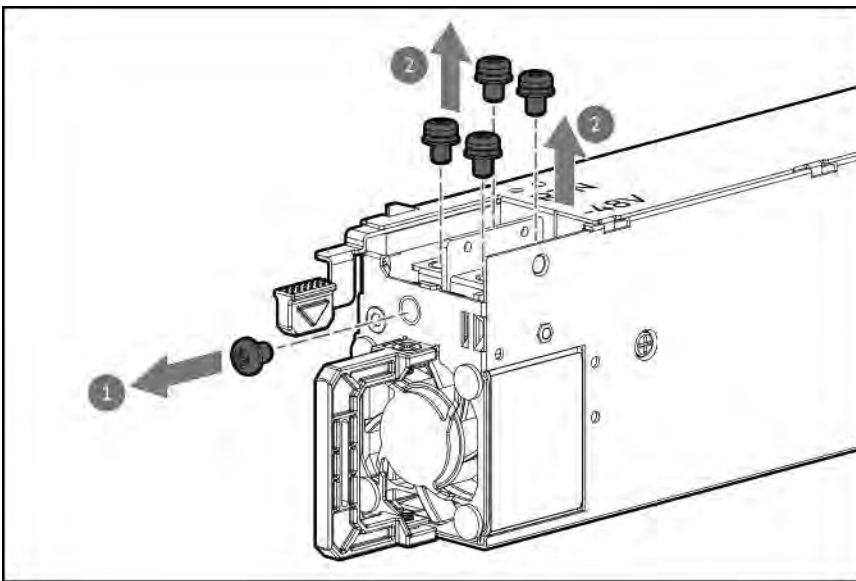
Procedure

1. Remove the protective cover from the power supply.
Retain this protective cover. This cover will be used to protect the wires on the new DC power supply.

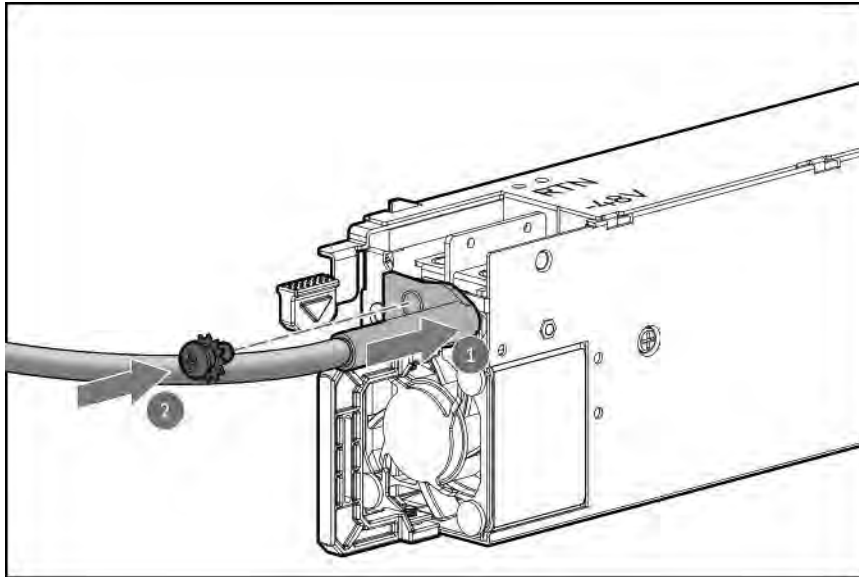


2. Remove the ground wire screw (callout 1), and then remove the positive return wire and negative input wire screws (callout 2).

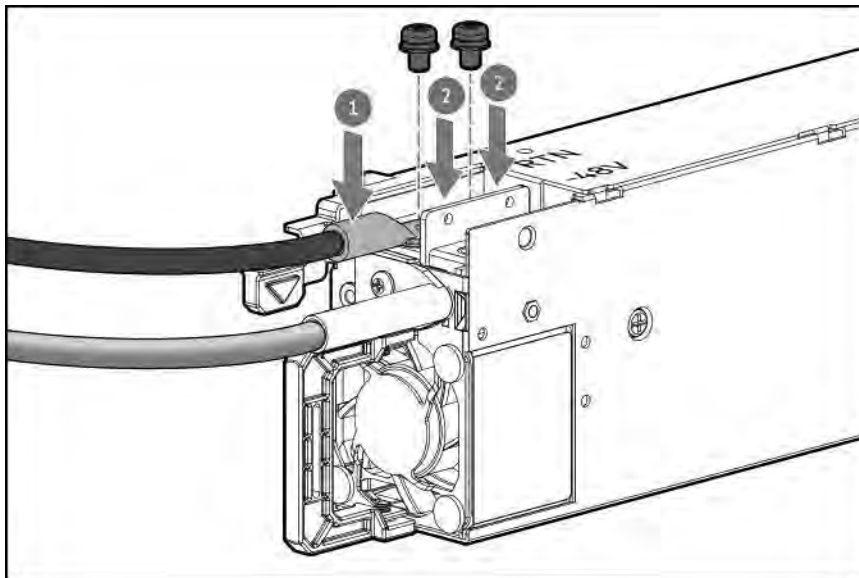
Retain the screws. These screws will be used to secure the wires on the new DC power supply.



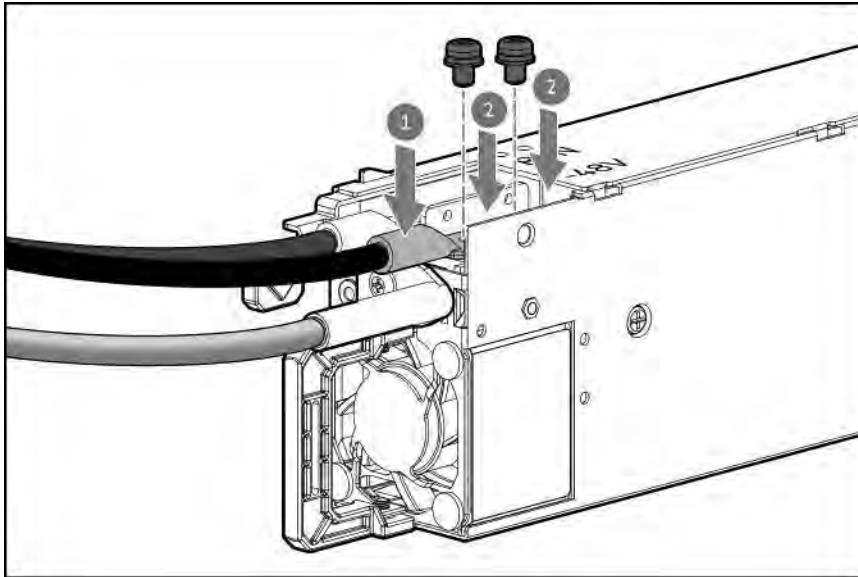
3. Attach the ground wire (green and yellow) to the DC power supply (callout 1) and tighten the screw and washer with 1.47 N-m (13 lbf-in) torque (callout 2).



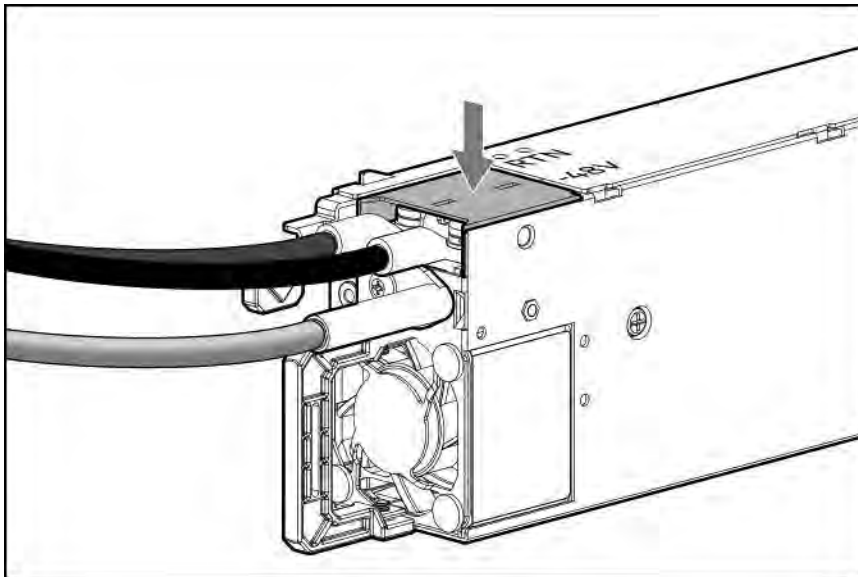
4. Install the positive return wire (red):
 - a. Insert the positive return wire (red) into the RTN slot on the DC power supply (callout 1).
 - b. Tighten the screw with 0.98 N-m (8.68 lbf-in) torque (callout 2).



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) torque (callout 2).

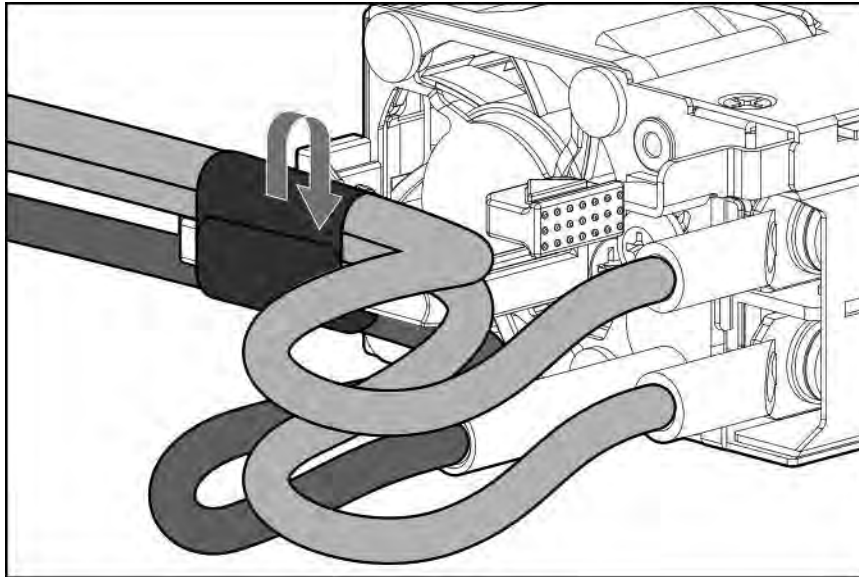


6. Install the protective cover on the DC power supply.
Make sure that the protective cover is locked.

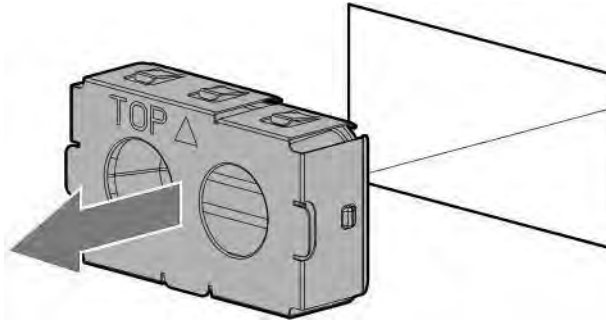


7. Secure the ground, positive return, and negative input wires in the strain relief strap.

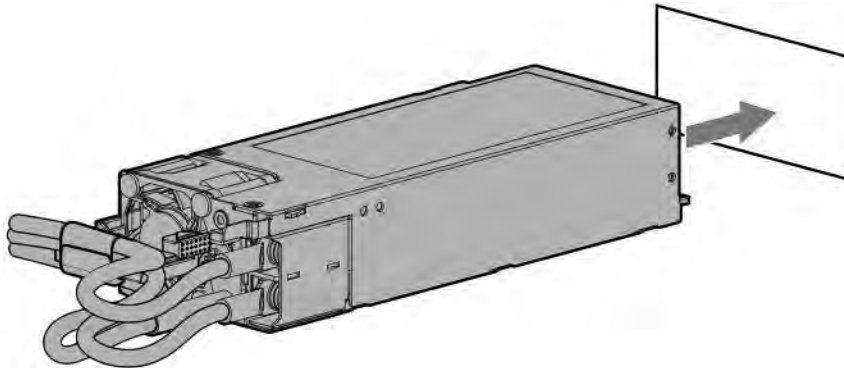
⚠ CAUTION: Avoid tight bend radii to prevent damaging the internal wires of a power cord or a server cable. Never bend power cords and server cables tight enough to cause a crease in the sheathing.



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

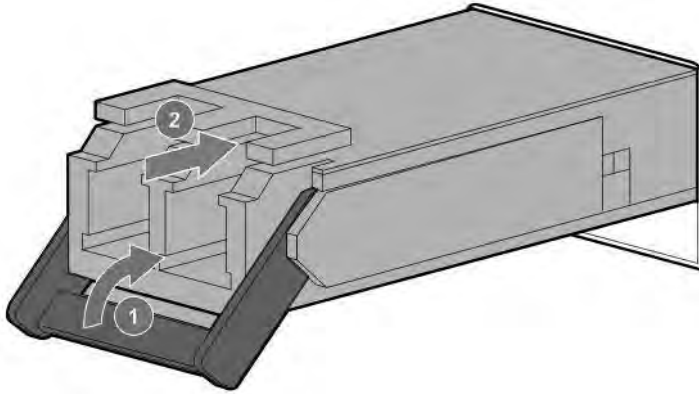
Before installing a transceiver option, review the following:

- [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.

Drive options

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

- Hot-plug LFF SAS or SATA drives
- Hot-plug SFF SAS, SATA, or U.3 NVMe drives
- Hot-plug E3.S PCIe5 NVMe SSDs

This server has no embedded software RAID support. Direct attached SATA drives operates in AHCI mode.

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 U.3 NVMe 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 hot-plug 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.

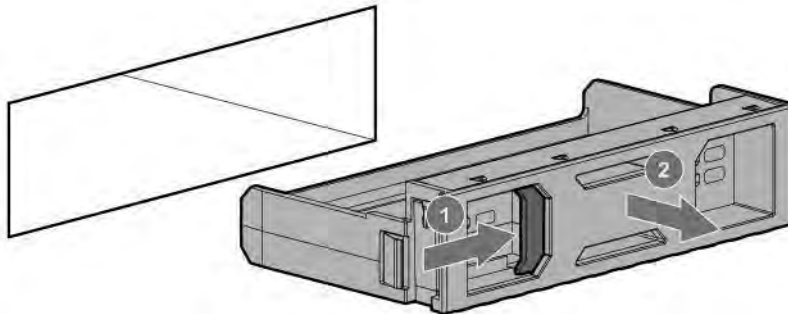
⚠ CAUTION: To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

Procedure

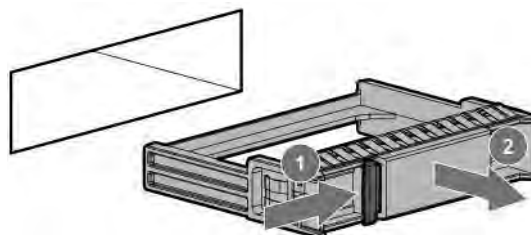
1. Back up all server data.
2. If installed, remove the front bezel.
3. Remove the drive blank.

Retain the blank for future use.

- LFF drive blank

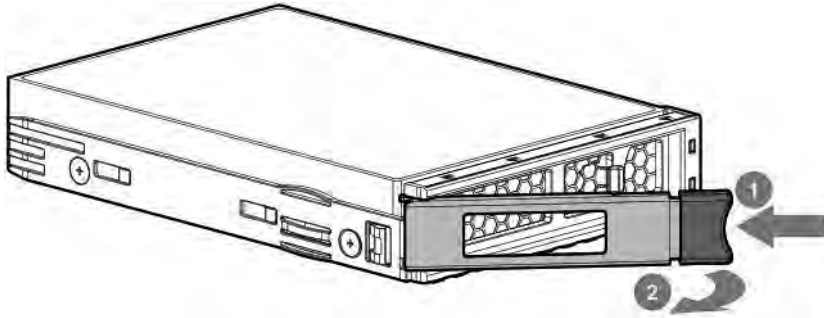


- SFF drive blank

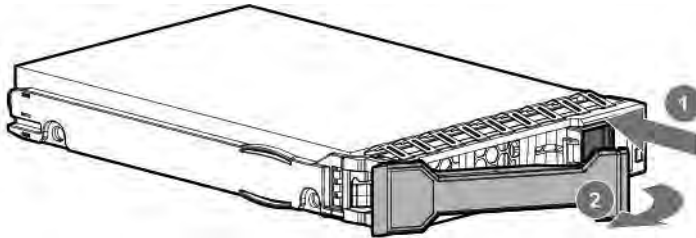


4. Prepare the drive.

- LFF drive

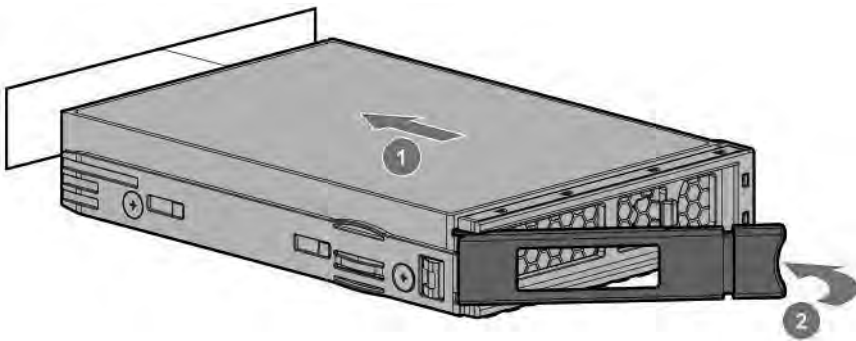


- SFF drive

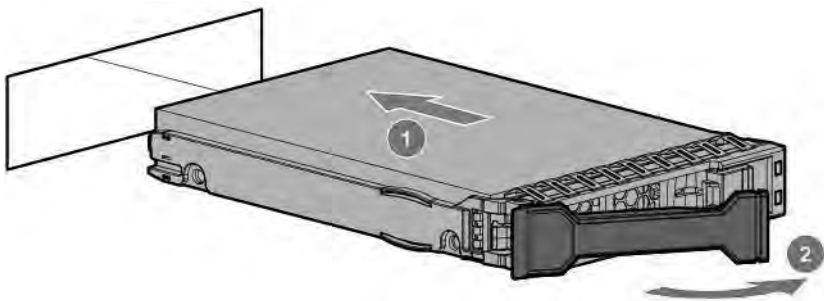


5. Install the drive.

- LFF drive



- SFF drive



6. Determine the status of the drive from the drive LED definition.
7. Install the front bezel.
8. To configure drive arrays, see the relevant storage controller guide.

The installation is complete.

Installing an E3.S drive

About this task

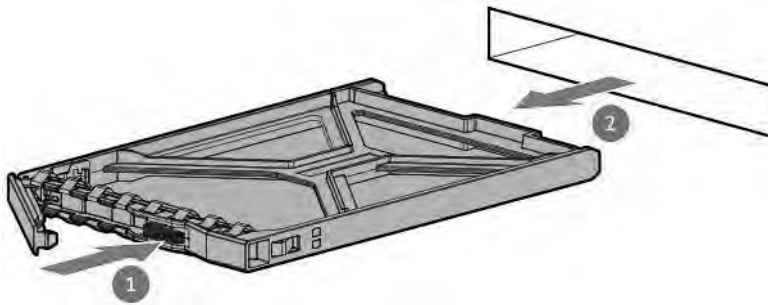
-
- ⚠ **CAUTION:** A discharge of static electricity from a finger or other conductor might damage system boards or other static-sensitive devices. To prevent damage, observe antistatic precautions.

 - ⚠ **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.

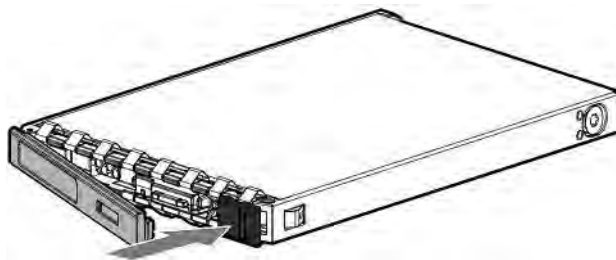
Procedure

1. Back up all server data.
2. If installed, remove the front bezel.
3. Remove the drive blank.

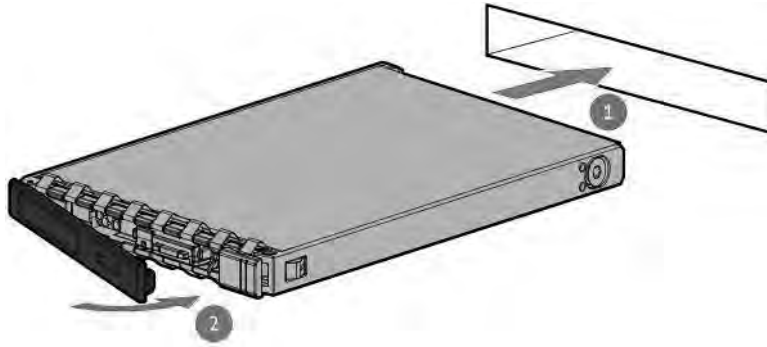
Retain the blank for future use.



4. Prepare the drive.



5. Install the drive.



NOTE: To make sure that the drive has installed successfully, make sure that the latch is engaged with the drive cage.

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

The installation is complete.

Installing the 2 SFF side-by-side drive cage option

Prerequisites

The following drive backplane options are supported in the 2 SFF drive configuration:

- 2 SFF 16G x4 U.2 NVMe / SAS UBM4 BC
- 2 SFF 24G x4 U.3 NVMe / SAS UBM3 BC
- 2 SFF 24G x4 U.3 NVMe / SAS UBM6 BC

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

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

- MR/SR G3 type-p controller
- MR G3 type-o controller
- SFF drive cable kit
- SFF drive
- T-10 Torx screwdriver

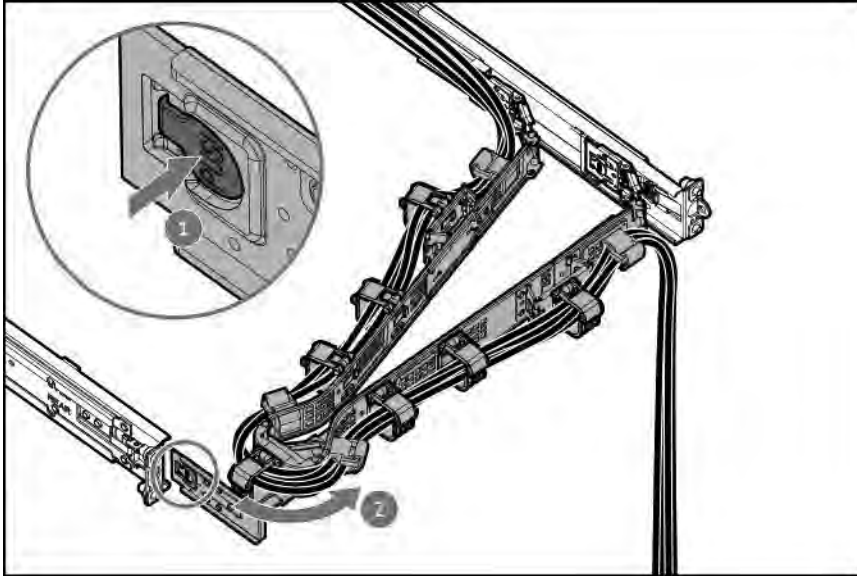
About this task

⚠ 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.

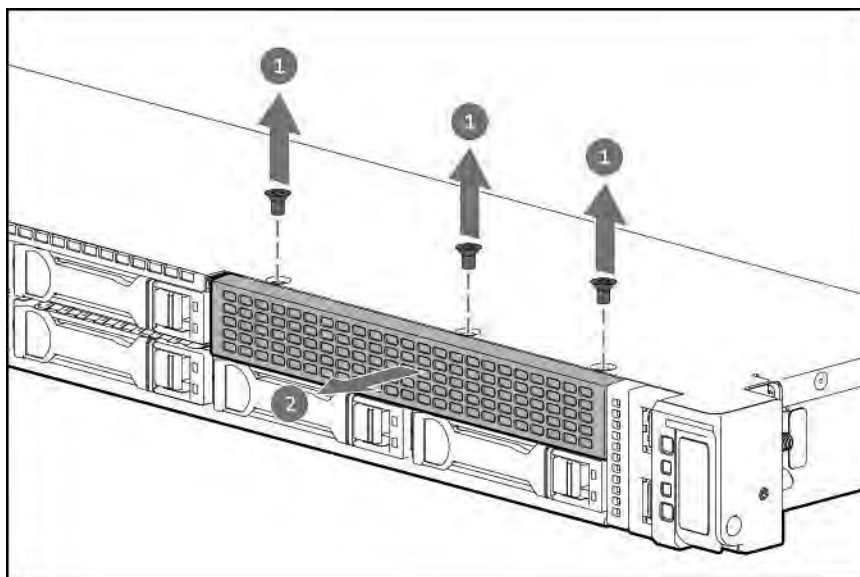
⚠ CAUTION: To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

Procedure

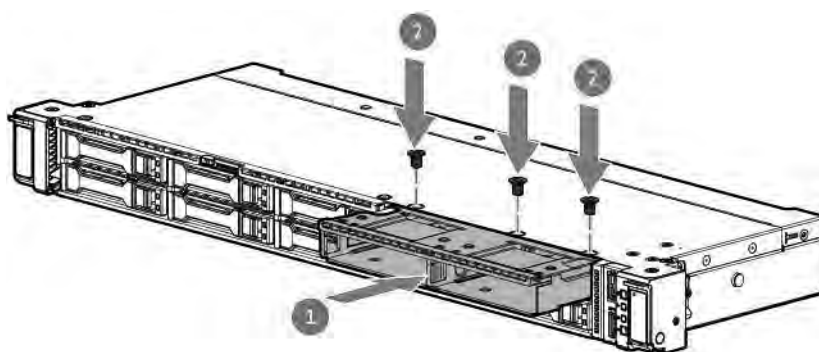
1. Back up all server data.
2. If installed, remove the front bezel.
3. Power down the server.
4. If installed, open the cable management arm.



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. Remove the middle cover.
11. Remove the universal media bay blank.
Retain the screws and blank. These screws will be used to secure the new 2 SFF side-by-side drive cage assembly.

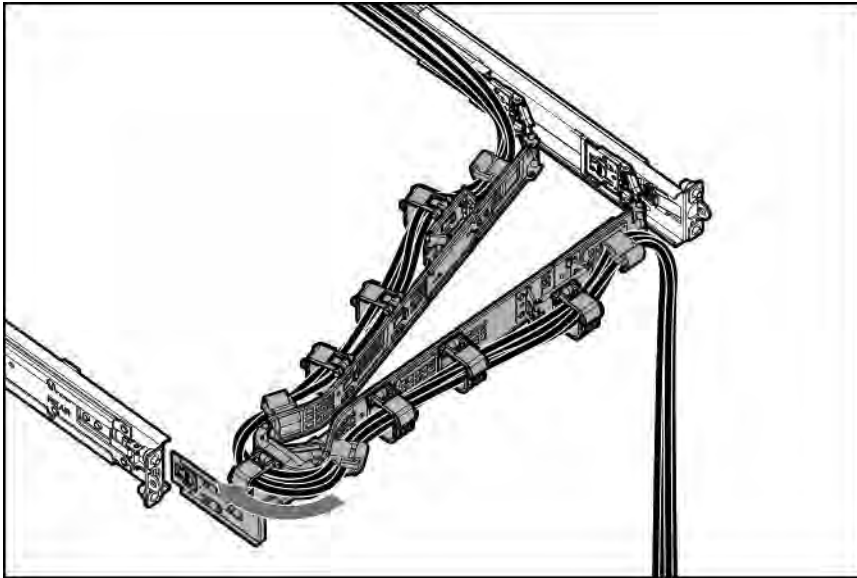


12. Install the 2 SFF side-by-side drive cage assembly.



13. If you are planning to manage the 2 SFF side-by-side drives by storage controller, install one of following options:
 - Type-p storage controller
 - Type-o storage controller (OROC)
14. Connect following cables to 2 SFF side-by-side drive cage backplane:
 - Storage controller cable
 - Drive power cable
15. Install the middle cover.
16. Install the access panel.
17. Install the server into the rack.
18. Connect the power cords:
 - a. Connect each power cord to the server.
 - b. Connect each power cord to the power source.

19. If installed, close the cable management arm.



20. Power up the server.
21. Install the SAS, SATA, or U.3 NVMe drives.
22. Install the front bezel.

The installation is complete.

Installing an 8 SFF drive backplane option

Prerequisites

The following drive backplane options are supported in the 8 SFF drive configuration:

- 8 SFF 16G x4 U.2 NVMe / SAS UBM4 BC
- 8 SFF 24G x1 U.3 NVMe / SAS UBM3 BC
- 8 SFF 24G x4 U.3 NVMe / SAS UBM3 BC
- 8 SFF 24G x1 U.3 NVMe / SAS UBM6 BC
- 8 SFF 24G x4 U.3 NVMe / SAS UBM6 BC

For more information on the drive backplane description, see [Drive backplane naming convention](#).

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

- MR/SR G3 type-p controller
- MR G3 type-o controller
- [SFF drive cable kit](#)
- SFF 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.

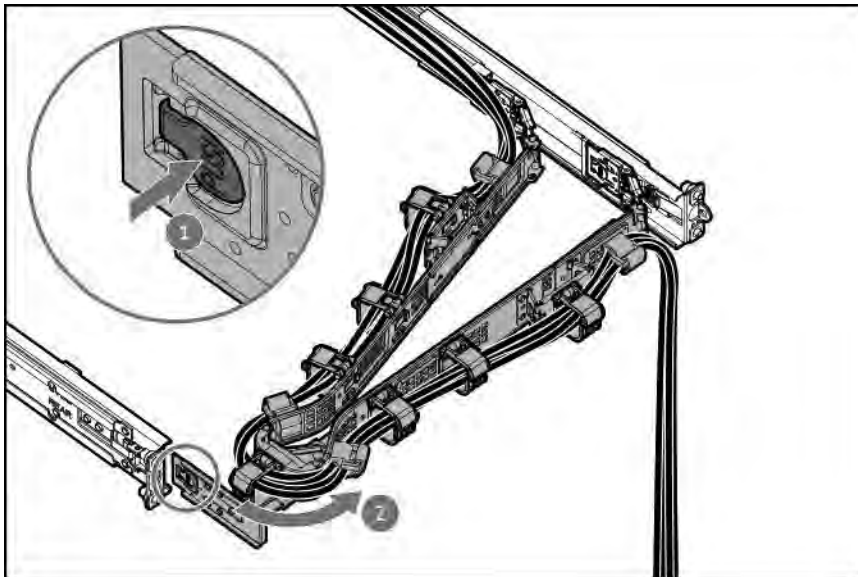
⚠ CAUTION: Before replacing a DIMM, backplane, expansion card, riser board, or other similar PCA components due to a perceived hardware error, make sure first that the component is firmly seated in the slot.

When installing the replacement component:

- Observe antistatic precautions.
- Handle the PCA only along the edges.
- Do not touch the components and connectors on the PCA.
- Do not bend or flex the PCA.

Procedure

1. Back up all server data.
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.

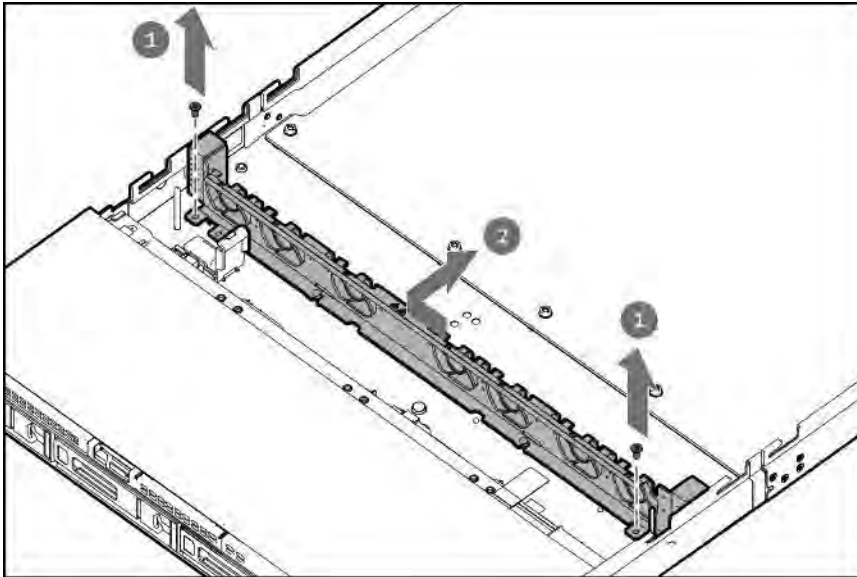
10. Remove the middle cover.

11. Remove the air baffle.

12. Remove all fans.

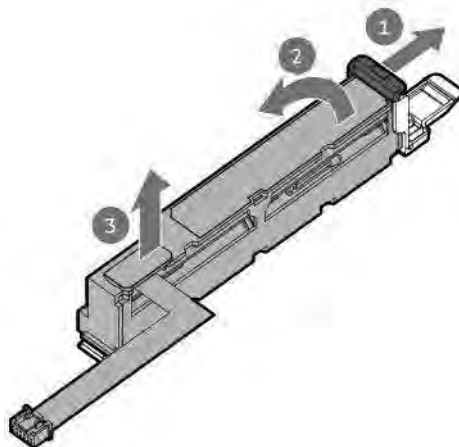
13. Remove the fan wall.

Retain the screws and fan wall. These screws will be used to secure the fan wall after internal component installation/replacement.



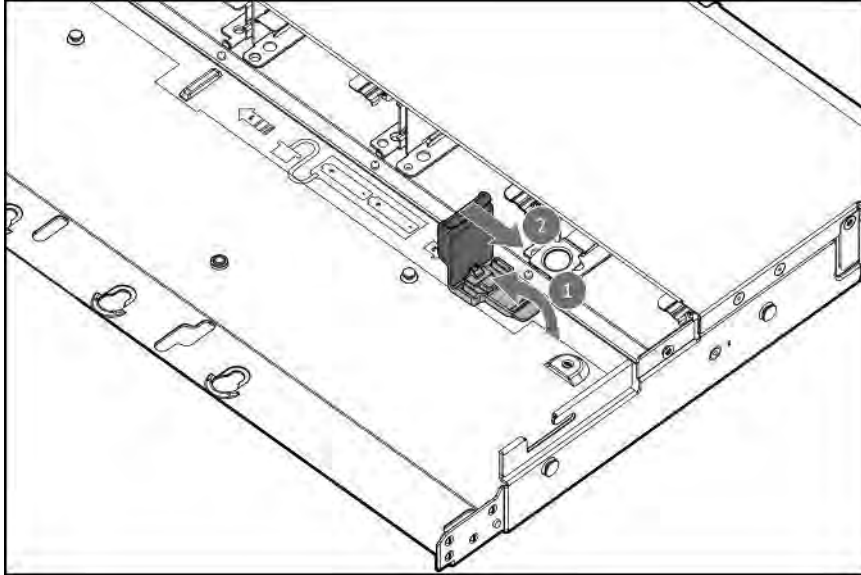
14. If installed, remove the energy pack:

- a. Press and hold the retention latch.
- b. Pivot the energy pack upward (callout 1).
- c. Lift one end of the energy pack and release it from the latch (callout 2).
- d. Detach the energy pack from the chassis (callout 3).

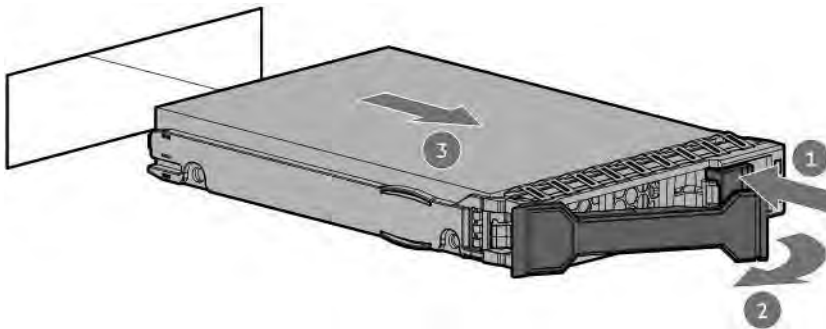


15. Remove the energy pack retention latch:

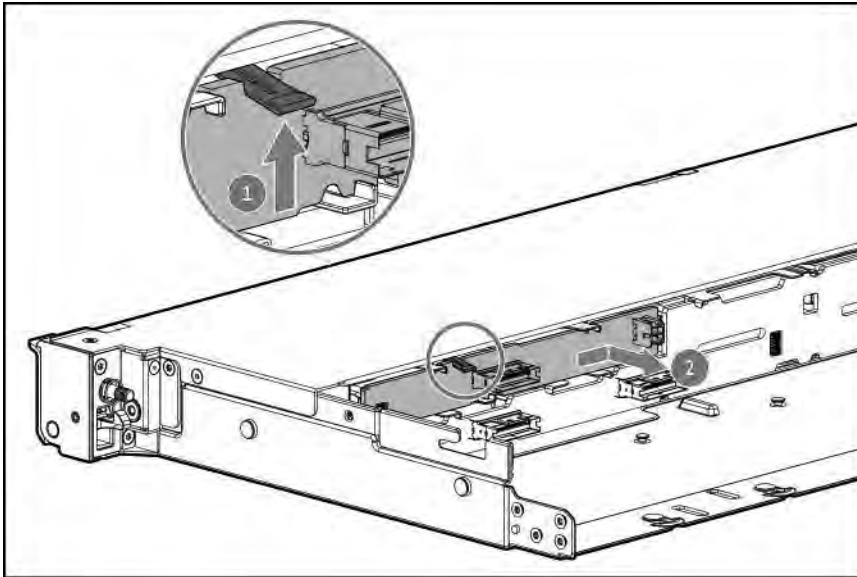
- a. Pull up and hold the latch (callout 1).
- b. Push the latch to detach from the chassis (callout 2).



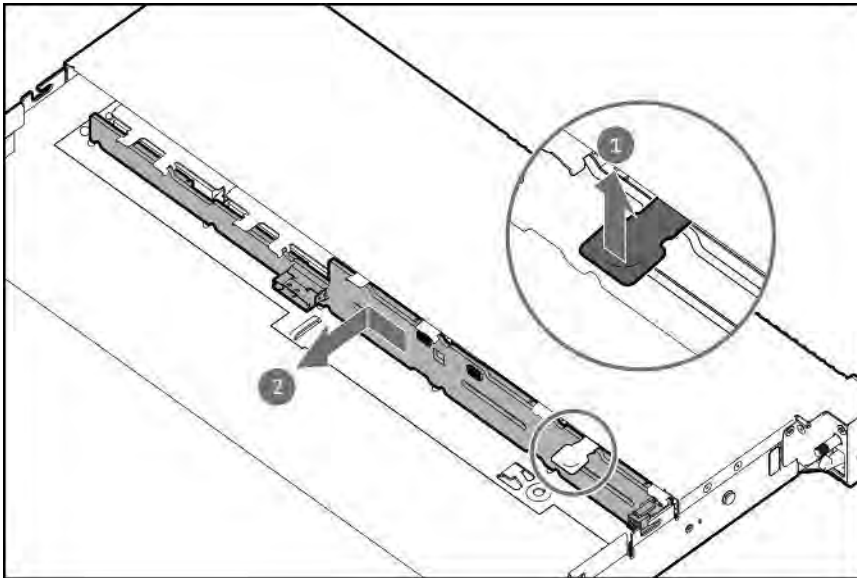
16. Remove all drives.



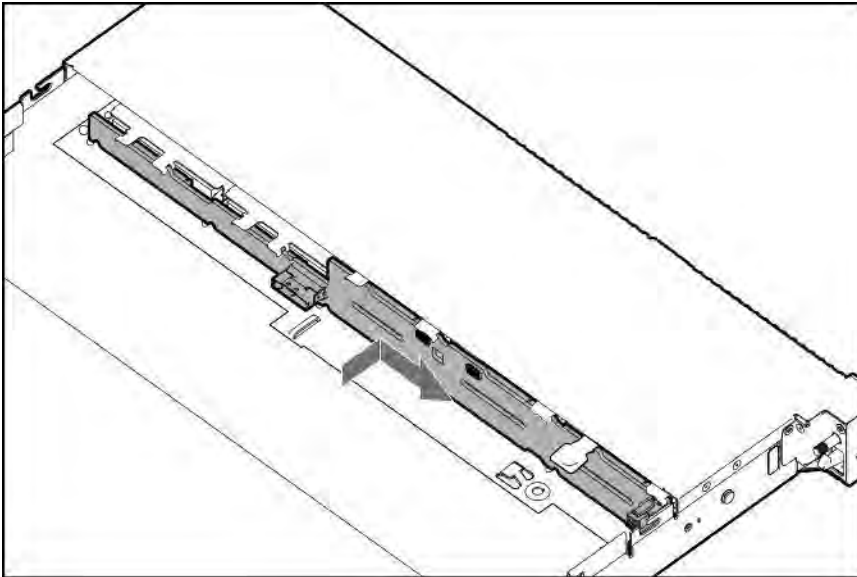
17. Disconnect all cables from the backplanes.
18. If installed, remove the 2 SFF drive backplane:
 - a. Press and hold the release latch (callout 1).
 - b. Detach the backplane from the drive cage (callout 2).



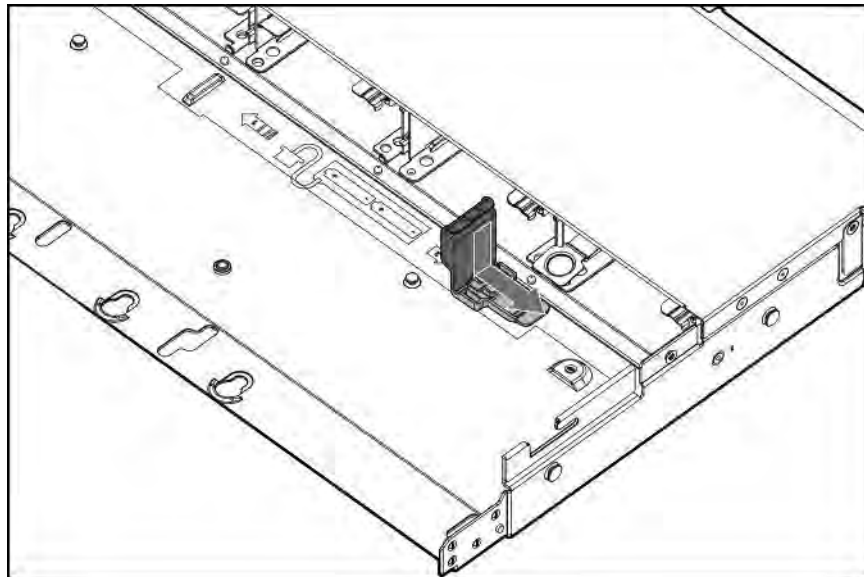
19. Pull up the release latch (callout 1) and detach the backplane (callout 2).



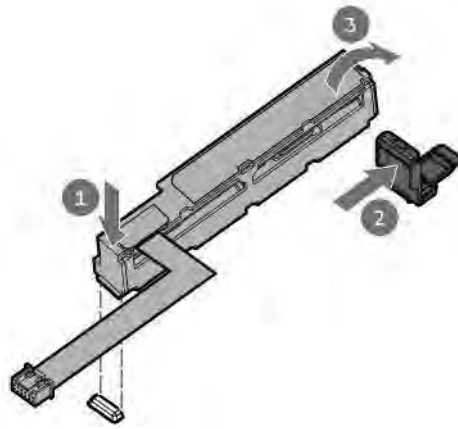
20. Install the 8 SFF drive backplane.
Make sure that the backplane is firmly seated in the drive cage and locked by the release latch.



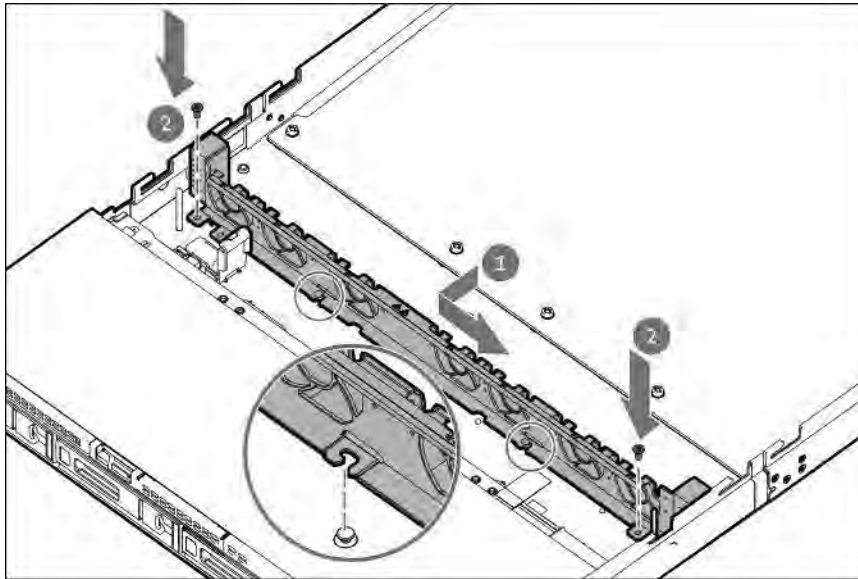
21. Install the energy pack retention latch:
 - a. Attach the energy pack retention latch on the chassis (callout 1).
 - b. Push the retention latch until it locks on the chassis (callout 2).



22. Install the energy pack:
 - a. Attach one end of energy pack on the chassis (callout 1).
 - b. Press and hold the retention latch (callout 2).
 - c. Pivot the energy pack downward and release the retention latch (callout 3).
Make sure that the energy pack is locked in the retention latch.



23. Install the fan wall.



24. If you are planning to manage the 8 SFF drives by the storage controller, install one of following options:

- Type-p storage controller
- Type-o storage controller (OROC)

25. Connect following cables to the new 8 SFF drive backplane:

- Storage controller cable
- Drive power cable

26. Install the middle cover.

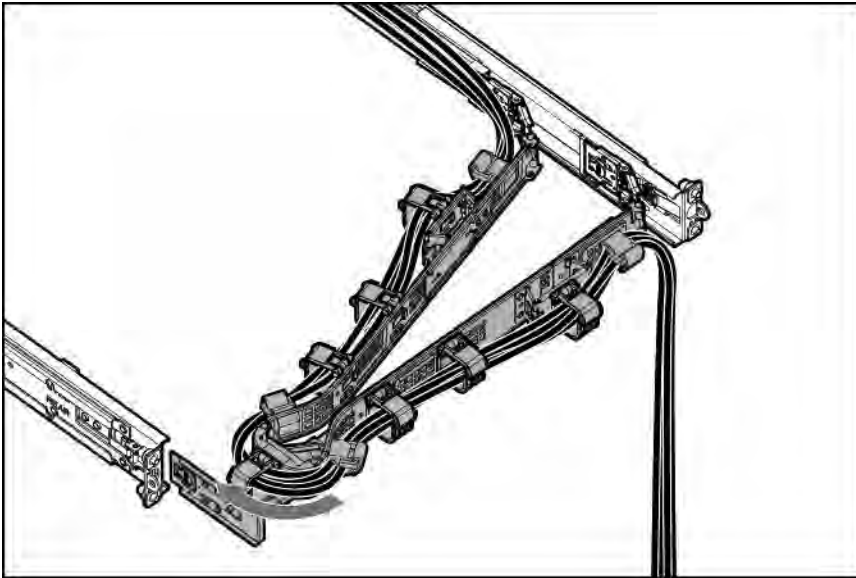
27. Install the access panel.

28. Install the server into the rack.

29. Connect the power cords:

- a. Connect each power cord to the server.
- b. Connect each power cord to the power source.

30. If installed, close the cable management arm.



31. Power up the server.
32. Install the SAS, SATA, or U.3 NVMe drives.
33. 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 LFF drive chassis

Prerequisites

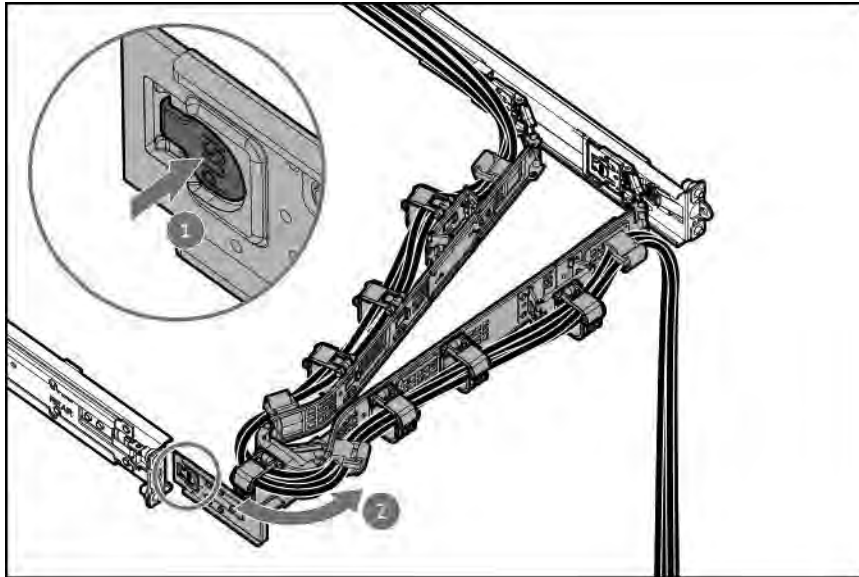
- Before you perform this procedure, make sure that you have the following items available:
 - T-10 Torx screwdriver
 - Phillips No. 1 screwdriver
 - Spudger or any small prying tool

About this task

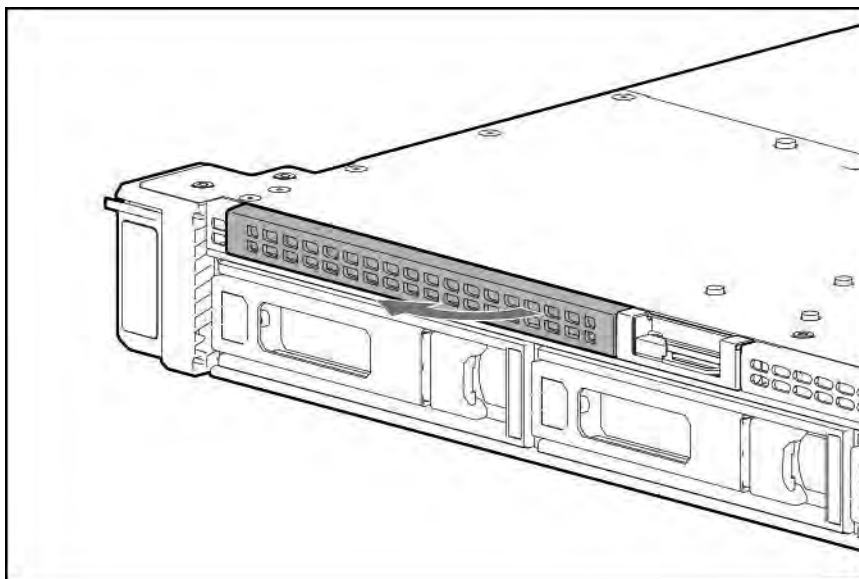
- ⚠ CAUTION:** A discharge of static electricity from a finger or other conductor might damage system boards or other static-sensitive devices. To prevent damage, observe antistatic precautions.

Procedure

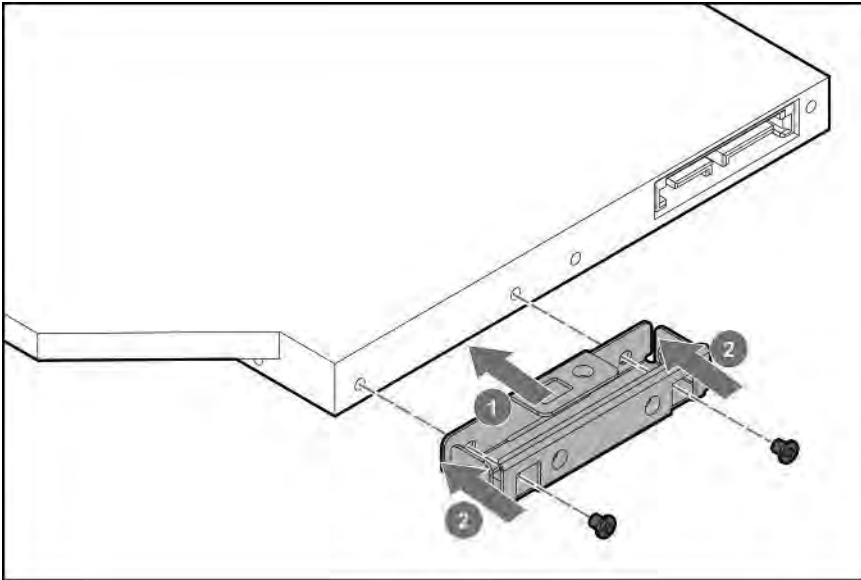
1. If installed, remove the front bezel.
2. Power down the server.
3. If installed, open the cable management arm.



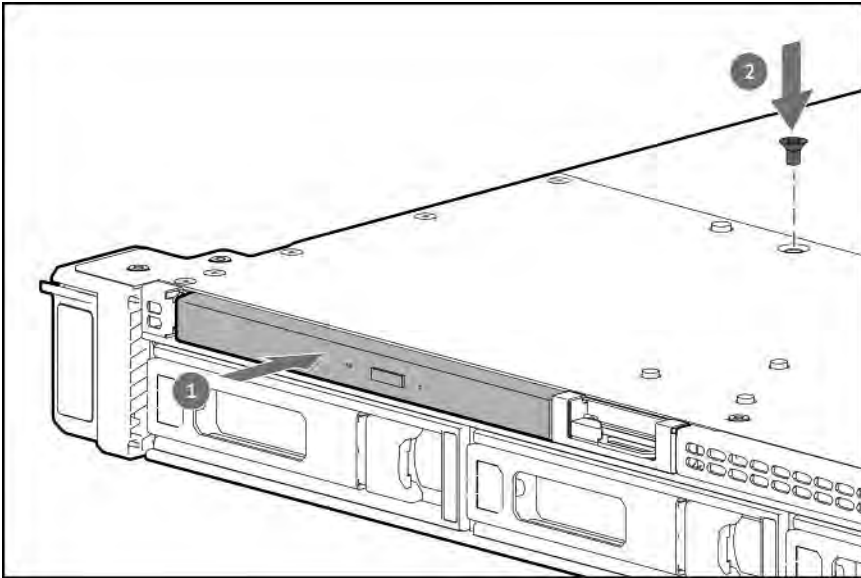
4. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
5. Disconnect all peripheral cables from the server.
6. Remove the server from the rack.
7. Place the server on a flat, level work surface.
8. Remove the access panel.
9. Remove the middle cover.
10. Remove the optical drive bay blank.
Retain the drive bay blank for future use.



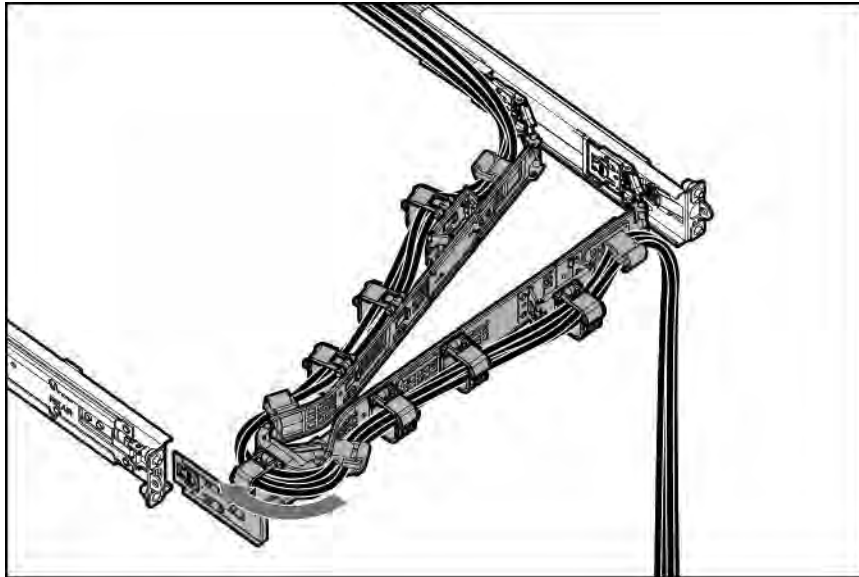
11. Install the optical drive bracket.



12. Install the optical drive.



13. Connect the optical drive cable.
14. Install the middle cover.
15. Install the access panel.
16. Install the server into the rack.
17. Connect all peripheral cables to the server.
18. Connect the power cords:
 - a. Connect each power cord to the server.
 - b. Connect each power cord to the power source.
19. If installed, close the cable management arm.



20. Power up the server.
21. Install the front bezel.

The installation is complete.

Installing the optical drive in the SFF drive chassis

Prerequisites

This optical drive installation requires the optical drive cage assembly (P56654-B21).

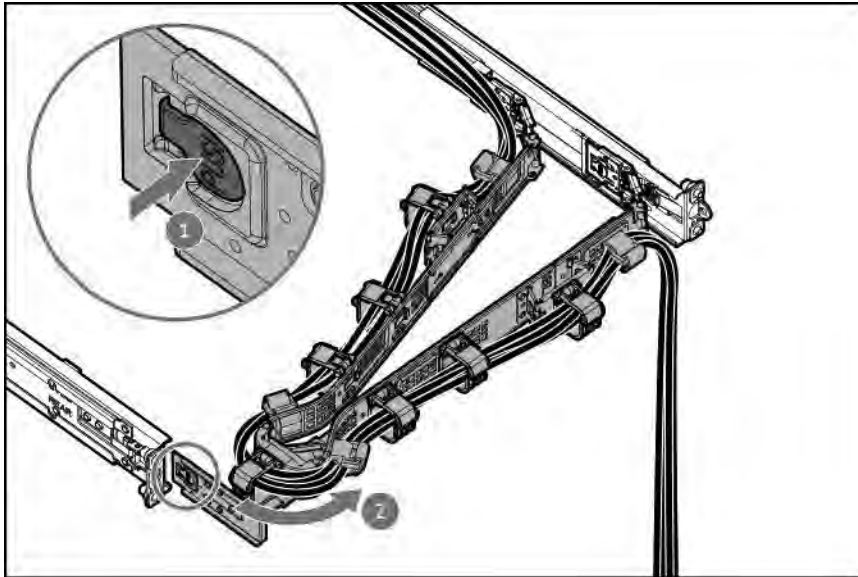
- Before you perform this procedure, make sure that you have the following items available:
 - T-10 Torx screwdriver
 - Phillips No. 1 screwdriver
 - Spudger or any small prying tool

About this task

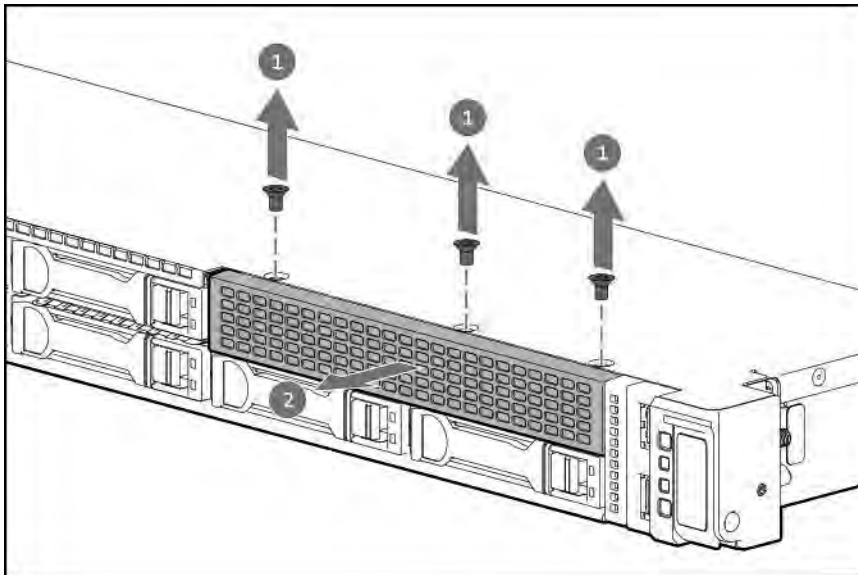
⚠ CAUTION: A discharge of static electricity from a finger or other conductor might damage system boards or other static-sensitive devices. To prevent damage, observe antistatic precautions.

Procedure

1. If installed, remove the front bezel.
2. Power down the server.
3. If installed, open the cable management arm.

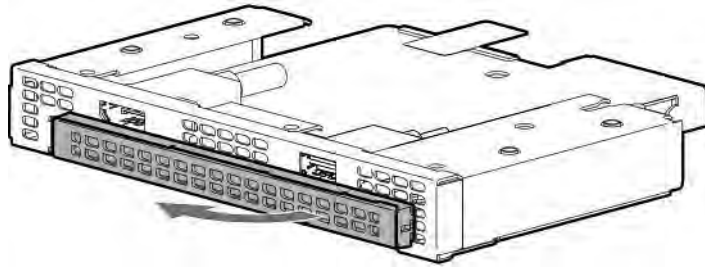


4. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
5. Disconnect all peripheral cables from the server.
6. Remove the server from the rack.
7. Place the server on a flat, level work surface.
8. Remove the access panel.
9. Remove the middle cover.
10. Remove the universal media bay blank.
Retain the screws and blank. These screws will be used to secure the new optical drive cage.

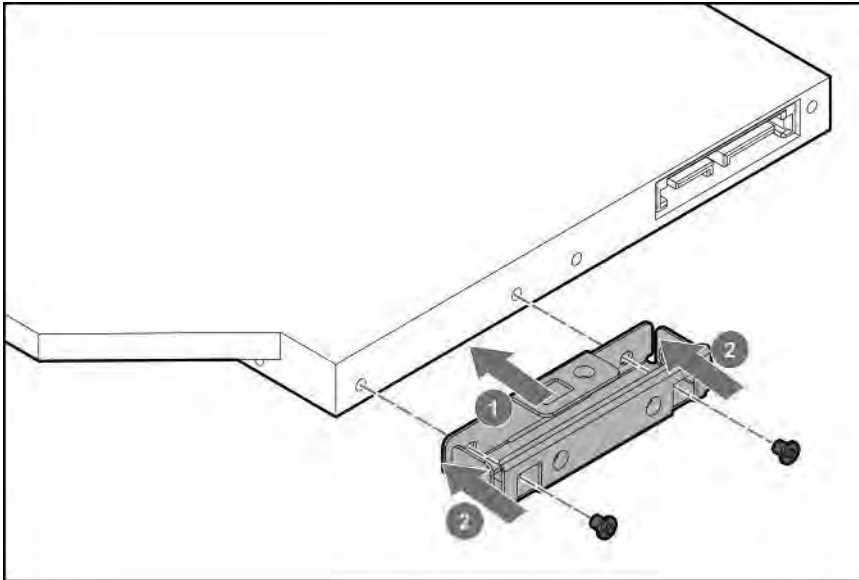


11. Remove the optical drive bay blank from the drive cage.

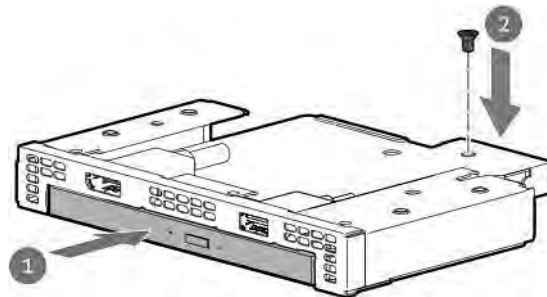
Retain the blank for future use.



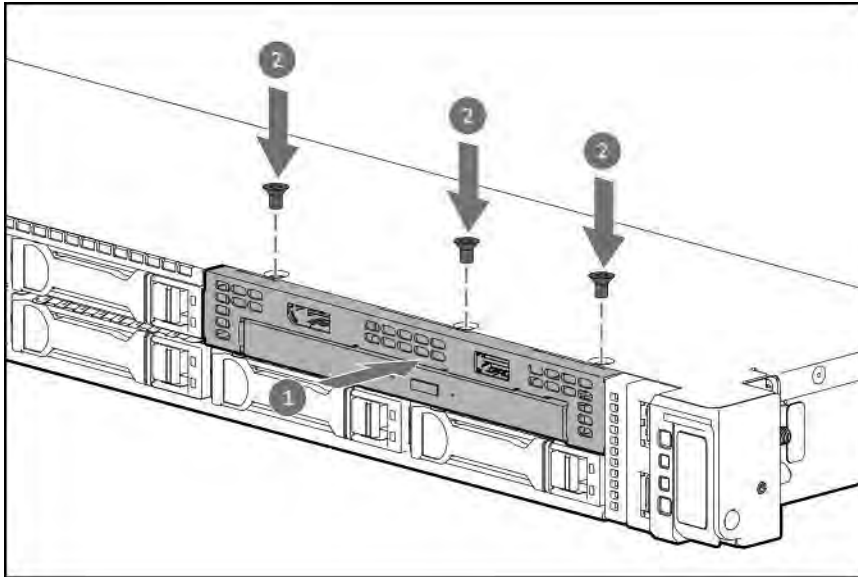
12. Install the optical drive bracket.



13. Install the optical drive in the optical drive cage.



14. Install the optical drive cage in the universal media bay.



15. Connect following cables to the system board:

- Optical drive cable
- Front USB and DisplayPort cable

16. Install the middle cover.

17. Install the access panel.

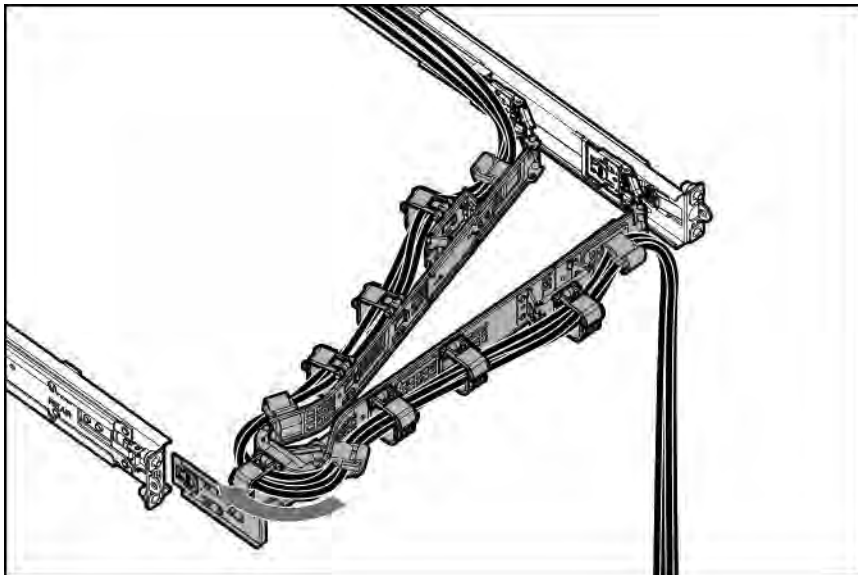
18. Install the server into the rack.

19. Connect all peripheral cables to the server.

20. Connect the power cords:

- a. Connect each power cord to the server.
- b. Connect each power cord to the power source.

21. If installed, close the cable management arm.



22. Power up the server.
23. Install the front bezel.

The installation is complete.

Installing the front USB and DisplayPort option

Prerequisites

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

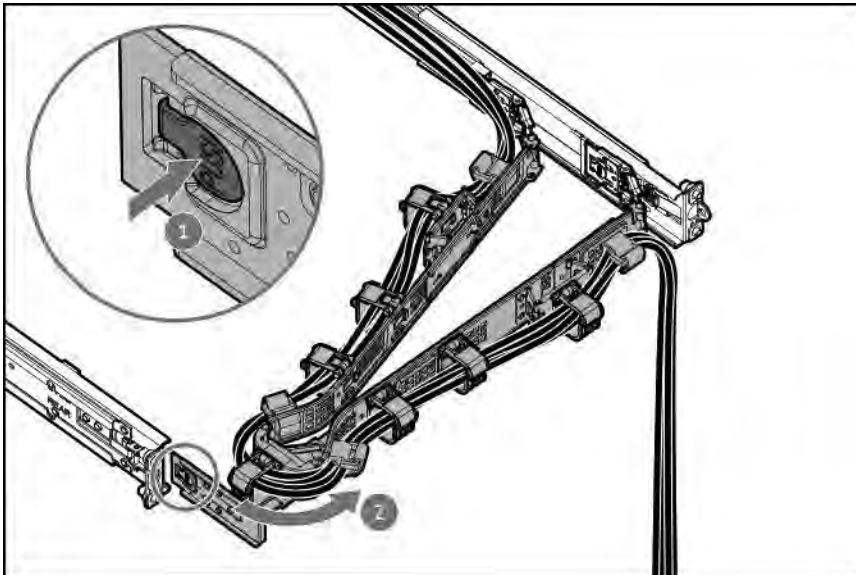
About this task

⚠ 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.

In the SFF drive chassis, the front USB and DisplayPort option is included in the optical drive cage assembly kit. For more information, see optical drive cage assembly installation in the SFF drive chassis.

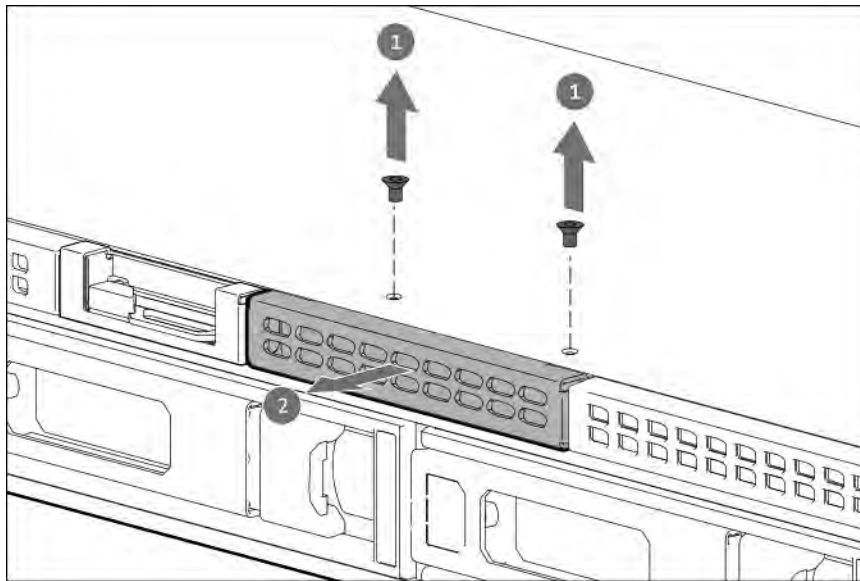
Procedure

1. If installed, remove the front bezel.
2. Power down the server.
3. If installed, open the cable management arm.

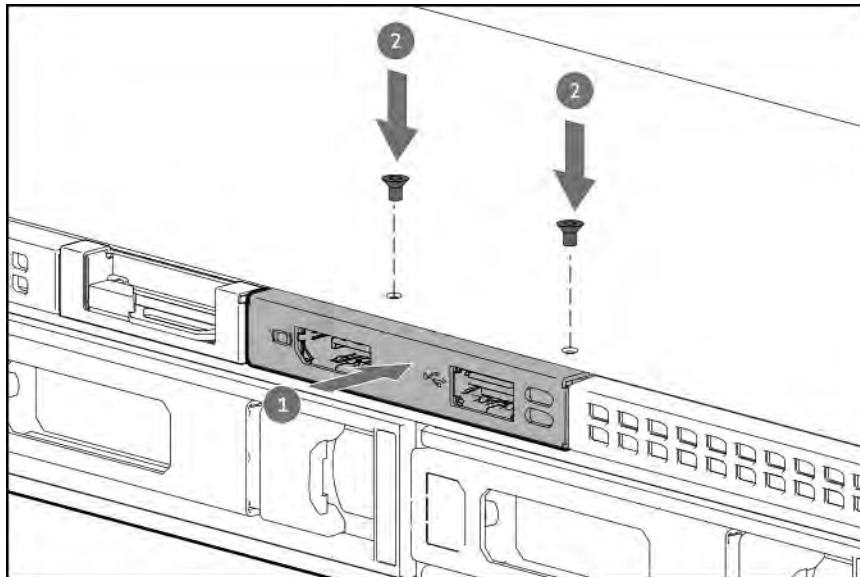


4. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
5. Disconnect all peripheral cables from the server.
6. Remove the server from the rack.
7. Place the server on a flat, level work surface.

8. Remove the access panel.
9. Remove the middle cover.
10. Remove the front USB and DisplayPort blank.
Retain the screws. These screws will be used to secure the front USB and DisplayPort assembly.

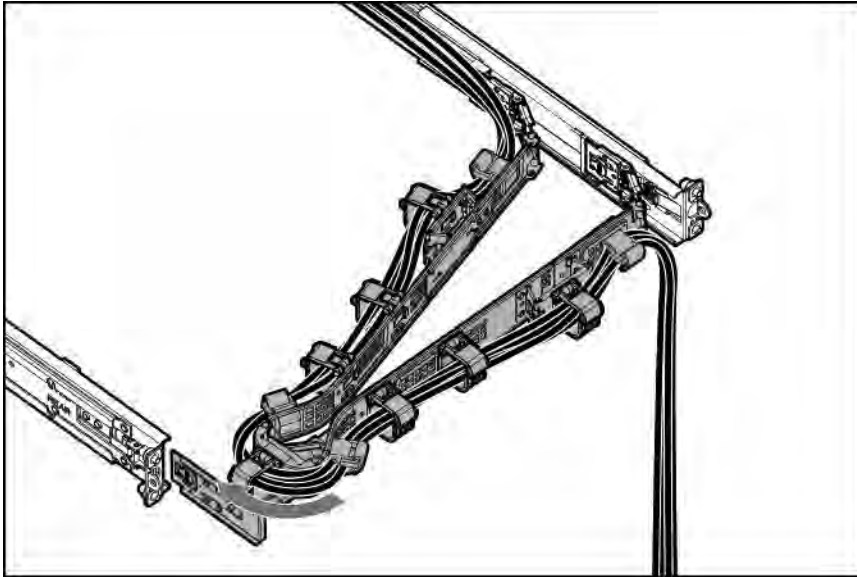


11. Install the front USB and DisplayPort assembly.



12. Connect the front USB and DisplayPort cable to the system board.
13. Install the middle cover.
14. Install the access panel.
15. Install the server into the rack.
16. Connect all peripheral cables to the server.
17. Connect the power cords:

- a. Connect each power cord to the server.
 - b. Connect each power cord to the power source.
18. If installed, close the cable management arm.

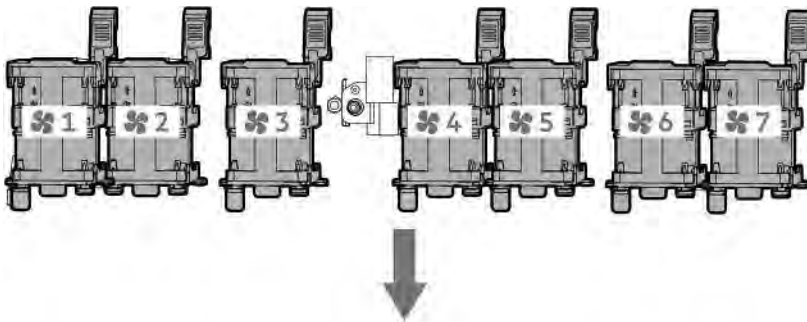


19. Power up the server.
20. Install the front bezel.

The installation is complete.

Fan options

To provide sufficient airflow to the system, the server is by default populated by seven fans. The fans can either be standard fan (P58461-B21) or high performance fan (P58462-B21). Mixed fan configuration is not supported.



The arrow points to the front of the server.

To maintain proper system cooling, install the correct fan and heatsink types required for specific hardware configurations.

Fan mode behavior

The default seven fan configuration provides redundant fan support. In redundant fan mode, if a fan rotor 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 rotor failure or a missing fan occurs, the operating system gracefully shuts down.

Installing a fan option

Prerequisites

Review the fan and heatsink requirements for specific hardware configurations.

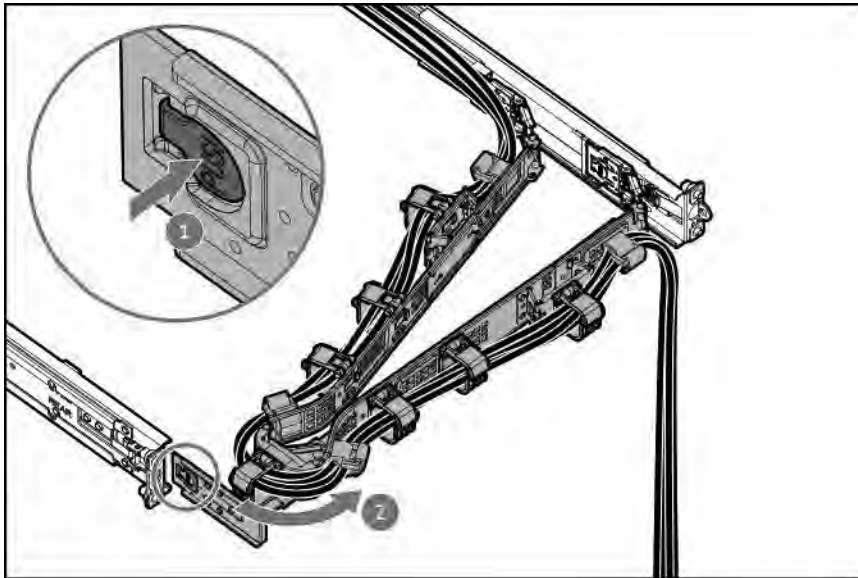
About this task

The installation and removal procedures for the standard and high performance fans are the same.

Procedure

❗ **IMPORTANT:** The fan setup can either be all seven of standard or high performance fans. Do not mix fan types in the same server.

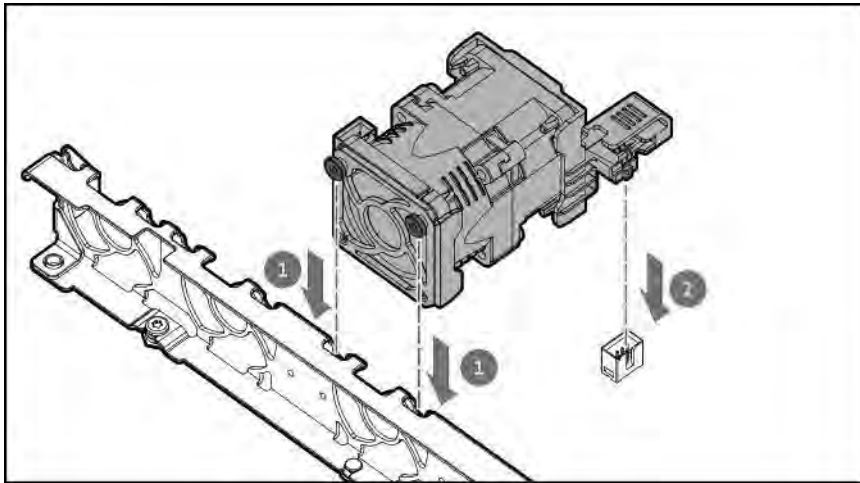
1. Power down the server.
2. If installed, open the cable management arm.



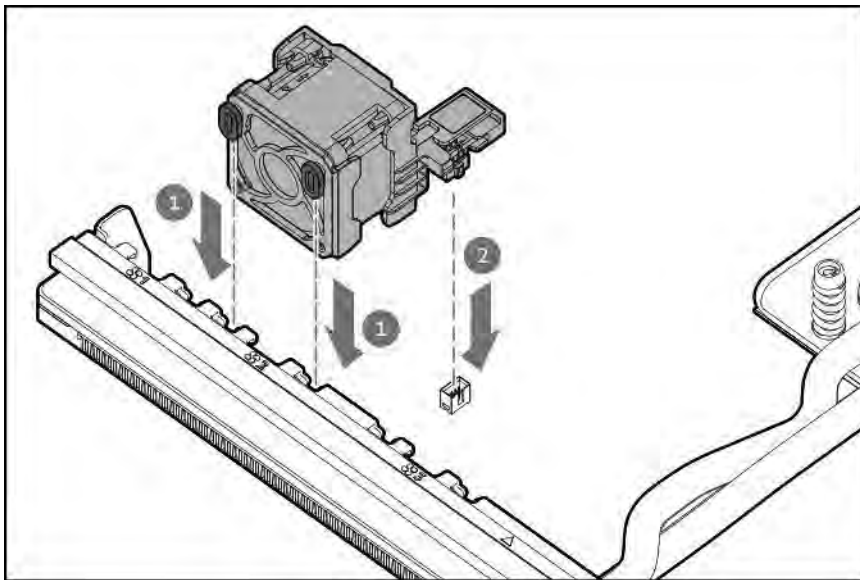
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. Remove the server from the rack.
6. Place the server on a flat, level work surface.
7. Remove the access panel.
8. Remove the middle cover.

9. Remove the air baffle.
10. Install the fan:
Make sure that the fan is firmly seated on its system board connector.

- Standard / high performance fan



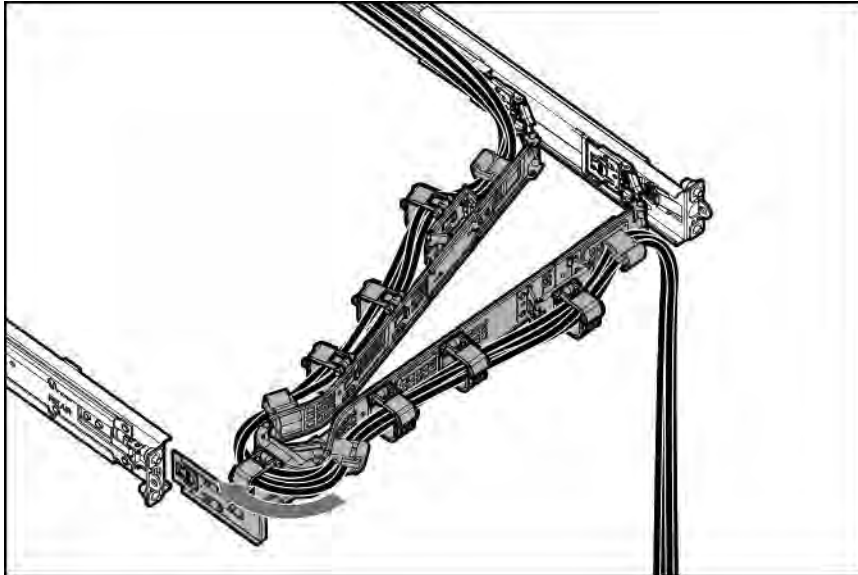
- Liquid cooling fan



11. Perform the post-installation or maintenance steps required by the procedure that necessitates the removal of the fan.
12. Install the air baffle.
13. Install the middle cover.
14. Install the access panel.
15. Install the server into the rack.
16. Connect all peripheral cables to the server.
17. Connect the power cords:

- a. Connect each power cord to the server.
- b. Connect each power cord to the power source.

18. If installed, close the cable management arm.

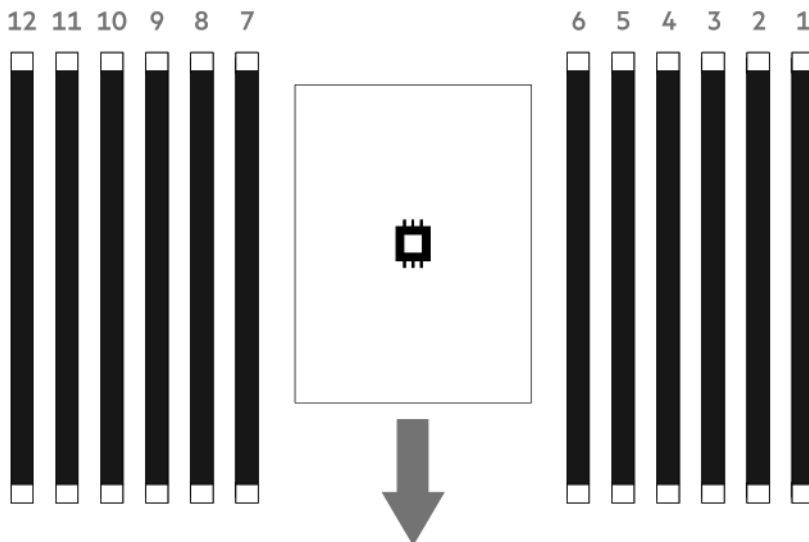


19. Power up the server.

The installation is complete.

Memory option

The server has 12 DIMM slots supporting DDR5 SmartMemory (RDIMM).



The arrow points to the front of the server.

SmartMemory speed and population information

For information about memory speed and server-specific DIMM population rules for Advanced Server models using AMD EPYC 9004 Series Processor, contact customer support.

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

About this task

⚠ CAUTION: Do not install x4 and x8 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: Before replacing a DIMM, backplane, expansion card, riser board, or other similar PCA components due to a perceived hardware error, make sure first that the component is firmly seated in the slot.

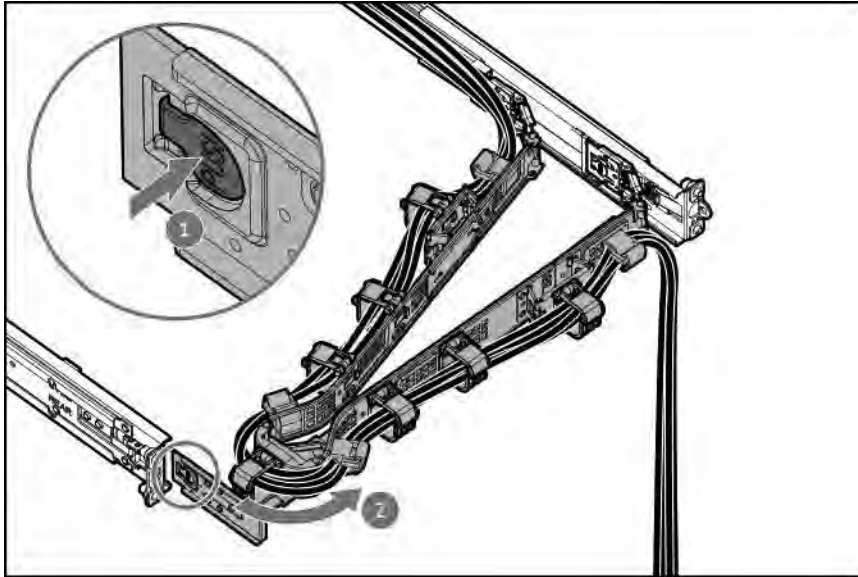
When installing the replacement component:

- Observe antistatic precautions.
- Handle the PCA only along the edges.
- Do not touch the components and connectors on the PCA.
- Do not bend or flex the PCA.

⚠ 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

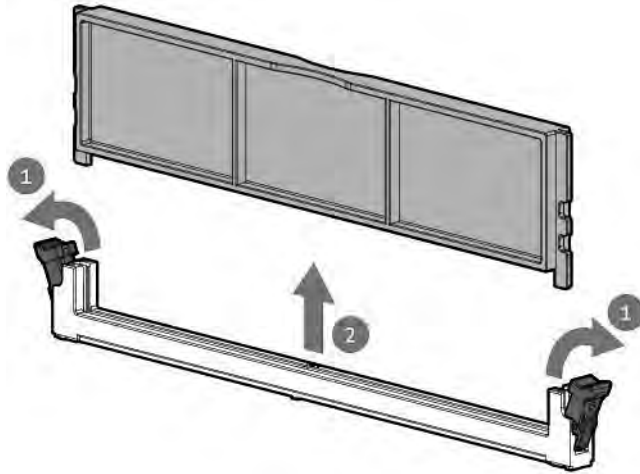
1. Power down the server.
2. If installed, open the cable management arm.



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 DIMM blank:

⚠ 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.

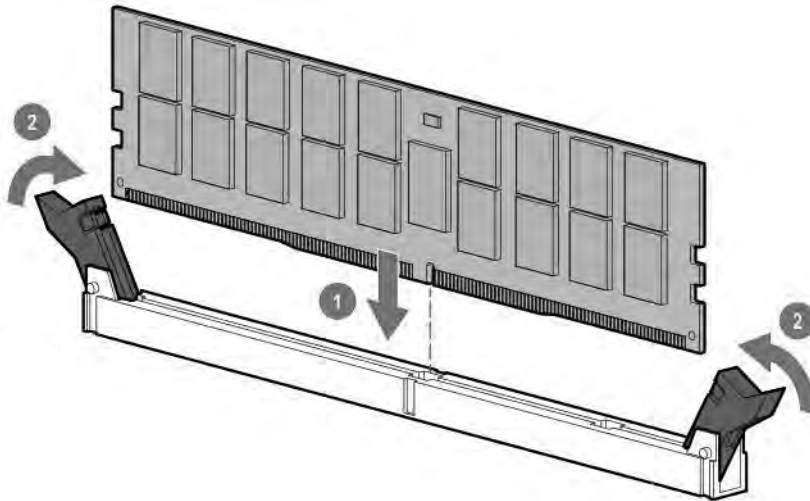
- a. Open the DIMM slot latches (callout 1).
- b. Lift the blank from the DIMM slot (callout 2).



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.

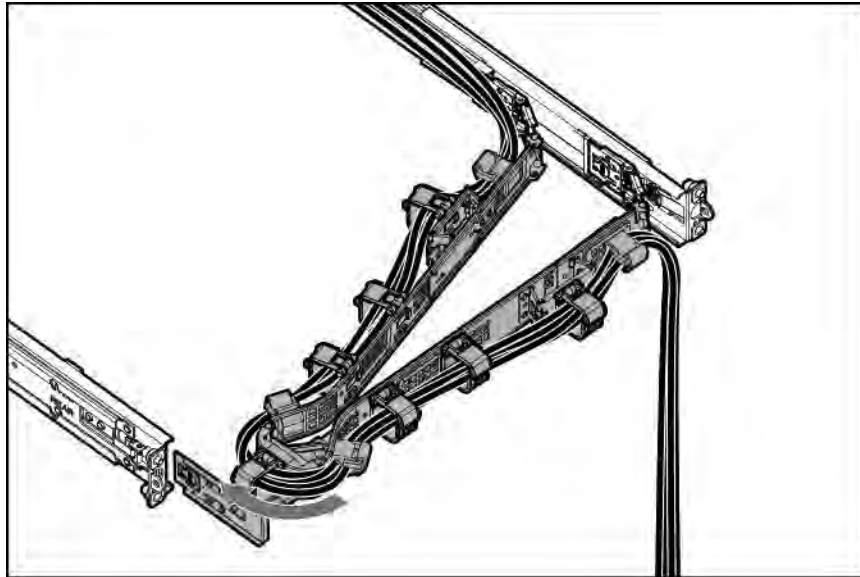
The DIMM slots are structured to ensure proper installation. If you try to insert a DIMM but it does not fit easily into the slot, you might have positioned it incorrectly. Reverse the orientation of the DIMM and insert it again.



10. Install the access panel.

11. Install the server into the rack.

12. Connect all peripheral cables to the server.
13. Connect the power cords:
 - a. Connect each power cord to the server.
 - b. Connect each power cord to the power source.
14. If installed, close the cable management arm.



15. Power up the server.
16. To configure the memory settings:
 - a. From the boot screen, press F9 to access UEFI System Utilities.
 - b. From the System Utilities screen, select System Utilities > System Configuration > BIOS/Platform Configuration (RBSU) > Memory Options.

The installation is complete.

Riser cage options

The one-slot primary riser cage is default in the server. Two secondary riser cage options are supported:

- One-slot secondary riser cage—supports standard and high-power expansion card options.
- NS204i-u + secondary low-profile riser cage—supports standard and high-power expansion card options.

For detailed information on riser option configurations, contact customer support.

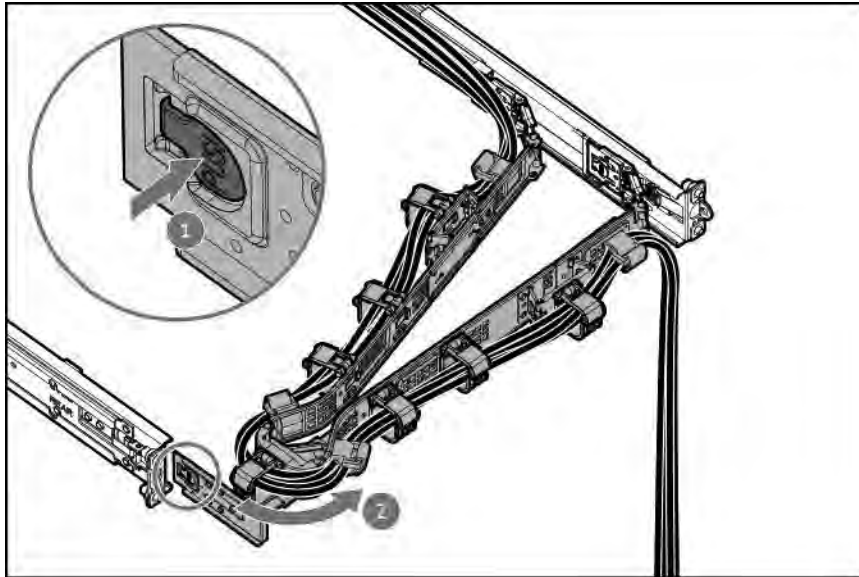
Installing the one-slot secondary riser cage

About this task

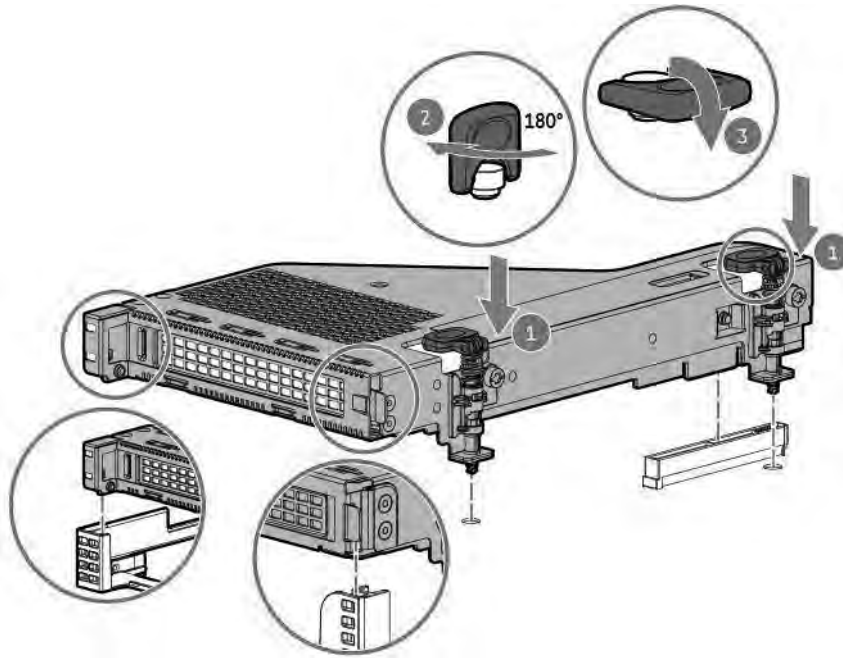
-
- ⚠ CAUTION:** To prevent damage to electrical components, properly ground the server before beginning any installation, removal, or replacement procedure. Improper grounding can cause electrostatic discharge.

Procedure

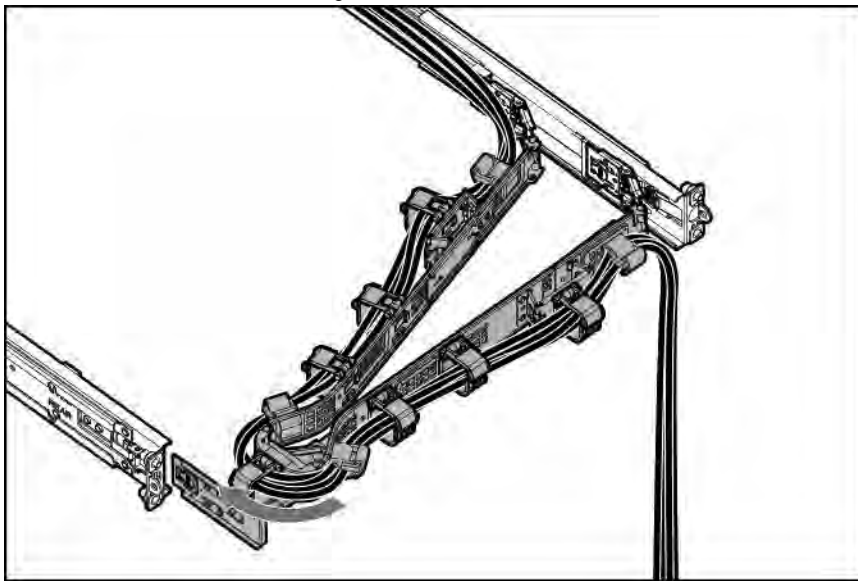
1. Power down the server.
2. If installed, open the cable management arm.



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 blank
9. Install one of the following options:
 - Expansion card
 - Type-p storage controller
10. 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).



11. Install the access panel.
12. Install the server into the rack.
13. Connect all peripheral cables to the server.
14. Connect the power cords:
 - a. Connect each power cord to the server.
 - b. Connect each power cord to the power source.
15. If installed, close the cable management arm.



16. Power up the server.

The installation is complete.

NS204i-u + low-profile riser cage option

The server supports the NS204i-u + low-profile riser cage with a PCIe5 x16 riser board that connects to secondary riser connector. The PCIe5 x16 riser board supports a half-height, half-length (low-profile) expansion card.

The riser cage supports NS204i Boot Device that includes two 2280 M.2 NVMe SSDs.

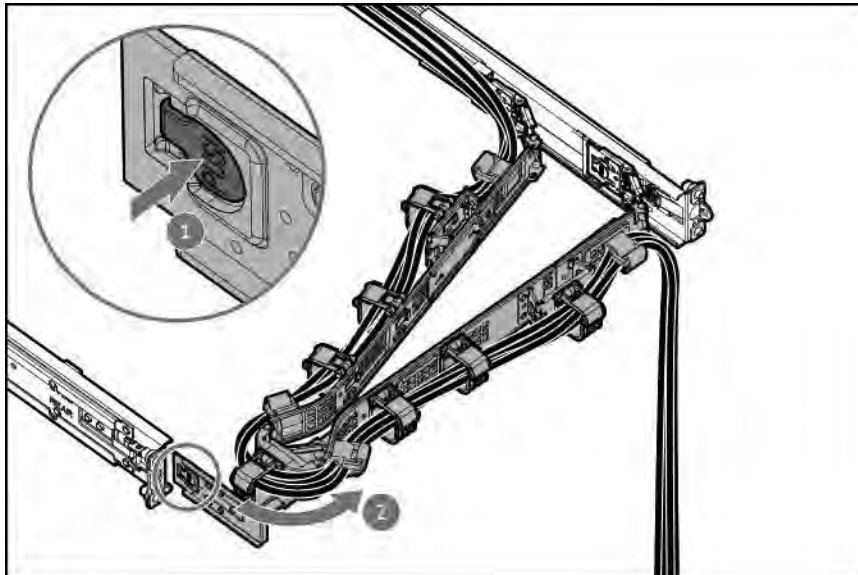
Installing the NS204i-u + secondary low-profile riser cage

About this task

⚠ 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.

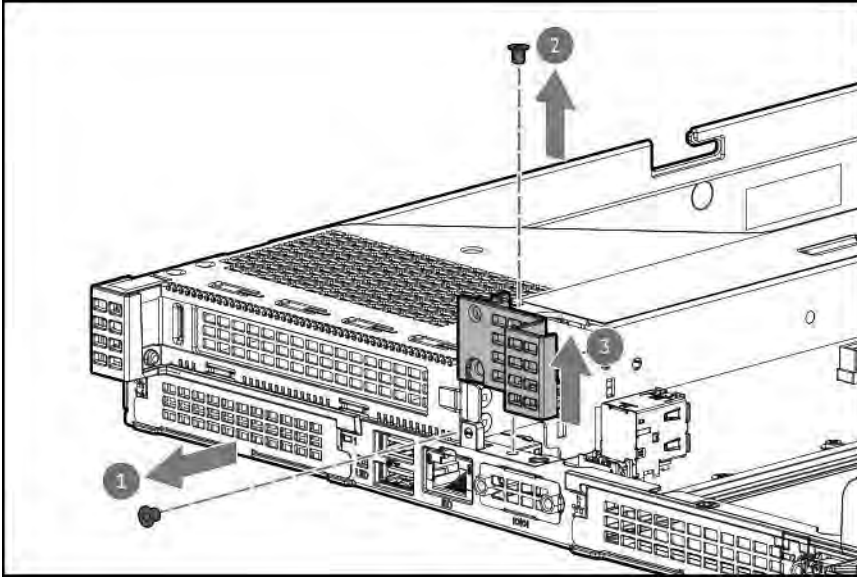
Procedure

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 blank.
9. Remove the default secondary riser cage bracket.

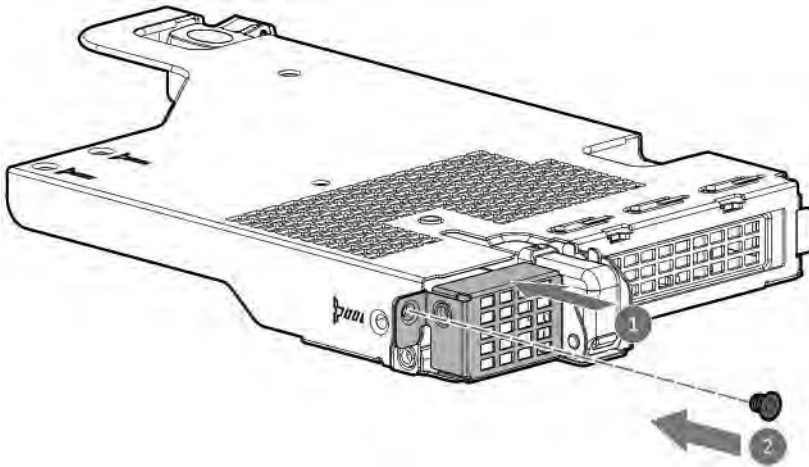
Retain the screws and bracket. These screws will be used to secure the new NS204i + secondary low-profile riser cage bracket.



10. Install the following options:

- Low-profile expansion card
- NS204i-u Boot Device

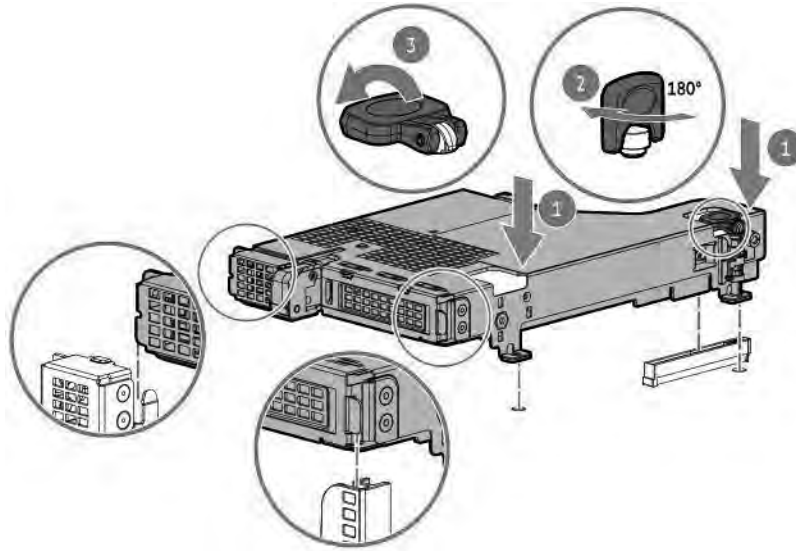
11. If the boot device is not install in the riser cage, or to prevent hot-plug access to the SSDs on the boot device, install the security cover.



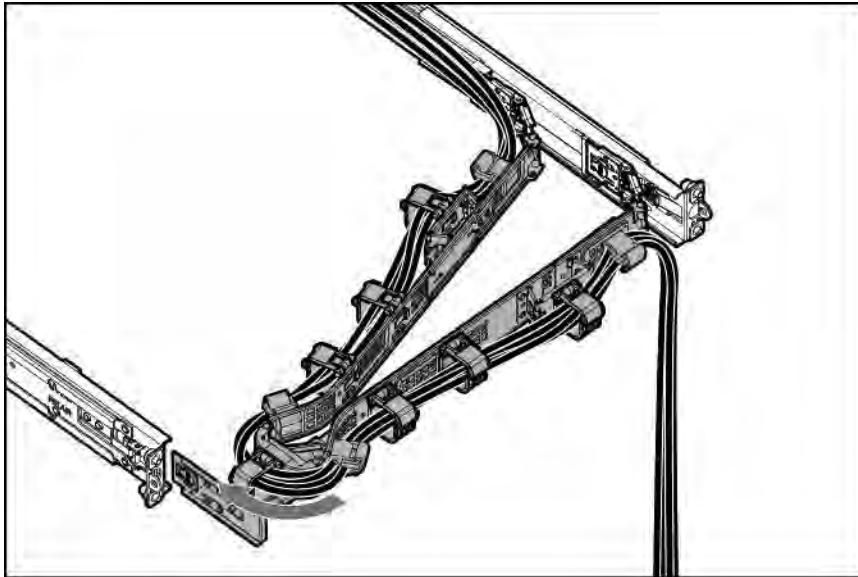
12. Install the NS204i-u + secondary low-profile riser cage:

- 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).



13. (Optional) Connect all necessary internal cabling to the expansion card.
For more information on these cabling requirements, see the documentation that ships with the option.
14. Install the access panel.
15. Install the server into the rack.
16. Connect all peripheral cables to the server.
17. Connect the power cords:
 - a. Connect each power cord to the server.
 - b. Connect each power cord to the power source.
18. If installed, close the cable management arm.



19. Power up the server.

The installation is complete.

Storage controller options

This server has no embedded software RAID support. Direct attached SATA drives operate AHCI mode.

To support hardware RAID, install a storage controller option:

- MR type-o and type-p G3 controllers
- SR type-p G3 controllers
- SR type-p G2 Plus controllers

When a tri-mode storage controller option is used together with a U.3 drive backplane, the system will support mixed drive configuration.

Preparing the server for storage controller installation

Prerequisites

Before beginning this procedure, download the Service Pack for Advanced Server (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-p storage controller

Prerequisites

To enable the flash-backed write cache (FBWC) feature of a storage controller option, install an energy pack.

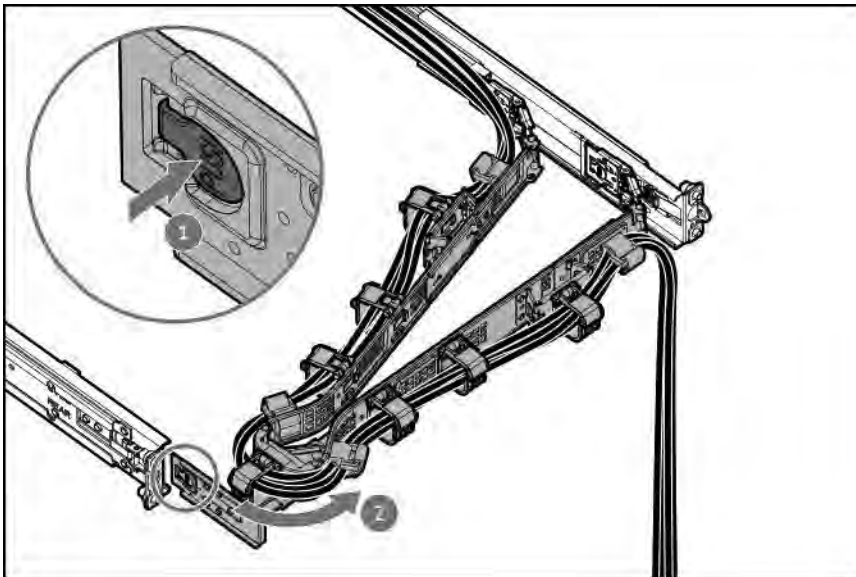
- Before you perform this procedure, make sure that you have the following items available:
 - Compatible controller cable
 - T-10 Torx screwdriver

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.

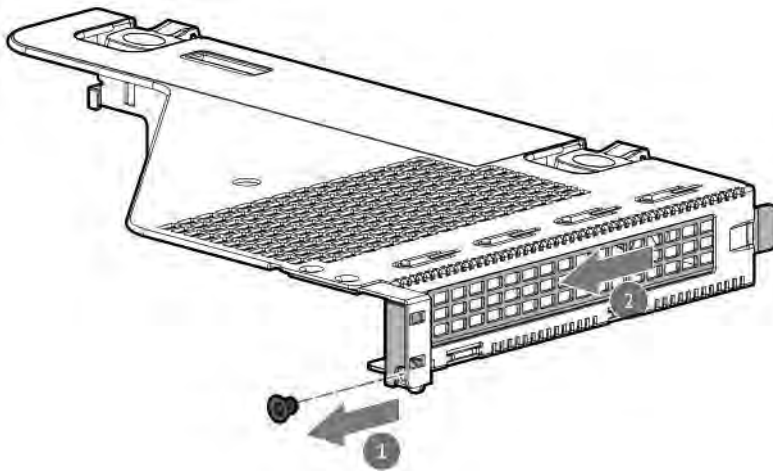
Procedure

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

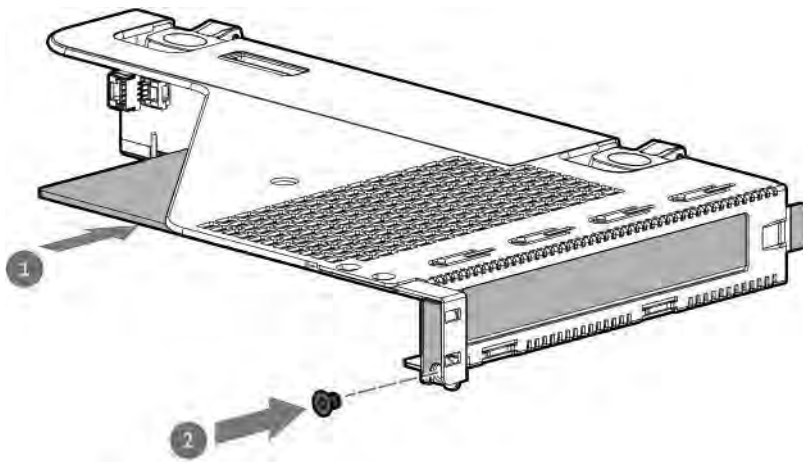


3. Remove all power:

- 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 middle cover.
9. Remove the riser cage.
10. Remove the riser slot blank.
Retain the screw and blank. This screw will be used to secure the new type-p storage controller.

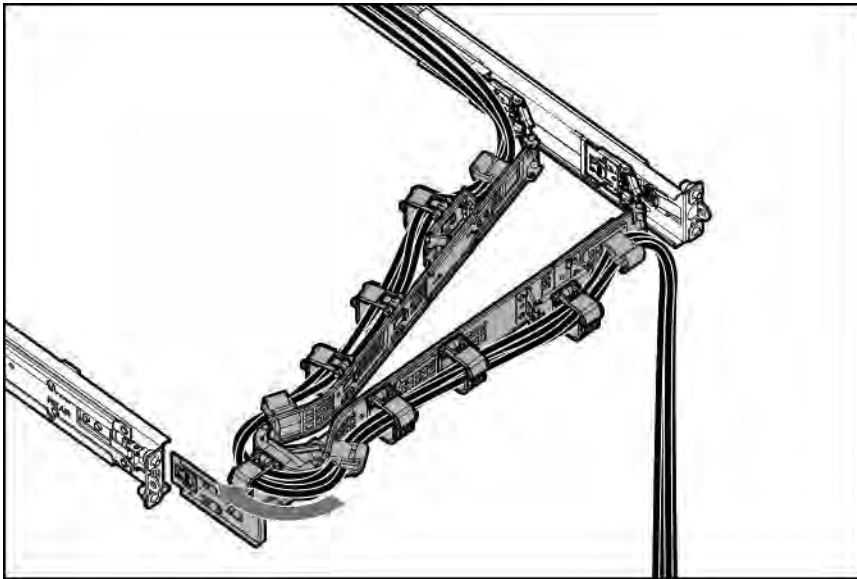


11. Install the type-p storage controller.
Make sure that the controller is seated firmly in the slot.



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. If removed, install the middle cover.
16. Install the access panel.
17. Install the server into the rack.
18. Connect all peripheral cables to the server.
19. Connect the power cords:
 - a. Connect each power cord to the server.
 - b. Connect each power cord to the power source.
20. If installed, close the cable management arm.



21. Power up the server.
22. Before using the controller for the first time, do the following:
 - Update the server firmware if they are not the latest revision
 - Configure the controller

The installation is complete.

Installing a type-o storage controller (OROC)

Prerequisites

- To enable the flash-backed write cache (FBWC) feature of a storage controller option, install an energy pack.
- Before you perform this procedure, make sure that you have the following items available:

- Compatible controller cable
- T-10 Torx screwdriver
- Spudger or any small prying tool

About this task

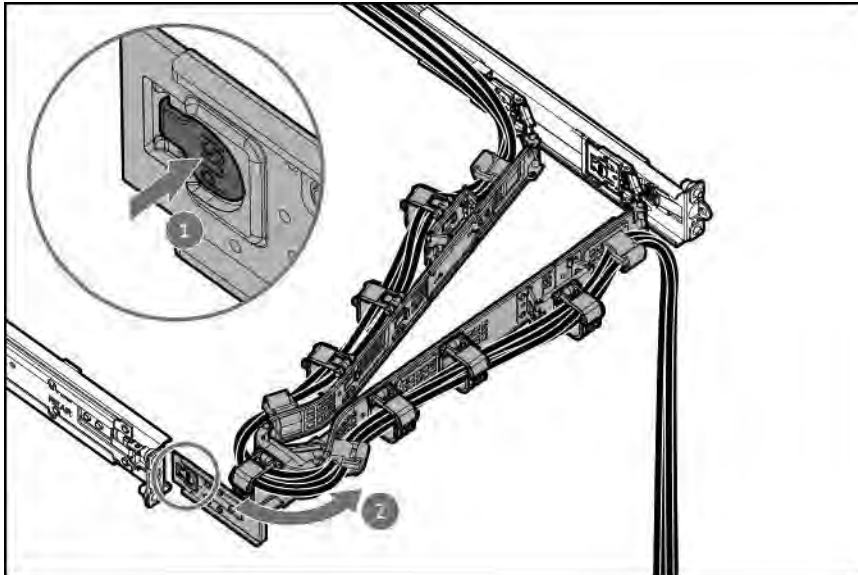
This server supports type-o storage controller installation in the OCP slot 22.

⚠ 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.

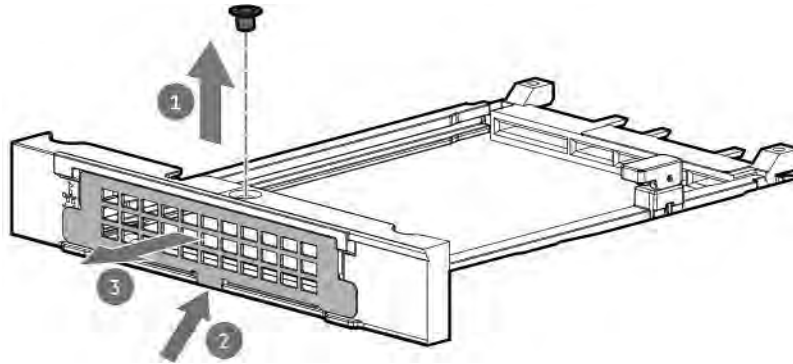


3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. Remove the server from the rack.
6. Place the server on a flat, level work surface.
7. Remove the access panel.
8. Remove the middle cover.
9. Do one of the following:

- Remove the secondary riser cage
- Remove the secondary riser cage blank

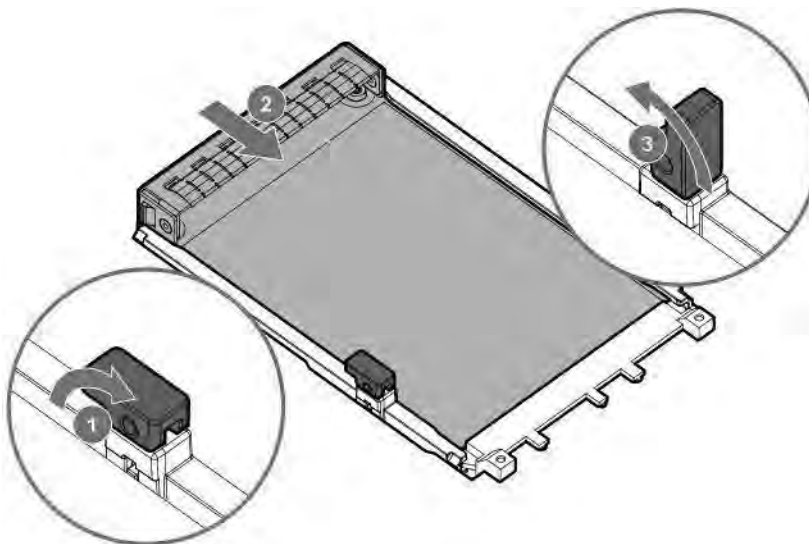
10. Remove the OCP slot blank:

- Remove the blank screw (callout 1).
 - Use a plastic spudger to pry the top side of the blank from the chassis (callout 2).
 - Remove the blank (callout 3).
- Retain the screw and blank for future use.

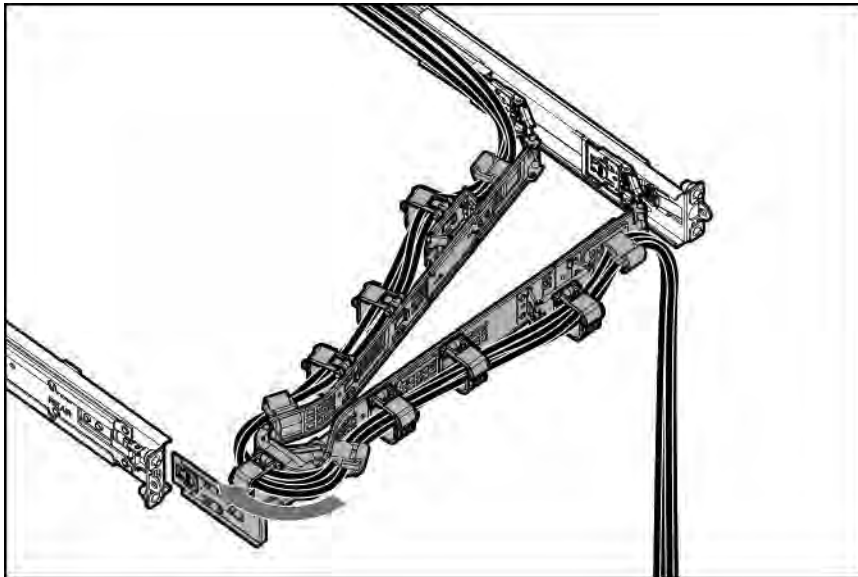


11. Install the type-o storage controller:

- Rotate the locking pin to the open (vertical) position (callout 1).
- Slide the controller into the bay until it clicks into place (callout 2).
Make sure that the controller is seated firmly in the slot.
- Rotate the locking pin to the close (horizontal) position (callout 3).



12. Do one of the following:
 - Install the secondary riser cage blank
 - Install the secondary riser cage
13. To enable the FBWC feature of the storage controller, install an energy pack.
14. Install the middle cover.
15. Install the access panel.
16. Install the server into the rack.
17. Connect all peripheral cables to the server.
18. Connect the power cords:
 - a. Connect each power cord to the server.
 - b. Connect each power cord to the power source.
19. If installed, close the cable management arm.



20. Power up the server.
21. Before using the controller for the first time, do the following:
 - Update the server firmware if they are not the latest revision
 - Configure the controller

The installation is complete.

Energy pack options

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

- [Smart Storage Battery](#)
- [Smart Storage Hybrid Capacitor](#)

One energy pack supports multiple devices. After it is installed, the status of the energy pack appears in iLO. For more information, see the iLO user guide:

Smart Storage Battery

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

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

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

Smart Storage Hybrid Capacitor

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

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

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

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

The capacitor pack is fully charged after the system boots.

Installing an energy pack

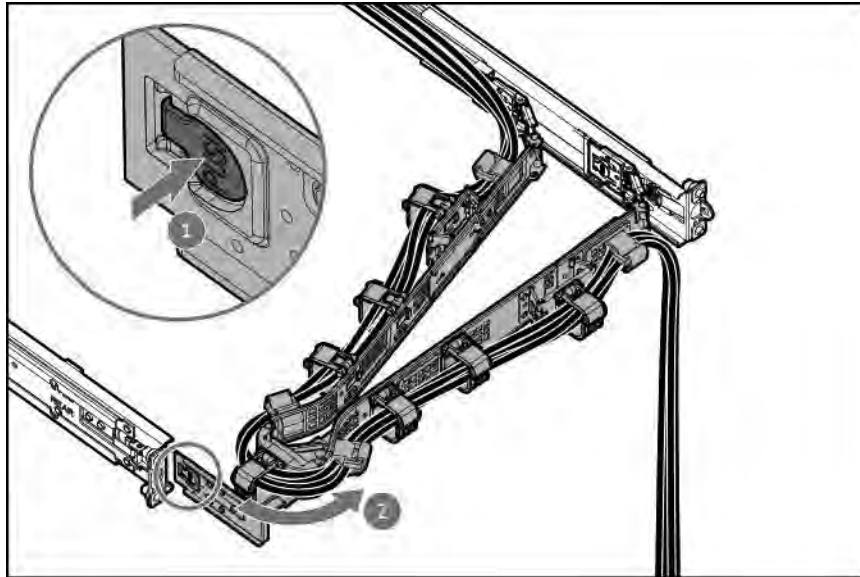
Prerequisites

Before you perform this procedure:

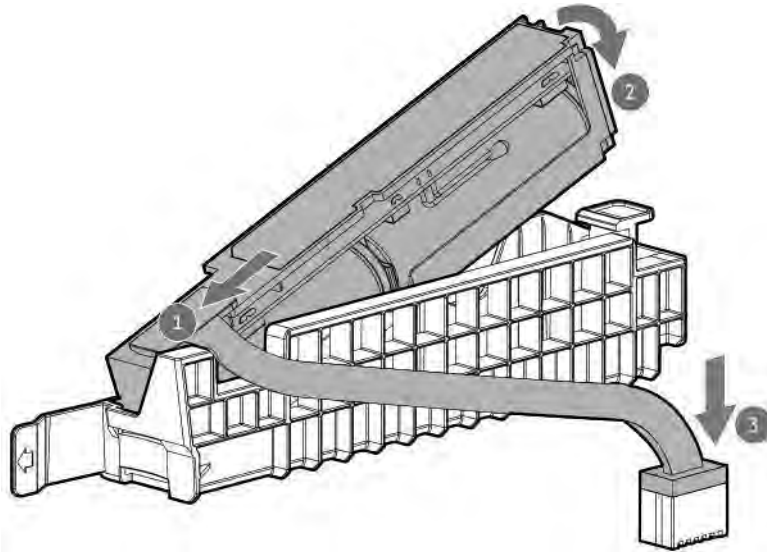
- Make sure that a SR/MR type-p or MR type-o storage controller is installed.
- Make sure that you have the following items available:
 - Storage controller backup power cable (ships with the storage controller)
 - Energy pack option

Procedure

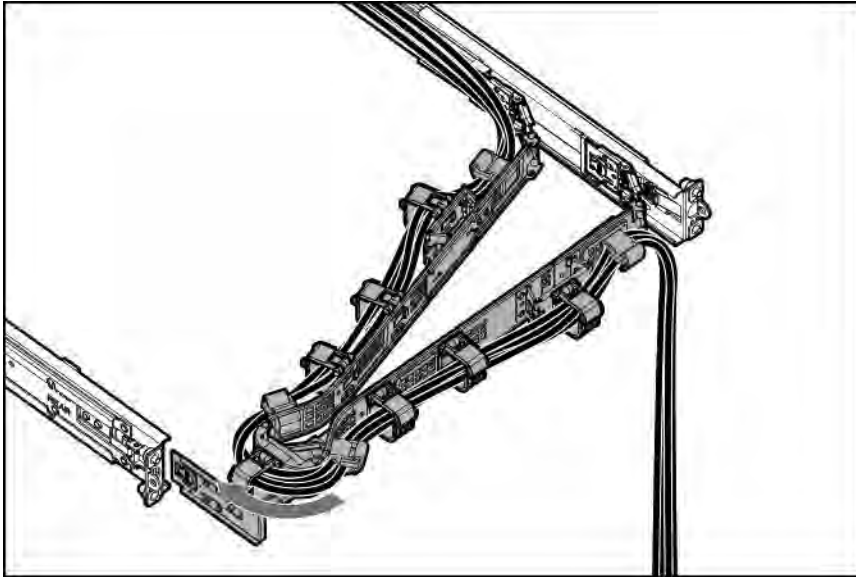
1. [Power down the server](#).
2. If installed, open the cable management arm.



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 energy pack:
 - a. Insert the energy pack at an angle (callout 1).
 - b. Push the energy pack down from other end (callout 2).
Make sure that the energy pack is locked in the holder.
 - c. Connect the energy pack cable (callout 3).



9. Install the access panel.
10. Install the server into the rack.
11. Connect all peripheral cables to the server.
12. Connect the power cords:
 - a. Connect each power cord to the server.
 - b. Connect each power cord to the power source.
13. If installed, close the cable management arm.



14. Power up the server.

The installation is complete.

Installing an energy pack on the chassis

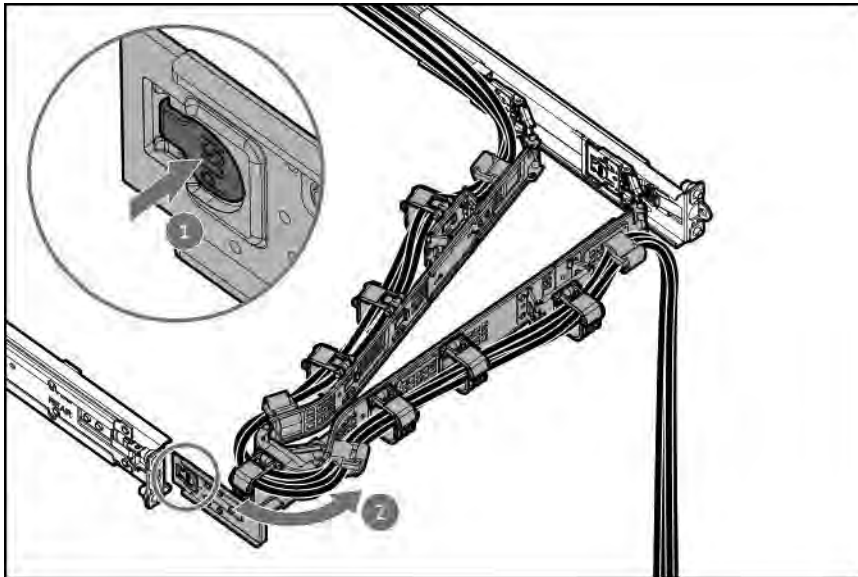
Prerequisites

Before you perform this procedure:

- Make sure that a SR/MR type-p or MR type-o storage controller is installed.
- Make sure that you have the following items available:
 - Storage controller backup power cable (ships with the storage controller)
 - Energy pack option
 - Energy pack extension power cable

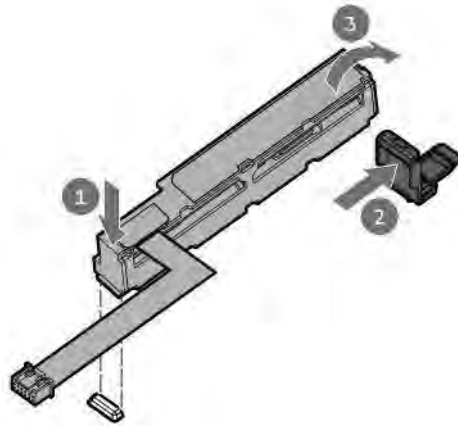
Procedure

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

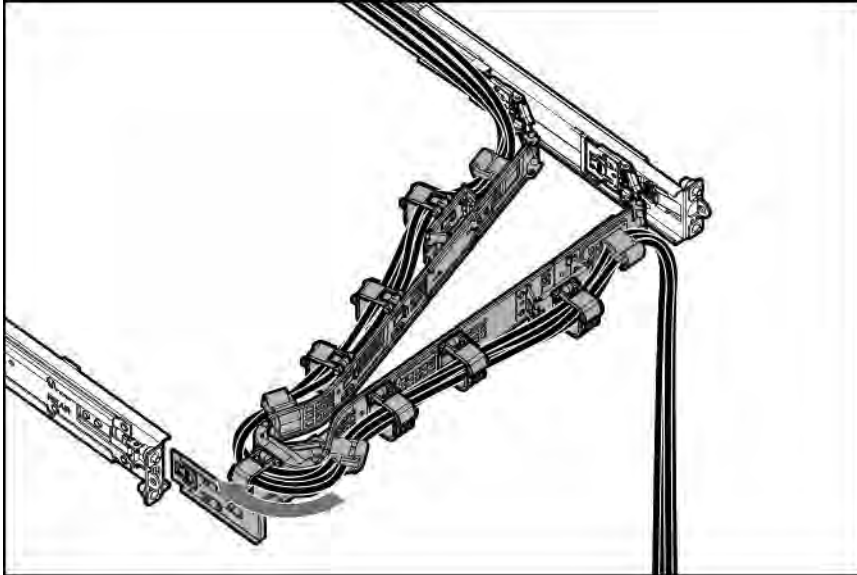


3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. Remove the server from the rack.
6. Place the server on a flat, level work surface.
7. Remove the access panel.
8. Install the energy pack:
 - a. Attach one end of energy pack on the chassis (callout 1).
 - b. Press and hold the retention latch (callout 2).
 - c. Pivot the energy pack downward and release the retention latch (callout 3).

Make sure that the energy pack is locked in the retention latch.



9. Connect the energy pack extension power cable to the system board and energy pack cable.
10. Install the access panel.
11. Install the server into the rack.
12. Connect all peripheral cables to the server.
13. Connect the power cords:
 - a. Connect each power cord to the server.
 - b. Connect each power cord to the power source.
14. If installed, close the cable management arm.



15. Power up the server.

The installation is complete.

Expansion card options

The server supports the installation of full-height, half-length, full-height, full-length (front GPU configuration) and half-height, half-length (low-profile) 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.


Installing the expansion card in the riser cage

Prerequisites

- Determine the fan requirement for the expansion option that you are installing.
- Before you perform this procedure, make sure that you have the following items available:
 - T-10 Torx screwdriver
 - Phillips No. 1 screwdriver

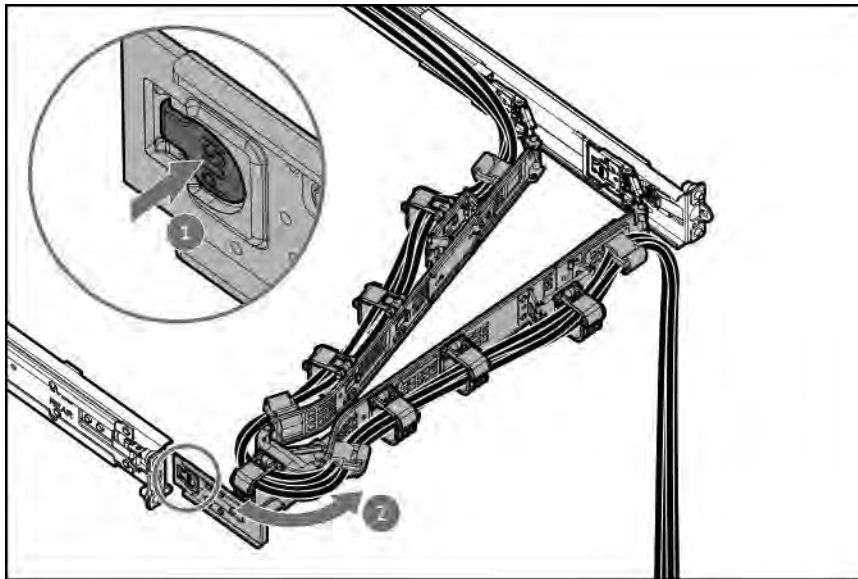
About this task

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

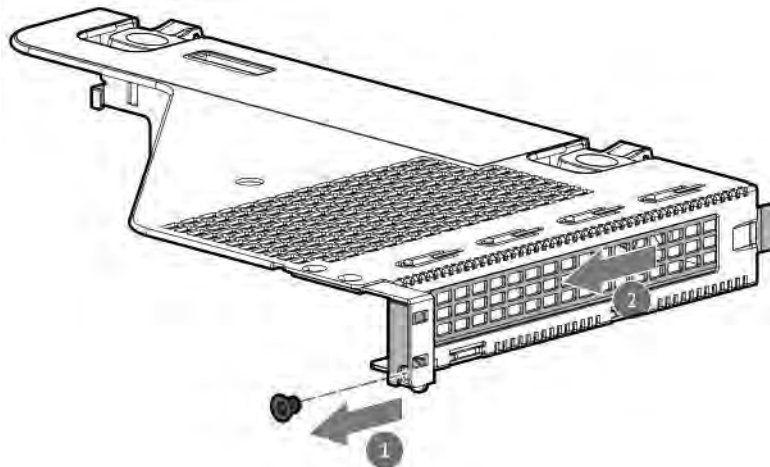
 **CAUTION:** A discharge of static electricity from a finger or other conductor might damage system boards or other static-sensitive devices. To prevent damage, observe antistatic precautions.

Procedure

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

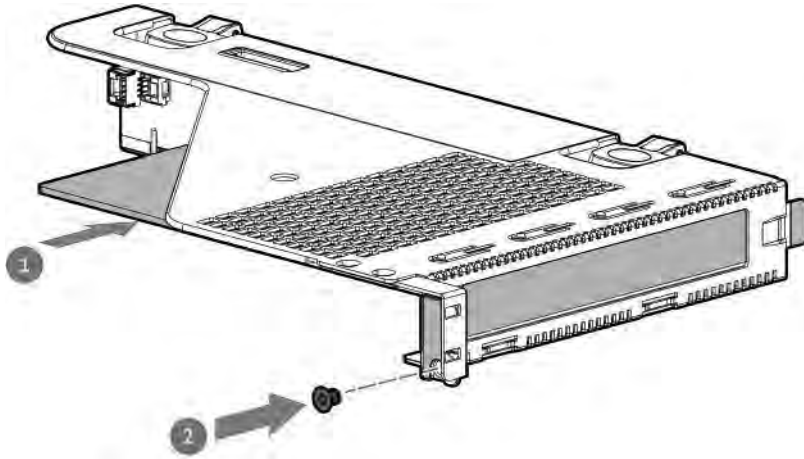


3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. Remove the server from the rack.
6. Place the server on a flat, level work surface.
7. Remove the access panel.
8. Remove the riser cage.
9. Remove the riser slot blank. Retain the screw and blank. The screw will be used to secure the new expansion card.

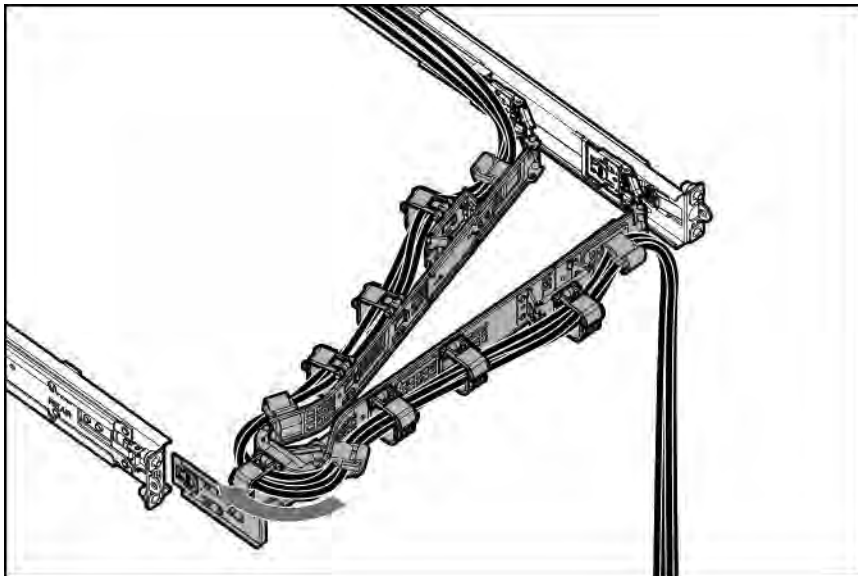


10. Make sure that any switches or jumpers on the expansion card are set properly. For more information, see the documentation that ships with the expansion card option.
11. Install the expansion card:

Make sure that the expansion card is seated firmly in the slot.



12. Connect all necessary internal cabling to the expansion card.
For more information on these cabling requirements, see the documentation that ships with the option.
13. Install the riser cage.
14. Install the access panel.
15. Install the server into the rack.
16. Connect all peripheral cables to the server.
17. Connect the power cords:
 - a. Connect each power cord to the server.
 - b. Connect each power cord to the power source.
18. If installed, close the cable management arm.



19. Power up the server.

The installation is complete.

Installing the expansion card in the NS204i-u + secondary low-profile riser cage

Prerequisites

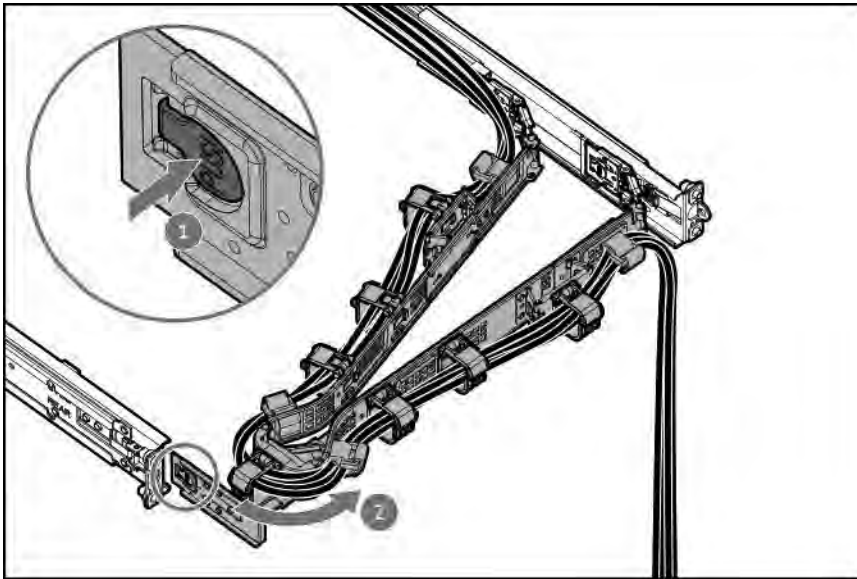
Before you perform this procedure, make sure that you have a T-10 Torx screwdriver available.

About this task

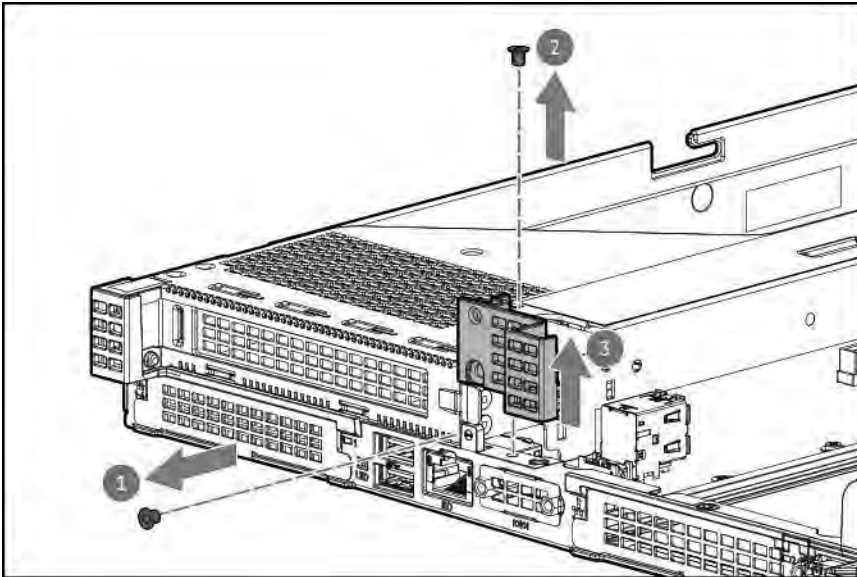
⚠ CAUTION: A discharge of static electricity from a finger or other conductor might damage system boards or other static-sensitive devices. To prevent damage, observe antistatic precautions.

Procedure

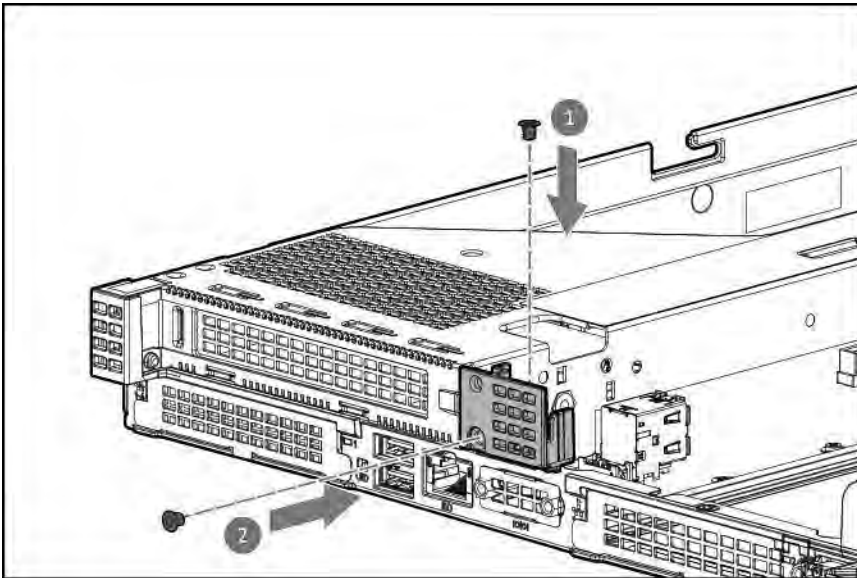
1. Power down the server.
2. If installed, open the cable management arm.



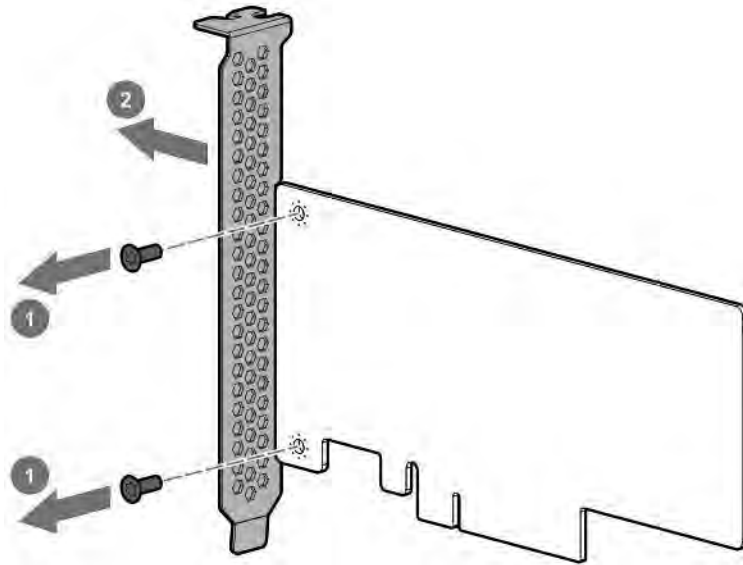
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. Remove the server from the rack.
6. Place the server on a flat, level work surface.
7. Remove the access panel.
8. Remove the secondary riser cage blank.
9. Remove the default secondary riser cage bracket.
Retain the screws and bracket. These screws will be used to secure the new NS204i + secondary low-profile riser cage bracket.



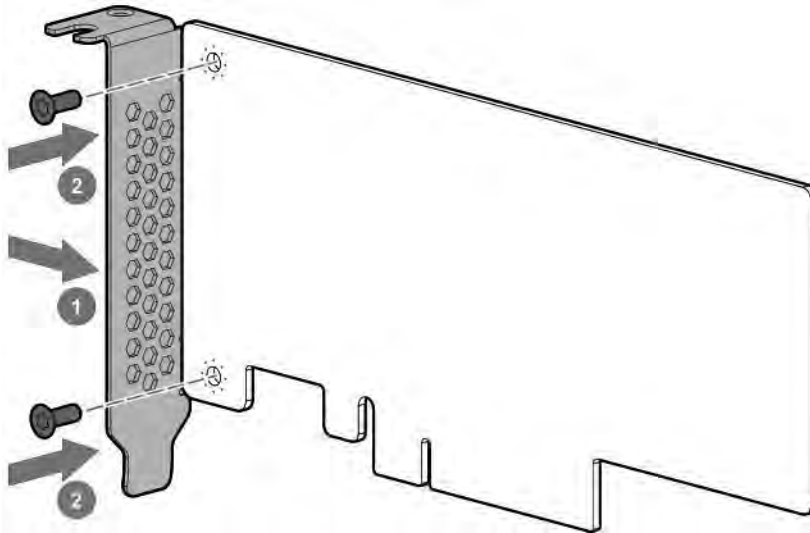
10. Install the NS204i + secondary low-profile riser cage bracket.



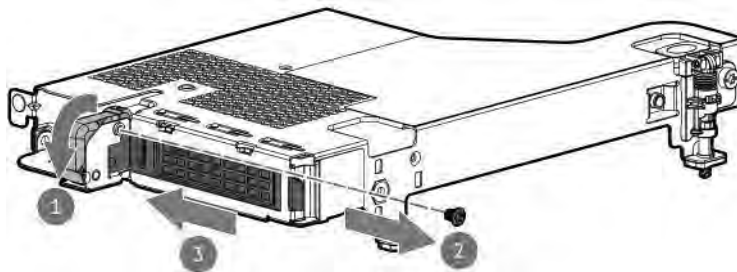
11. If installed, remove the full-height bracket from the expansion card.
Retain the screws and bracket. The screws will be used to secure the low-profile bracket on the expansion card.



12. Install the low-profile bracket on the expansion card.

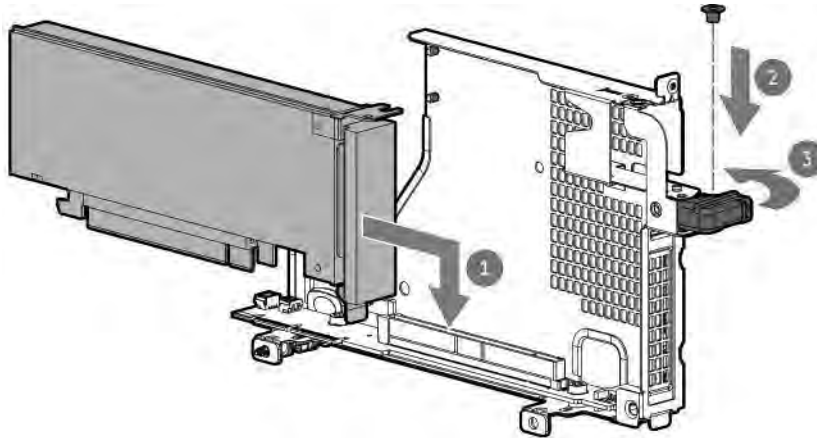


13. Remove the riser slot blank.
Retain the screw and blank. The screw will be used to secure the new expansion card.

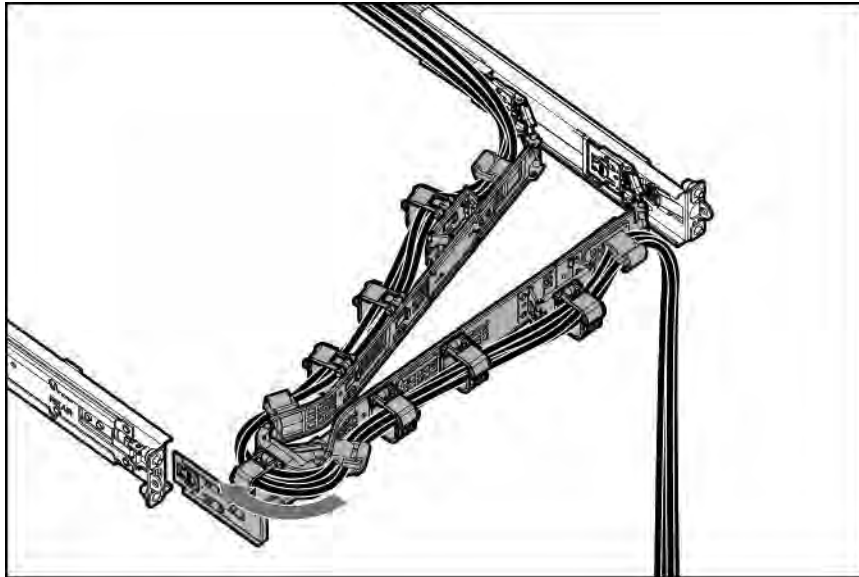


14. Install the expansion card:

- a. Pivot the NS204i-u + secondary low-profile riser cage and the riser slot is facing up.
- b. Install the expansion card (callouts 1 and 2).
Make sure that the expansion card is seated firmly in the slot.
- c. Close the retention latch (callout 3).



15. Connect all necessary internal cabling to the expansion card. For more information on these cabling requirements, see the documentation that ships with the option.
16. Installing the NS204i-u + secondary low-profile riser cage.
17. Install the access panel.
18. Install the server into the rack.
19. Connect all peripheral cables to the server.
20. Connect the power cords:
 - a. Connect each power cord to the server.
 - b. Connect each power cord to the power source.
21. If installed, close the cable management arm.



22. Power up the server.

The installation is complete.

NS204i Boot Device option

The NS204i-u boot device can be installed in the NS204i-u + secondary low-profile riser cage.

In a preconfigured server that ships with the NS204i boot device already installed in the riser cage, the accessory bag in the server box includes the security cover for the boot device. If you want to prevent hot-plug access to the SSDs on the boot device, install the security cover on the NS204i-u + secondary low-profile riser cage.

Note the following information about the NS204i Boot Device option:

- The NS204i-u G3 NVMe Hot Plug Boot Optimized Storage Device (NS204i-u) is a PCIe3 x4 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, therefore does not require configuration.
- This boot device is compatible with the following native OS:
 - Windows
 - Linux
 - VMware
- This boot device uses native inbox OS NVMe drivers.

Installing the NS204i Boot Device on the NS204i-u + secondary low-profile riser cage

Prerequisites

- Make sure that the server is updated with the latest operating system firmware and drivers.
- Identify the NS204i 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.

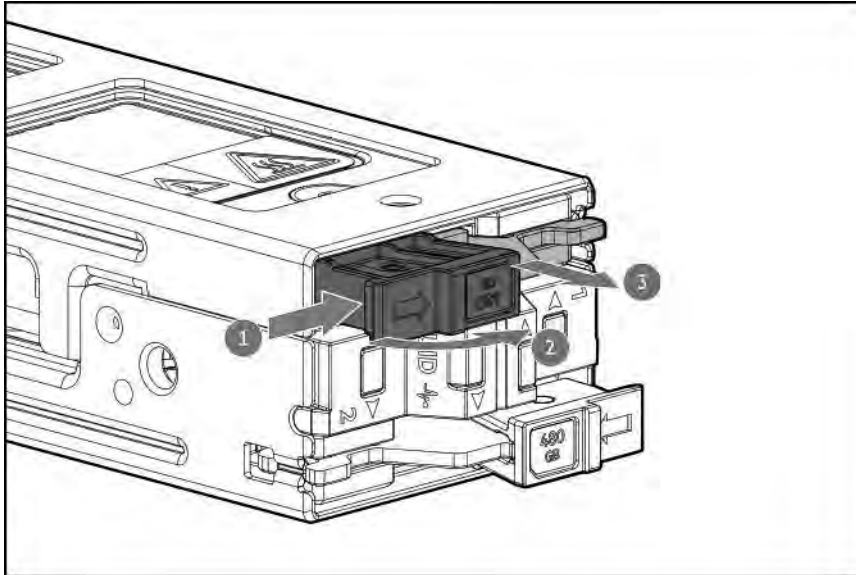
About this task

⚠ 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.

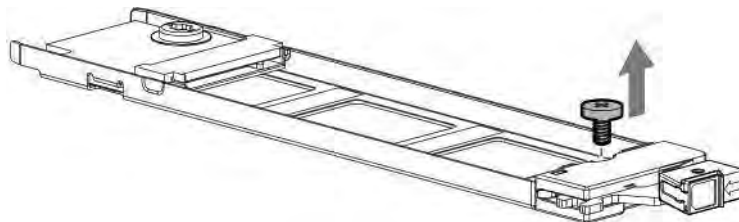
Procedure

Installing drives onto the boot device

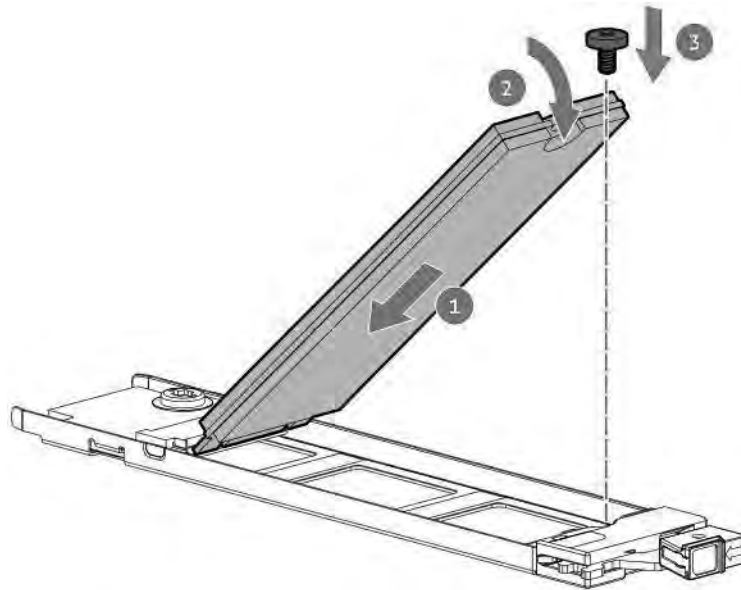
1. Remove the boot device carrier:
 - a. Press and hold the carrier latch (callout 1).
 - b. Pivot the latch to open (callout 2).
 - c. Slide the carrier out from the boot device cage (callout 3).



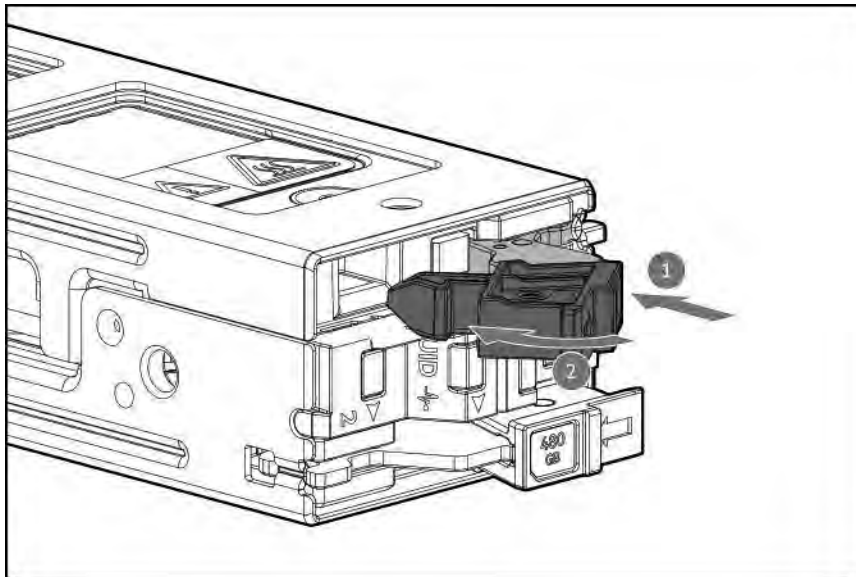
2. Install the SSDs on the boot device carrier:
 - a. Remove the SSD mounting screw.



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

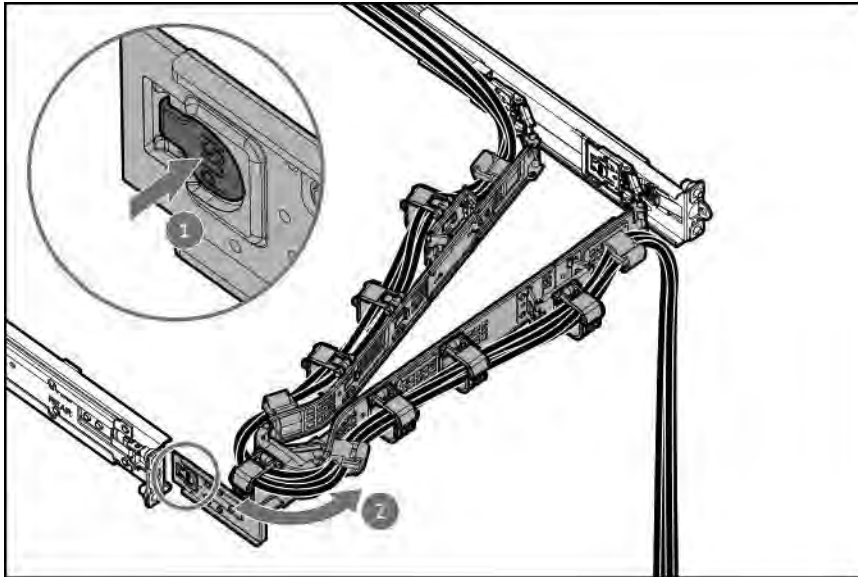


3. Install the boot device carriers:
 - a. If closed, pivot the carrier latch to open.
 - b. Slide the carrier into the boot device cage (callout 1).
 - c. Pivot the latch to close (callout 2).
Make sure that the carrier latch is locked on the boot device cage.

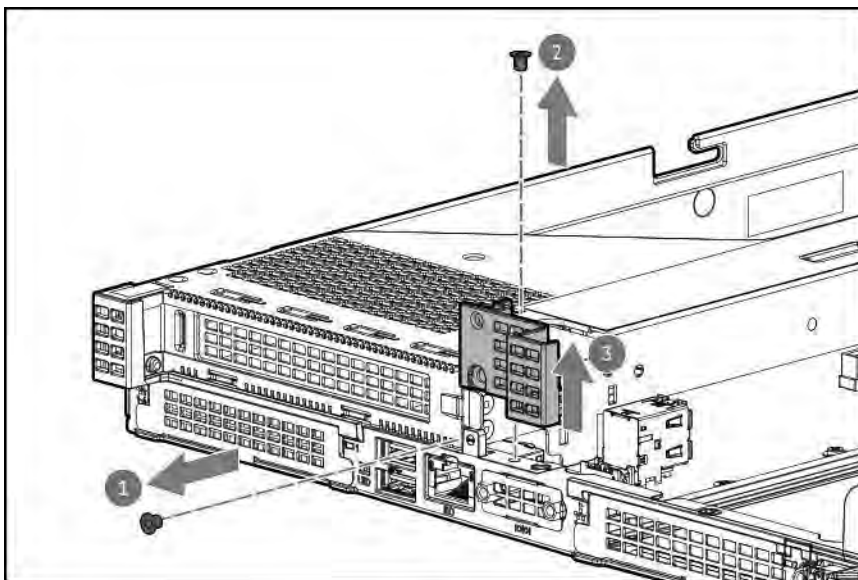


Installing the boot device

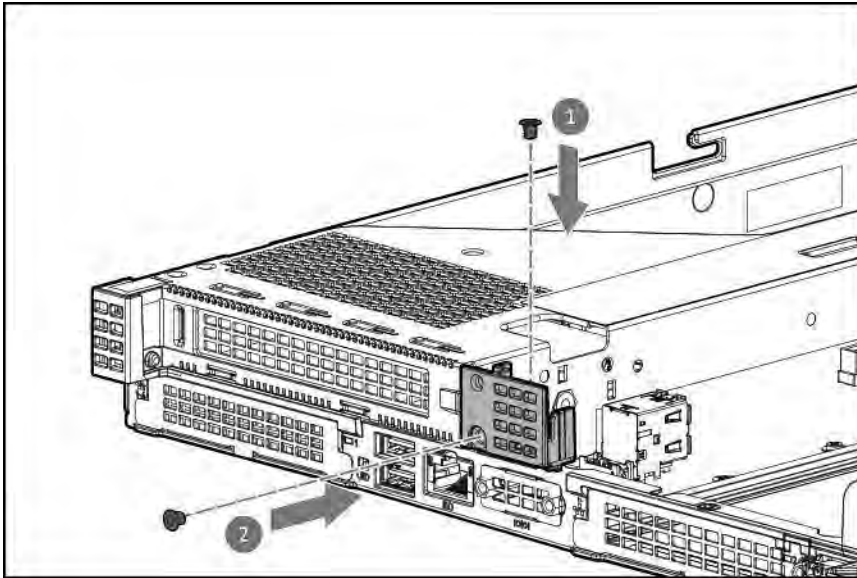
4. Power down the server.
5. If installed, open the cable management arm.



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 blank.
12. Remove the default secondary riser cage bracket.
Retain the screws and bracket. These screws will be used to secure the new NS204i + secondary low-profile riser cage bracket.

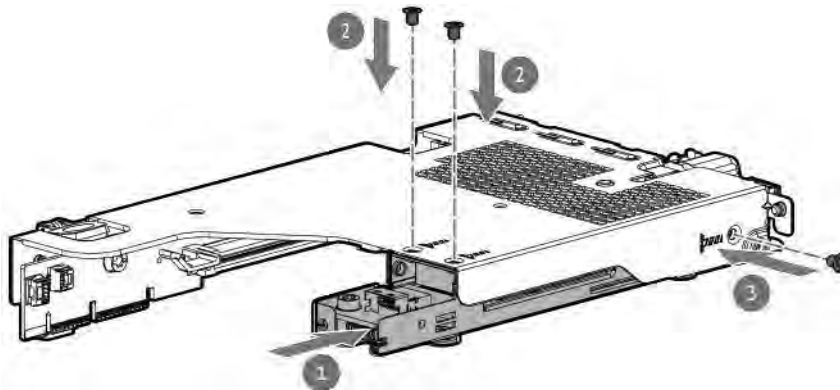


13. Install the NS204i + secondary low-profile riser cage bracket.

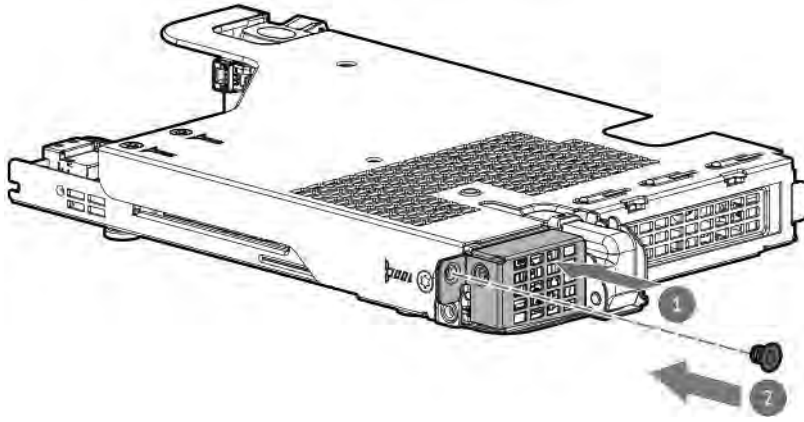


14. Install the boot device in the riser cage:

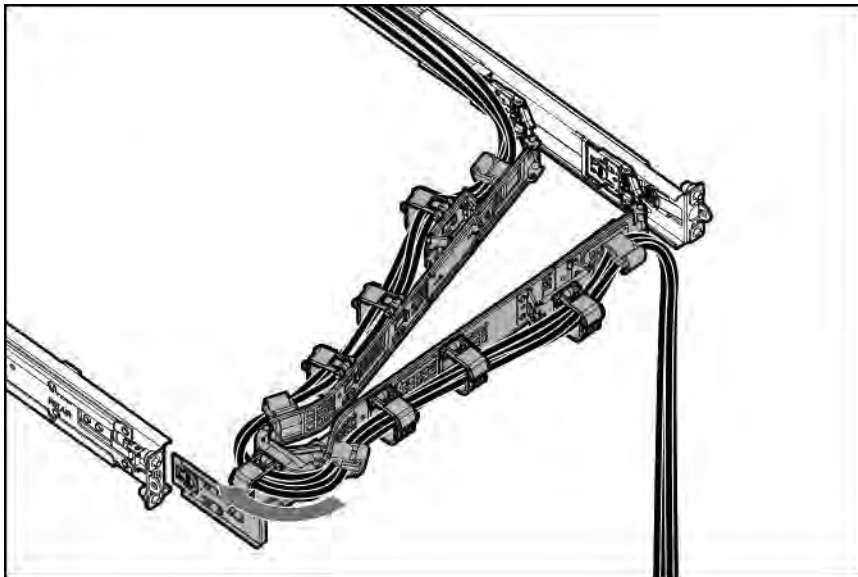
- a. Position the latch end of the boot device on the NS204 opening on the rear side of the riser cage (callout 1).
- b. Install the boot device screws (callouts 2 and 3).



15. Connect the signal and power cables to a boot device in the secondary riser cage.
16. To prevent hot-plug access to the SSDs on the boot device, install the security cover. After the security cover is installed, the hot-plug feature of the boot device is disabled.



17. Install the NS204i-u + secondary low-profile riser cage.
18. Connect the boot device signal and power cables to the system board.
19. Install the access panel.
20. Install the server into the rack.
21. Connect all peripheral cables to the server.
22. Connect the power cords:
 - a. Connect each power cord to the server.
 - b. Connect each power cord to the power source.
23. If installed, close the cable management arm.



24. Power up the server.
25. Verify the Online/Activity LEDs on the NS204i Boot Device are in solid green.

The installation is complete.

Installing the boot device security cover in a preconfigured server

Prerequisites

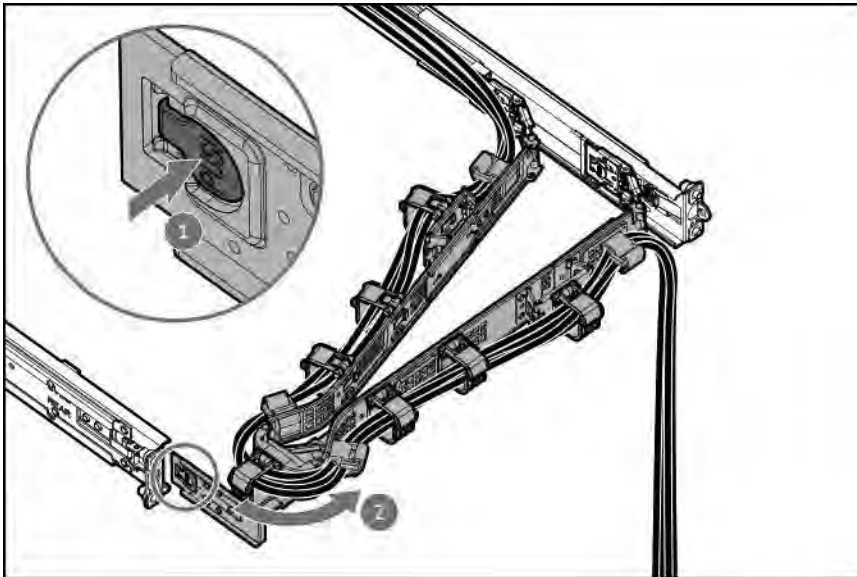
Before you perform this procedure, make sure that you have a T-10 Torx screwdriver available.

About this task

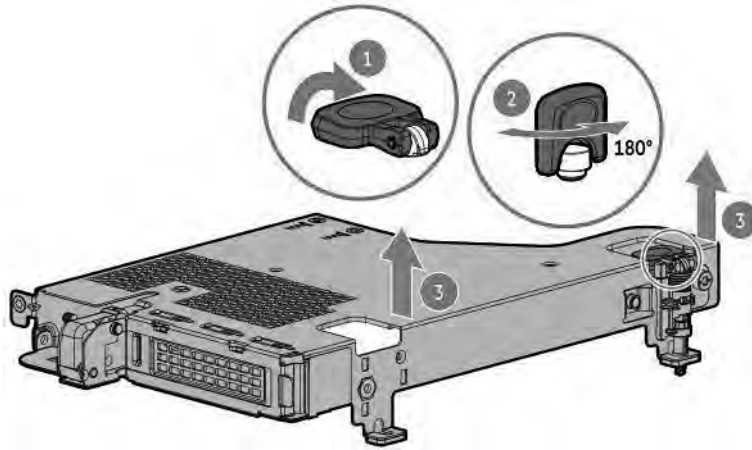
In a preconfigured server that ships with the boot device already installed in the NS204i-u + secondary low-profile riser cage, the accessory bag in the server box includes the security cover for the boot device. If you want to prevent hot-plug access to the SSDs on the boot device, install this security cover.

Procedure

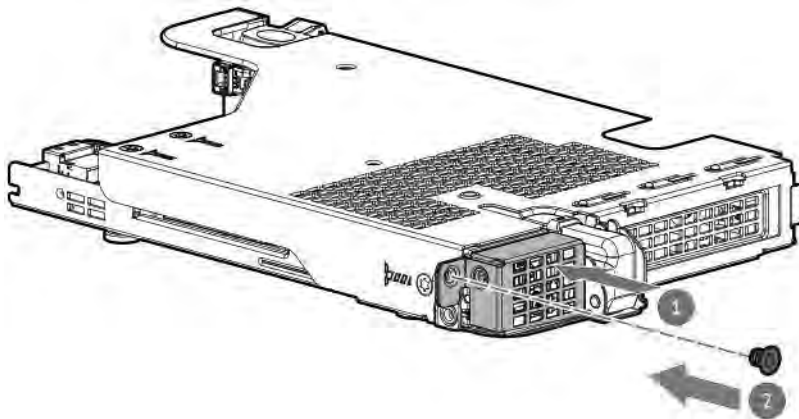
1. Back up all server data.
2. Power down the server.
3. If installed, open the cable management arm.



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. Remove the NS204i-u + secondary low-profile riser cage:
 - a. Release the half-turn spring latch (callouts 1 and 2).
 - b. Lift the riser cage off the system board (callout 3).

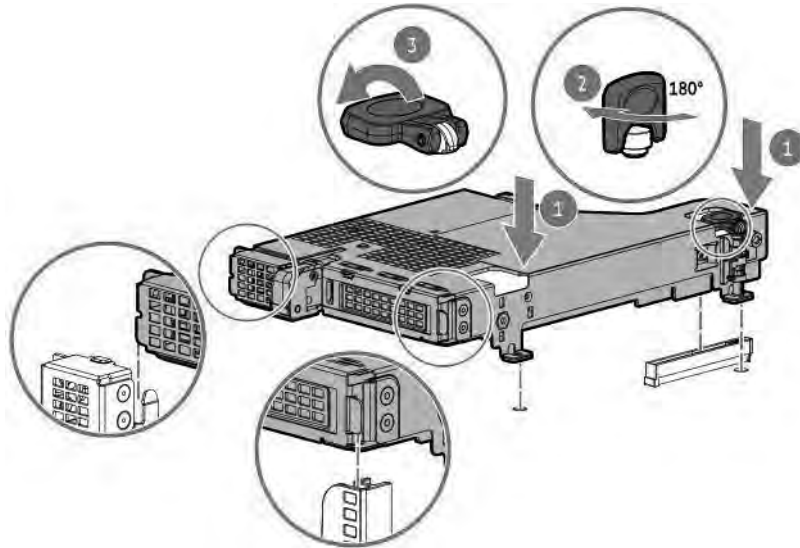


10. Install the security cover for the boot device.

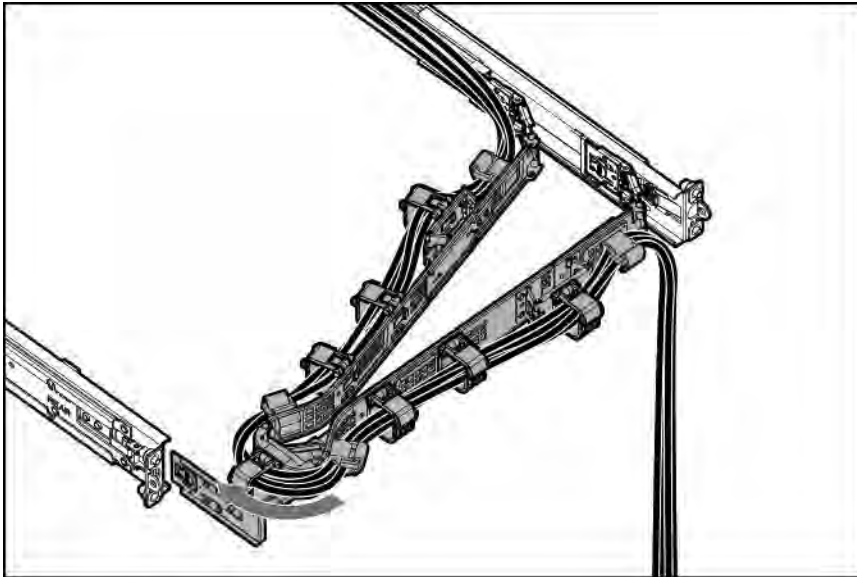


11. Install the NS204i-u + secondary low-profile riser cage:

- 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).



12. Install the access panel.
13. Install the server into the rack.
14. Connect all peripheral cables to the server.
15. Connect the power cords:
 - a. Connect each power cord to the server.
 - b. Connect each power cord to the power source.
16. If installed, close the cable management arm.



17. Power up the server.

The installation is complete.

M.2 SSD options

The server supports the installation of M.2 SATA and NVMe SSD options for:

- Booting up from flash solution
- Data backup/redundancy

In this server, M.2 SSD support is provided through the following options:

- [NS204i Boot Device](#)
- [M.2 SSD pass-through card](#)

Installing the M.2 SSD on the pass-through card

Prerequisites


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

- Phillips No. 1 screwdriver—This tool is required only if the M.2 SSDs are not preinstalled on the pass-through card.
- 1/4" slotted screwdriver
- [Identify the M.2 SSD pass-through card components](#)

About this task

The dual-slot M.2 SSD pass-through card option supports both SATA and NVMe SSDs in 2280 and 22110 form factors. Mixed SSD type installation is not supported.

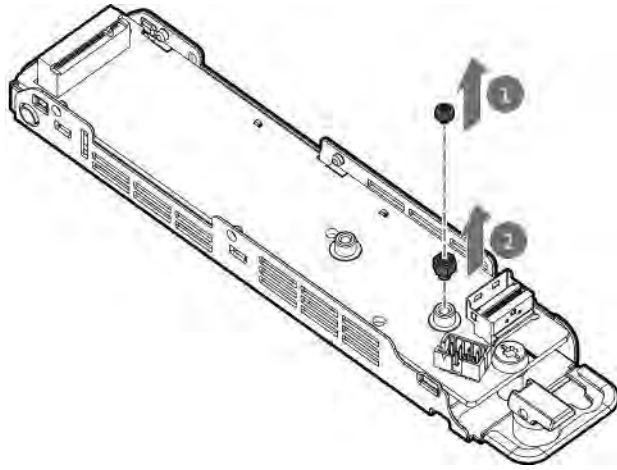
- If installing the NVMe SSD, connect the [P56691-001](#) signal cable to the system board.
- If installing the SATA SSD, connect the [P56690-001](#) signal cable to the system board.

 **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](#).

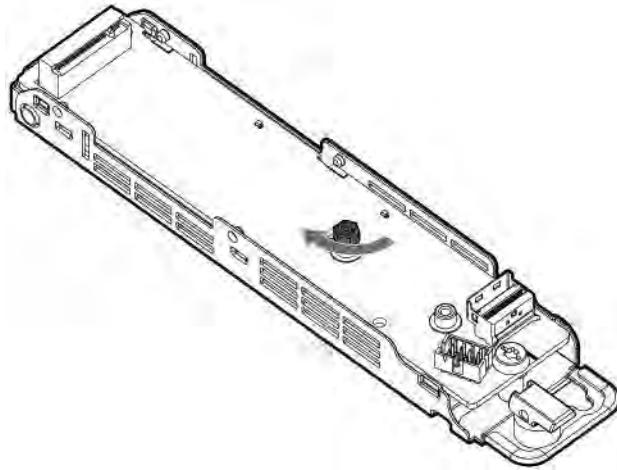
Procedure

Installing the M.2 SSD on the pass-through card

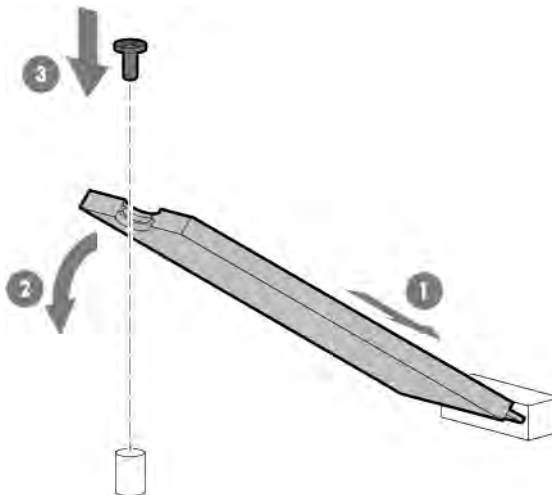
1. If you are installing M.2 2280 SSD on the pass-through card slot 1:
 - a. Remove the SSD mounting screw (callout 1) and the hex screw (callout 2) from the 22110 standoff. Retain the screws. These screws will be used to secure the M.2 2280 SSD.



b. Install the hex screw on the 2280 standoff.



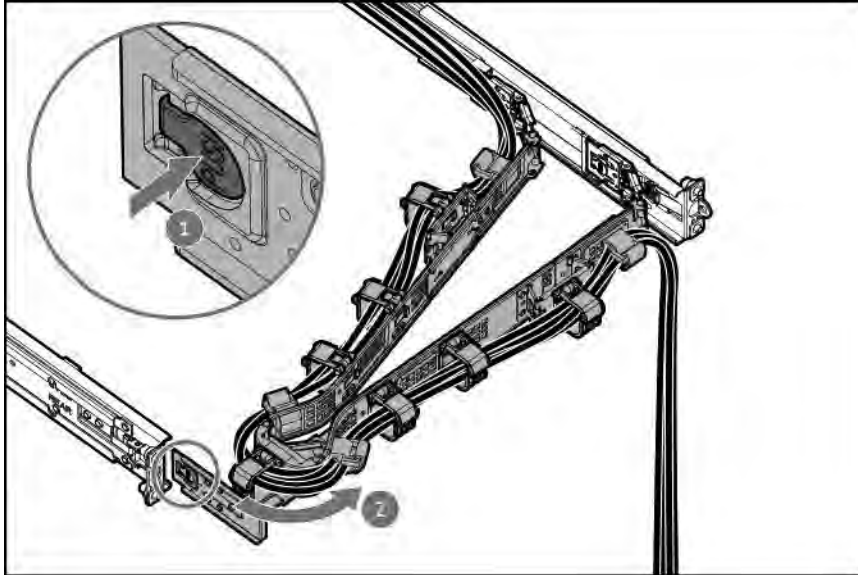
2. Insert the SSD into the M.2 slot at a 45° angle (callout 1).
3. Carefully press the SSD down to the horizontal position (callout 2).
4. Install the SSD mounting screw (callout 3).



5. If you are installing a second M.2 SSD, repeat steps 2–4 on the slot 2.

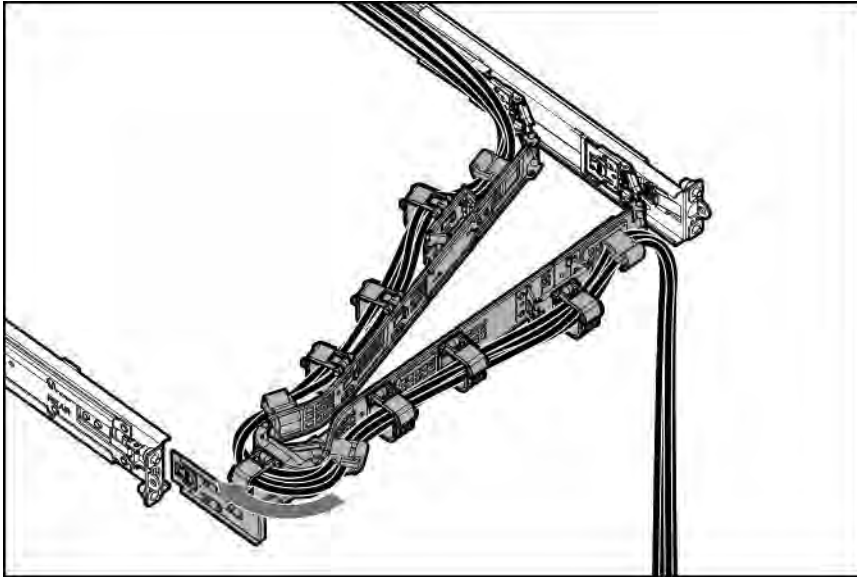
Installing the M.2 pass-through card

6. Power down the server.
7. If installed, open the cable management arm.



8. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
9. Disconnect all peripheral cables from the server.
10. Remove the server from the rack.
11. Place the server on a flat, level work surface.
12. Remove the access panel.
13. Install the M.2 SSD pass-through card.
14. Do the following:
 - If you are installing the NVMe SSD, connect the P56691-001 signal cable to the system board.
 - If you are installing the SATA SSD, connect the P56690-001 signal cable to the system board.
 - Connect the M.2 SSD pass-through power cable to the system board.
15. Install the access panel.
16. Install the server into the rack.
17. Connect all peripheral cables to the server.
18. Connect the power cords:

- a. Connect each power cord to the server.
 - b. Connect each power cord to the power source.
19. If installed, close the cable management arm.



20. Power up the server.

The installation is complete.

Installing the M.2 SSD pass-through card option

Prerequisites

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

- Phillips No. 1 screwdriver
- 1/4" slotted screwdriver

About this task

The dual-slot M.2 SSD pass-through card option supports both SATA and NVMe SSDs in 2280 and 22110 form factors.

- Mixed SSD type installation is not supported.
- Software RAID for M.2 NVMe SSDs is not supported. Use NVMe SSDs for storage only.

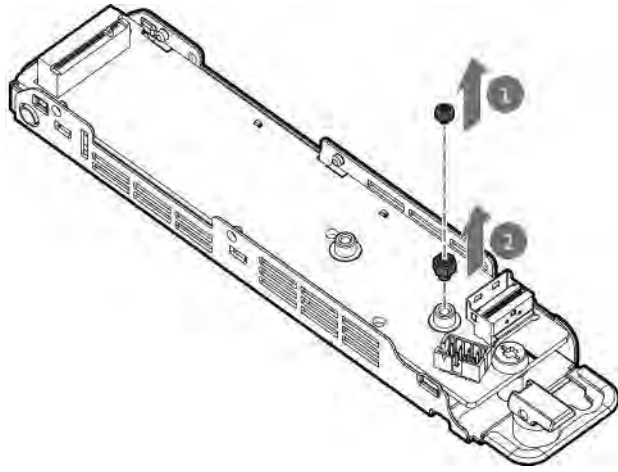
⚠ CAUTION: A discharge of static electricity from a finger or other conductor might damage system boards or other static-sensitive devices. To prevent damage, observe antistatic precautions.

Procedure

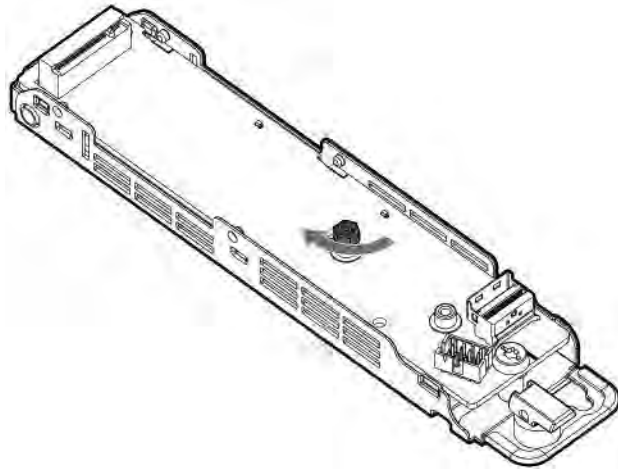
Installing the M.2 SSD on the pass-through card

1. If you are installing M.2 2280 SSD on the pass-through card slot 1:
 - a. Remove the SSD mounting screw (callout 1) and the hex screw (callout 2) from the 22110 standoff.

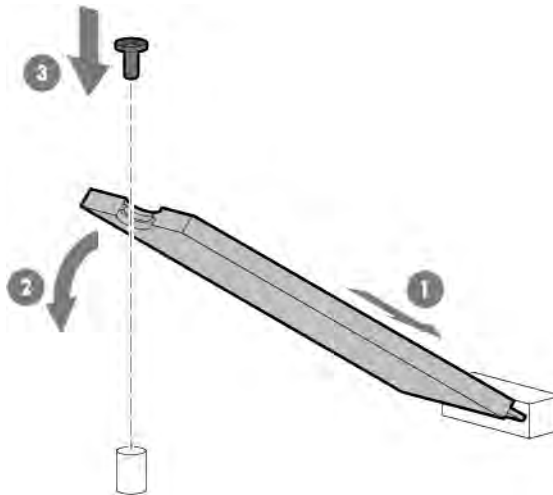
Retain the screws. These screws will be used to secure the M.2 2280 SSD.



b. Install the hex screw on the 2280 standoff.



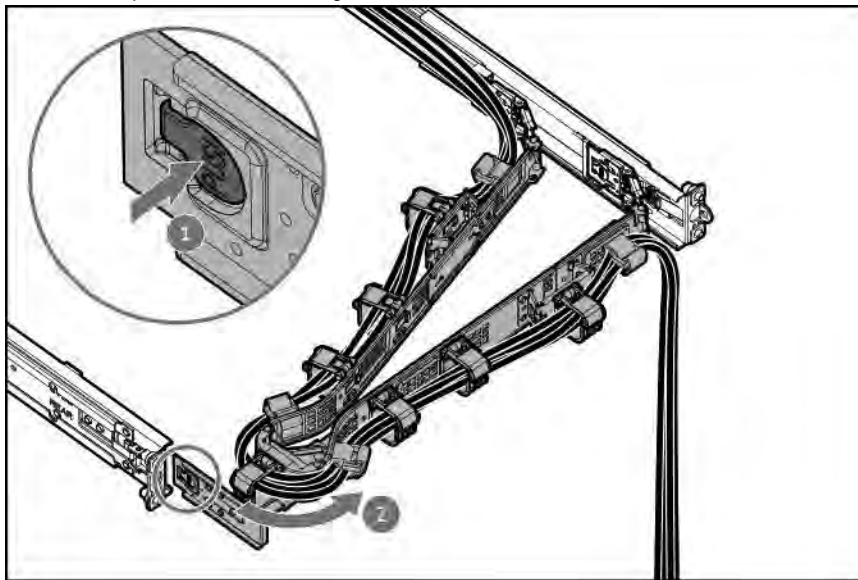
2. Insert the SSD into the M.2 slot at a 45° angle (callout 1).
3. Carefully press the SSD down to the horizontal position (callout 2).
4. Install the SSD mounting screw (callout 3).



5. If you are installing a second SSD, repeat steps 2–4 on the slot 2.

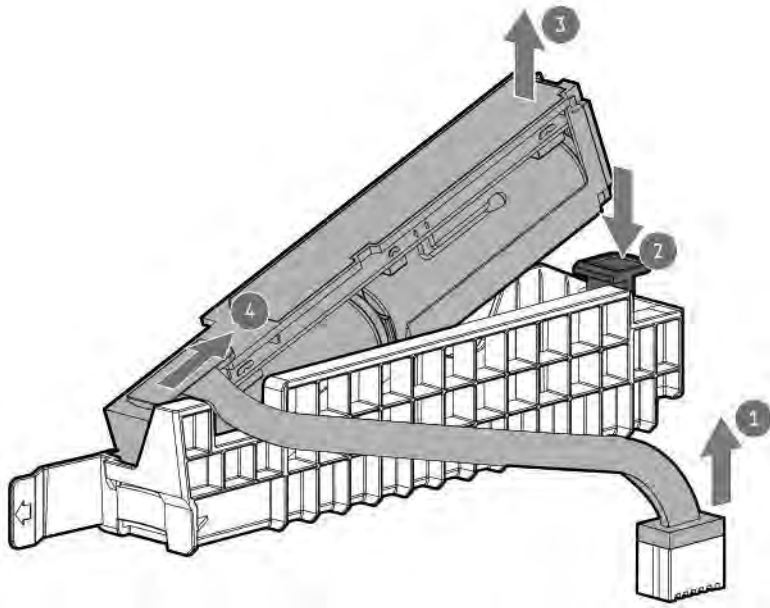
Installing the M.2 pass-through card

6. Power down the server.
7. If installed, open the cable management arm.

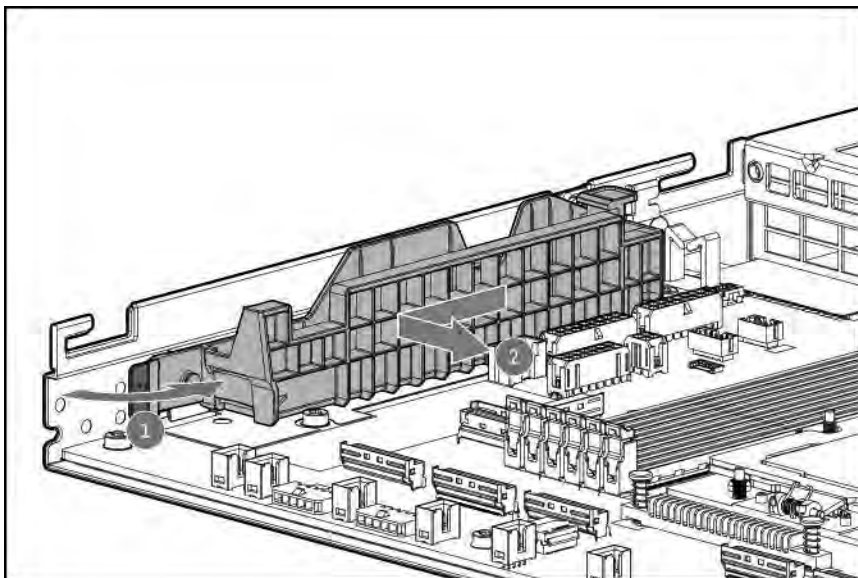


8. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
9. Disconnect all peripheral cables from the server.
10. Remove the server from the rack.
11. Place the server on a flat, level work surface.
12. Remove the access panel.
13. Remove the middle cover.

14. To remove the energy pack from the holder, do the following:
 - a. Disconnect the cable (callout 1).
 - b. Press and hold the release latch (callout 2).
 - c. Lift one end of the energy pack and release it from the holder (callouts 3 and 4).



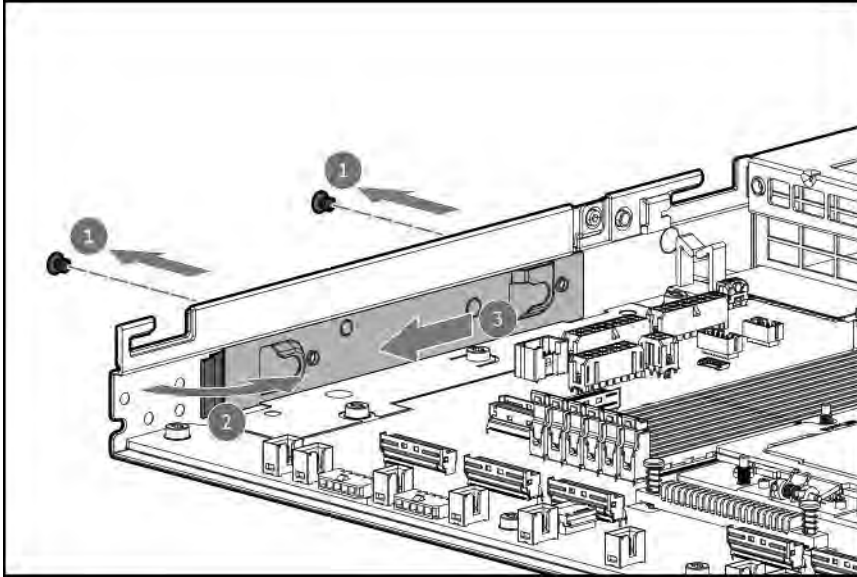
15. Remove the energy pack holder:
 - a. Pull and hold the release latch on the holder (callout 1).
 - b. Pull the holder towards the front panel to disengage from chassis (callout 2).



16. Remove the energy pack bracket:
 - a. Remove screws for the chassis (callout 1).

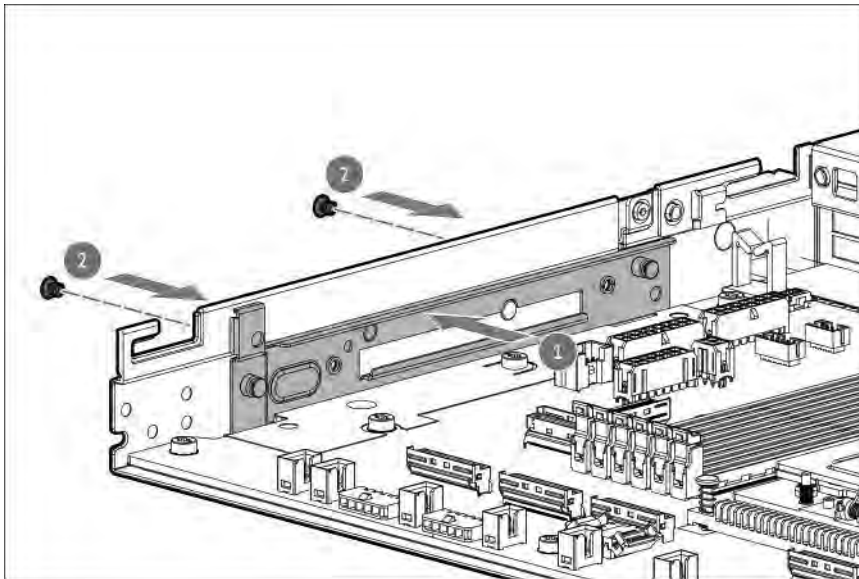
Retain the screws. These screws will be used to secure the M.2 pass-through card assembly bracket.

- b. Press and hold the latch on the bracket (callout 2).
- c. Pull the bracket to detach from the chassis (callout 3).



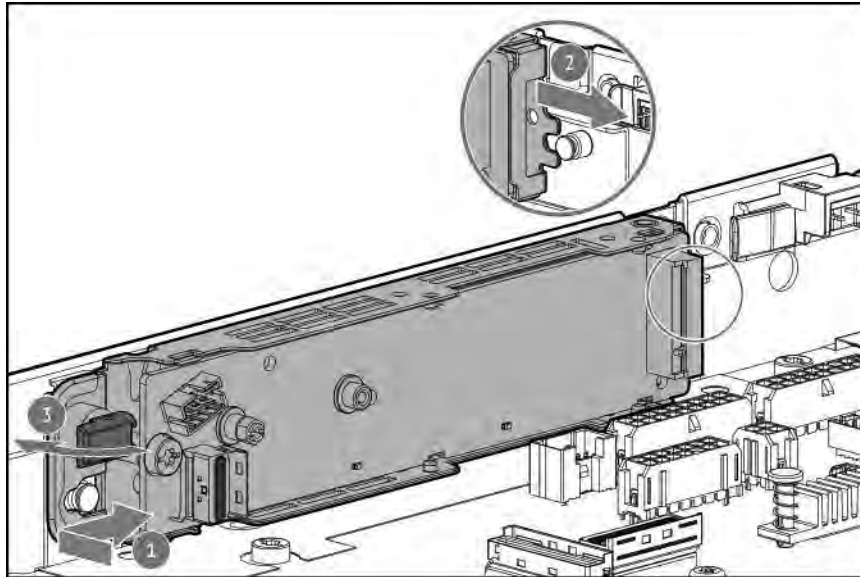
17. Install the M.2 pass-through card assembly bracket:

- a. Attach the bracket on the chassis (callout 1).
- b. Secure the bracket (callout 2).

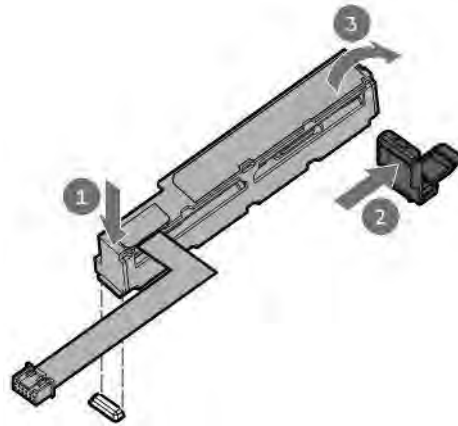


18. Install the M.2 pass-through card assembly:

- a. With the retaining latch in the open position, insert the spool on the side of the chassis through the notch on the card bracket (callout 1).
- b. Slide the pass-through card assembly towards the rear panel (callout 2).
- c. Close the retaining latch (callout 3).

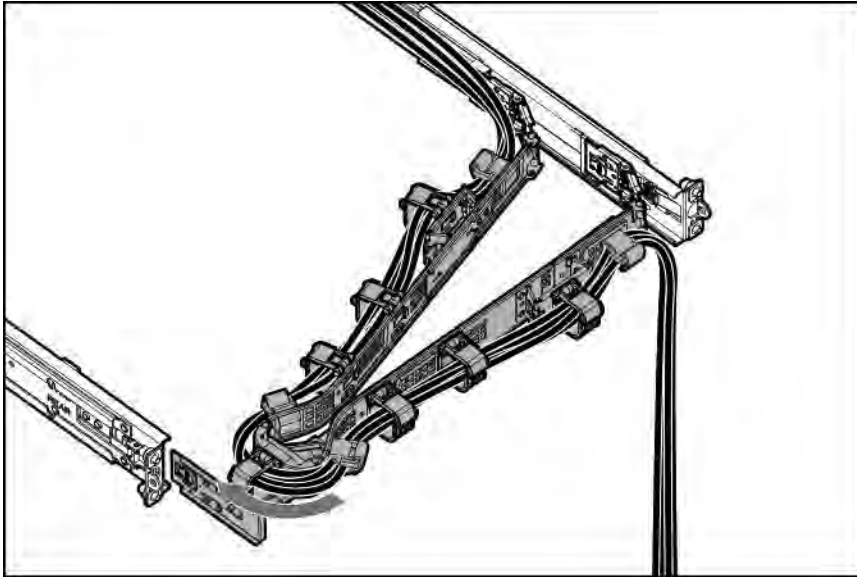


19. Connect the power and signal cables to the M.2 SSD pass-through card.
20. Install the energy pack:
 - a. Attach one end of energy pack on the chassis (callout 1).
 - b. Press and hold the retention latch (callout 2).
 - c. Pivot the energy pack downward and release the retention latch (callout 3).
Make sure that the energy pack is locked in the retention latch.



21. Connect the energy pack extension power cable to the system board and energy pack cable.
22. Install the middle cover.
23. Install the access panel.
24. Install the server into the rack.
25. Connect all peripheral cables to the server.
26. Connect the power cords:

- a. Connect each power cord to the server.
 - b. Connect each power cord to the power source.
27. If installed, close the cable management arm.



28. 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



Review following OCP slot population rules with different heatsink options before installation:

- Server with standard or high performance heatsink installed

Slot number	Supported hardware components
Slot 21 OCP PCIe5 x8 ¹	OCP NIC adapter
Slot 22 OCP PCIe5 x8	<ul style="list-style-type: none"> ◦ Type-o storage controller ◦ Dual-port ≤10/25 GbE OCP NIC adapter

¹ When installing the first OCP NIC 3.0 adapter, always install in Slot 21.

- Server with liquid cooling heatsink installed

Slot number	Supported hardware components
Slot 21 OCP PCIe5 x8 ¹	Dual-port or quad-port less than 100 GbE OCP NIC adapter
Slot 22 OCP PCIe5 x8	<ul style="list-style-type: none">◦ Type-o storage controller◦ Dual-port ≤10/25 GbE OCP NIC adapter


¹ When installing the first OCP NIC 3.0 adapter, always install in Slot 21.


Installing the OCP NIC 3.0 adapter

Prerequisites

- Review the [OCP slot population rules](#)
- Before you perform this procedure, make sure that you have the following items available:
 - T-10 Torx screwdriver
 - Spudger or any small prying tool
- If you are installing an OCP NIC 3.0 x16 adapter in the Slot 21, the [OCP bandwidth upgrade cable](#) is required.

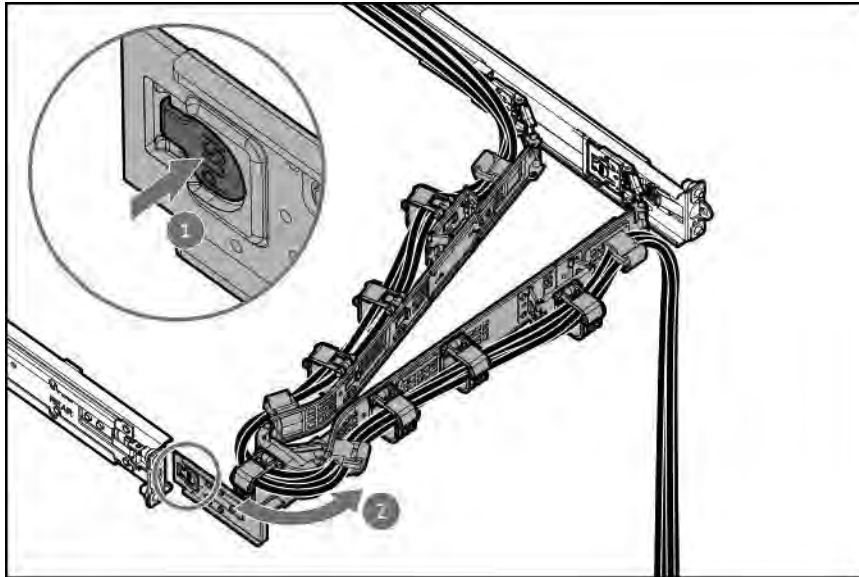
About this task

 **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](#).

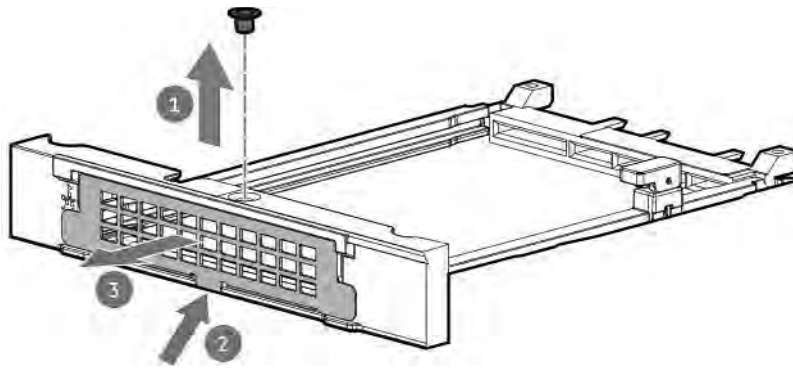
 **CAUTION:** The port blank provides EMI shielding and helps maintain proper thermal status inside the server. Do not operate the server when a port blank is removed without the corresponding I/O port option installed.

Procedure

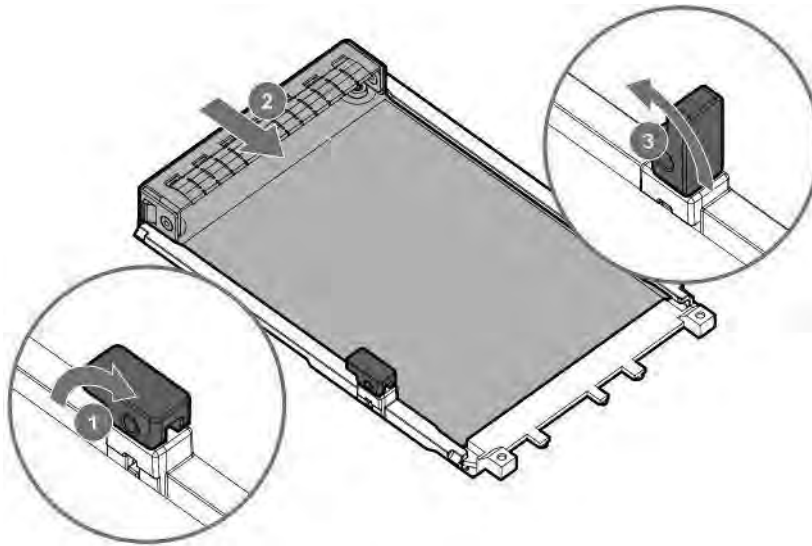
1. [Power down the server](#).
2. If installed, open the cable management arm.



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. To install an OCP NIC adapter in the Slot 21, remove the primary riser cage.
9. To install an OCP NIC adapter in the Slot 22, remove one of the following:
 - Secondary riser cage blank
 - Secondary riser cage
10. Remove the OCP slot blank:
 - a. Remove the blank screw (callout 1).
 - b. Use a plastic spudger to pry the top side of the blank from the chassis (callout 2).
 - c. Remove the blank (callout 3).
Retain the screw and blank for future use.

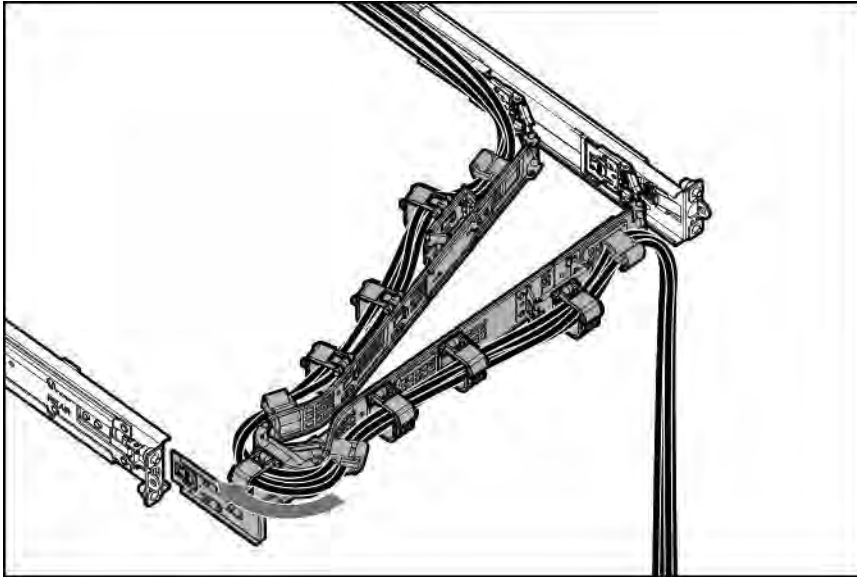


11. Install the OCP NIC 3.0 adapter:
 - a. Rotate the locking pin to the open (vertical) position (callout 1).
 - b. Slide the adapter into the bay until it clicks into place (callout 2).
Make sure that the adapter is seated firmly in the slot.
 - c. Rotate the locking pin to the close (horizontal) position (callout 3).



12. If removed, install one of the following:
 - Primary / secondary riser cage
 - Secondary riser cage blank
13. Install the access panel.
14. Install the server into the rack.
15. Connect all peripheral cables to the server.
16. Connect the power cords:

- a. Connect each power cord to the server.
 - b. Connect each power cord to the power source.
17. If installed, close the cable management arm.



18. Power up the server.

The installation is complete.

Heatsink options

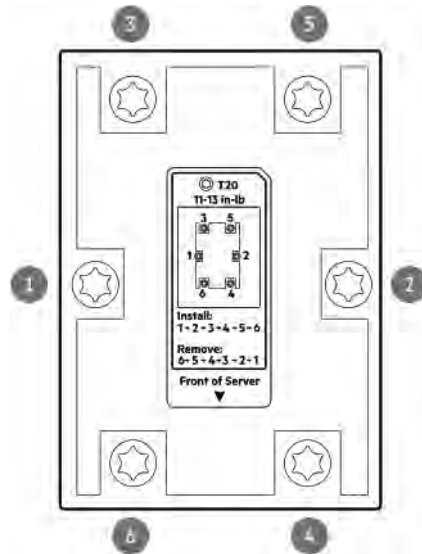
Before proceed the heatsink installation, observer all following:

- Identify the heatsink screw numbering and the orientation on the heatsink label
- Review the heatsink cautions
- Review the Fan and heatsink requirements

Heatsink label and screws

Before installing or removing a heatsink, observe the following on the heatsink label:

- Identify heatsink screw number from 1 to 6.



- When loosening 6 heatsink screws, start from 6 to 1.
- When tightening 6 heatsink screws, start from 1 to 6.
- Verify Front of Server arrow on the heatsink label pointed to the fan and drive backplane.

Heatsink cautions

-
- ⚠ **CAUTION:** Do not overtighten the captive screws on the heatsink. Use a T-20 that is preset to a torque between 1.24 N-m (11 lbf-in) to 1.47 N-m (13 lbf-in) or an adjustable torque screwdriver set to a torque between 1.24 N-m (11 lbf-in) to 1.47 N-m (13 lbf-in).
-
- ⚠ **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:** The heatsink thermal interface media is not reusable and must be replaced if the heatsink is removed from the processor after it has been installed.

Installing the high performance heatsink

Prerequisites

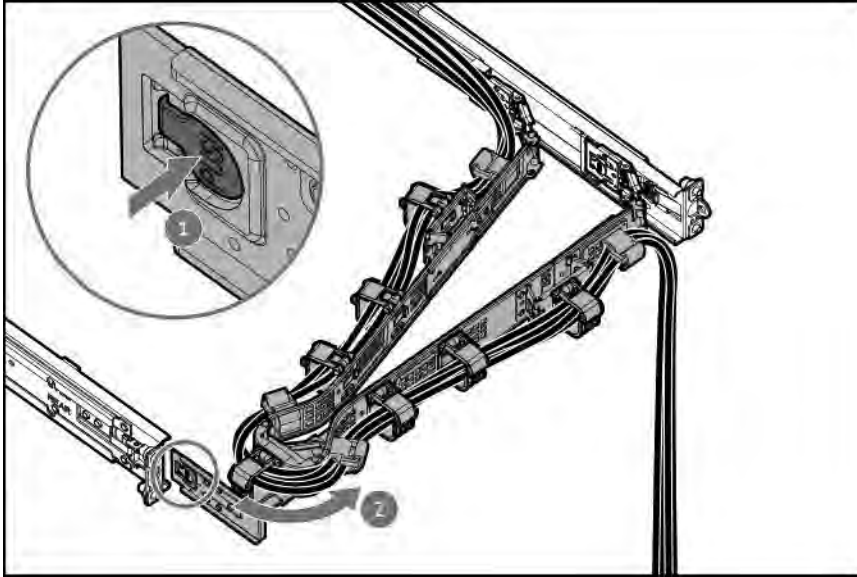
- Identify the heatsink screw numbering on the heatsink label.
- Observe the tightening and loosening heatsink screws sequence specify on the heatsink label.
- If a processor TDP between 260 W to 300 W is installed, the high performance heatsink and high performance fans are required.
- Before you perform this procedure, make sure that you have the following items available:
 - T-20 Torx screwdriver
 - Alcohol wipe

About this task

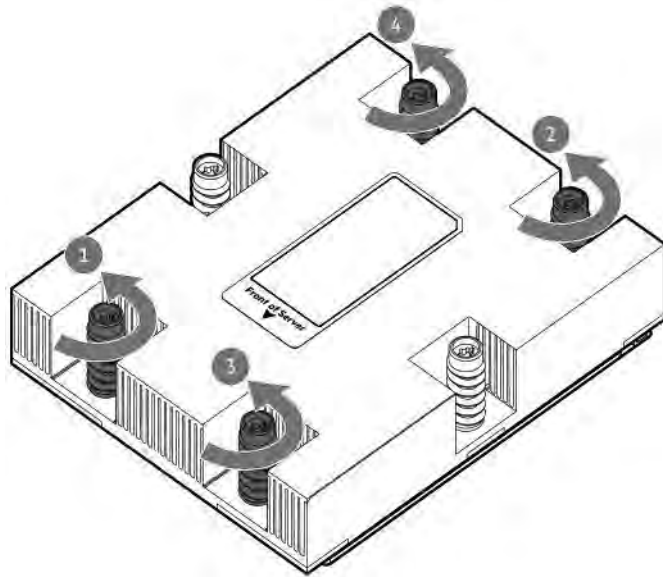
- ⚠ CAUTION:** A discharge of static electricity from a finger or other conductor might damage system boards or other static-sensitive devices. To prevent damage, observe antistatic precautions.

Procedure

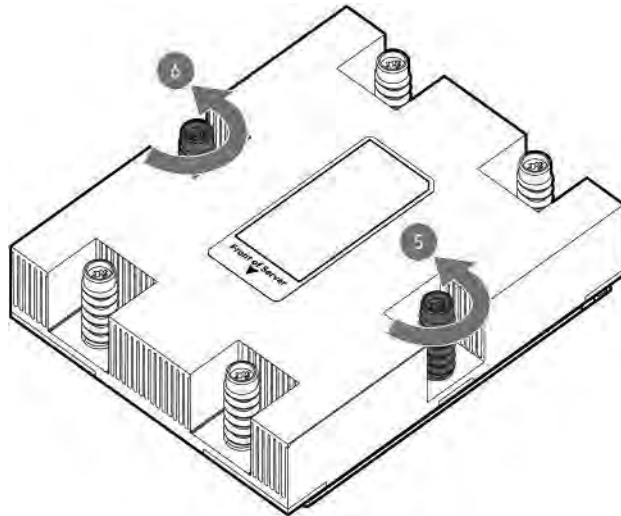
1. Power down the server.
2. If installed, open the cable management arm.



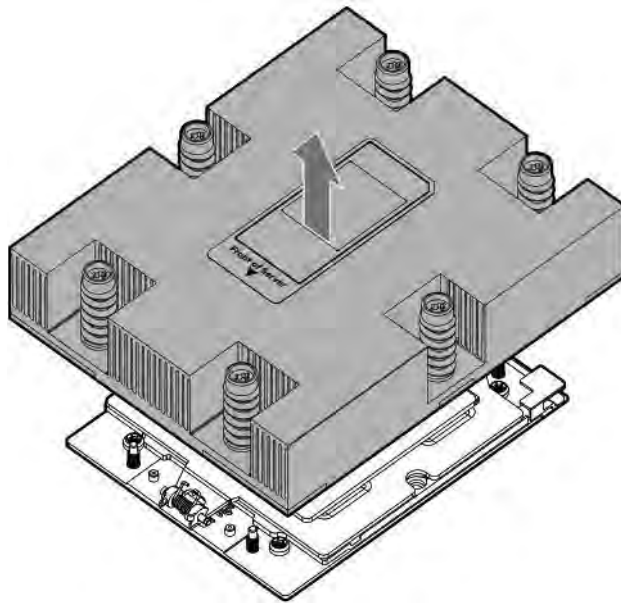
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. Remove the server from the rack.
6. Place the server on a flat, level work surface.
7. Remove the access panel.
8. Remove the air baffle.
9. Allow all internal system components to cool before continuing.
10. Remove the standard heatsink:
 - a. Review the heatsink screw numbering on the heatsink label.
 - b. Loosen the heatsink screw numbers 6, 5, 4, and 3 in a diagonal manner (callouts 1 to 4).



c. Loosen the heatsink screw numbers 2 and 1 (callouts 5 and 6).



11. Lift the standard heatsink away from the processor socket.

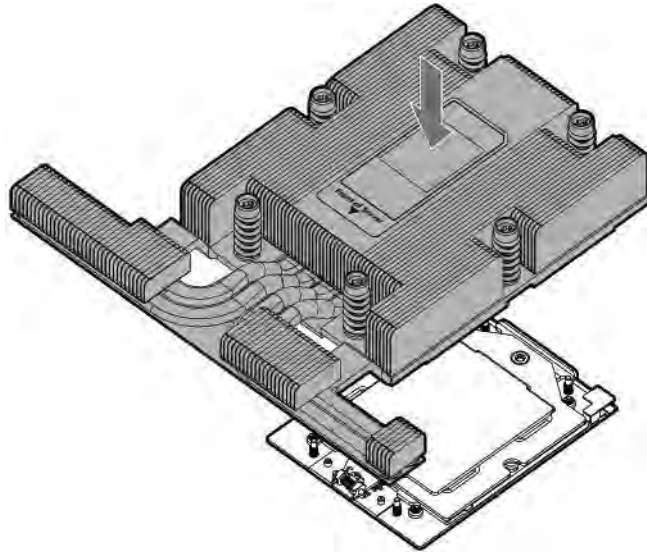


12. Place the heatsink on a flat work surface with its contact side facing up.
13. Use an alcohol wipe to remove the existing thermal grease from the heatsink and processor. Allow the alcohol to evaporate before continuing.
14. Install the high performance heatsink:

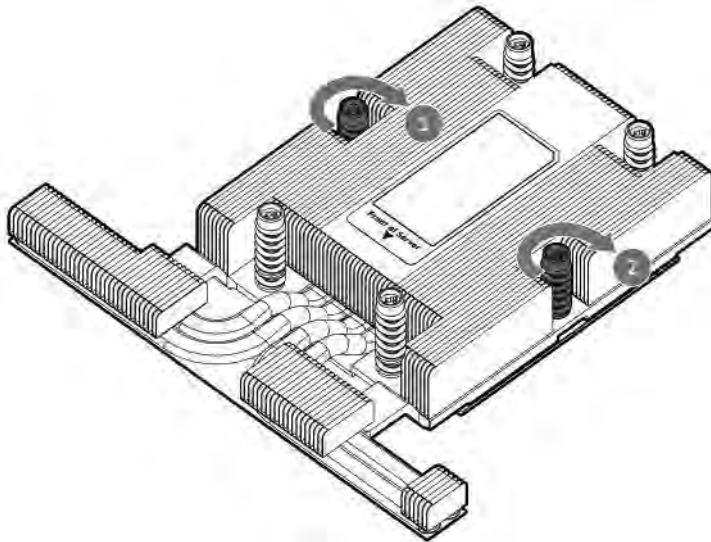
⚠ CAUTION: To prevent mechanical damage or depositing oil on your hands or other contaminant to the heatsink contact surface, hold the heatsink only by the edge of its base plate. Do not touch the heatsink fins.

⚠ 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.

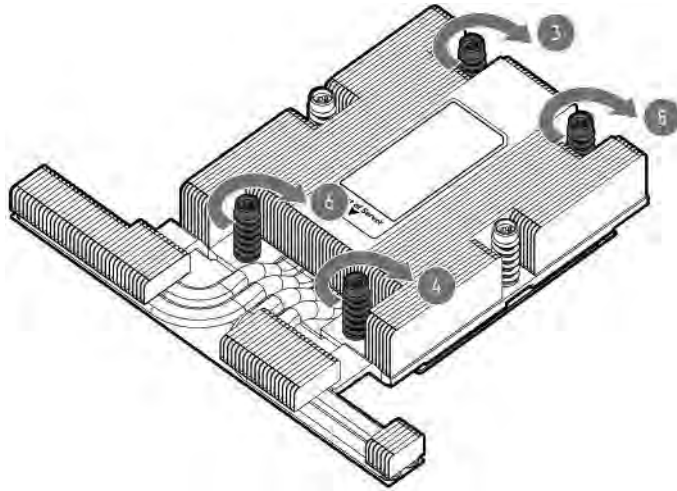
- a. When using a torque wrench to tighten the heatsink screws, set a torque between 1.24 N-m (11 lbf-in) to 1.47 N-m (13 lbf-in).
- b. Note the Front of server text on the heatsink label to correctly orient the heatsink over the processor socket.
- c. Position the heatsink on top of the processor, ensuring that it is properly seated before securing the screws.



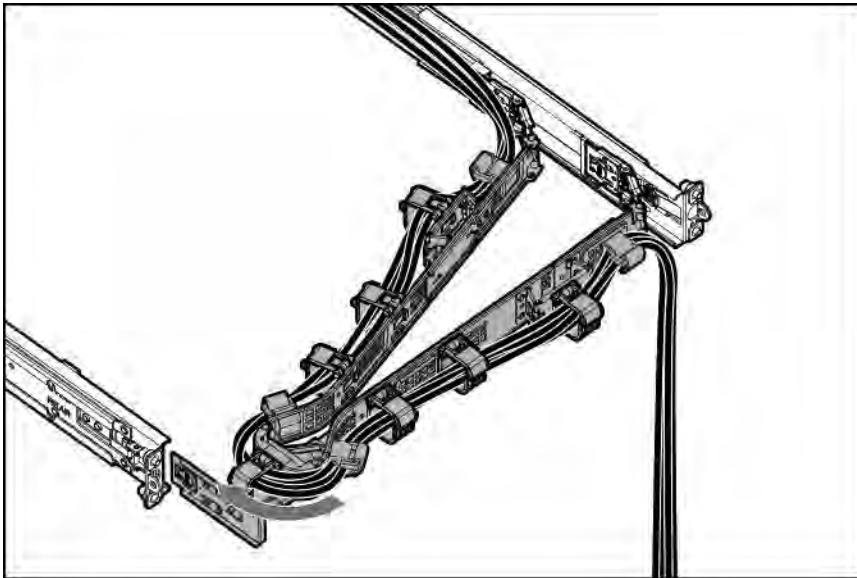
d. Tighten the heatsink screw numbers 1 and 2 (callouts 1 and 2).



e. Tighten the heatsink screw numbers 3, 4, 5, and 6 in a diagonal manner (callouts 3 to 6).



15. Install the high performance fan.
16. Install the air baffle.
17. Install the access panel.
18. Install the server into the rack.
19. Connect all peripheral cables to the server.
20. Connect the power cords:
 - a. Connect each power cord to the server.
 - b. Connect each power cord to the power source.
21. If installed, close the cable management arm.



22. Power up the server.

The installation is complete.

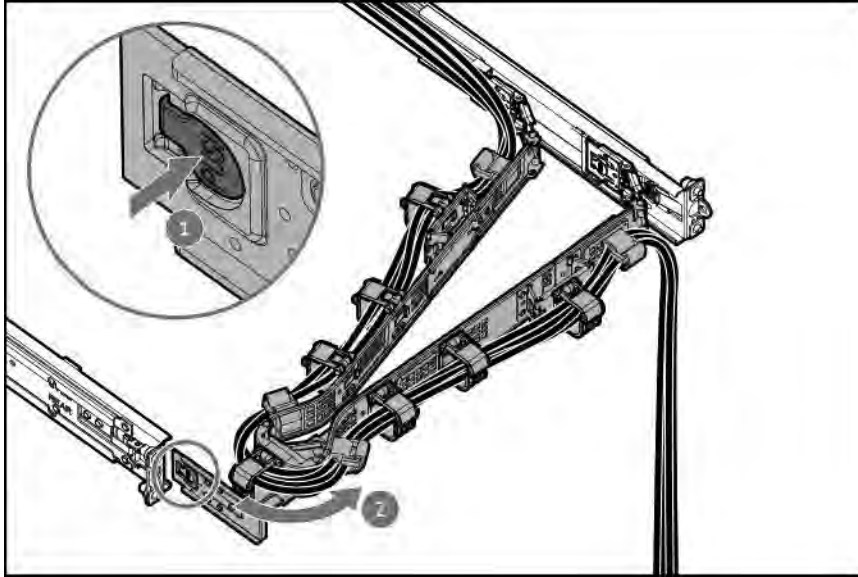
Chassis intrusion detection switch option

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.

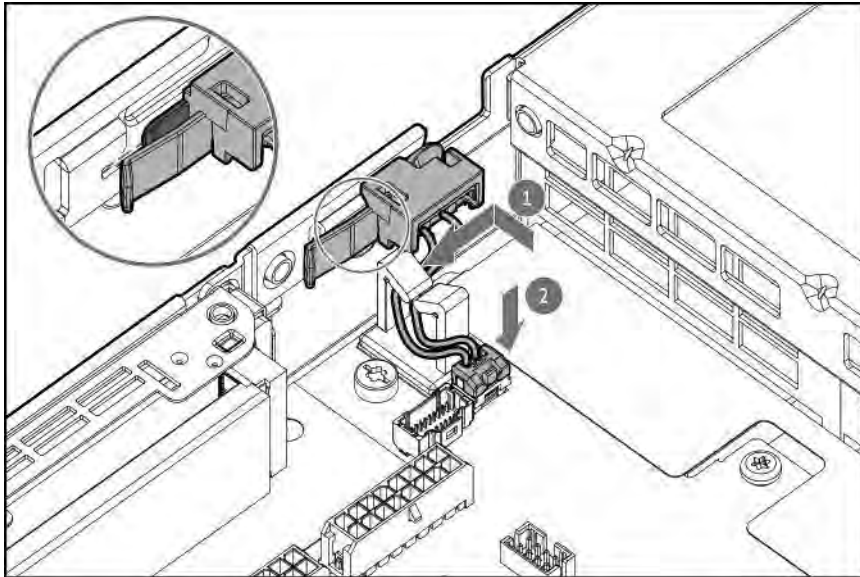
Installing the chassis intrusion detection switch

Procedure

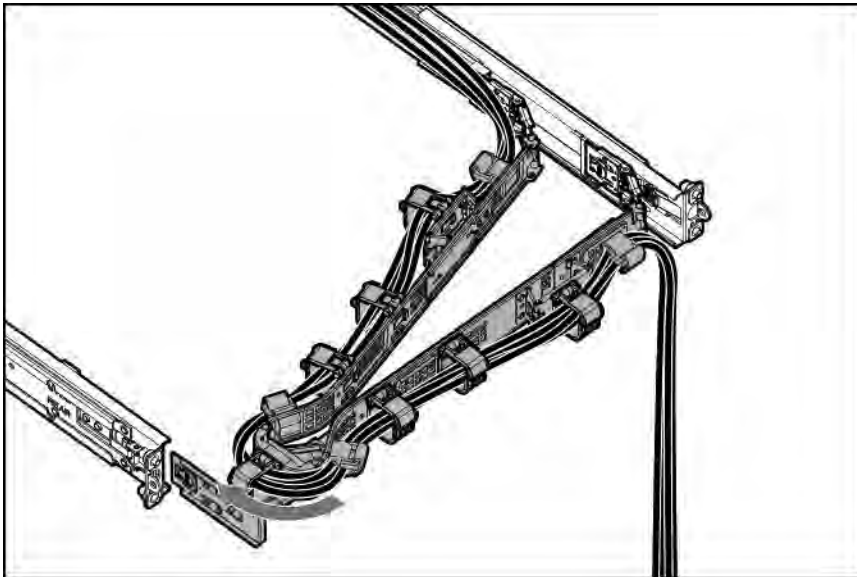
1. Power down the server.
2. If installed, open the cable management arm.



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. 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 and secure it in the cable clamp (callout 2).



9. Install the access panel.
10. Install the server into the rack.
11. Connect all peripheral cables to the server.
12. Connect the power cords:
 - a. Connect each power cord to the server.
 - b. Connect each power cord to the power source.
13. If installed, close the cable management arm.



14. Power up the server.

The installation is complete.

The System Intrusion Detection setting in the UEFI System Utilities is automatically enabled after installing the chassis intrusion detection switch.

For more information, see the iLO user guide or contact customer support.

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 the following items available:

- Hex screwdriver
- Spudger or any small prying tool

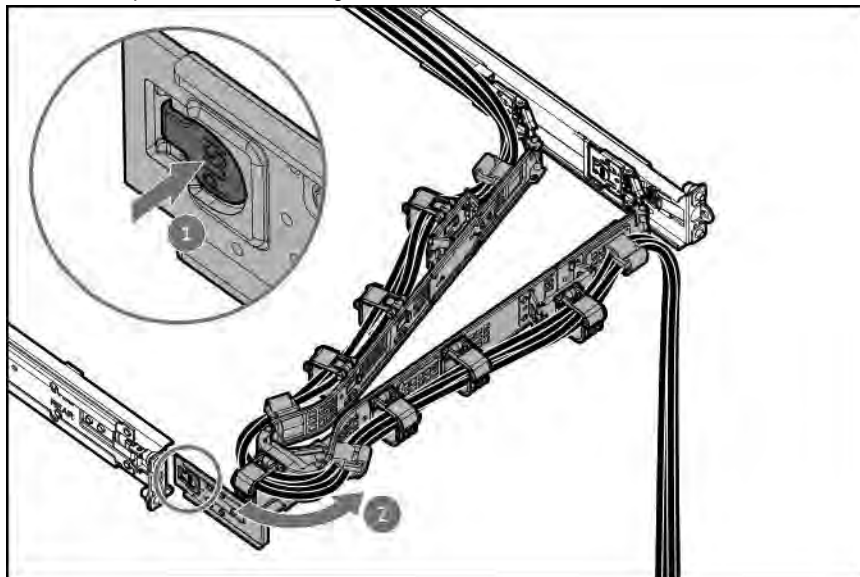
About this task

⚠ 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.

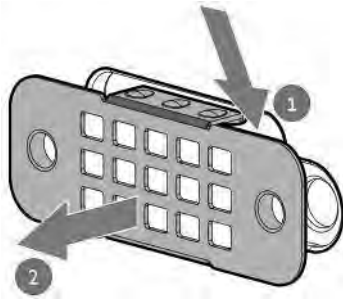
Procedure

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

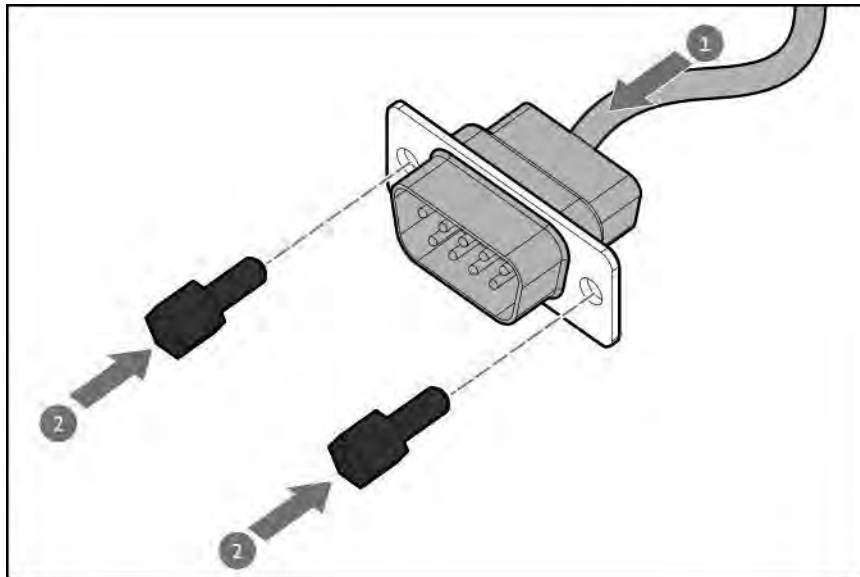


3. Remove all power:

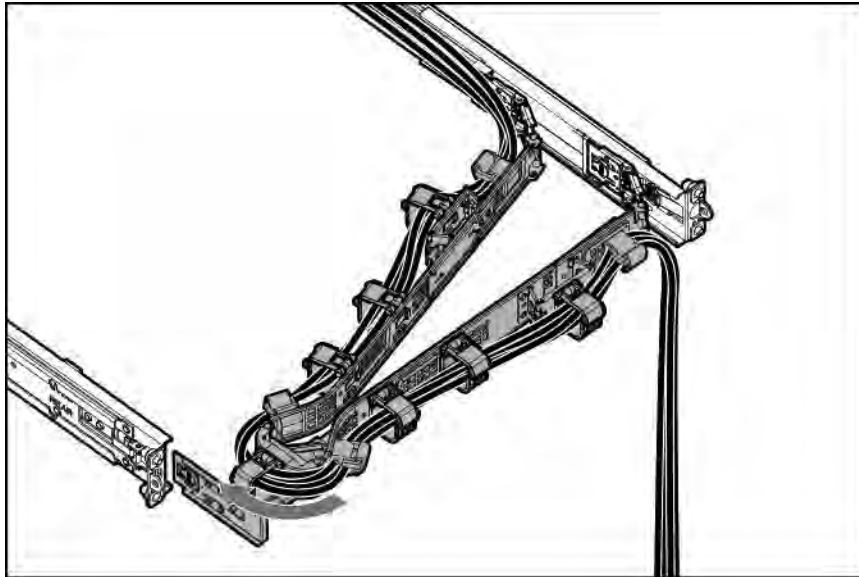
- a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
 5. Remove the server from the rack.
 6. Place the server on a flat, level work surface.
 7. Remove the access panel.
 8. Remove one of the following:
 - Secondary riser cage blank
 - Secondary riser cage
 9. Remove the serial port blank:
 - a. Detach the right side of the blank (callout 1).
 - b. Repeat step a on the left side to remove the blank (callout 2).
Retain the blank for future use.



10. Install the serial port:
 - a. Insert the serial port into the rear panel opening (callout 1).
 - b. Install the hex screws (callout 2).



11. Install one of the following:
 - Secondary riser cage blank
 - Secondary riser cage
12. Install the access panel.
13. Install the server into the rack.
14. Connect all peripheral cables to the server.
15. Connect the power cords:
 - a. Connect each power cord to the server.
 - b. Connect each power cord to the power source.
16. If installed, close the cable management arm.



17. Power up the server.

The installation is complete.

Internal USB device option

The server has an internal USB 3.2 Gen1 port to install a USB device that can be used as a flash boot media or for data backup/redundancy.

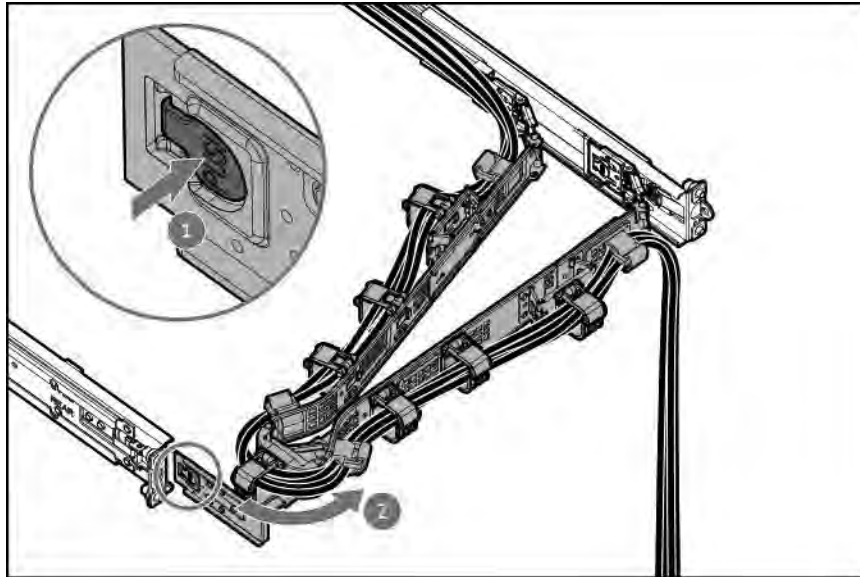
Installing the internal USB device

About this task

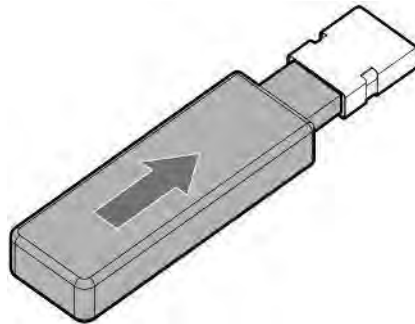
-
- ⚠ CAUTION:** A discharge of static electricity from a finger or other conductor might damage system boards or other static-sensitive devices. To prevent damage, observe antistatic precautions.

Procedure

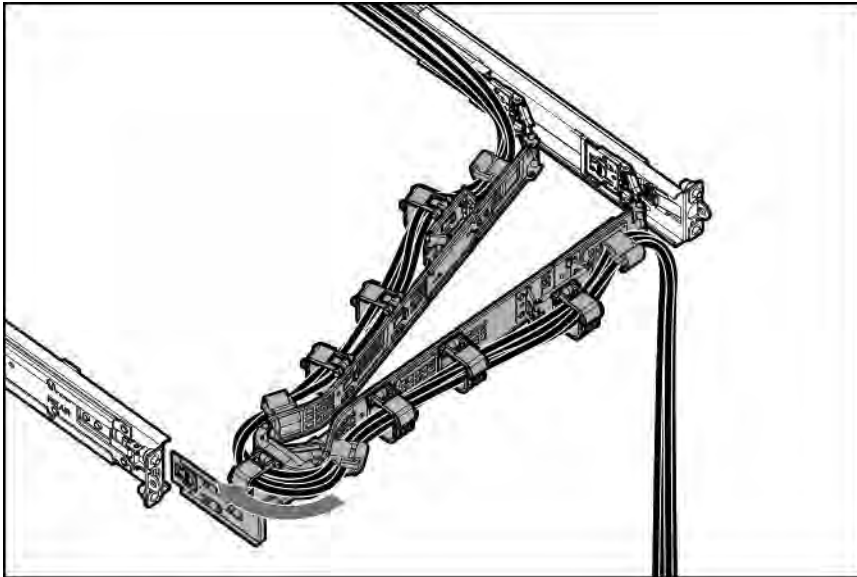
1. Power down the server.
2. If installed, open the cable management arm.



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. Plug in the USB device into the USB port.



9. Install the access panel.
10. Install the server into the rack.
11. Connect all peripheral cables to the server.
12. Connect the power cords:
 - a. Connect each power cord to the server.
 - b. Connect each power cord to the power source.
13. If installed, close the cable management arm.



14. 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

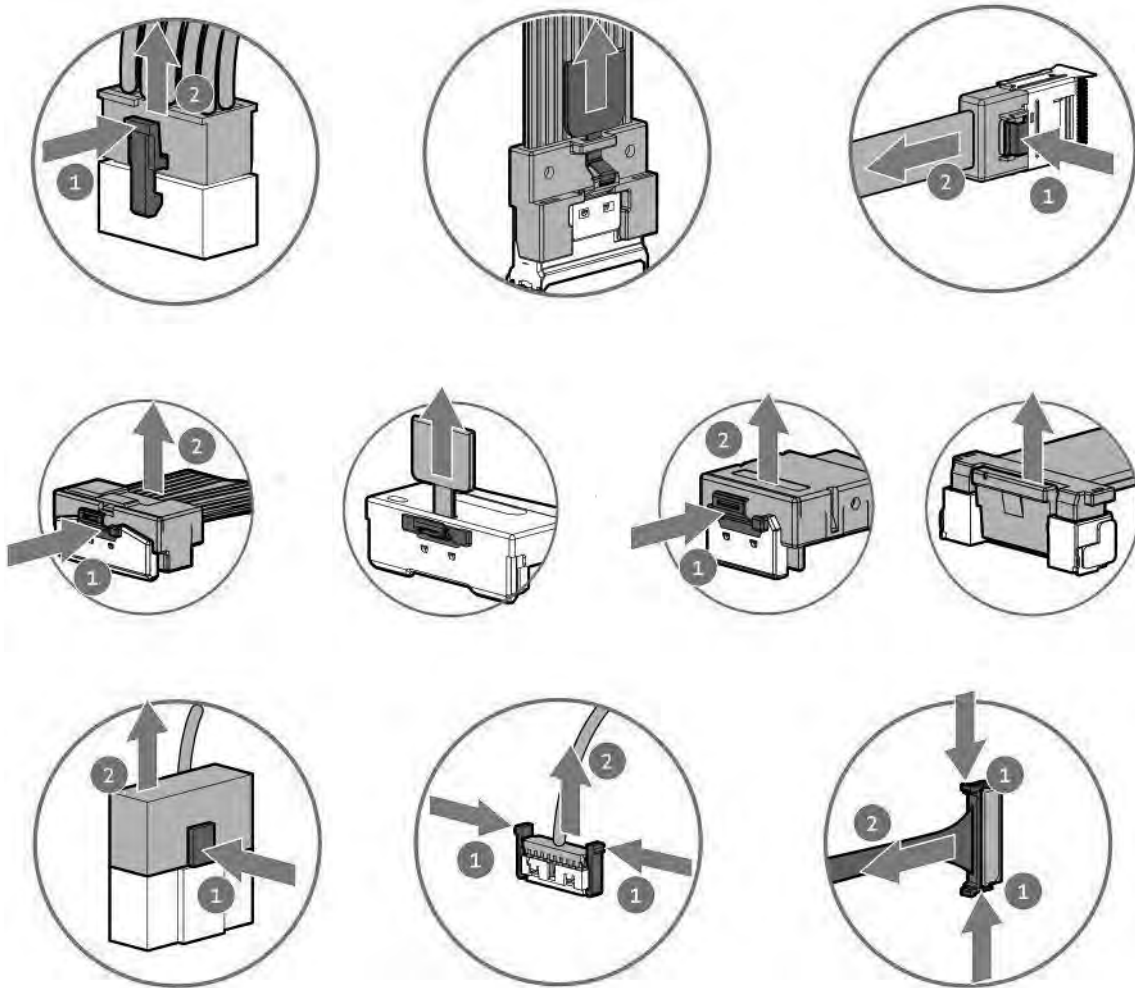
- Note the port labels on the PCA components. Not all these components are used by all servers:
 - System board ports
 - Drive and power supply backplane ports
 - Expansion board ports (controllers, adapters, expanders, risers, and similar boards)
- Note the label near each cable connector. This label 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
Storage controller–NVMe drive	
2 SFF Box 2 to the system board	P54592-001
2 SFF Box 2 to the Secondary riser tri-mode type-p controller	P57042-001
8 SFF Box 1 to the system board	P54589-001

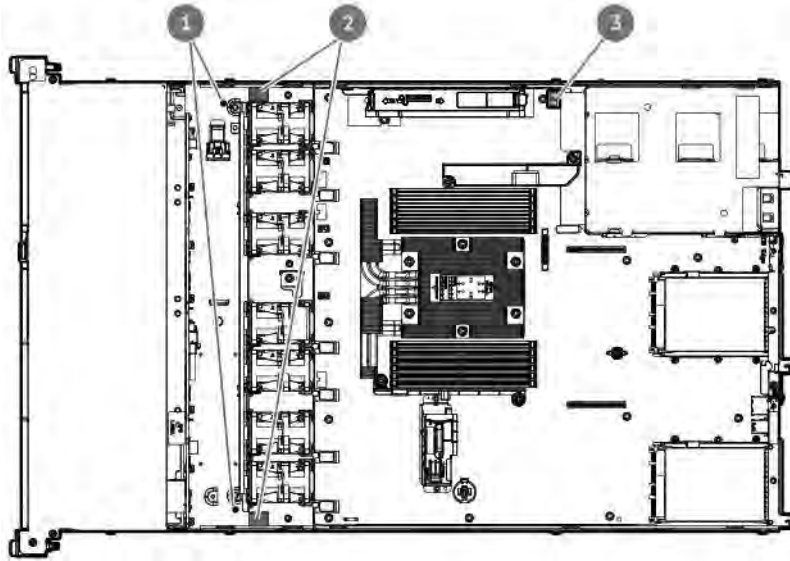
Table Continued

Component cabling	Cable part number
	<u>P54586-001</u>
	<u>P54588-001</u>
	<u>P54587-001</u>
8 SFF Box 1 to the Slot 22 type-o controller	<u>P57074-001</u>
	<u>P57075-001</u>
8 SFF Box 1 to the Primary riser tri-mode type-p controller—4 single cables	<u>P57070-001</u>
	<u>P57057-001</u>
	<u>P57076-001</u>
	<u>P57041-001</u>
8 SFF Box 1 to the Secondary riser tri-mode type-p controller—4 single cables	<u>P57060-001</u>
	<u>P57061-001</u>
	<u>P57062-001</u>
	<u>P57042-001</u>
8 SFF Box 1 to the Secondary riser tri-mode type-p controller—2 Y-cables	<u>P57064-001</u>
	<u>P57065-001</u>
8 + 2 SFF Boxes 1 and 2 to the system board	<u>P54589-001</u>
	<u>P54586-001</u>
	<u>P54588-001</u>
	<u>P54587-001</u>
	<u>P54592-001</u>
8 + 2 SFF Boxes 1 and 2 to the Secondary riser tri-mode type-p controller	<u>P57064-001</u>
	<u>P57065-001</u>
	<u>P57042-001</u>
20 E3.S Box 1 x4 NVMe to the system board — 10 cables	<u>P59645-001</u>
	<u>P59646-001</u>
20 E3.S Box 1 x2 NVMe to the system board — 5 Y-cables	<u>P57082-001</u>
	<u>P57083-001</u>
Storage controller—SAS / SATA drive	
4 LFF Box 1 to the system board	<u>P57037-001</u>
4 LFF Box 1 to the Slot 22 type-o controller	<u>P57038-001</u>
2 SFF Box 2 to the system board	<u>P57045-001</u>
2 SFF Box 2 to the Slot 22 type-o controller	<u>P57040-001</u>
2 SFF Box 2 to the Secondary riser type-p controller	<u>P57042-001</u>

Table Continued

Component cabling	Cable part number
8 SFF Box 1 to the system board	<u>P56679-001</u>
8 SFF Box 1 to the Slot 22 type-o controller	<u>P57080-001</u>
8 + 2 SFF Boxes 1 and 2 to the system board	<u>P56679-001</u>
	<u>P57045-001</u>
8 + 2 SFF Boxes 1 and 2 to the type-o controller	<u>P57080-001</u>
	<u>P57040-001</u>
Drive power	
4 LFF drive power	<u>P56680-001</u>
2 SFF drive power	<u>P54591-001</u>
8 SFF drive power	<u>P54590-001</u>
20 E3.S drive power	<u>P56682-001</u>
Energy pack	<u>P56688-001</u>
<u>Storage backup power</u>	
Miscellaneous cable options	
Front I/O	<u>P43727-001</u>
Front USB and DisplayPort	<u>P45619-001</u>
	<u>P45620-001</u>
Optical drive	<u>P58696-001</u>
	<u>P56685-001</u>
M.2 SSD pass-through card	<u>P56689-001</u>
	<u>P56690-001</u>
	<u>P56691-001</u>
NS204i Boot Device	<u>P54087-001</u>
	<u>P54088-001</u>
Chassis intrusion detection switch	<u>P47751-001</u>
Serial port	<u>P47752-001</u>
Pump signal	<u>P58463-B21</u>
OCP NIC x16 adapter	<u>P56686-001</u>

Internal cabling management



Item	Description
1	Cable routing posts ¹
2	Cable routing foams
3	Chassis intrusion detection switch cable clip

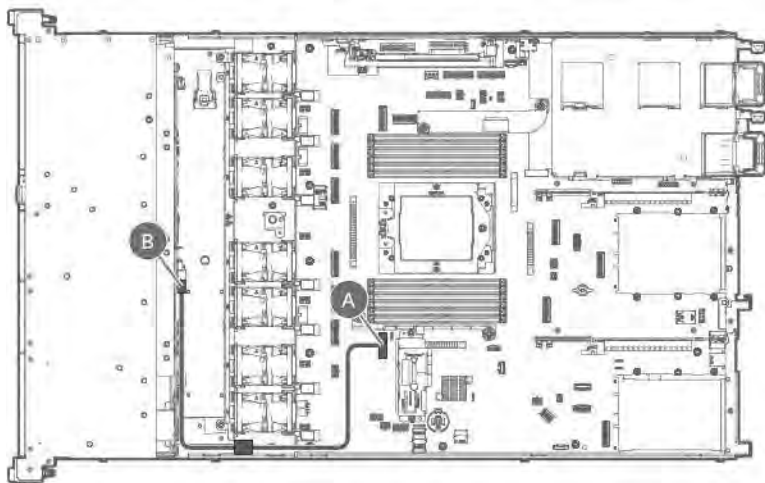
¹ These posts are in the LFF or E3.S drive configurations.

Storage cabling

Storage controller cabling

4 LFF SAS/SATA drive controller cabling

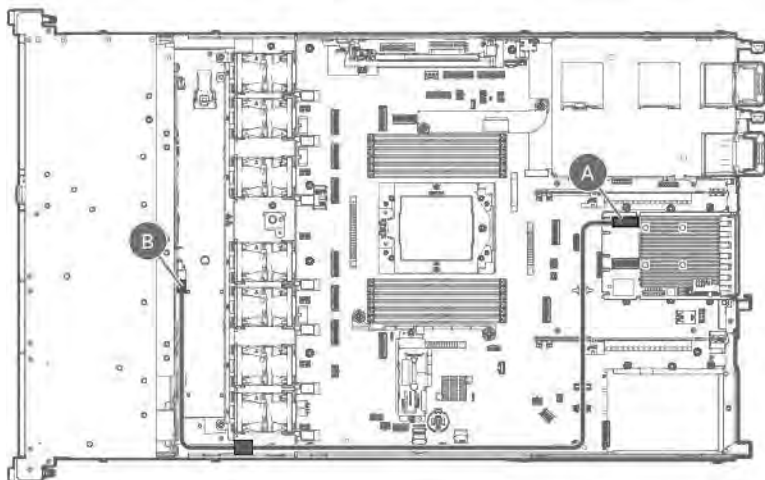
4 LFF drive: Onboard SATA cabling



Cable part number	Cable color	From	To
P57037-001 ¹	Orange	Port 1	NVMe port 1A

¹ Option kit: P57015-B21

4 LFF drive controller cable: Type-o controller in the Slot 22

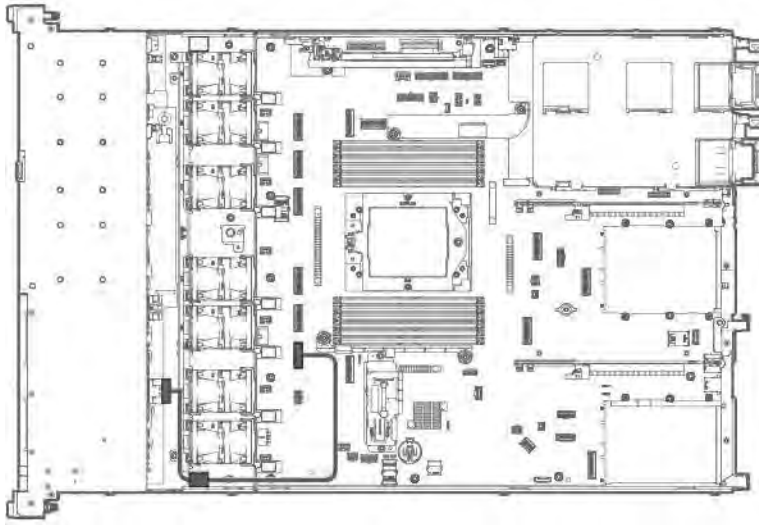


Cable part number	Cable color	From	To
P57038-001 ¹	Orange	Port 1	Port 1

¹ Option kit: P57016-B21

2 SFF NVMe drive controller cabling

² SFF drive: Direct attach cabling

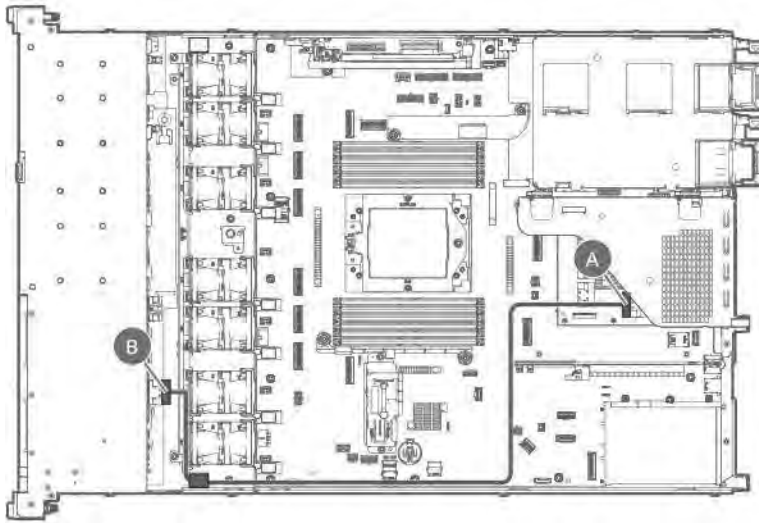


Cable part number	Cable color	From	To
P54592-001 ^{1,2}	Orange	Port 1	NVMe/SATA port 2A

¹ Option kit: P55005-B21

² Option kit: P56652-B21

2 SFF drive controller cabling: Tri-mode type-p storage controller in the secondary riser

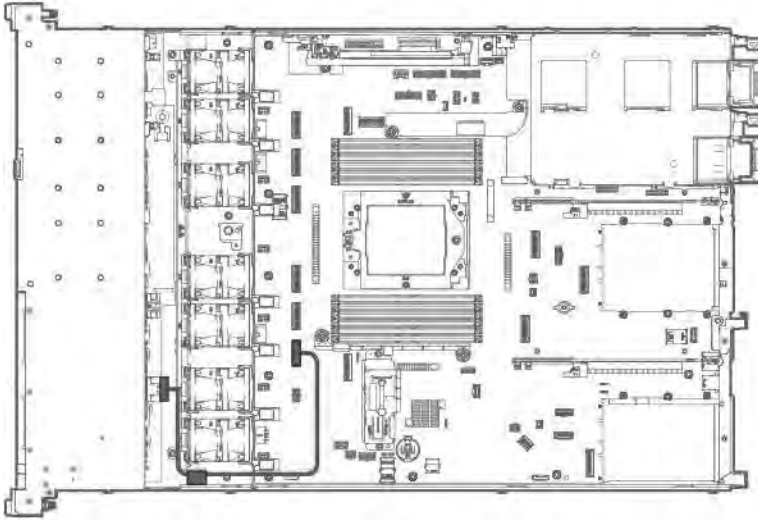


Cable part number	Cable color	From	To
P57042-001 ¹	Orange	Port 1	Port 1

¹ Option kit: P59621-B21

2 SFF SAS/SATA drive controller cabling

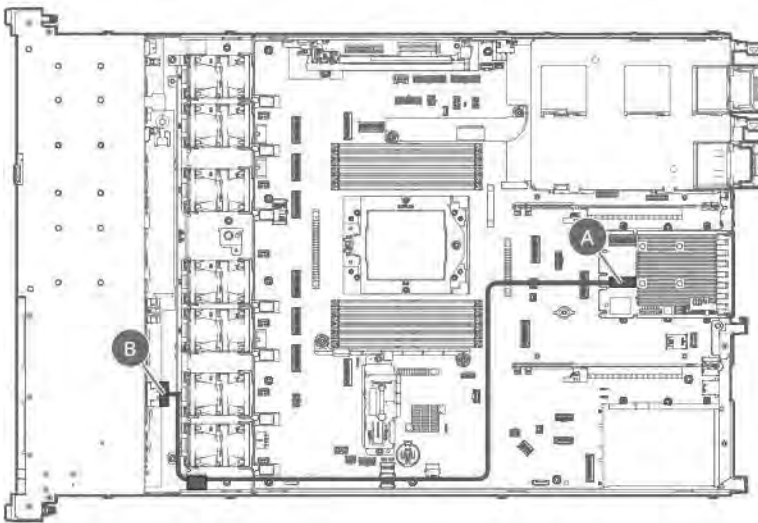
2 SFF drive: Onboard SATA cabling



Cable part number	Cable color	From	To
P57045-001 ¹	Orange	Port 1	NVMe/SATA port 2A

¹ Option kit: P59617-B21

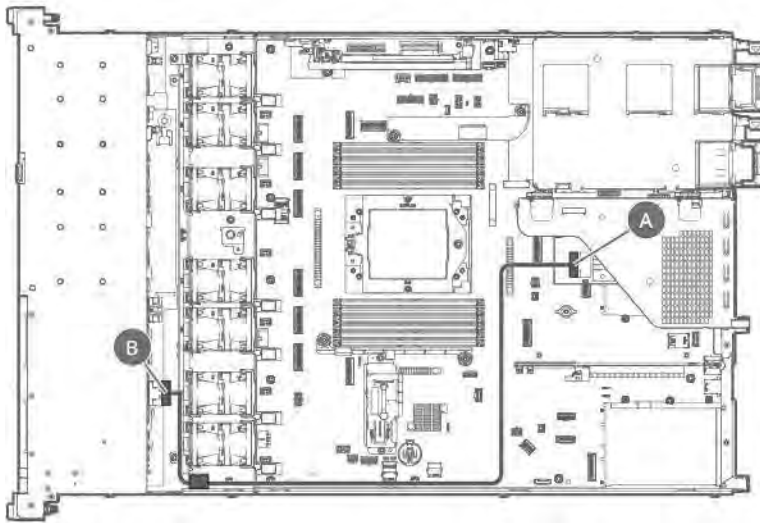
2 SFF drive controller cabling: Type-o storage controller in the Slot 22



Cable part number	Cable color	From	To
P57040-001 ¹	Orange	Port 1	Port 1

¹ Option kit: P59620-B21

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

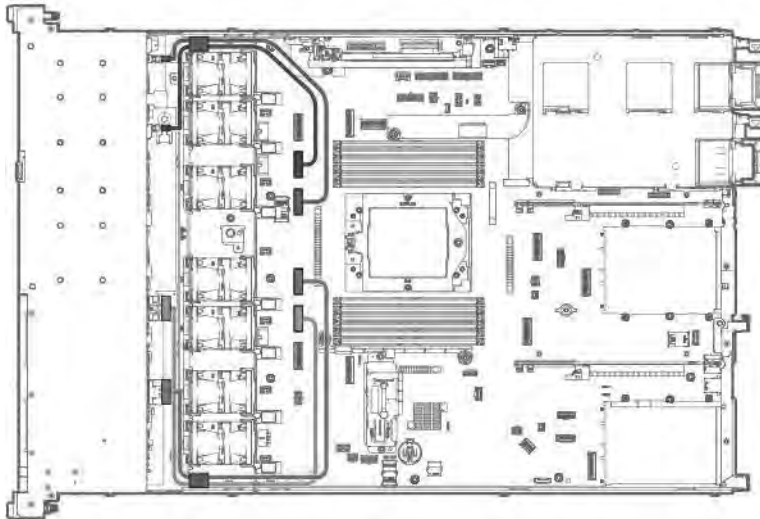


Cable part number	Cable color	From	To
P57042-001 ¹	Orange	Port	Port 1

¹ Option kit: P59621-B21

8 SFF NVMe drive controller cabling

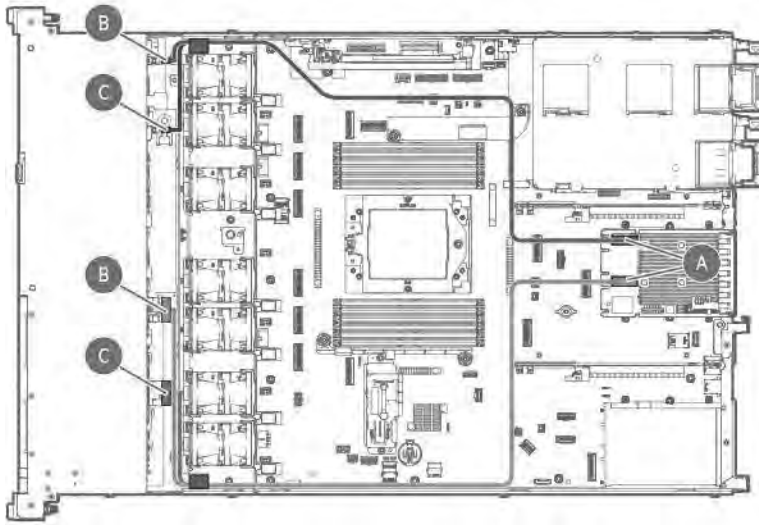
8 SFF drive: Direct attach cabling



Cable part number	Cable color	From	To
P54589-001 ¹	Orange	Port 1	NVMe port 5A
P54586-001 ¹	Blue	Port 2	NVMe port 6A
P54588-001 ¹	Gold	Port 3	NVMe port 3A
P54587-001 ¹	Pink	Port 4	NVMe port 4A

¹ Option kit: P55000-B21

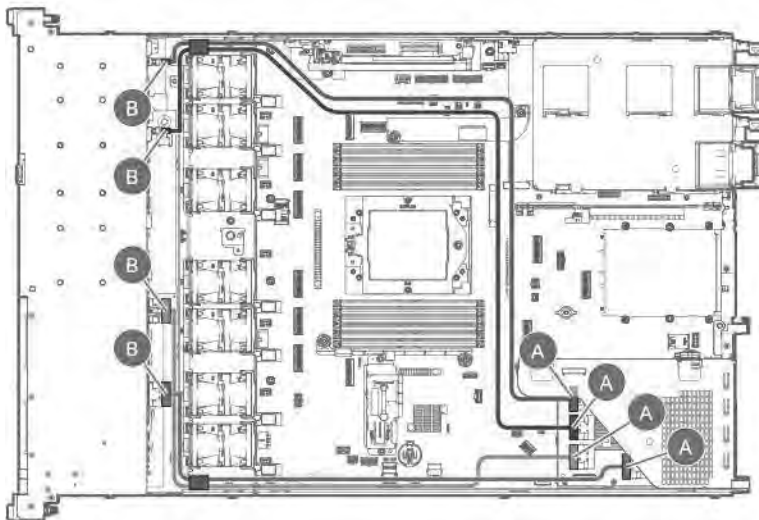
8 SFF drive controller cabling: Type-o storage controller in the Slot 22



Cable part number	Cable color	From	To
P57074-001 ¹	Orange	Port 1	Port 2
	Blue	Port 2	
P57075-001 ¹	Gold	Port 3	Port 1
	Pink	Port 4	

¹ Option kit: P57008-B21

8 SFF drive controller cabling: Tri-mode type-p storage controller in the primary riser

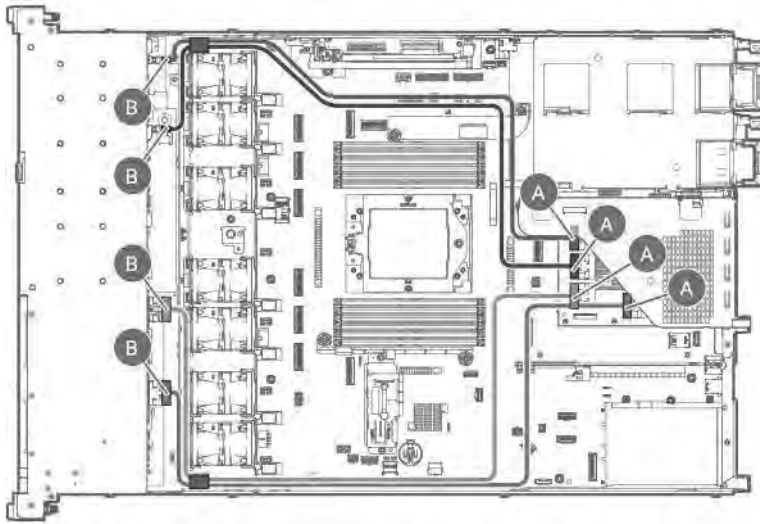


Cable part number	Cable color	From	To
P57070-001 ¹	Orange	Port 1	Port 4
P57057-001 ¹	Blue	Port 2	Port 3
P57076-001 ¹	Gold	Port 3	Port 2
P57041-001 ¹	Pink	Port 4	Port 1

¹ Option kit: P57004-B21

8 SFF drive controller cabling: Tri-mode type-p storage controller in the secondary riser

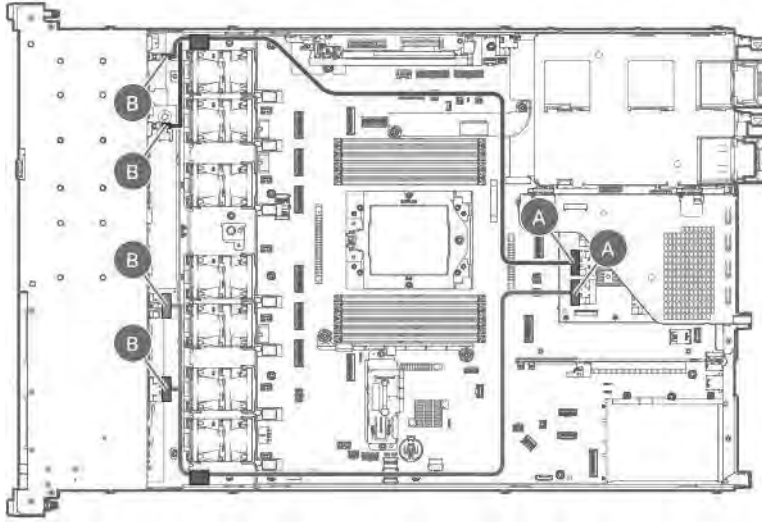
- 4 single cables



Cable part number	Cable color	From	To
P57060-001 ¹	Orange	Port 1	Port 4
P57061-001 ¹	Blue	Port 2	Port 3
P57062-001 ¹	Gold	Port 3	Port 2
P57042-001 ¹	Pink	Port 4	Port 1

¹ Option kit: P57005-B21

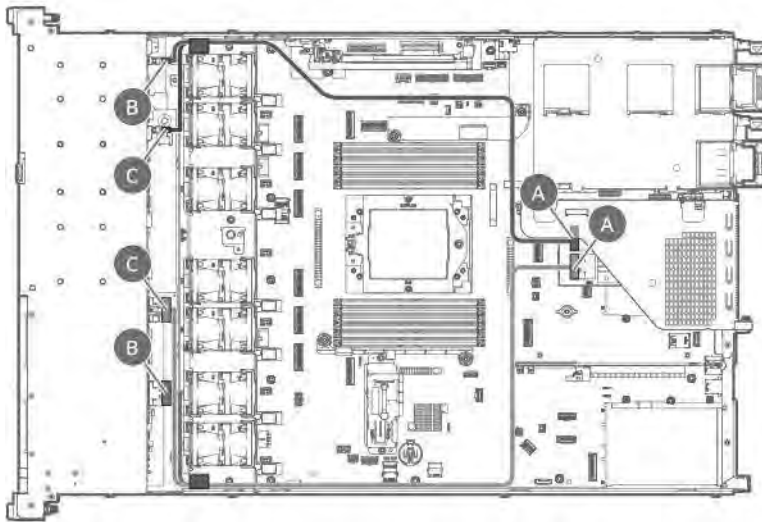
- 2 Y-cables
 - SR 932i-p G3 storage controller



Cable part number	Cable color	From	To
P57064-001 ¹	Orange	Port 1	Port 3
	Blue	Port 2	
P57065-001 ¹	Gold	Port 3	Port 2
	Pink	Port 4	

¹ Option kit: P57006-B21

- MR 416i-p G3 storage controller



Cable part number	Cable color	From	To
P57064-001 ¹	Orange	Port 1	Port 2
	Blue	Port 2	

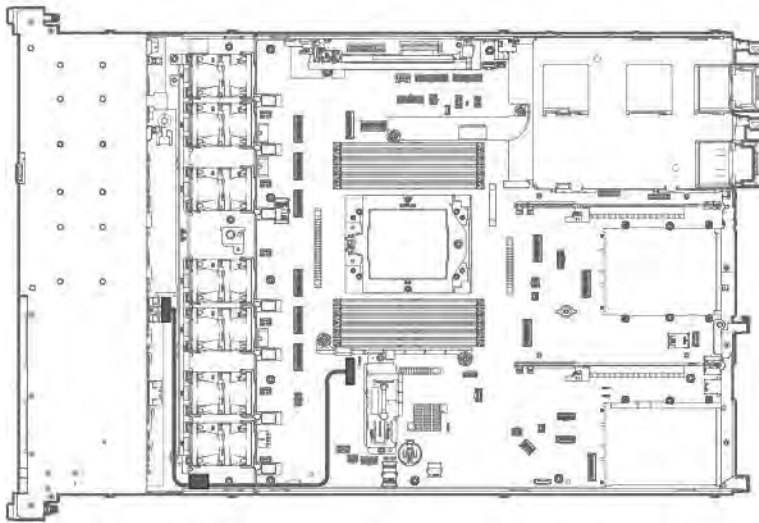
Table Continued

Cable part number	Cable color	From	To
P57065-001 ¹	Gold	Port 3	Port 1
	Pink	Port 4	

¹ Option kit: P57006-B21

8 SFF SAS/SATA drive controller cabling

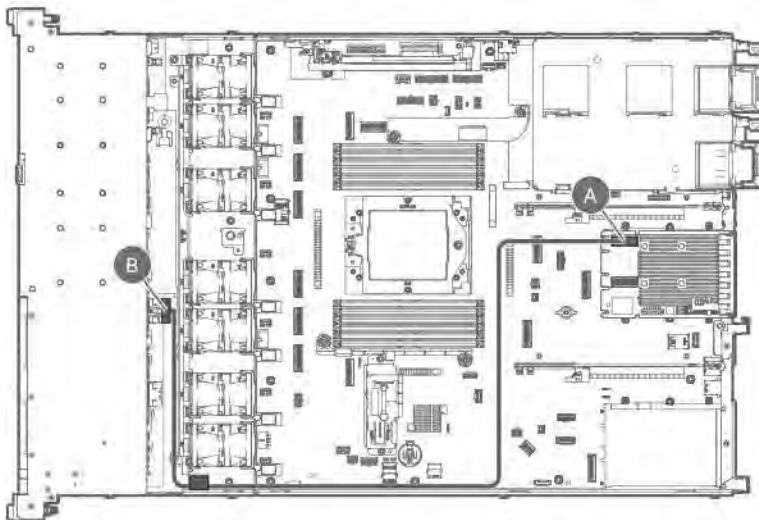
8 SFF drive: Onboard SATA cabling



Cable part number	Cable color	From	To
P56679-001 ¹	Orange	Port 1	NVMe / SATA port 1A

¹ Option kit: P54999-B21

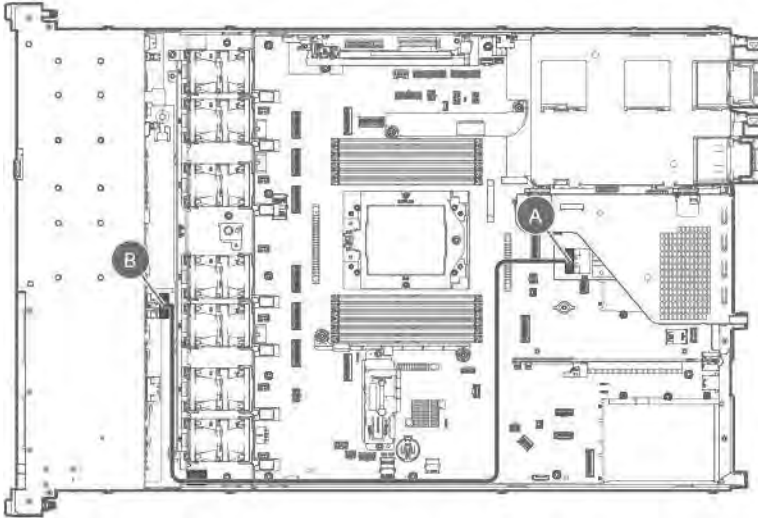
8 SFF drive controller cabling: Type-o storage controller in the Slot 22



Cable part number	Cable color	From	To
P57080-001 ¹	Orange	Port 1	Port 2

¹ Option kit: P59619-B21

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

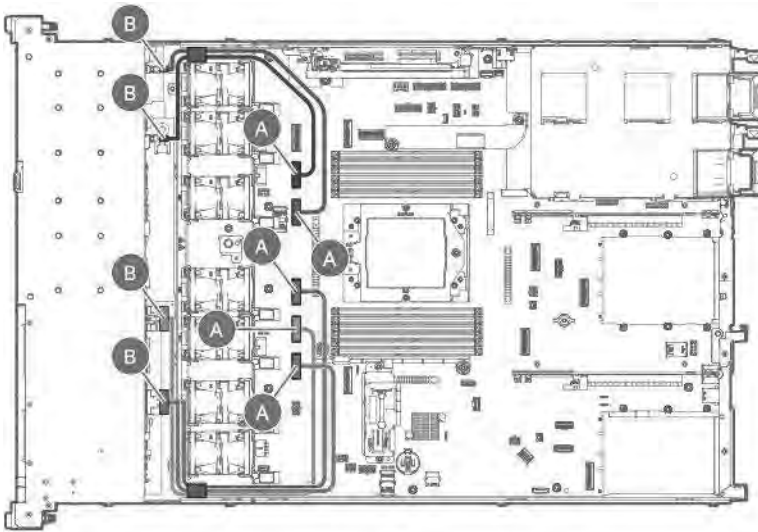


Cable part number	Cable color	From	To
P57077-001 ¹	Orange	Port 1	Port 1

¹ Option kit: P57009-B21

8 + 2 SFF NVMe drive controller cabling

8 + 2 SFF drive: Direct attach cabling

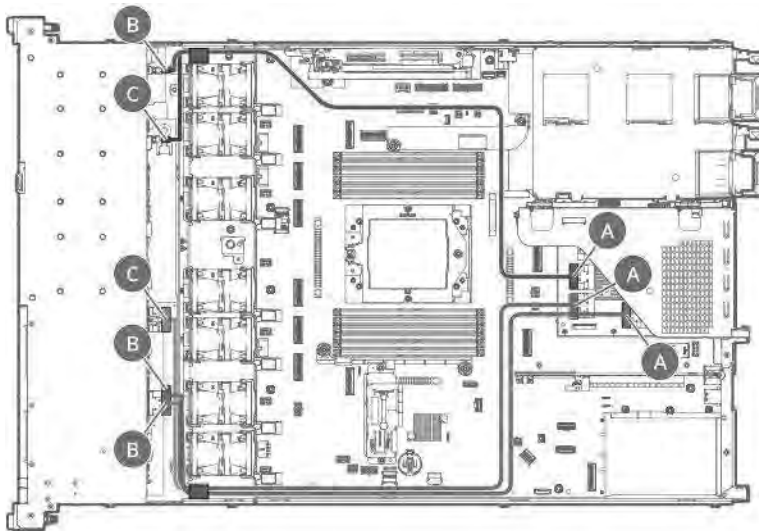


Cable part number	Cable color	From	To
P54589-001 ¹	Orange	Box 1 Port 1	NVMe port 5A
P54586-001 ¹	Blue	Box 1 Port 2	NVMe port 6A
P54588-001 ¹	Gold	Box 1 Port 3	NVMe port 3A
P54587-001 ¹	Green	Box 1 Port 4	NVMe port 4A
P54592-001 ²	Pink	Box 2 Port 1	NVMe/SATA port 2A

¹ Option kit: P55000-B21

² Option kit: P57019-B21

8 + 2 SFF drive controller cabling: Tri-mode type-p storage controller in the secondary riser



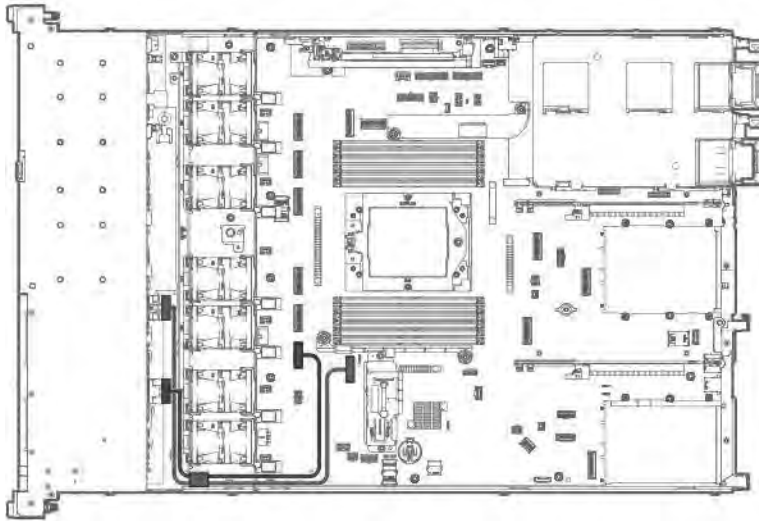
Cable part number	Cable color	From	To
P57064-001 ¹	Orange	Box 1 Port 1	Port 3
	Blue	Box 1 Port 2	
P57065-001 ¹	Gold	Box 1 Port 3	Port 2
	Pink	Box 1 Port 4	
P57042-001 ²	Green	Box 2 Port 1	Port 1

¹ Option kit: P57006-B21

² Option kit: P59621-B21

8 + 2 SFF SAS/SATA drive controller cabling

8 + 2 SFF drive: Onboard SATA cabling

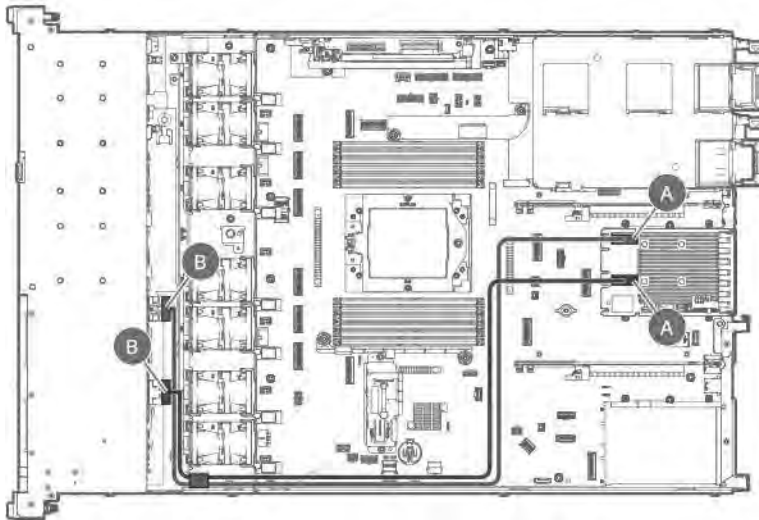


Cable part number	Cable color	From	To
P56679-001 ¹	Orange	Box 1 Port 1	NVMe port 1A
P57045-001 ²	Blue	Box 2 Port 1	NVMe/SATA port 2A

¹ Option kit: P54999-B21

² Option kit: P59618-B21

8 + 2 SFF drive controller cabling: Type-o storage controller in the Slot 22



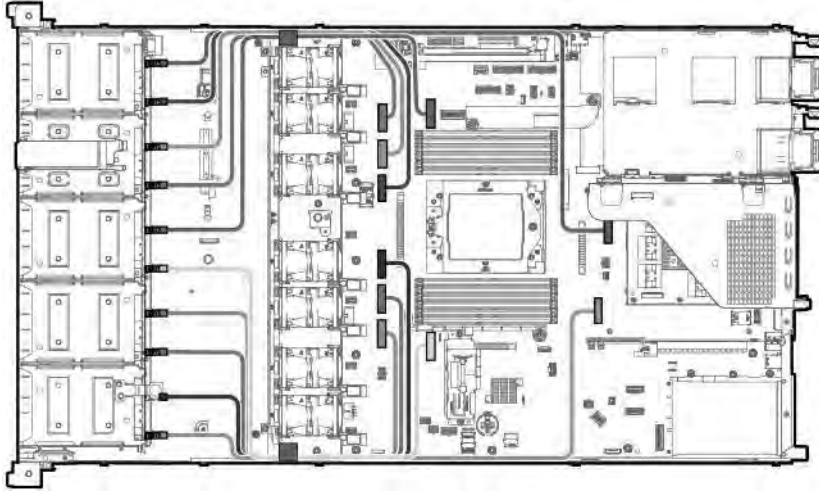
Cable part number	Cable color	From	To
P57080-001 ¹	Orange	Box 1 Port 1	Port 2
P57040-001 ²	Blue	Box 2 Port 1	Port 1

¹ Option kit: P59619-B21

² Option kit: P59620-B21

20 E3.S drive controller cabling

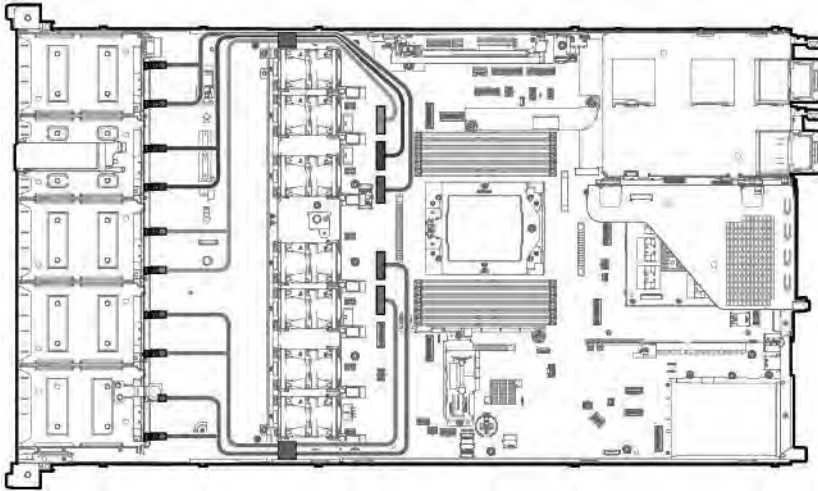
20 E3.S x4 NVMe drive: Direct attach cabling



Cable part number	Cable color	From	To
P59645-001 ¹	Orange	Port 1	NVMe/SATA port 1B
	Blue	Port 2	NVMe port 5A
	Gold	Port 3	NVMe port 6A
	Pink	Port 4	NVMe port 7A
	Green	Port 5	NVMe port 8A
P59646-001 ¹	Yellow	Port 6	NVMe/SATA port 1A
	Sky blue	Port 7	NVMe/SATA port 2A
	Dark sand	Port 8	NVMe port 3A
	Purple	Port 9	NVMe port 4A
	Light Green	Port 10	NVMe port 9A

¹ Option kit: P57026-B21

20 E3.S x2 NVMe drive: Direct attach cabling

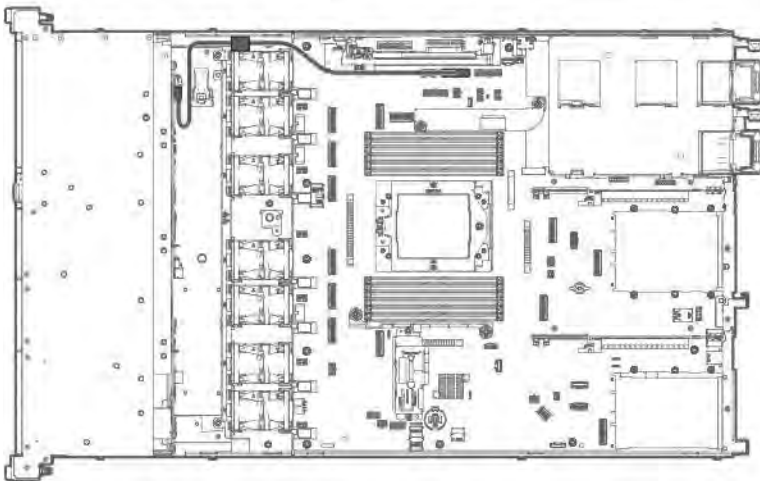


Cable part number	Cable color	From	To
P57082-001 ¹	Orange	Ports 1 and 2	NVMe port 5A
	Blue	Ports 3 and 4	NVMe port 6A
	Gold	Ports 5 and 6	NVMe port 7A
P57083-001 ¹	Pink	Ports 7 and 8	NVMe port 3A
	Green	Ports 9 and 10	NVMe port 4A

¹ Option kit: P57034-B21

Drive power cabling

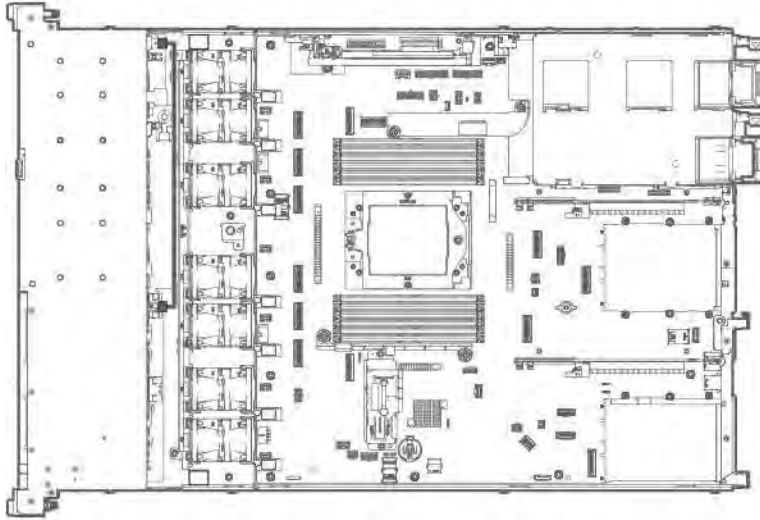
4 LFF drive power cable



Cable part number	Cable color	From	To
P56680-001 ¹	Orange	Box 1	Drive backplane / Graphics card power connector A (J9017)

¹ Option kit: P59623-B21

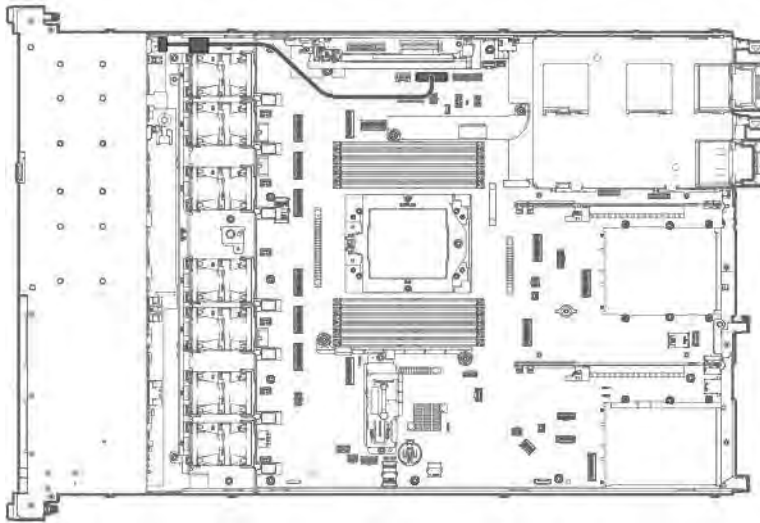
² SFF drive power cable



Cable part number	Cable color	From	To
P54591-001 ¹	Orange	Box 2	Box 1

¹ Option kit: P55005-B21

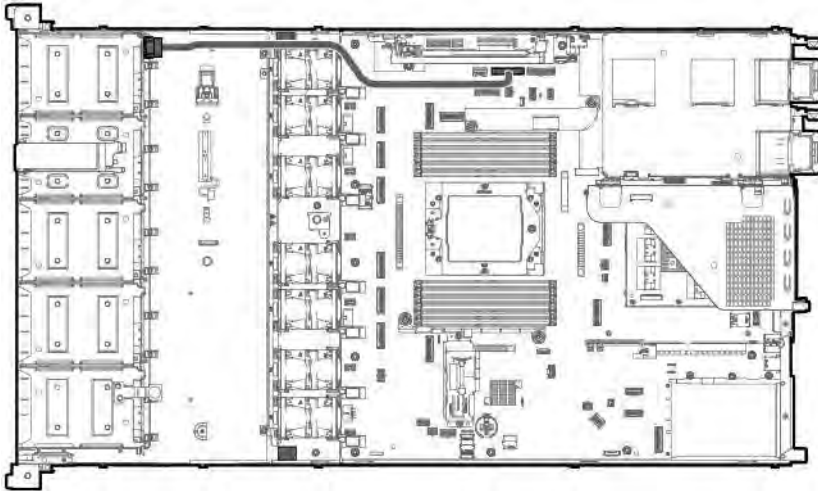
⁸ SFF drive power cable



Cable part number	Cable color	From	To
P54590-001 ¹	Orange	Box 1	Drive backplane / Graphics card power connector A (J9017)

¹ Option kit: P54999-B21

20 E3.S drive power cable

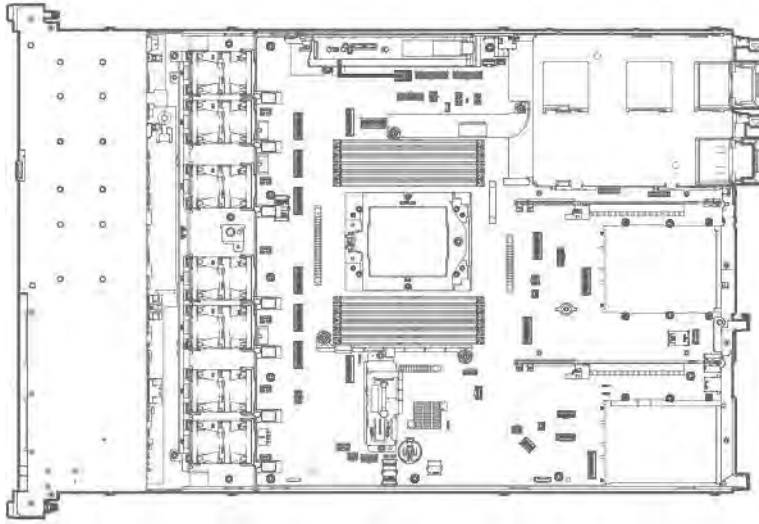


Cable part number	Cable color	From	To
P56682-001 ¹	Orange	Box 1	Drive backplane / Graphics card power connector A (J9017)

¹ Option kit: P57026-B21

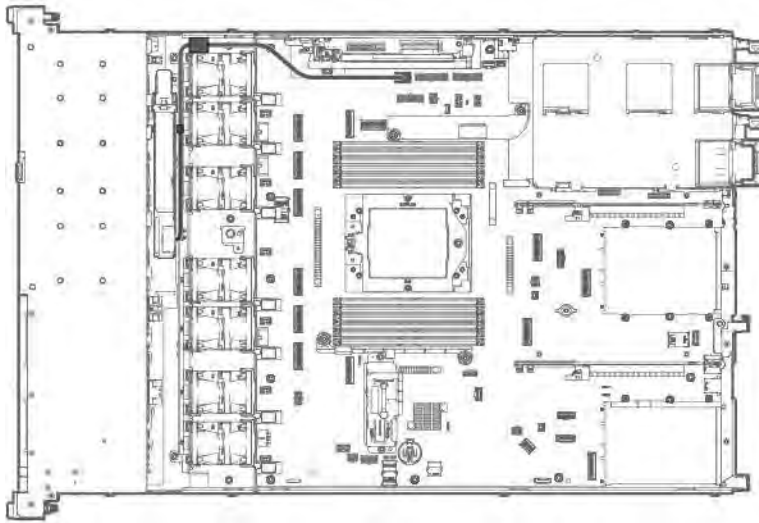
Energy pack cabling

Energy pack cabling from the energy pack holder



Option part number	Cable color	From	To
P01366-B21	Orange	Energy pack	Energy pack connector

Energy pack power extension cabling from the energy pack retention latch



Cable/option part number	Cable color	From	To
P56688-001 ¹	Orange	Energy pack power extension cable	Energy pack connector
P01366-B21	Blue	Energy pack	Energy pack power extension cable

¹ Option kit: P56659-B21

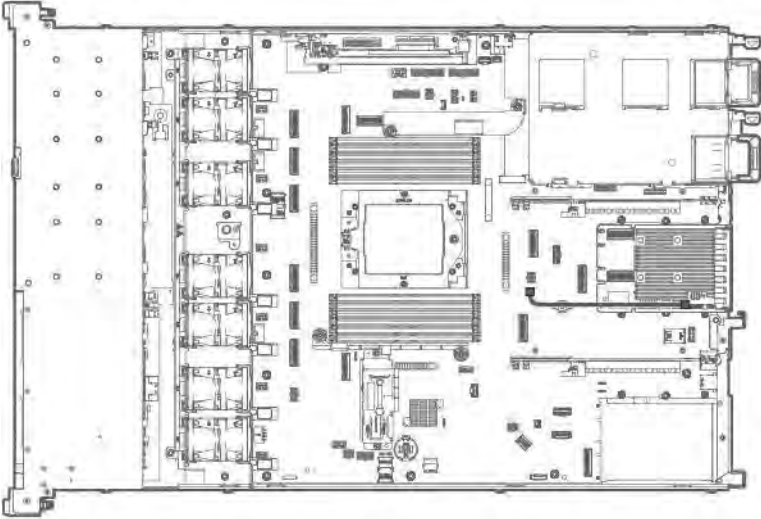
Storage controller backup power cabling

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.

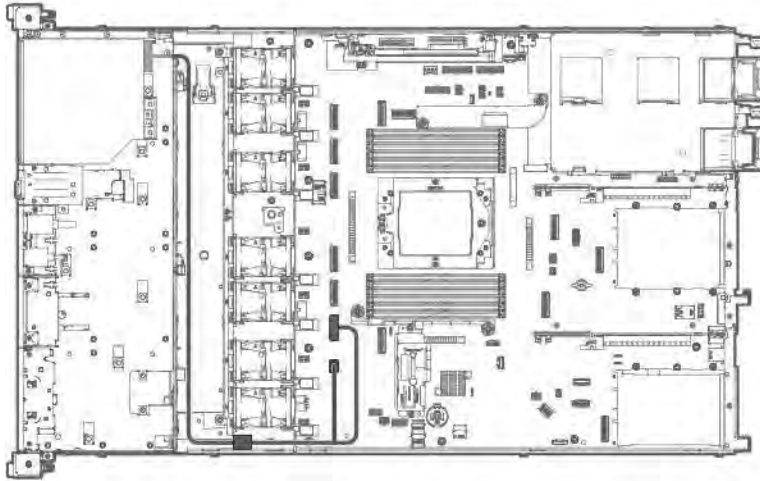
Storage controller backup power cabling from type-o storage controller in Slot 22



Cable color	From	To
Orange	Type-o controller in Slot 22	Slot 22 OROC storage backup power connector

Optical drive cabling

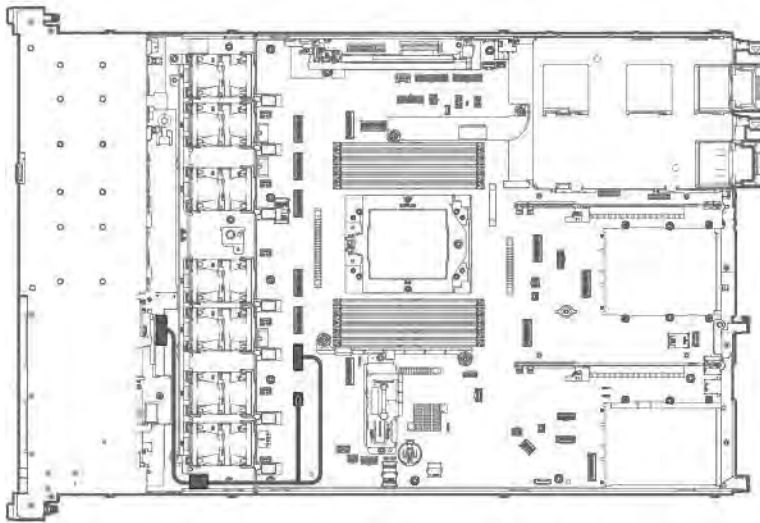
LFF drive chassis



Cable part number	Cable color	From	To
P58696-001 ¹	Orange	Optical drive	NVMe/SATA port 2A
	Blue		Optical drive power connector

¹ Option kit: P56655-B21

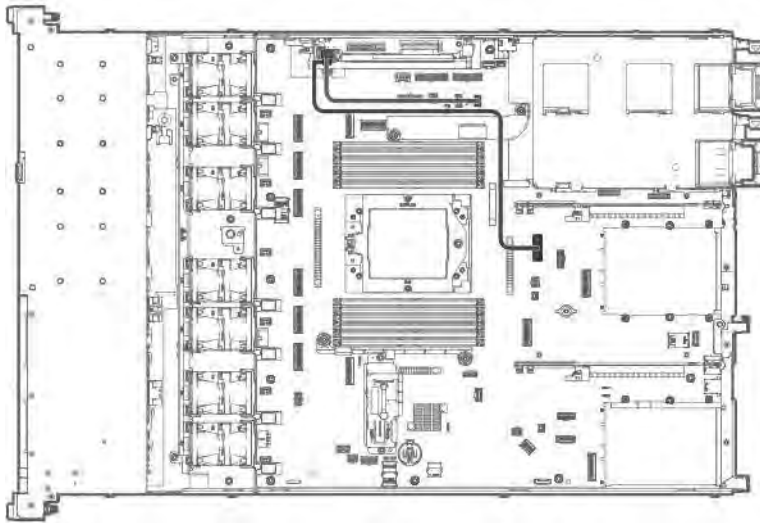
SFF drive chassis



Cable part number	Cable color	From	To
P56685-001 ¹	Orange	Optical drive	NVMe/SATA port 2A
	Blue		Optical drive power connector

¹ Option kit: P56654-B21

M.2 SSD pass-through card cabling



Cable part number	Cable color	From	To
P56689-001 ¹	Orange	M.2 SSD pass-through card	M.2 SSD power connector ²
P56690-001 ³	Blue		NVMe/SATA port 1B
P56691-001 ⁴			

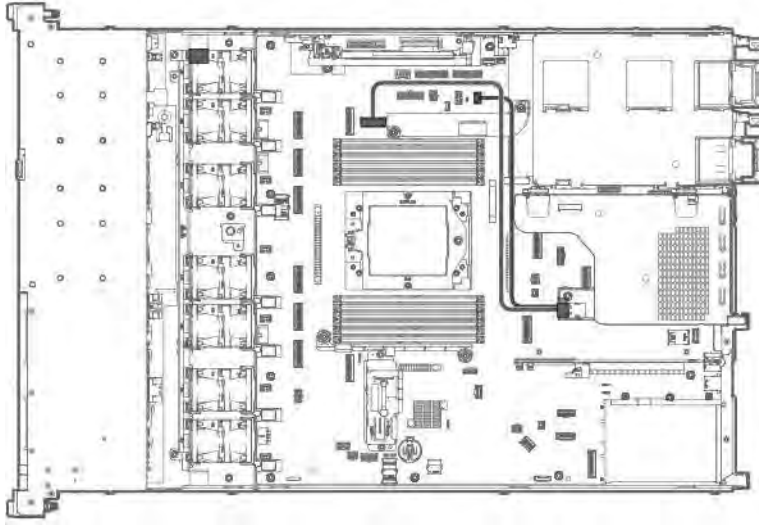
¹ Option kit: P57014-B21

² This power cable connector is used in both NS204i-u boot device and M.2 SSD pass-through card.

³ Option kit: P57014-B21; This cable is used in the SATA M.2 SSD.

⁴ Option kit: P57014-B21; This cable is used in the NVMe M.2 SSD.

NS204i Boot Device cabling

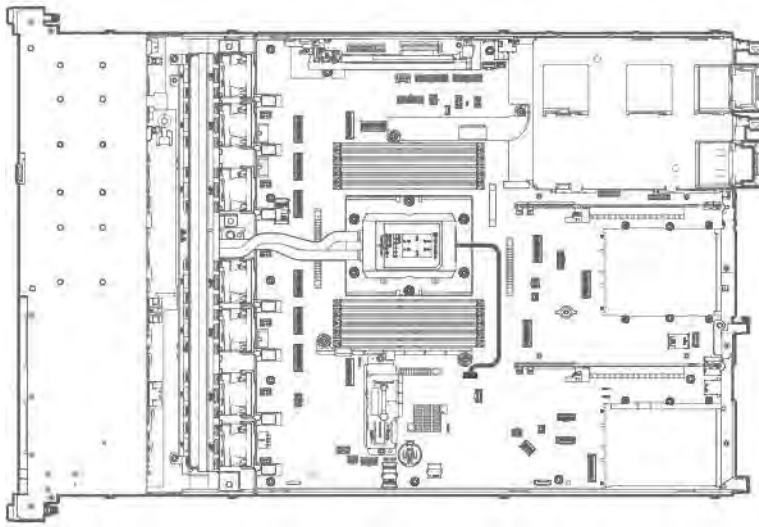


Cable part number	Cable color	From	To
P54087-001 ¹	Orange	NS204i Boot Device	NS204i-u signal connector
P54088-001 ¹	Blue		M.2 SSD power connector ²

¹ Option kit: P57013-B21

² This power cable connector is used in both NS204i-u boot device and M.2 SSD pass-through card.

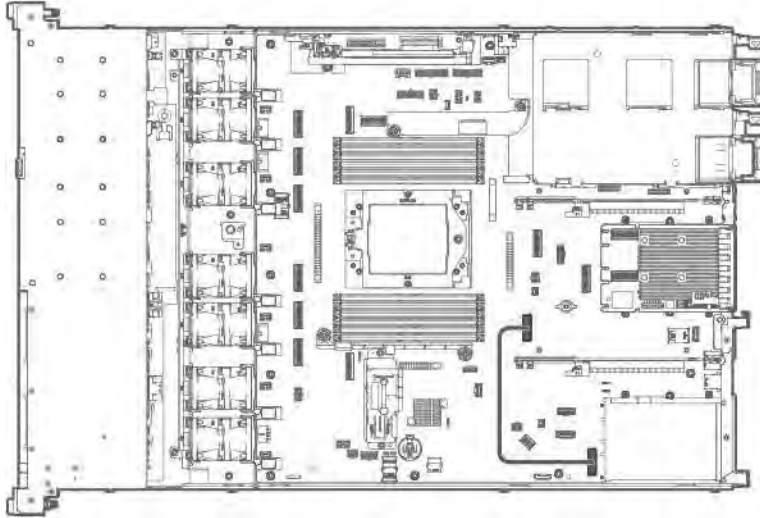
Pump signal cabling for the liquid cooling heatsink



Option part number	Cable color	From	To
P58463-B21	Orange	Pump-cold plate	Pump signal connector

OCP bandwidth upgrade cabling

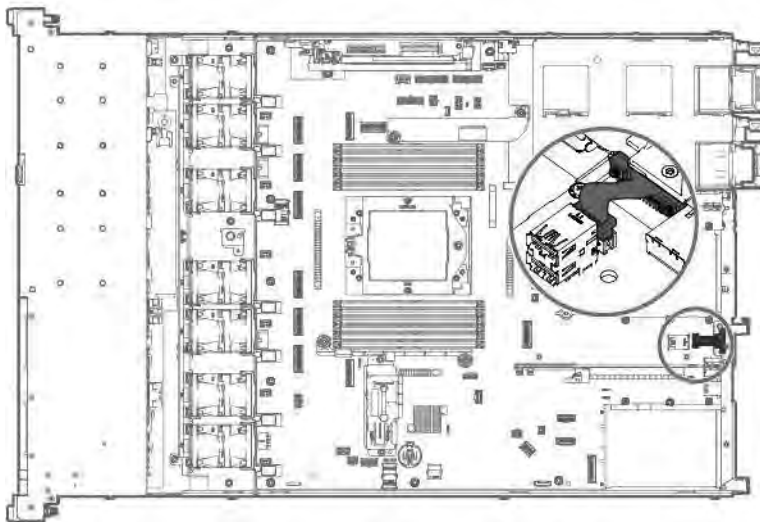
In the Slot 21 OCP, the OCP bandwidth upgrade cable is required to support a x16 OCP expansion option.



Cable part number	Cable color	From	To
P56686-001 ¹	Orange	NVMe port 9A	Slot 21 OCP x16 upgrade connector

¹ Option kit: P56658-B21

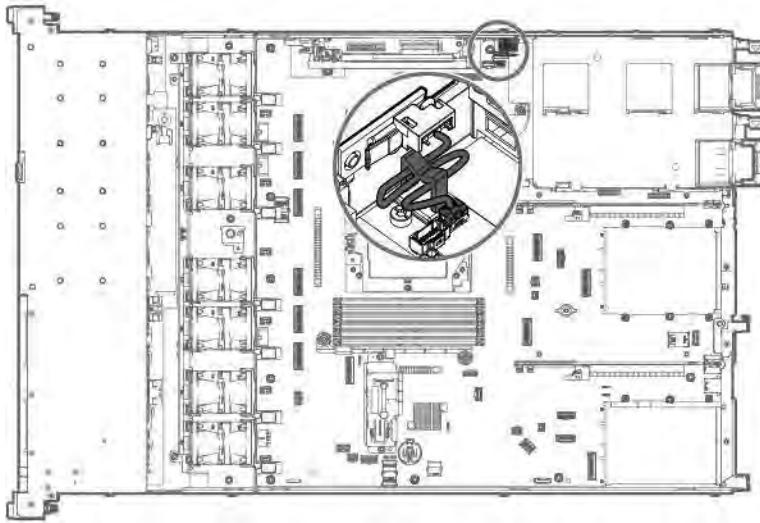
Serial port cabling



Cable part number	Cable color	From	To
P47752-001 ¹	Orange	Serial port	Serial port connector

¹ Option kit: P50887-B21

Chassis intrusion detection switch cabling

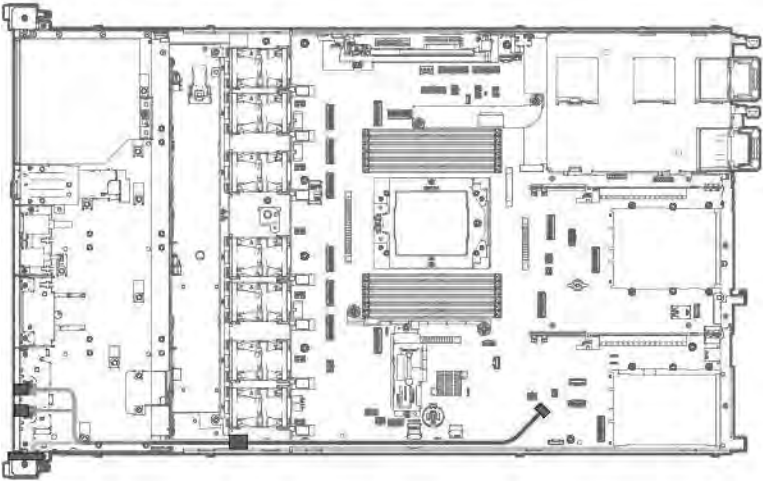


Cable part number	Cable color	From	To
P47751-001 ¹	Orange	Chassis intrusion detection switch	Chassis intrusion detection switch connector

¹ Option kit: P48922-B21

Front I/O cabling

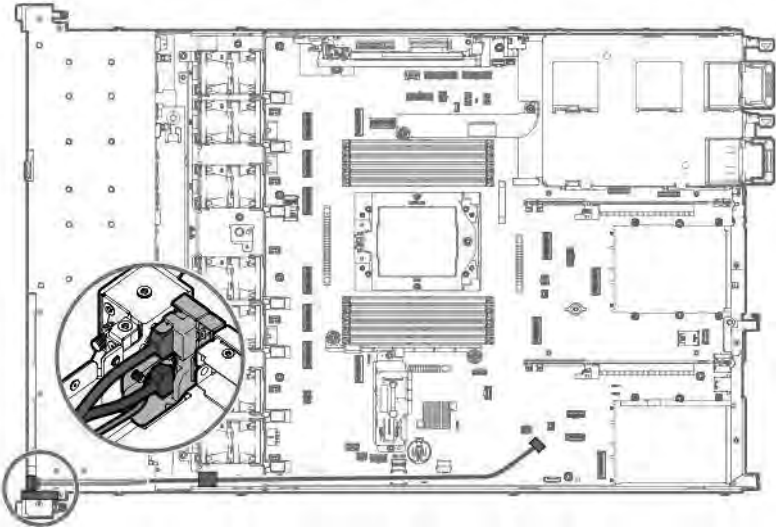
LFF drive configuration



Cable part number	Cable color	From	To
P43727-001 ¹	Orange	USB 3.2 Gen1 port	Front I/O connector
	Blue	iLO service port	
	Gold	Front I/O	

¹ Option kit: P54990-B21

SFF / E3.S drive configuration

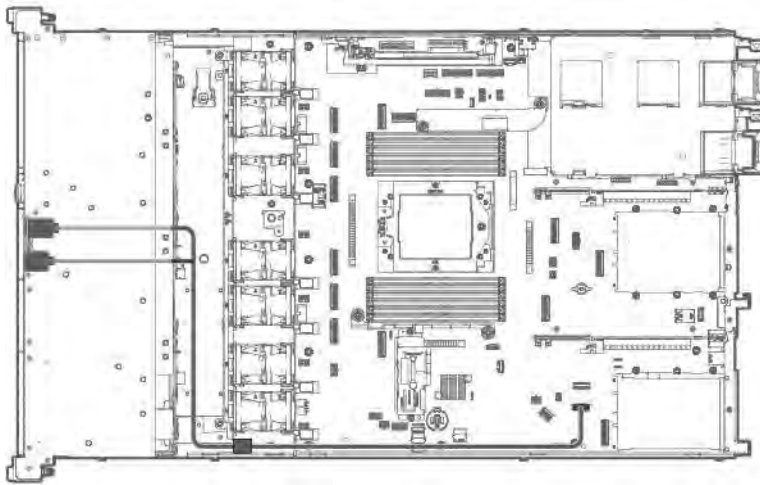


Cable part number	Cable color	From	To
P43727-001 ¹	Orange	iLO service port	Front I/O connector
	Blue	USB 3.2 Gen1 port	
	Gold	Front I/O	

¹ Option kit: P54991-B21

Front USB and DisplayPort cabling

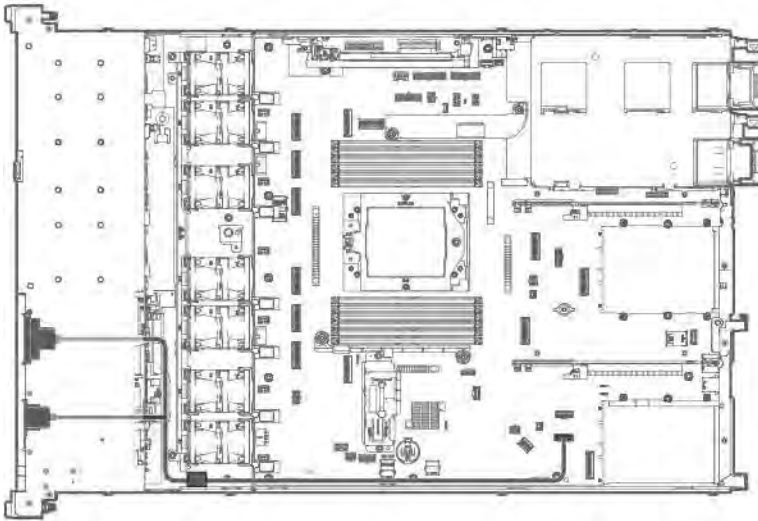
LFF drive chassis



Cable part number	Cable color	From	To
P45619-001 ¹	Orange	DisplayPort	Front USB and DisplayPort connector
	Blue	USB 2.0 port	

¹ Option kit: P56655-B21

SFF drive chassis



Cable part number	Cable color	From	To
P45620-001 ¹	Orange	DisplayPort	Front USB and DisplayPort connector
	Blue	USB 2.0 port	

¹ Option kit: P56654-B21

Configuration resources

Use the following resources to find documentation for configuring and managing 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 Advanced Server (SPV) https://support.hitachivantara.com/en/user/answers/downloads.html#hardware-download
<ul style="list-style-type: none">• Enable policy-based management of server or server group firmware for distributed server infrastructure• Monitor server compliance with a configured firmware baseline• Receive automatic iLO firmware updates• Receive baseline update alerts	UCP Advisor for Computer Management Contact customer support

Configuring the server

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

Configuring storage controllers

Controller type	Documentation
SR controllers	—
G3	<i>SR G3 Controller User Guide</i> Contact customer support
G2	<i>Smart Array SR Controller G2 User Guide</i> Contact customer support
MR controllers	—
G3	<i>MR G3 Controller User Guide</i> Contact customer support

Managing the NS204i Boot Device

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

Deploying an OS

For a list of supported operating systems, see <https://support.hitachivantara.com/en/user/answers/interoperability.html>.

To	See
Configure the server to boot from a SAN	The relevant document at https://knowledge.hitachivantara.com/Documents/Servers
Deploy an OS using iLO virtual media	iLO user guide Contact customer support
Deploy an OS using Intelligent Provisioning	Intelligent Provisioning user guide Contact customer support

Configuration resources **211**

Configuring security

To	See
Implement server security best practices.	<ul style="list-style-type: none"><i>Hitachi Advanced Server HA800 G3 Compute Security Reference Guide</i><i>iLO 6 Security Technology Brief</i>

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	UCP Advisor for Compute Management Contact customer support

Managing Linux-based high performance compute clusters

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

Troubleshooting

NMI functionality

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

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

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

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 the fire and burns 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 extremely 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 the battery in fire or water.

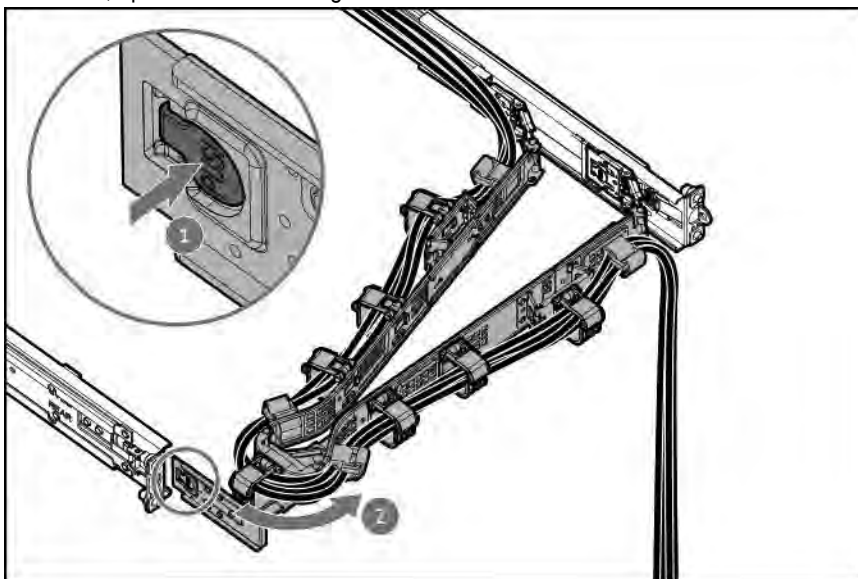
Removing and replacing the system battery

Prerequisites

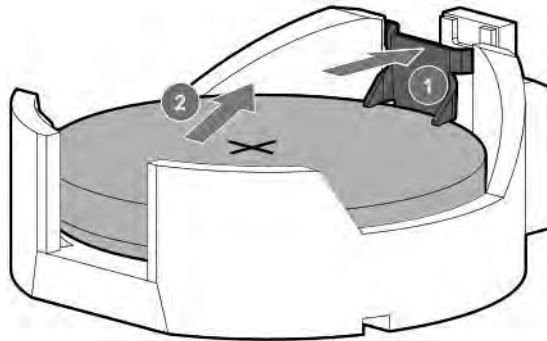
Before you perform this procedure, make sure that you have a spudger or any small prying tool available.

Procedure

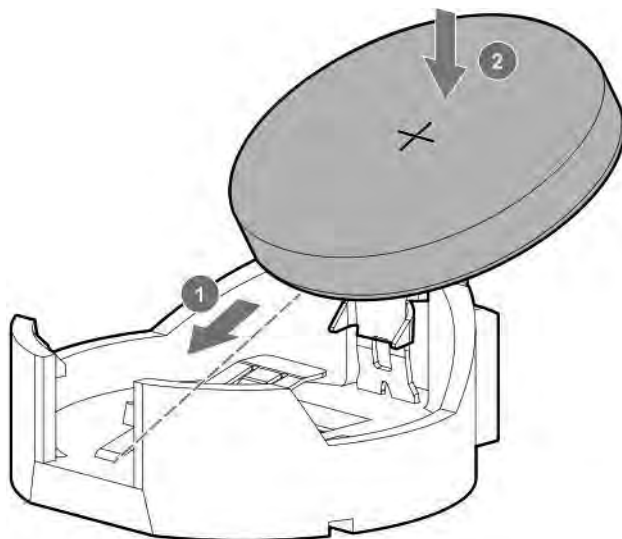
1. If physically powering down a server with the front bezel installed, remove the front bezel.
2. Power down the server.
3. If installed, open the cable management arm.



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. Remove the system battery:
 - a. Use a small flat-bladed, nonconductive tool to press the battery latch (callout 1).
 - b. Remove the system battery from the socket (callout 2).



10. Install the system battery:
 - a. With the side of the battery showing the "+" sign facing up, insert the battery into the socket (callout 1).
 - b. Press the system battery down until it clicks into place (callout 2).



Safety, warranty, and regulatory information

Regulatory information

Additional regulatory information

Hitachi Vantara is committed to providing our customers with information about the chemical substances in our products as needed to comply with legal requirements such as REACH (Regulation EC No 1907/2006 of the European Parliament and the Council).

For Hitachi Vantara product environmental and safety information and compliance data, including RoHS and REACH, contact customer support:

<https://support.hitachivantara.com>

For Hitachi Vantara environmental information, including company programs, product recycling, and energy efficiency, contact customer support:

<https://support.hitachivantara.com>

Notices for Eurasian Economic Union



Manufacturer information:

Hitachi Vantara LLC, 2535 Augustine Drive, Santa Clara, CA 95054 USA

Warranty information

To check the warranty information for the following products, contact customer support:

Hitachi Advanced Servers and Options

Enterprise and Cloudline Servers

Storage Products

Networking Products

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 information about approved hardware configurations, contact customer support.

Mechanical specifications

Specification	Value
Dimensions	—
Height	4.28 cm (1.69 in)
Depth	64.94 cm (25.57 in)
Width	43.46 cm (17.12 in)
Weight, approximate values	—
Minimum	13.76 kg (30.33 lb)
Maximum	14.57 kg (32.12 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.

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

Specification	Value
Input requirements	—
Rated input voltage	100 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	5.8 A at 100 VAC 2.8 A at 200 VAC 2.4 A at 240 VDC for China only
Maximum rated input power	580 W at 100 VAC 560 W at 200 VAC 558 W at 240 VDC for China only
BTUs per hour	1999 at 100 VAC 1912 at 200 VAC 1904 at 240 VDC for China only

Table Continued

Specification	Value
Power supply output	—
Rated steady-state power	500 W at 100 VAC to 127 VAC input 500 W at 100 VAC to 240 VAC input 500 W at 240 VDC input for China only
Maximum peak power	500 W at 100 VAC to 127 VAC input 500 W at 100 VAC to 240 VAC input 500 W at 240 VDC input for China only

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

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

Table Continued

Specification	Value
Rated steady-state power	800 W at 100 VAC to 127 VAC input 800 W at 100 VAC to 240 VAC input 800 W at 240 VDC input for China only
Maximum peak power	800 W at 100 VAC to 127 VAC input 800 W at 100 VAC to 240 VAC input 800 W at 240 VDC input for China only

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

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

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

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

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