



Hewlett Packard
Enterprise

HPE ProLiant Compute DL320 Gen12 Server User Guide

Part Number: 30-1DEA6CD6-002

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HPE ProLiant Compute DL320 Gen12 Server User Guide

Abstract

This document is for the person who installs, administers, and troubleshoots servers and storage systems. Hewlett Packard Enterprise assumes you are qualified in the servicing of computer equipment and trained in recognizing hazards in products with hazardous energy levels, and are familiar with the weight and stability precautions for rack installations.

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Component identification

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

Subtopics

[Front panel components](#)

[Front panel LEDs and buttons](#)

[Rear panel components](#)

[Rear panel LEDs](#)

[System board and power distribution board components](#)

[Component touchpoints](#)

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[Liquid cooling guidelines](#)

[Fan and heatsink requirements](#)

[Datacenter Secure Control Module components](#)

[OCP NIC 3.0 slot numbering](#)

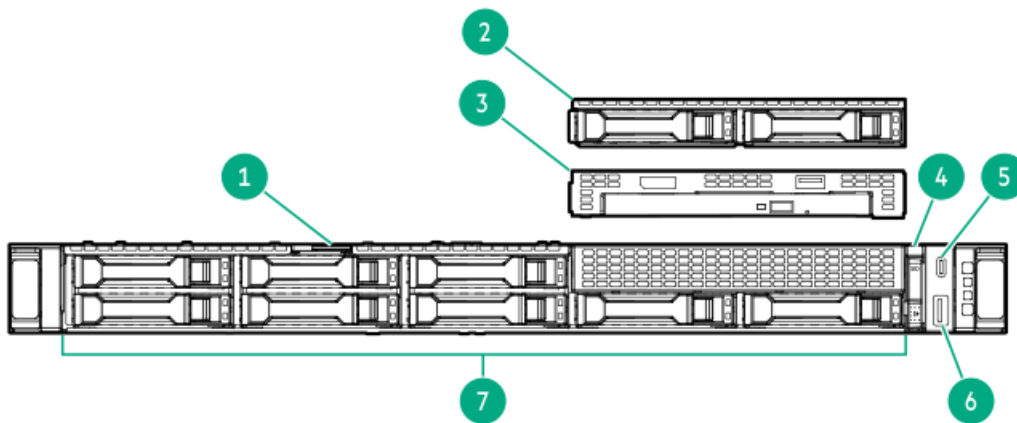
[HPE NS204i-u Boot Device V2 components](#)

[HPE NS204i-u Boot Device V2 LED definitions](#)

[Riser board components](#)

Front panel components

8 + 2 SFF drive configuration



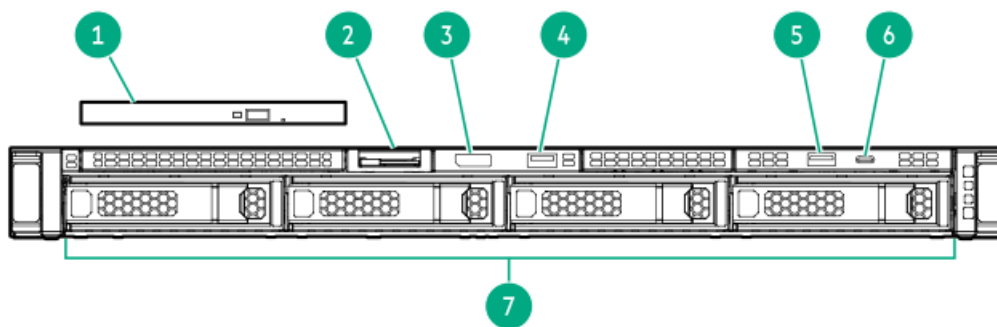
Item	Description
1	Serial number/iLO information pull tab ¹
2	2 SFF side-by-side drive cage assembly (optional) ²
3	Optical drive cage assembly (optional) ³
4	System Insight Display (optional)
5	iLO Service Port
6	USB 3.2 Gen 1 port
7	8 SFF drives

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

² Depending on the drive backplane installed, the server supports SATA, SAS, U.2 NVMe, and U.3 NVMe drives.
³ This assembly includes:

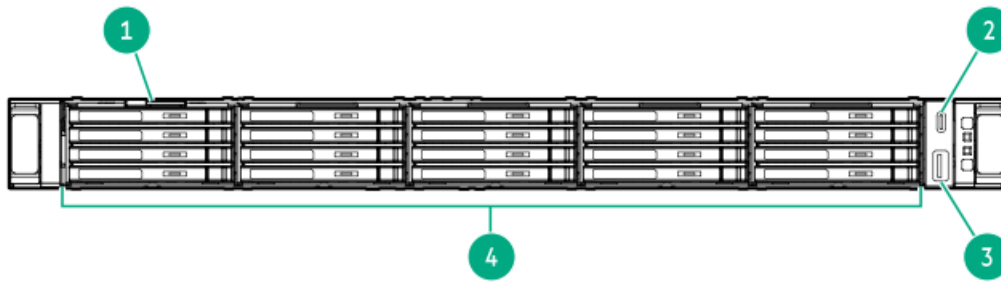
- One DisplayPort 1.1a
- One USB 2.0
- One optical drive bay

4 LFF drive configuration



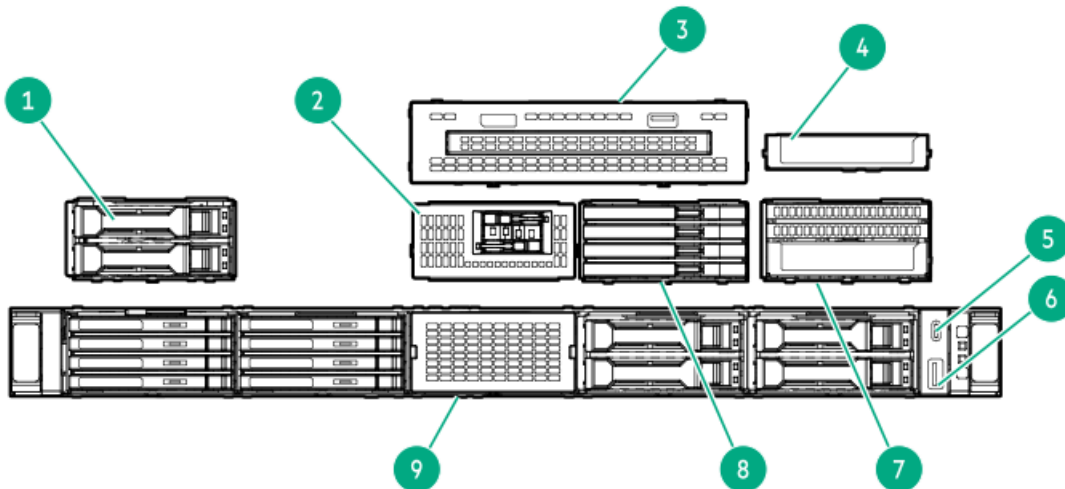
Item	Description
1	Optical drive cage (optional)
2	Serial number/iLO information pull tab
3	DisplayPort 1.1a (optional)
4	USB 2.0 port (optional)
5	USB 3.2 Gen 1 port
6	iLO Service Port
7	4 LFF drives

20 E3.S drive configuration



Item	Description
1	Serial number/iLO information pull tab
2	iLO Service Port
3	USB 3.2 Gen 1 port
4	20 E3.S drives

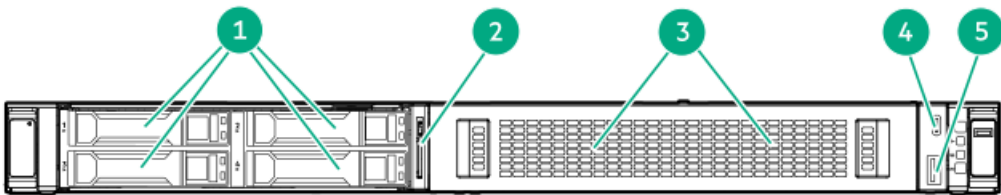
10 SFF or 20 E3.S mixed drive configuration with options



Item	Description
1	2 SFF drives (optional)
2	NS204i-u boot device (optional) ¹
3	Universal media bay (optional) ²
4	Front OCP (optional) ³
5	iLO Service Port
6	USB 3.2 Gen 1 port
7	Front OCP cage ⁴
8	4 E3.S drives (optional)
9	Front OCP blank

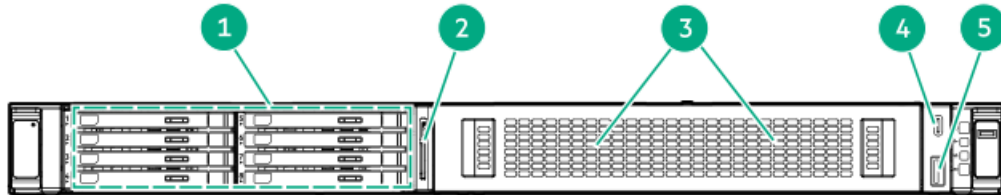
- ¹ This option is installed in box 3.
² This option is installed in box 4 and 5.
³ This option is installed in box 3 bay 1 or bay 3.
⁴ This option is installed in box 3.

4 SFF drive configuration with a GPU riser cage



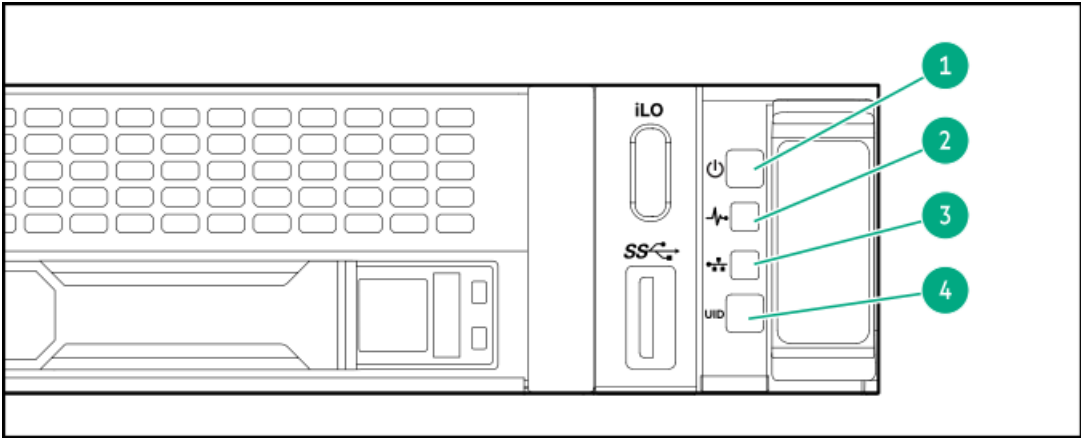
Item	Description
1	4 SFF drives
2	Serial number/iLO information pull tab
3	GPU riser cage
4	iLO Service Port
5	USB 3.2 Gen 1 port

8 E3.S drive configuration with a GPU riser cage



Item	Description
1	8 E3.S drives
2	Serial number/iLO information pull tab
3	GPU riser cage
4	iLO Service Port
5	USB 3.2 Gen 1 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 ³	Solid green	Normal
		Flashing green	iLO is rebooting
		Flashing amber	System degraded ³
		Flashing red	System critical ³
3	NIC status LED ¹	Solid green	Linked to network
		Flashing green	Network active
		Off	No network activity
4	UID button/LED ¹	Solid blue	Activated
		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

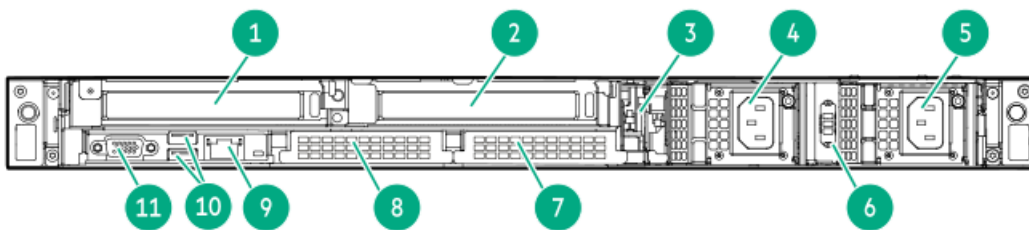
¹ When all LEDs flash simultaneously, a power fault has occurred. For more information, see [Front panel LED power fault codes](#).

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, [review the system Integrated Management Log \(IML\)](#) or use [HPE iLO](#) to review the system health status.

Rear panel components

Rear panel with 60 mm PSU



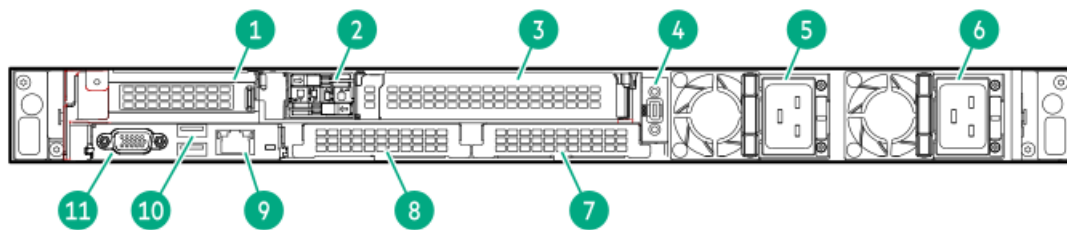
Item	Description
1	Slot 1 PCIe5 x16 (optional)
2	Slot 2 PCIe5 x16 (optional)
3	NS204i-u boot device (optional)
4	M-CRPS 2 (optional)
5	M-CRPS 1
6	ix port (optional) ¹
7	Slot 21 OCP B PCIe5 x16 (optional)
8	Slot 20 OCP A PCIe5 x16
9	iLO dedicated network port ²
10	USB 3.2 Gen 1 ports ²
11	VGA port ³

¹ The ix port connects to an external serial port dongle.

² These components are on the DC-SCM option.

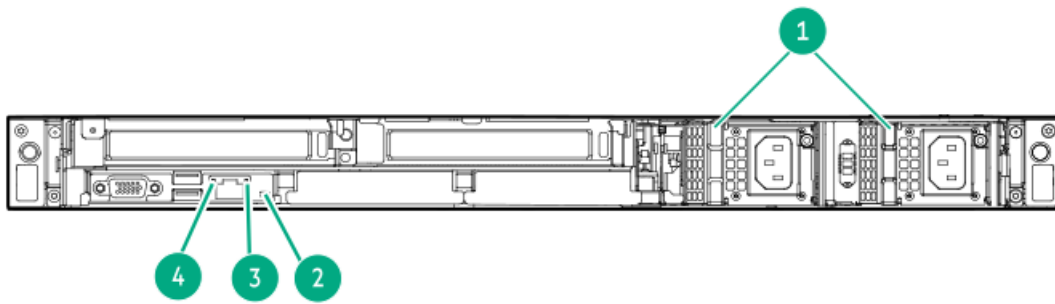
³ Connect a display device to the VGA port. Use of any kind of adapter, converter cable, or dongle might lead to decreased display quality or lag over the connection.

Rear panel with 73.5 mm PSU



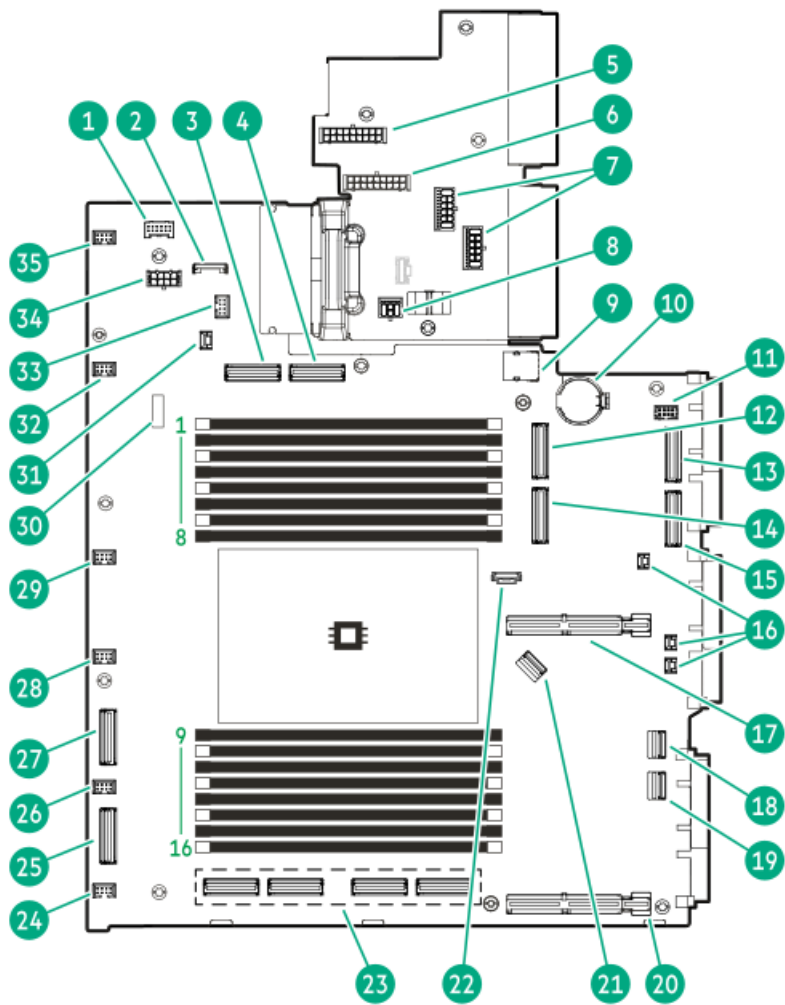
Item	Description
1	Slot 1 PCIe5 x16 (optional)
2	NS204i-u boot device (optional)
3	Slot 2 PCIe5 x16 (optional)
4	ix port (optional)
5	M-CRPS 2 (optional)
6	M-CRPS 1
7	Slot 21 OCP B PCIe5 x16 (optional)
8	Slot 20 OCP A PCIe5 x16
9	iLO dedicated network port
10	USB 3.2 Gen 1 ports
11	VGA port

Rear panel LEDs



Item	LED	Status	Definition
1	Power supply	Solid green	The power supply is operating normally.
		Flashing green	<ul style="list-style-type: none"> 1 flash per sec—Power supply is in standby mode 2 flashes per sec—Power supply firmware is updating
		Solid amber	One or more of the following conditions exists: <ul style="list-style-type: none"> Power supply failure Power supply error
		Off	One or more of the following conditions exists: <ul style="list-style-type: none"> Power is unavailable The power cord is disconnected.
2	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
3	iLO status	Solid green	Linked to network
		Flashing green	Network active
		Off	No network activity
4	iLO link	Solid green	Network link
		Off	No network link

System board and power distribution board components



Item	Description
1	Energy pack connector
2	SID connector
3	M-XIO port 6
4	M-XIO port 4
5	Box 1, 2 drive backplane power connector
6	Box 3, 4 drive backplane power connector
7	2 x 6 M-PIC power connectors
8	2 x 3 M-PIC power connector
9	USB 3.2 Gen1 port
10	System battery
11	NS204i-u power connector
12	M-XIO port 17
13	MCIO OCP B-1 input port
14	M-XIO port 13
15	MCIO OCP B-2 input port
16	Storage controller backup power connector
17	Secondary riser connector
18	Front I/O connector
19	USB 2.0 DisplayPort cable connector
20	Primary riser connector
21	NS204i-u signal connector
22	CLC connector
23	M-XIO ports ¹
24	Fan connector 7
25	M-XIO port 0
26	Fan connector 6
27	M-XIO port 2
28	Fan connector 5
29	Fan connector 4
30	<u>System maintenance switch</u>
31	Chassis intrusion detection switch connector
32	Fan connector 3
33	Fan connector 1
34	Box 5 drive backplane power connector
35	Fan connector 2

¹ These M-XIO ports are numbered 7, 5, 1, and 3 from left to right.

Subtopics

[System maintenance switch descriptions](#)

[DIMM slot numbering](#)

[DIMM label identification](#)



System maintenance switch descriptions

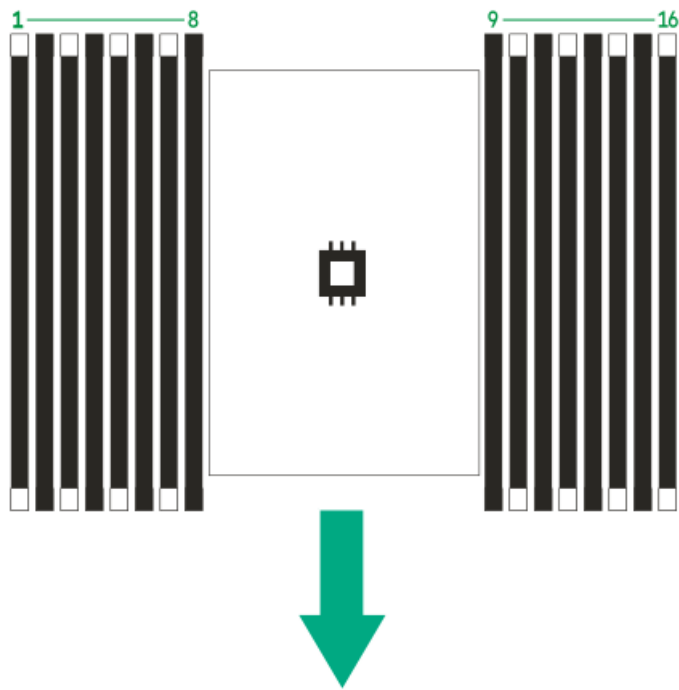
Position	Default	Function
S1 ¹	Off	<ul style="list-style-type: none">Off—iLO 7 security is enabled.On—iLO 7 security is disabled.
S2	Off	Reserved
S3	Off	Reserved
S4	Off	Reserved
S5 ¹	Off	<ul style="list-style-type: none">Off—Power-on password is enabled.On—Power-on password is disabled.
S6 ^{1, 2, 3}	Off	<ul style="list-style-type: none">Off—No functionOn—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 slot numbering

The arrow points to the front of the server.



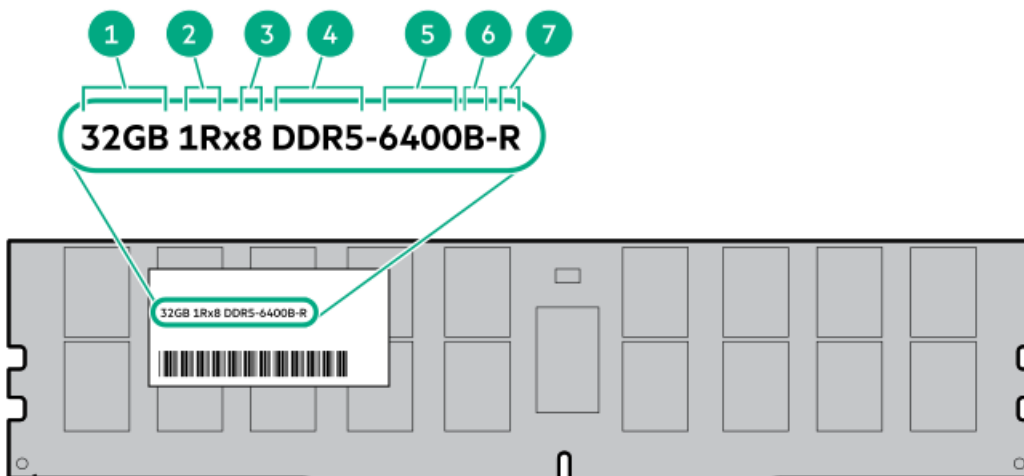


DIMM label identification

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, see the HPE DDR5 SmartMemory QuickSpecs:

<https://www.hpe.com/docs/server-memory>



Item	Description	Example
1	Capacity*	16 GB
		32 GB
		64 GB
		96 GB
		128 GB
		256 GB
2	Rank	1R—Single rank
		2R—Dual rank
		4R—Quad rank
3	Data width on DRAM	x4—4-bit
		x8—8-bit
4	Memory generation	PC5—DDR5
5	Maximum memory speed*	6400 MT/s
6	CAS latency	B—42-42-42
7	DIMM type	R—RDIMM (registered)

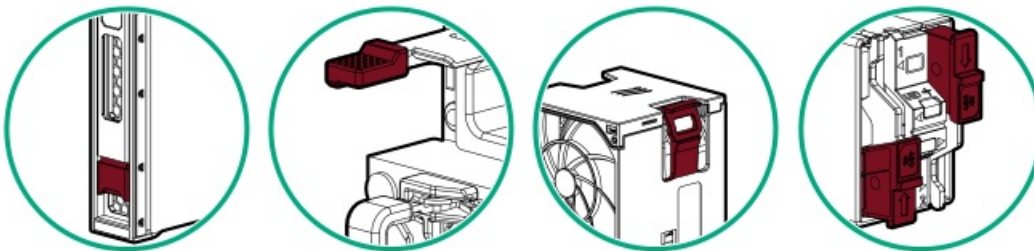
* The maximum memory speed and capacity is a function of the memory type, memory configuration, and processor model.

Component touchpoints

Certain components are color-coded. These colors represent the recommended touch areas for a removal process and indicate whether components require a system shutdown before removal.

The following diagrams are examples only.

HPE hot-plug red

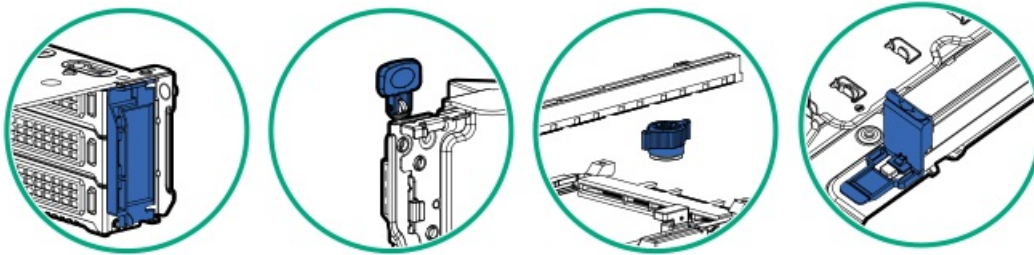


Hot-plug red indicates hot-pluggable components. These components can be removed and installed while the system is running, and doing so will not result in a system shutdown.

Component examples:

- Power supplies in a redundant power configuration
- Hot-plug fans
- Hot-plug drives
- M.2 SSDs in a hot-plug boot device

HPE touchpoint blue



Touchpoint blue indicates cold-pluggable components. These components require a system shutdown. Failure to do so might result in system failure or data loss. Cold-pluggable components might also indicate touchpoints on non-electrical components.

Component examples:

- Storage devices
- Fan cages
- System boards
- Energy packs

Systems Insight Display LEDs

The Systems Insight Display (SID) LEDs represent components on the system board. The display enables component issue diagnosis even with the access panel installed.

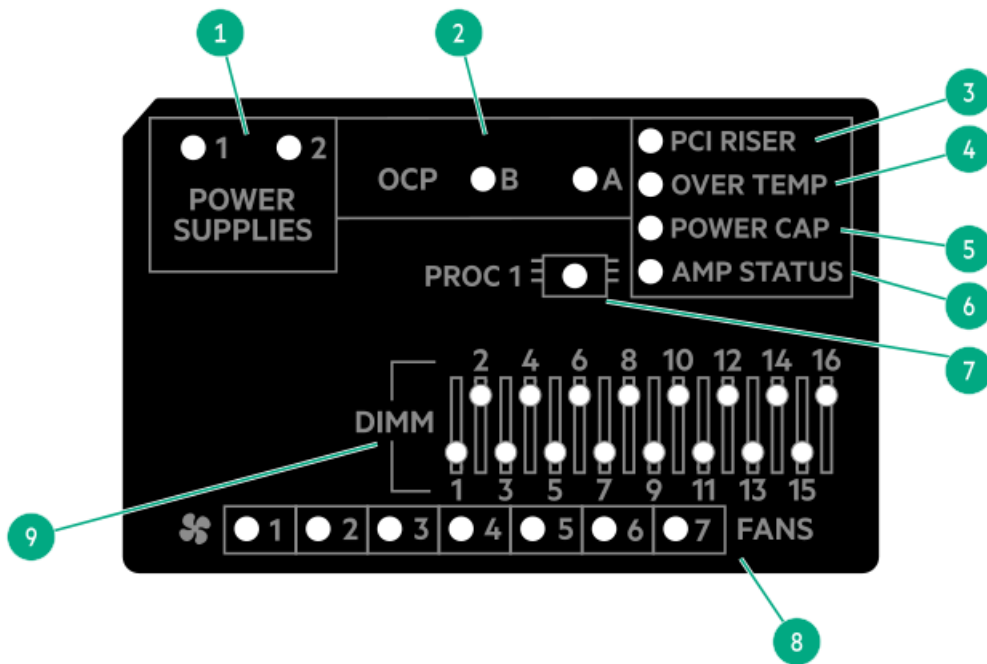


IMPORTANT

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

For information about memory population rules, see the relevant memory technical paper in:

<https://www.hpe.com/docs/server-memory>



Item	LED	Status	Description
1	Power supply LEDs	Off	Normal
		Solid amber	One or more of the following conditions exit: <ul style="list-style-type: none"> Power subsystem degraded Power supply failure Input power lost
2	OCP LEDs	Solid green	Network link
		Flashing green	Network active
		Off	No network link
3	PCI riser LED	Off	Normal
		Solid amber	Incorrectly installed PCI riser cage
4	Over temp LED	Off	Normal
		Solid amber	High system temperature detected
5	Power cap LED	Solid green	Power cap applied
		Off	One or more of the following conditions exit: <ul style="list-style-type: none"> System is in standby No cap is set
6	AMP ¹	Solid green	AMP mode enabled
		Solid amber	Failover
		Flashing amber	Invalid configuration
		Off	AMP modes disabled
7	Processor LED	Off	Normal
		Solid amber	Failed processor
8	Fan LEDs	Off	Normal
		Solid amber	Failed fan or missing fan
9	DIMM LEDs	Off	Normal
		Solid amber	Failed DIMM or configuration issue

¹ To enable Advanced Memory Protection (AMP), see the UEFI user guide (<https://www.hpe.com/support/hpeuefisystemutilities-quicklinks>).

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

Systems Insight Display combined LED descriptions

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

- SID LEDs
- System power LED
- Health LED



SID LED status	Health LED status	System power LED status	Definition
Power supply (solid amber)	Flashing red	Solid amber	One or more of the following conditions exist: <ul style="list-style-type: none"> Only one power supply is installed and that power supply is in standby. Power supply fault. System board fault.
	Flashing amber	Solid green	One or more of the following conditions exist: <ul style="list-style-type: none"> Redundant power supply is installed and only one power supply is functional. AC power cord is not plugged into redundant power supply. Redundant power supply fault. Power supply mismatch at POST or power supply mismatch through hot-plug addition.
PCI riser (solid amber)	Flashing red	Solid green	The PCI riser cage is not seated properly.
Over temp (solid amber)	Flashing amber	Solid green	The Health Driver has detected a cautionary temperature level.
	Flashing red	Solid amber	The server has detected a hardware critical temperature level.
Power cap (solid green)	—	Solid green	Power is available.
Power cap (solid green)	—	Flashing green	Waiting for power
Power cap (flashing amber)	—	Solid amber	Power is not available.
Power cap (off)	—	Solid amber	Standby
Processor (solid amber)	Flashing red	Solid amber	One or more of the following conditions might exist: <ul style="list-style-type: none"> Processor in socket X has failed. Processor X is not installed in the socket. Processor X is unsupported. ROM detects a failed processor during POST.
	Flashing amber	Solid green	Processor in socket X is in a pre-failure condition.
Fan (solid amber)	Flashing amber	Solid green	One fan has failed or has been removed.
	Flashing red	Solid green	Two or more fans have failed or been removed.
DIMM (solid amber)	Flashing red	Solid green	One or more DIMMs have failed.
	Flashing amber	Solid green	DIMM in slot X is in a pre-failure condition.

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.

Subtopics

[SFF drive bay numbering](#)

[LFF drive bay numbering](#)

[E3.S drive bay numbering](#)

SFF drive bay numbering

The following drive backplane options are supported:

2 SFF drive backplanes:

- 2 SFF 16G x4 U.2 NVMe UBM4 BC
- 2 SFF 16G x4 U.2 NVMe UBM6 BC
- 2 SFF 24G x4 U.3 NVMe / SAS UBM4 BC
- 2 SFF 24G x4 U.3 NVMe / SAS UBM6 BC
- 2 SFF 16G x4 NVMe UBM10 BC (stacked)
- 2 SFF 16G x4 NVMe UBM11 BC (stacked)

8 SFF drive backplanes:

- 8 SFF 16G x4 U.2 NVMe / SAS UBM4 BC
- 8 SFF 16G x4 U.2 NVMe / SAS UBM6 BC
- 8 SFF 24G x1 U.3 NVMe /SAS UBM3 BC
- 8 SFF 24G x1 U.3 NVMe / SAS UBM6 BC
- 8 SFF 24G x4 U.3 NVMe / SAS UBM3 BC
- 8 SFF 24G x4 U.3 NVMe / SAS UBM 6 BC

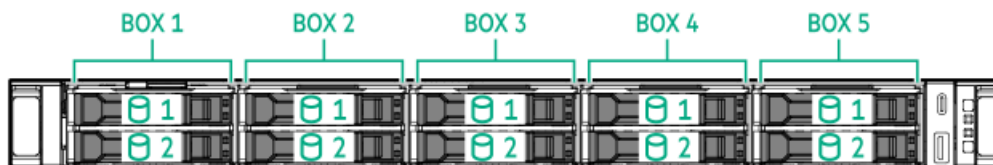
For more information on the drive backplane description, see [Drive backplane naming](#).



8 + 2 SFF drive bay numbering



10 SFF drive bay numbering



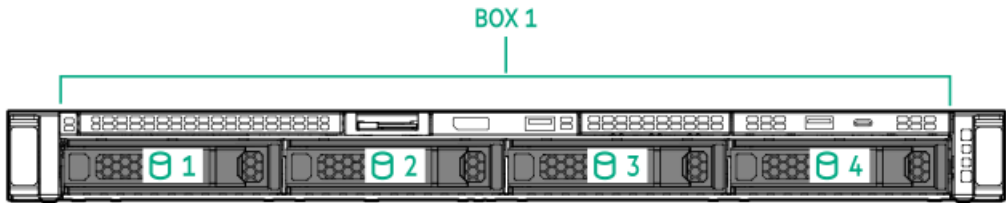
LFF drive bay numbering

The following drive backplane options are supported:

- 4 LFF 12G x1 U.2 SAS UBM2 BC
- 4 LFF 12G x1 U.2 SAS UBM6 BC

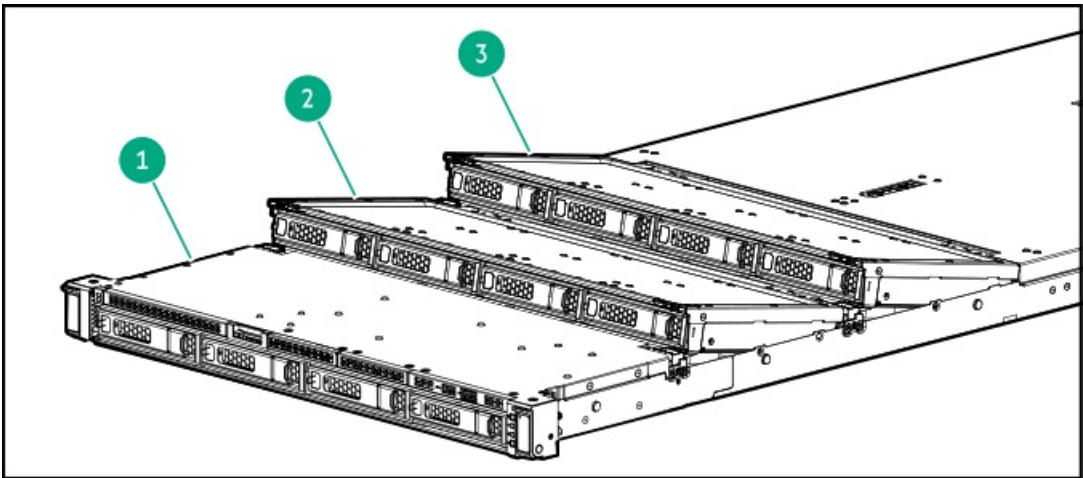
For more information on the drive backplane description, see [Drive backplane naming](#).

4 LFF



12 LFF

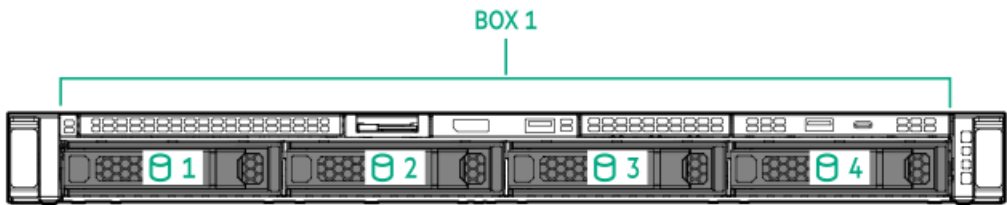
Drive box numbering



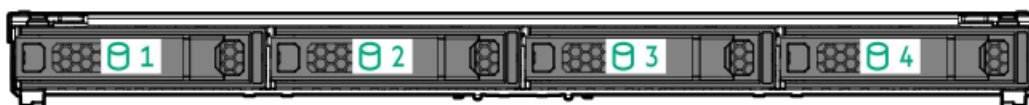
Item	Description
1	Box 1
2	Box 3
3	Box 5

Drive bay numbering

- Box 1



- Box 3 and 5



E3.S drive bay numbering

The following drive backplane options are supported:

- 2 E3.S 32G x8 NVMe UBM10 BC
- 4 E3.S 32G x4 NVMe UBM10 BC
- 4 E3.S 32G x4 NVMe UBM11 BC

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

20 E3.S drive bay numbering



Mixed drive bay numbering

The following drive backplane options are supported:

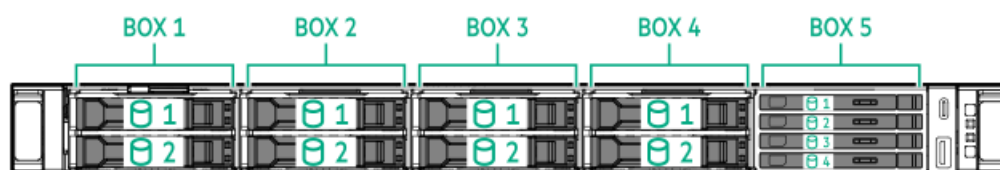
2 SFF drive backplanes:

- 2 SFF 16G x4 NVMe UBM10 BC (stacked)
- 2 SFF 16G x4 NVMe UBM11 BC (stacked)

4 E3.S drive backplanes:

- 4 E3.S 32G x4 NVMe UBM10 BC
- 4 E3.S 32G x4 NVMe UBM11 BC

8 SFF + 4 E3.S drive bay numbering



GPU-optimized configuration drive bay numbering

The following drive backplanes are supported:

2 SFF drive backplanes:

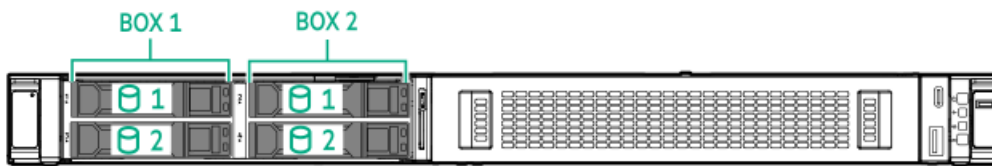
- 2 SFF 16G x4 NVMe UBM10 BC (stacked)
- 2 SFF 16G x4 NVMe UBM11 BC (stacked)

E3.S drive backplanes:

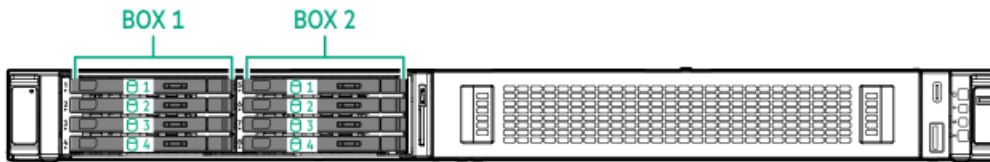
- 4 E3.S 32G x4 NVMe UBM10 BC
- 4 E3.S 32G x4 NVMe UBM11 BC

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

4 SFF drive bay numbering



8 E3.S drive bay numbering

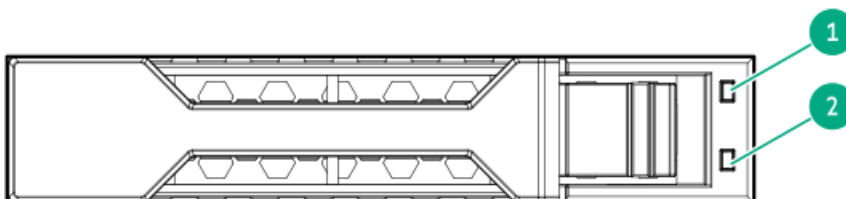


HPE Basic Drive LED definitions

The HPE 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.

The SFF basic drive carrier supports hot-plug NVMe.



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

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.

GPU riser slot numbering

This server supports 4 single-width GPUs and 2 dual-width GPUs with 4 SFF SAS/ SATA/ NVMe drives or 8 E3.S drives.

4 single-width GPUs



2 double-width GPUs



Drive backplane naming

This topic explains the features represented in the drive backplane naming. This naming convention was adopted starting in the HPE Gen11 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
		E3S—Enterprise and Datacenter Standard Form Factor (EDSFF E3.S)
3	Maximum link rate per lane (GT/s)	12G
		16G
		24G
		32G
4	Port link width and interface	x1 NVMe/SAS—U.3 NVMe, SAS, or SATA 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) model	The UBM model defines the UBM firmware used by the backplane. Examples of UBM models: UBM2, UBM3, etc.
6	Drive carrier type	BC—Basic carrier (SFF)
		LP—Low-profile carrier (LFF)
		EC—E3.S carrier

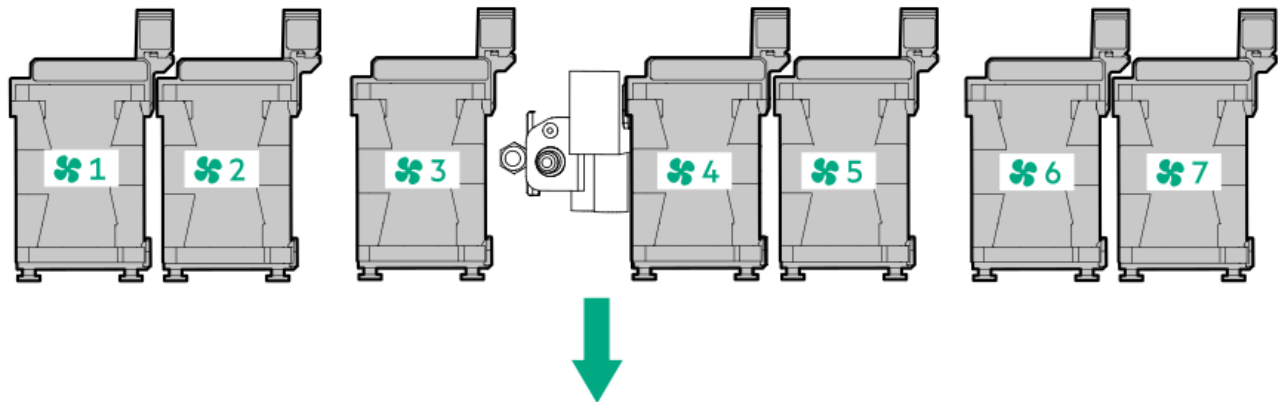
¹
Tri-mode controller support for x1 U.3 NVMe, SAS, and SATA drives. System board connection supports SATA drives only (not available on Gen12).

²
CPU direct attach or tri-mode controller support for x4 U.3 NVMe, x2 (via a splitter cable) 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

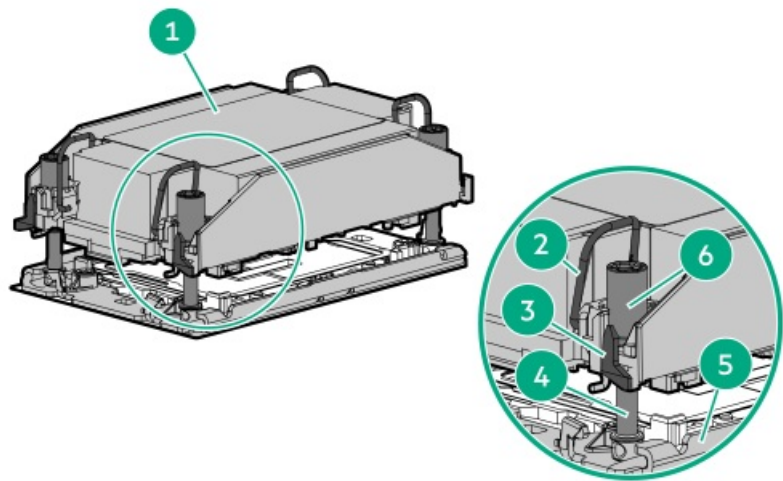
To provide sufficient airflow to the system, the server has seven high performance fans.



The arrow points to the front of the server.

Heatsink and processor socket components

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



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

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

Closed-loop liquid cooling components

When Intel Xeon processor with $270\text{ W} < \text{TDP} \leq 350\text{ W}$ 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.



NOTE

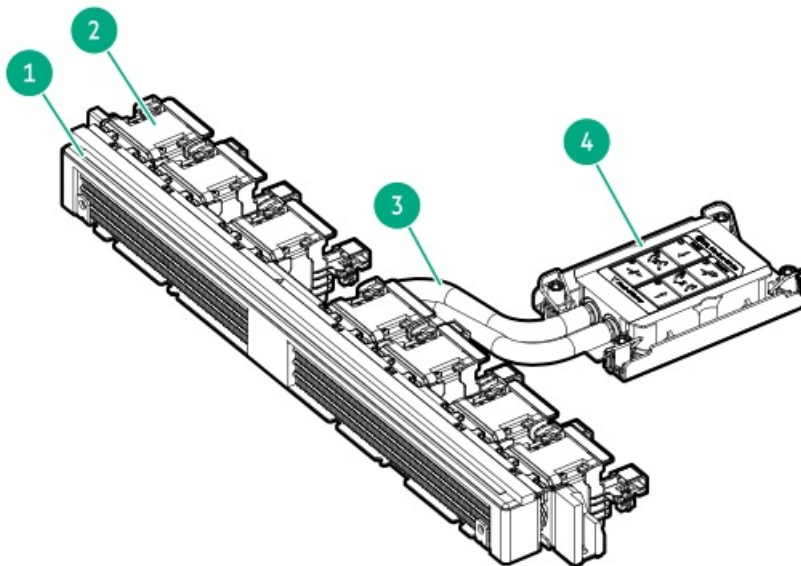
The coolant in the liquid cooling module contains anti-corrosion additives which could degrade over time resulting in potential leaks in the system. To protect the system, HPE recommends replacing the module every five years. For additional information, contact your local HPE representative.



CAUTION

Heatsink coolant leakage

- The tubes of the closed-loop liquid cooling (CLLC) heatsink are prefilled with coolant. iLO automatically detects if a coolant leakage occurs and:
 - Sends an iLO REST alert and SNMP trap
 - Records the event in the Integrated Management Log (IML)
 - Furthermore, the system initiates an immediate shutdown and iLO:
Prevents power-on until the leakage event is cleared, and REST API is performed for system recovery. For more information on clearing the leakage event using the iLO web interface or RESTful API, see the iLO user guide (<https://www.hpe.com/support/hpeilodocs-quicklinks>).
- If a coolant leakage occurs, follow the recommended procedure in Appendix I: Server coolant spill response of the server maintenance guide (<https://www.hpe.com/info/dl320gen12-msg>). Do not attempt to replace the coolant in the CLLC heatsink. For service inquiries, contact your local service provider.



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

¹ The liquid cooling heatsink has two pumps for redundancy.

Liquid cooling guidelines

The closed-loop liquid cooling (CLLC) module tubes are prefilled with coolant. The coolant is a mixture of purified water and ethylene glycol with additional corrosion-resistant additives. In the direct liquid cooling (DLC) module, coolant is fed into the hoses through the rack manifolds.

CLLC module lifespan

HPE recommends replacing the module every five years. The coolant anti-corrosion additives degrade over time resulting in potential leaks in the system. For additional information on protecting the system, contact your local HPE representative.

Coolant leakage detection

If a liquid cooling module coolant leakage occurs, the following happens:

- iLO automatically detects it and:
 - Sends an iLO REST alert and Simple Network Management Protocol (SNMP) trap
 - Records the event in the Integrated Management Log (IML)
- The system initiates an immediate shutdown. The system will not power on until the leakage event is cleared, and a REST API operation for system recovery is performed.
- Follow the recommended procedure in [Appendix I: Server coolant spill response](#) of the server maintenance guide (<https://www.hpe.com/info/dl320gen12-msg>).

Do not attempt to replace the coolant in the CLLC heatsink. For service inquiries, contact your local service provider.

Storage temperature

Store the liquid cooling module (CLLC, DLC) in temperatures between -10°C to 60°C (14°F to 140°F). Allowing coolant to freeze inside the module can damage its metallic microstructures.

Fan and heatsink requirements



CAUTION

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

The table lists the fan and heatsink requirements for the server depending on the drive configuration and hardware options. For more detailed information, see the product QuickSpecs on the Hewlett Packard Enterprise website (<https://www.hpe.com/info/quickspecs>).

8 SFF and 4 LFF drive configurations

Processor TDP	Fan	Heatsink
≤ 185 W	Standard	Standard
185 W < Processor TDP ≤ 270 W	Performance	Performance
270 W < Processor TDP ≤ 350 W	Liquid cooling	Closed-loop liquid cooling

1

The maximum recommended ambient operating temperature is 27°C.

12 LFF drive and GPU configurations

Processor TDP	Fan	Heatsink
≤ 185 W	Performance	Standard
185 W < Processor TDP ≤ 270 W	Performance	Performance
270 W < Processor TDP ≤ 350 W	Liquid cooling	Closed-loop liquid cooling

Hardware options

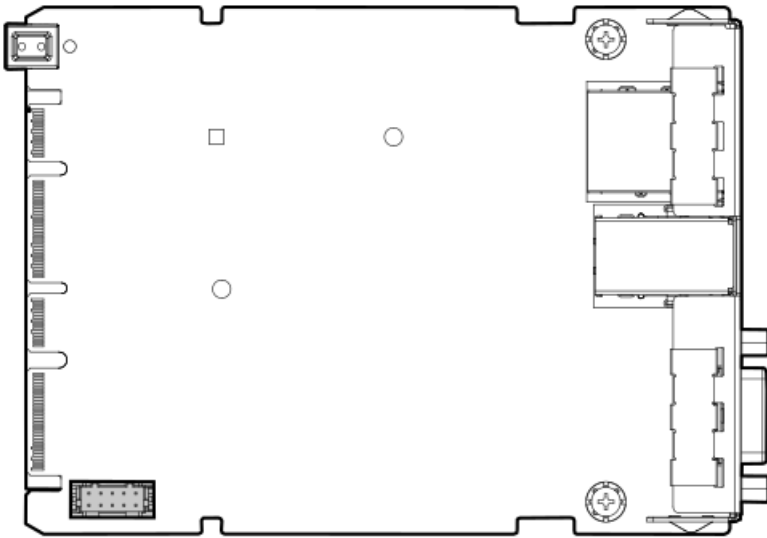
To maintain proper system cooling, make sure to use a performance fan and a standard or performance heatsink for the following hardware options:

- Energy pack
- E3.S / NVMe / SAS4 drives / HPE NS204i-u Boot Device V2 v2
- 96 GB or higher capacity DIMMs *
- Type-p Ethernet adapters or type-o InfiniBand adapters with 100/200 Gb speed
- OCP NIC 3.0 adapters with 100/200 Gb speed
- GPU cards

Datacenter Secure Control Module components

This server is a Datacenter Modular Hardware System (DC-MHS)-based product.

- The processors and DIMMs on the system board provide the compute function. The system board serves as the Host Processor Module (HPM).
- The iLO and the Trusted Platform Module 2.0 (TPM 2.0) chipsets embedded on the Datacenter Secure Control Module (DC-SCM) provide this server's manageability and security functions. This module also has the connector for the serial port option.



OCP NIC 3.0 slot numbering

This server supports up to two OCP NIC 3.0 slots in either the rear or the front panel.

Rear OCP NIC 3.0 slots

The rear OCP NIC 3.0 slots are standard in the system.



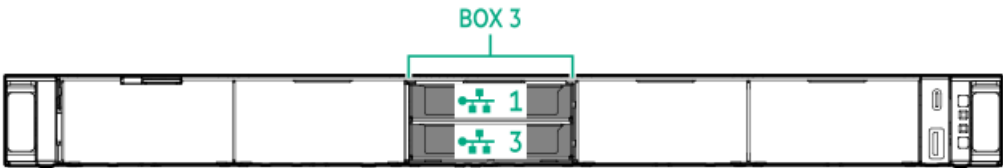
Item	Slot number	Supported options
1	Slot 20 OCP A PCIe5 x16	<ul style="list-style-type: none"> • OCP NIC adapter • Type-o storage controller
2	Slot 21 OCP B PCIe5 x16	

1

When installing a single OCP NIC adapter, install it in Slot 20 OCP A.

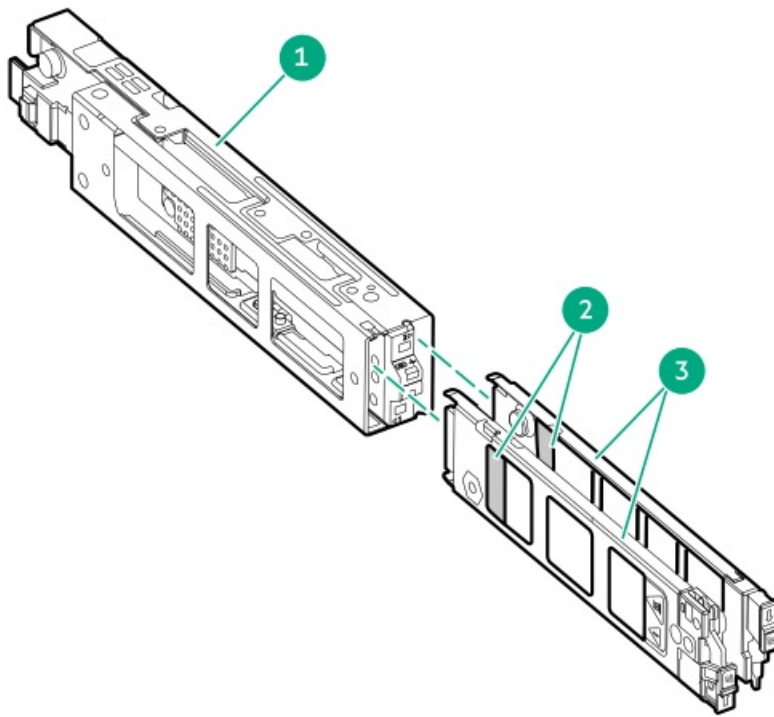
Front OCP NIC 3.0 slots

The front OCP NIC 3.0 slots are in box 3. They require the front OCP enablement option kits (Bay 1: P77261-B21, Bay 3: P76982-B21) and support NIC adapter options.



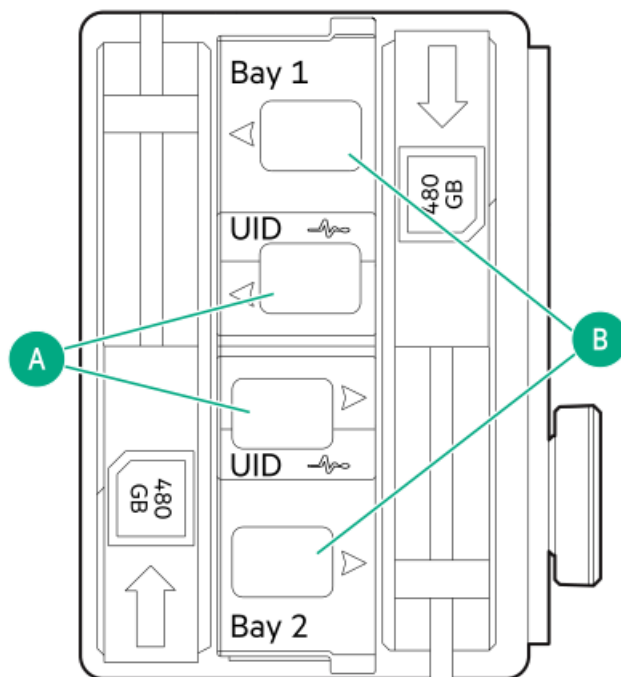
Bay	Slot number
1	OCP slot PCIe5 x16
3	

HPE NS204i-u Boot Device V2 components



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

HPE NS204i-u Boot Device V2 LED definitions



**NOTE**

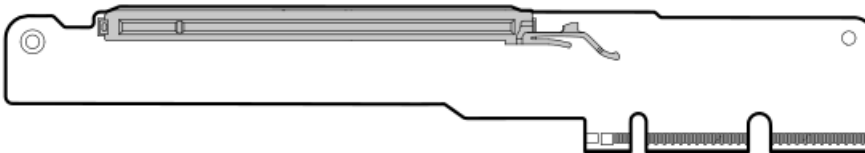
The bay number can be found on the SSD carrier handle.

Item	LED	Status	Definition
A	Fault or Locate	Solid amber	Drive has failed, unsupported, or invalid.
		Solid blue	Drive is operating normally.
		Flashing amber or blue (one flash per second)	Drive has failed, or a predictive failure alert is received for the drive.
		Flashing amber (one 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 any application.
B	Online/Activity	Solid green	Drive is online and has no activity.
		Flashing green (one 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.

Riser board components

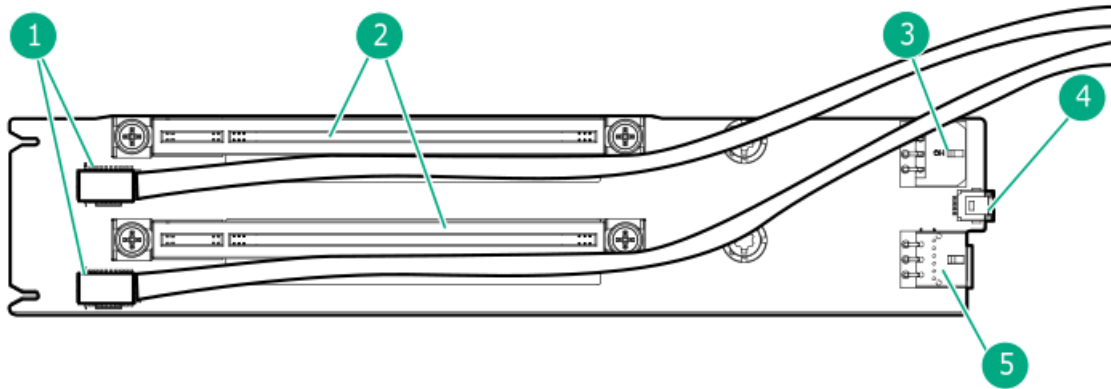
One-slot PCIe x16 riser board

This riser board supports PCIe5 x16 (16, 8, 4, 2) and full-height, half-length expansion cards.



Two-slot PCIe x16 captive riser board

This riser board supports single-width, full-height, full-length form factors in the GPU-optimized drive configurations.



Item	Description
1	PCIe slots sideband signal connectors
2	PCIe5 x16 (16, 8, 4, 2)
3	GPU auxiliary power connector
4	GPU sideband connector
5	Captive riser power connector

Setup

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

Subtopics

- [HPE Installation Service](#)
- [Setting up the server](#)
- [Operational requirements](#)
- [Rack warnings and cautions](#)
- [Server warnings and cautions](#)
- [Electrostatic discharge](#)

HPE Installation Service

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

The HPE Installation Service provides the following benefits:

- Installation by an HPE 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 HPE authorized technical specialist.

For more information on the features, limitations, provisions, and ordering information of the HPE Installation Service, see this Hewlett

Setting up the server

Prerequisites

- As a best practice, Hewlett Packard Enterprise recommends installing the latest firmware, drivers, and system software before using the server for the first time. You have these options:
 - HPE Compute Ops Management is an advanced software-as-a-service platform that securely streamlines operations from edge-to-cloud and automates key life cycle tasks through a unified single browser-based interface. For more information on using HPE Compute Ops Management, see <https://www.hpe.com/info/com-docs>.
 - Use the Firmware Update option in Intelligent Provisioning—Intelligent Provisioning is a server deployment tool embedded in HPE ProLiant servers. To access Intelligent Provisioning, during the server boot process, press **F10**. For more information, see the Intelligent Provisioning user guide at <https://www.hpe.com/support/hpeintelligentprovisioning-quicklinks>.
 - Download the Service Pack for ProLiant—SPP is a comprehensive system software and firmware update solution that is delivered as a single ISO image. This solution uses Smart Update Manager as the deployment tool.
 - The preferred method for downloading an SPP is by creating an SPP custom download at <https://www.hpe.com/servers/spp/custom>.

This option reduces the size of the SPP by excluding firmware and drivers for OS and server models that are not needed.
 - The SPP is also available for download from the SPP download page at <https://www.hpe.com/servers/spp/download>.
- Verify that your OS or virtualization software is supported:
<https://www.hpe.com/support/Servers-Certification-Matrices>
- Read the [Operational requirements](#) for the server.
- Read the safety and compliance information:
<https://www.hpe.com/support/safety-compliance-enterpriseproducts>

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 a connect a keyboard, monitor, and mouse.
 - Remotely: Connect to the iLO web interface and run a remote console:
 - a. Verify the following:
 - iLO is licensed to use the remote console feature.

If iLO is not licensed, visit the HPE website:

<https://www.hpe.com/info/ilo>

- The iLO dedicated network 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.](#)

10. [Register the server.](#)

Operational requirements

When preparing and planning the installation, observe the following operational requirements:

- [Space and airflow requirements](#)
- [Temperature requirements](#)
- [Power requirements](#)
- [Electrical grounding requirements](#)

For environmental requirements, see [Environmental specifications](#).

Subtopics

[Space and airflow requirements](#)

[Temperature requirements](#)

[Power requirements](#)

[Electrical grounding requirements](#)

Space and airflow requirements

To allow for servicing and adequate airflow, observe the following space and airflow requirements when installing the server in an indoor commercial rack:

- 63.50 cm (25.00 in) in front of the rack

- 76.20 cm (30.00 in) behind the rack
- 121.90 cm (48.00 in) from the back of the rack to the back of another rack or row of racks

Observe the following:

- Servers draw in cool air through the front of the rack and expel warm air through the rear. The front and rear rack doors must be adequately ventilated to allow ambient air to enter the cabinet. 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.



CAUTION

When the vertical space in the rack is not filled by a server or rack component, the gaps between the components can cause changes in airflow through the rack and around the servers. Cover all gaps with blanking panels to maintain proper airflow. Using a rack without blanking panels results in improper cooling which can lead to thermal damage.

- If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and 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 7.00 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, Hewlett Packard Enterprise recommends the use of a PDU that is either permanently wired to the building's branch circuit or includes a nondetachable cord that is wired to an industrial-style plug. NEMA locking-style plugs or those complying with IEC 60309 are considered suitable for this purpose. Using common power outlet strips for the server is not recommended.

Rack warnings and cautions

**WARNING**

When all components are removed, the server weighs 11.05 kg (24.36 lb). When all components are installed, the server can weigh up to 17.25 kg (38.03 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 11.05 kg (24.36 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, Hewlett Packard Enterprise recommends that you back up all server data before installing or removing a hardware option, or performing a server maintenance or troubleshooting procedure.



CAUTION

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

Electrostatic discharge

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

To prevent electrostatic damage:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:
 - Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm \pm 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](#)

Subtopics

[iLO service port](#)

[Intel VROC support](#)

[Server UID LED](#)

[Display device setup](#)

[Trusted Platform Module 2.0](#)

[Trusted Platform Module 2.0 guidelines](#)

[Accessing the Systems Insight Display](#)

[System battery information](#)

iLO service port

The iLO service port is a USB port with the label **iLO** on the front of the server.

When you have physical access to a server, you can use the iLO service port to:

- 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 OS.

- Connect a host system (Windows/Mac/Linux laptop or desktop) using either a standard USB Type A-to-Type C cable or USB Type C-to-Type C cable to access the:
 - iLO web interface
 - Remote console
 - iLO RESTful API
 - CLI

When you use the iLO service port:

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

You can also retrieve the iLO service port status by using a REST client and the iLO RESTful API.

- You cannot use the iLO service port to boot any device within the server, or the server itself.



- You cannot access the server by connecting to the iLO service port.
- You cannot access the connected device from the server.

For more information about the iLO service port, see the iLO user guide:

<https://www.hpe.com/support/hpeilodocs-quicklinks>

Intel VROC support

Intel Virtual RAID on CPU (Intel VROC) provides enterprise-level hybrid RAID support. Note the following information:

- Intel VROC provides RAID support for direct attached NVMe SSD.
- The Intel VROC driver is required. For the OS-specific driver download, see the following page:
<https://www.hpe.com/support/VROC-UG>
- If you plan to enable Intel VROC for NVMe devices, secure an Intel VROC Hybrid RAID License. For more information on Intel VROC licenses, see the server QuickSpecs:
<https://www.hpe.com/info/quickspecs>
- Intel VROC requires the server boot mode to be set to UEFI Mode.
- Intel VROC RAID support is disabled by default. In the pre-OS environment, use UEFI System Utilities to enable Intel VROC and create a VROC RAID volume. These tasks are not supported in Intelligent Provisioning.
- The VROC RAID volume must use drives of the same interface and form factor.
- Intel VROC supports RAID management through the following tools:
 - Non-OS specific: UEFI System Utilities
 - Windows: Intel VROC GUI, Intel VROC CLI
 - Linux: mdadm CLI

For more information on Intel VROC features and configuration, see [Configuring storage controllers](#).

Server UID LED

The UID LED can be used to help an on-site technician quickly identify or locate a particular server when it is deployed in a dense rack with other equipment. It can also be used to identify if a remote management, firmware upgrade, or reboot sequence is in progress.

Subtopics

[Using the UID button to view the Server Health Summary](#)

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

Be sure to press and release the UID button. Pressing the UID button at any time for more than five seconds will initiate a graceful iLO reboot or a hardware iLO reboot. Data loss or NVRAM corruption might occur during a hardware iLO reboot.

Procedure

1. Press and release the UID button.

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

<https://www.hpe.com/support/hpeilodocs-quicklinks>

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

Display device setup

The server supports both VGA port and DisplayPort 1.1a. Before connecting a display device, observe following:

- Display output modes:
 - If you connect two display devices to the server using both the VGA port and DisplayPort, the same image is mirrored on both devices.
 - The embedded video controller in the iLO chipset does not support dual display or screen extension mode. To enable dual display, install a compatible graphics card.
- When using HDMI or DVI adapters for the DisplayPort, use an active-type adapter. Passive-type adapters marked with the DP++ symbol are not supported.

Whenever possible, use the same display connection type. For example, if your monitor only has a VGA port, use the VGA port on the server. Using other adapters or converter cables or dongles might lead to decreased display quality or a lag over the connection.

Trusted Platform Module 2.0

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

The TPM 2.0 is embedded on the DC-SCM.

The TPM 2.0 is supported with specific operating system support such as Microsoft Windows Server 2012 R2 and later. For more information about operating system support, see the product QuickSpecs on the Hewlett Packard Enterprise website (<https://www.hpe.com/info/quickspecs>). For more information about Microsoft Windows BitLocker Drive Encryption feature, see the Microsoft website (<https://www.microsoft.com>).

Trusted Platform Module 2.0 guidelines





CAUTION

- Always observe the TPM guidelines in this section. Failure to follow these guidelines can cause hardware damage or halt data access.
 - If you do not follow procedures for modifying the server and suspending or disabling the TPM in the OS, an OS that is using TPM might lock all data access. This includes updating system or option firmware, replacing hardware such as the system board and drives, and modifying TPM OS settings.
 - Changing the TPM mode after installing an OS might cause problems, including loss of data.
-
- 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, see the UEFI user guide:
<https://www.hpe.com/support/hpeuefisystemutilities-quicklinks>
 - 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.
 - HPE 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.

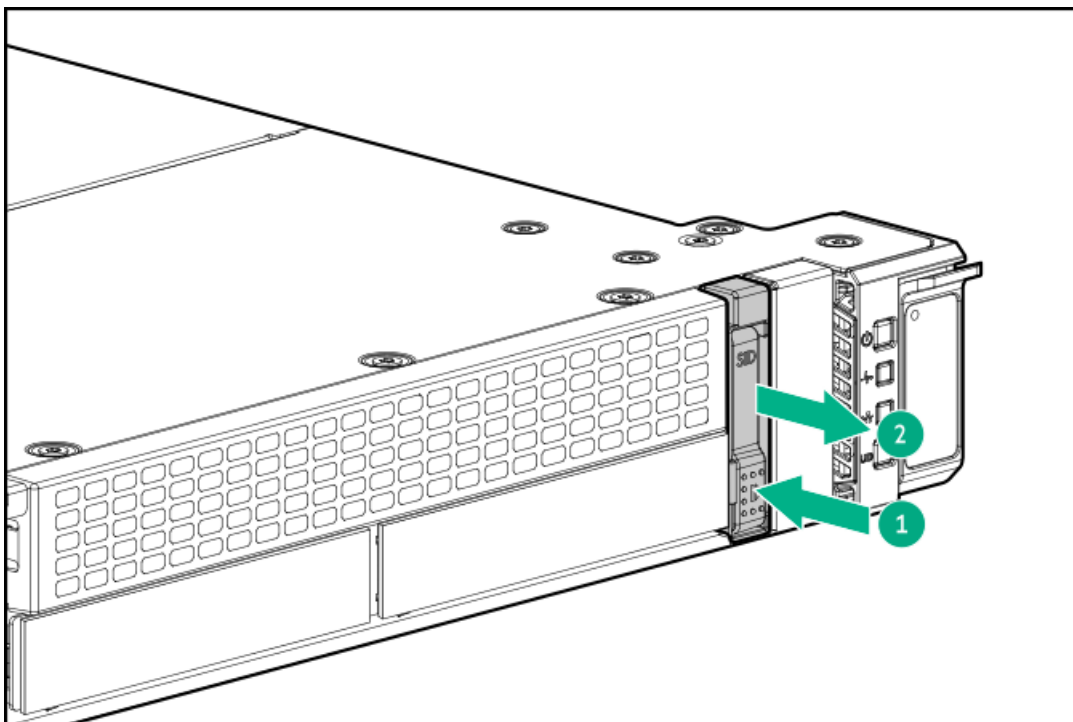
Accessing the Systems Insight Display

About this task

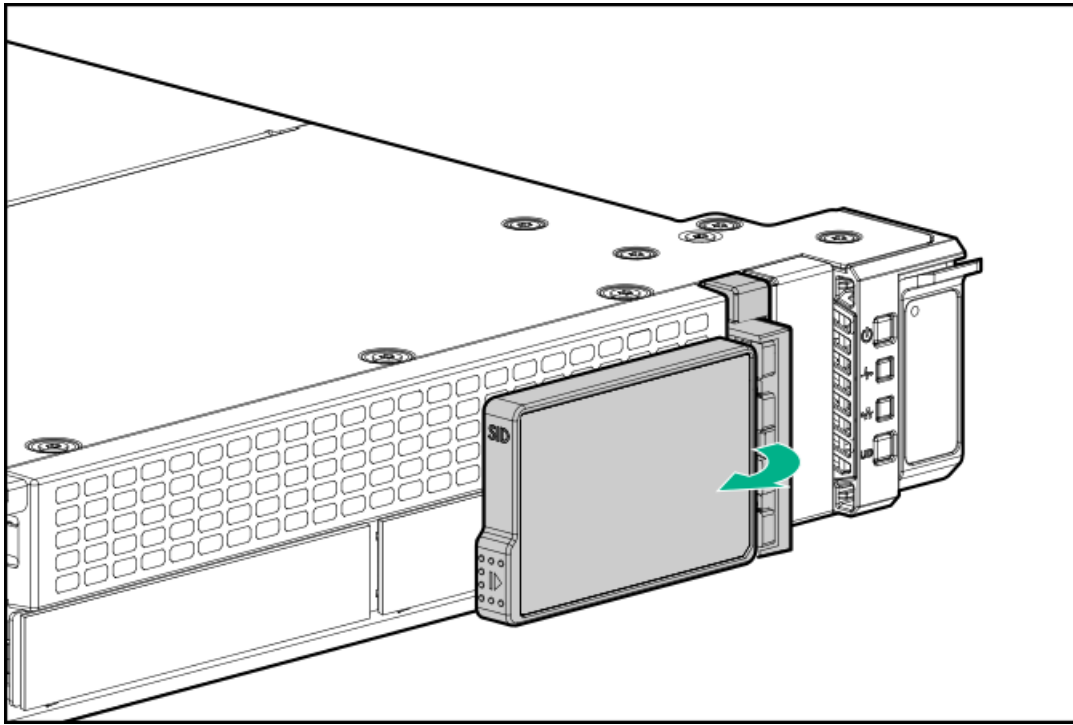
The Systems Insight Display is only available on SFF platforms.

Procedure

1. Press and release the panel.



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



System battery information

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



WARNING

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

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

Hardware options installation

This chapter provides instructions for installing supported hardware options. To ensure proper server deployment and operation, Hewlett Packard Enterprise recommends installing only HPE-validated hardware options. To see the list of validated options for this server, see the product QuickSpecs on the HPE website:

<https://www.hpe.com/info/quickspecs>

To view the warranty for your server and supported options, see [Warranty information](#).

Subtopics



[Hewlett Packard Enterprise product QuickSpecs](#)

[Hardware option installation guidelines](#)

[Pre-installation procedures](#)

[Post-installation procedures](#)

[Rack rail and CMA](#)

[Drives](#)

[Drive cages](#)

[GPU options](#)

[Memory options](#)

[Management](#)

[Fans](#)

[Networking](#)

[Power supply options](#)

[Riser and riser cage options](#)

[Optical drives and media bays](#)

[OS boot device](#)

[Security](#)

[Energy packs](#)

[Storage controllers](#)

[Processors and heatsinks](#)

[Internal USB device option](#)

Hewlett Packard Enterprise product QuickSpecs

To learn more about your product, search the Hewlett Packard Enterprise website (<https://www.hpe.com/info/quickspecs>) for the product QuickSpecs:

- Supported options
- Supported configurations
- Component compatibility
- New features
- Specifications
- Part numbers

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, Hewlett Packard Enterprise recommends that you back up all server data before installing or removing a hardware option, or performing a server maintenance or troubleshooting procedure.



CAUTION

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

- Install any hardware options before initializing the server.
- If multiple options are being installed, read the installation instructions for all the hardware options to identify similar steps and streamline the installation process.
- If the hardware option installation involves internal cabling, review the Cabling guidelines.

Pre-installation procedures

Subtopics

Server data backup

Power down the server

Release the cable management arm

Extend the server out of the rack

Remove the server from the rack

Remove the front bezel

Remove the access panel

Remove the middle cover

Remove the fan

Remove the fan wall

Remove the riser cage

Remove the riser cage blank

Remove the power supply

Server data backup

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

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

- User data files
- User account names and passwords
- Application settings and passwords
- Component drivers and firmware
- TPM recovery key/password
- BIOS configuration settings—Use the backup and restore function in UEFI System Utilities. For more information, see the UEFI user guide (<https://www.hpe.com/support/hpeuefisystemutilities-quicklinks>).
 - Custom default system settings
 - Security passwords including those required for power-on and BIOS admin access, persistent memory, and Server Configuration Lock (for HPE Trusted Supply Chain servers)
 - Server serial number and the product ID

- iLO-related data—Use the iLO backup and restore function. For more information, see the iLO user guide (<https://www.hpe.com/support/hpeilodocs-quicklinks>).
 - iLO license
 - Customer iLO user name, password, and DNS name
 - iLO configuration settings

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 7.
This method initiates a controlled remote shutdown of applications and the OS before the server enters standby mode.

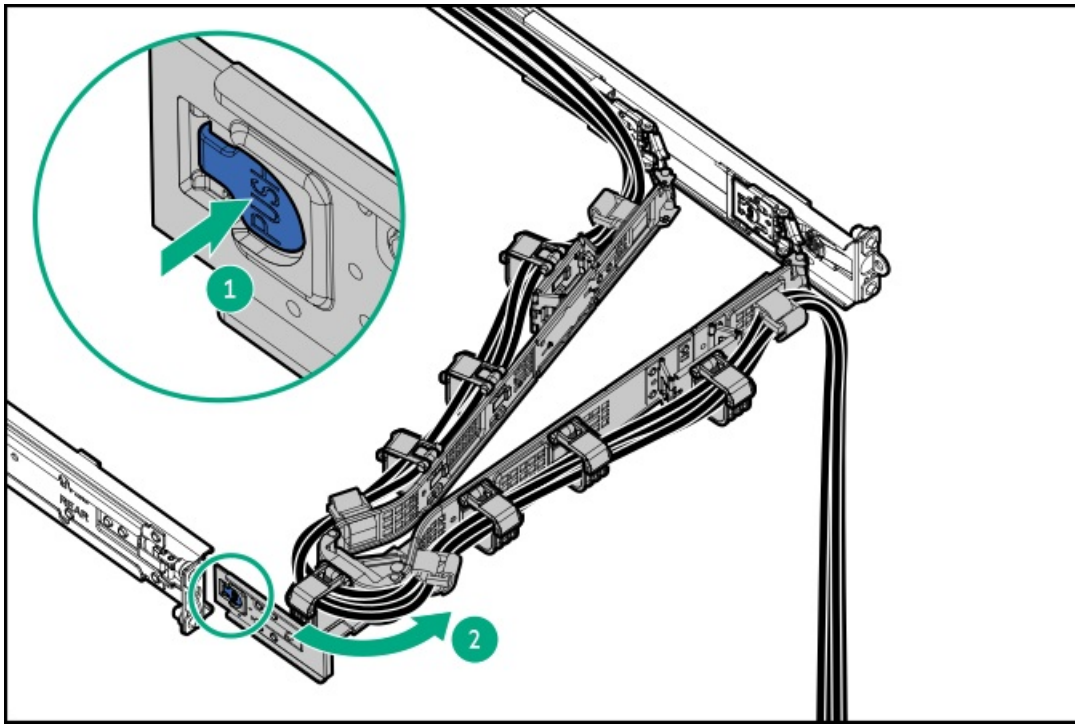
Before proceeding, verify that the server is in standby mode by observing that the system power LED is amber.

Release the cable management arm

Procedure

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





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

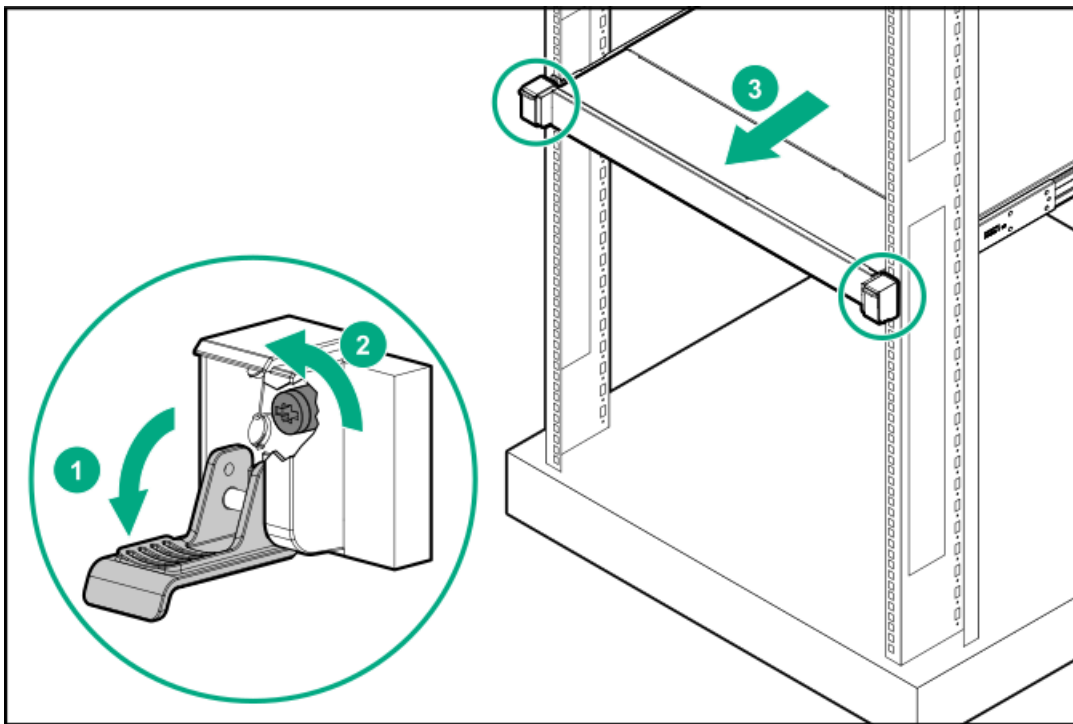


WARNING

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.

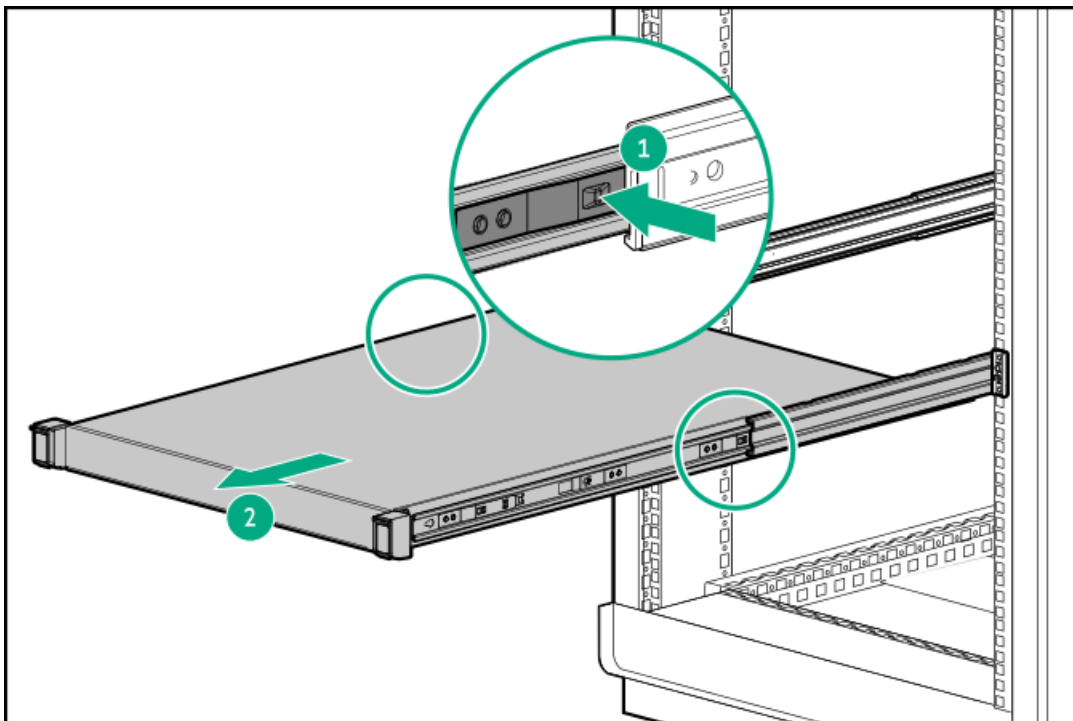


2. Press and hold the rear-end rail-release latches, and then slide the server out of the rack until it is fully extended.



WARNING

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



Remove the server from the rack

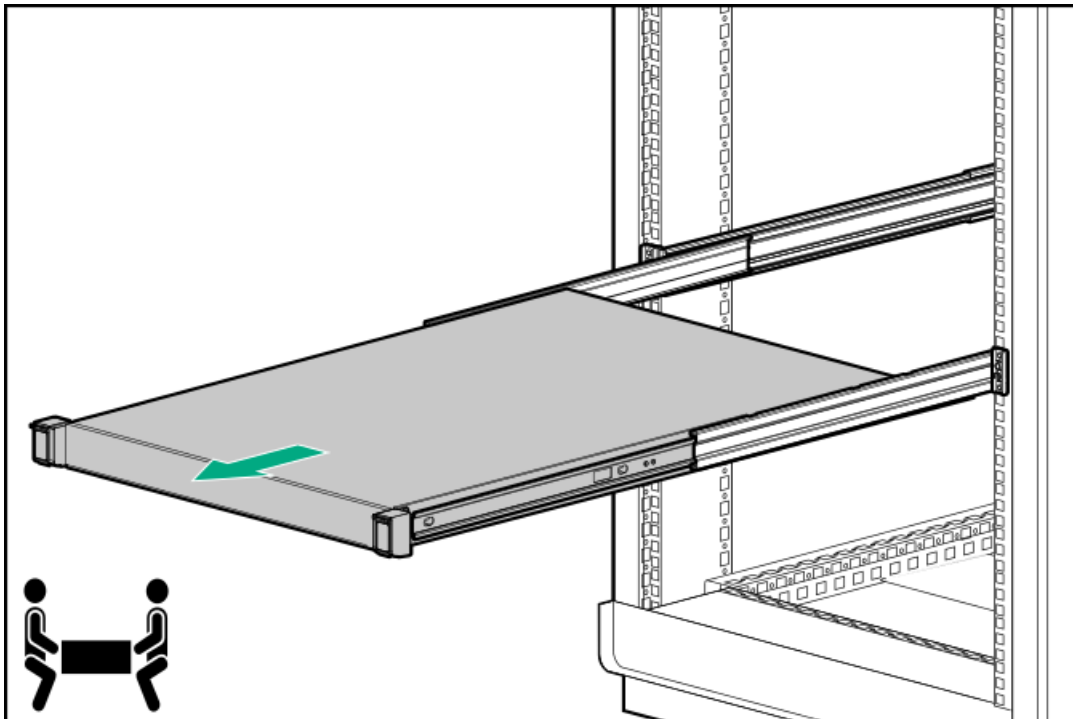


Prerequisites

- Get help to lift and stabilize the server during removal from the rack. **If the server is installed higher than chest level, additional two people might be required to help remove the server:** One person to support the server weight, and the other two 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. Hewlett Packard Enterprise recommends removing the external chassis components before removing the server from the rack.

Procedure

1. [Power down the server.](#)
2. If installed, [release 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. [Fully extend the server out of the rack.](#)
6. Slide the server completely out of the rack.



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

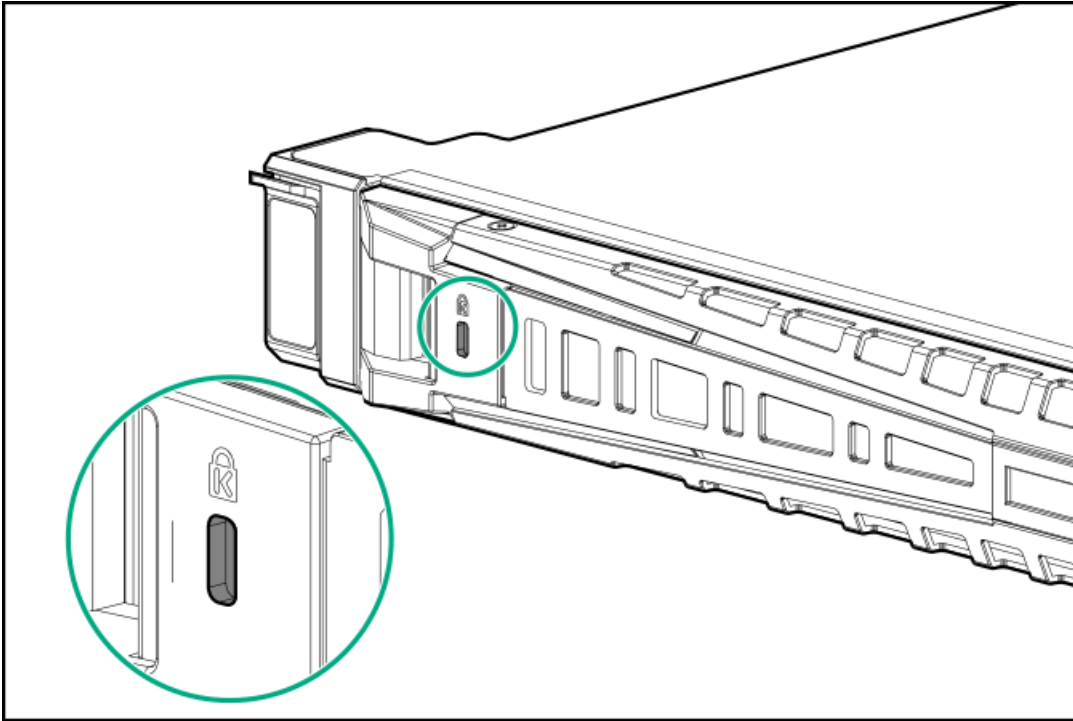
Remove the front bezel

About this task

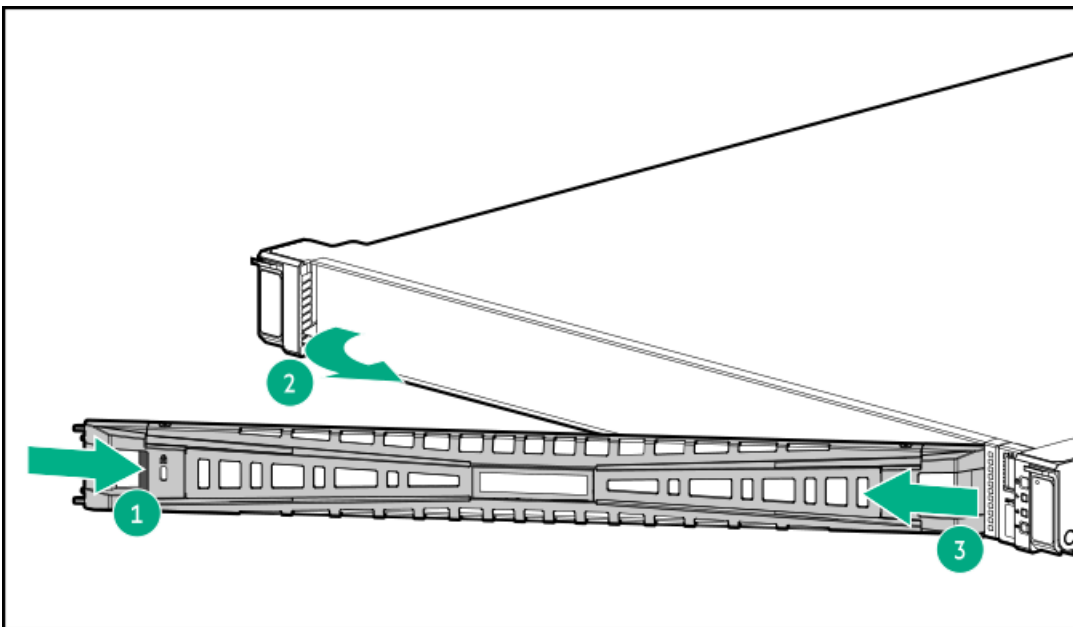
If you are using the virtual power button in iLO to power the server on/off, you do not need to remove the front bezel. Remove the front bezel only if you need to access the front panel components.

Procedure

1. If installed, remove the Kensington security lock.



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



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.



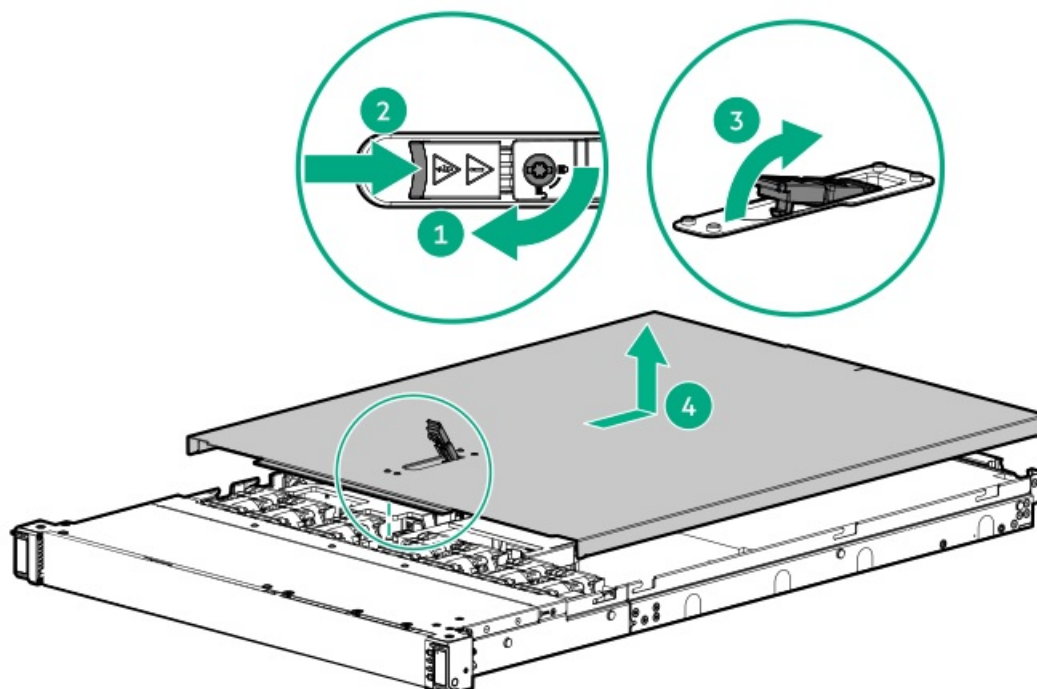
CAUTION

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

Procedure

1. Power down the server.
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Disconnect all peripheral cables from the server.
4. Do one of the following:
 - a. Extend the server from the rack.
 - b. Remove the server from the rack.
5. Remove the access panel:
 - a. If necessary, unlock the access panel latch.
 - b. To disengage the access panel from the chassis, press the release button and pull up the latch.
 - c. Lift the access panel.





Remove the middle cover

Prerequisites

A T-10 Torx screwdriver is required to remove the middle cover from a GPU-optimized server.

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.

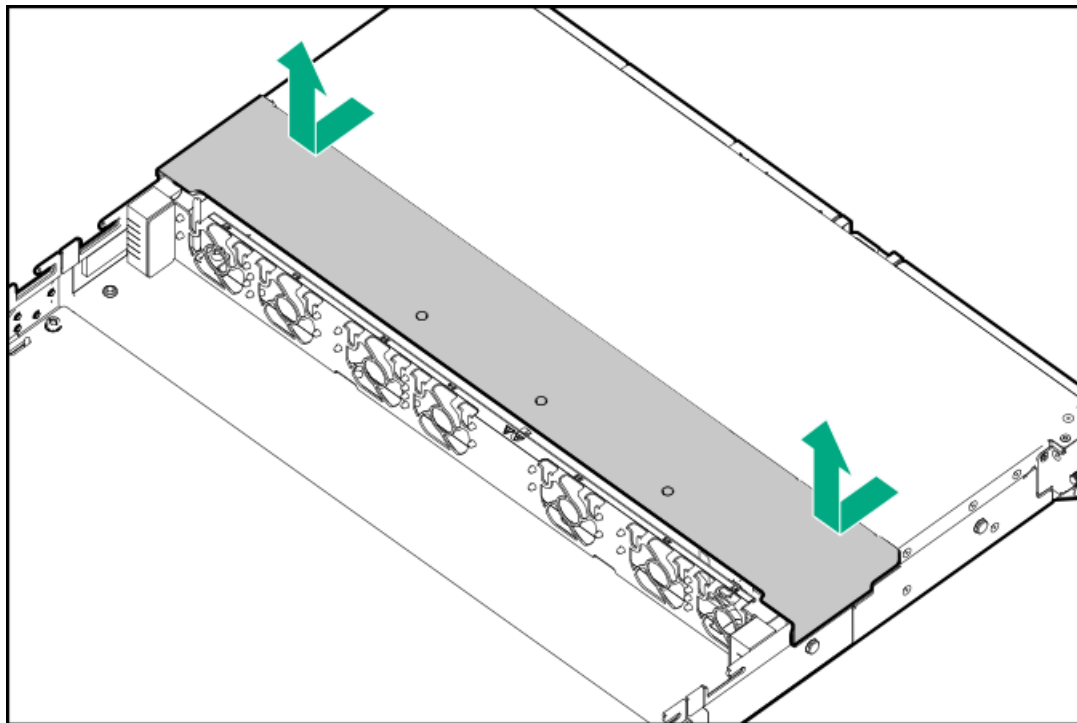
Procedure

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

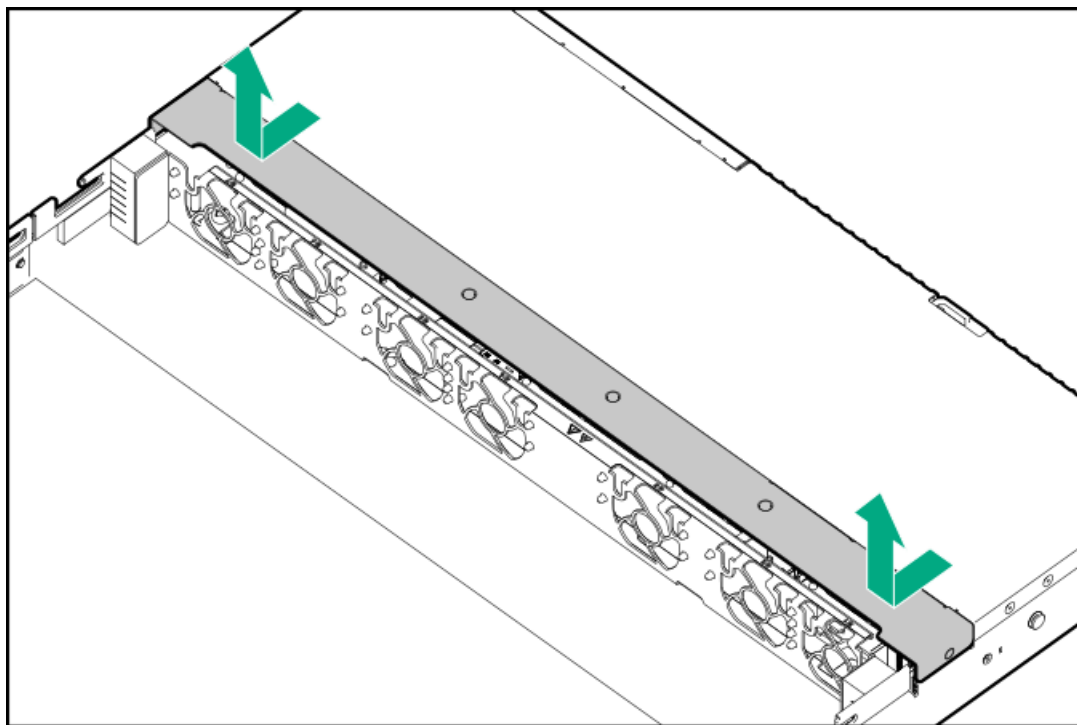
6. Remove the access panel.

7. To remove the middle cover from the SFF, LFF, and the mixed drive configuration, take both sides of the middle cover and detach from the server.

- LFF and mixed drive configuration

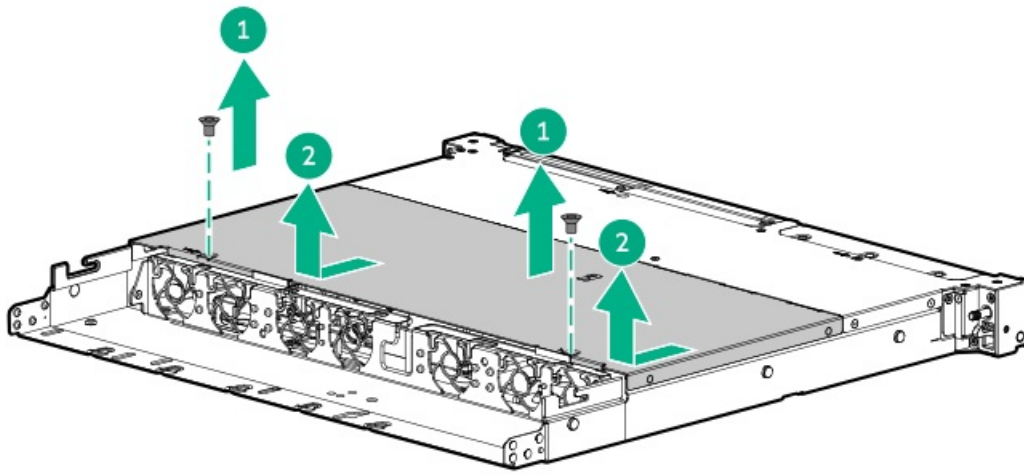


- SFF drive configuration



8. To remove the middle cover from the GPU-optimized configuration, do the following:

- Remove the screws.
- Take both sides of the middle cover and detach from the server.



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.



IMPORTANT

After removing a high-performance (dual-rotor) fan, install or replace the fan within 60 seconds. Otherwise, the server will shut down gracefully.



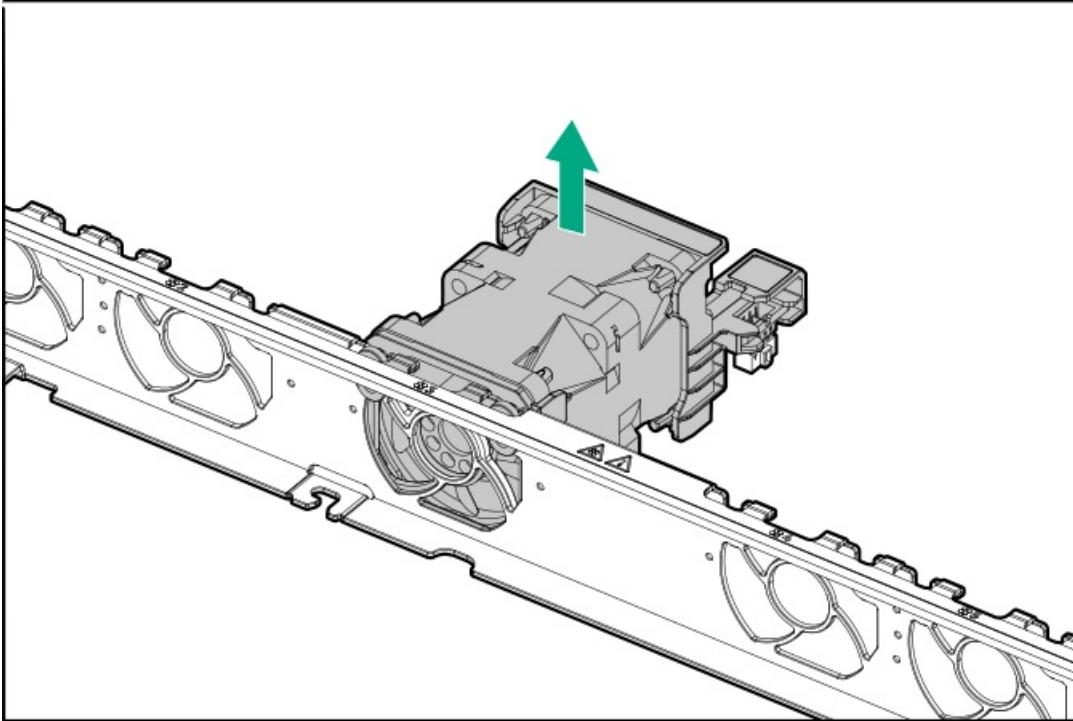
CAUTION

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, release the cable management arm.
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. Do one of the following:
 - a. Extend the server from the rack.
 - b. Remove the server from the rack.

6. Remove the access panel.
7. Lift the fan out of the slot.



Remove the fan wall

Prerequisites

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

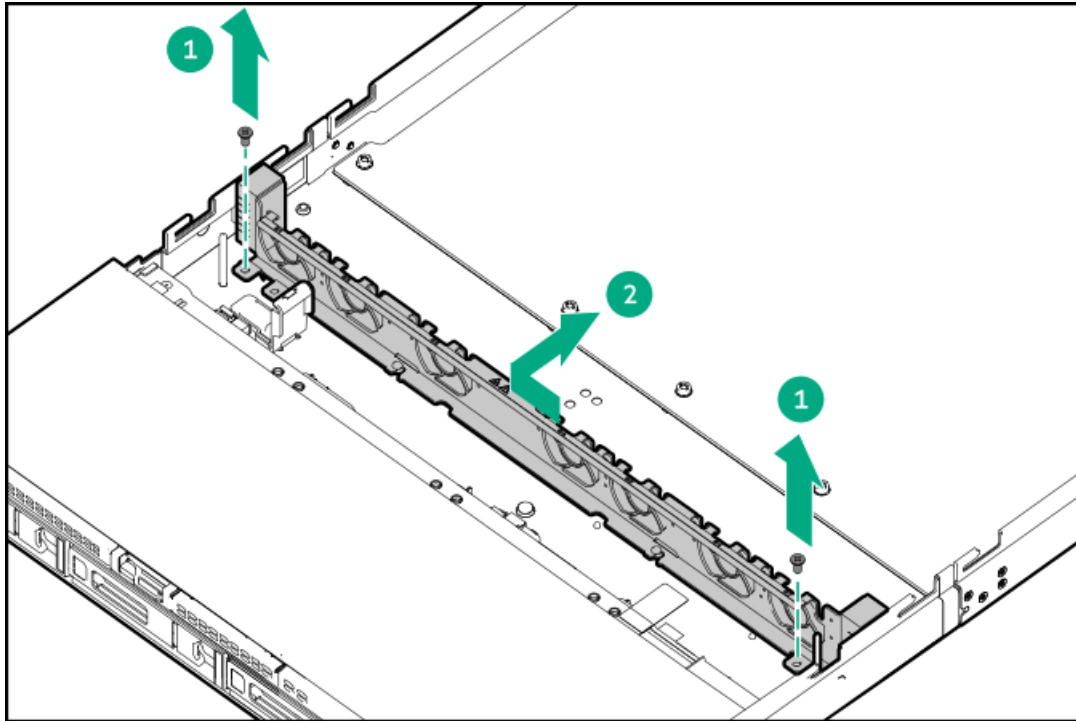
- T-15 Torx screwdriver—This is required to remove the fan wall from the SFF or 4 LFF drive configuration.
- T-10 Torx screwdriver—This is required to remove the fan wall from the 12 LFF drive or GPU-optimized configuration.

Procedure

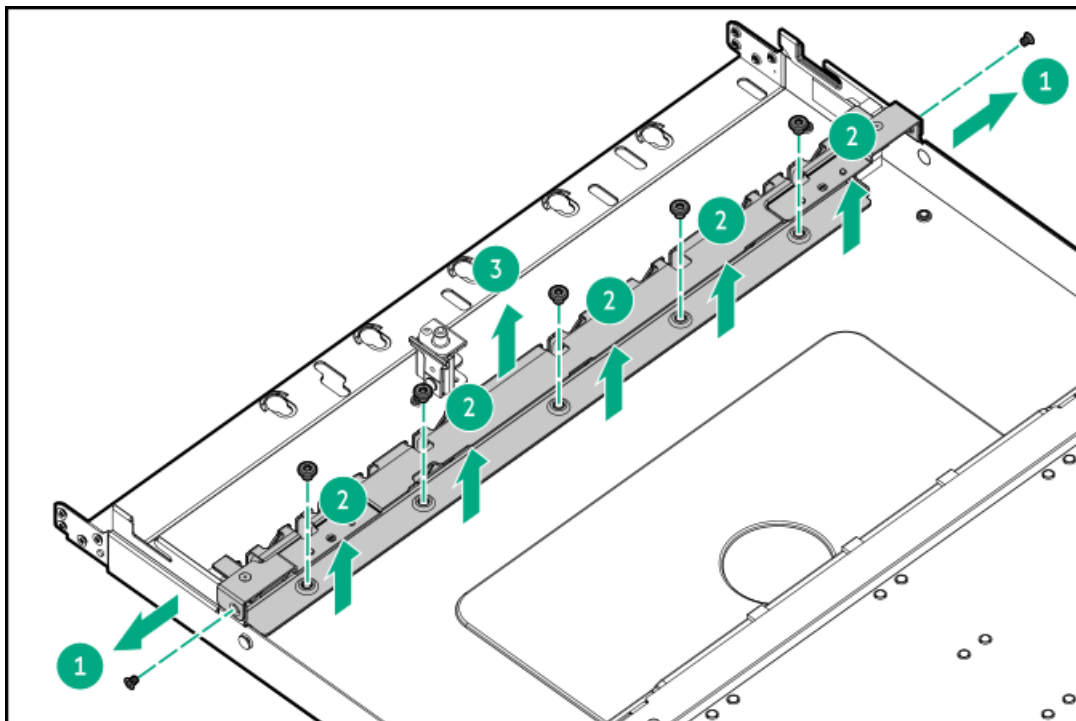
1. Power down the server.
2. If installed, release the cable management arm.
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. Remove the server from the rack.
6. Place the server on a flat, level work surface.
7. Remove the access panel.
8. Remove the middle cover.
9. Remove the fans.
10. Remove the fan wall.

Retain the screws and fan wall. These screws will be used to secure the fan wall after replacing or installing the internal component.

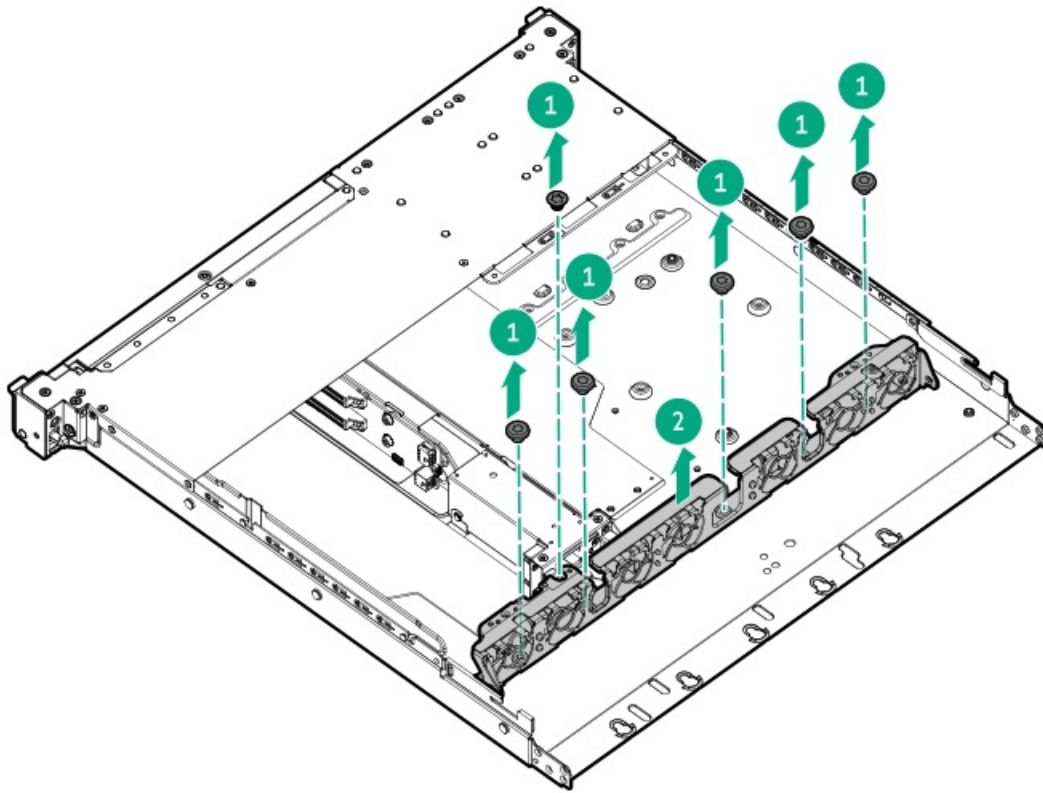
- SFF or 4 LFF drive configuration:



- 12 LFF drive configuration:



- GPU-optimized configuration:



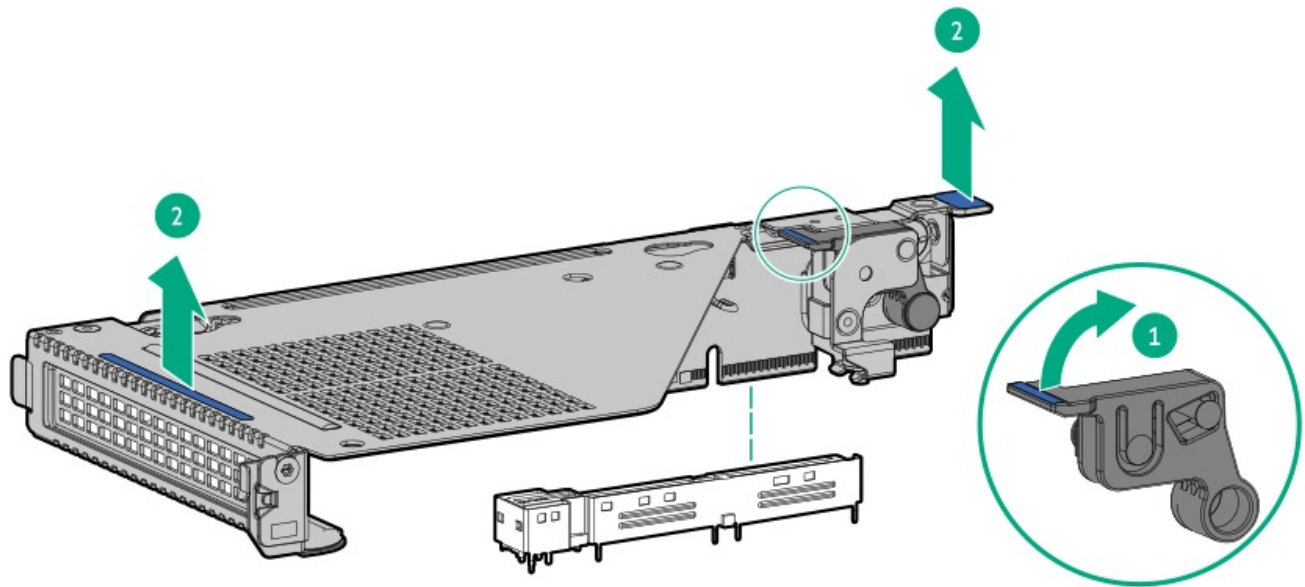
Remove the riser cage

Prerequisites

A T-10 Torx screwdriver is required to remove the GPU riser cage.

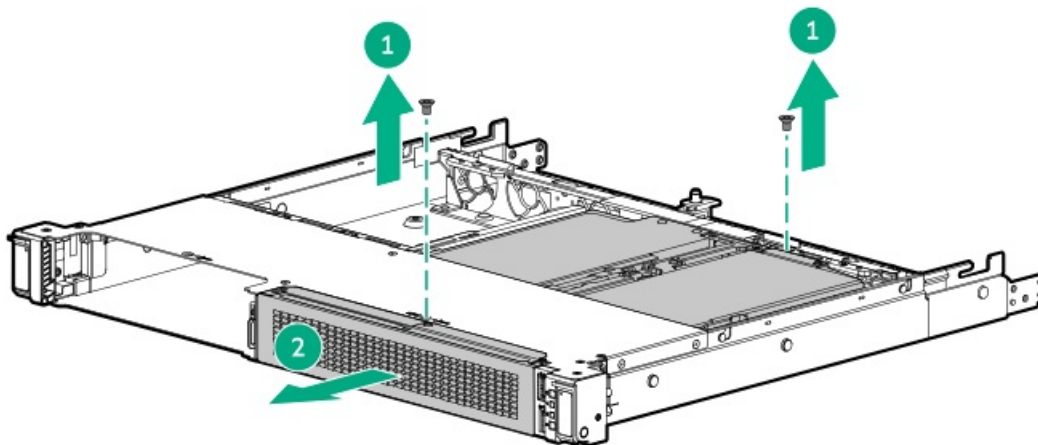
Procedure

1. Power down the server.
2. Release 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. To remove a full-height or low-profile riser cage, do the following:
 - a. Open the latch.
 - b. Remove the cage off of the system board.



10. To remove the GPU riser cage, do the following:

- a. Remove the two screws.
- b. Push the cage forward, and then slide it out.



Remove the riser cage blank

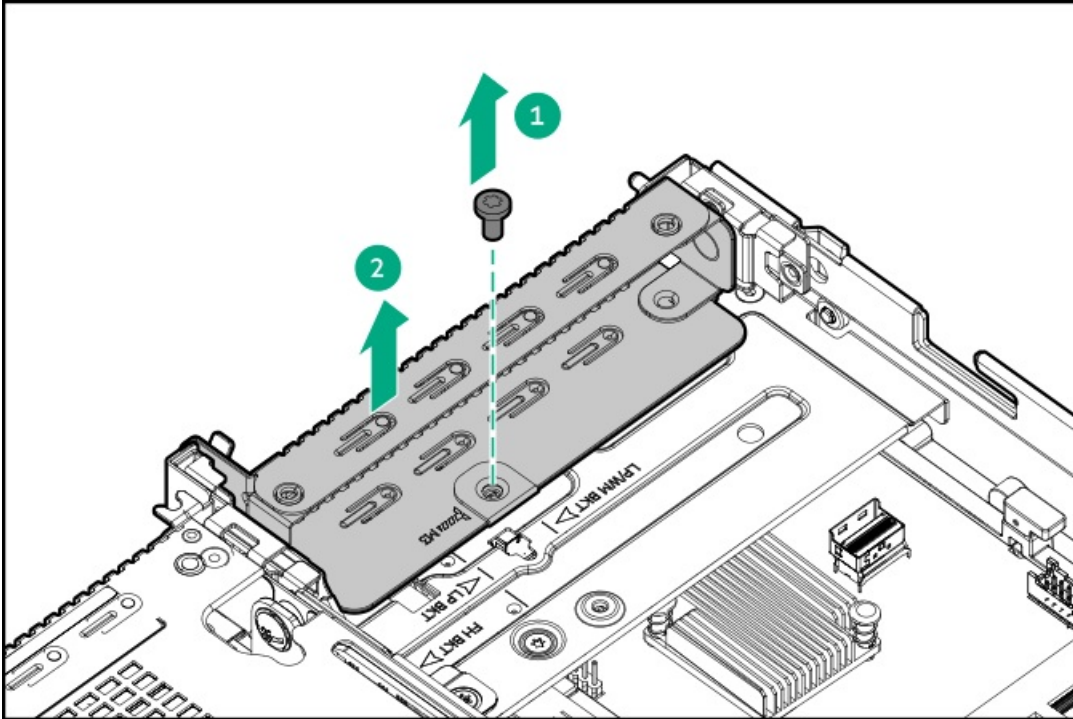
Prerequisites

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

Procedure

1. Power down the server.
2. Remove all power:
 - a. Disconnect each power cord from the power source.

- b. Disconnect each power cord from the server.
3. Disconnect all peripheral cables from the server.
4. Remove the server from the rack.
5. Place the server on a flat, level work surface.
6. Remove the access panel.
7. Remove the full-height or low-profile riser cage blank.



Remove the power supply

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.

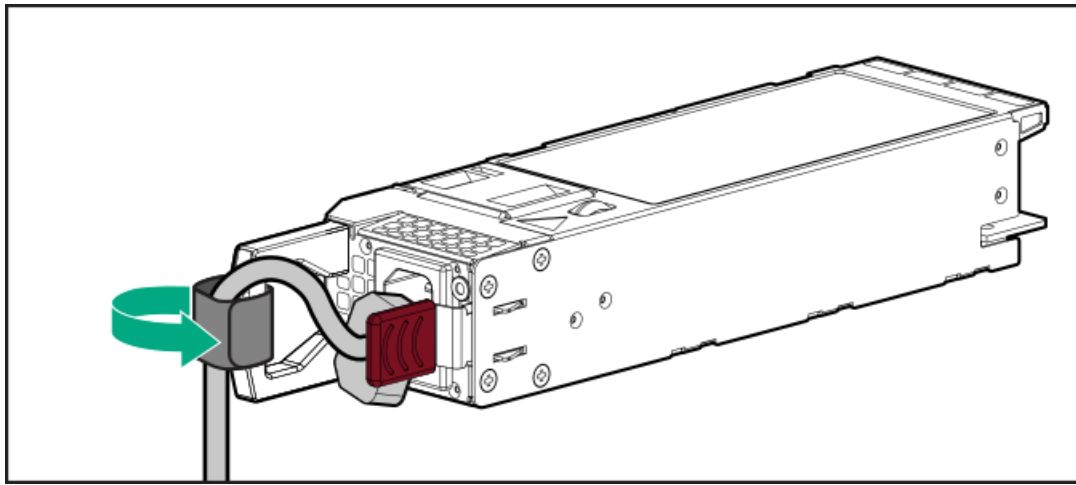


CAUTION

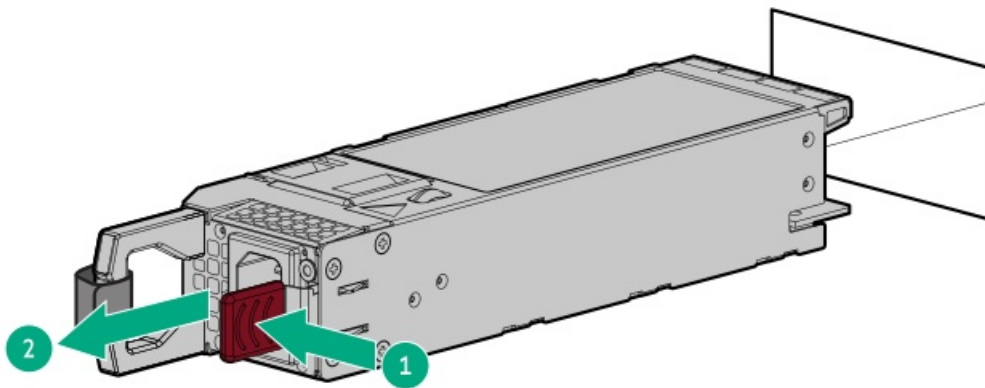
To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

Procedure

1. Power down the server.
2. Remove the power supply:
 - a. Release the power cords, wires, and cables from the strain relief strap.



- b. Press and hold the release latch, and then remove the power supply.



Post-installation procedures

Subtopics

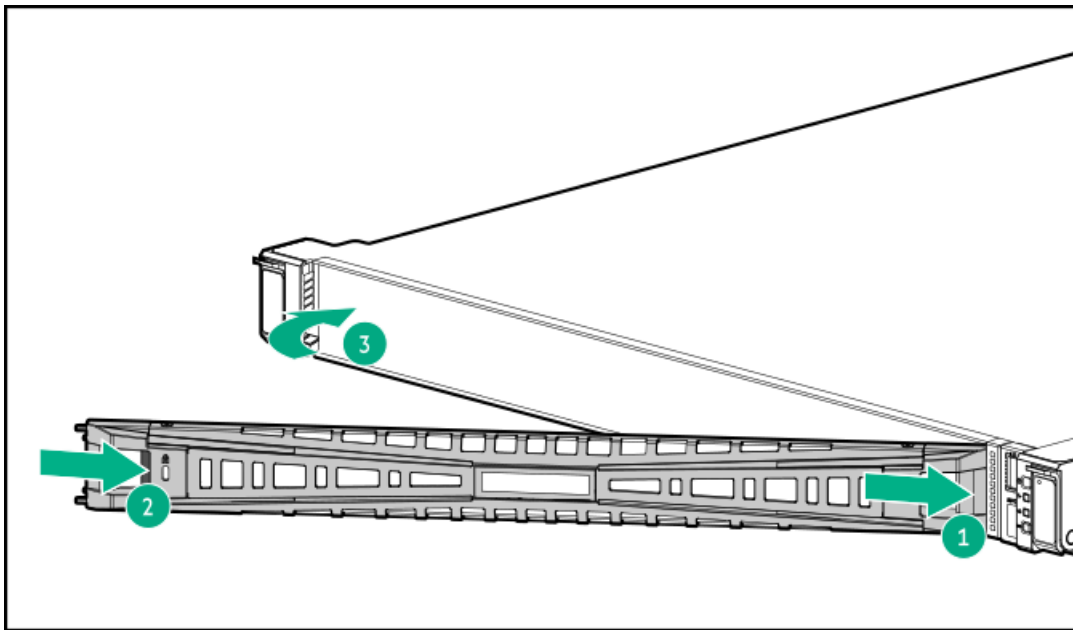
- [Install the front bezel](#)
- [Install the access panel](#)
- [Install the middle cover](#)
- [Install the fan wall](#)
- [Install the riser cage](#)
- [Install the server into the rack](#)
- [Power up the server](#)

Install the front bezel

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.

Install the access panel

Prerequisites

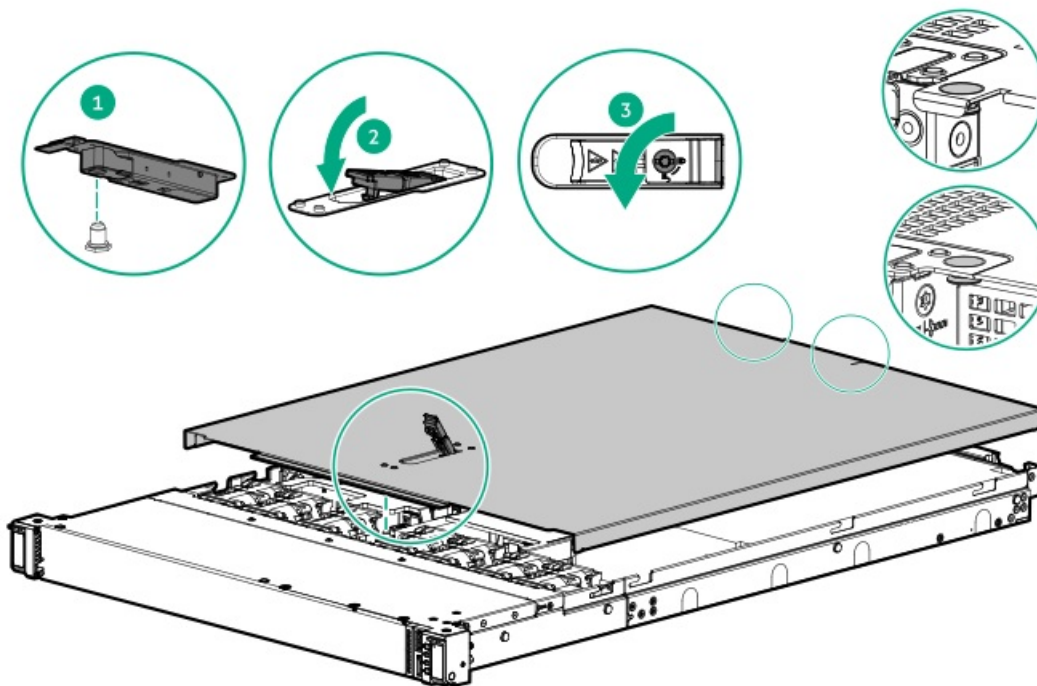
Before you perform this procedure, make sure that you have a T-15 Torx screwdriver available.

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.

Ensure that the rear spools of the access panel are engaged with the riser and power supply cage.

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.

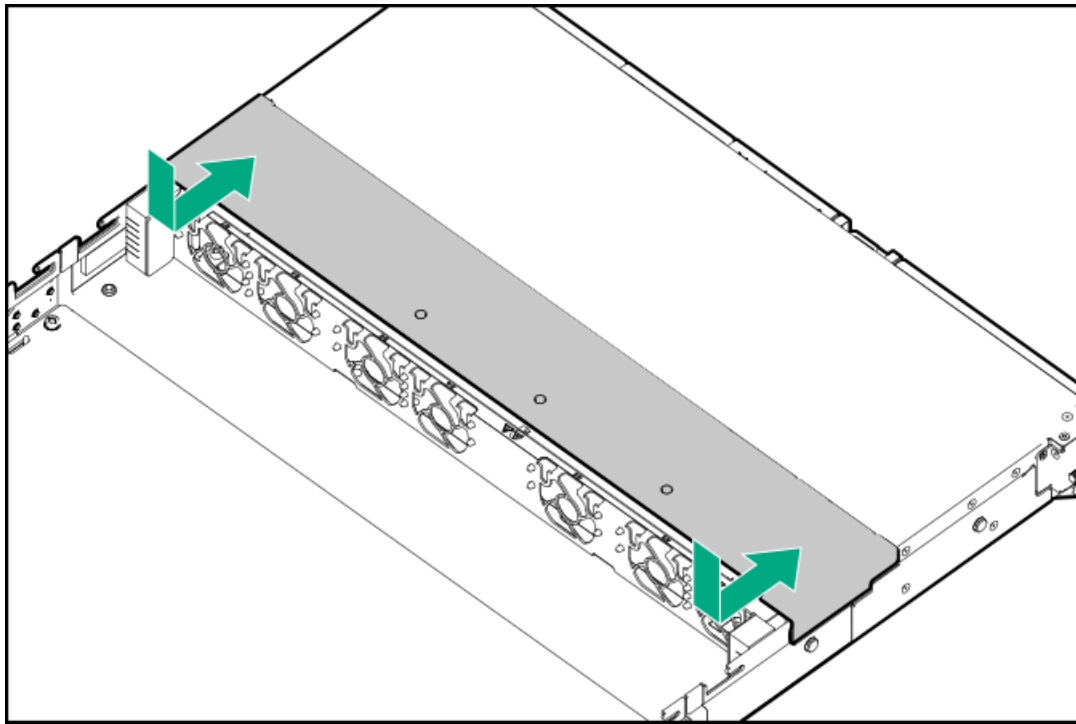
Install the middle cover

Prerequisites

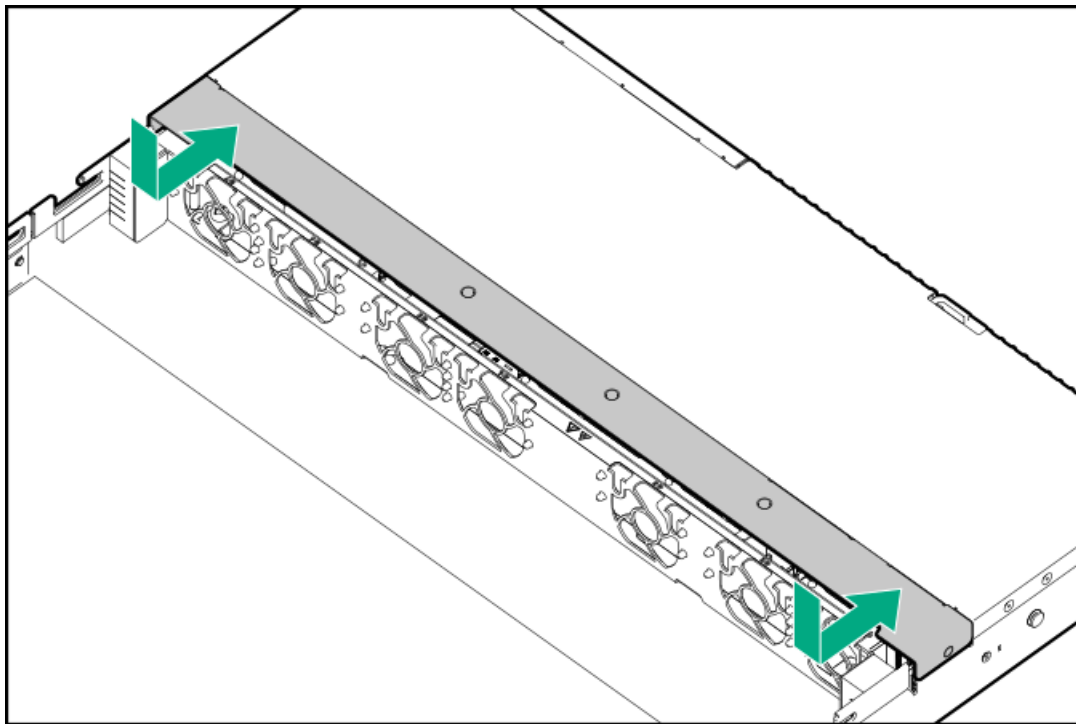
A T-10 Torx screwdriver is required to install the middle cover on a GPU-optimized server.

Procedure

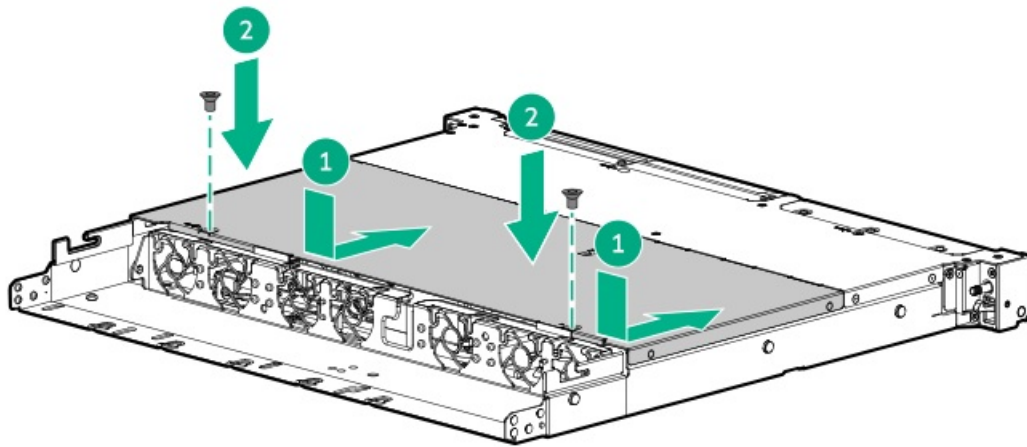
1. To install the middle cover on the SFF, LFF, or mixed drive configuration, take both sides of the middle cover and install on the server.
 - LFF or mixed drive configuration



- SFF drive configuration



2. To install the middle cover on a GPU-optimized server:
 - a. Take both sides of the middle cover and attach on the server.
 - b. Install the screws.



Install the fan wall

Prerequisites

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

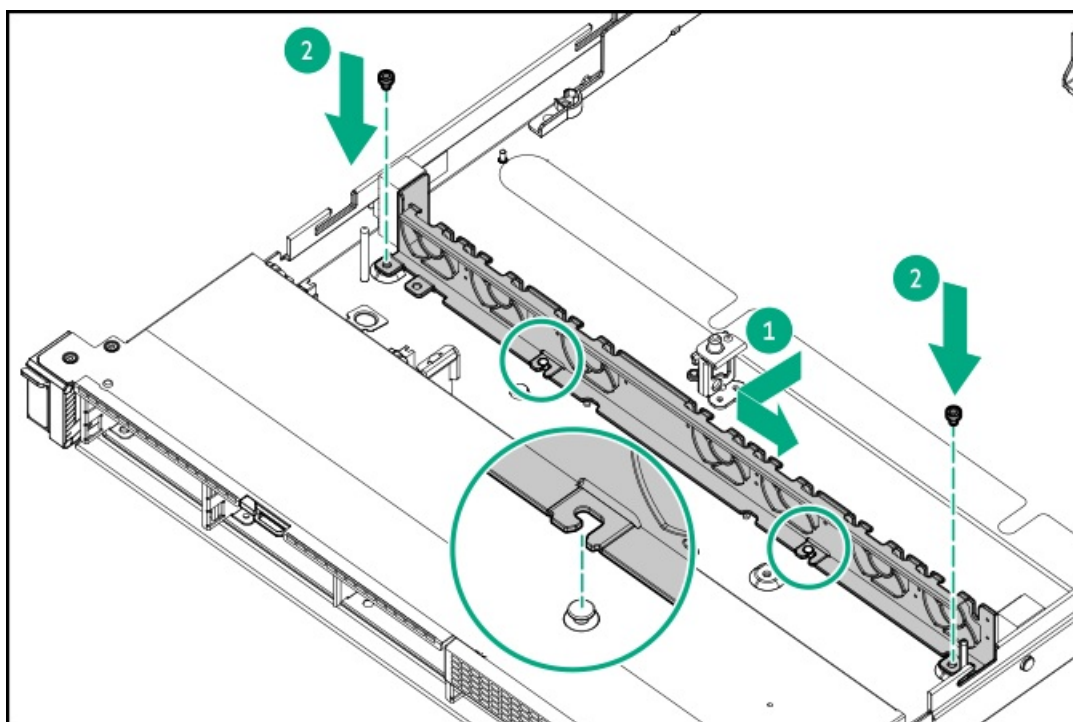
- T-15 Torx screwdriver—This tool is required to install the fan wall in the SFF or 4 LFF drive configuration.
- T-10 Torx screwdriver—This tool is required to install the fan wall in the 12 LFF drive configuration or the GPU-optimized configuration.

Procedure

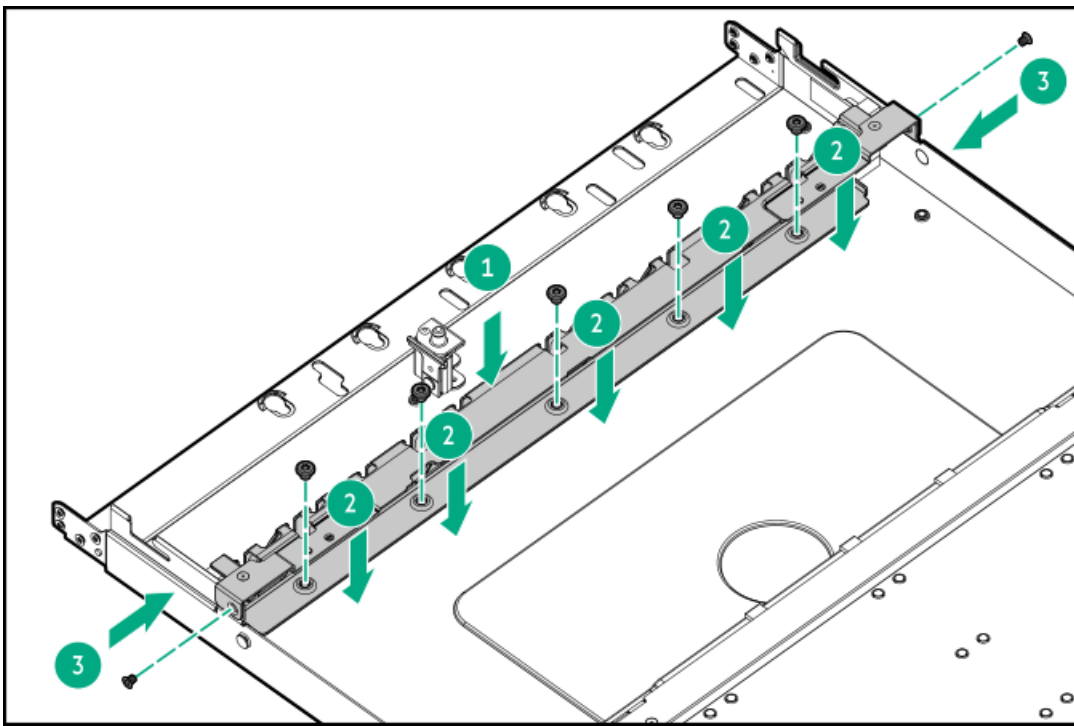
Slide the fan wall to engage with the spools, and then install the screws.

Retain the screws and fan wall. These screws will be used to secure the fan wall after replacing or installing the internal component.

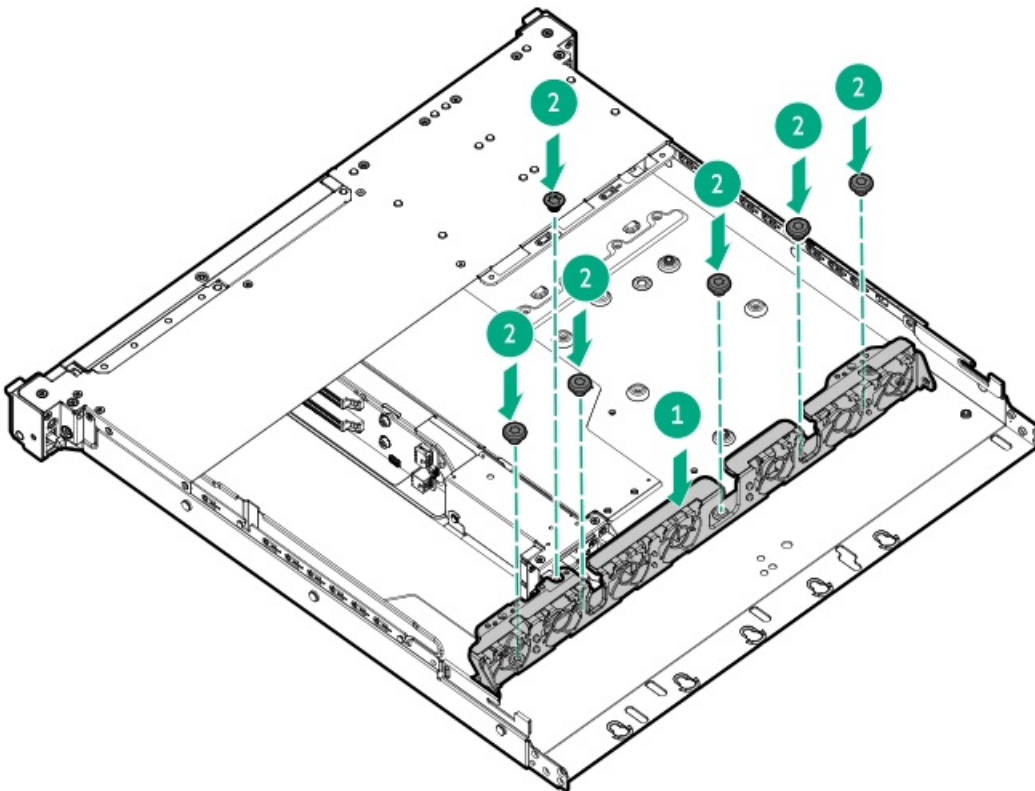
- SFF or 4 LFF drive configuration:



- 12 LFF drive configuration:



- GPU-optimized configuration:



Install the riser cage

Prerequisites

A T-10 Torx screwdriver is required to install the GPU riser cage.



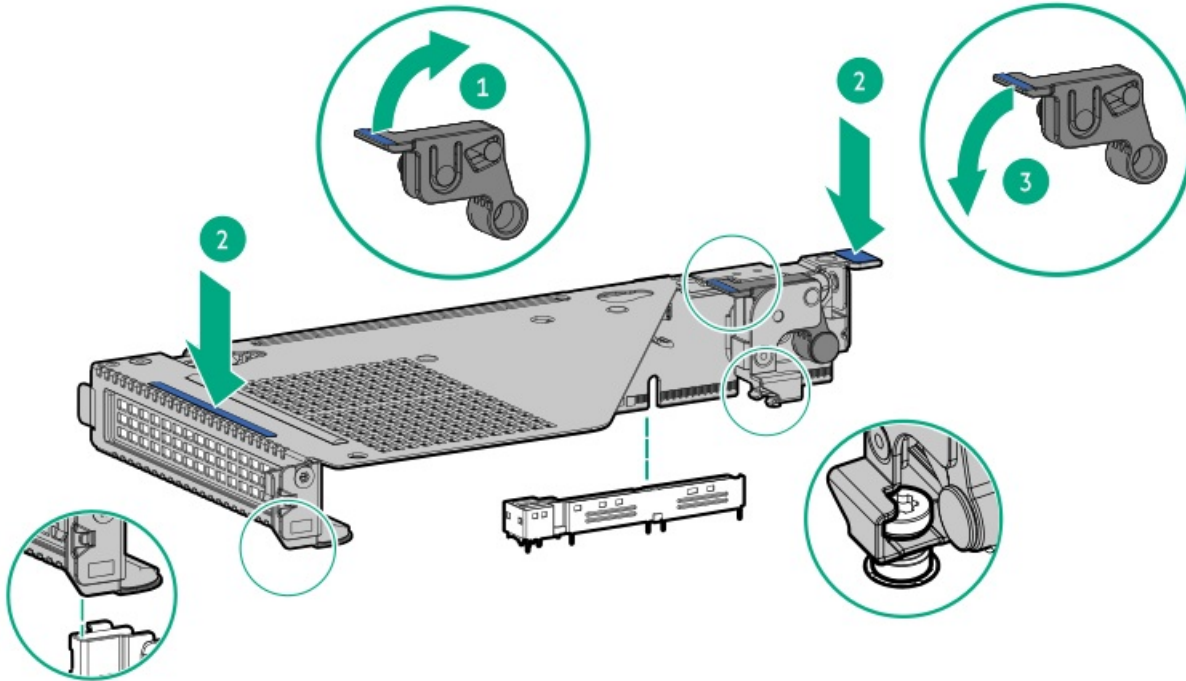
Procedure

1. If an expansion card or its internal cabling was removed, reinstall these components.
2. If a storage controller is installed, connect the storage controller backup cable.
3. To install the full-height or low-profile riser cage, do the following:

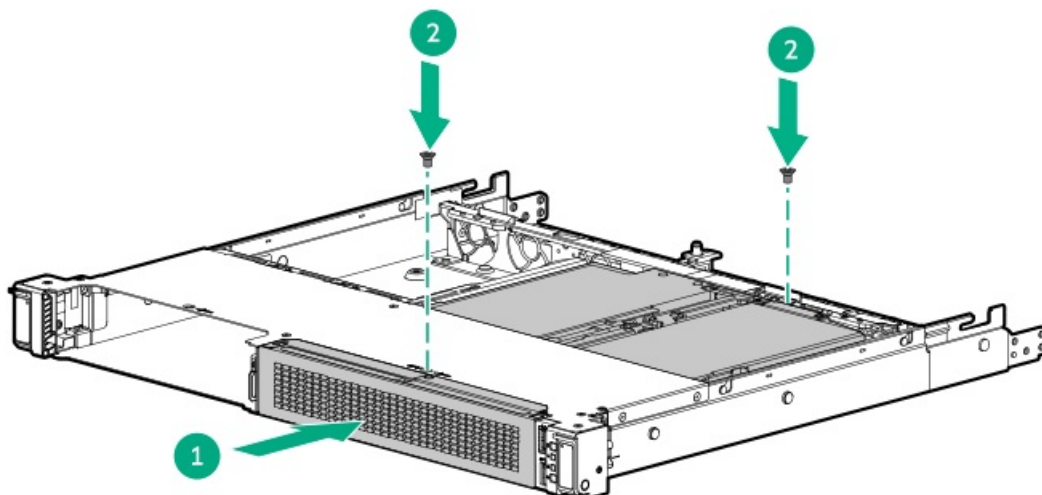
- a. Install the riser cage onto the system board.

Ensure the riser cage is engaged with the spool on the system board.

- b. Close the latch.



4. To install the GPU riser cage, do the following:
 - a. Slide the cage into the slot.
 - b. Install the two screws.



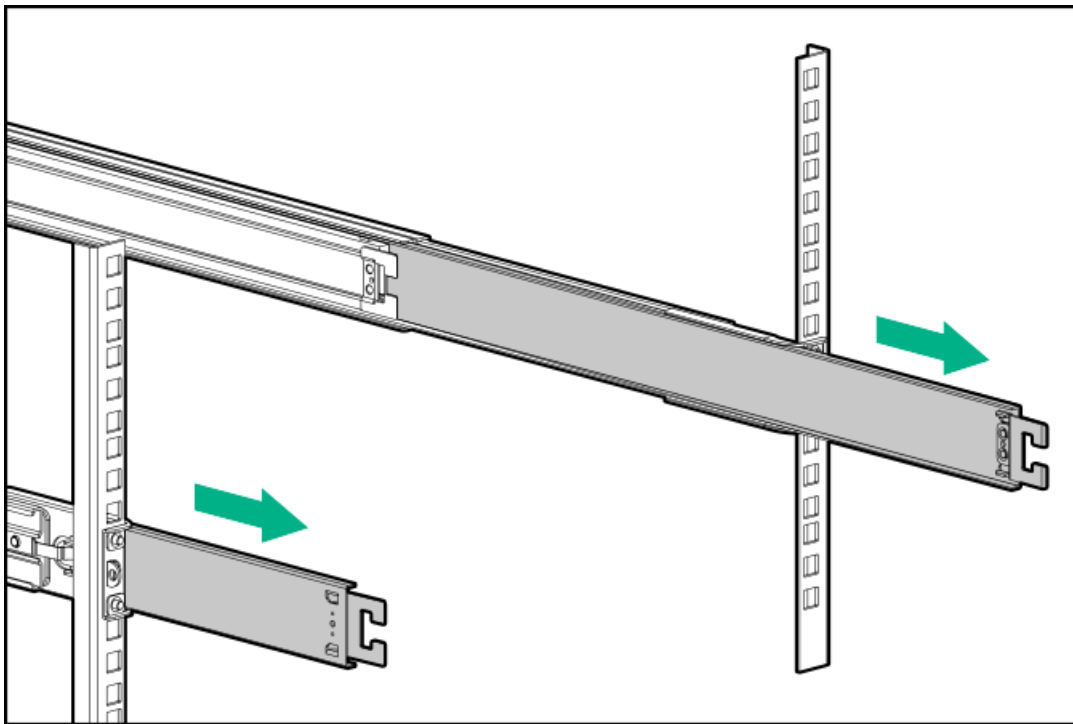
Install the server into the rack

Prerequisites

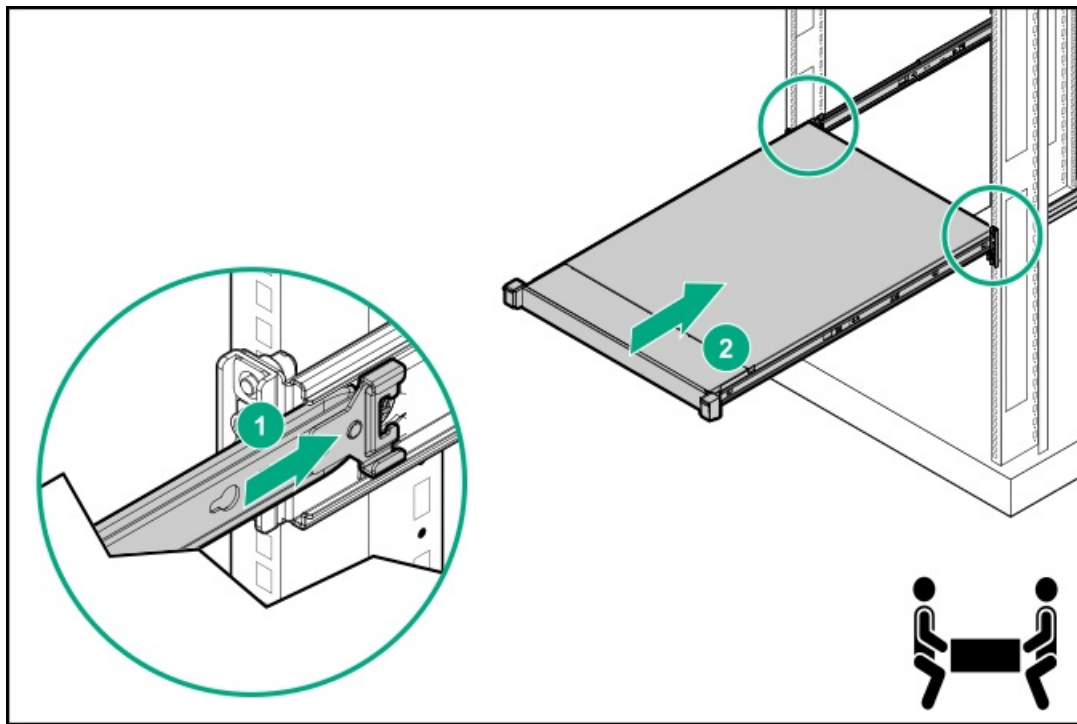
- Get help to lift and stabilize the server during rack installation. **If the server is installed higher than chest level, additional two people might be required to help install the server:** One person to support the server weight, and the other two to slide the server into the rack.
- Before you perform this procedure, review the:
 - [Rack warnings and cautions](#)
 - [Server warnings and cautions](#)
- A fully populated server is heavy. Hewlett Packard Enterprise recommends removing the external chassis components before installing the server into a rack.

Procedure

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



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



3. Connect all peripheral cables to the server.
4. Connect each power cord to the server.
5. Employ industry best practices in routing and managing the peripheral cables and power cords. Do one of the following:
 - Install the rack rail hoop-and-loop strap.
 - Install the cable management arm.

Power up the server

Procedure

- Press the Power On/Standby button.
- Use the virtual power button through iLO 7.

Rack rail and CMA

Subtopics

[Rack rail options](#)

[Rail identification markers](#)

[Rack mounting interfaces](#)

[Installing the cable management arm](#)

Rack rail options

This server supports the following HPE Easy Install friction rack rail (stab-in) options:



Server configuration	Rack rail option	Minimum rail length	Adjustable rail range
SFF drive	Rail option #1 (P52349-B21)	674.20 mm (26.54 in)	609.60 mm to 867.30 mm (24.00 in to 34.00 in)
4 LFF drive	Rail option #2 (P52351-B21)	714.32 mm (28.12 in)	609.60 mm to 918.10 mm (24.00 in to 36.15 in)
12 LFF drive	Rail option #9 (P52353-B21)	1029.61 mm (40.54 in)	609.60 mm to 918.10 mm (24.00 in to 36.15 in)
GPU	Rail option #14 (P68106-B21)	852.91 mm (33.58 in)	609.60 mm to 918.10 mm (24.00 in to 36.15 in)

Subtopics

[Installing the rack rail option](#)

[Installing the rack rail hook-and-loop strap](#)

Installing the rack rail option

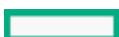
Prerequisites

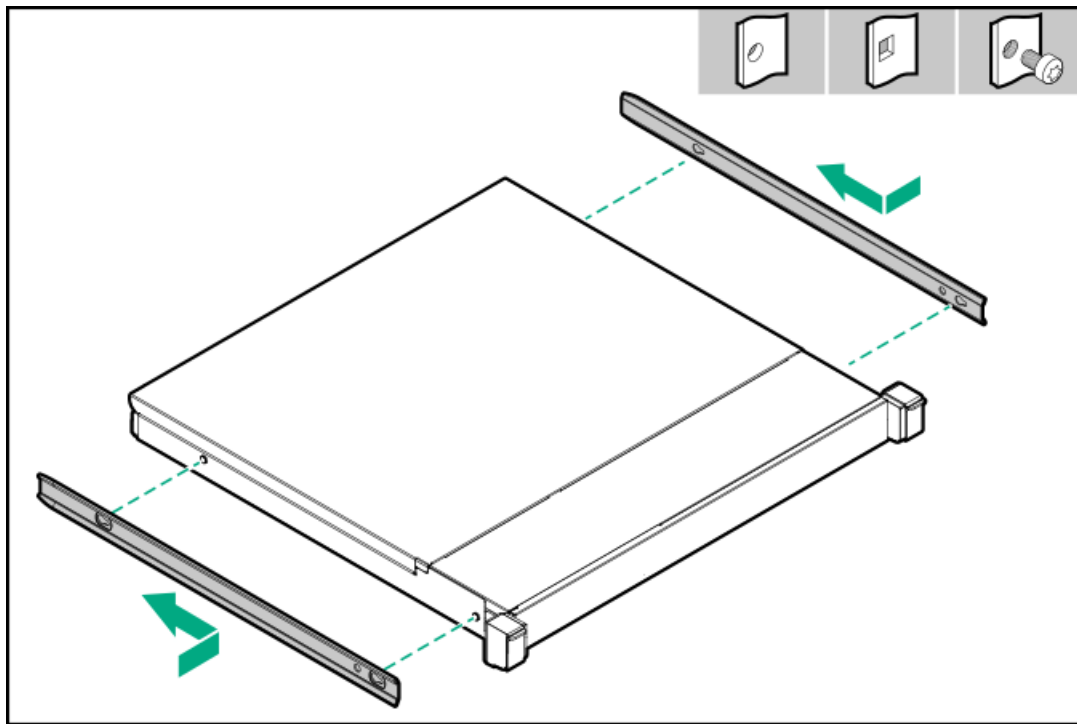
- [Rail identification markers](#)
- Make sure that the rail option is compatible with the server configuration.
- Small slotted screwdriver—This tool is required if you intend to install the server in a threaded round-hole rack.

Procedure

Installing the inner rails on the server

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.

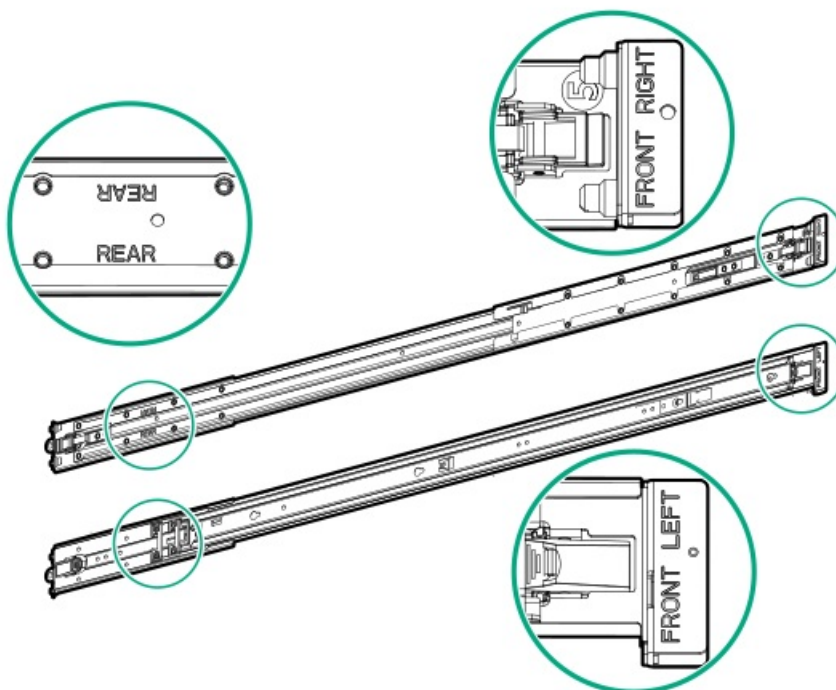




Installing the mounting rails on the rack

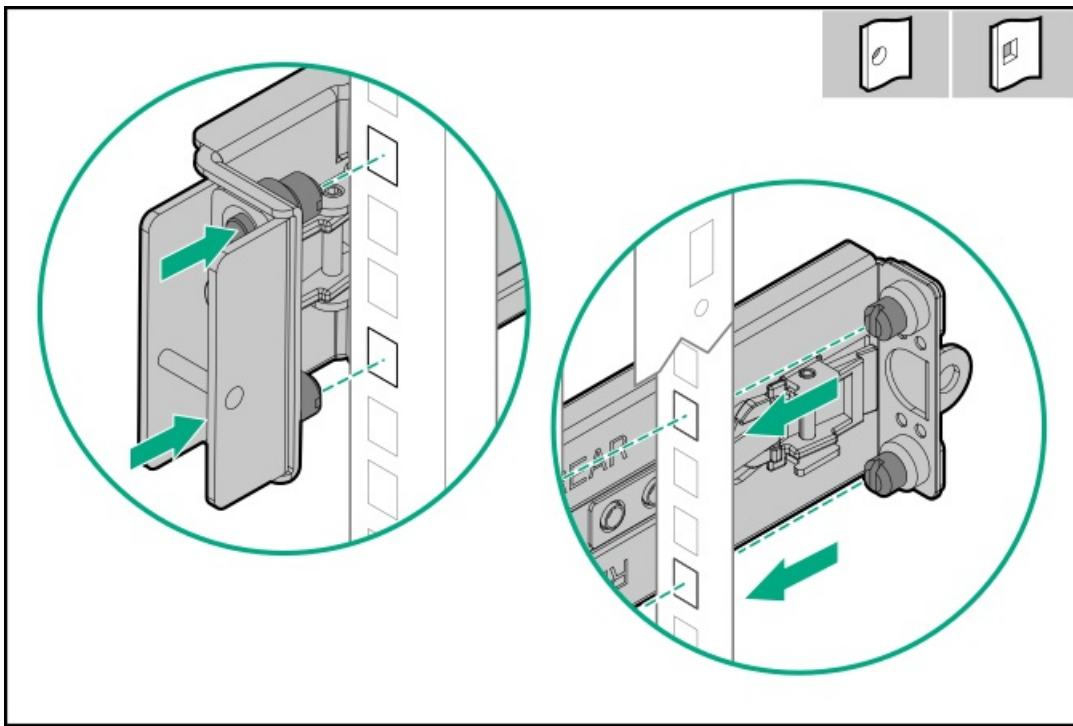
2. Locate the orientation markers on the mounting rails.

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



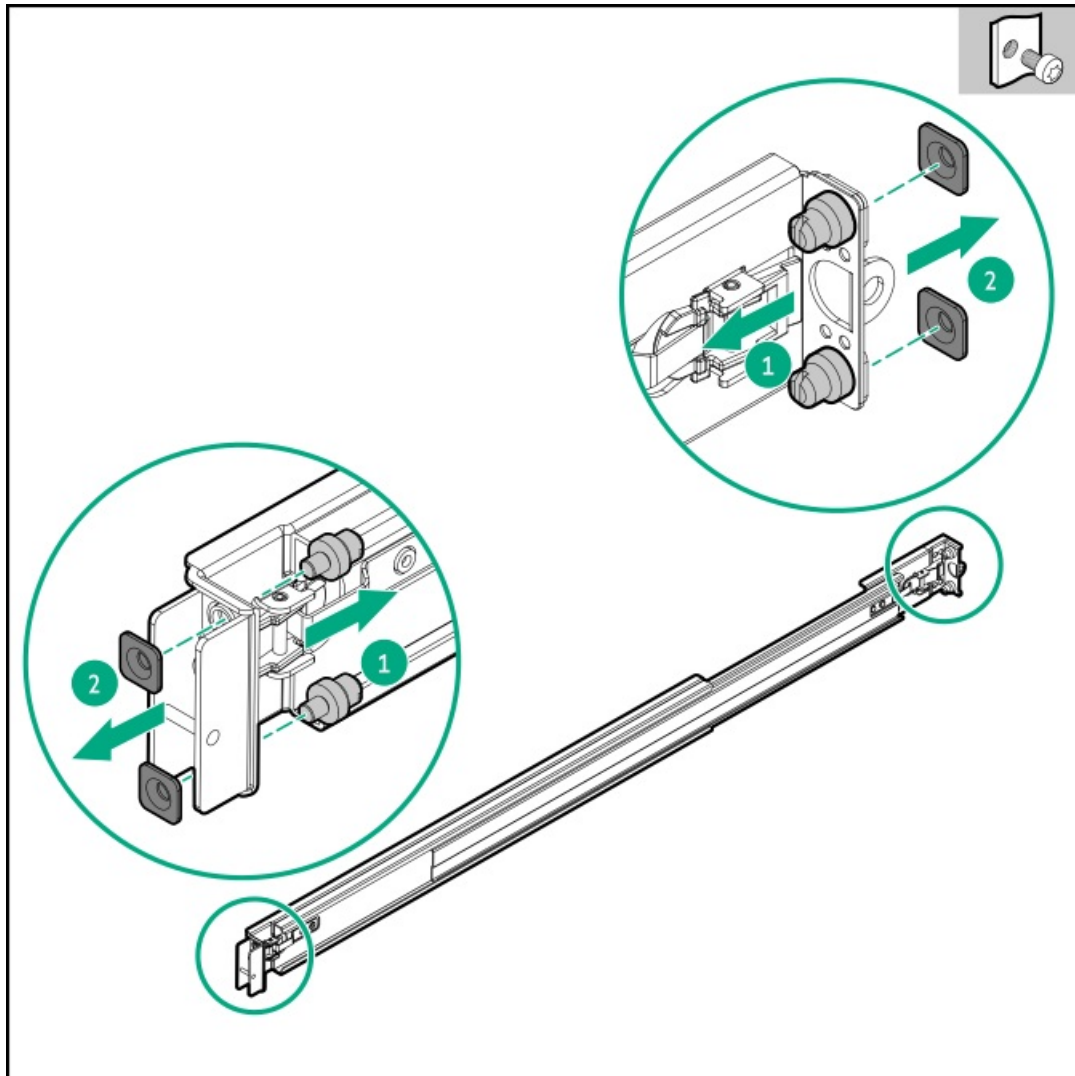
3. Extend the mounting rails to align with the depth of the rack.

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.

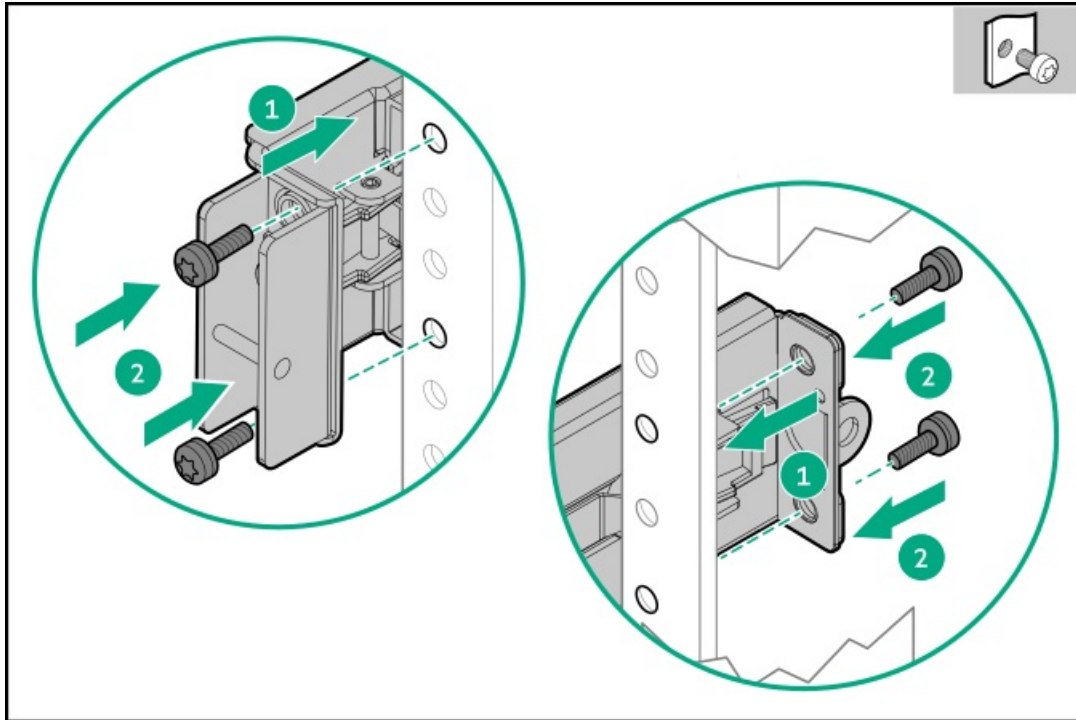


5. To install the mounting rails in a threaded round-hole rack, do the following:

- 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.
- c. Install the rack mounting screws.



- 6. Install the server into the rack.

Results

The installation procedure is complete.

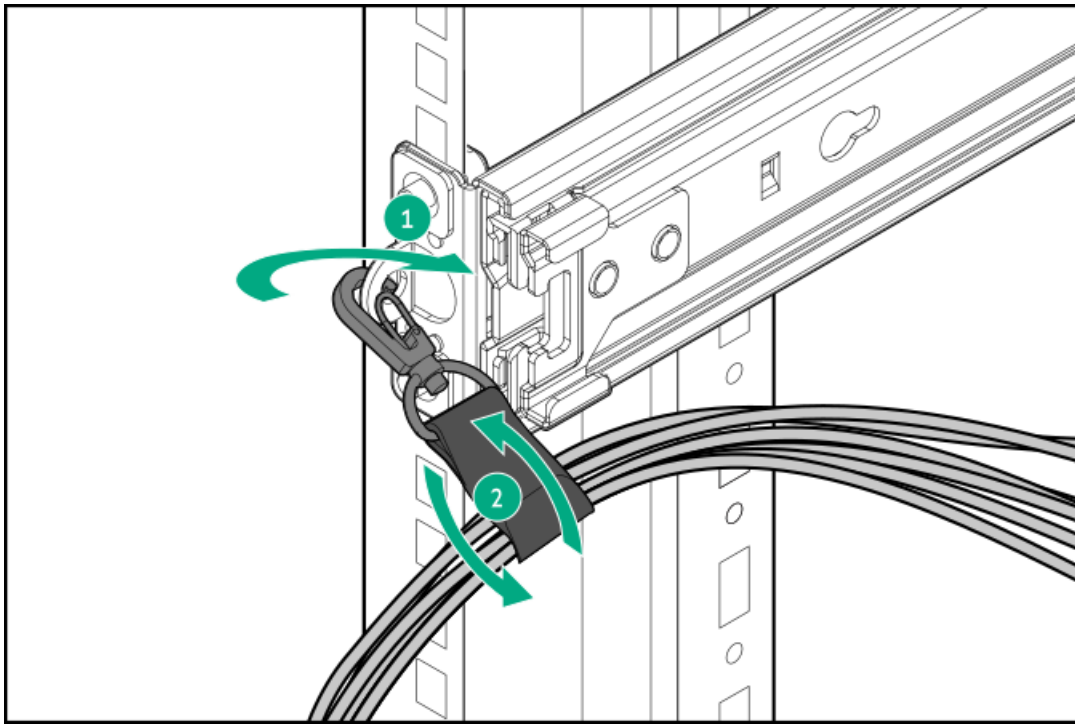
Installing the rack rail hook-and-loop strap

About this task

The hook-and-loop strap can be installed on either the left or right rail.

Procedure

- 1. Attach the strap carabiner to the rail.
- 2. Bundle the cords and cables, and then wrap the strap around the cables.



Results

The installation procedure is complete.

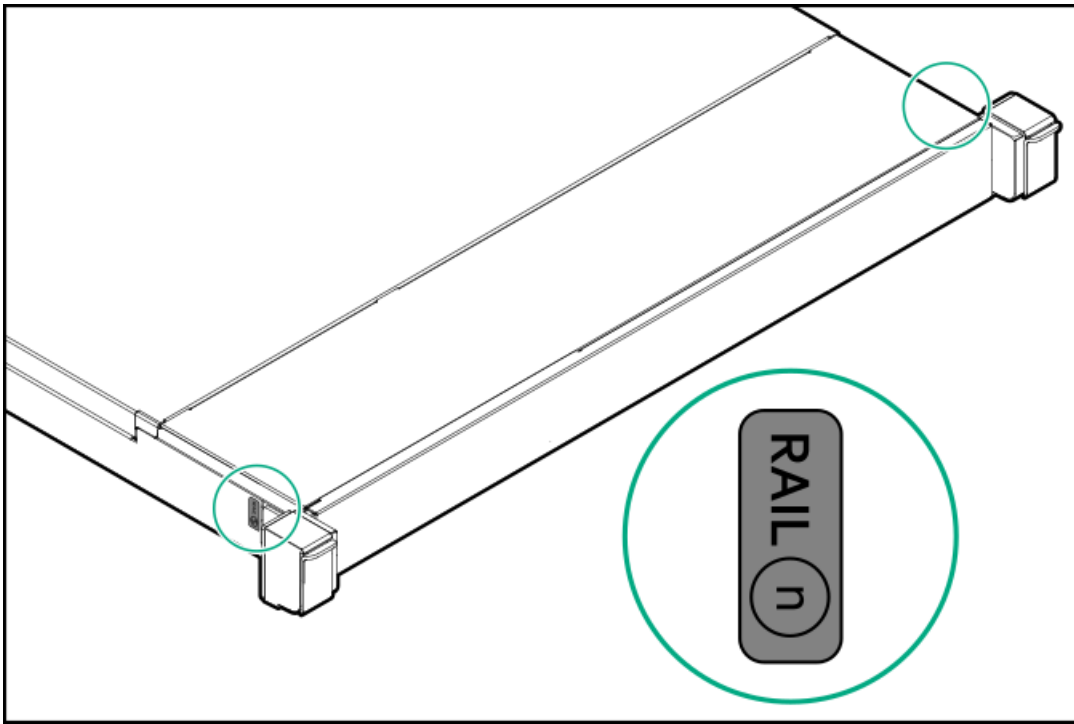
Rail identification markers

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.

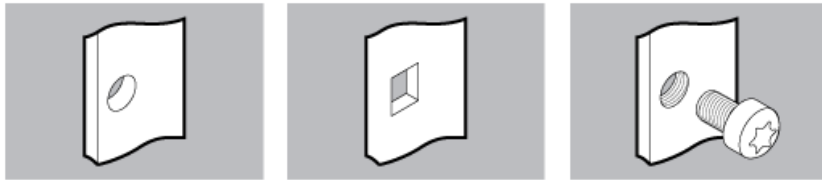
To ensure compatibility between the rack rails and the server, verify that the rail number labels on the chassis match the ones stamped on the rails.

- Rail number labels on the chassis



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.

Installing the cable management arm

Prerequisites

- Before you perform this procedure, review the [Rack warnings and cautions](#).
- T-25 Torx screwdriver—This tool is required if the shipping screws located inside the chassis ears need to be loosened or tightened.

About this task

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

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



CAUTION

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

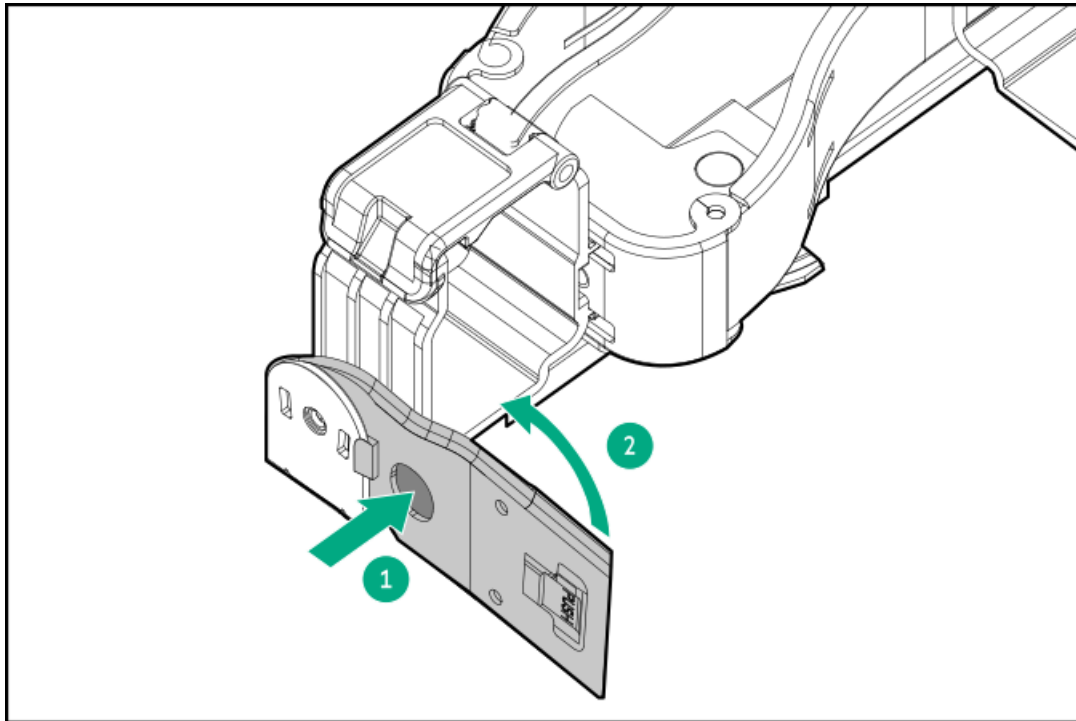
Procedure

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

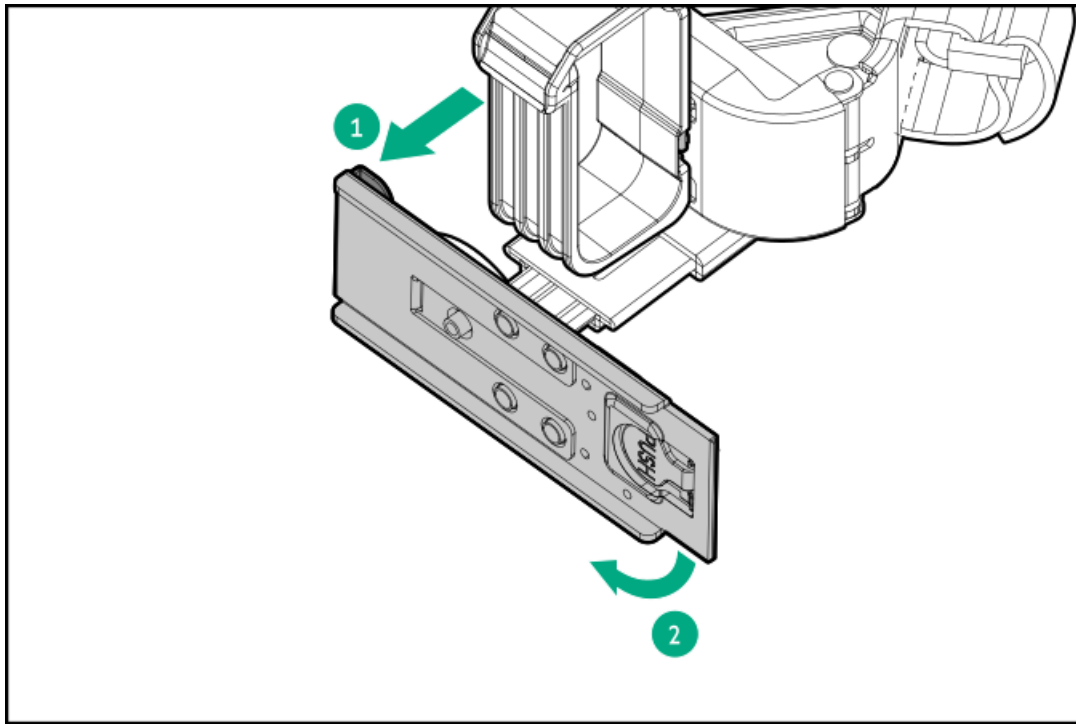
There will be an audible click to indicate that the bracket is locked in its adjusted position.

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

- CMA with a rotate button

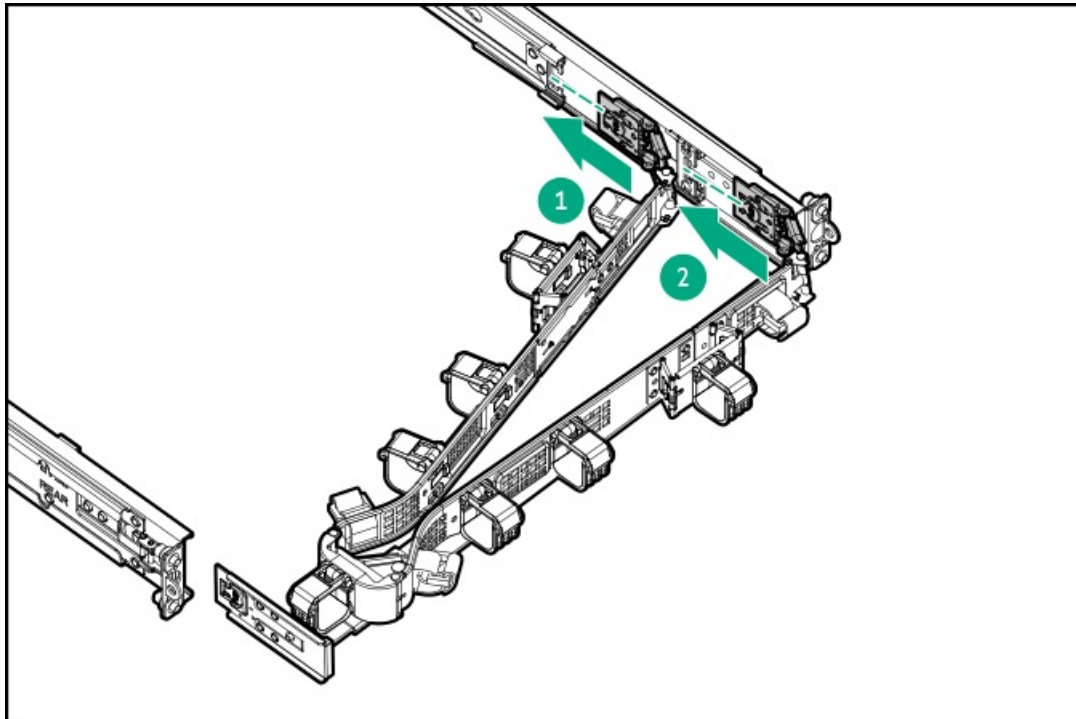


- CMA with a rotate latch

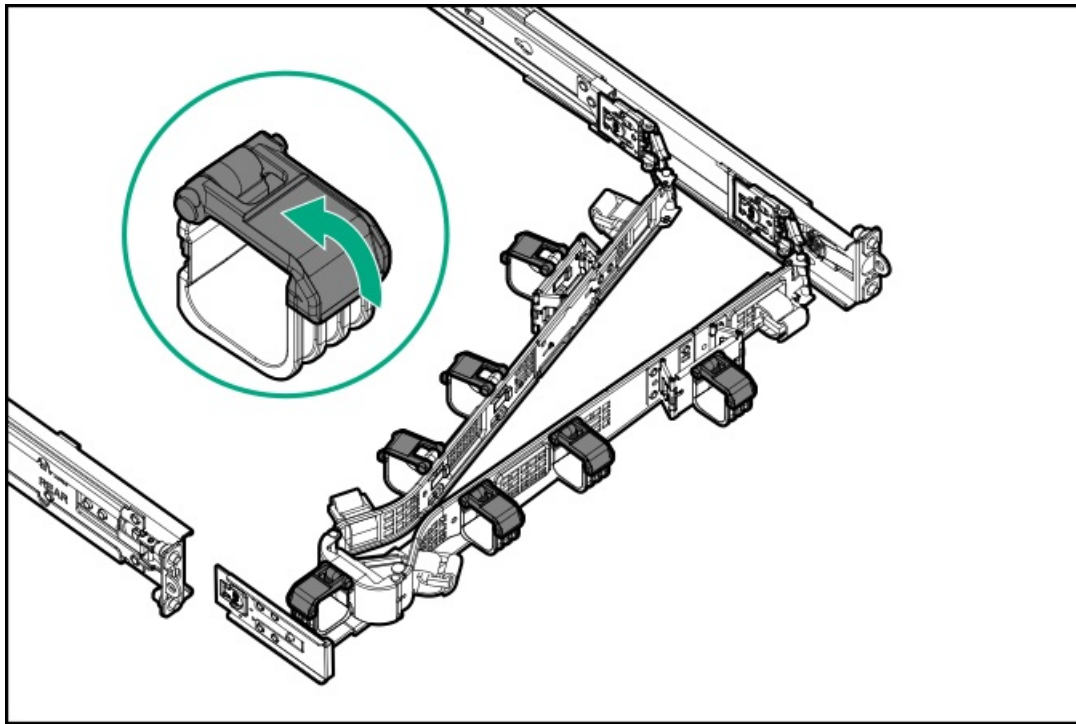


3. Connect the CMA hinged tabs and retention bracket to the rack rails:

- a. Insert the inner tab into the sliding rail.
- b. Insert the outer tab into the mounting rail.



- c. Open the cable clamps.



d.

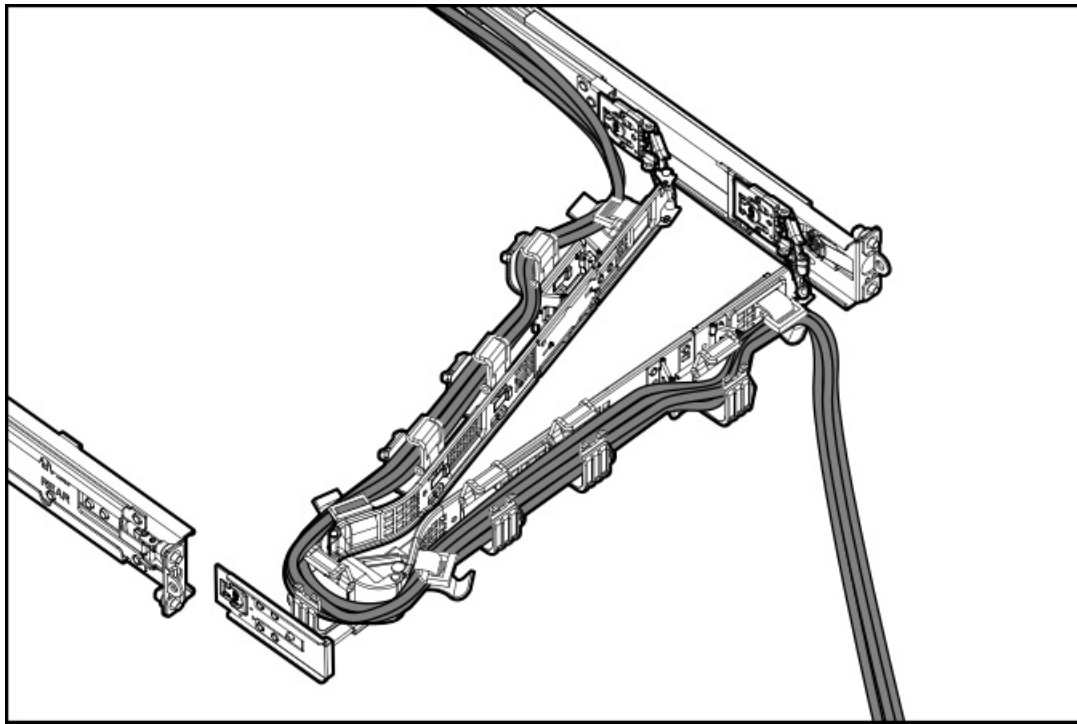


CAUTION

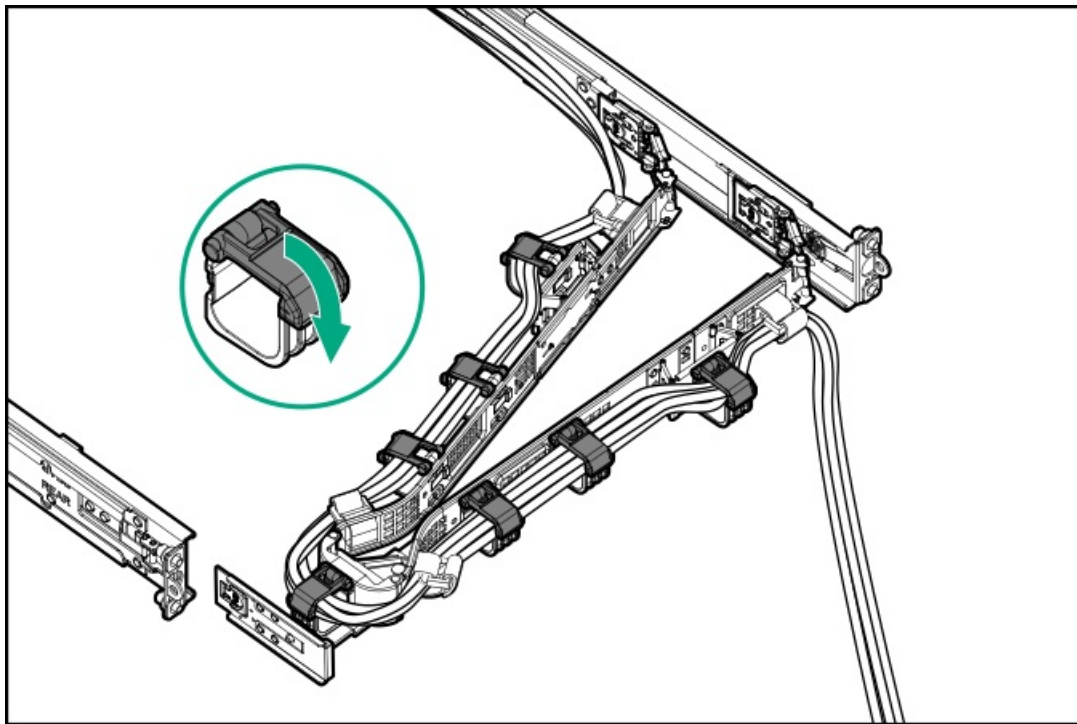
Employ industry best practices in managing peripheral cables and power cords secured in the CMA. These are some of the more important points:

- 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.

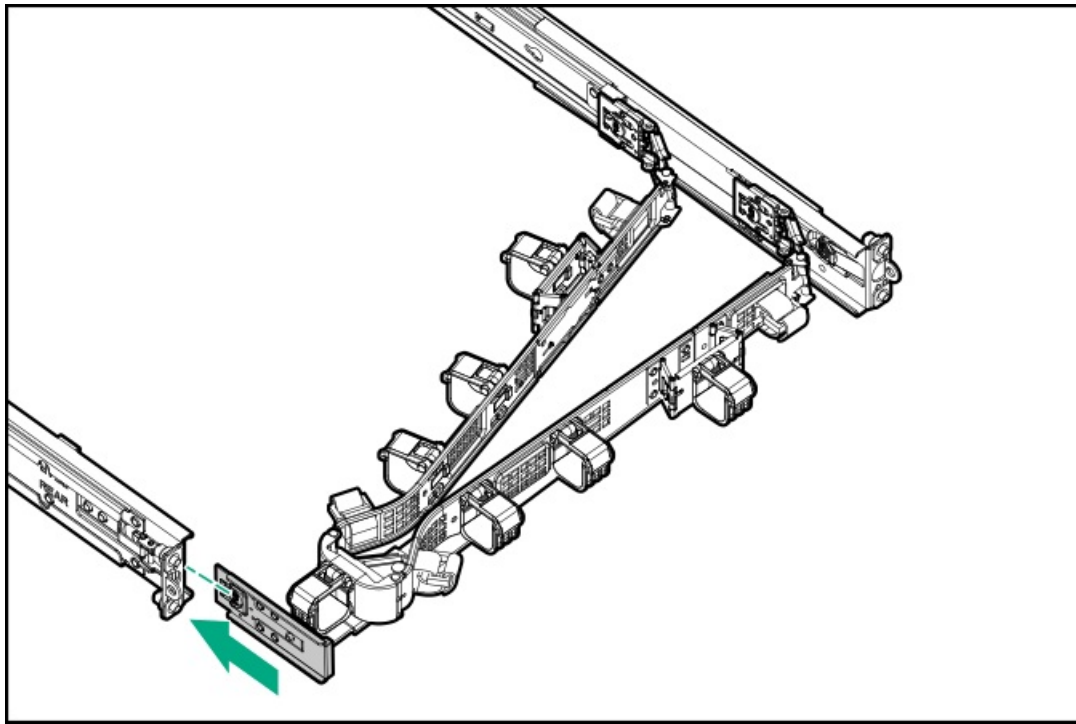


- e. Close the cable clamps.

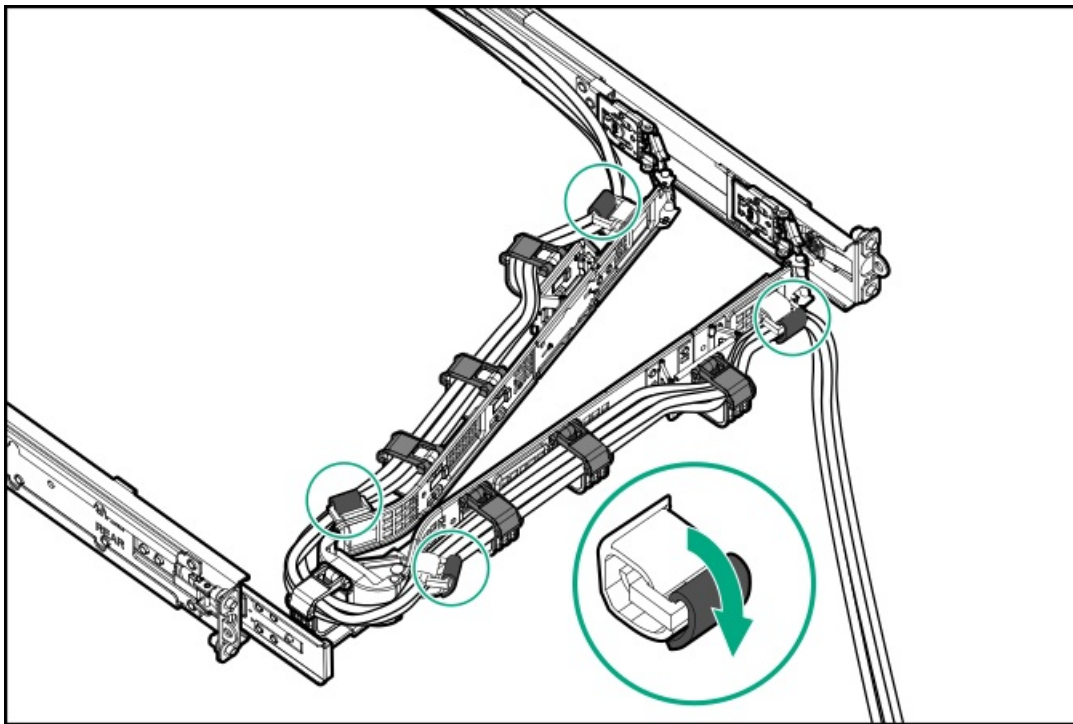


- f. Insert the retention bracket into the opposite mounting rail.

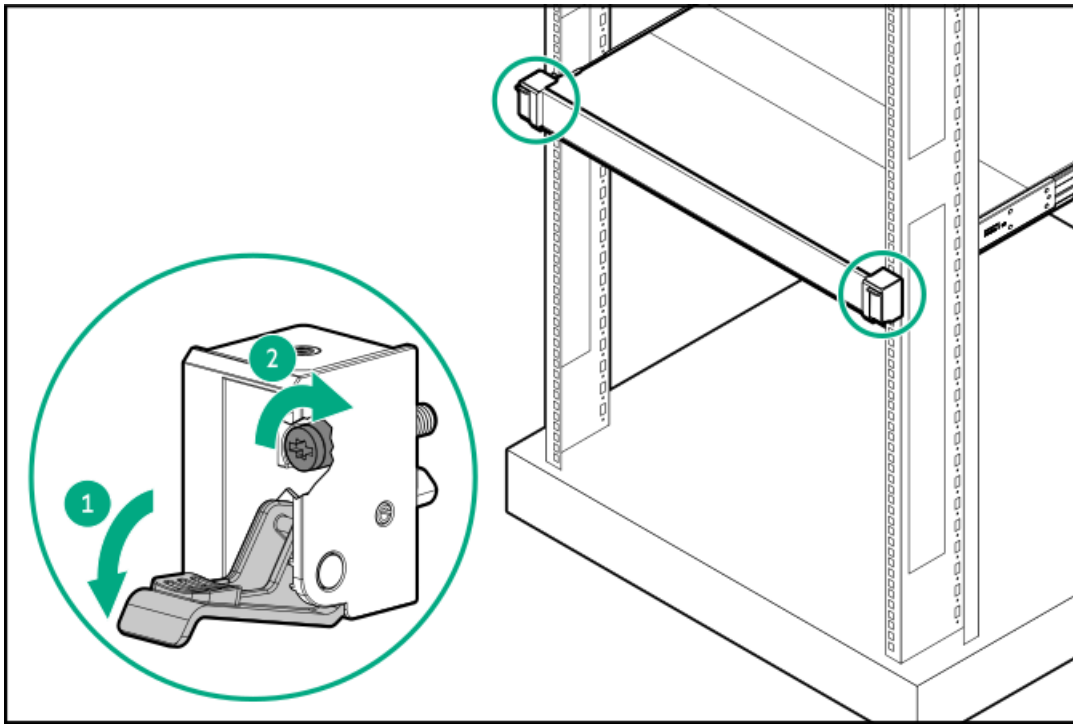
There will be an audible click to indicate that the tabs and bracket are locked into place.



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



5. Verify the operation of the rack rails:
 - a. Fully extend the chassis out of the rack.
 - b. Check that there is enough slack in the cables and cords for full extension of the chassis. Make sure that there is no cable binding or crimping.
 - c. To ensure that the cables and cords are secured properly, slide the chassis in and out of the rack. Make sure that there is no risk of accidental disconnection of the peripheral cables and power cords.
6. Slide the server into the rack until the chassis ears are flushed against the rack posts.
7. (Optional) Open the chassis ear latches, and then tighten the shipping screws.



Results

The installation procedure is complete.

Drives

Subtopics

[Drive installation guidelines](#)

[Installing a hot-plug drive](#)

[Installing a hot-plug drive in box three or box five](#)

[Installing an E3.S drive](#)

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.
- All drives grouped into the same drive array must meet the following criteria:

- All drives must be either all hard drives or all solid-state drives.
- All drives must be of the same capacity to provide the greatest storage space efficiency when drives are grouped into the same drive array.

Installing a hot-plug drive

About this task



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.



CAUTION

A discharge of static electricity from a finger or other conductor might damage system boards or other static-sensitive devices. To prevent damage, observe [antistatic precautions](#).



CAUTION

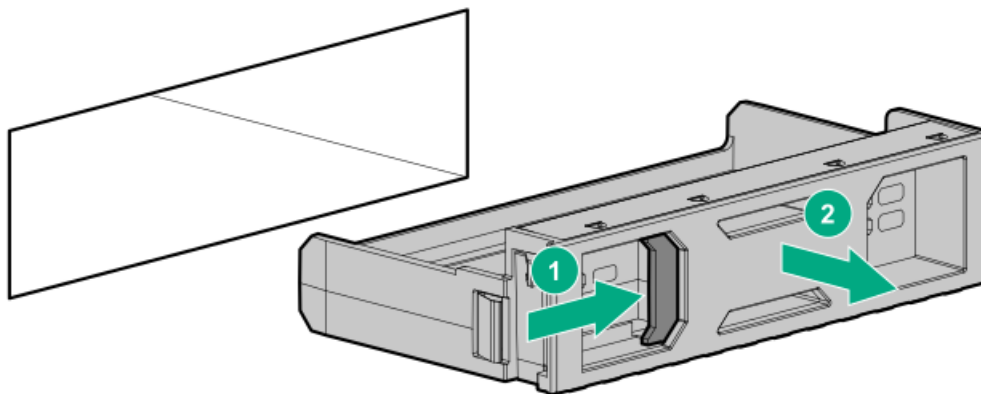
To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

Procedure

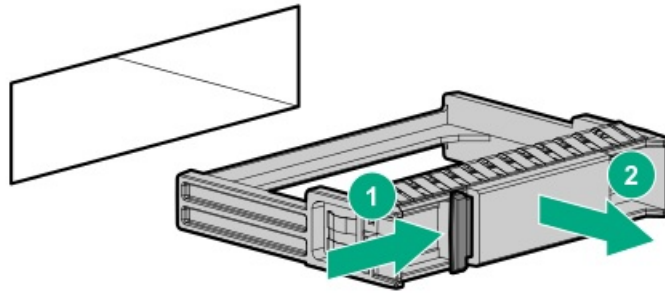
1. If installed, remove the front bezel.
2. Remove the drive blank.

Retain the blank for future use.

- LFF drive blank

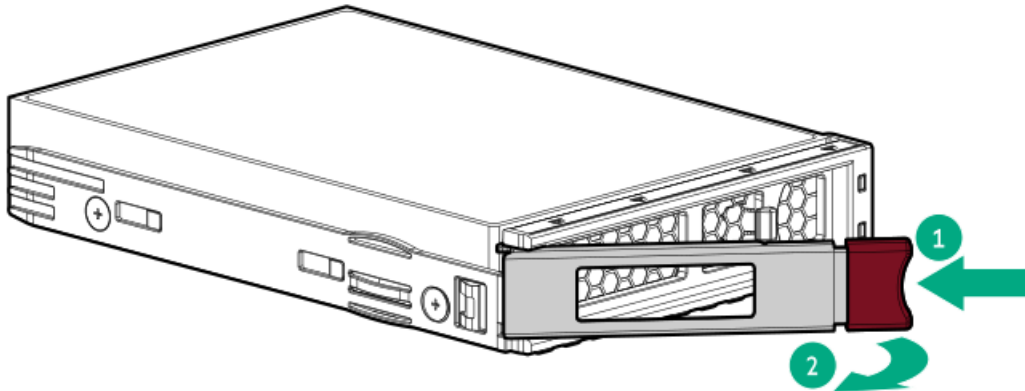


- SFF drive blank

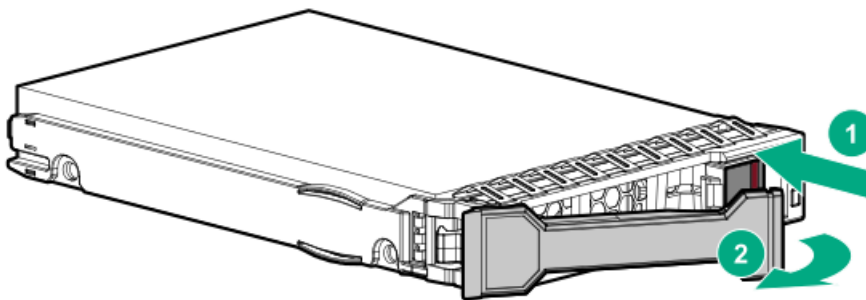


3. Prepare the drive.

- LFF drive

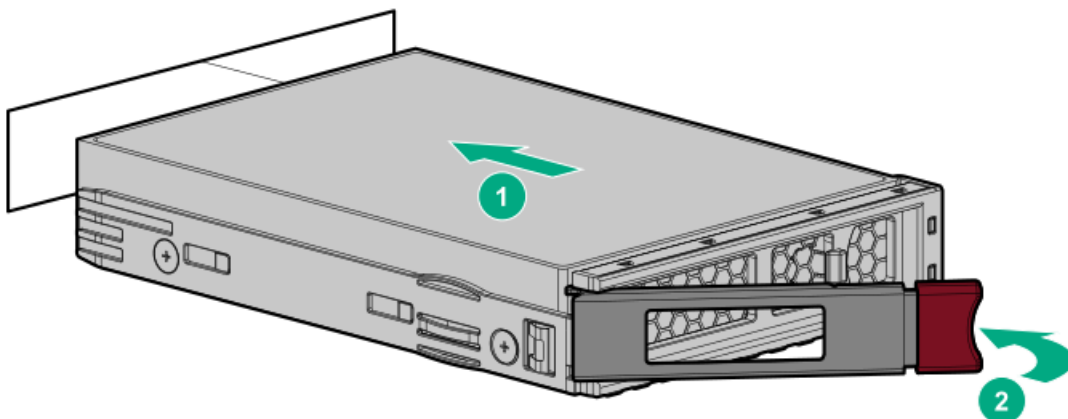


- SFF drive

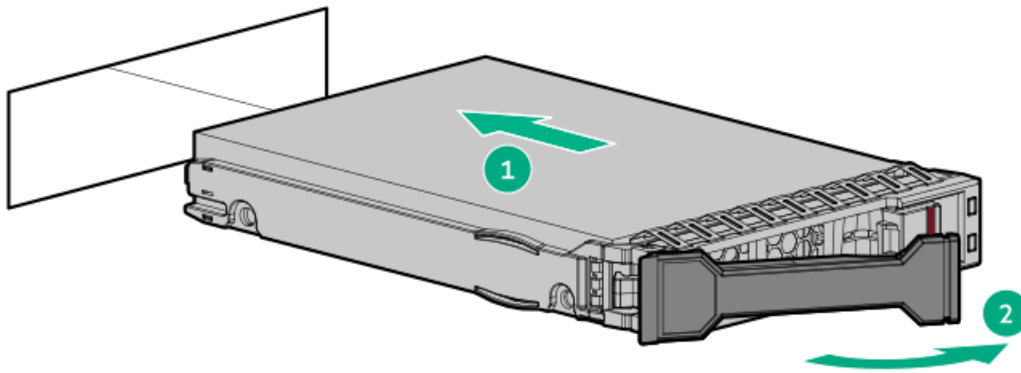


4. Install the drive.

- LFF drive



- SFF drive



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

Results

The installation procedure is complete.

Installing a hot-plug drive in box three or box five

About this task



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.



CAUTION

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

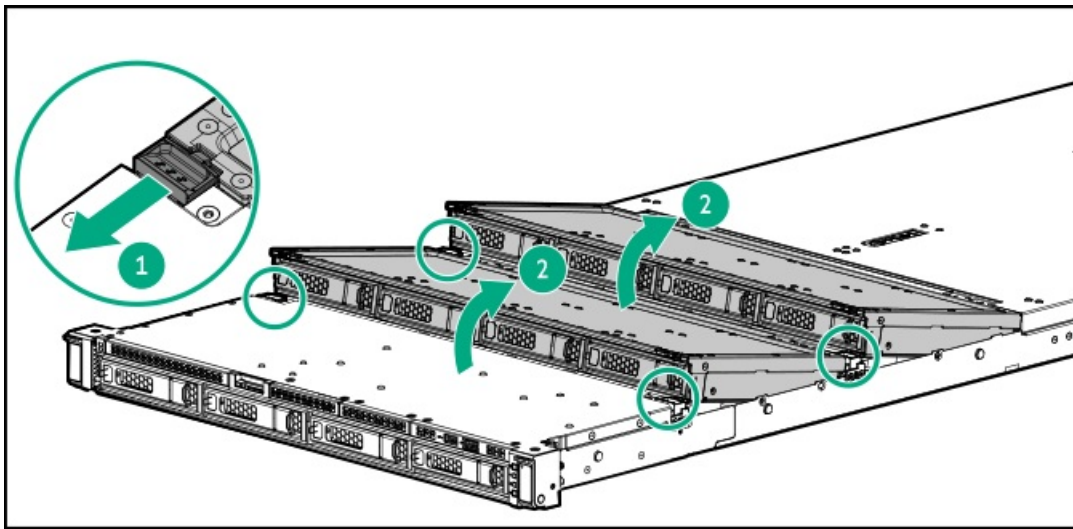


CAUTION

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

Procedure

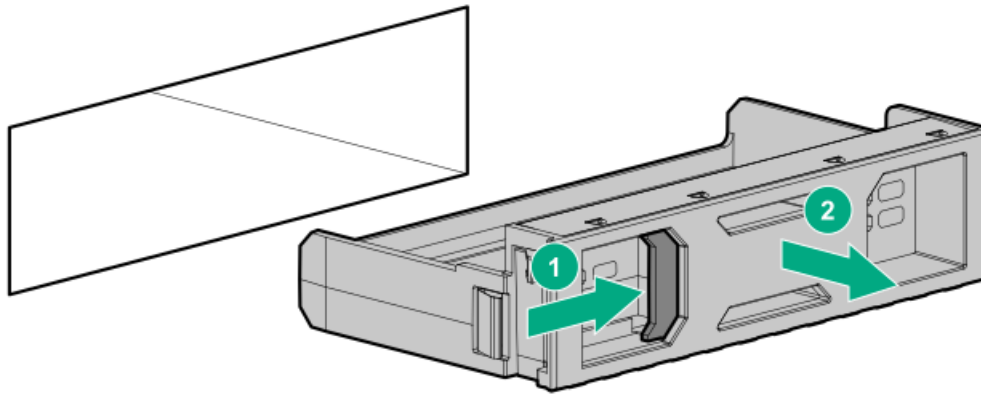
1. If installed, open the cable management arm.
2. Do one of the following:
 - a. Extend the server from the rack.
 - b. Remove the server from the rack.
3. Press and pull the tab.



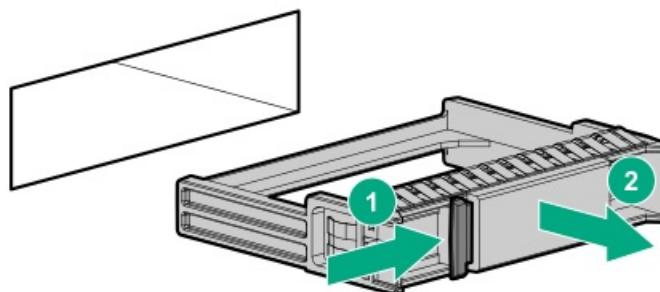
4. Remove the drive blank.

Retain the blank for future use.

- LFF drive blank

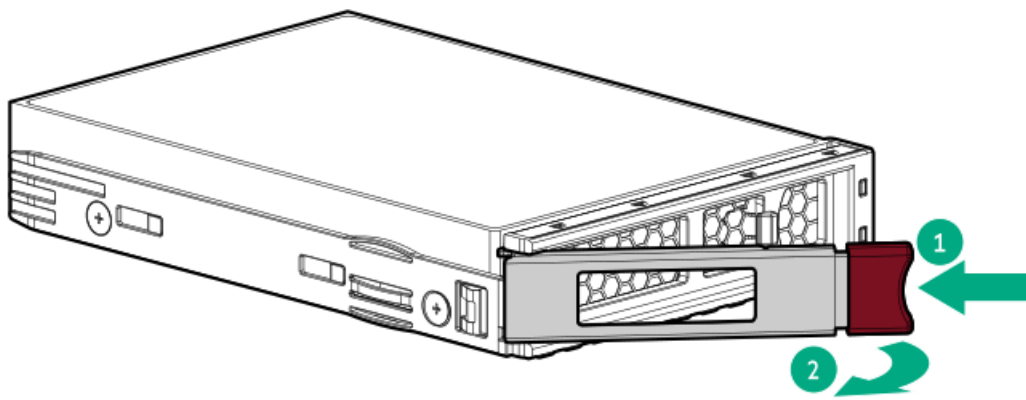


- SFF drive blank

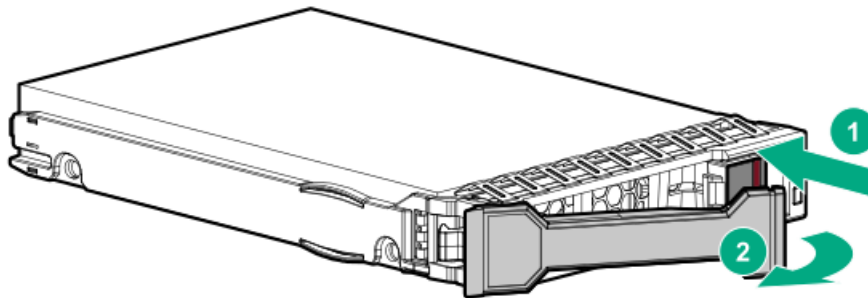


5. Prepare the drive.

- LFF drive

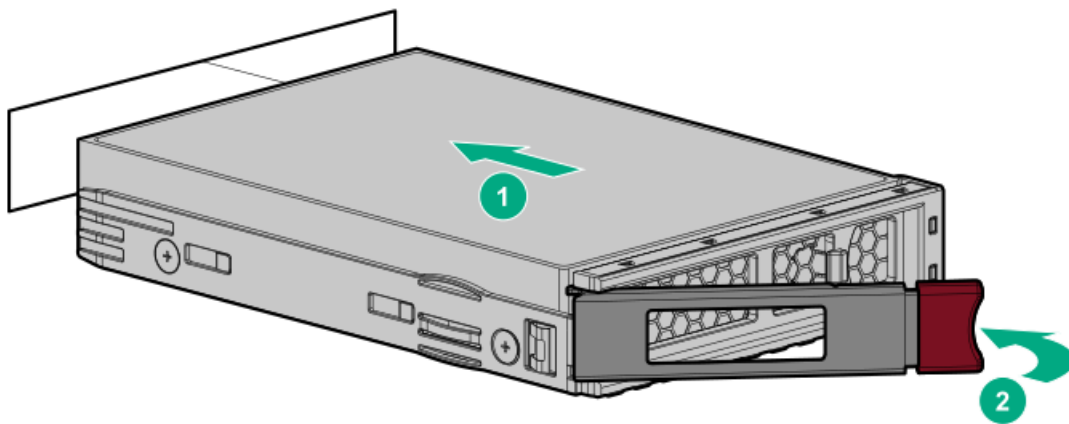


- SFF drive

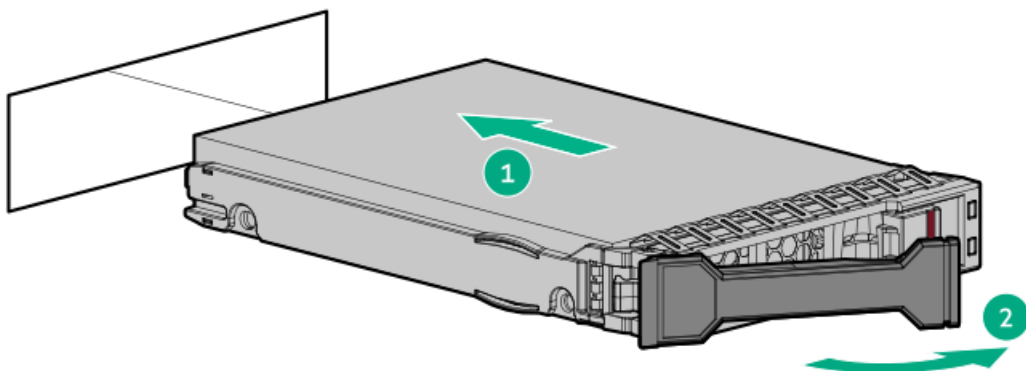


6. Install the drive.

- LFF drive



- SFF drive



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



8. To configure drive arrays, see the [relevant storage controller guide](#).

Results

The installation procedure 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](#).



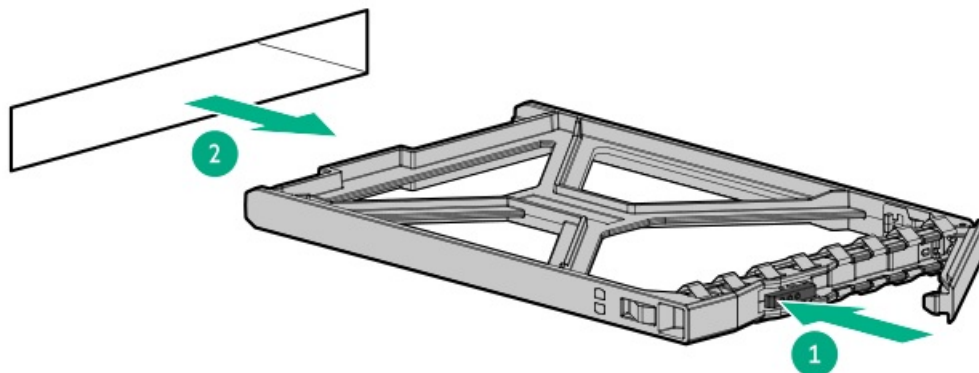
CAUTION

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

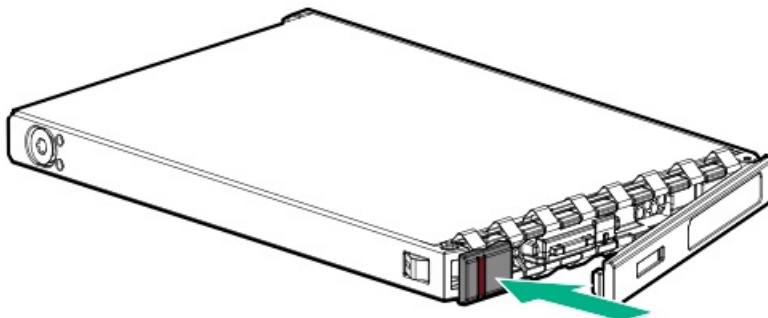
Procedure

1. [Back up all server data](#).
2. If installed, [remove the front bezel](#).
3. Remove the drive blank.

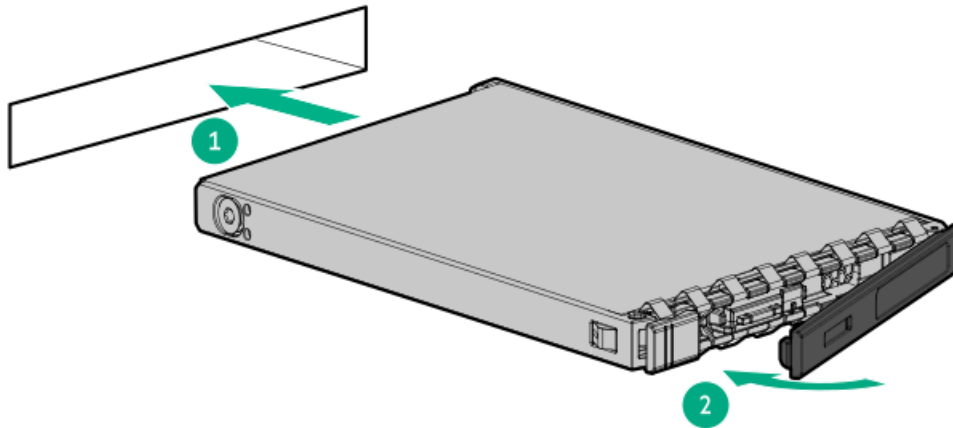
Retain the blank for future use.



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. [Install the front bezel](#).
8. To configure drive arrays, see [the relevant storage controller guide](#).

Results

The installation procedure is complete.

Drive cages

Subtopics

[Installing a 2 SFF drive cage](#)

[Installing the 8 SFF drive backplane](#)

Installing a 2 SFF drive cage

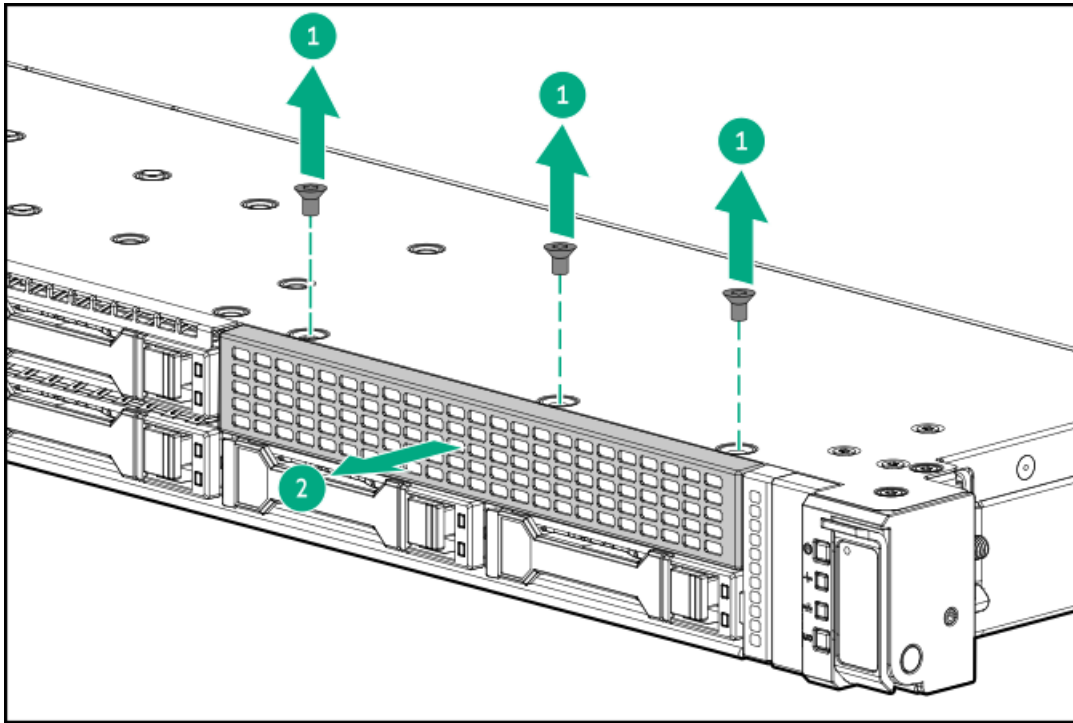
Prerequisites

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

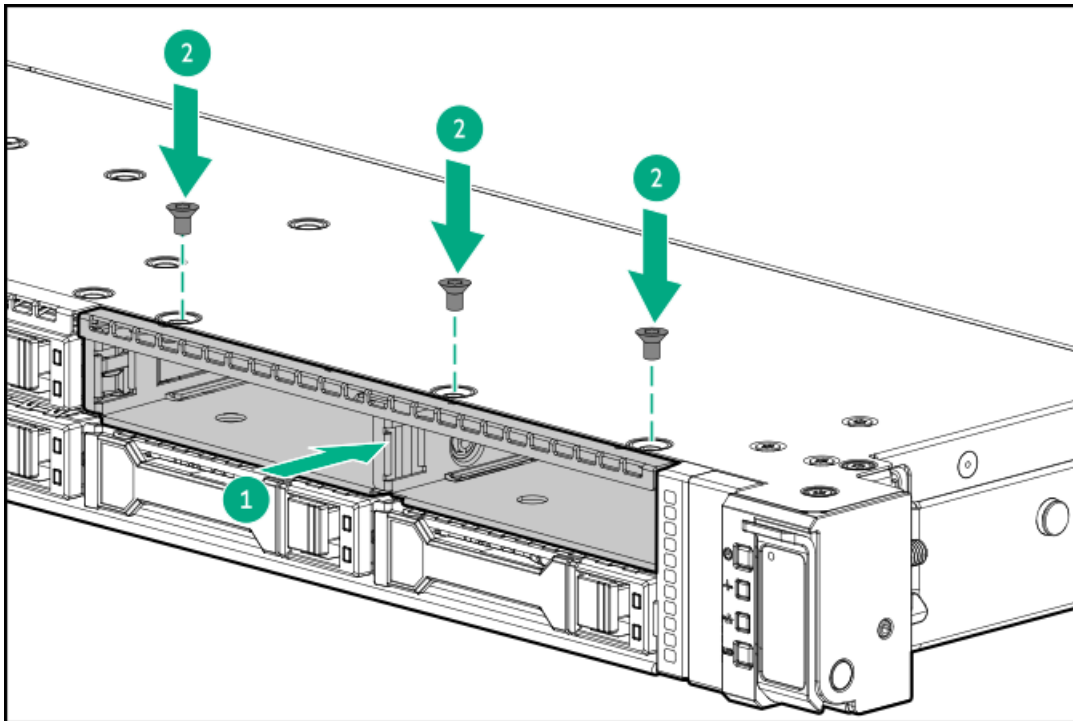
Procedure

1. Back up all server data.
2. [Power down the server](#).
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.

4. Do one of the following:
 - a. Extend the server out of the rack.
 - b. Remove the server from the rack.
5. Remove the universal media bay blank.



6. Install the 2 SFF drive cage.



7. Install the drives.
8. Install the server in the rack.
9. Connect each power cord to the server.
10. Connect each power cord to the power source.

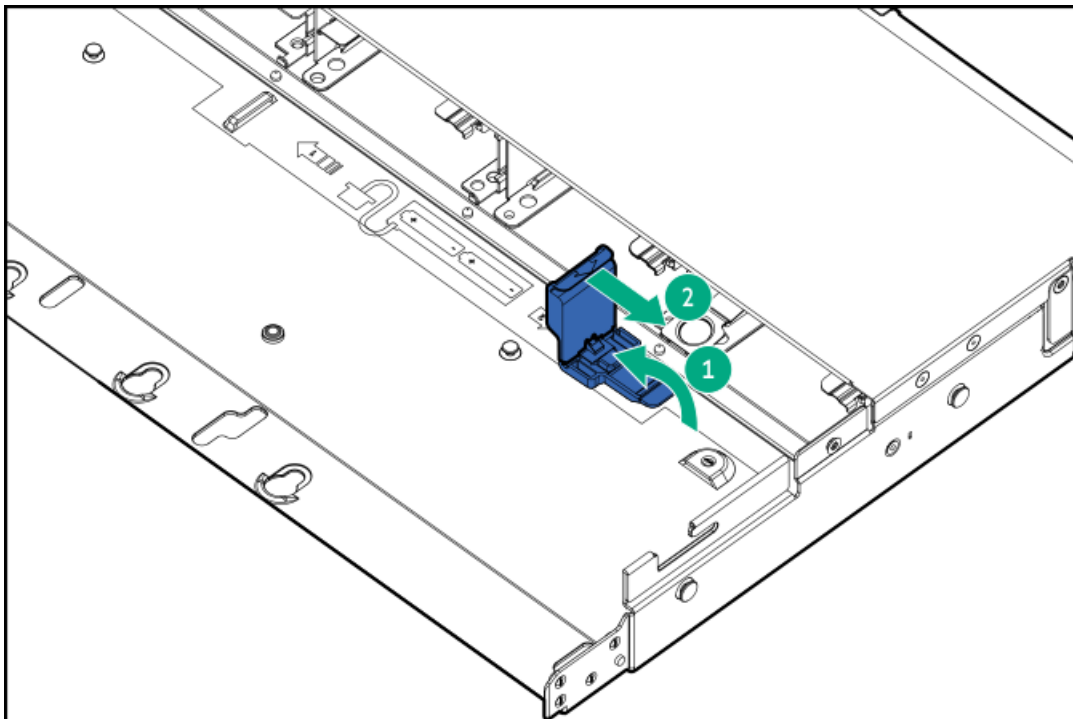


11. Power up the server.

Installing the 8 SFF drive backplane

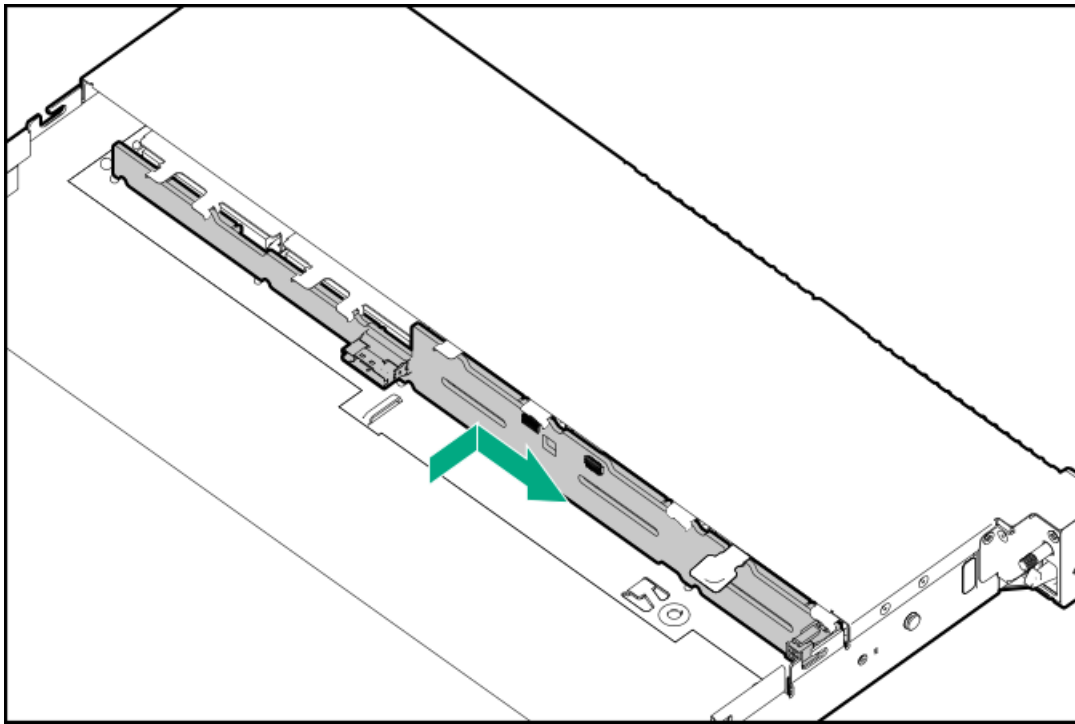
Procedure

1. Power down the server.
2. If installed, release 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 fans.
10. Remove the fan wall.
11. Remove the energy pack retention latch:
 - a. Pull up and hold the latch.
 - b. Push the latch to detach from the chassis.



12. Install the 8 SFF drive backplane.

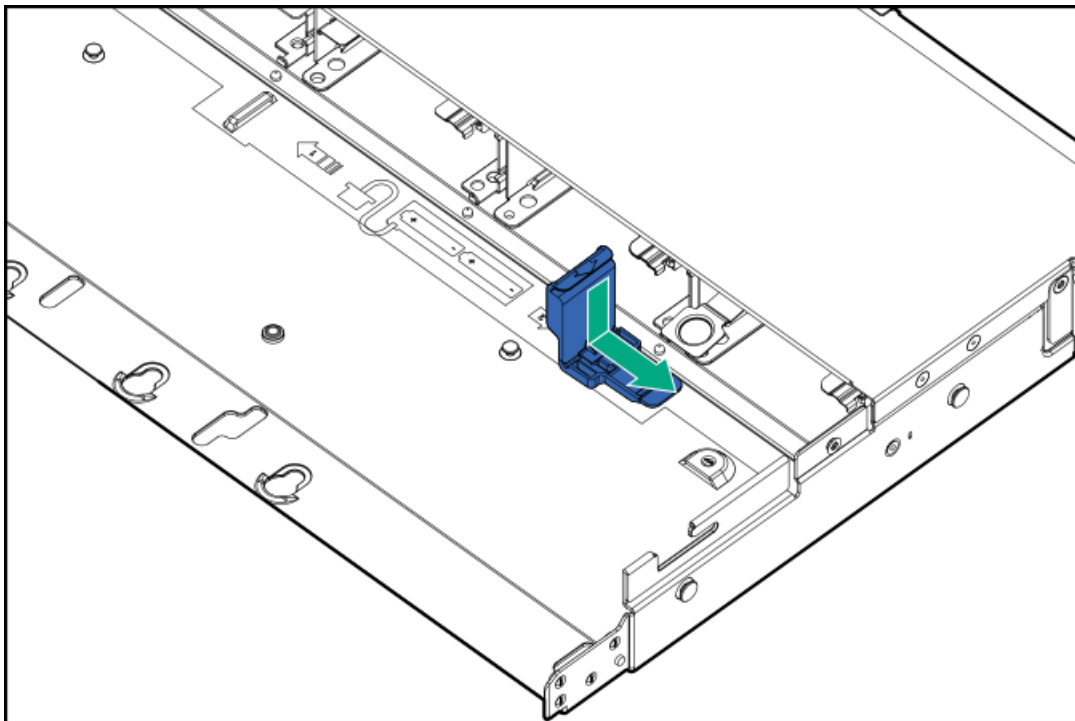
Make sure the backplane is firmly seated in the drive cage and locked by the release latch.



13. Connect the following cables:

- Drive power cable
- Storage controller cable

14. Install the energy pack retention latch:



15. Install the fan wall.

16. Install the fans.

17. Install the middle cover.

18. Install the access panel.



19. Install the server into the rack.
20. Connect all peripheral cables to the server.
21. Connect each power cord to the server.
22. Power up the server.

Results

The installation procedure is complete.

GPU options

This server supports various GPU options to meet your computational and graphics workload requirements. For a list of supported GPU models, see the server QuickSpecs on the Hewlett Packard Enterprise website (<https://www.hpe.com/info/quickspecs>).

Subtopics

[Installing a GPU in the GPU riser cage](#)

[Installing a GPU in the rear riser cage](#)

Installing a GPU in the GPU riser cage

Prerequisites

Before installing this option, do the following:

- Be sure that the power supplies support the installation of this option. For more information, see the [Hewlett Packard Enterprise Configurator website](#).
- 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.



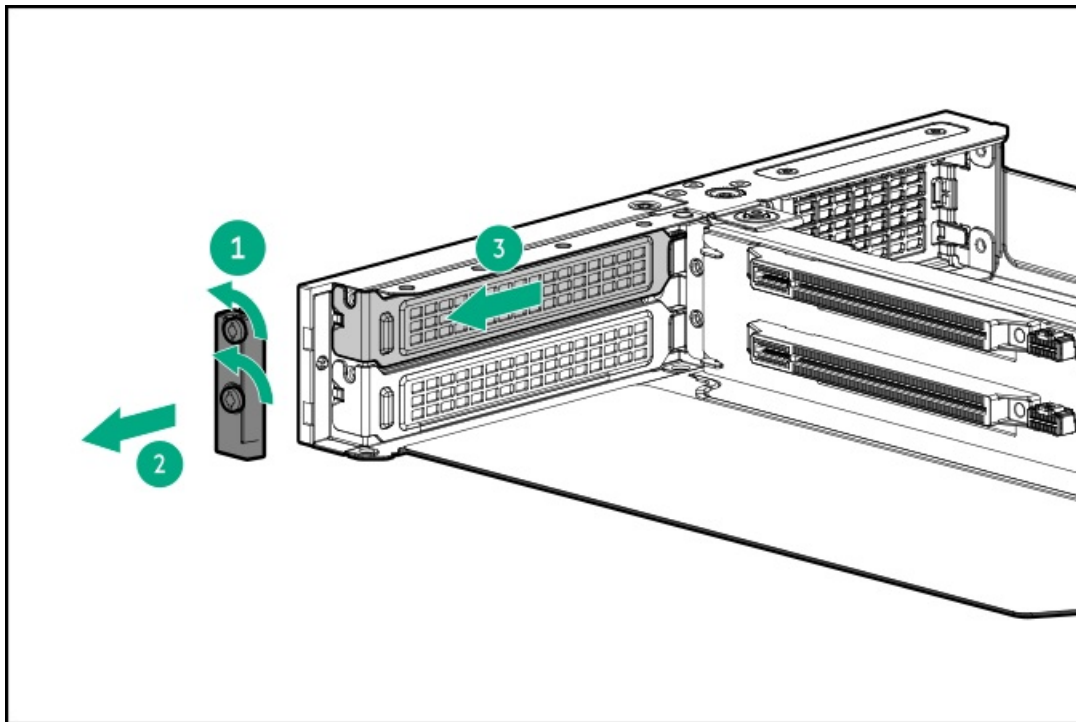
CAUTION

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

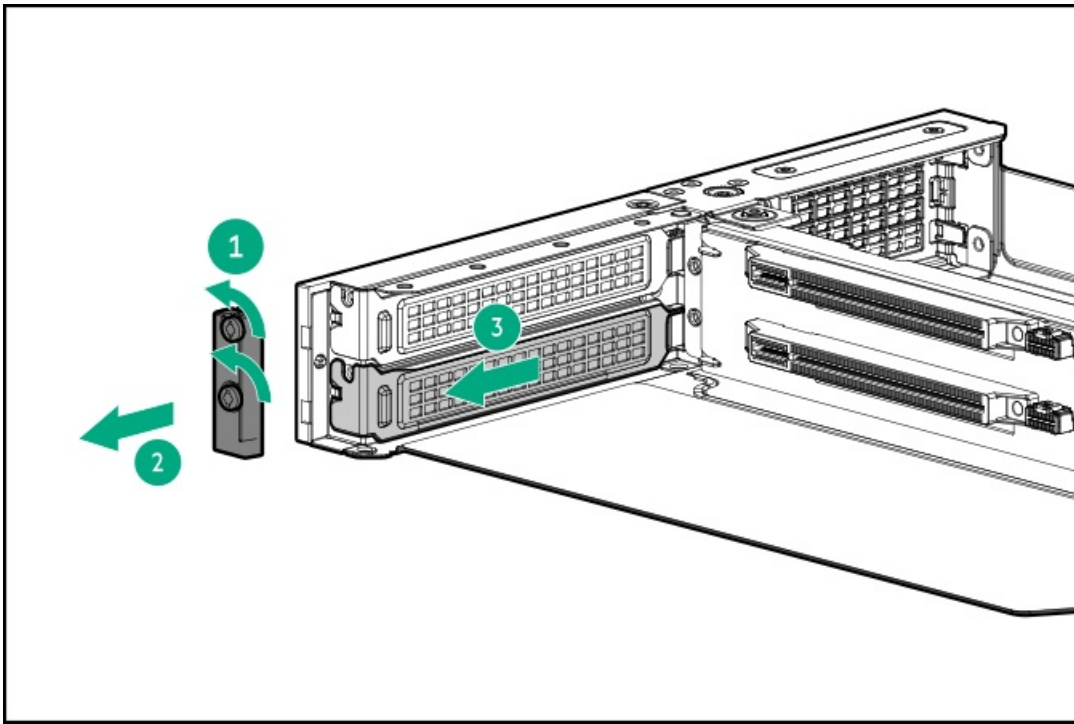
Procedure

1. Back up all server data.
2. Power down the server.
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. 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 GPU riser cage.
10. Remove the GPU riser slot blank:
 - a. Loosen the captive screws on the GPU bracket retainer.
 - b. Remove the GPU bracket retainer.
 - c. Remove the riser slot blank.
 - Single-width:



- Double-width:



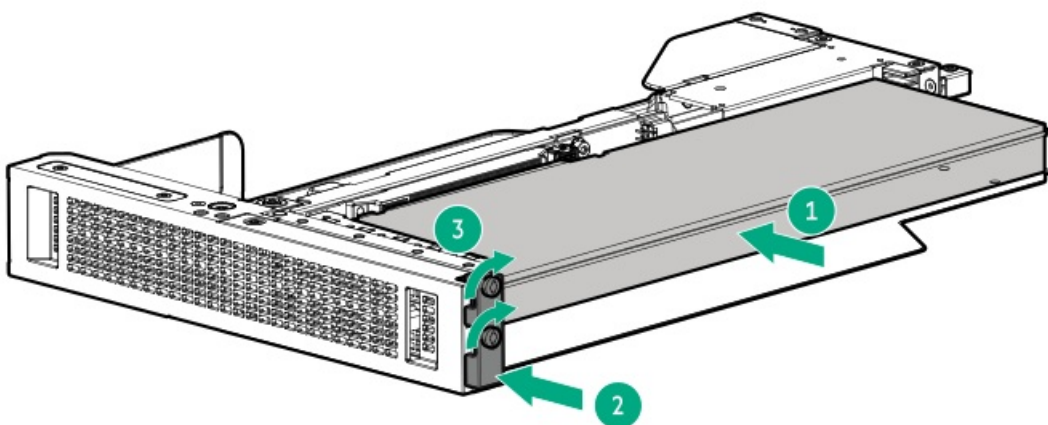
11. Install the GPU:

- a. Plug the GPU into the slot.

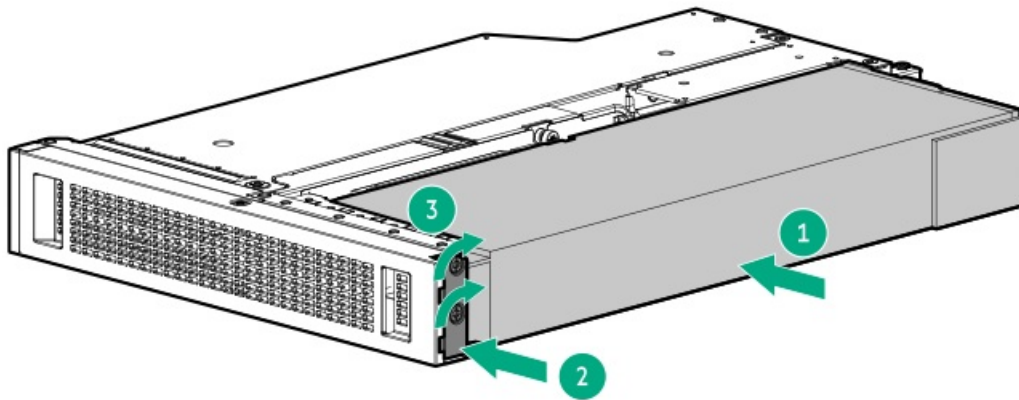
Make sure that the GPU is firmly seated.

- b. Attach the bracket retainer.
- c. Tighten the captive screws.

- Single-width:



- Double-width:



12. [Install the GPU riser cage.](#)
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 each power cord to the server.
18. [Power up the server.](#)

Results

The installation procedure is complete.

Installing a GPU in the rear riser cage

Prerequisites

- Be sure that the power supplies support the installation of this option. For more information, see the [Hewlett Packard Enterprise Configurator website](#).
- Before you perform this procedure, make sure that you have a T-10 Torx screwdriver available.

About this task

The GPU can be installed in the rear PCIe slots 1 or 2. HPE recommends installing the accelerator in [slot 2](#) for better performance.



WARNING

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

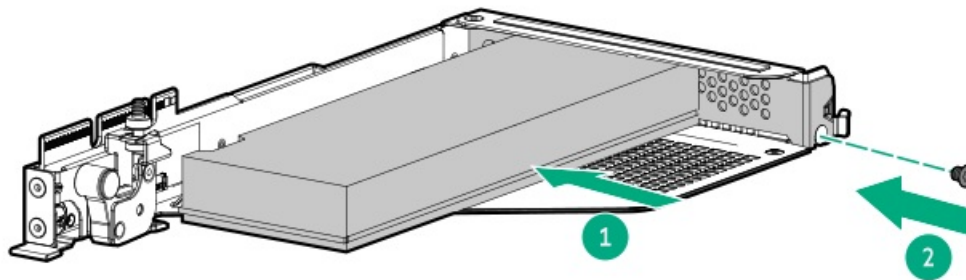


CAUTION

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

Procedure

1. Back up all server data.
2. Power down the server.
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. 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 existing rear guide bracket from the card, if installed.
10. Install the GPU.



11. Install the riser cage.
12. Install the access panel.
13. Install the server into the rack.
14. Connect all peripheral cables to the server.
15. Connect each power cord to the server.
16. Connect each power cord to the power source.
17. Power up the server.

Results

The installation procedure is complete.

Memory options





IMPORTANT

This server does not support mixing LRDIMMs and RDIMMs. Attempting to mix any combination of these DIMMs can cause the server to halt during BIOS initialization. All memory installed in the server must be of the same type.

Subtopics

[DIMM installation guidelines](#)

[HPE SmartMemory speed and population information](#)

[Installing a DIMM](#)

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, see the Hewlett Packard Enterprise website (<https://www.hpe.com/support/DIMM-20070214-CN>).

HPE SmartMemory speed and population information

For information about memory speed and server-specific DIMM population rules for HPE servers using Intel Xeon 6 Processors, see the relevant memory technical paper in:

<https://www.hpe.com/docs/server-memory>

Installing a DIMM

Prerequisites





CAUTION

- Do not install RDIMMs and LRDIMMs in the same server.
- Do not install RDIMMs and 3DS RDIMMs in the same server.
- Do not install ×4 and ×8 DRAM widths in the same server.

Attempting to mix any combination of these DIMMs can cause the server to halt during BIOS initialization. All memory installed in the server must be of the same type.



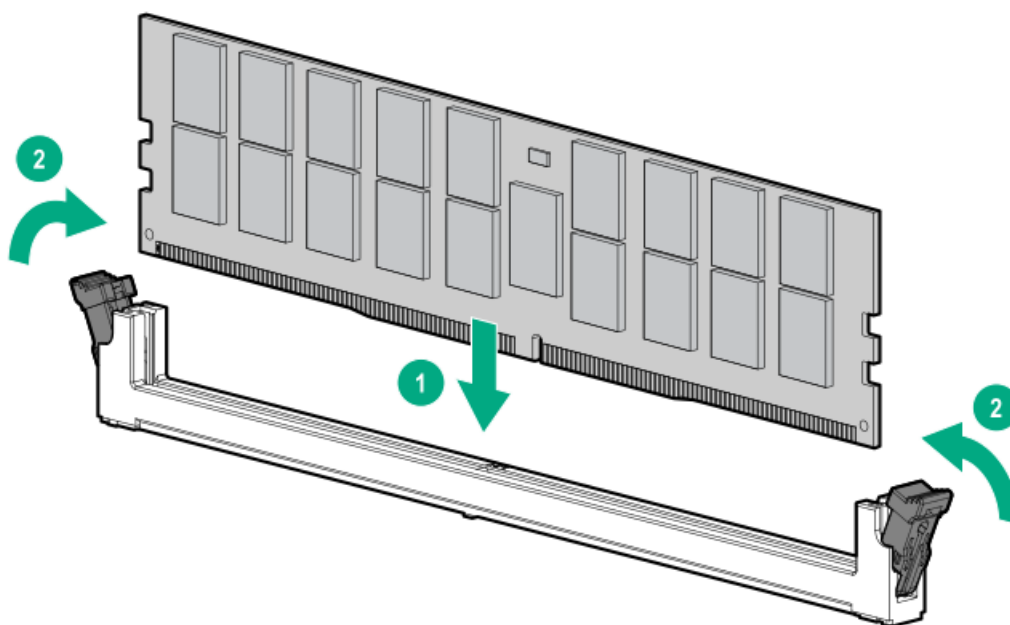
CAUTION

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. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Disconnect all peripheral cables from the server.
4. Remove the server from the rack.
5. Remove the access panel.
6. 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.



7. [Install the access panel.](#)
8. 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.**

Results

The installation procedure is complete.

Management

Subtopics

[Installing the serial port](#)

[Installing the Systems Insight Display](#)

Installing the serial port

Prerequisites

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

- Phillips No. 1 screwdriver
- T-10 Torx screwdriver

About this task

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.



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

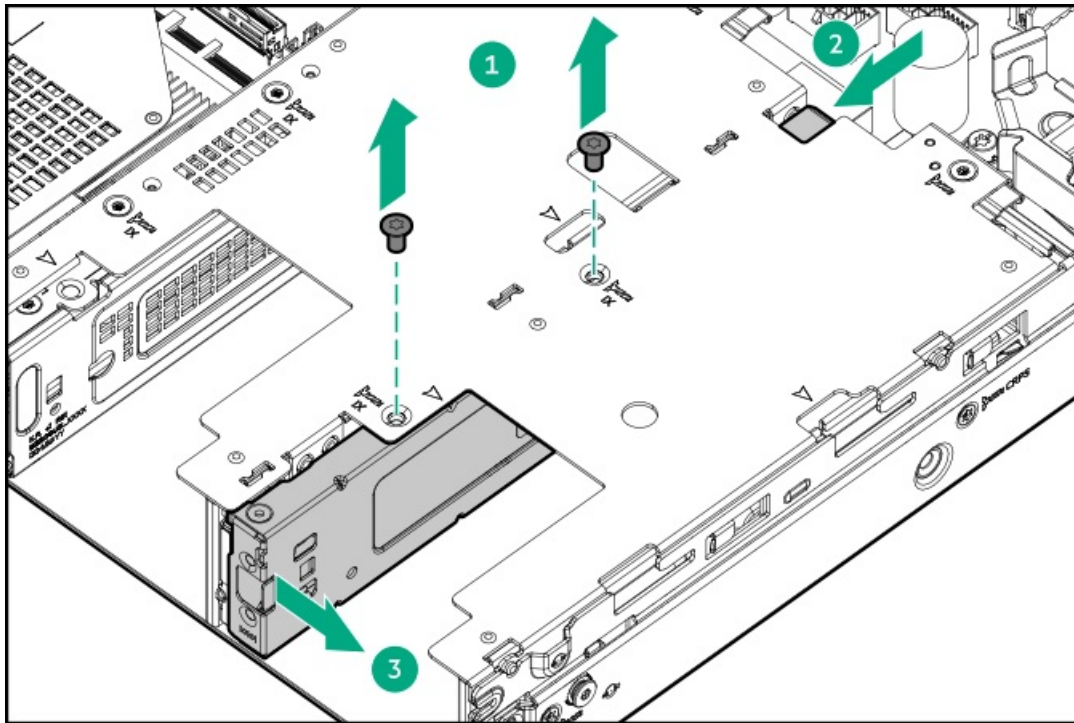
The port blank provides EMI shielding and helps maintain proper thermal status inside the server. Do not operate the server when a port blank is removed without the corresponding I/O port option installed.

Procedure

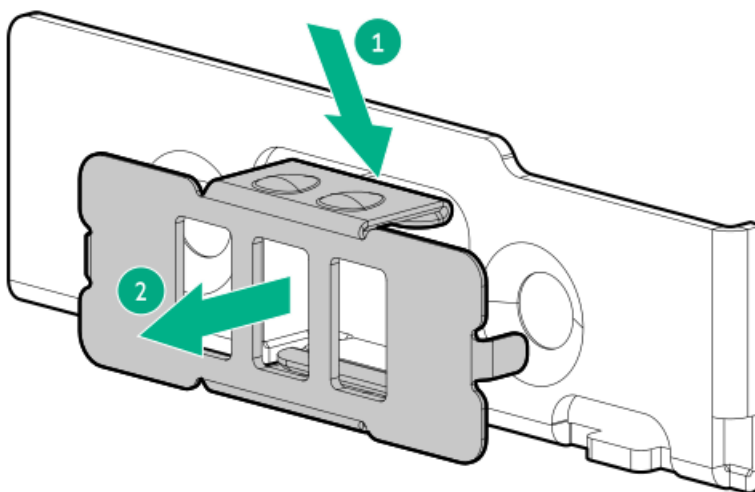
1. [Power down the server.](#)
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Disconnect all peripheral cables from the server.
4. [Remove the server from the rack.](#)



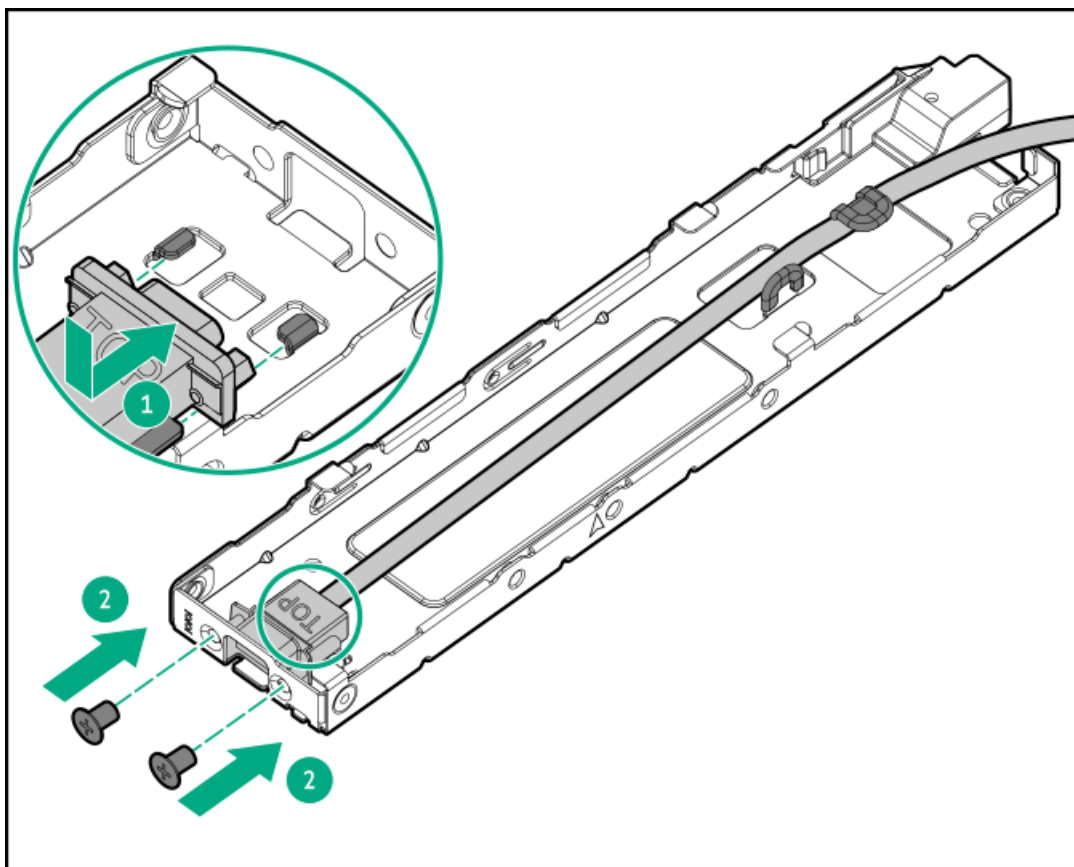
5. Place the server on a flat, level work surface.
6. Remove the access panel.
7. Remove the power supply from bay 1.
8. Remove the ix port cage.
 - a. Remove the screws.
 - b. Push the cage from the back to detach it from the power supply bay.
 - c. Remove the cage.



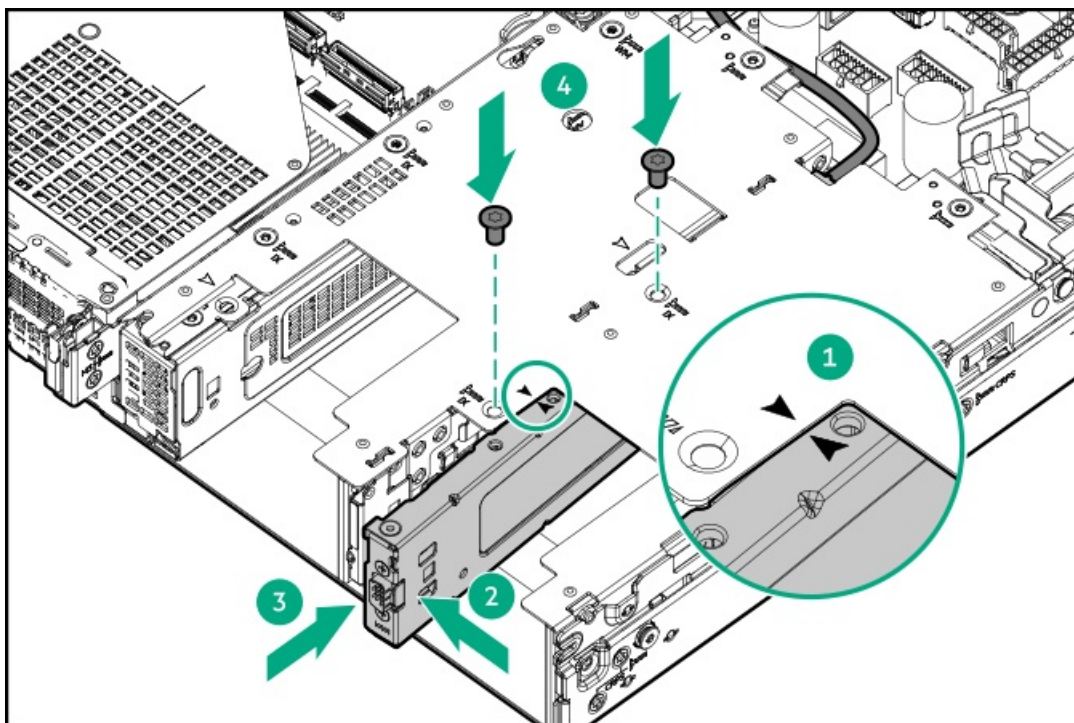
9. Remove the ix port blank.



10. Slide the ix port in the tabs, and then secure the ix port on the bracket.



11. Feed the serial port cable through the empty bay.
12. Install the serial/ix port assembly.



13. Connect the ix port cable to the system board.
14. Install the power supply.
15. Install the access panel.
16. Install the server into the rack.



17. Connect all peripheral cables to the server.
18. Connect each power cord to the server.
19. Connect the serial port dongle to the ix port.
20. Power up the server.

Configuring the serial port

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

Results

The installation procedure is complete.

Installing the Systems Insight Display

Prerequisites

Before you perform this procedure, make sure that you have a T-10 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

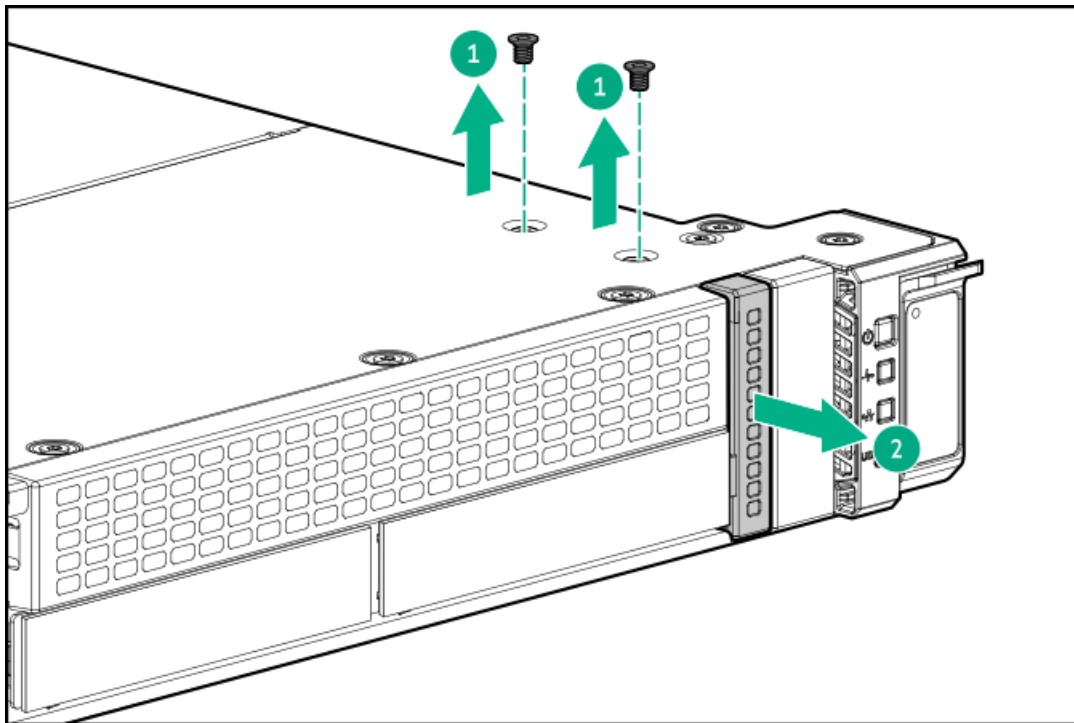
To prevent damage to electrical components, properly ground the server before beginning any installation procedure. Improper grounding can cause electrostatic discharge.

Procedure

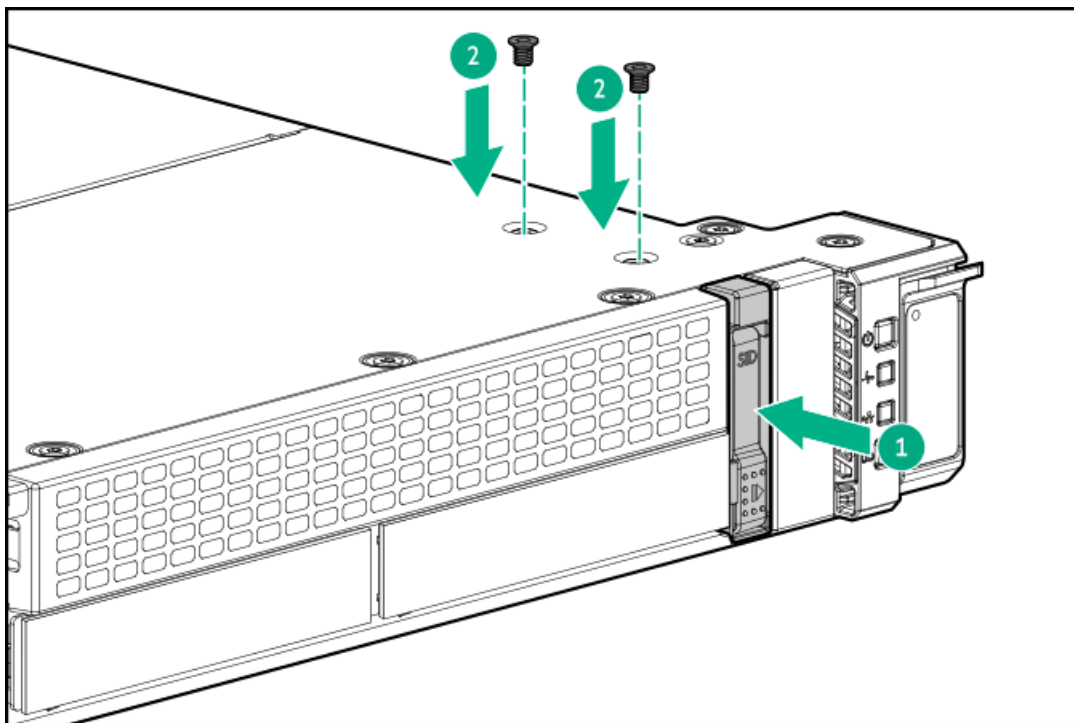
1. Back up all server data.
2. Power down the server.
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Do one of the following:
 - Extend the server from the rack.
 - Remove the server from the rack.



5. Remove the access panel.
6. Remove the middle cover.
7. Remove the SID blank.



8. Route the SID cable through the slot.
9. Install the SID.



10. Connect the SID cable to the system board.
11. Install the access panel.



12. [Install the server into the rack.](#)
13. Connect all peripheral cables to the server.
14. Connect each power cord to the server.
15. Connect each power cord to the power source.
16. [Power up the server.](#)

Results

The installation procedure is complete.

Fans

Subtopics

[Installing a fan](#)

Installing a fan

About this task



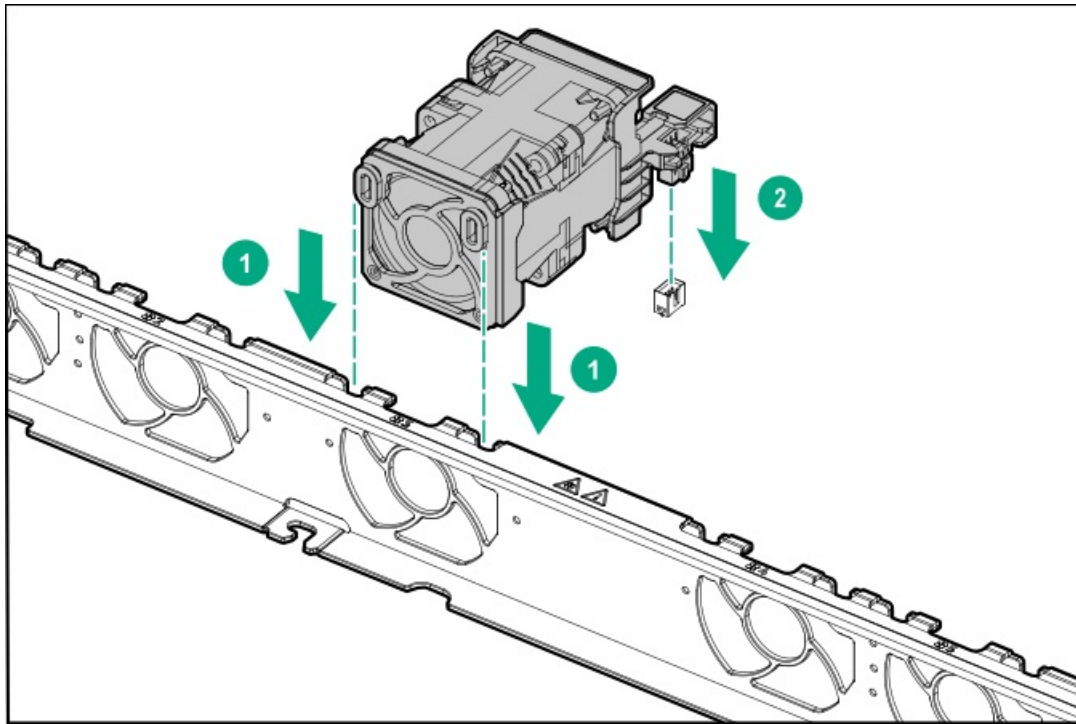
IMPORTANT

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.

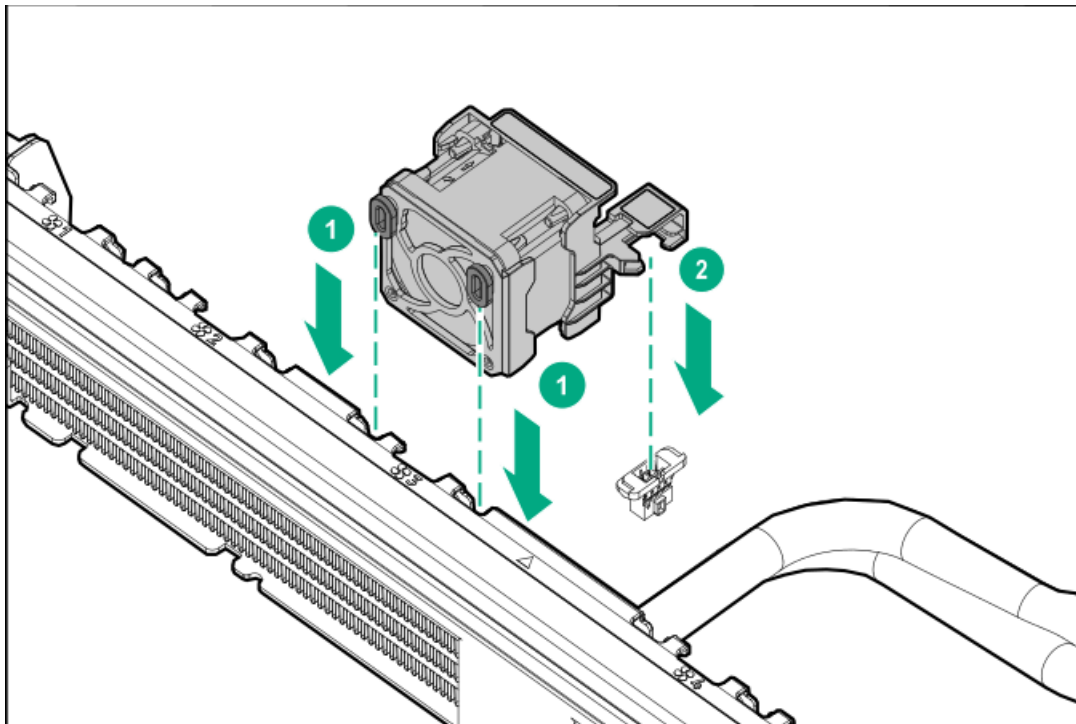
Procedure

1. Do one of the following:
 - [Remove the server from the rack.](#)
 - [Extend the server out of the rack.](#)
2. [Remove the access panel.](#)
3. Install the fan:
 - Standard or high performance:





- Liquid cooling:



4. Install the access panel.
5. Install the server into the rack.

Results

The installation procedure is complete.

Networking



About the front OCP NIC enablement kits

About the front OCP NIC enablement kits

The server supports up to two OCP NIC 3.0 SFF slots in either the the front or the rear panel. The front OCP slots are supported in Box 3 mixed drive type configuration and require the front OCP enablement kits.

The front OCP NIC enablement kits transfer the NIC signal from the rear OCP slots to the OCP slots in Box 3 on the front panel. The front OCP NIC slots have the following advantages:

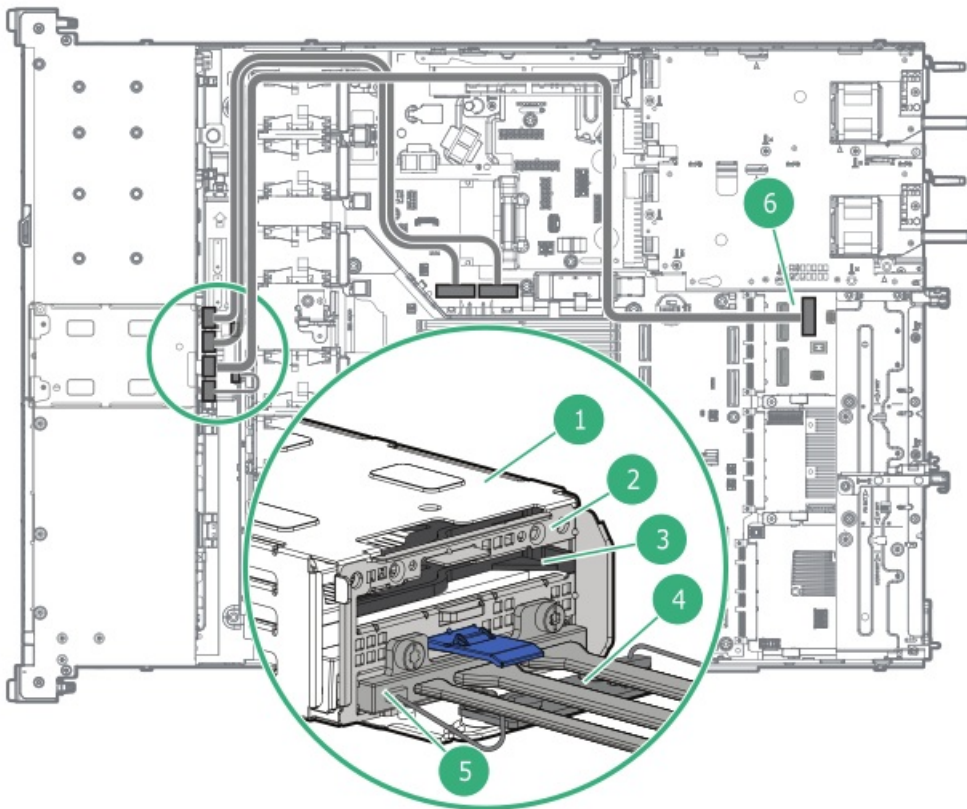
- More convenient access to network ports
- Better cooling condition for NIC adapter installation

The front OCP NIC is only supported in Box 3 in the mixed drive type configuration on this server.

The front OCP NIC can be deployed in a single-slot or dual-slot configuration using the following options:

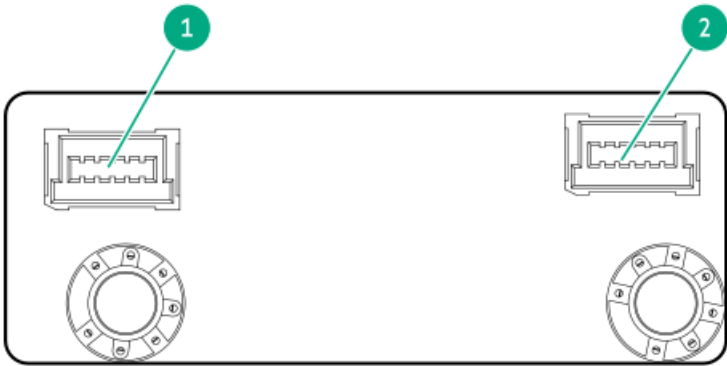
- Primary front OCP NIC enablement kit (P77261-B21) — This kit is installed in Box 3 and enables the Bay 3 OCP slot.
- Secondary front OCP NIC enablement kit (P76982-B21) — Installation of this kit requires the primary front OCP NIC option. This kit is installed in Box 3 and enables the Bay 1 OCP slot.

Primary front OCP NIC enablement kit



Item	Description
1	<p>4 E3.S drive cage</p> <p>This cage supports several options:</p> <ul style="list-style-type: none"> Up to 4 E3.S drives Up to 2 front OCP NIC adapters
2	Front OCP NIC cable bracket
3	E3.S drive filler
4	<p><u>PHY board</u></p> <p>The PHY board serves as a transceiver that physically links the front OCP NIC adapter to the OCP NIC interposer. When setting up an iLO shared network connection, the PHY board transfers the signal from the rear iLO dedicated network port to the front OCP NIC adapter.</p>
5	Primary front OCP NIC cable
6	<p>OCP NIC interposer (in the rear Slot 20 OCP A PCIe5 x16)</p> <p>The interposer reroutes the NIC signal from the rear Slot 20 OCP A PCIe5 x16 to the front Box 3, Bay 3 OCP slot.</p>

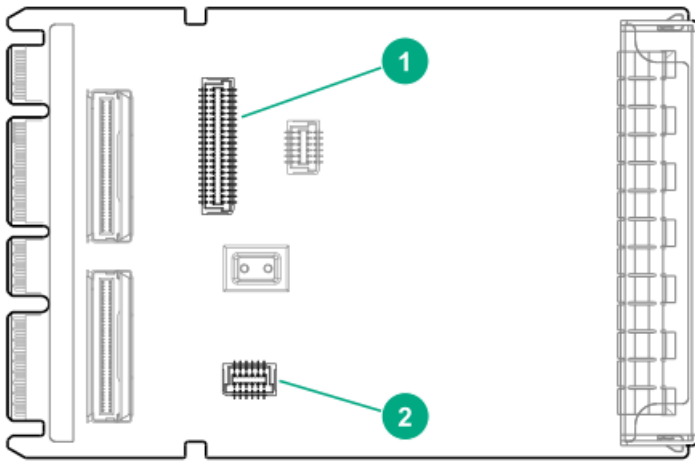
PHY board connectors



Item	Description
1	PHY board cable connector
2	Front OCP NIC cable connector

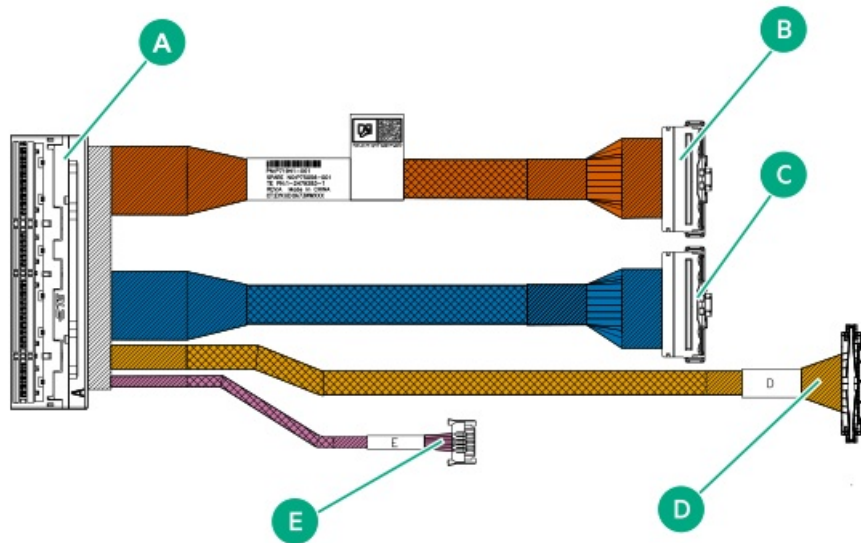
OCP NIC interposer connectors

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



Item	Description
1	Front OCP NIC cable connector
2	PHY board cable connector

Front OCP NIC cable connectors



NOTE
The cable colors are for illustration purposes only.

Cable color	Cable connector label	Cable function
Orange	A	OCP NIC 3.0 slot
	B	System board connector
Blue	C	System board connector
Gold	D	OCP NIC interposer connector
Pink	E	PHY board connector

PHY board cable connectors





The cable color is for illustration purposes only.





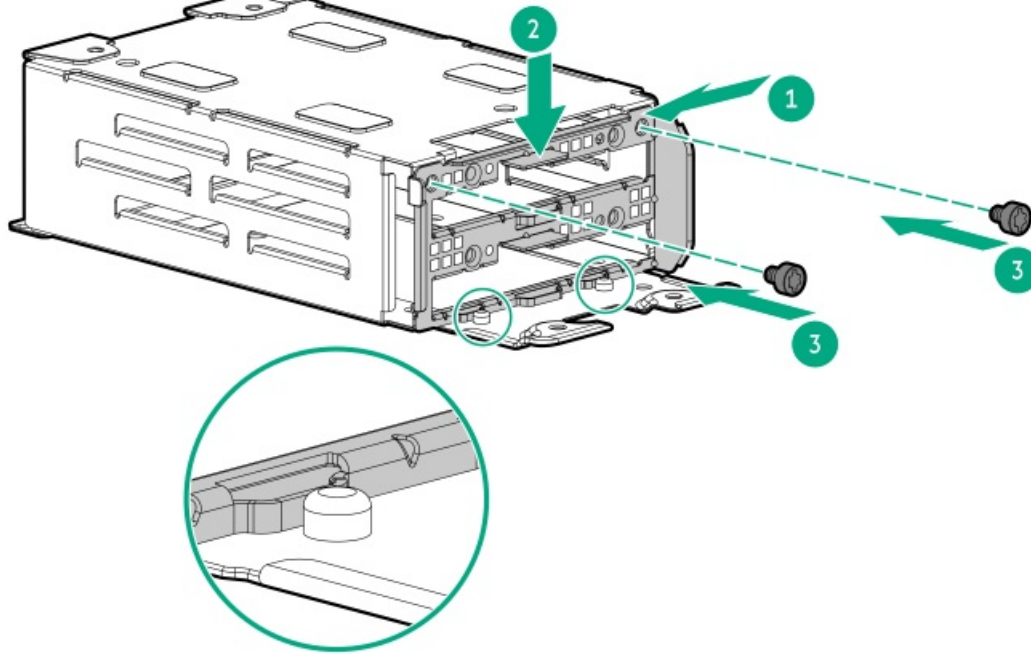
CAUTION

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

Install the front OCP NIC bracket

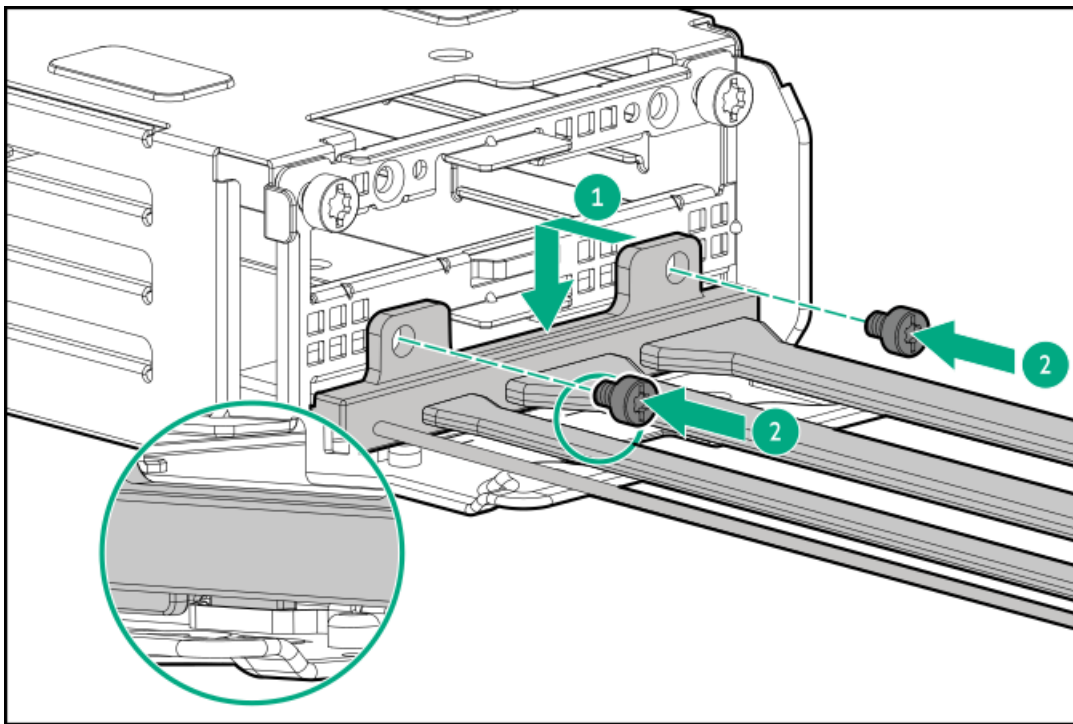
1. Slide the front OCP NIC bracket onto the E3.S drive cage included in the option kit, and then secure the bracket with two screws.



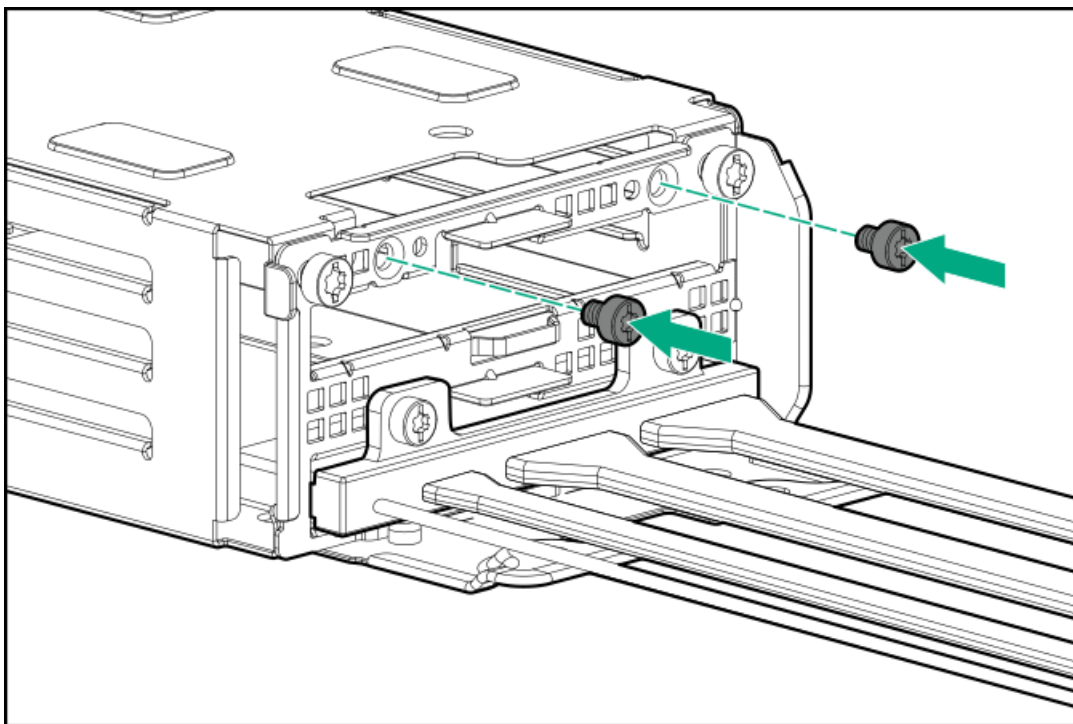
Install the primary front OCP NIC cable

2. Insert the plastic tabs on the front OCP NIC cable connector into the notches on the bracket. Then secure the front OCP NIC cable with two screws.

Make sure that the plastic tabs are secured in the bracket.



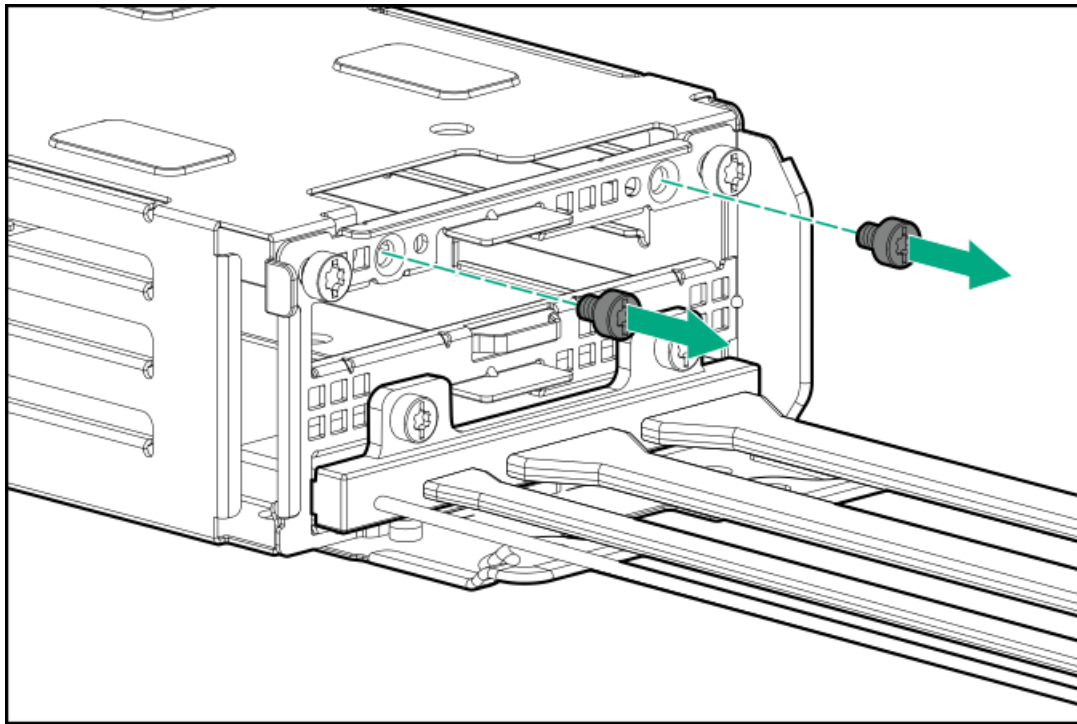
3. If you are not installing the secondary front OCP NIC cable, install the other two screws on the bracket as spares.



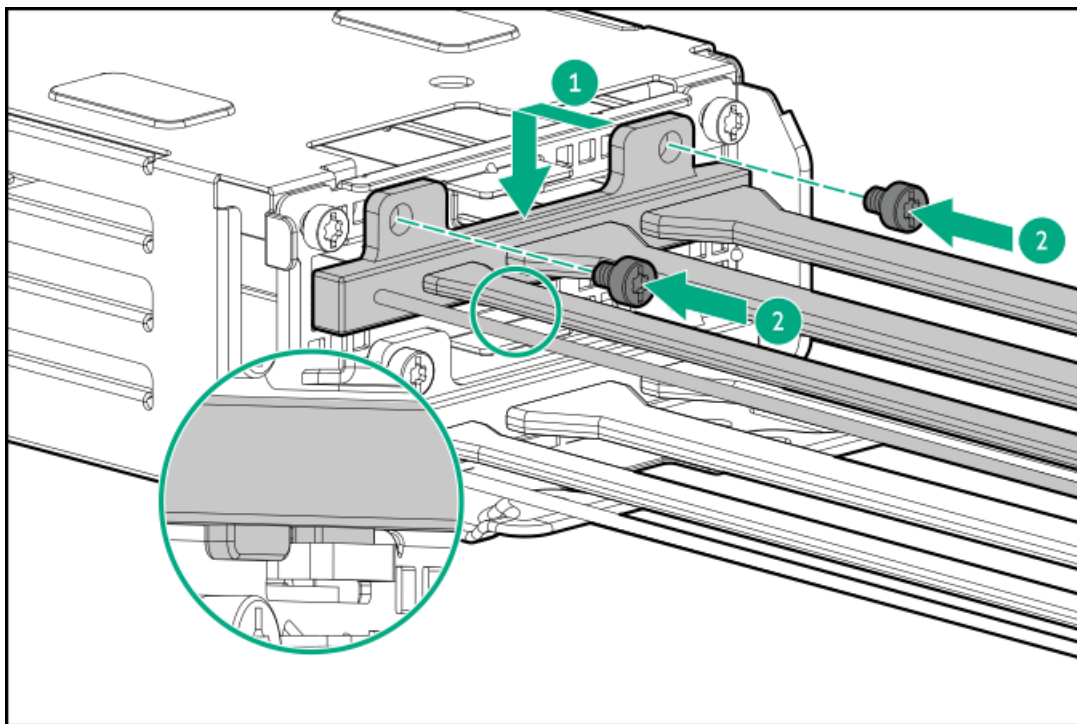
Install the secondary front OCP NIC cable

4. If you are installing the secondary front OCP NIC cable, do the following:
 - a. If installed, remove these screws from the OCP NIC bracket.

Retain the screws. These screws will be used to secure the secondary OCP NIC cable.

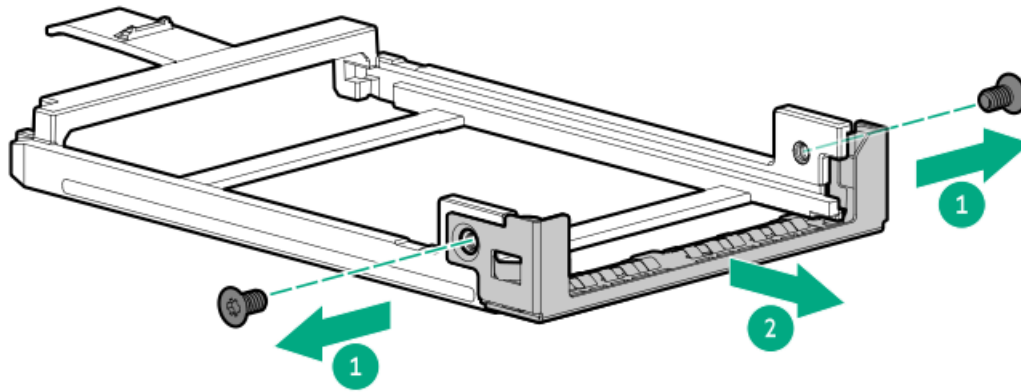


b. Repeat step 2 to install the secondary OCP NIC cable.

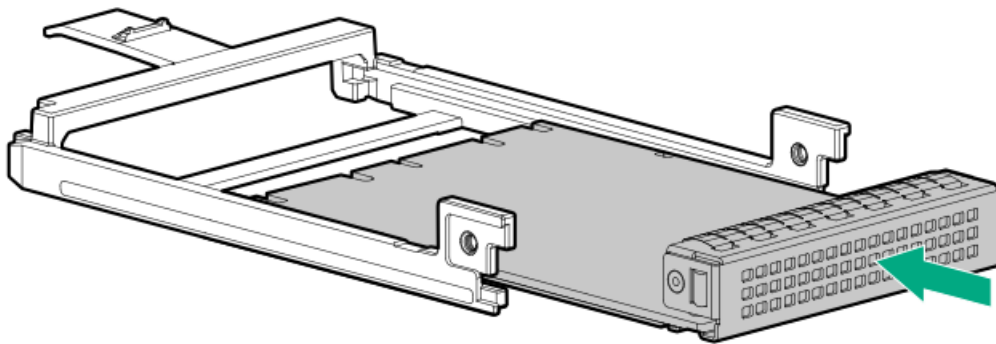


Install the OCP NIC adapter in the E3.S cage

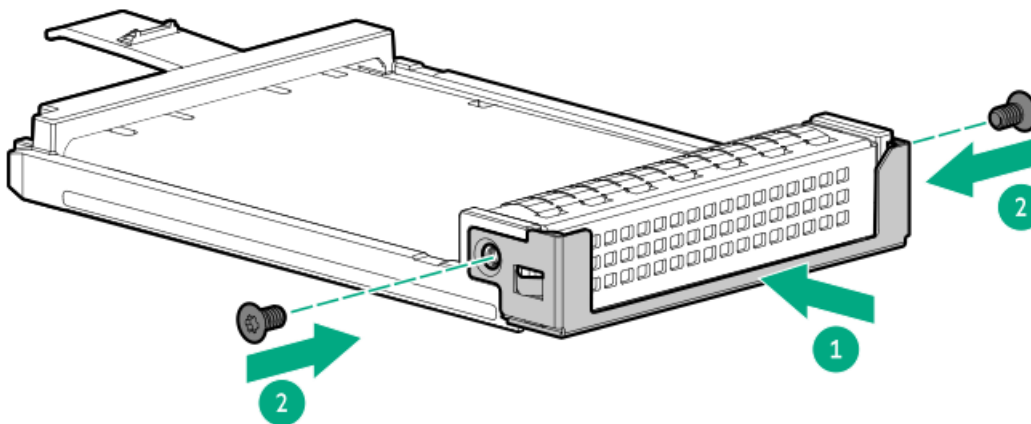
5. Remove the OCP NIC bracket.



6. Slide the OCP NIC adapter into the OCP NIC carrier.



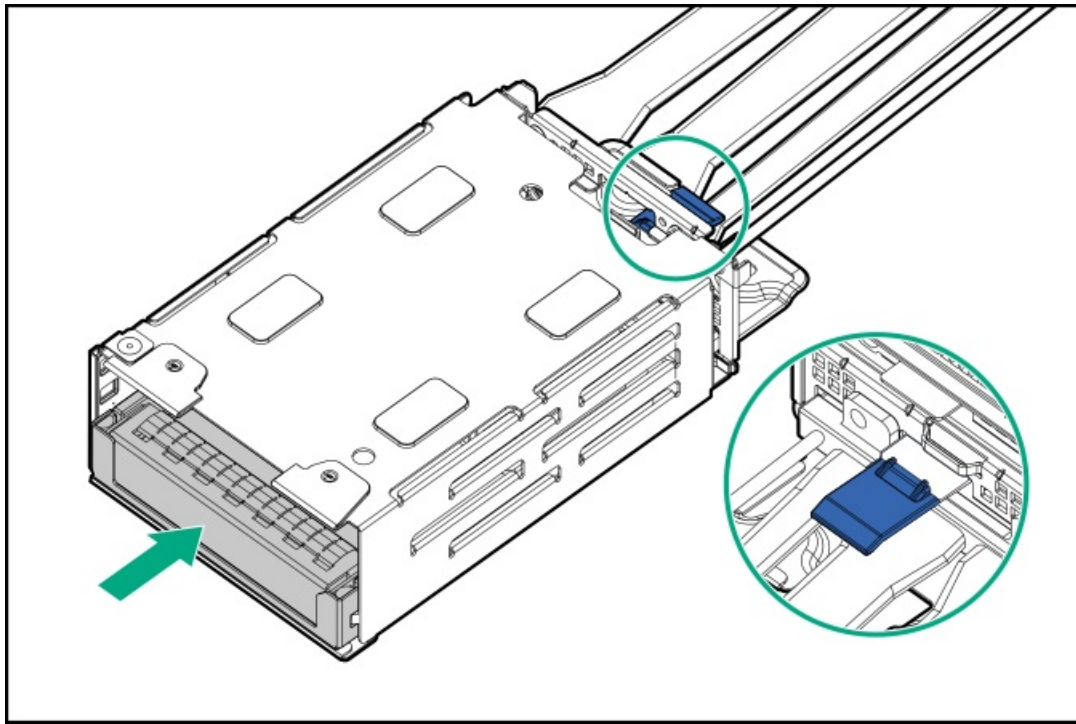
7. Install the OCP NIC bracket.



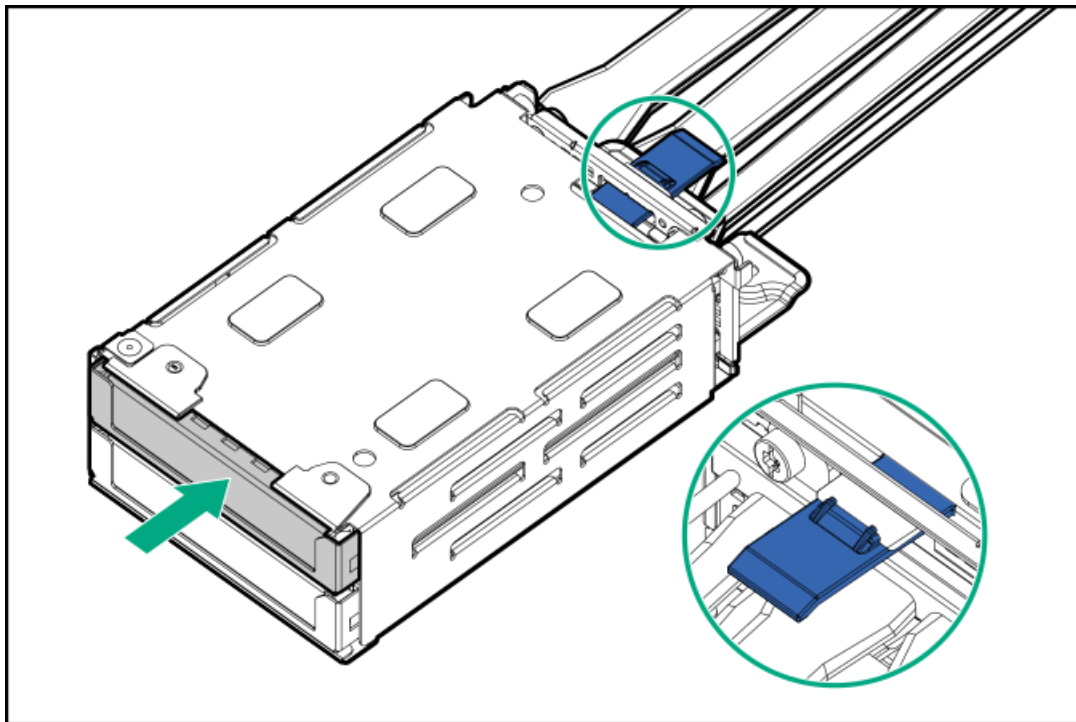
8. Slide the OCP NIC adapter into the E3.S cage until the carrier tab engages with the front OCP NIC bracket.

There will be an audible click to indicate that the carrier tab is engaged with the bracket.

- Bay 3—Primary front OCP NIC adapter

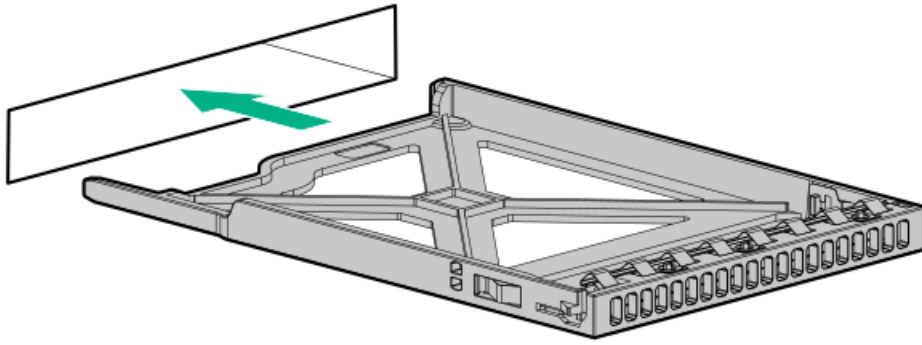


- Bay 1—Secondary front OCP NIC adapter



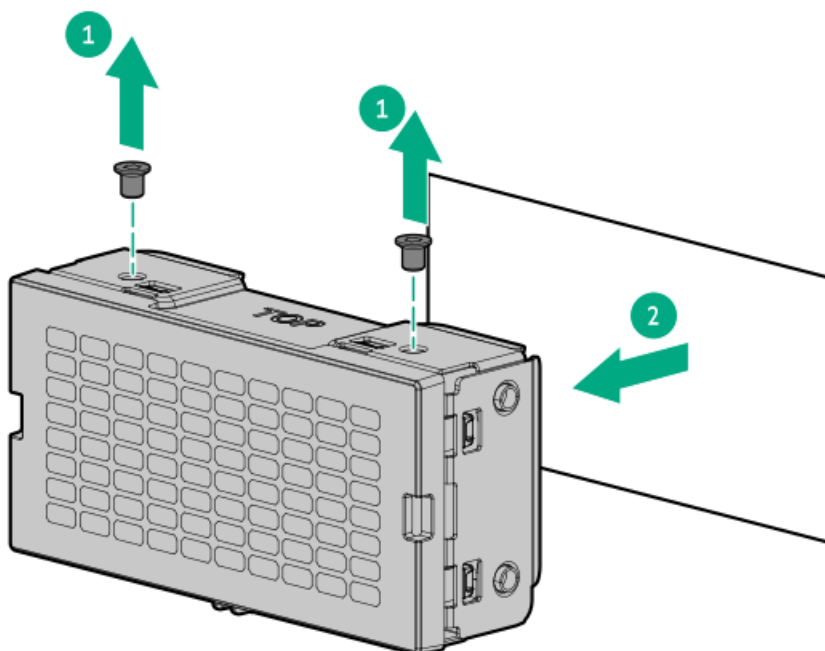
Install the E3.S drive filler

9. If you are not installing the secondary front OCP NIC adapter, install the E3.S drive fillers into Bay 1 of the cage.



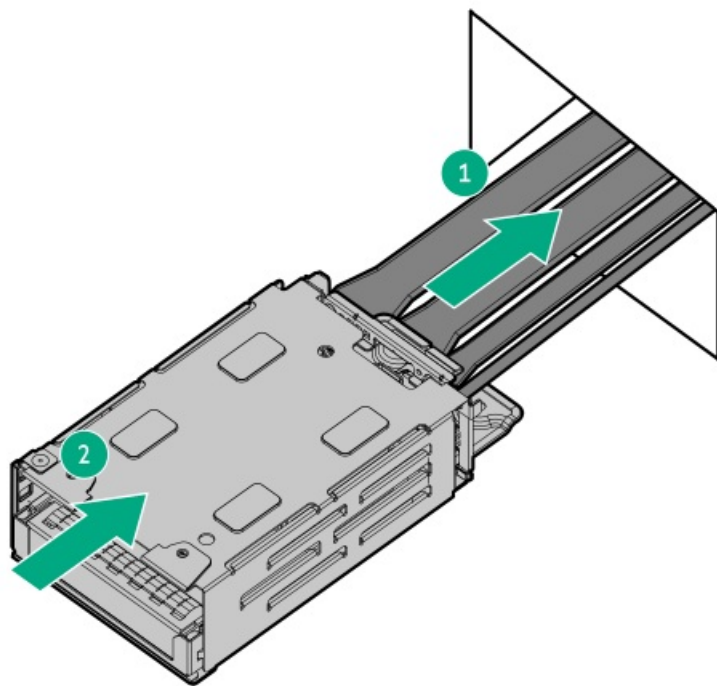
Install the cage in the chassis

10. Power down the server.
11. If installed, release the cable management arm.
12. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
13. Disconnect all peripheral cables from the server.
14. Do one of the following:
 - Extend the server out of the rack.
 - Remove the server from the rack.
15. Remove the access panel.
16. Remove the blank from drive Box 3.

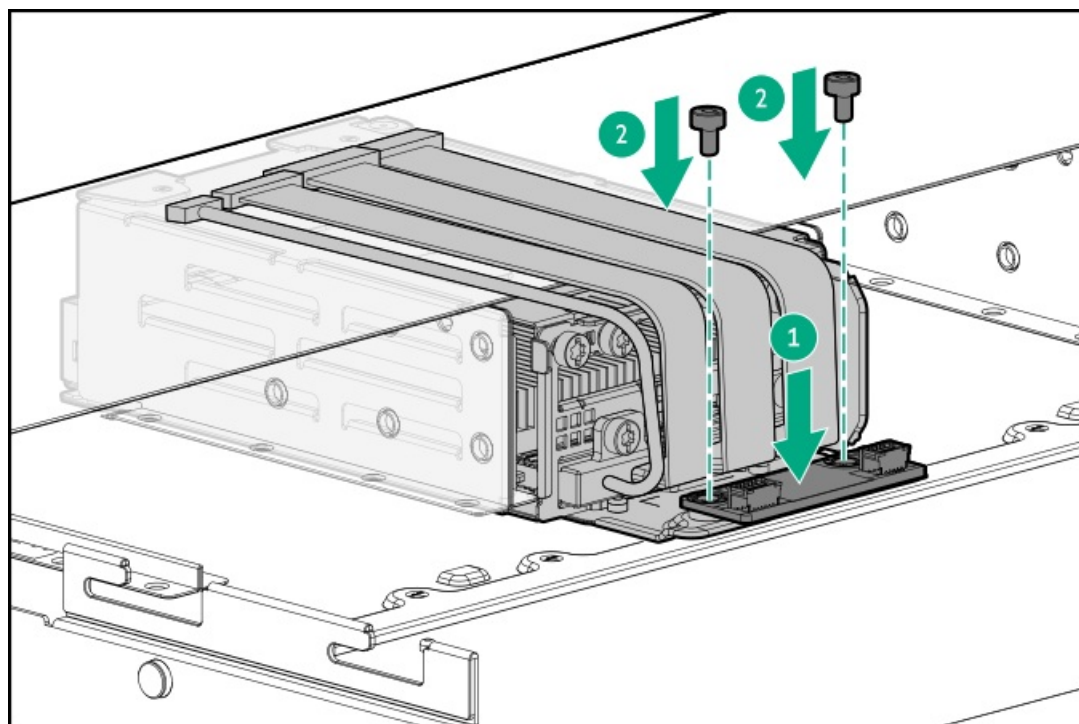


17. Install the E3.S cage in Box 3:

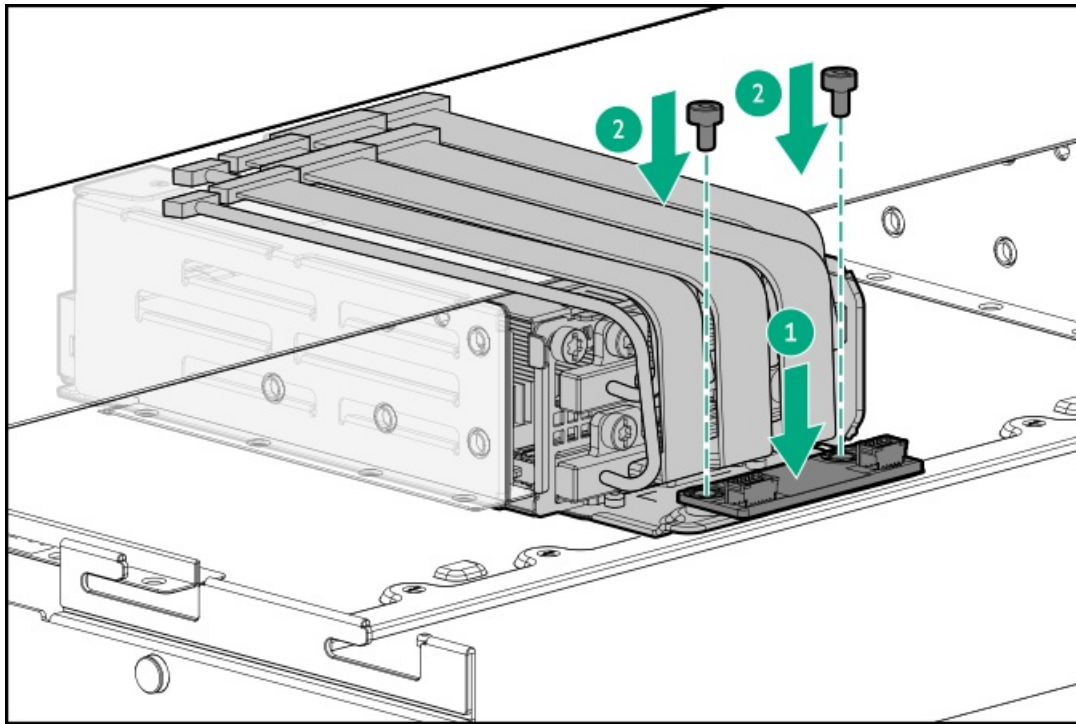
- a. Feed the OCP NIC cables through the front panel, and slide the cage into Box 3.



- b. Position the OCP NIC cables over the drive box as shown in the following illustration.
 - c. While the cables are in this position, put the PHY board on the cage and install the screws.
- Bay 3 OCP NIC cables



- Bay 1 and Bay 3 OCP NIC cables

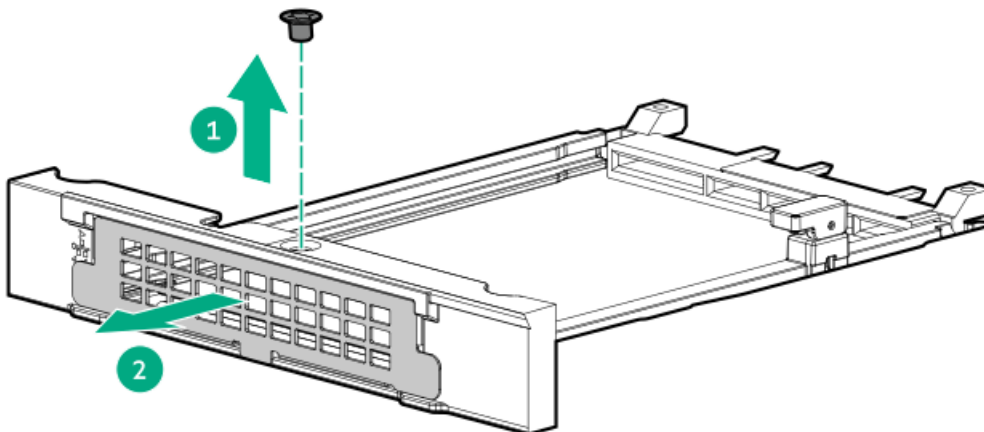


Install the OCP NIC interposer

18. Remove the OCP slot blank:

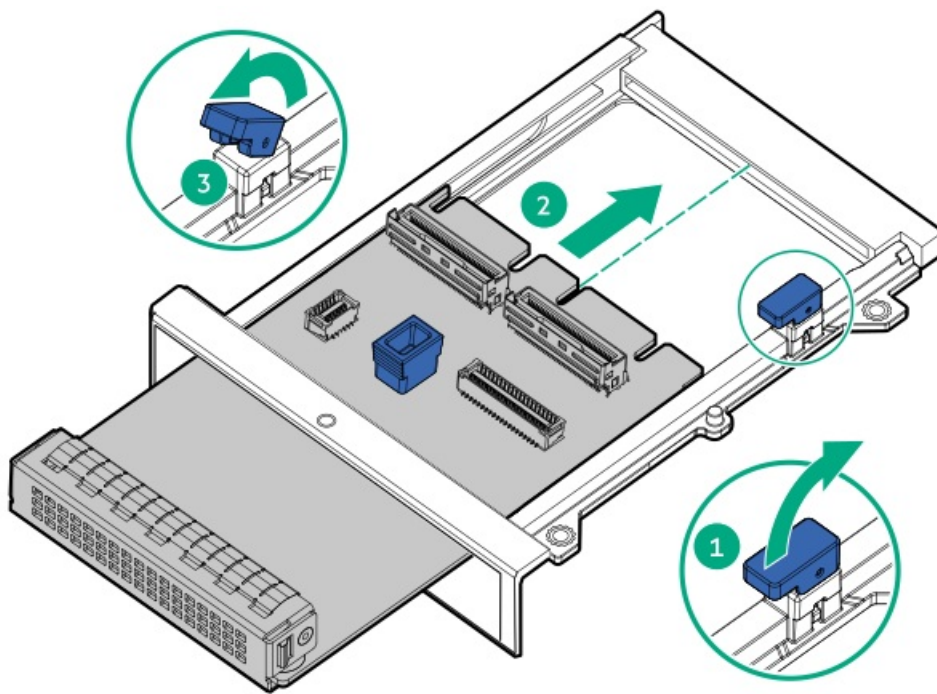
- a. Remove the blank screw.
- b. Remove the blank.

Retain the screw and blank for future use.



19. Install the OCP NIC interposer:

- a. Rotate the locking pin to the open (vertical) position.
- b. Slide the interposer into the slot until it clicks into place.
Make sure that the interposer is seated firmly in the slot.
- c. Rotate the locking pin to the close (horizontal) position.



Connect the OCP NIC cables

20. Connect the following connectors of the primary front OCP NIC cable:

- OCP NIC cable system board connectors (labeled B and C) to the system board.
- OCP NIC cable interposer connector (labeled D) to the OCP NIC interposer.
- OCP NIC cable PHY board connector (labeled E) to the PHY board.

21. (Optional) If you intend to use a front OCP NIC adapter port as an iLO shared network port, connect the iLO shared connection cable (labeled B) from the PHY board to the OCP interposer.

The iLO shared connection through the front OCP NIC adapter is supported in the primary OCP NIC slot.

22. If the second front OCP NIC adapter is installed, connect the following connectors of the secondary front OCP NIC cable:

- OCP NIC cable system board connectors (labeled B and C) to the system board.
- OCP NIC cable interposer connector (labeled D) to the OCP NIC interposer.

23. Install the access panel.

24. Install the front bezel.

25. Install the server into the rack.

26. Connect all peripheral cables to the server.

27. Connect each power cord to the server.

28. Connect each power cord to the power source.

29. Power up the server.

30. (Optional) To use a front OCP NIC adapter port as an iLO shared network port, enable the iLO shared connection in the UEFI System Utilities.

Results

The installation procedure is complete.

Installing the OCP NIC 3.0 adapter

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](#).



CAUTION

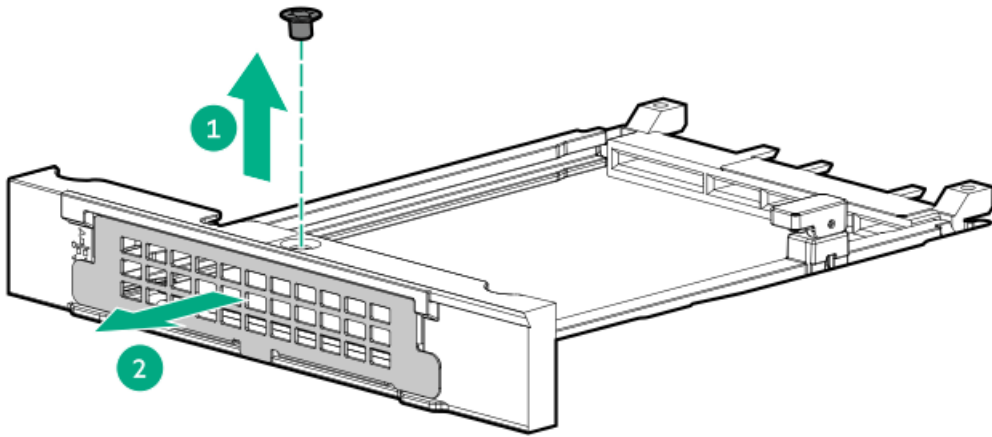
The port blank provides EMI shielding and helps maintain proper thermal status inside the server. Do not operate the server when a port blank is removed without the corresponding I/O port option installed.

Procedure

1. [Power down the server.](#)
2. [Release the cable management arm.](#)
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. [Remove the server from the rack.](#)
6. Place the server on a flat, level work surface.
7. [Remove the access panel.](#)
8. [Remove the riser cage.](#)
9. Remove the OCP slot blank:
 - a. Remove the blank screw.
 - b. Remove the blank.

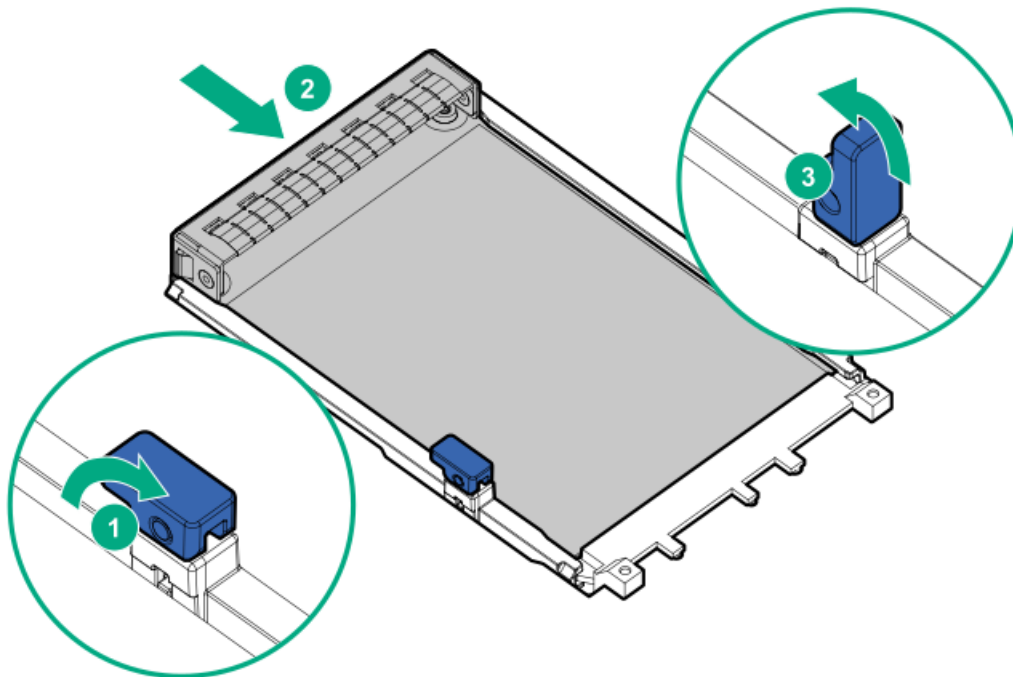
Retain the screw and blank for future use.





10. Install the OCP NIC 3.0 adapter:

- a. Rotate the locking pin to the open (vertical) position.
- b. Slide the adapter into the bay until it clicks into place.
Ensure that the adapter is seated firmly in the slot.
- c. Rotate the locking pin to the close (horizontal) position.



11. Install the riser cage.
12. Install the access panel.
13. Install the server into the rack.
14. Connect all peripheral cables to the server.
15. Connect each power cord to the server.
16. Power up the server.

17. Power up the server.

Results

The installation procedure is complete.

Enabling the iLO shared network connection

About this task

This procedure applies to iLO 6 and iLO 7.



IMPORTANT

If the iLO configuration settings are reset to the default values, remote access to the machine will be lost. Access the physical machine and repeat the procedure described in this section to re-enable the iLO shared network port.

Procedure

1. From the boot screen, press **F9** to access the UEFI System Utilities.
2. From the System Utilities screen, select System Configuration > iLO Configuration Utility > Network Options.
3. Set the Network Interface Adapter field to Shared Network Port - OCPA or Shared Network Port - OCPB, and then press **Enter**.
4. Press **F10** to save your changes.
5. Press **Enter** to reboot the iLO settings.
6. Press **Esc** until the main menu is displayed.
7. Select Reboot the System to exit the utility and resume the boot process.

The IP address of the iLO shared network port appears on the POST screen on the subsequent boot-up. Access the Network Options screen again to view this IP address for later reference.

Power supply options

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

Subtopics

[Hot-plug power supply calculations](#)

[Power supply warnings and cautions](#)

[Installing the power supply](#)

Hot-plug power supply calculations

For hot-plug power supply specifications and calculators to determine electrical and heat loading for the server, see the Hewlett Packard Enterprise Power Advisor website (<https://www.hpe.com/info/poweradvisor/online>).



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.

Installing the power supply

Prerequisites

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

About this task

The installation procedure for the 60-mm and 73.5-mm modular hardware common redundant power supplies (M-CRPS) is the same.



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.



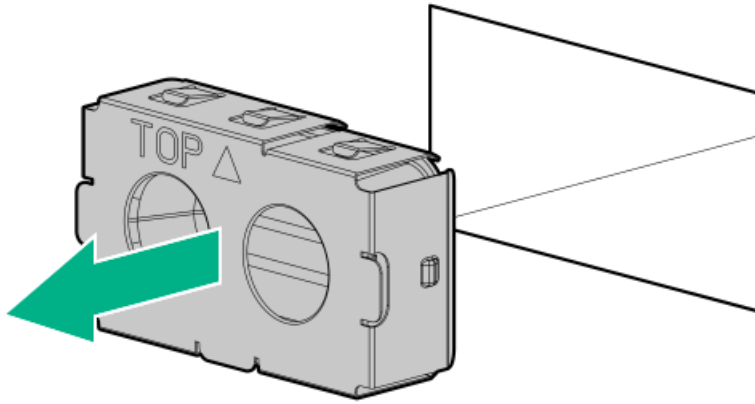
CAUTION

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

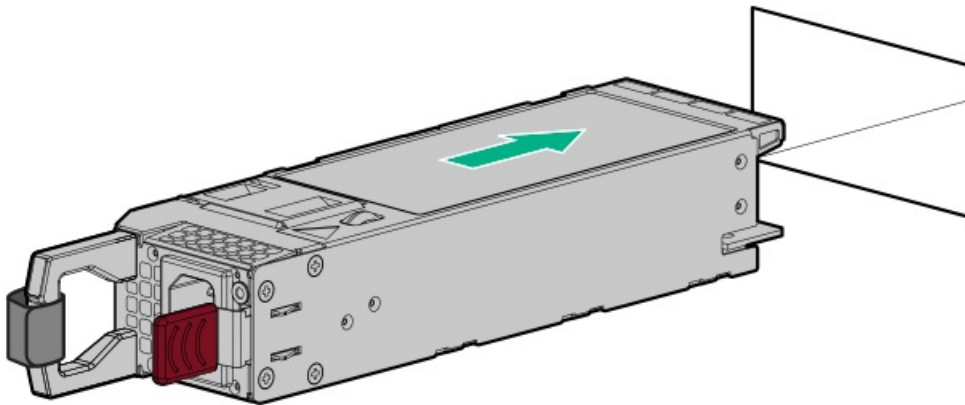
1. Remove the power supply bay blank.



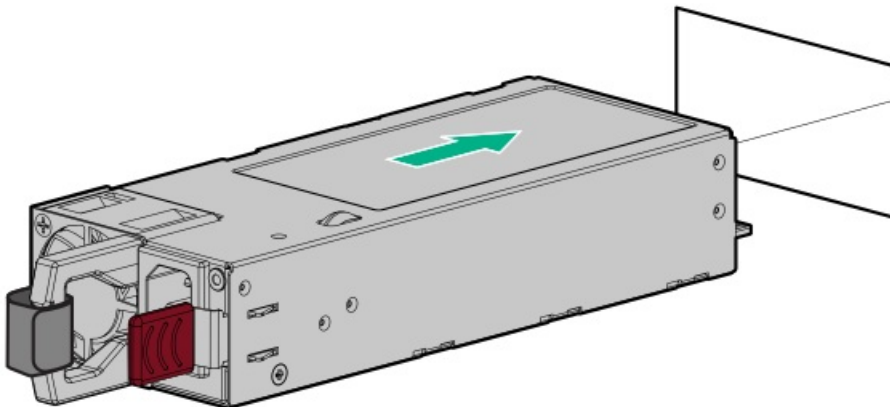


2. Immediately slide the power supply into the bay until it clicks into place.

- 60-mm M-CRPS



- 73.5-mm M-CRPS



3. Connect the power cord to the power supply.



WARNING

To reduce the risk of electric shock or damage to the equipment, do not connect the power cord to the power supply until the power supply is installed.



IMPORTANT

Make sure that the facility power phases are balanced. An imbalance can result in circuit breakers tripping.

4. 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.

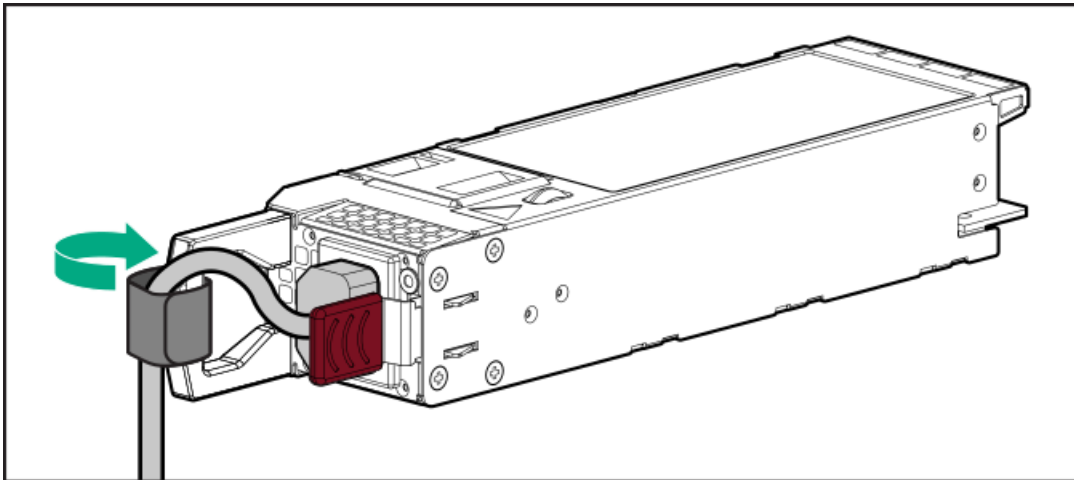


CAUTION

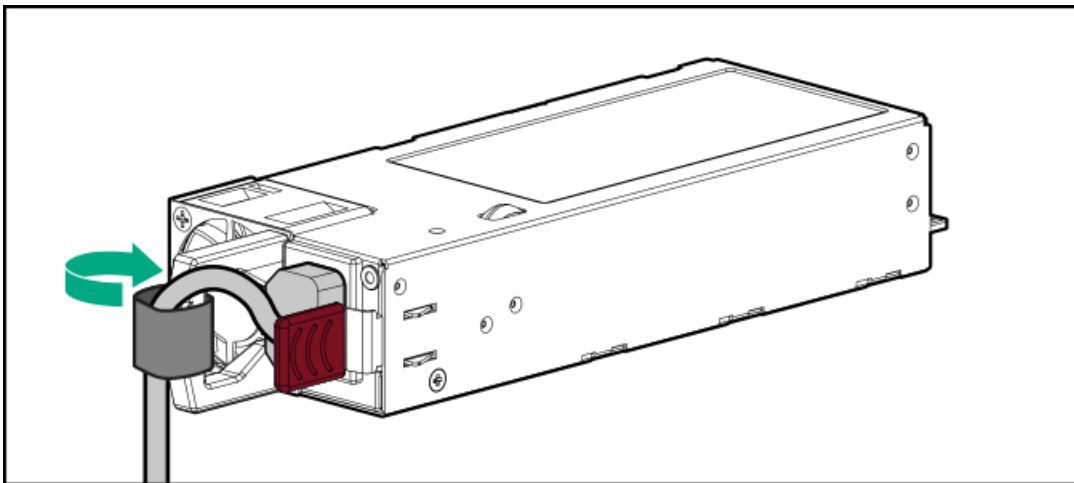
Avoid tight bend radii to prevent damaging the internal wires of a power cord or a server cable. Never bend power cords and server cables tight enough to cause a crease in the sheathing.

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

- 60-mm M-CRPS



- 73.5-mm M-CRPS



5. Connect each power cord to the server.
6. Connect each power cord to the server.
7. Connect each power cord to the power source.
8. Power up the server.
9. Make sure that the power supply LED is green.

Results

The installation procedure is complete.

Riser and riser cage options

Subtopics

- [Installing the riser cage blank](#)
- [Installing the primary riser cage](#)
- [Installing the GPU captive riser](#)
- [Installing an expansion card](#)

Installing the riser cage blank

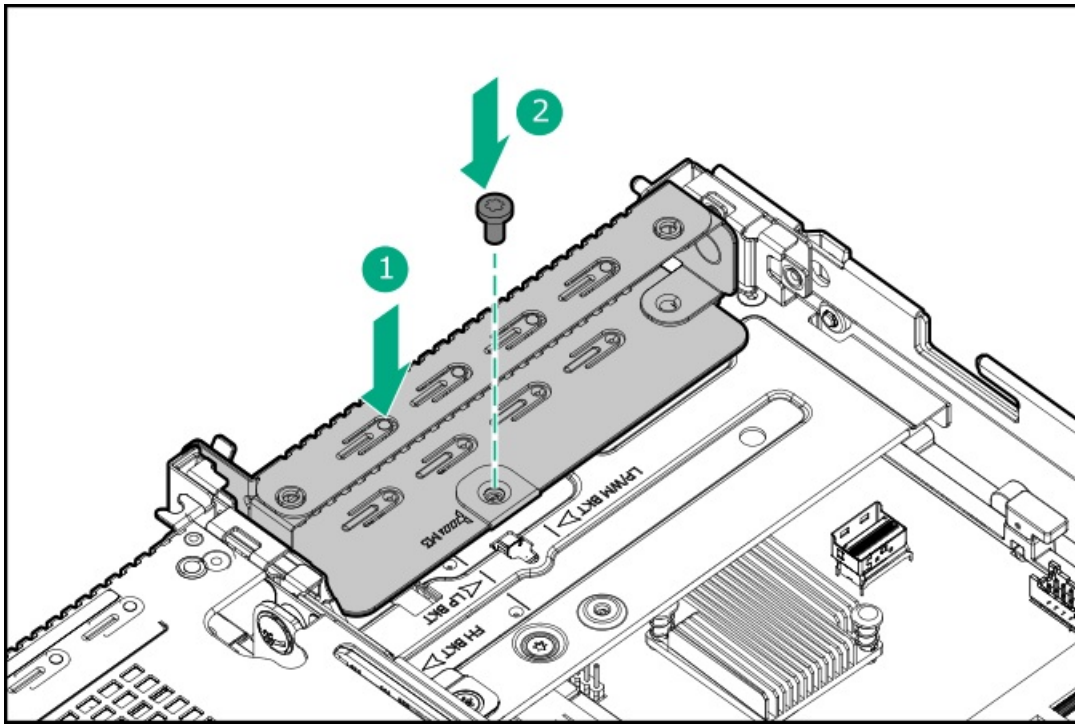
Prerequisites

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

Procedure

1. [Power down the server.](#)
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Disconnect all peripheral cables from the server.
4. [Remove the server from the rack.](#)
5. Place the server on a flat, level work surface.
6. [Remove the access panel.](#)
7. [Remove the riser cage.](#)
8. Install the riser cage blank.





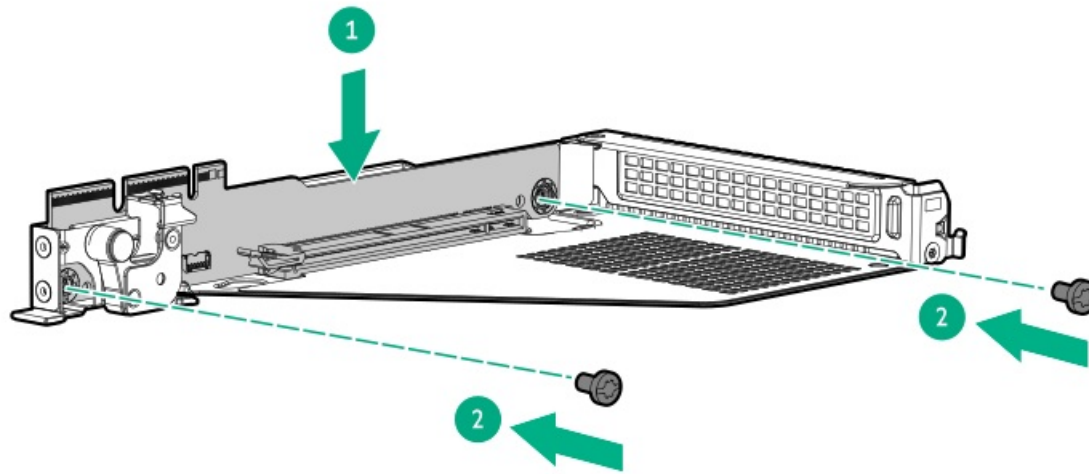
Installing the primary riser cage

Prerequisites

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

Procedure

1. Power down the server.
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Disconnect all peripheral cables from the server.
4. Remove the server from the rack.
5. Place the server on a flat, level work surface.
6. Remove the access panel.
7. Remove the primary riser cage blank.
8. Attach the riser board to the cage, and then install the screws.



9. Install the primary riser cage.
10. Install the access panel.
11. Install the server into the rack.
12. Connect all peripheral cables to the server.
13. Connect each power cord to the server.
14. Power up the server.

Results

The installation procedure is complete.

Installing the GPU captive riser

Prerequisites

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

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

About this task



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

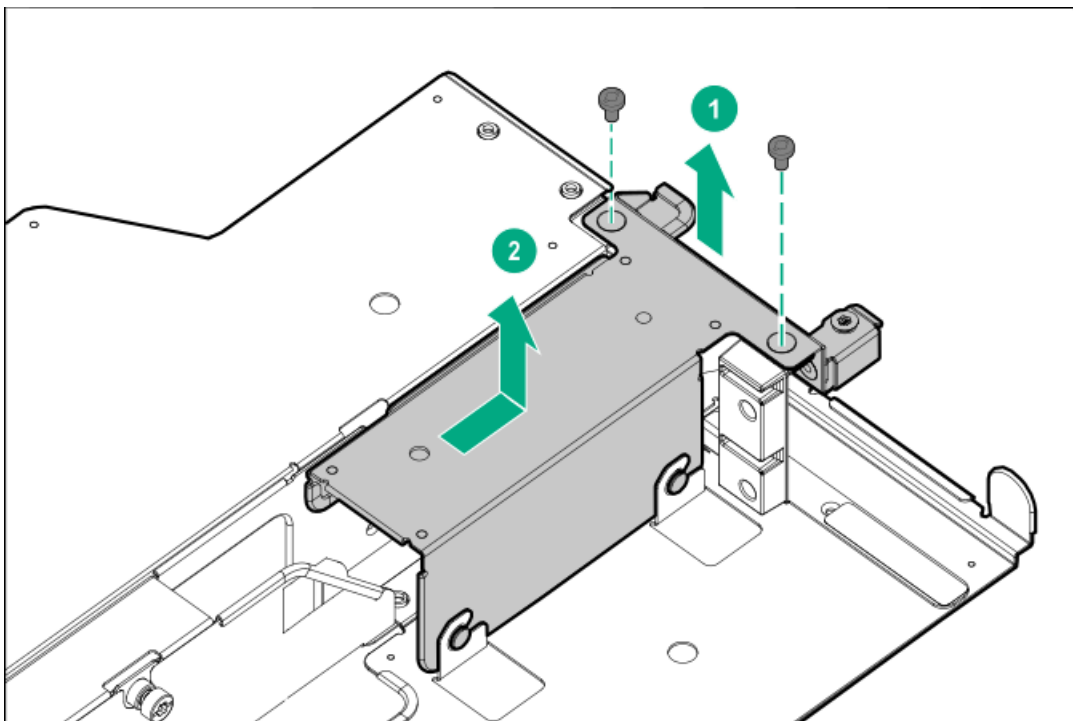
Before replacing a DIMM, backplane, expansion card, riser board, or other similar PCA components due to a perceived hardware error, make sure first that the component is firmly seated in the slot.

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.

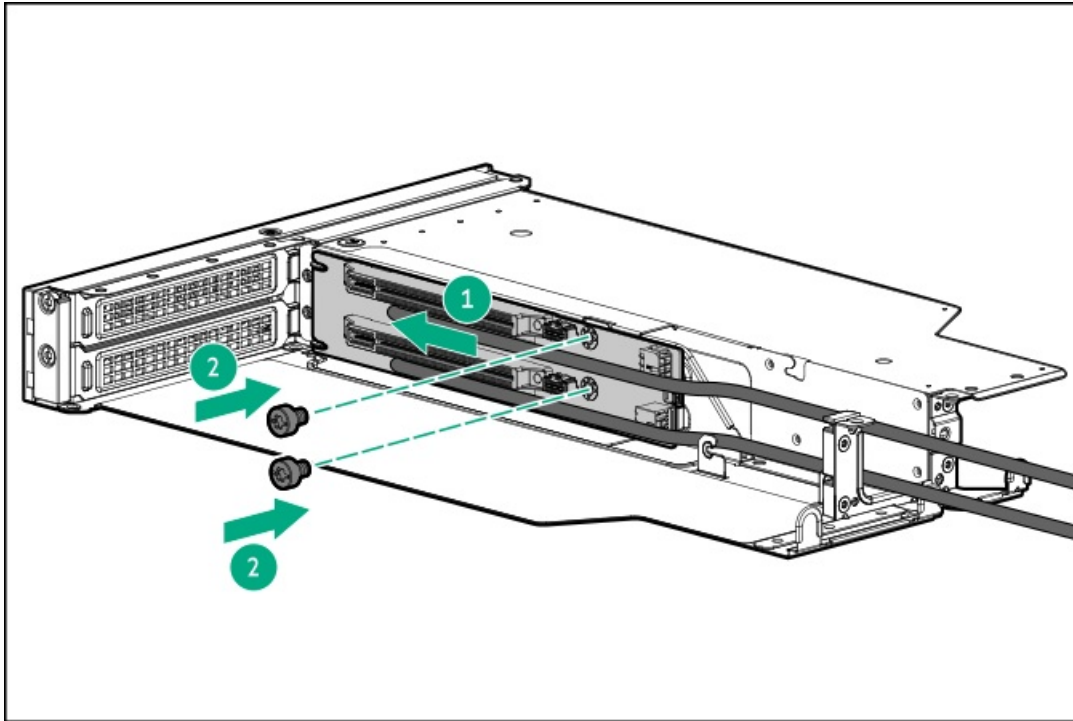
Procedure

1. Power down the server.
2. If installed, remove the front bezel.
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 GPU riser cage.
11. Remove the cable holder.

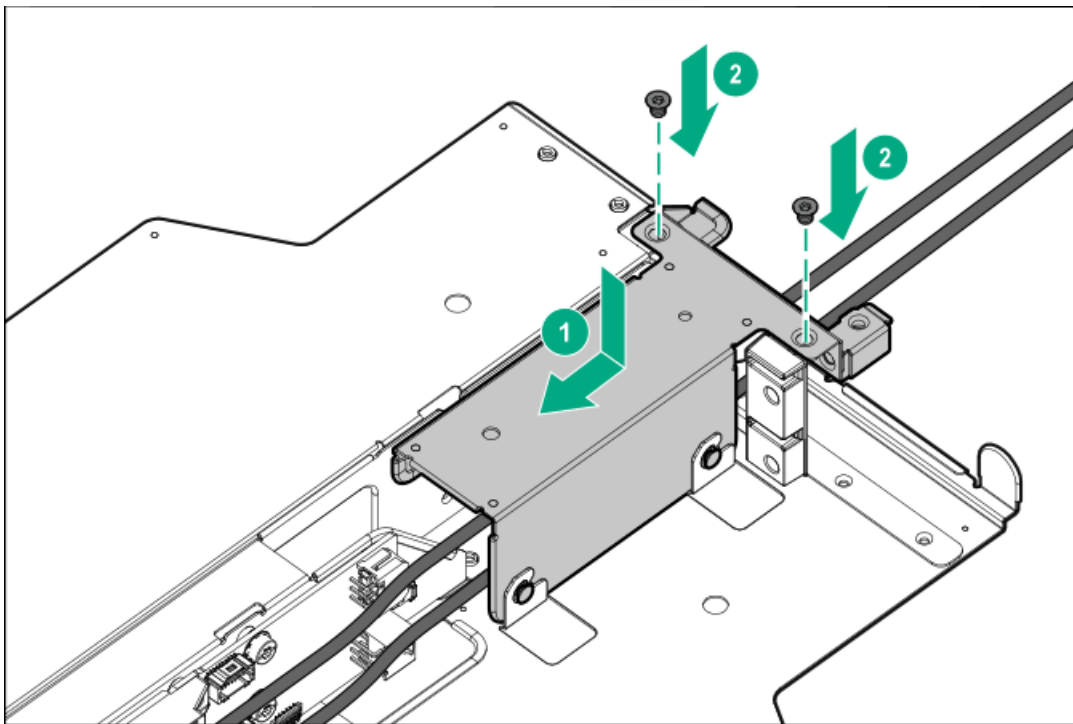


12. Slide the captive riser into the slot, and then install the screws.

Make sure the cables are properly routed through the space of the cable holder.



13. Install the cable holder.



14. Connect the cables to the system board.
15. Install the GPU riser cage.
16. Install the middle cover.
17. Install the access panel.
18. Install the front bezel.



Results

The installation procedure is complete.

Installing an expansion card

Prerequisites

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

About this task



CAUTION

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



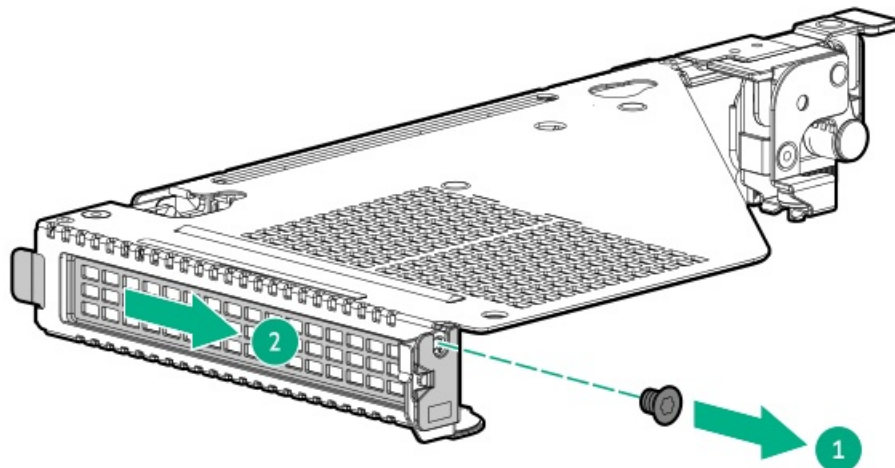
CAUTION

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

Retain the blank for future use.

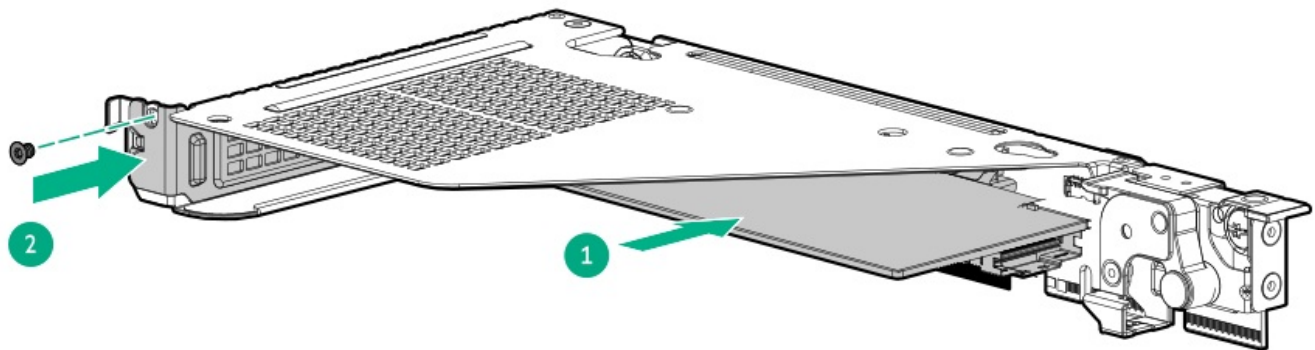


9. Ensure that any switches or jumpers on the expansion card are set properly.

For more information, see the documentation that ships with the expansion card option.

10. Install the expansion card:

Ensure that the expansion card is seated firmly in the slot.



11. Connect all necessary internal cabling to the expansion card.

For more information on these cabling requirements, see the documentation that ships with the option.

12. [Install the riser cage.](#)

13. [Install the access panel.](#)

14. [Install the server into the rack.](#)

15. Connect all peripheral cables to the server.

16. Connect each power cord to the server.

17. [Power up the server.](#)

Results

The installation procedure is complete.

Optical drives and media bays

Subtopics

[Installing the 4 LFF display port/USB assembly](#)

[Installing the 4 LFF optical drive](#)

[Installing an 8 SFF display port/USB/optical drive cage](#)

[Installing the 8 SFF optical drive](#)

[Installing the mixed front end DisplayPort/USB/optical blank and optical drive option](#)

Installing the 4 LFF display port/USB assembly

Prerequisites

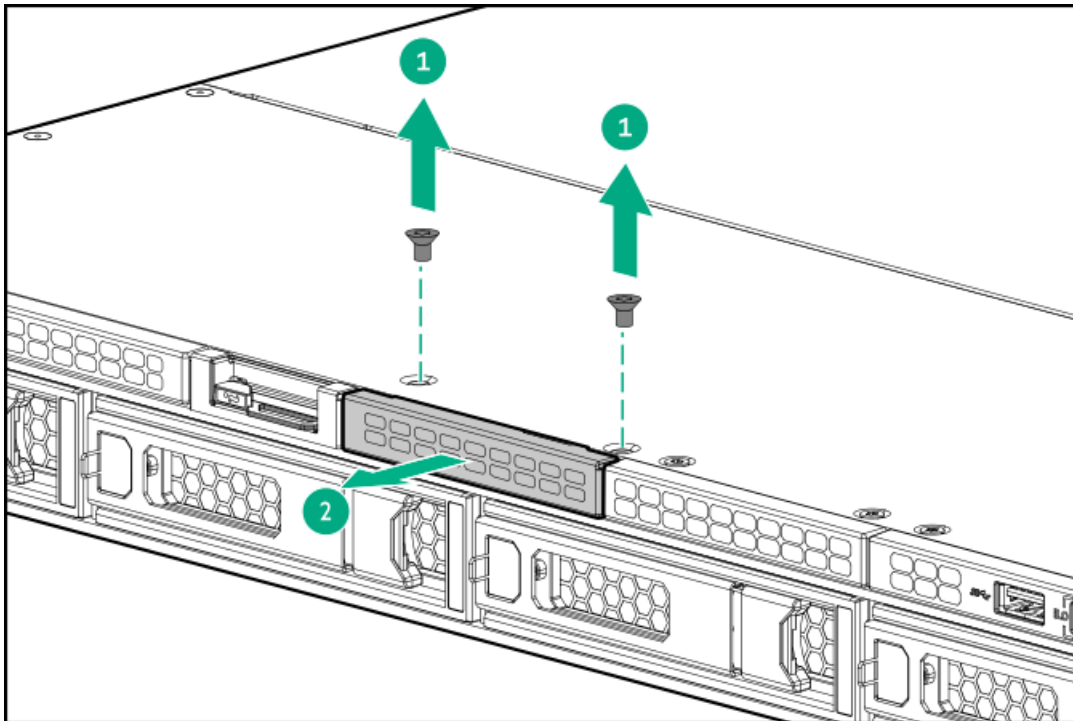
Before you perform this procedure, make sure that you have a T-10 Torx screwdriver available.



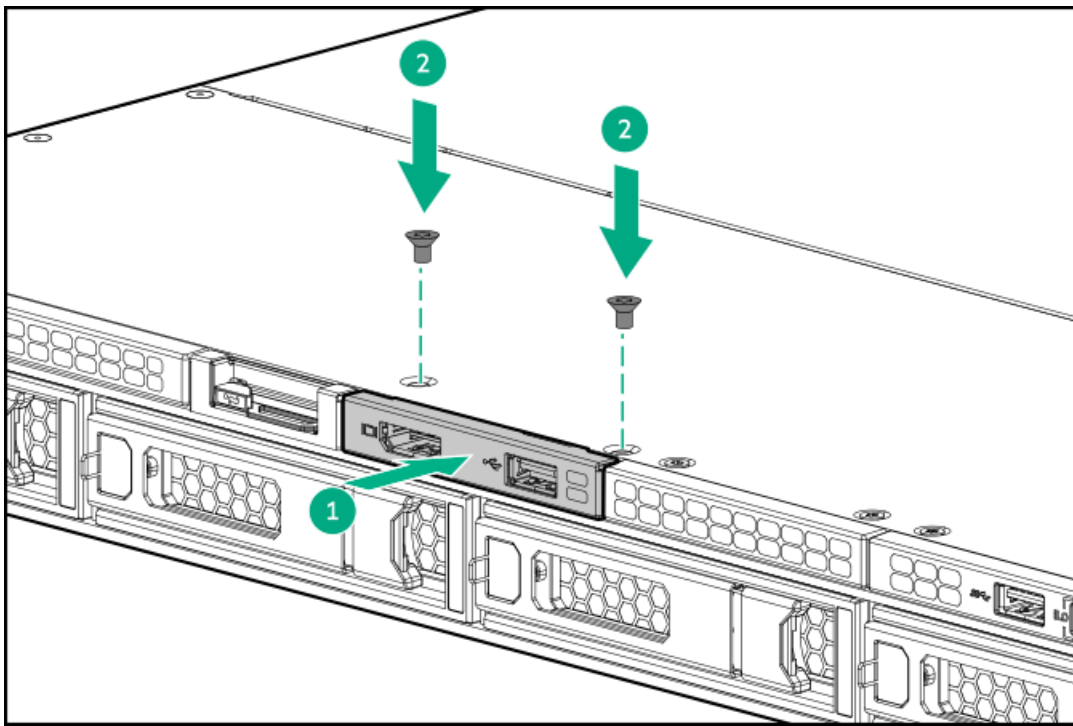
Procedure

1. Power down the server.
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Disconnect all peripheral cables from the server.
4. Do one of the following:
 - a. Extend the server from the rack.
 - b. Remove the server from the rack.
5. If installed, remove the front bezel.
6. Remove the access panel.
7. Remove the front USB and DisplayPort blank.

Retain the screws. These screws will be used to secure the front USB and DisplayPort assembly.



8. Install the front USB and DisplayPort assembly.



9. Cable the option.
10. Install the access panel.
11. Install the server into the rack.
12. Connect all peripheral cables to the server.
13. Connect each power cord to the server.
14. Power up the server.
15. Install the front bezel.

Results

The installation procedure is complete.

Installing the 4 LFF optical drive

Prerequisites

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

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](#).

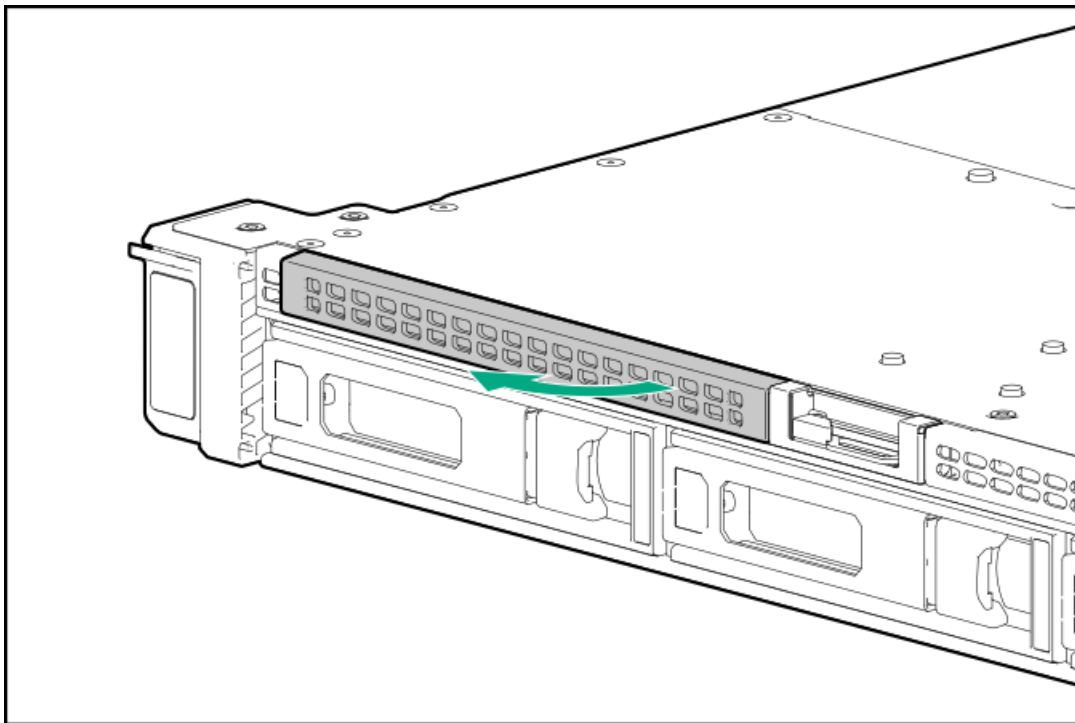


CAUTION

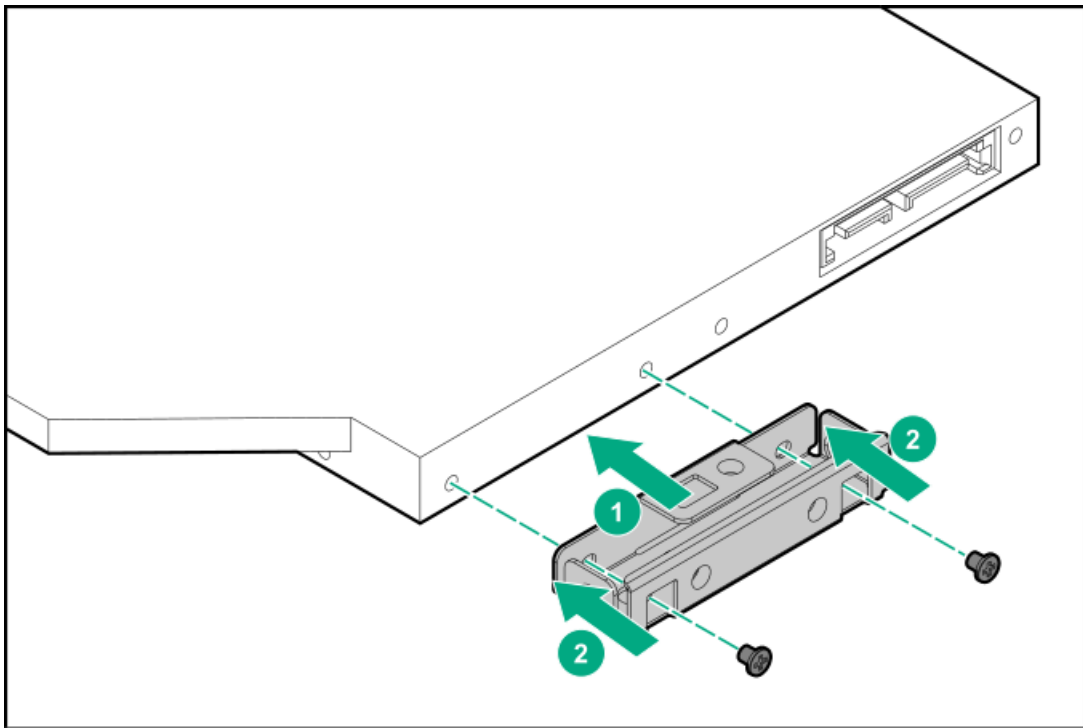
To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

Procedure

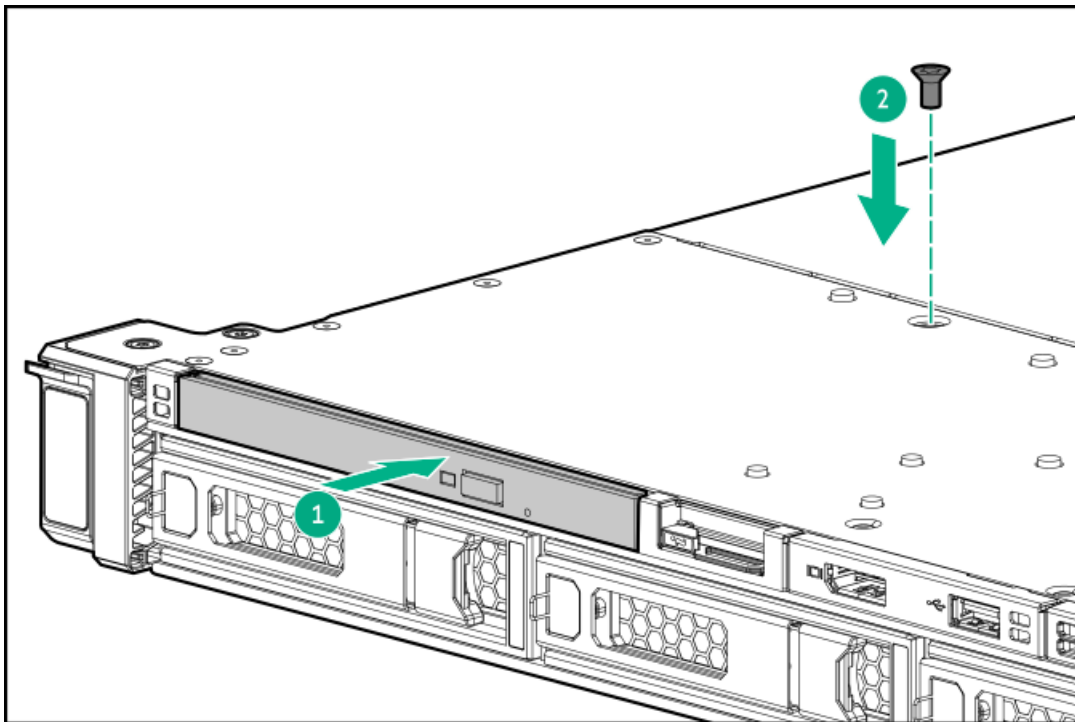
1. Back up all server data.
2. Power down the server.
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. Do one of the following:
 - a. Extend the server from the rack.
 - b. Remove the server from the rack.
6. If installed, remove the front bezel.
7. Remove the access panel.
8. Remove the LFF optical drive bay blank.



9. Install the optical drive bracket.



10. Install the optical drive.



11. Connect the cable to the system board.

12. Install the access panel.

13. Install the server into the rack.

14. Install the front bezel.

15. Connect all peripheral cables to the server.

16. Connect each power cord to the server.

17. Power up the server.

Results

The installation procedure is complete.

Installing an 8 SFF display port/USB/optical drive cage

Prerequisites

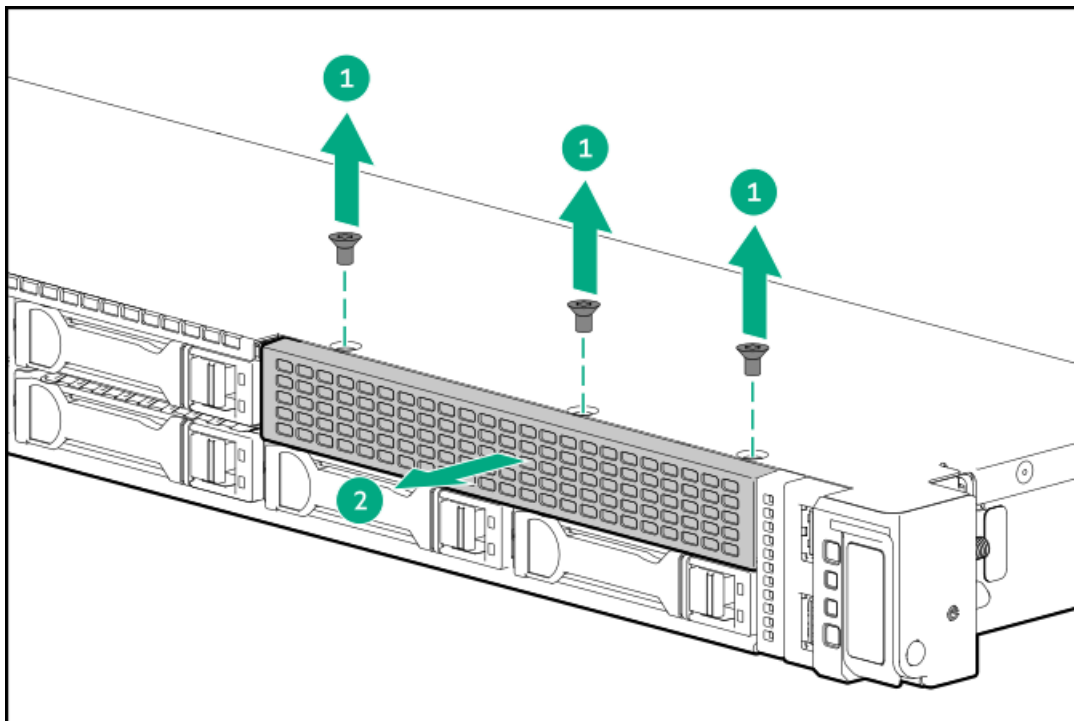
Before you perform this procedure, make sure that you have the following items available:

- T-10 Torx screwdriver
- Phillips No. 1 screwdriver

Procedure

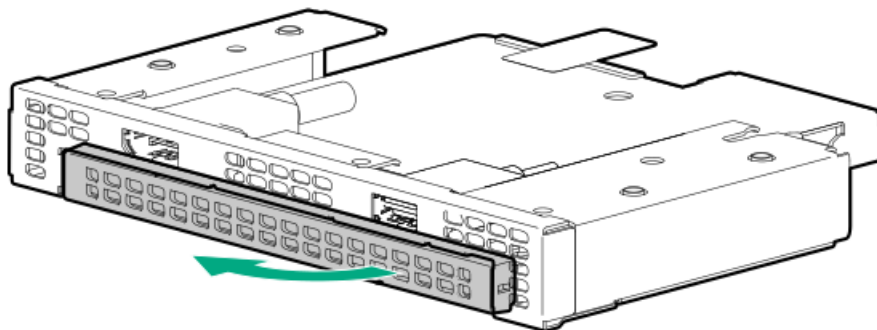
1. Power down the server.
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Disconnect all peripheral cables from the server.
4. Remove the server from the rack.
5. Place the server on a flat, level work surface.
6. If installed, remove the front bezel.
7. Remove the access panel.
8. Remove the universal media bay blank.

Retain the screws and blank. These screws will be used to secure the new optical drive cage.

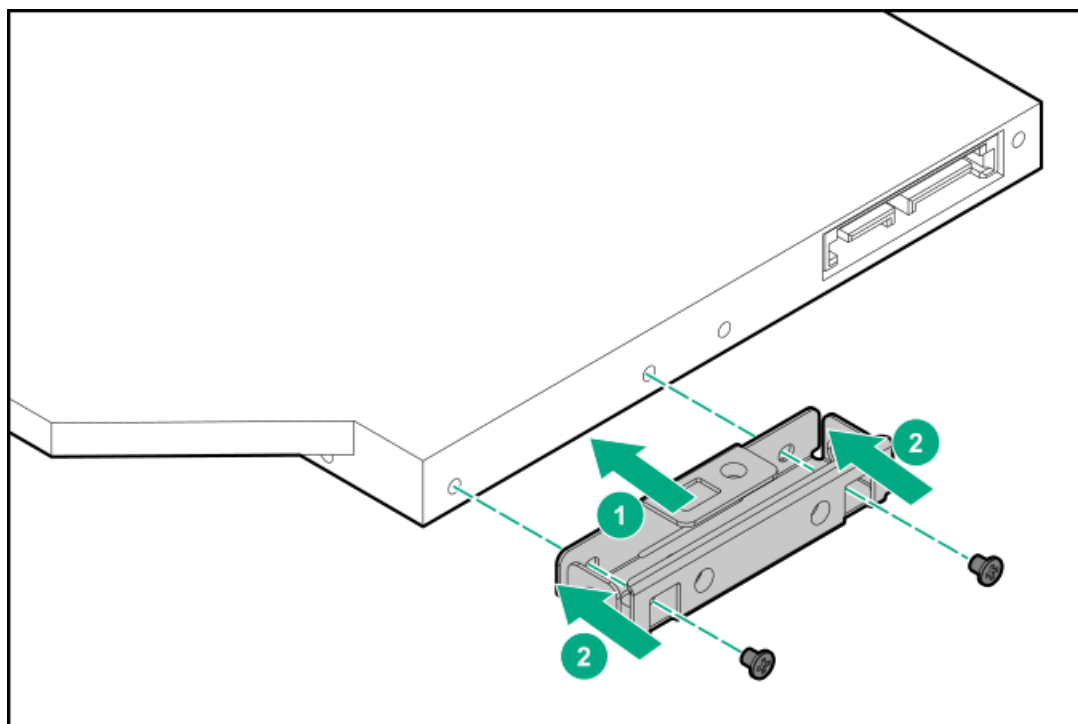


9. Remove the optical drive bay blank from the drive cage.

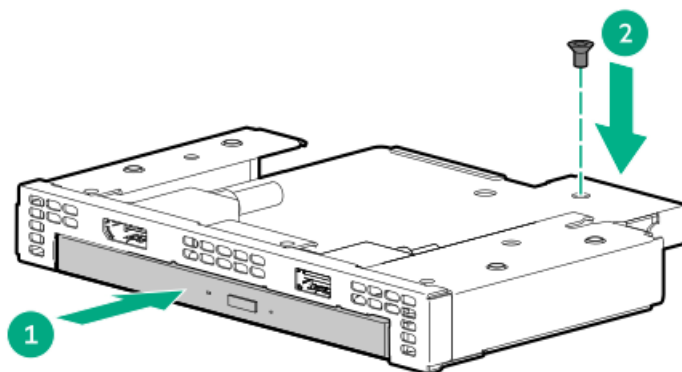
Retain the blank for future use.



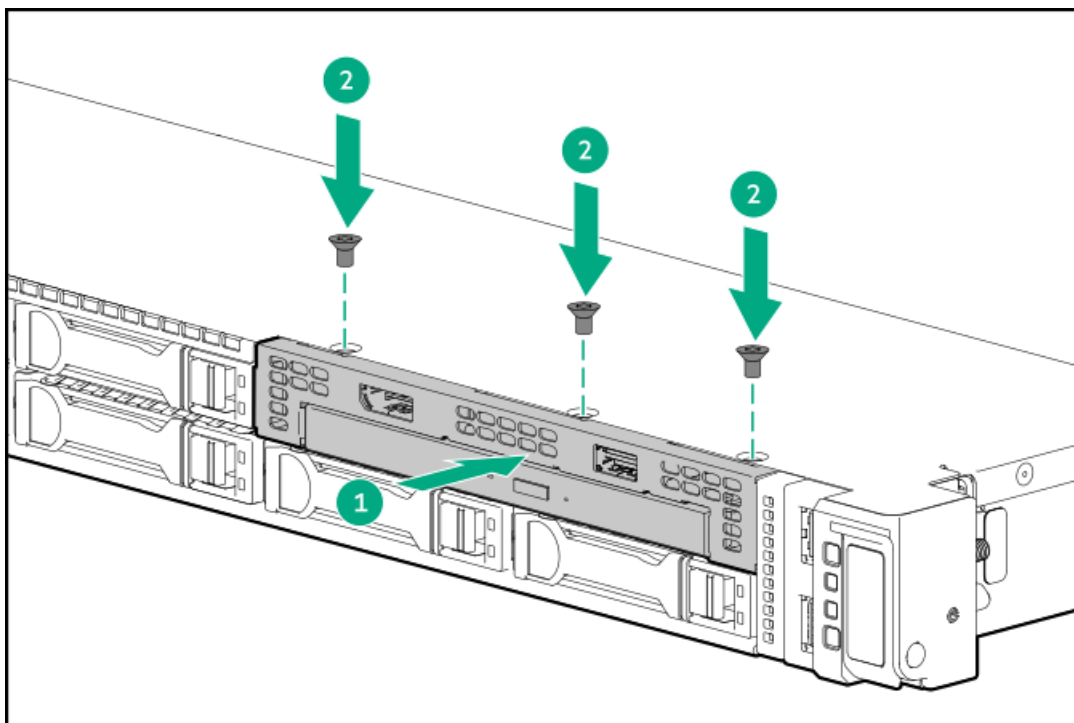
10. Install the optical drive bracket.



11. Install the optical drive in the optical drive cage.



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



13. [Cable the option.](#)
14. [Install the access panel.](#)
15. [Install the server into the rack.](#)
16. Connect all peripheral cables to the server.
17. Connect each power cord to the server.
18. [Power up the server.](#)
19. [Install the front bezel.](#)

Results

The installation procedure is complete.

Installing the 8 SFF optical drive

Prerequisites

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

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](#).

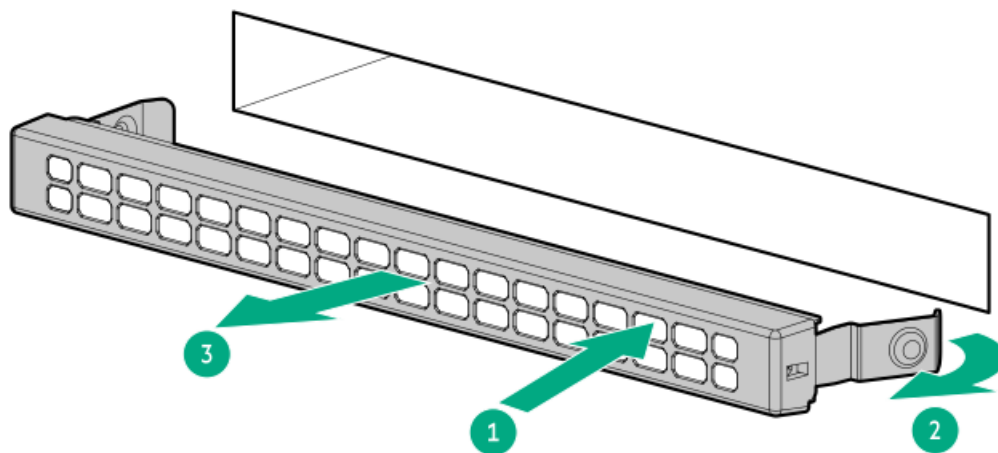


CAUTION

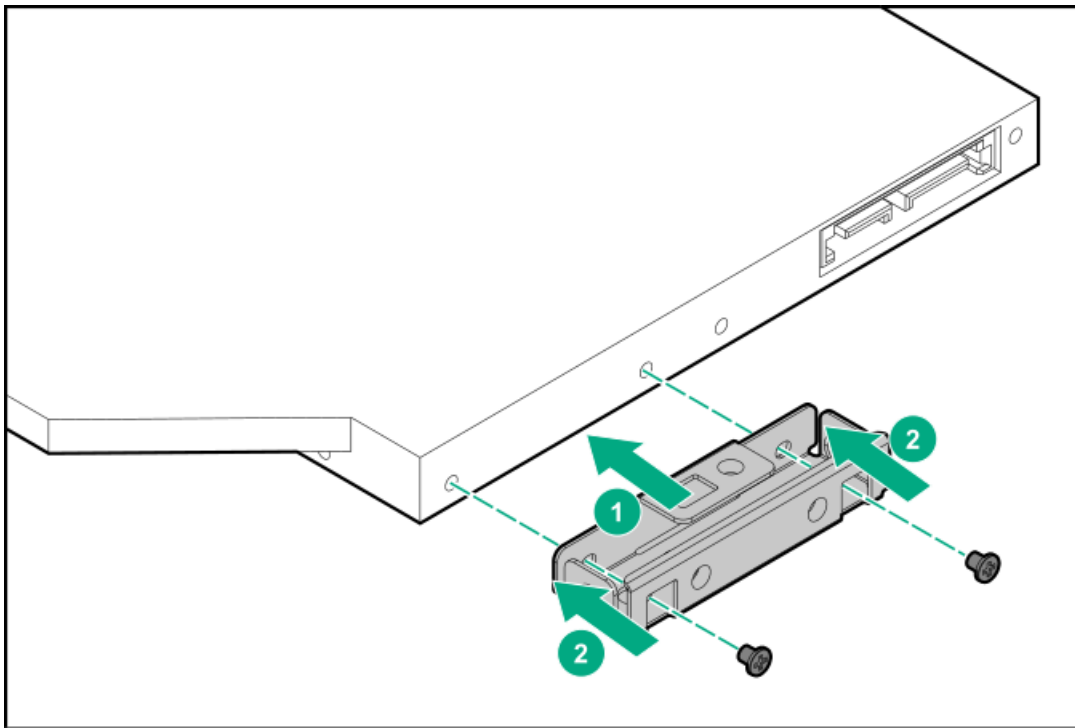
To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

Procedure

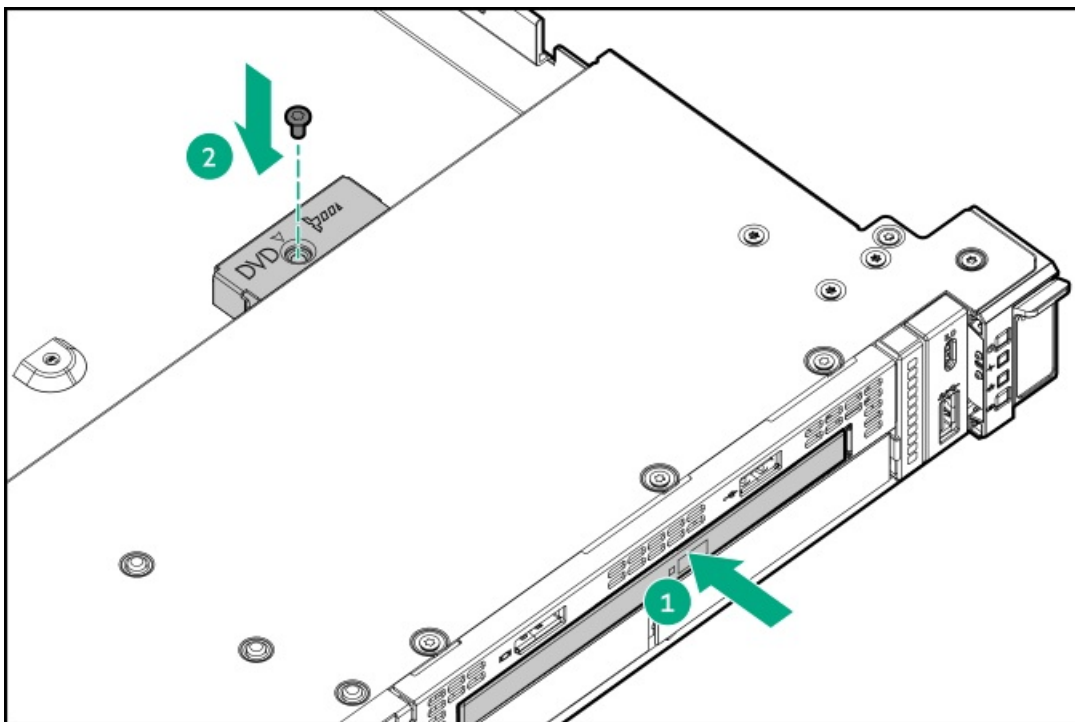
1. Back up all server data.
2. Power down the server.
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Do one of the following:
 - a. Extend the server from the rack.
 - b. Remove the server from the rack.
5. If installed, remove the front bezel.
6. Remove the access panel.
7. Remove the optical drive blank.



8. Install the optical drive bracket.



9. Install the optical drive.



10. Cable the option.
11. Install the access panel.
12. Install the server into the rack.
13. Install the front bezel.
14. Connect all peripheral cables to the server.
15. Connect each power cord to the server.
16. Power up the server.

Results

The installation procedure is complete.

Installing the mixed front end DisplayPort/USB/optical blank and optical drive option

Prerequisites

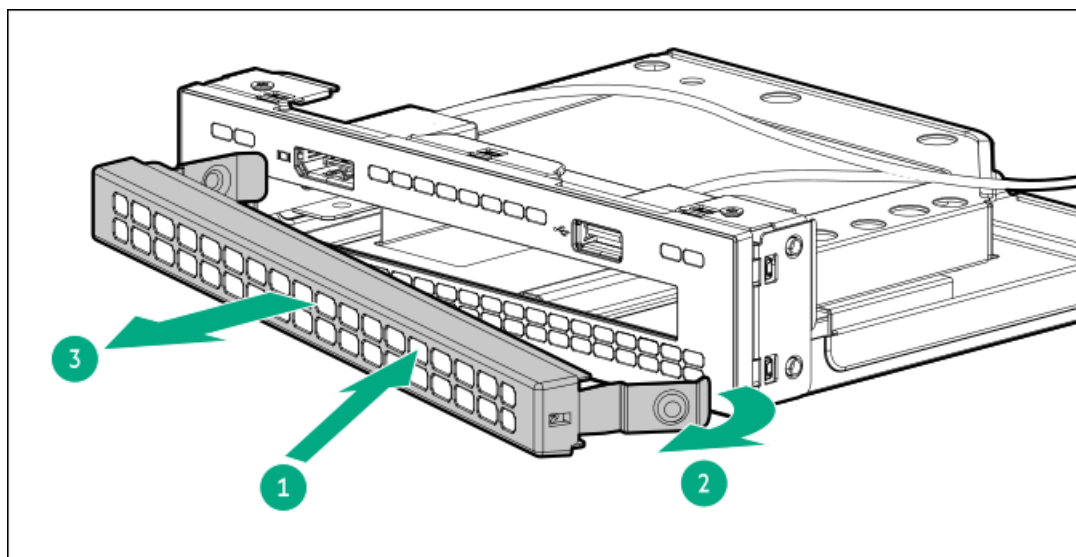
Before you perform this procedure, make sure that you have the following items available:

- T-10 Torx screwdriver
- T-25 Torx screwdriver
- Phillips No. 1 screwdriver

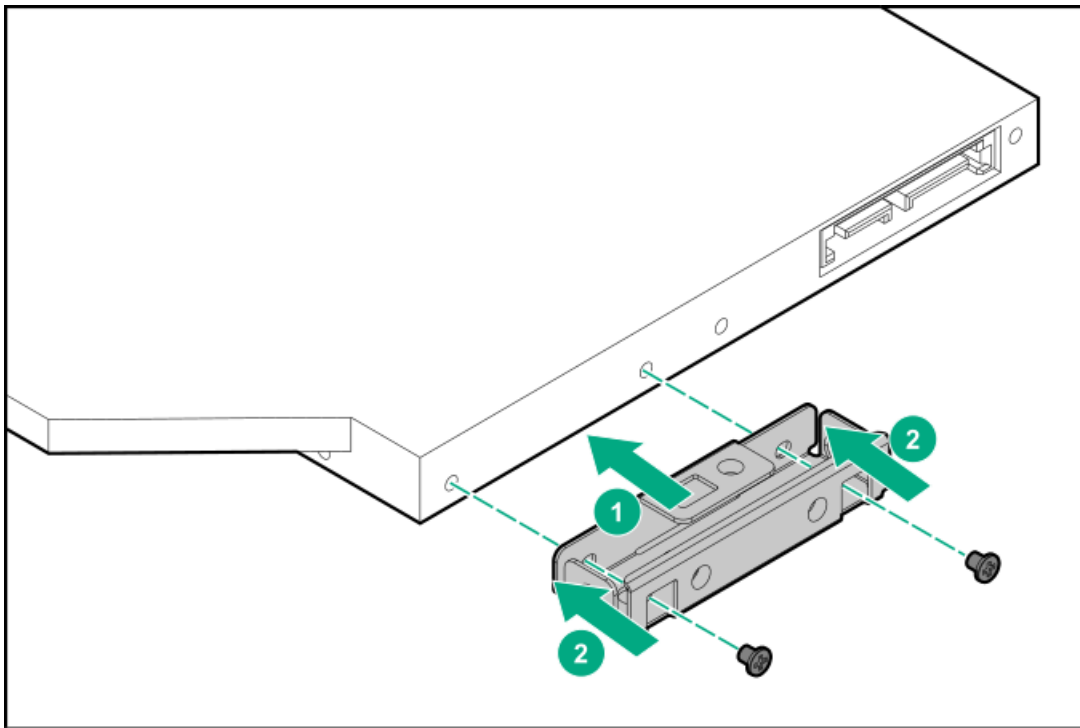
Procedure

Install the optical drive

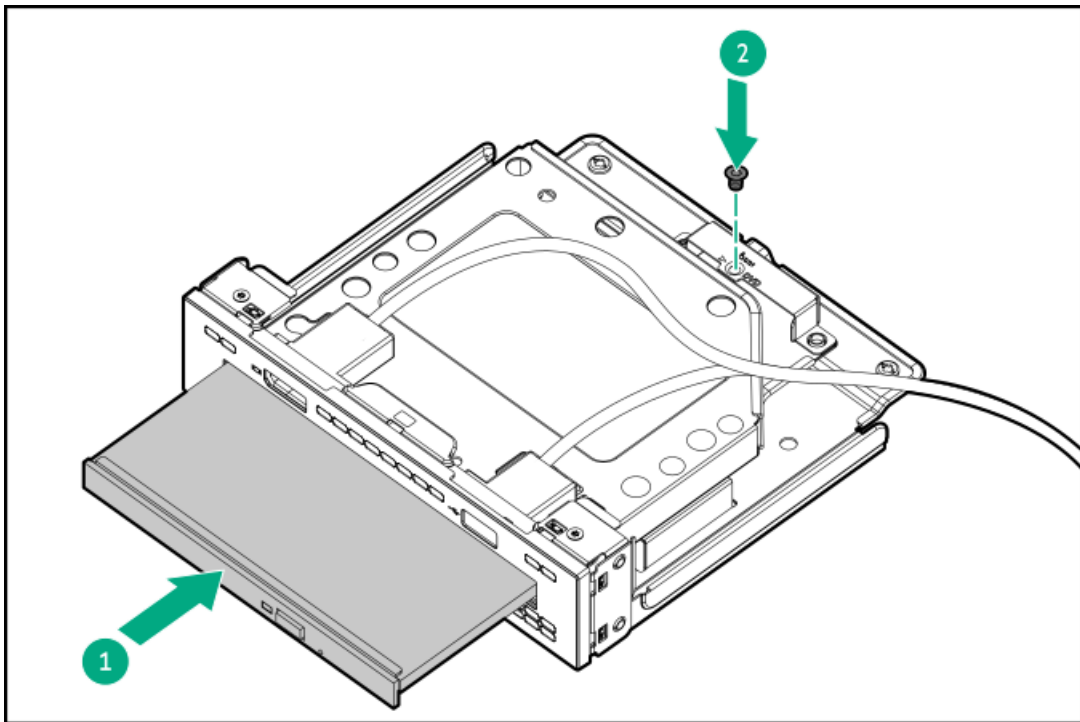
1. Remove the optical drive blank.



2. Install the optical drive bracket.



3. Install the optical drive.

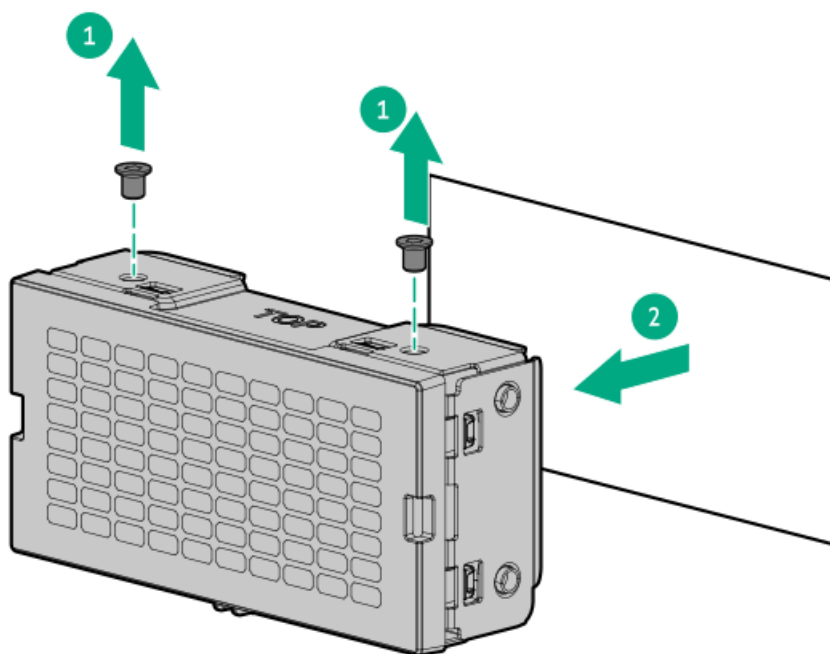


Install the DisplayPort/USB/optical blank

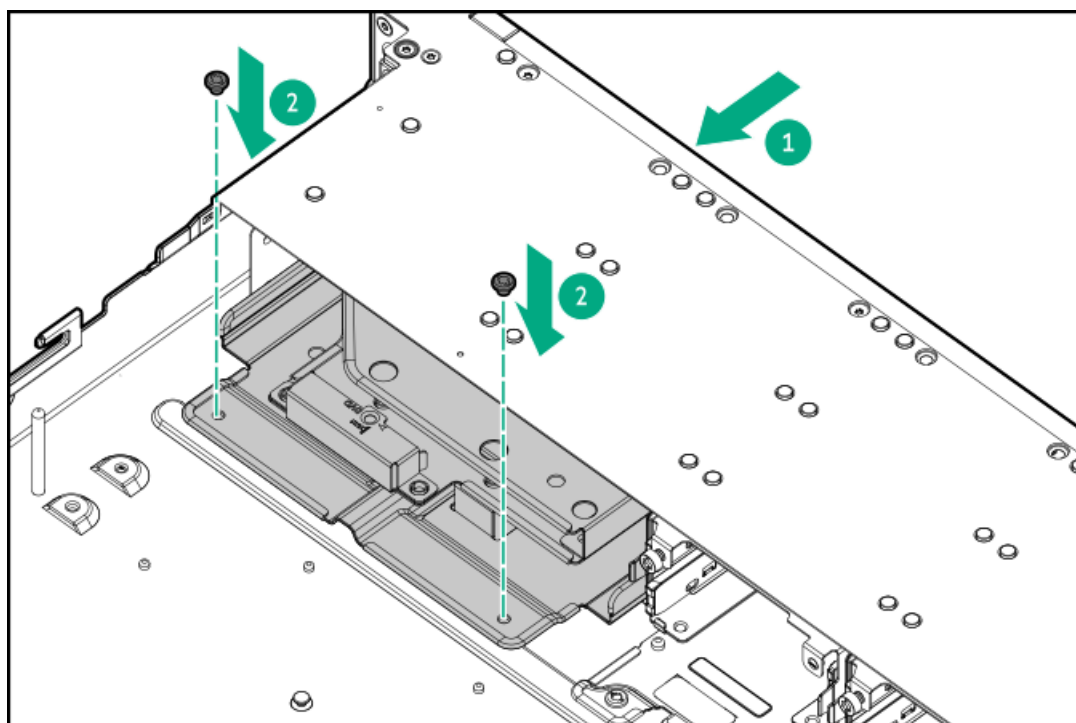
4. Back up all server data.
5. Power down the server.
6. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
7. Disconnect all peripheral cables from the server.
8. Do one of the following:



- a. Extend the server from the rack.
- b. Remove the server from the rack.
9. If installed, remove the front bezel.
10. Remove the access panel.
11. Remove the middle cover.
12. Remove the blanks from Box 4 and Box 5.



13. Install the DisplayPort/USB/optical blank option.



14. Connect the optical drive cable.

15. [Connect the DisplayPort/USB cable.](#)
16. [Install the access panel.](#)
17. [Install the server into the rack.](#)
18. [Install the front bezel.](#)
19. Connect all peripheral cables to the server.
20. Connect each power cord to the server.
21. [Power up the server.](#)

Results

The installation procedure is complete.

OS boot device

Subtopics

- [Installing the HPE NS204i-u Boot Device V2 in Box 3](#)
- [Installing the HPE NS204i-u Boot Device V2 on the chassis](#)
- [Installing the HPE NS204i-u Boot Device V2 in the power supply bay](#)
- [Installing the HPE NS204i-u Boot Device V2 beside the low-profile riser cage](#)

Installing the HPE NS204i-u Boot Device V2 in Box 3

Prerequisites

Before beginning installation, make sure that the server is updated with the latest operating system firmware and drivers.

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

- T-10 Torx screwdriver
- T-25 Torx screwdriver
- Phillips No. 1 screwdriver

About this task



CAUTION

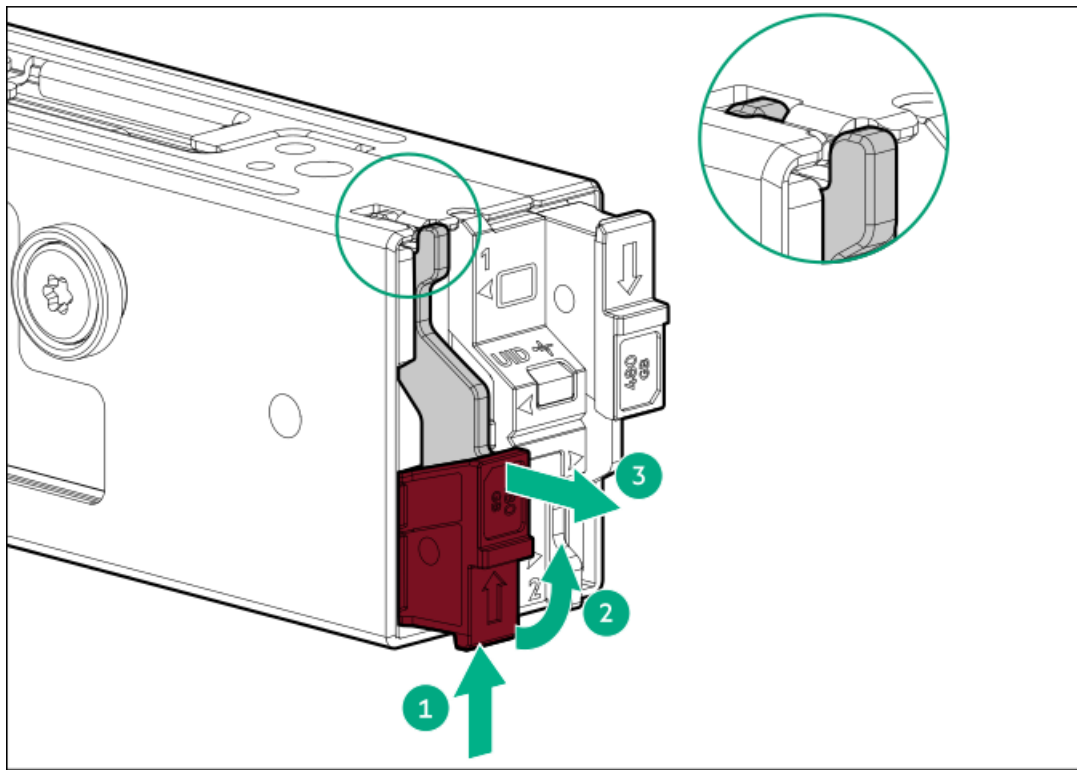
A discharge of static electricity from a finger or other conductor might damage system boards or other static-sensitive devices. To prevent damage, observe [antistatic precautions](#).

Procedure

Installing drives onto the boot device

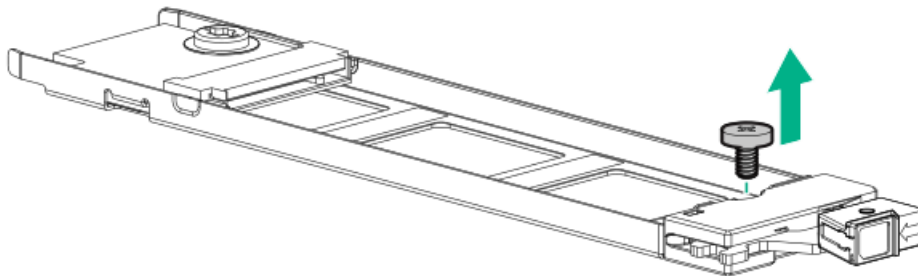
1. Remove the boot device carrier:
 - a. Press and hold the carrier latch.
 - b. Pivot the latch to open.
 - c. Slide the carrier out from the boot device cage.



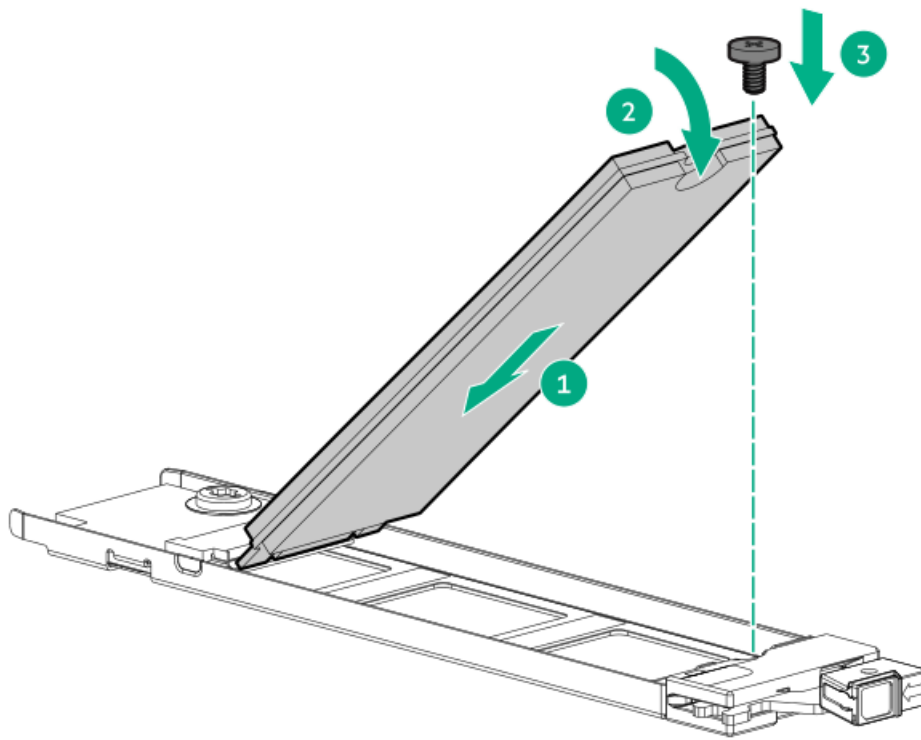


2. Install the SSD on the boot device carrier:

- a. Remove the SSD mounting screw.



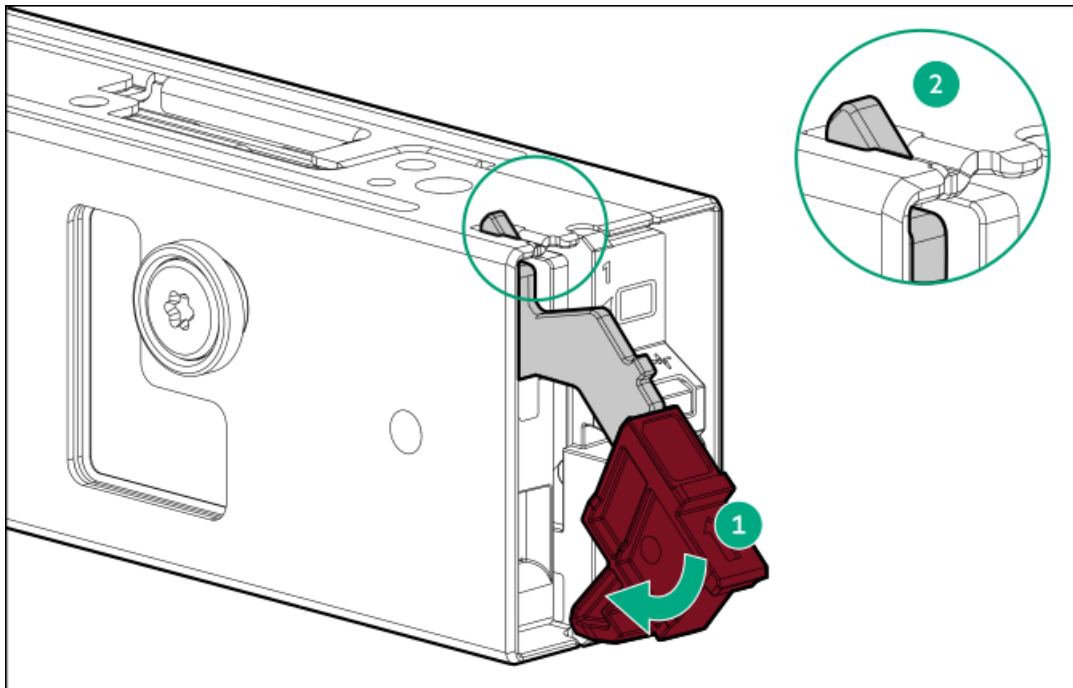
- b. Insert the SSD into the M.2 slot at a 45° angle.
- c. Carefully press the SSD down to the horizontal position.
- d. Install the SSD mounting screw.



3. Install the boot device carriers:

- a. If closed, pivot the carrier latch to open.
- b. Slide the carrier into the boot device cage.
- c. Pivot the latch to close.

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



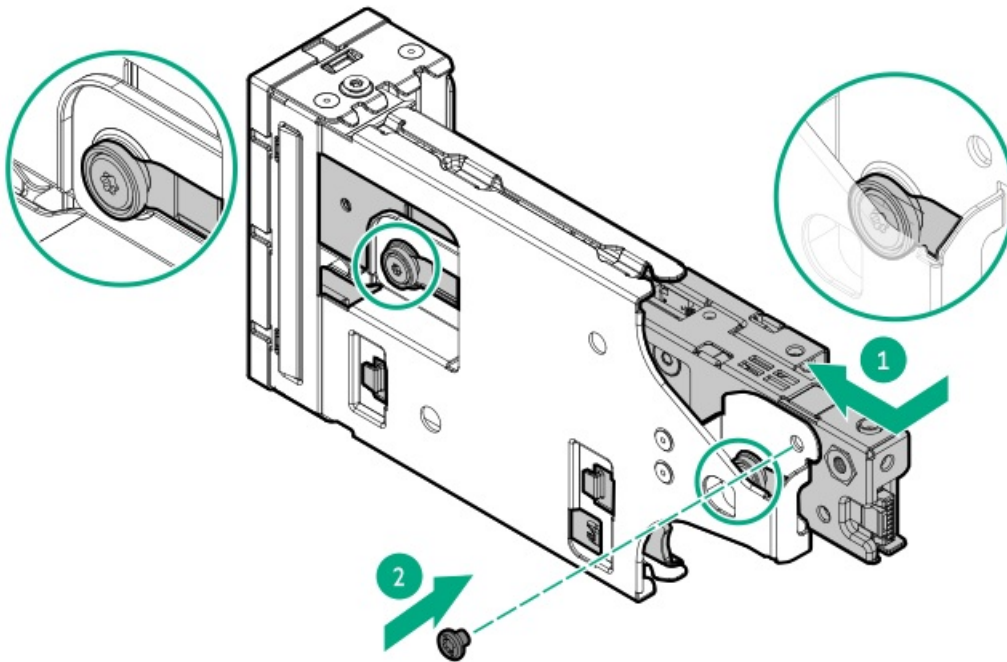
Installing the boot device

4. Power down the server.

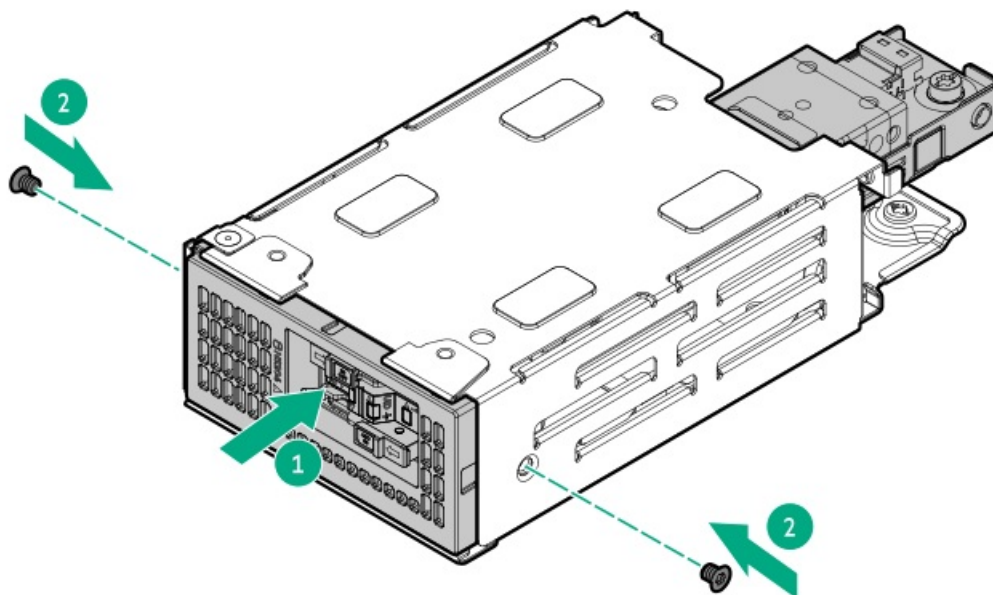
5. Remove all power:

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

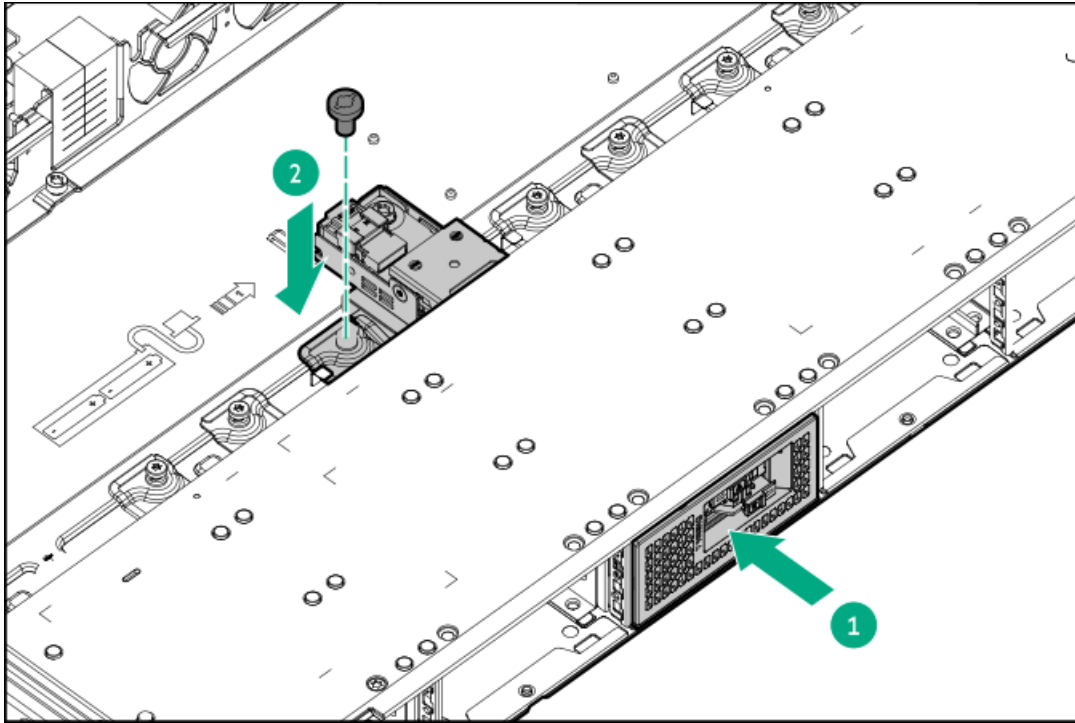
- b. Disconnect each power cord from the server.
6. Disconnect all peripheral cables from the server.
7. Remove the server from the rack.
8. Place the server on a flat, level work surface.
9. If installed, remove the front bezel.
10. Remove the access panel.
11. Remove the middle cover.
12. Install the boot device on the bracket.



13. Install the boot device bracket into the multipurpose cage.



14. Connect the power and signal cables to the boot device.
15. Install the cage into the server.



16. Connect the cables to the system board.
17. Install the access panel.
18. Install the middle cover.
19. Install the server into the rack.
20. Connect all peripheral cables to the server.
21. Connect each power cord to the server.
22. Power up the server.

Results

The installation procedure is complete.

Installing the HPE NS204i-u Boot Device V2 on the chassis

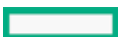
Prerequisites

Before beginning installation, make sure that the server is updated with the latest operating system firmware and drivers.

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

- T-10 Torx screwdriver
- T-25 Torx screwdriver
- Phillips No. 1 screwdriver

About this task





CAUTION

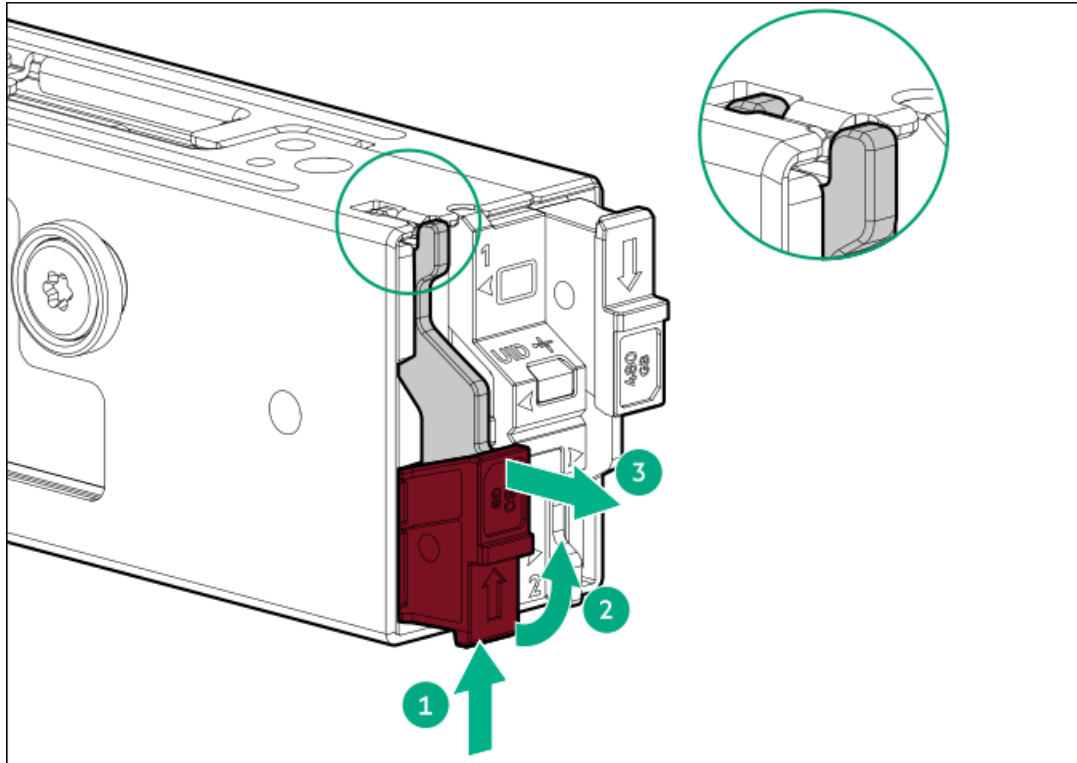
A discharge of static electricity from a finger or other conductor might damage system boards or other static-sensitive devices. To prevent damage, observe antistatic precautions.

Procedure

Installing drives onto the boot device

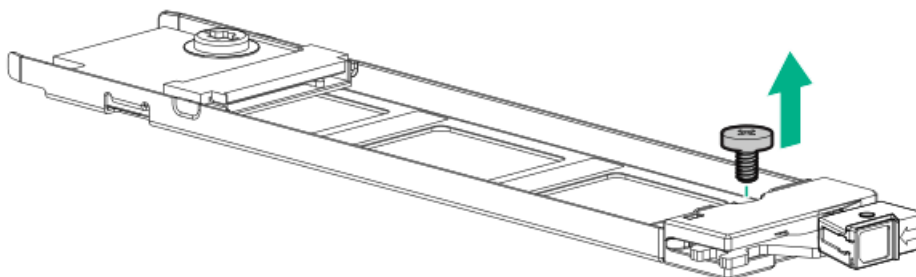
1. Remove the boot device carrier:

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

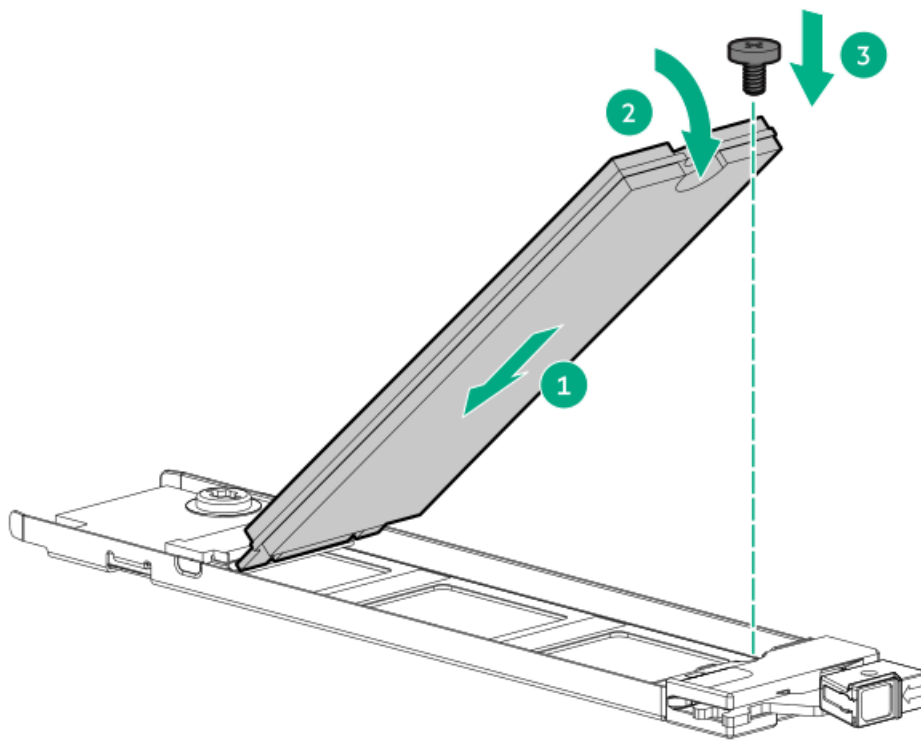


2. Install the SSD on the boot device carrier:

- a. Remove the SSD mounting screw.



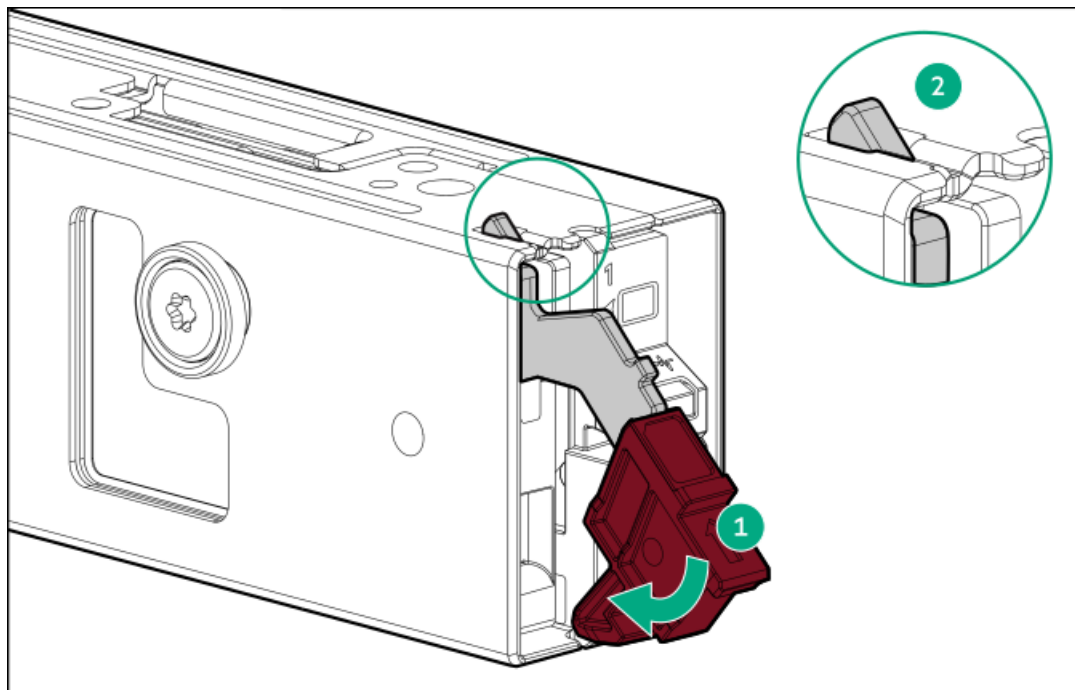
- b. Insert the SSD into the M.2 slot at a 45° angle.
- c. Carefully press the SSD down to the horizontal position.
- d. Install the SSD mounting screw.



3. Install the boot device carriers:

- a. If closed, pivot the carrier latch to open.
- b. Slide the carrier into the boot device cage.
- c. Pivot the latch to close.

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



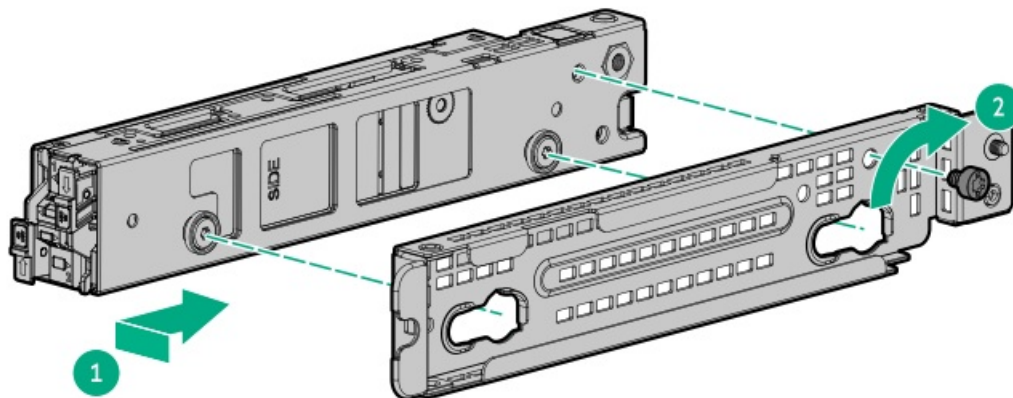
Installing the boot device

4. Power down the server.

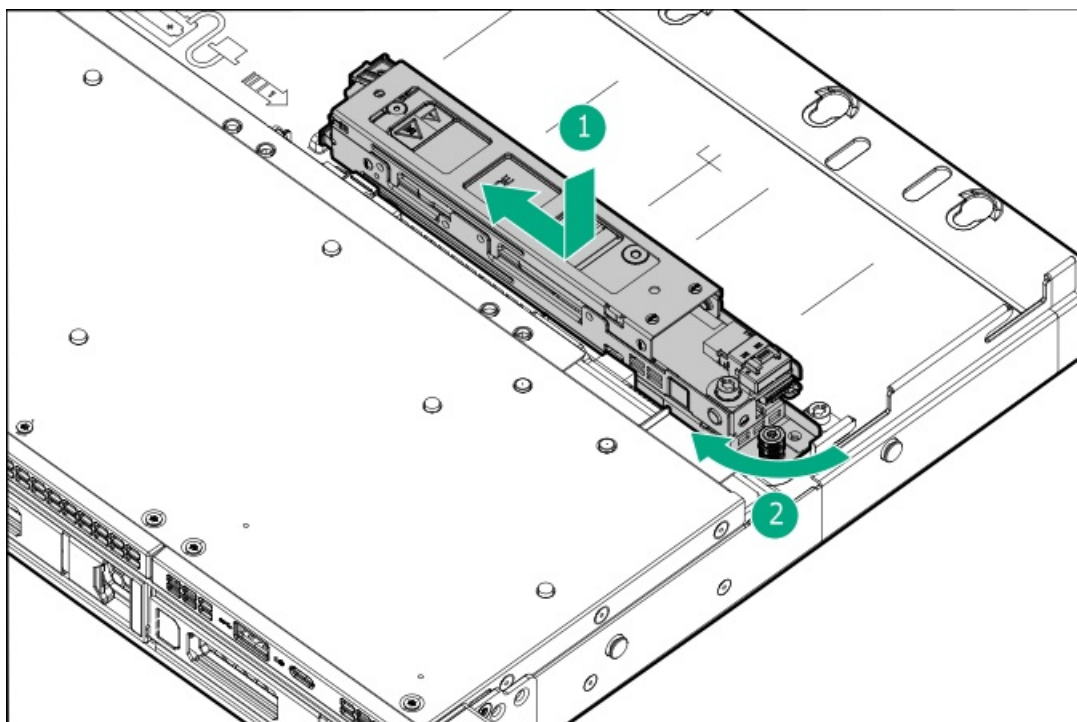
5. Remove all power:

- 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 middle cover.
10. Install the mounting bracket.

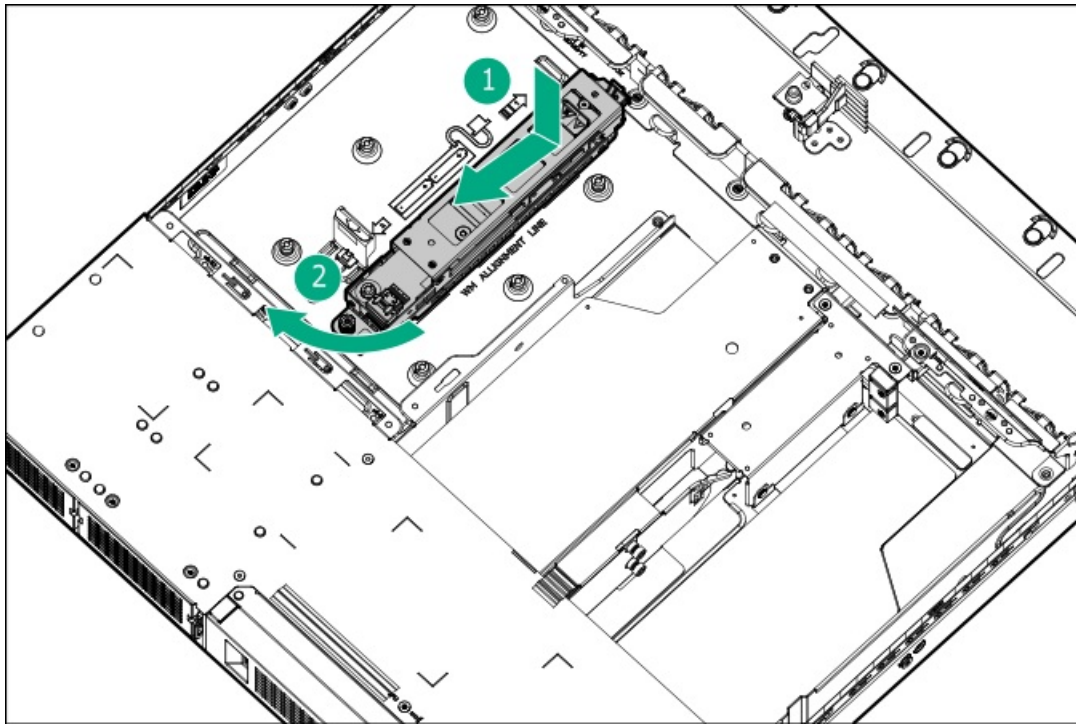


11. Connect the power and signal cables to the boot device.
12. Install the boot device:
 - a. Align the boot device on the chassis.
 - b. Secure the thumbscrew.
 - 4 LFF drive configuration



- GPU-optimized drive configuration





13. Connect the cables to the system board.
14. Install the middle cover.
15. Install the server into the rack.
16. Connect all peripheral cables to the server.
17. Connect each power cord to the server.
18. Power up the server.

Results

The installation procedure is complete.

Installing the HPE NS204i-u Boot Device V2 in the power supply bay

Prerequisites

Before beginning installation, make sure that the server is updated with the latest operating system firmware and drivers.

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

- T-10 Torx screwdriver
- Phillips No. 1 screwdriver

About this task



CAUTION

A discharge of static electricity from a finger or other conductor might damage system boards or other static-sensitive devices. To prevent damage, observe [antistatic precautions](#).

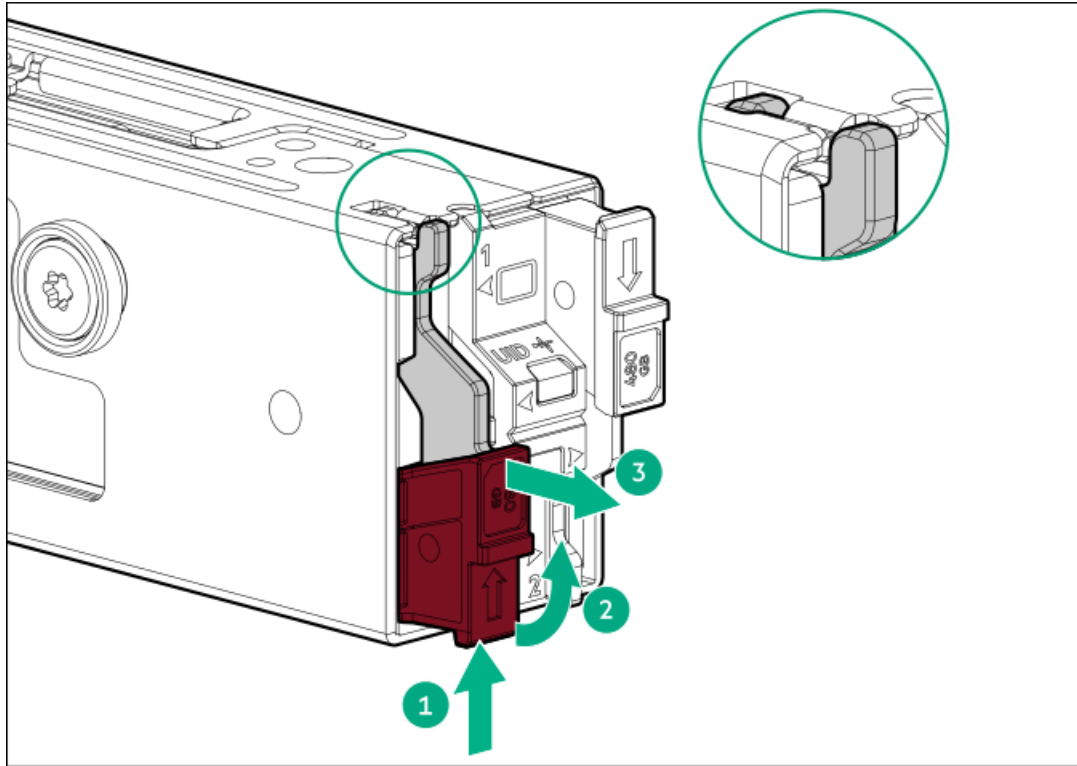
Procedure



Installing drives onto the boot device

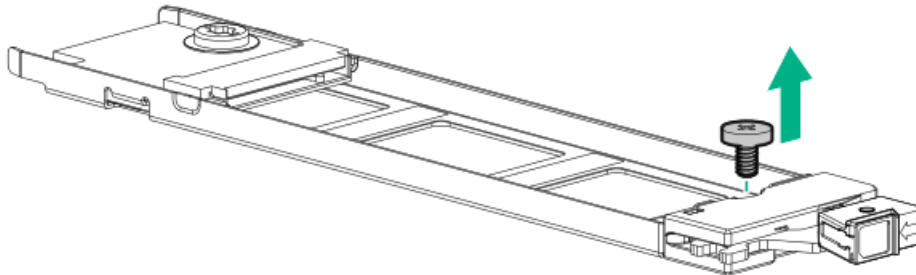
1. Remove the boot device carrier:

- Press and hold the carrier latch.
- Pivot the latch to open.
- Slide the carrier out from the boot device cage.

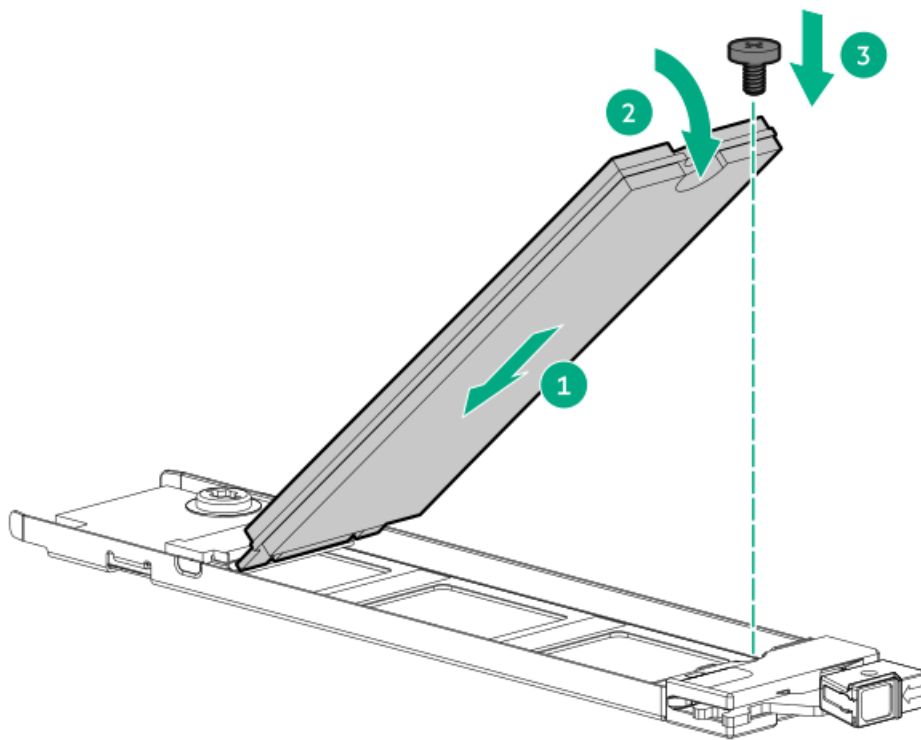


2. Install the SSD on the boot device carrier:

- Remove the SSD mounting screw.



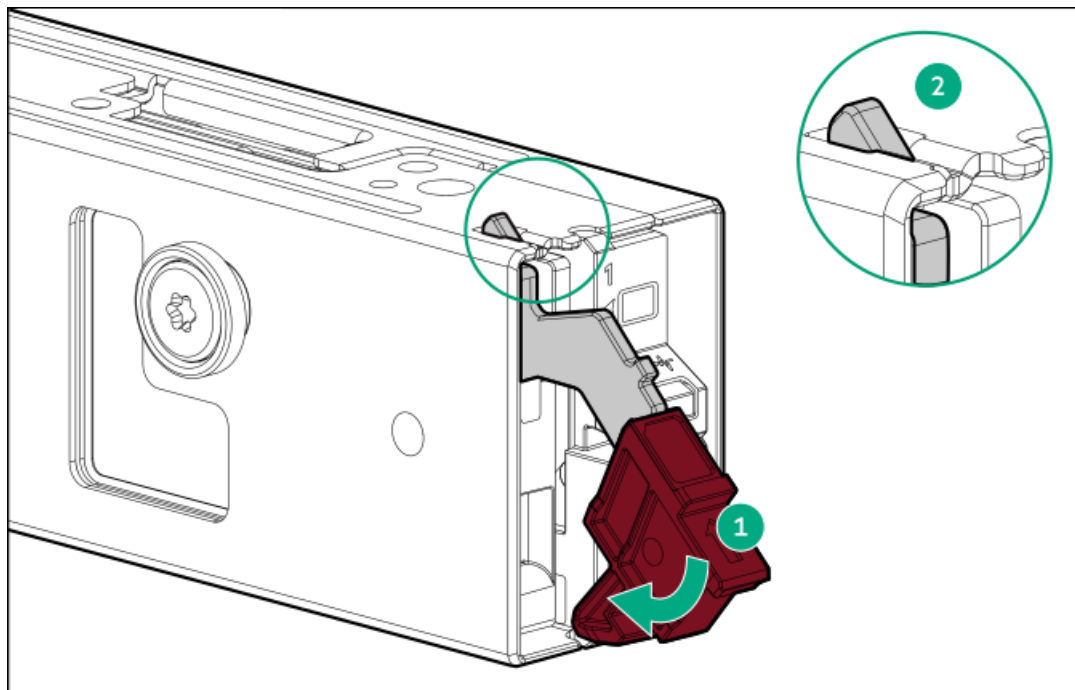
- Insert the SSD into the M.2 slot at a 45° angle.
- Carefully press the SSD down to the horizontal position.
- Install the SSD mounting screw.



3. Install the boot device carriers:

- a. If closed, pivot the carrier latch to open.
- b. Slide the carrier into the boot device cage.
- c. Pivot the latch to close.

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



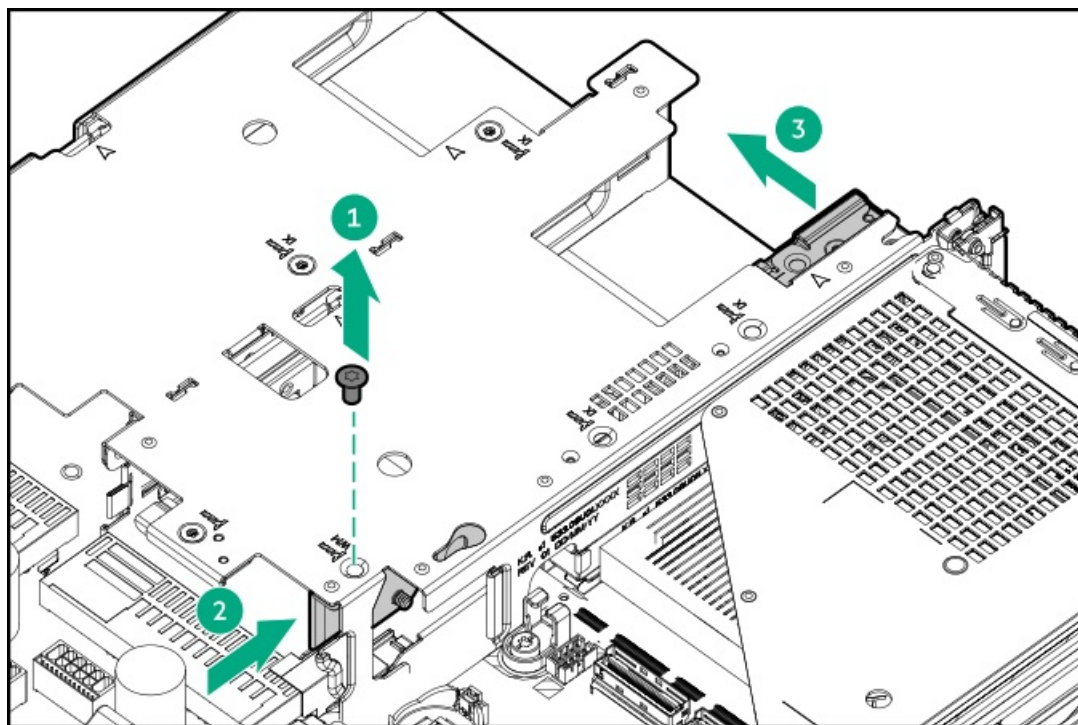
Installing the boot device

4. Power down the server.

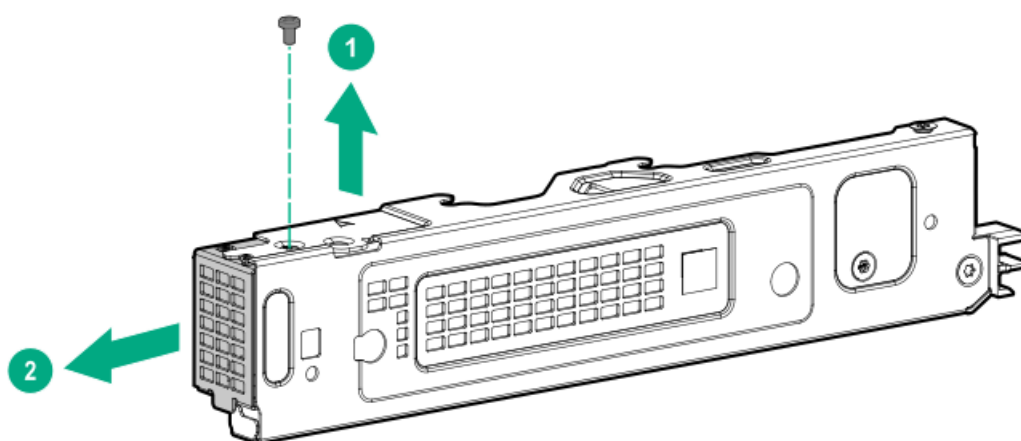
5. Remove all power:

- 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. If installed, remove the power supply from bay 2.
11. Remove the boot device bracket.

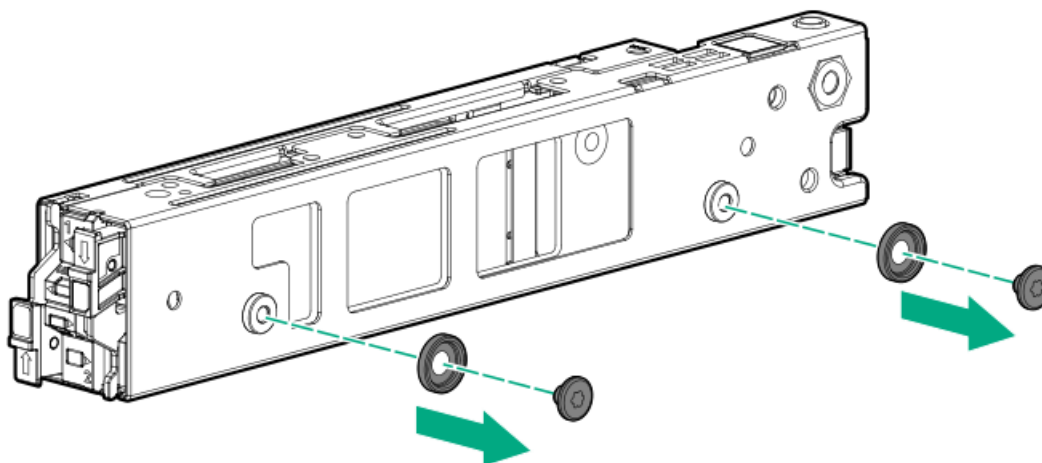


12. Remove the boot device blank.



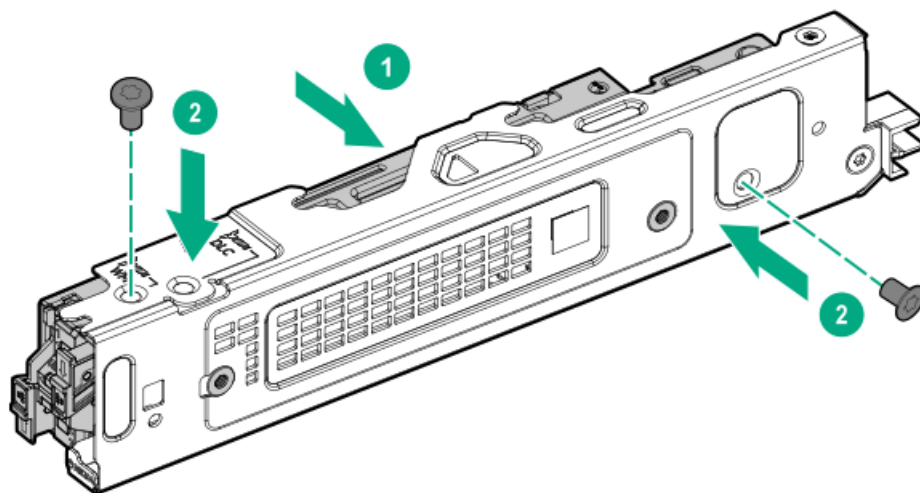
13. Remove the screws and spools on the boot device cage.

Retain the screws to secure the boot device.



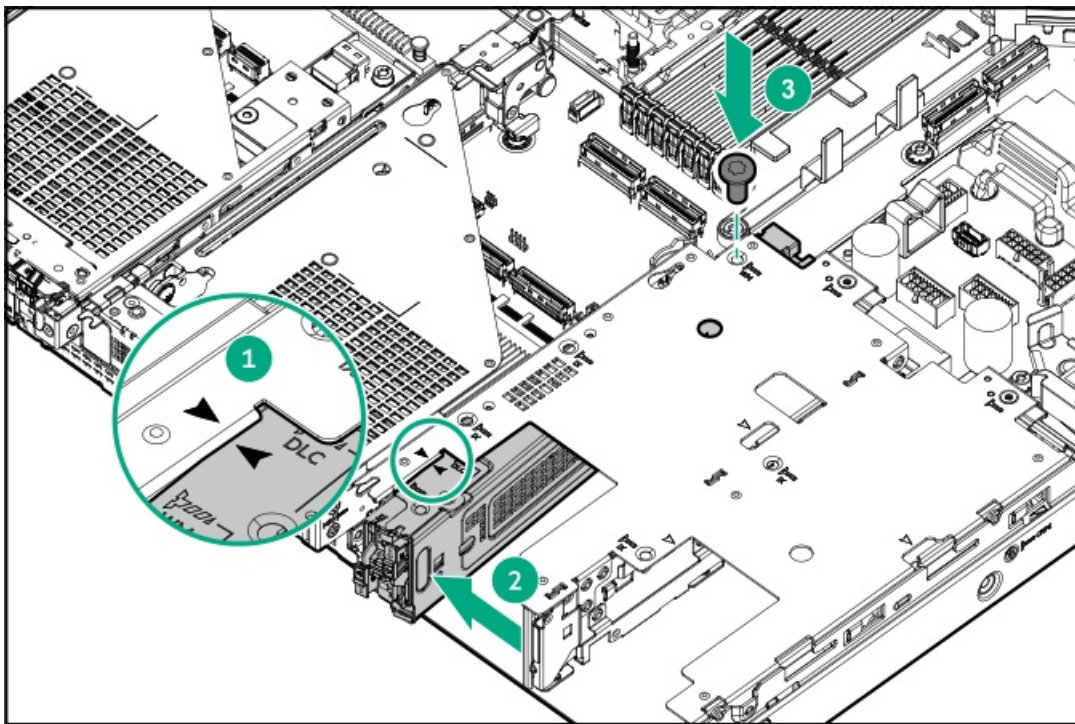
14. Install the boot device onto the bracket.

- a. Put the boot device against the bracket.
- b. Install the screws.



15. Connect the power and signal cables to the boot device.

16. Install the boot device.



17. Connect the cables to the system board.
18. Install the power supply.
19. Install the access panel.
20. Install the server into the rack.
21. Connect all peripheral cables to the server.
22. Connect each power cord to the server.
23. Power up the server.

Results

The installation procedure is complete.

Installing the HPE NS204i-u Boot Device V2 beside the low-profile riser cage

Prerequisites

Before beginning installation, make sure that the server is updated with the latest operating system firmware and drivers.

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

- T-10 Torx screwdriver
- Phillips No. 1 screwdriver

About this task



CAUTION

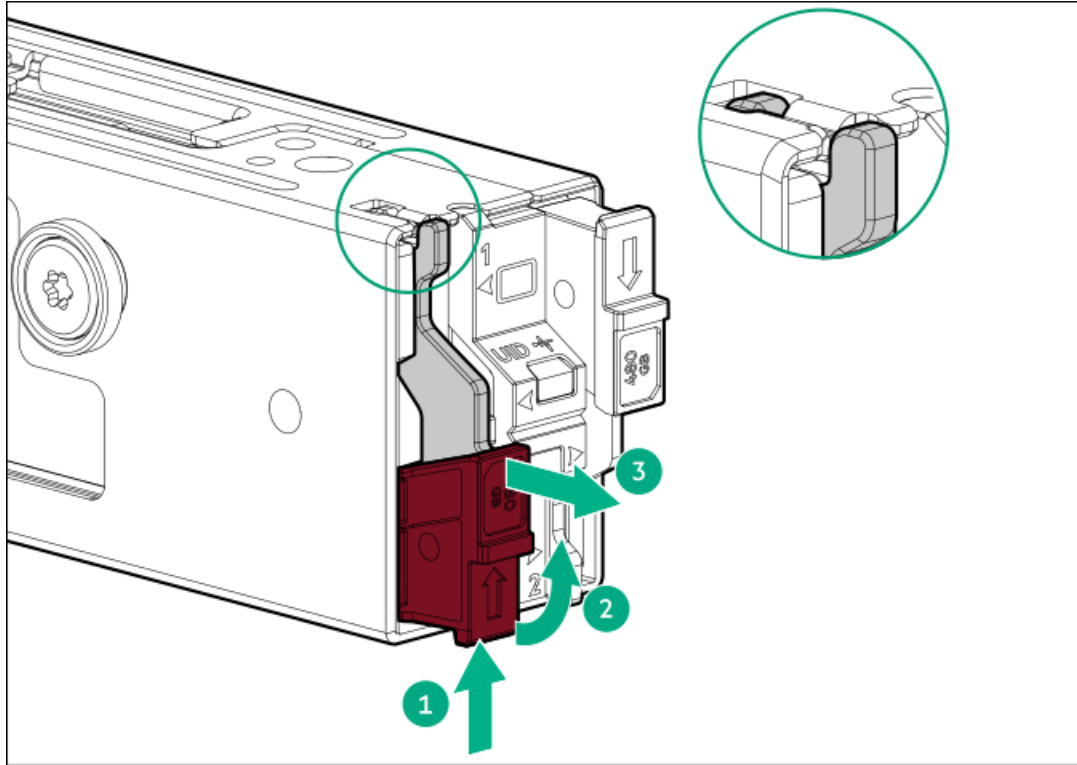
A discharge of static electricity from a finger or other conductor might damage system boards or other static-sensitive devices. To prevent damage, observe antistatic precautions.

Procedure

Installing drives onto the boot device

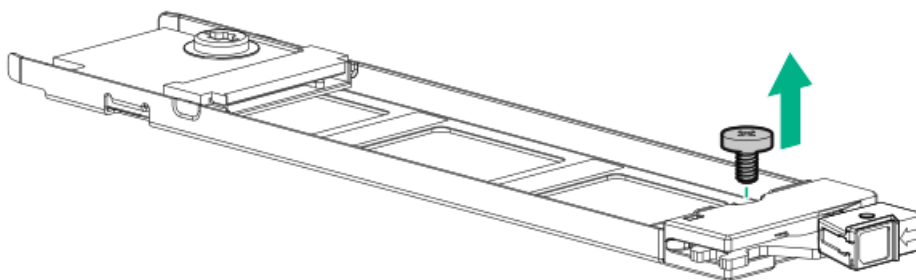
1. Remove the boot device carrier:

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

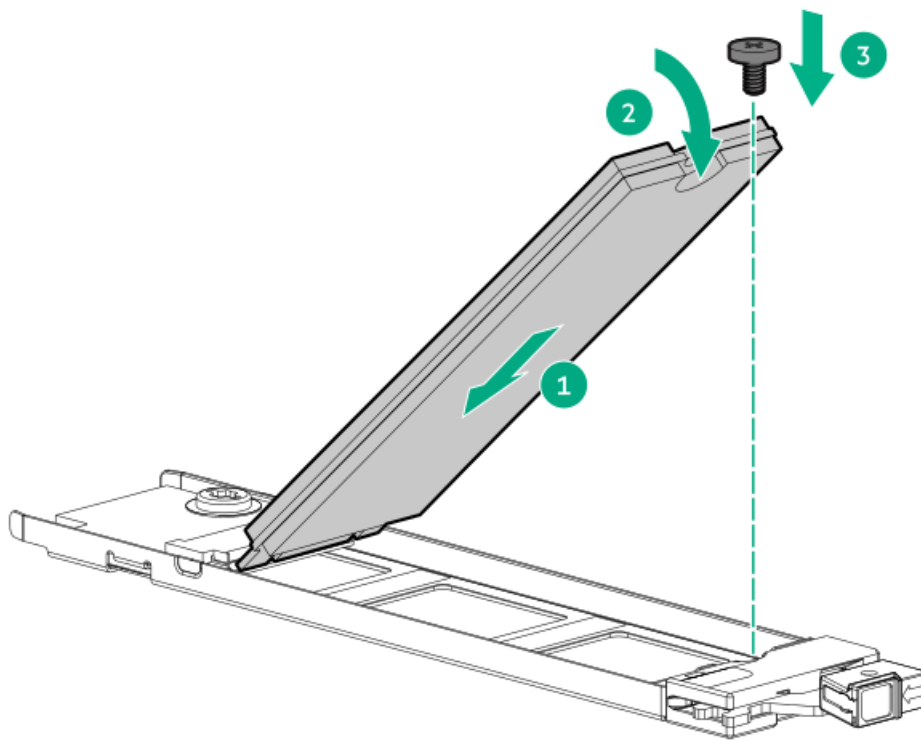


2. Install the SSD on the boot device carrier:

- a. Remove the SSD mounting screw.



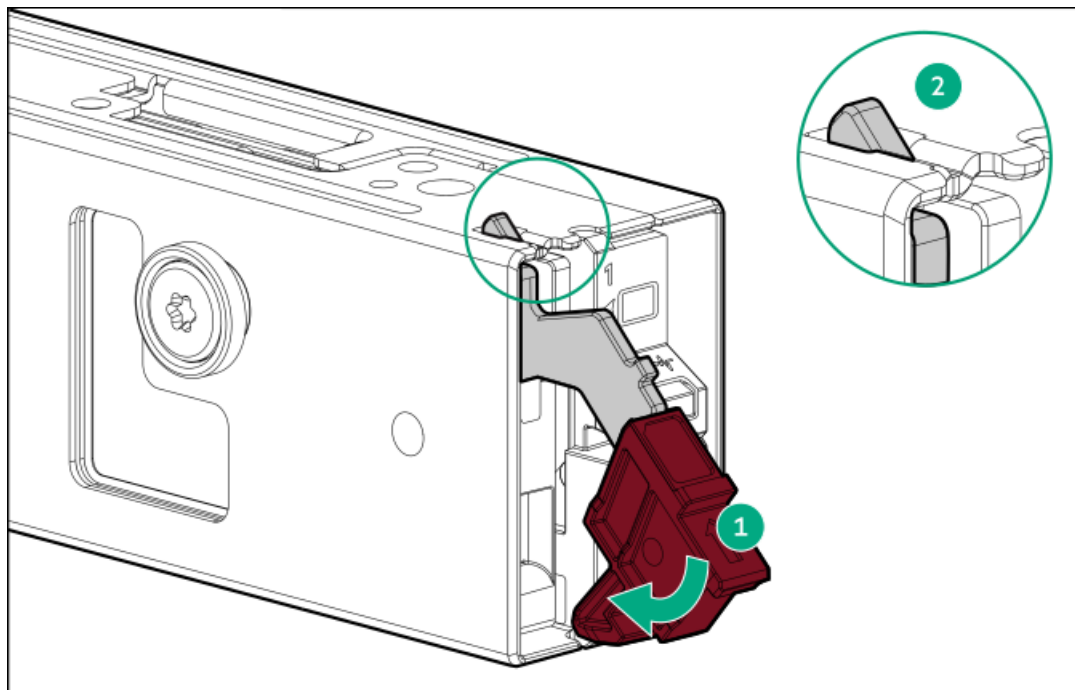
- b. Insert the SSD into the M.2 slot at a 45° angle.
- c. Carefully press the SSD down to the horizontal position.
- d. Install the SSD mounting screw.



3. Install the boot device carriers:

- a. If closed, pivot the carrier latch to open.
- b. Slide the carrier into the boot device cage.
- c. Pivot the latch to close.

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



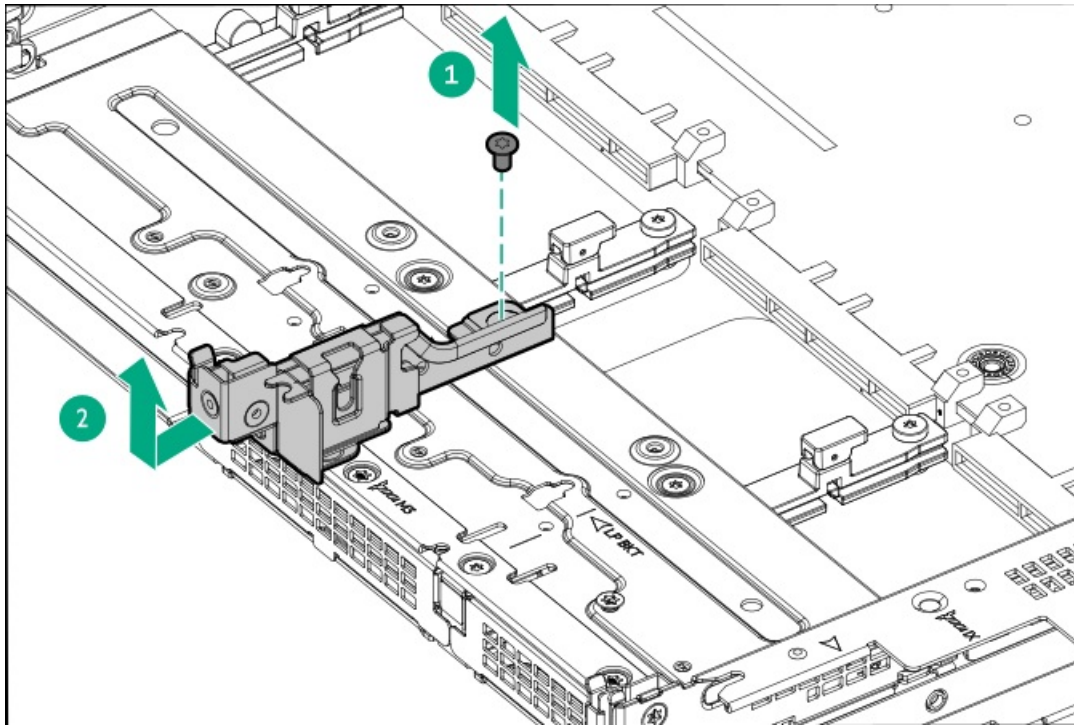
Installing the boot device

4. Power down the server.

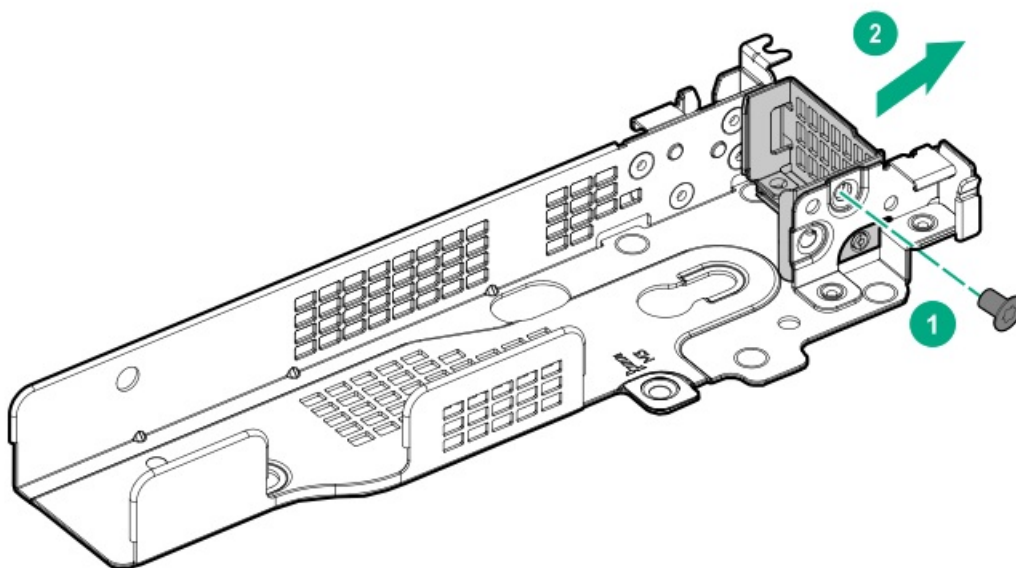
5. Remove all power:

- 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 riser cages.
11. Remove the riser bracket.

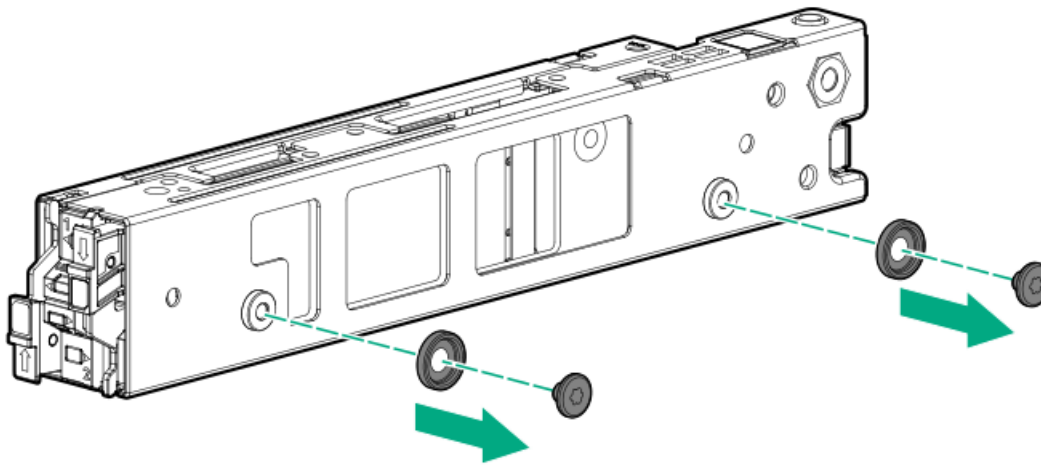


12. Remove the blank from the boot device bracket.



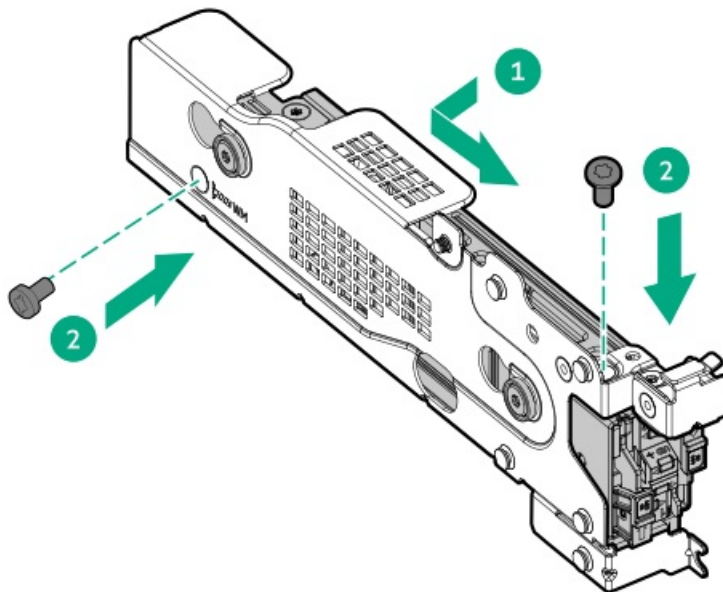
13. Remove the screws and spools on the boot device cage.

Retain the screws to secure the boot device.

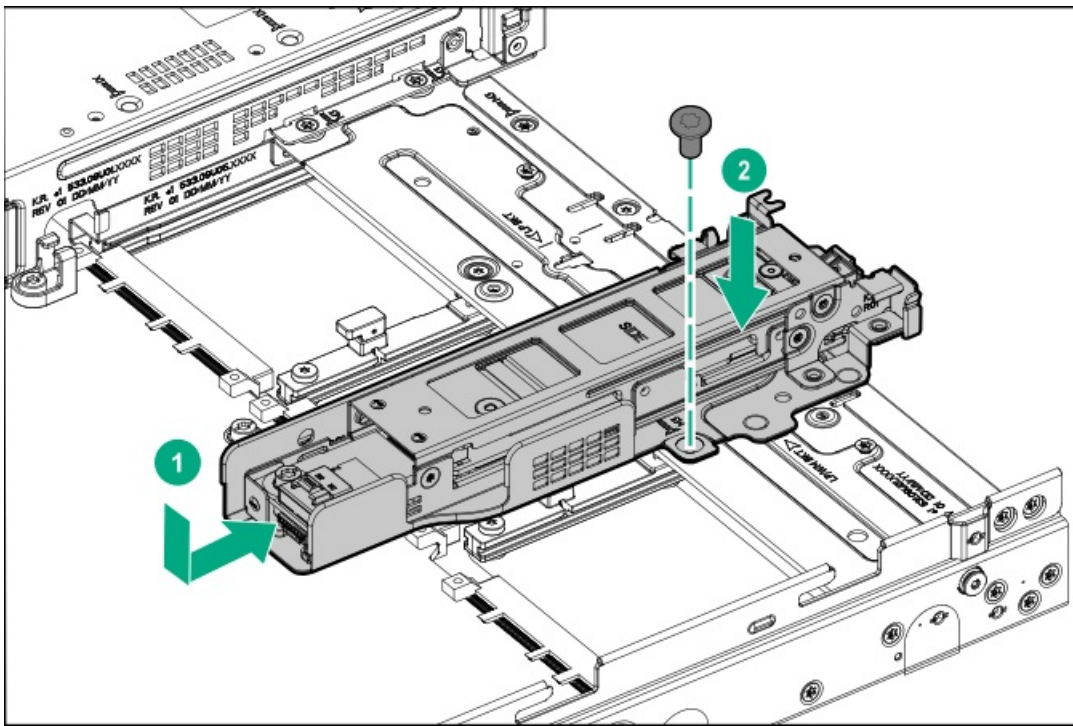


14. Connect the power and signal cables to the boot device.

15. Install the boot device onto the bracket.



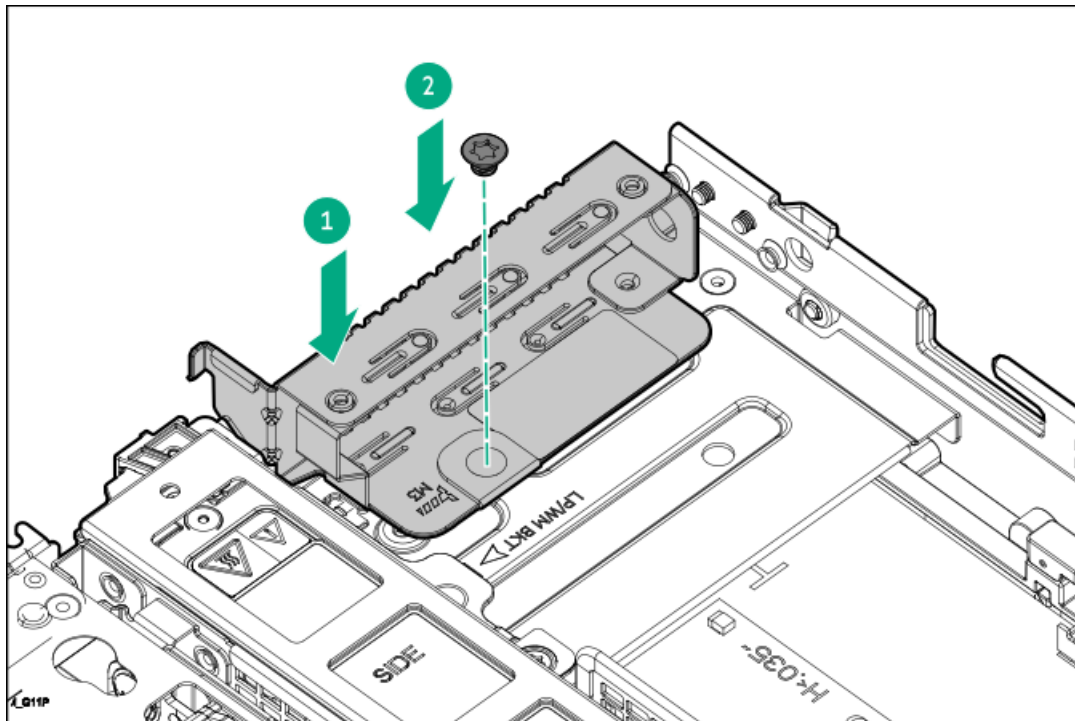
16. Install the boot device on the server.



17. Connect the cables to the system board.

18. Do one of the following:

- Install the low-profile riser cage
- Install the low-profile riser cage blank



19. Install the access panel.

20. Install the server into the rack.

21. Connect all peripheral cables to the server.

22. Connect each power cord to the server.



23. Power up the server.

Results

The installation procedure is complete.

Security

Subtopics

Installing the chassis intrusion detection switch

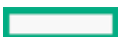
Installing the chassis intrusion detection switch

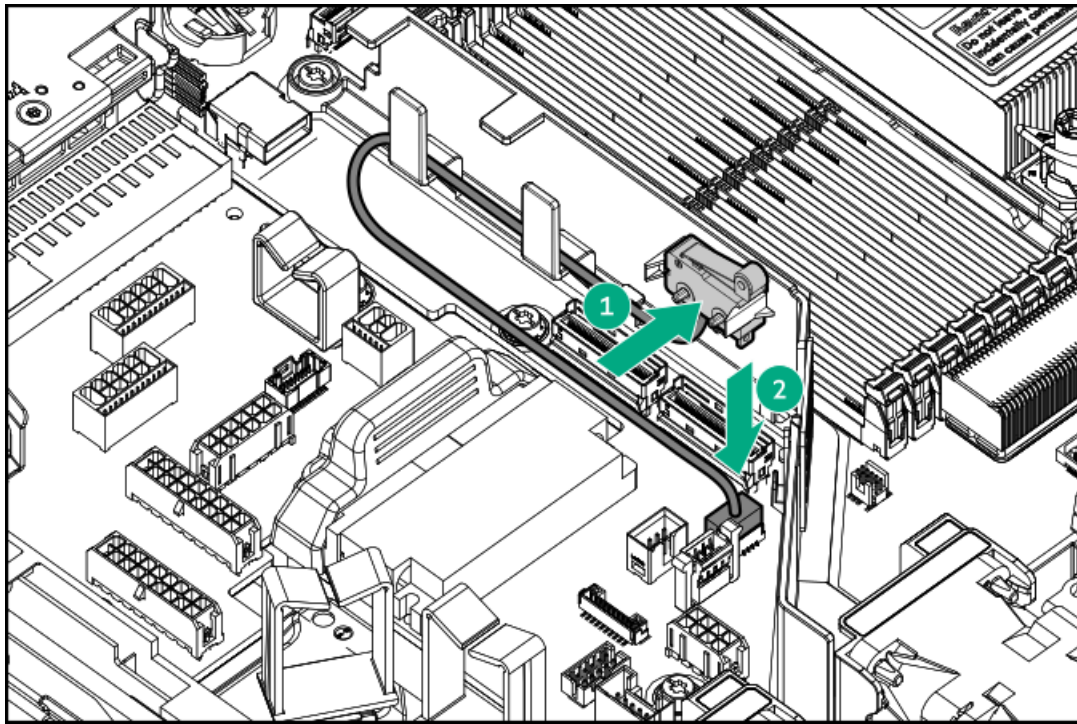
About this task

The chassis intrusion detection switch enables iLO to record an event in the Integrated Management Log (IML) 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.

Procedure

1. Power down the server.
2. Release 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. Disconnect the top storage controller cables.
9. Install the chassis intrusion detection switch:
 - a. Insert the alignment pins on the left DIMM guard through the holes on the switch.
 - b. Route the rest of the cable.





10. Install the access panel.
11. Install the server into the rack.
12. Connect all peripheral cables to the server.
13. Connect each power cord to the server.
14. Power up the server.

Results

The installation procedure is complete.

The System Intrusion Detection setting in the UEFI System Utilities is automatically enabled after installing the chassis intrusion detection switch. To view a log of intrusion events, use the iLO web interface to access the IML or the iLO event log. For more information, see the iLO user guide on the Hewlett Packard Enterprise website (<https://www.hpe.com/support/ilo-docs>).

Energy packs

Subtopics

[HPE Smart Storage Battery](#)

[HPE Smart Storage Hybrid Capacitor](#)

[Installing an energy pack](#)

HPE Smart Storage Battery

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 HPE Smart Storage Battery with the 145 mm cable.

For more information, see HPE Smart Storage Batteries and Hybrid Capacitors QuickSpecs:

https://www.hpe.com/psnow/doc/a00028553enw.pdf?jumpid=in_pdp-psnow-qs

HPE Smart Storage Hybrid Capacitor

The capacitor pack can support up to three devices.

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

Before installing the HPE 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.

For more information, see HPE Smart Storage Batteries and Hybrid Capacitors QuickSpecs:

https://www.hpe.com/psnow/doc/a00028553enw.pdf?jumpid=in_pdp-psnow-qs

Subtopics

[Minimum firmware versions](#)

Minimum firmware versions

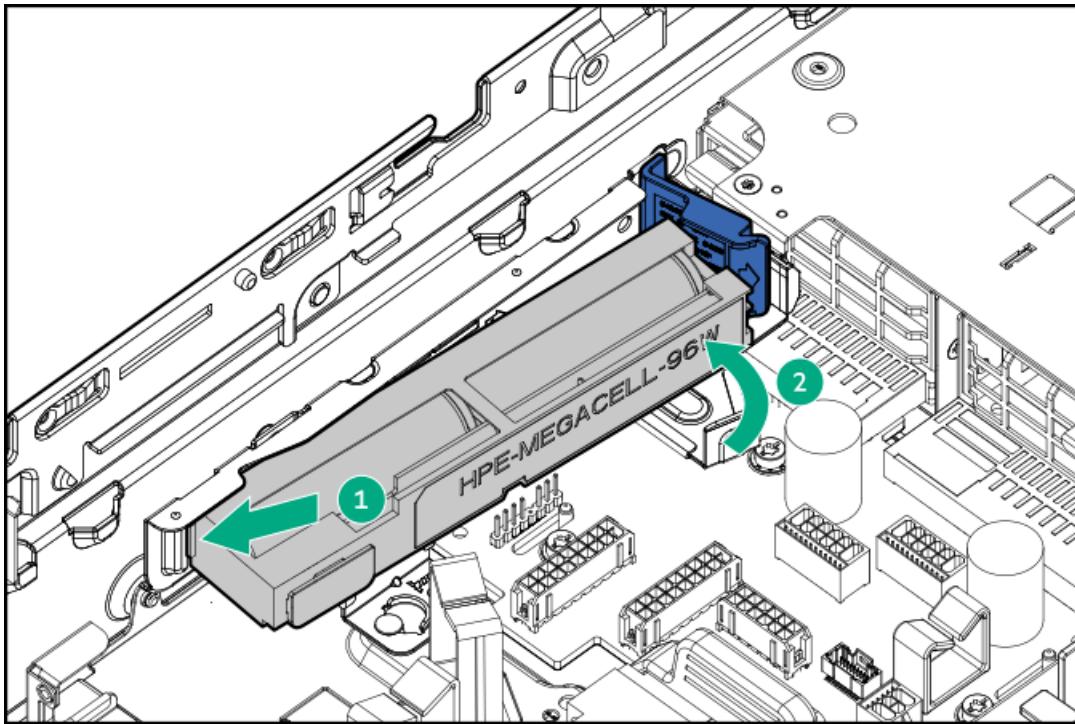
Product	Minimum firmware version
Server system ROM	1.20
HPE MR type-o and type-p Gen11 controllers	52.24.3-4948

Installing an energy pack

Procedure

1. [Power down the server.](#)
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Disconnect all peripheral cables from the server.
4. [Remove the server from the rack.](#)
5. Place the server on a flat, level work surface.
6. [Remove the access panel.](#)
7. Install the energy pack.





8. Cable the energy pack.
9. Install the access panel.
10. Install the server into the rack.
11. Connect all peripheral cables to the server.
12. Connect each power cord to the server.

Results

The installation procedure is complete.

Storage controllers

Subtopics

- Preparing the server for storage controller installation
- Installing a type-o storage controller
- Installing a type-p controller

Preparing the server for storage controller installation

Prerequisites

Before beginning this procedure, download the Service Pack for ProLiant from the Hewlett Packard Enterprise website (<https://www.hpe.com/servers/spp/download>).

Procedure

1. If the server was previously configured:
 - a. Back up data on the system.

- b. Close all applications.
- c. Ensure that users are logged off and that all tasks are completed on the server.



CAUTION

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

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

Installing a type-o storage controller

Prerequisites

The flash-backed write cache (FBWC) feature of some storage controllers requires the installation of an energy pack option. For more information, see the controller QuickSpecs on the Hewlett Packard Enterprise website (<https://www.hpe.com/info/quickspecs>).

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

- Compatible controller cable option
- T-10 Torx screwdriver

About this task



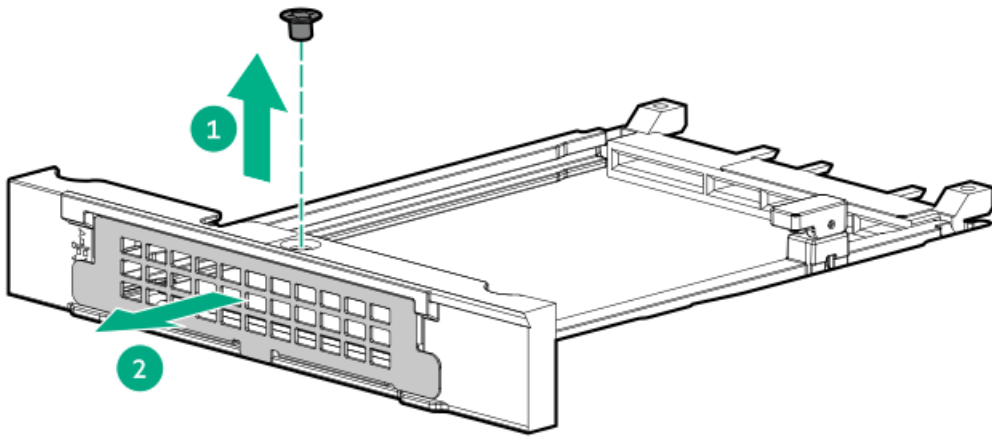
CAUTION

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

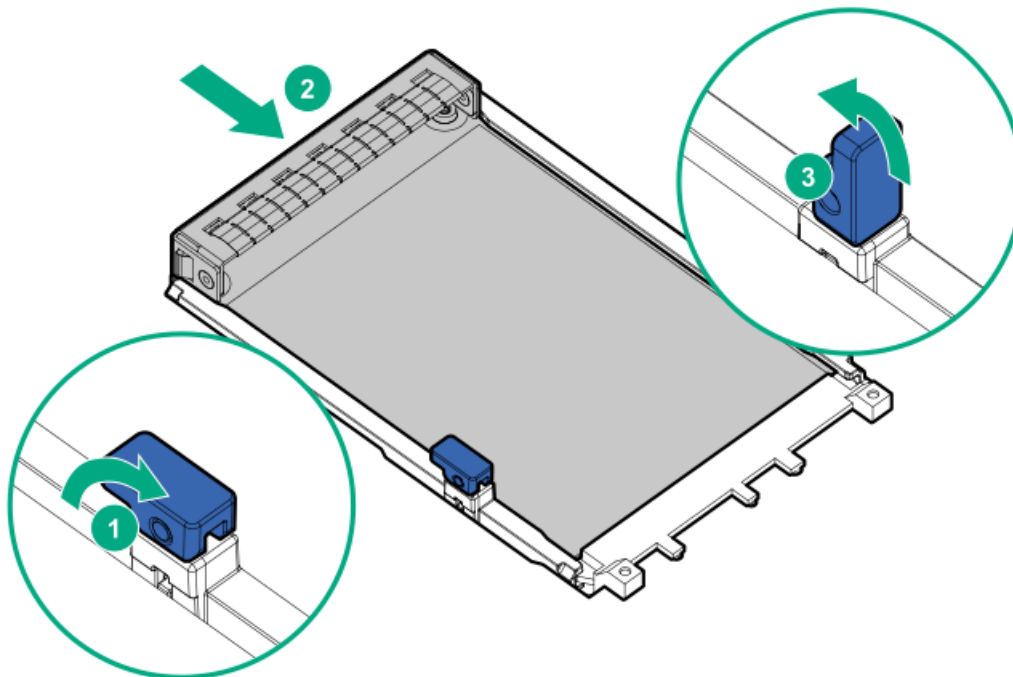
1. Power down the server.
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Disconnect all peripheral cables from the server.
4. Do one of the following:
 - a. Extend the server from the rack.
 - b. Remove the server from the rack.
5. Remove the access panel.
6. Remove the secondary riser cage.
7. Remove the OCP slot blank:
 - a. Remove the blank screw.
 - b. Remove the blank.

Retain the screw and blank for future use.



8. Install the type-o storage controller:

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



9. Cable the type-o storage controller.
10. Install the secondary riser cage.
11. Install the access panel.
12. Install the server into the rack.
13. Connect all peripheral cables to the server.
14. Connect each power cord to the server.

15. [Power up the server.](#)

Results

The installation procedure is complete.

Installing a type-p controller

Prerequisites

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

- 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

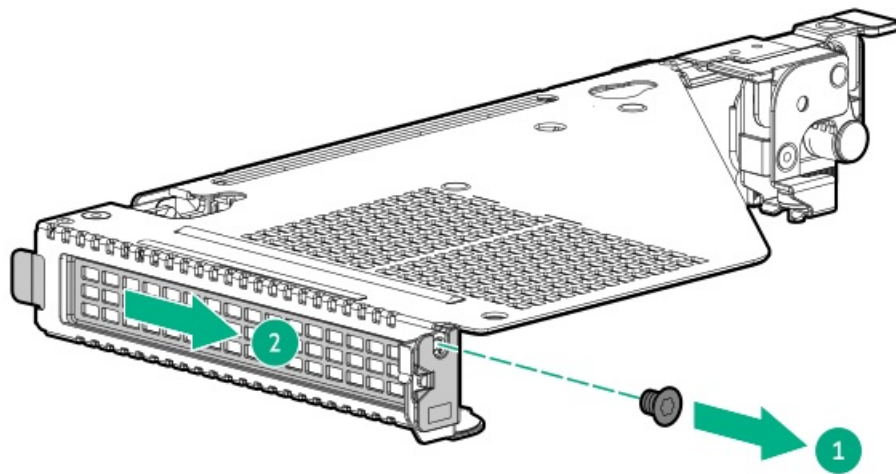
To prevent improper cooling and thermal damage, do not operate the server unless all PCIe slots have either a riser slot blank or an expansion card installed.

Procedure

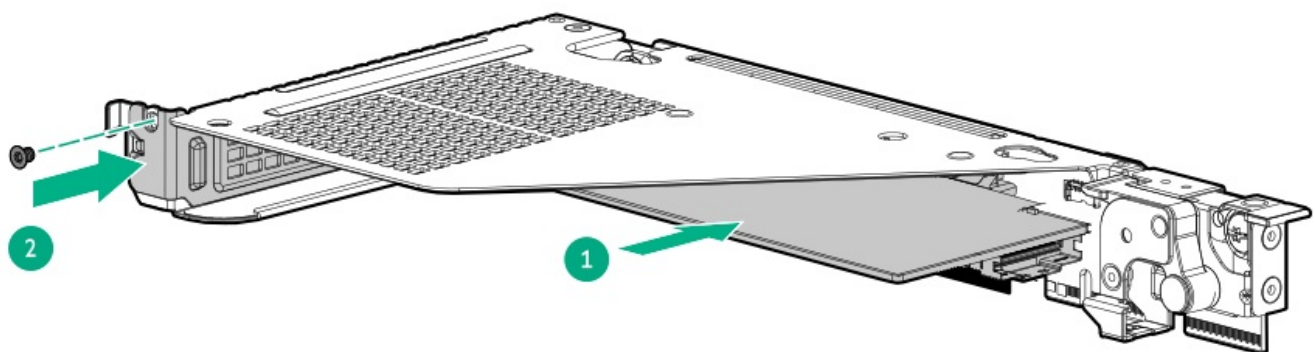
1. [Power down the server.](#)
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Disconnect all peripheral cables from the server.
4. Do one of the following:
 - a. [Extend the server from the rack.](#)
 - b. [Remove the server from the rack.](#)
5. [Remove the access panel.](#)
6. [Remove the riser cage.](#)
7. Remove the riser slot blank.

Retain the blank for future use.





8. Install the type-p storage controller:



9. Cable the type-p storage controller.

10. Install the riser cage.

11. Install the access panel.

12. Install the server into the rack.

13. Connect all peripheral cables to the server.

14. Connect each power cord to the server.

15. Power up the server.

Results

The installation procedure is complete.

Processors and heatsinks

Subtopics

Processor cautions

Installing a processor heatsink assembly

Processor cautions



CAUTION

To avoid damage to the processor or system board, only authorized personnel should attempt to replace or install the processor in this server.



CAUTION

To prevent possible server malfunction and damage to the equipment, multiprocessor configurations must contain processors with the same part number.



CAUTION

The pins on the processor socket and on the processor are very fragile and easily damaged . To avoid component damage, do not touch these pins. Any damage to them might require replacing the system board and/or processor.



IMPORTANT

Processor socket 1 must be populated at all times or the server does not function.



IMPORTANT

If installing a processor with a faster speed, update the system ROM before installing the processor. To download firmware, see [Updating firmware or system ROM](#).

Installing a processor heatsink assembly

Prerequisites

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

- T-10 Torx screwdriver
- T-30 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](#).

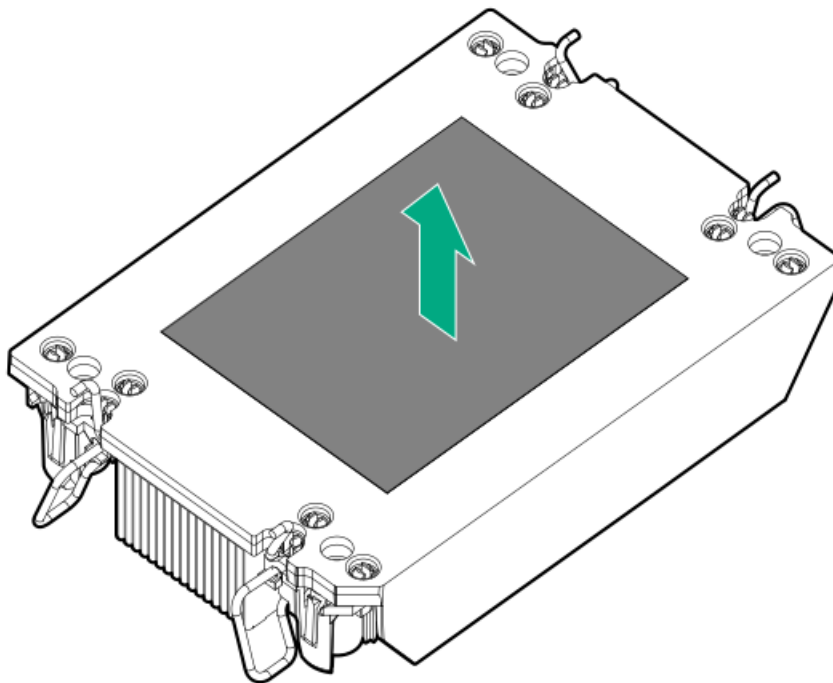
Procedure

1. [Power down the server](#).
2. If installed, [release 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 protective film from the thermal interface material.

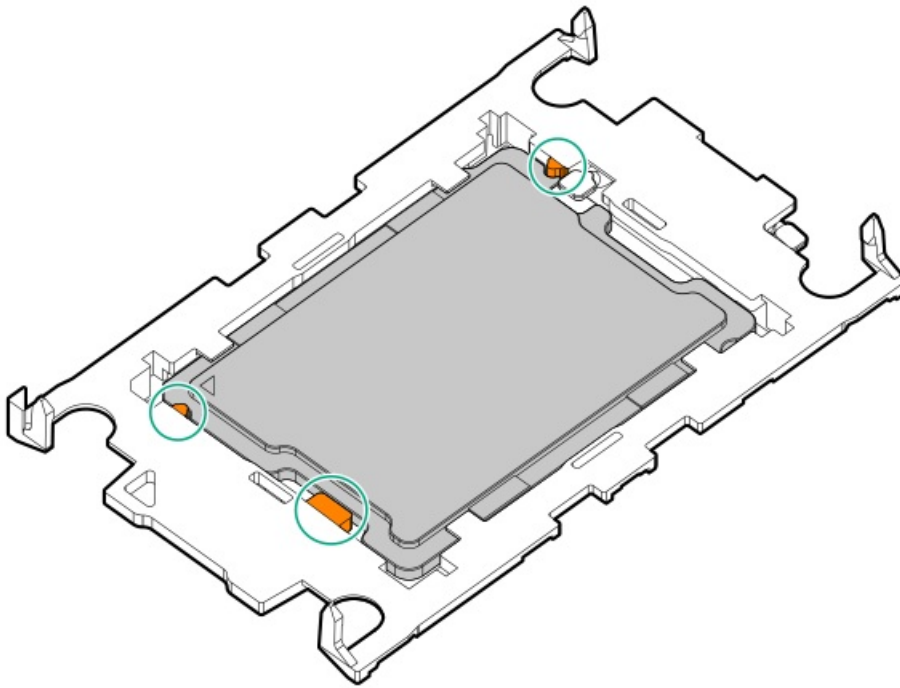
**CAUTION**

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



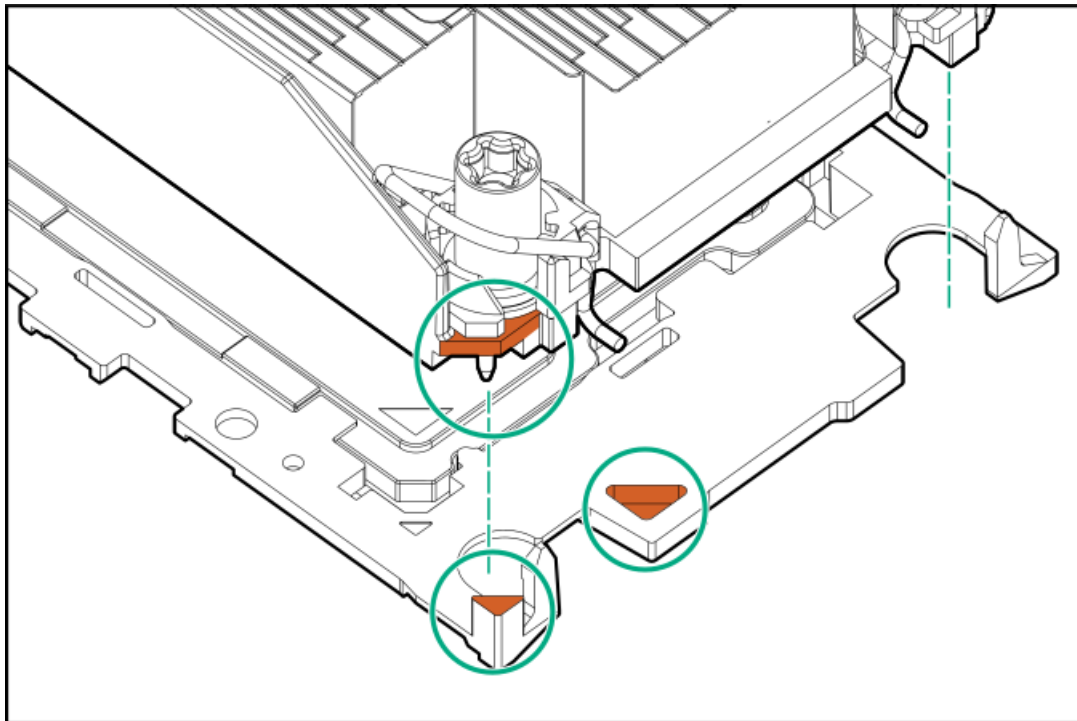
9. Verify that the processor is securely latched to the processor carrier.

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



10. Attach the heatsink to the processor carrier:

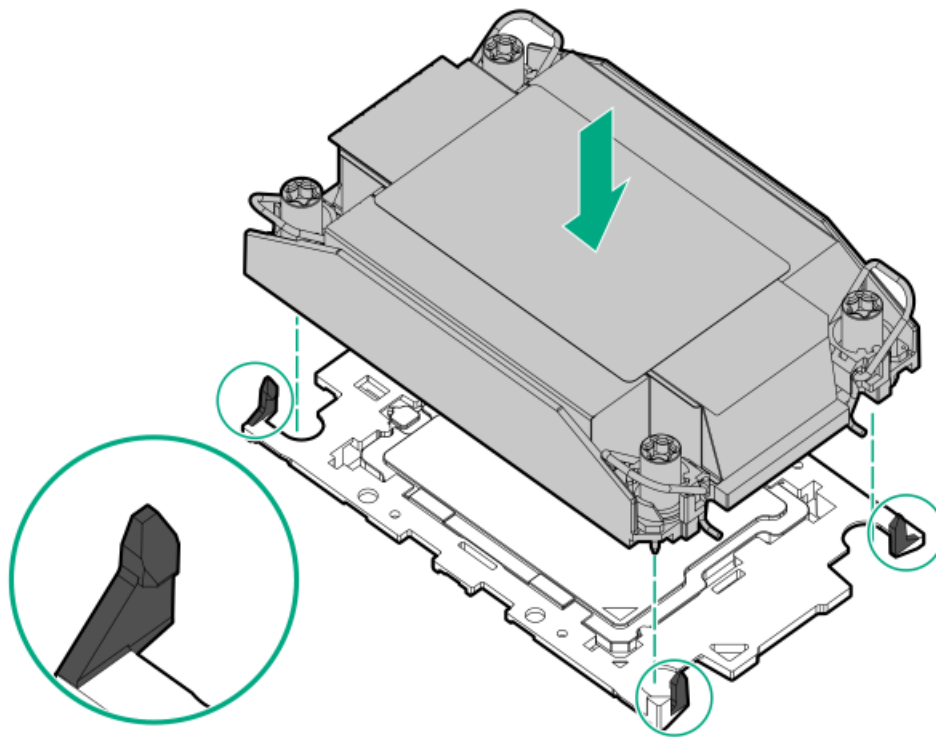
- a. Align the pin 1 indicator on the processor carrier with that on the heatsink.



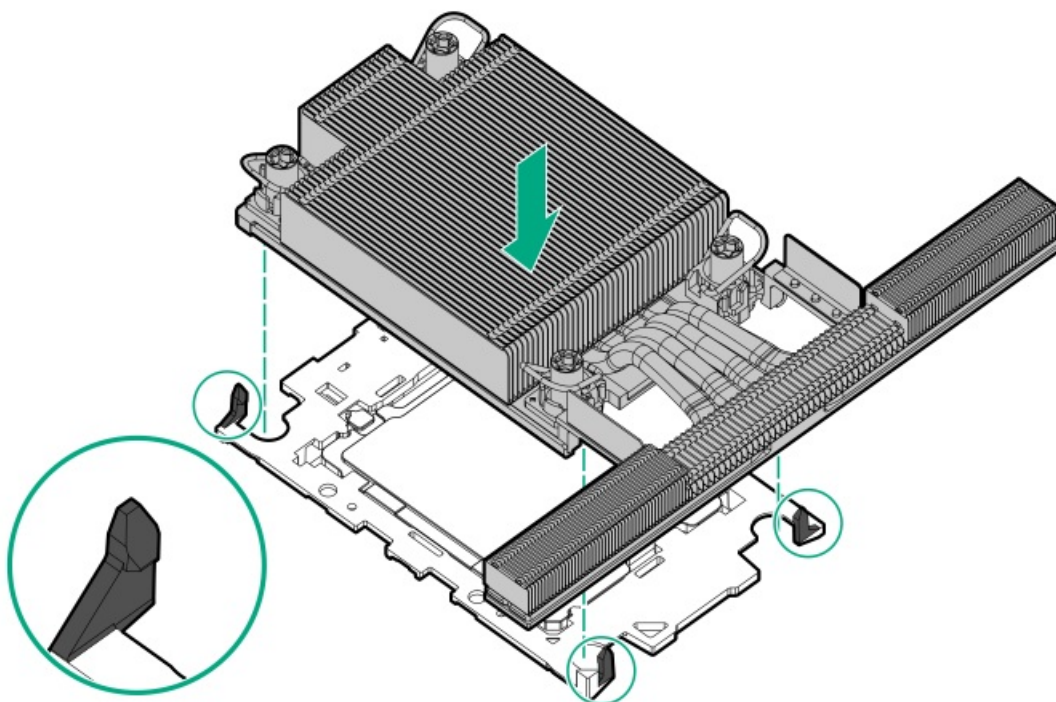
- b. Lower the heatsink on the processor carrier until the carrier tabs snap into place.

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

- Standard heatsink

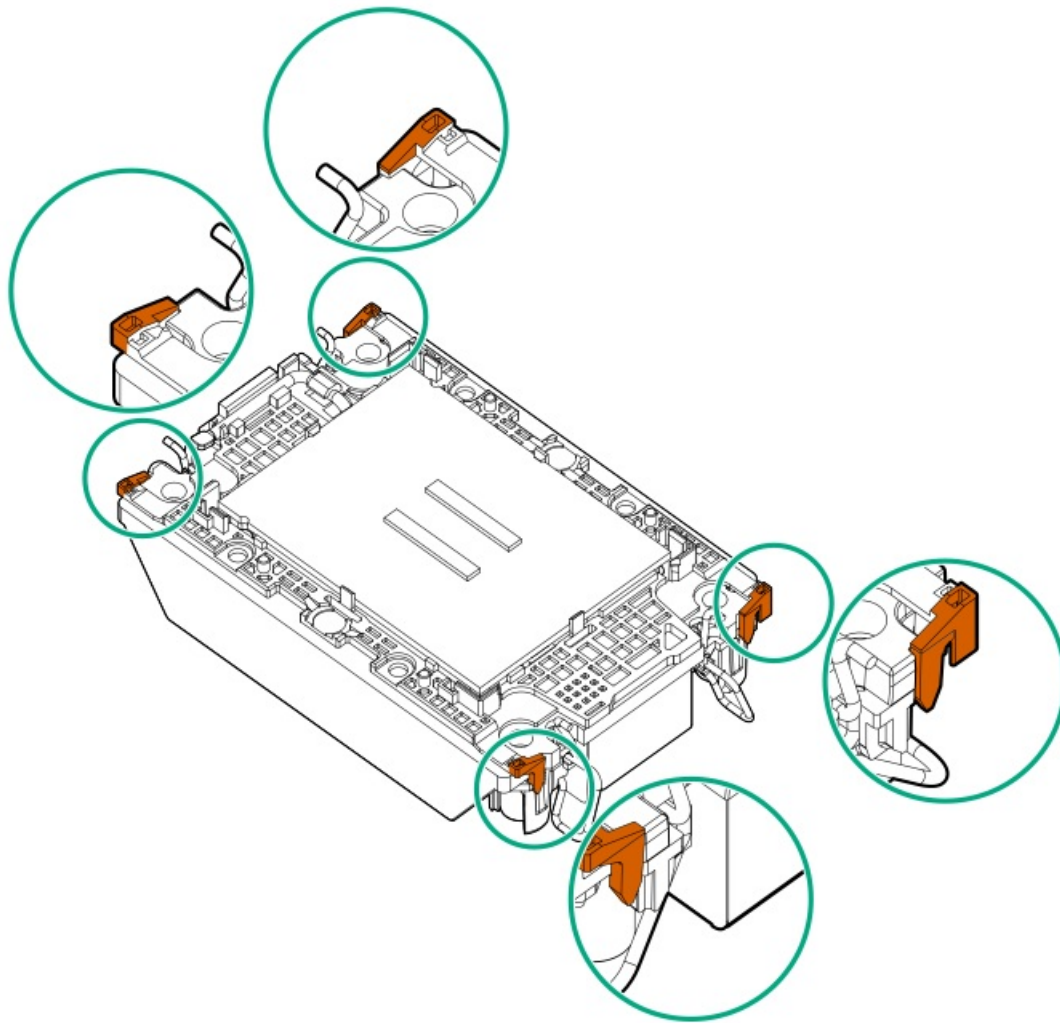


- Performance heatsink

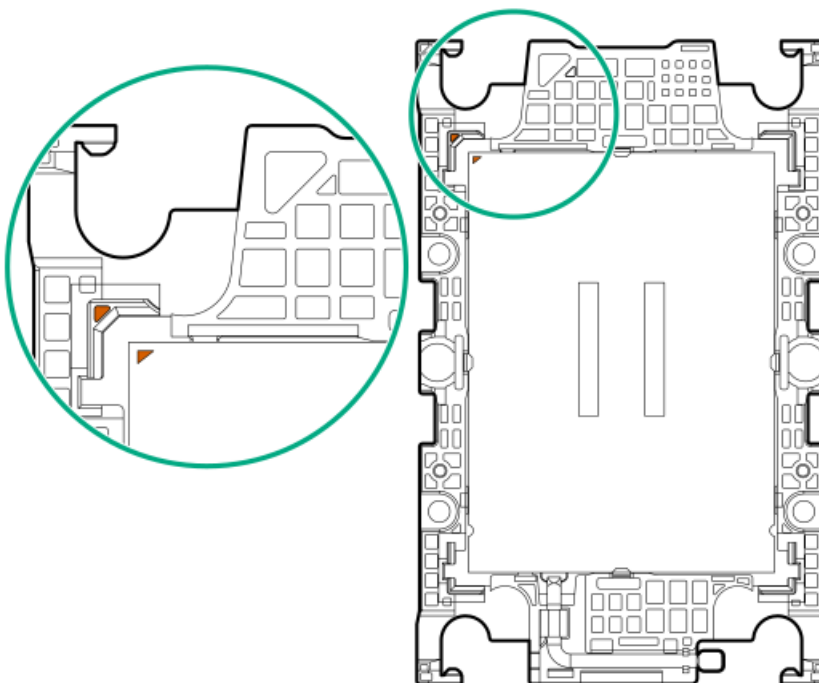


11. Perform the following verification steps:

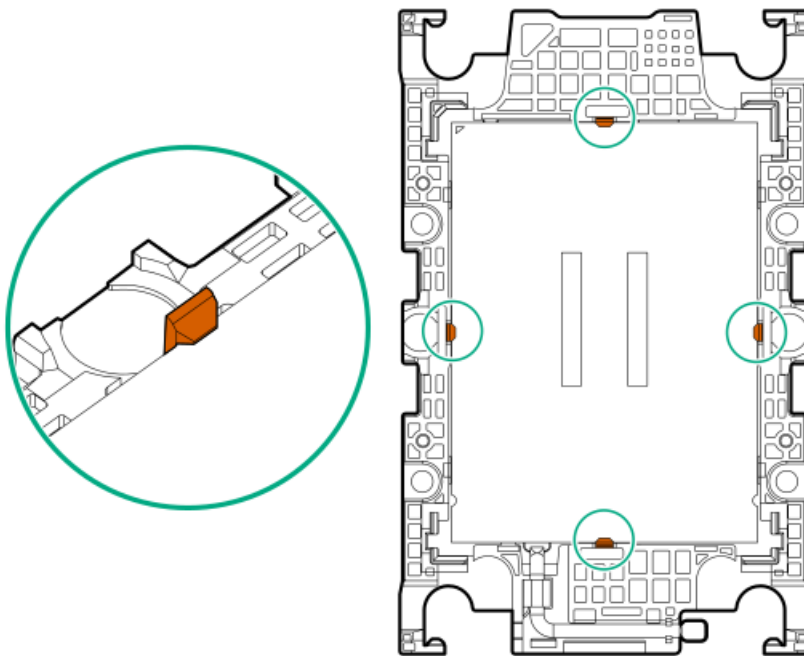
- Verify that the tabs on the processor carrier are securely latched on the heatsink.



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



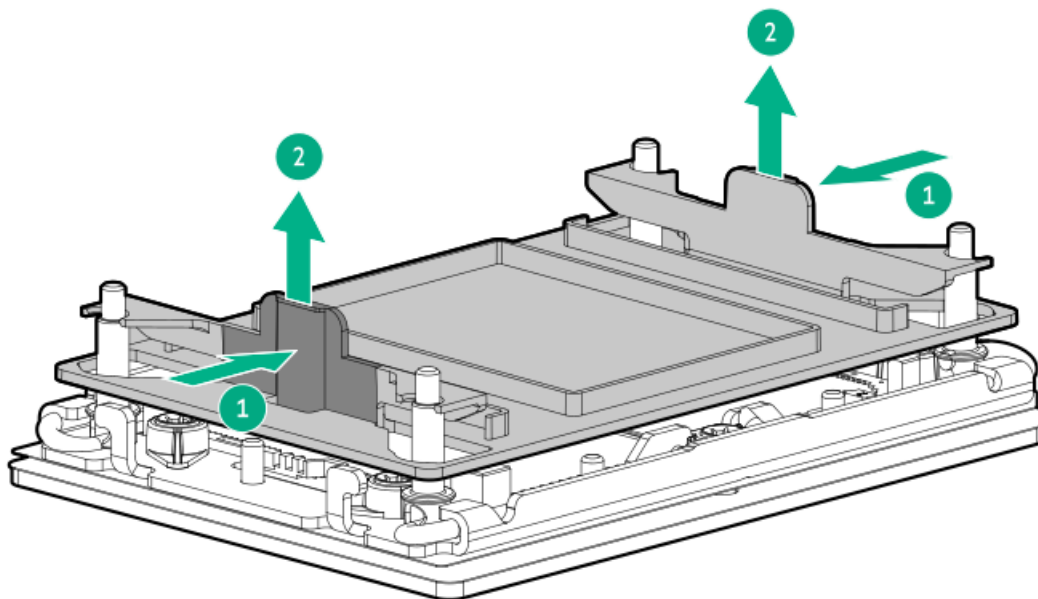
- c. Verify that the processor is properly secured by the carrier snaps.



12. Remove the dust cover from the processor socket:

- a. Press and hold the grip tabs on the dust cover.
- b. Lift the dust cover away from the bolster plate.

Retain the cover for future use.



13.



CAUTION

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

Install the processor-heatsink module:

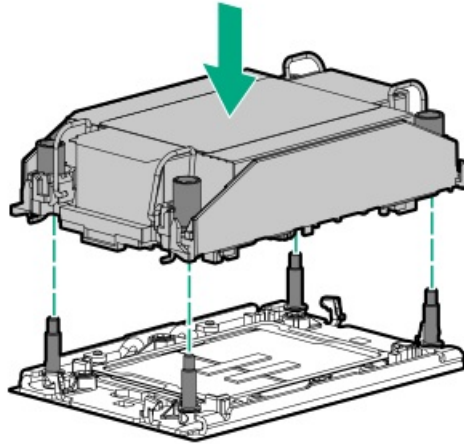
- a. When using a torque wrench to tighten the heatsink screws, set 0.9 N-m (8 in-lb) of torque.



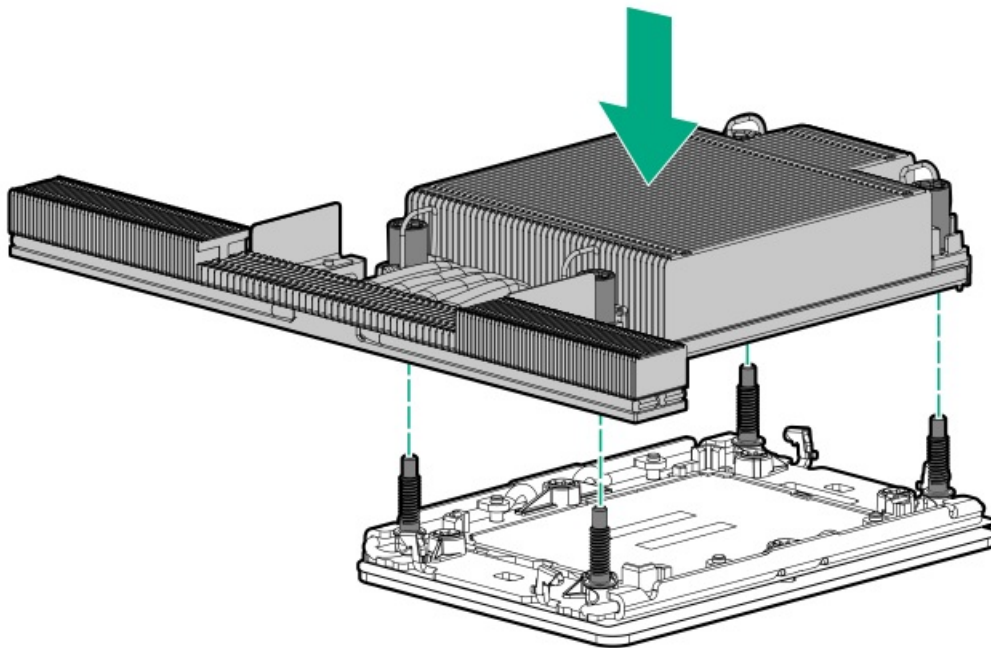
- b. Note the **Front of server** text on the heatsink label to correctly orient the processor-heatsink module over the bolster plate.
- c. Carefully lower the processor-heatsink module straight down onto the bolster plate guide posts.

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

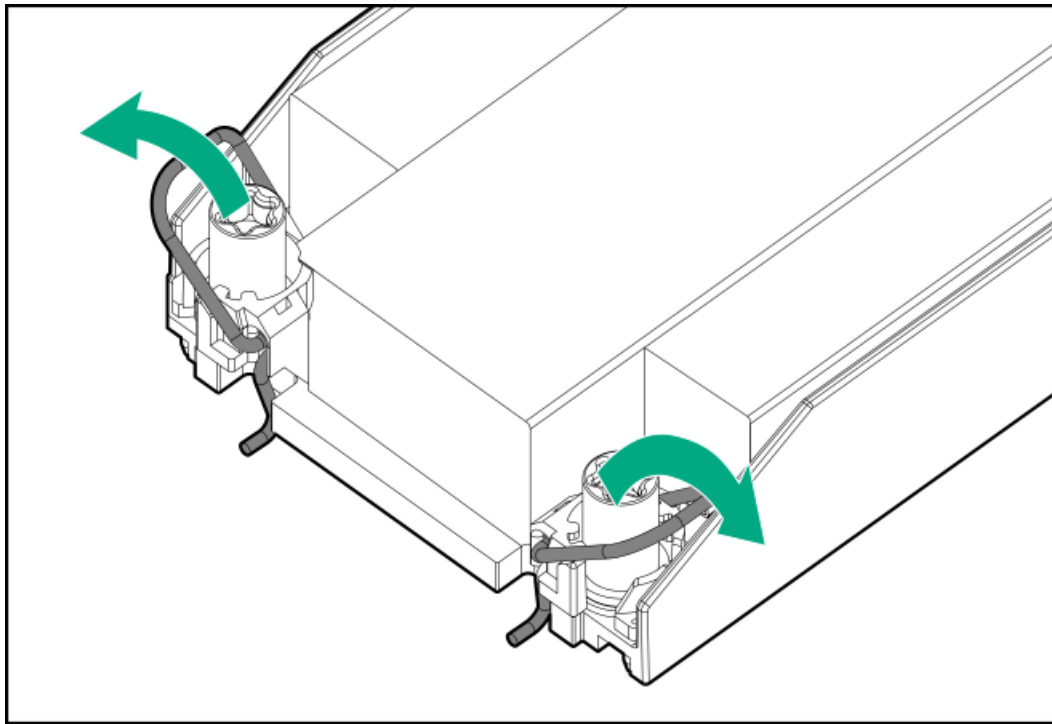
- Standard heatsink



- Performance heatsink

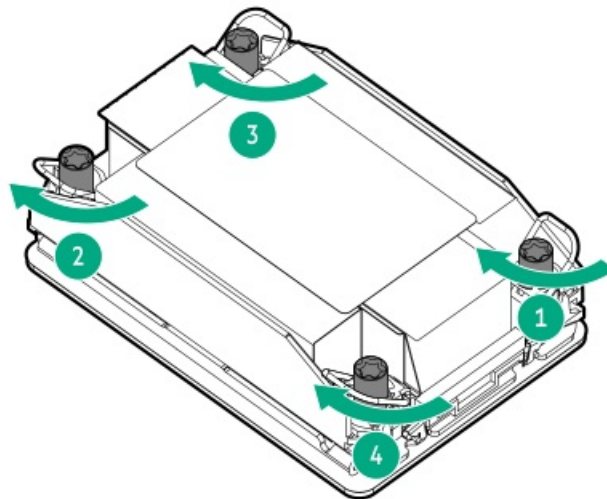


- d. Set the anti-tilt wires to the locked position.

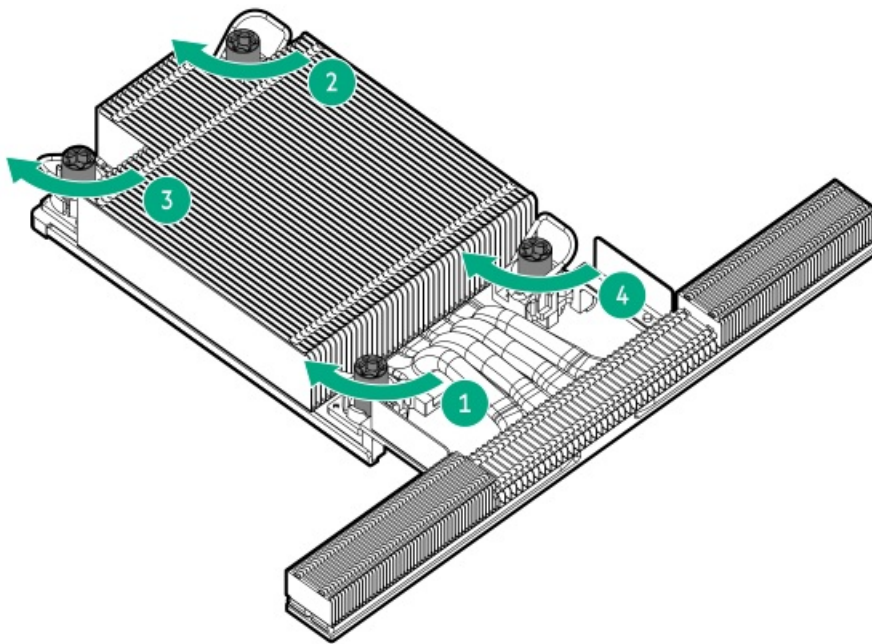


e. Tighten one pair of diagonally opposite heatsink screws, and then tighten the other pair of heatsink screws.

- Standard heatsink



- Performance heatsink



14. Install the access panel.
15. Install the server into the rack.
16. Connect all peripheral cables to the server.
17. Connect each power cord to the server.
18. Power up the server.

Results

The installation procedure is complete.

Internal USB device option

The server has an internal USB 2.0 port to install a USB device that can be used as a flash boot media or for data backup/redundancy.

Subtopics

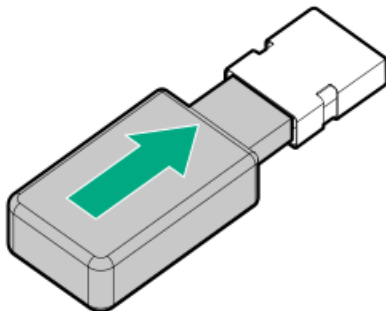
Installing an internal USB device

Installing an internal USB device

Procedure

1. Power down the server.
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.

3. Disconnect all peripheral cables from the server.
4. Do one of the following:
 - a. Extend the server from the rack.
 - b. Remove the server from the rack.
5. Remove the access panel.
6. Locate the internal USB port.
7. Plug in the USB device into the USB port.



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

Results

The installation procedure is complete.

Cabling

This chapter includes cabling guidelines and diagrams for internal component cabling.

Subtopics

- Cabling guidelines
- Internal cabling management
- Cabling diagrams
- Storage cabling
- Fan cabling
- Closed-loop liquid cooling heatsink cabling
- HPE NS204i-u Boot Device V2 cabling
- GPU cabling
- Serial port cabling
- Optical drive cabling
- Display port cabling
- Systems Insight Display cabling
- Front OCP NIC and PHY board cabling
- Rear OCP upgrade cabling

Cabling guidelines

Observe the following:



NOTE

The colors in the cabling diagrams are for illustration purposes only.

- For cable option kits, see the product QuickSpecs.
- For cable spare part numbers, see the Illustrated parts catalog in the maintenance and service guide.
- Some diagrams show alphabetical callouts such as A, B, C, etc. These callouts correspond to labels near the connectors on the cable.
- Some cables have more than one connector, such as a Y-cable, but not all connectors are used.
- Observe all guidelines when working with server cables.

Before connecting cables

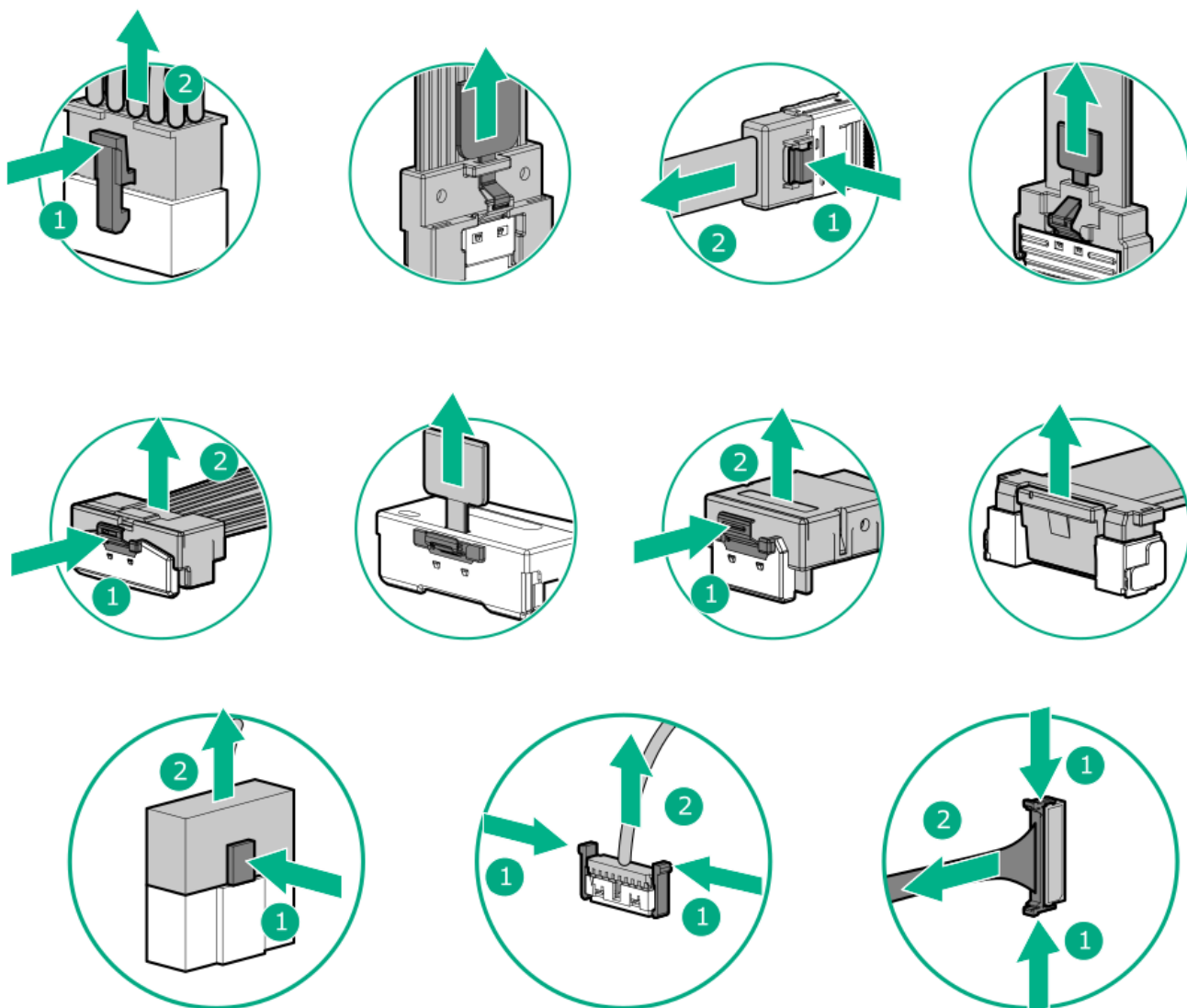
- Note the port labels on the PCA components. Not all these components are used by all servers:
 - System board ports
 - Drive and power supply backplane ports
 - Expansion board ports (controllers, retimers, adapters, expanders, risers, and similar boards)
- Note the label near each cable connector.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

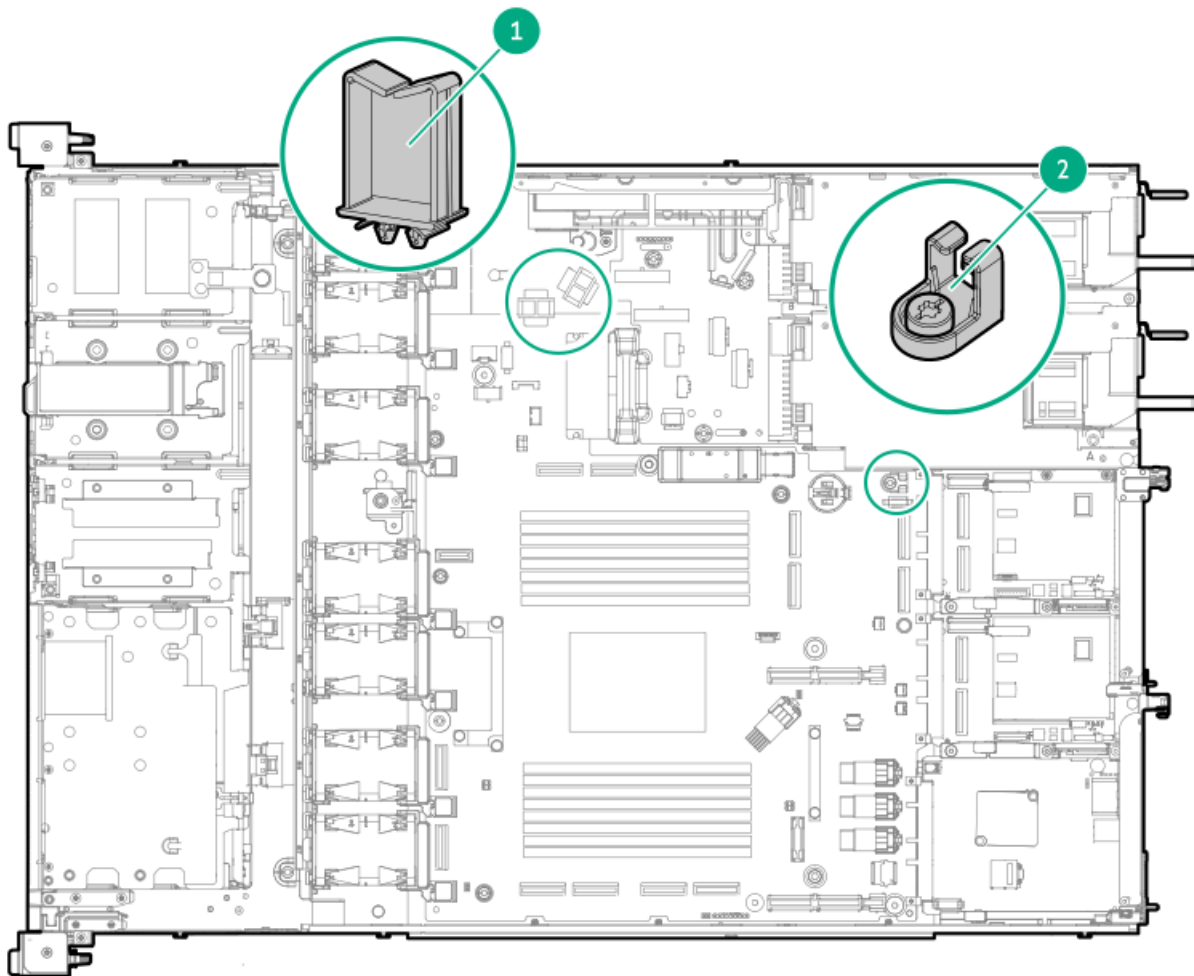
When disconnecting cables

- 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.

Internal cabling management



Item	Description
1	Cable clips
2	Serial port cable clamp

Cabling diagrams

Observe the following:

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

Component cabling	Cable part number
Drive power cabling	—
2 SFF drive power cabling	P54591-001
8 SFF drive power cabling	P71911-001
Mixed drive power cabling	<ul style="list-style-type: none"> • P75582-001 • P75586-001

Component cabling	Cable part number
4 LFF drive power cabling	P75584-001
12 LFF drive power cabling	<ul style="list-style-type: none"> • P75585-001 • P75584-001 • P75583-001
GPU-optimized drive power cabling	P75582-001
SFF drive controller cabling	—
8 SFF drive: Direct-attached cabling	P75908-001
8 SFF drive: Type-p controller cabling	P75590-001
8 SFF drive: Direct attached cabling	<ul style="list-style-type: none"> • P71912-001 • P71910-001
8 + 2 SFF drive: Primary type-p controller cabling	<ul style="list-style-type: none"> • P45611-001 • P53972-001
2 SFF drive: Secondary riser connector cabling	P74810-001
8 + 2 SFF drive: Type-o controller cabling	<ul style="list-style-type: none"> • P48961-001 • P48960-001
LFF drive controller cabling	—
4 LFF drive: Type-o controller cabling	P53989-001
4 LFF drive: Primary type-p controller cabling	P54931-001
12 LFF drive: Primary type-p controller cabling	<ul style="list-style-type: none"> • P54930-001 • P54931-001
12 LFF drive: Type-o controller cabling	<ul style="list-style-type: none"> • P54928-001 • P53989-001
E3.S drive controller cabling	—
8 E3.S drive: Direct-attached cabling	P75592-001
8 E3.S drive: Primary and secondary riser connector cabling	<ul style="list-style-type: none"> • P75580-001 • P75577-001
4 SFF drive with a GPU riser cage: Primary riser type-p controller cabling	P75588-001
8 E3.S drive with a GPU riser cage: Secondary riser type-p controller cabling	<ul style="list-style-type: none"> • P75590-001 • P75575-001

Component cabling	Cable part number
16 E3.S drive: Primary and secondary riser connector cabling	<ul style="list-style-type: none"> • P75592-001 • P75580-001 • P75577-001 • P75578-001 • P75579-001
4/16 E3.S drive: Primary type-p controller cabling	P75590-001
4/16 E3.S drive: Secondary type-p controller cabling	P75590-001
20 E3.S drive: Direct-attached cabling	<ul style="list-style-type: none"> • P75592-001 • P75576-001 • P75504-001 • P75505-001
20 E3.S drive: Type-p controller cabling	P75593-001
Mixed drive controller cabling	—
8 SFF drive: Type-o controller cabling	P75589-001
8 SFF + 4 E3.S drive: Onboard SAS/SATA/NVMe cabling	P75594-001
8 SFF + 4 E3.S drive: Type-p controller cabling	P75590-001
10 SFF drive: Direct attached cabling	<ul style="list-style-type: none"> • P75592-001 • P75580-001
GPU-optimized configuration drive controller cabling	—
4 SFF drive: Type-o controller cabling	<ul style="list-style-type: none"> • P75587-001 • P75589-001
4 SFF/16 E3.S drive: Primary type-p controller cabling	P75588-001
8 E3.S drive: Primary and secondary riser connector cabling	P75580-001
HPE NS204i-u Boot Device V2 cabling	—
HPE NS204i-u Boot Device V2 cabling with the boot device installed in the power supply bay	<ul style="list-style-type: none"> • P72024-001 • P63720-001
HPE NS204i-u Boot Device V2 cabling with the boot device installed next to the low-profile riser cage	<ul style="list-style-type: none"> • P63720-001 • P71913-001
HPE NS204i-u Boot Device V2 cabling with the boot device installed in box 3	<ul style="list-style-type: none"> • P48956-001 • P74730-001
4 LFF drive: HPE NS204i-u Boot Device V2 cabling with the boot device installed on the chassis	<ul style="list-style-type: none"> • P48956-001 • P72024-001

Component cabling	Cable part number
GPU-optimized configuration: HPE NS204i-u Boot Device V2 cabling with the boot device installed on the chassis	<ul style="list-style-type: none"> • P48956-001 • P74730-001
GPU cabling	—
GPU auxiliary power cabling	P75256-001
GPU riser power cabling	P75594-001
GPU riser signal cabling	<ul style="list-style-type: none"> • P71886-001 • P73415-001
Optical drive and DisplayPort cabling	—
8 SFF and mixed drive optical drive cabling	P73776-001
4 LFF drive optical drive cabling	P73776-001
SFF and E3.S drive DisplayPort cabling	P73948-001
LFF drive DisplayPort cabling	P73948-001
OCP cabling	—
Rear OCP upgrade cabling	<ul style="list-style-type: none"> • P75506-001 • P75507-001 • P73494-001
Front OCP NIC and PHY board cabling	—
Primary OCP	<ul style="list-style-type: none"> • P71941-001 • P73927-001
Secondary OCP	P71941-001
Rich I/O configuration: Primary OCP	<ul style="list-style-type: none"> • P71941-001 • P73927-001
Rich I/O configuration: Secondary OCP	P71941-001
Serial port cabling	—
Serial port cabling with the 60 mm power supply	<ul style="list-style-type: none"> • P73744-001 • P71826-001
Serial port cabling with the 73.5 mm power supply	<ul style="list-style-type: none"> • P73744-001 • P71826-001
Front I/O cabling	—
SFF / E3.S / 4 LFF drive	P71909-001
12 LFF drive front I/O cabling	P73417-001
Mixed drive front I/O cabling	P73417-001
Miscellaneous cabling	—
Fan cabling	P71914-001
System Insight Display cabling	P48971-001

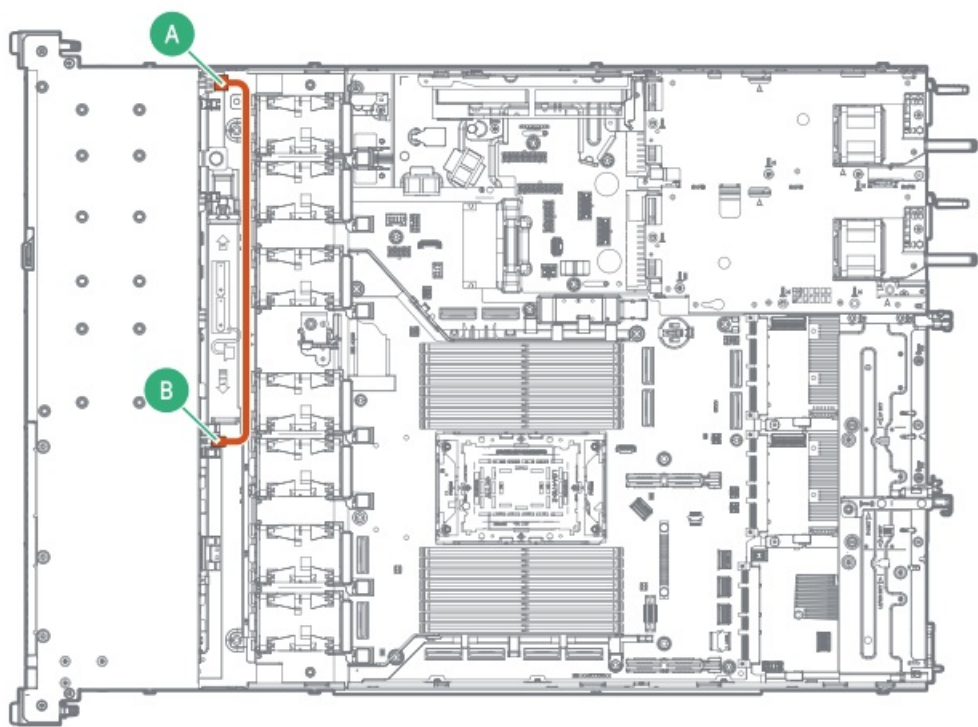
Storage cabling

- Subtopics
- Drive power cabling

Storage controller cabling

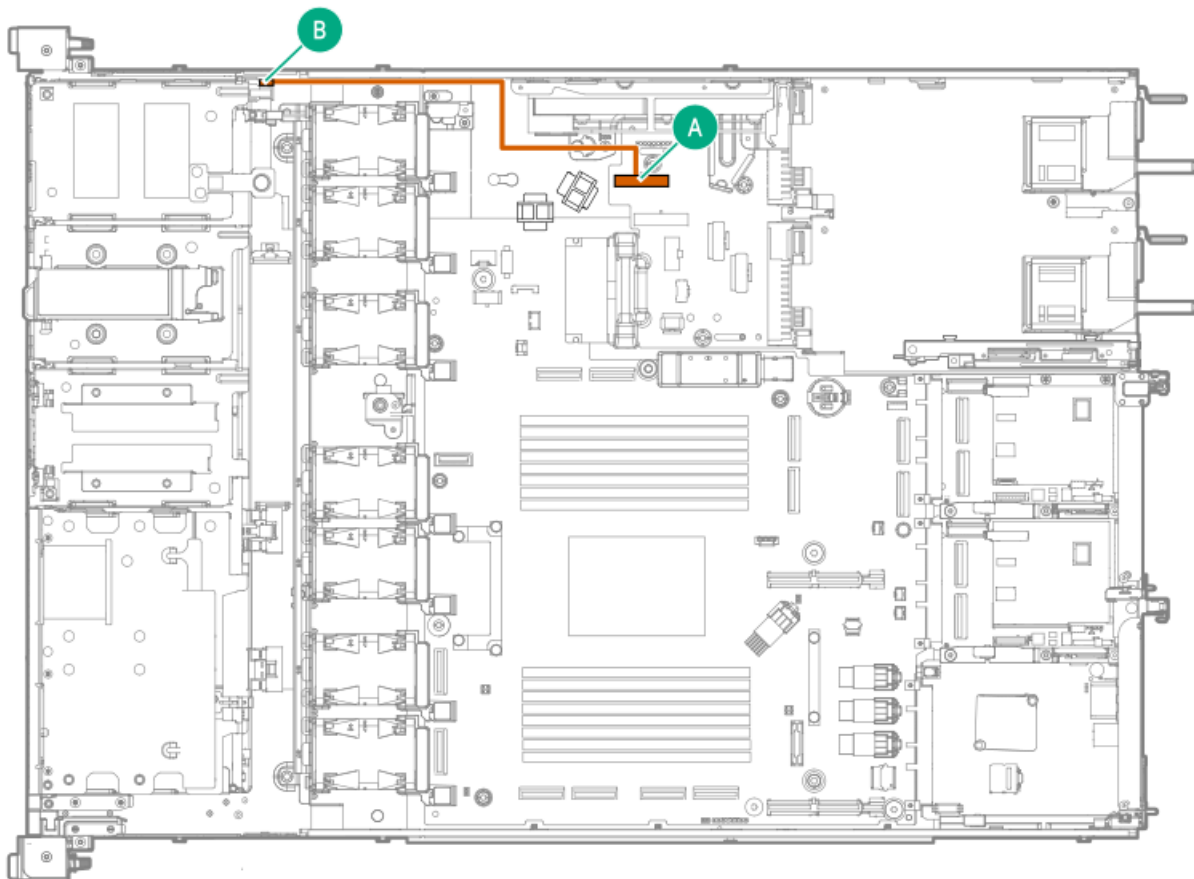
Drive power cabling

2 SFF drive power cabling



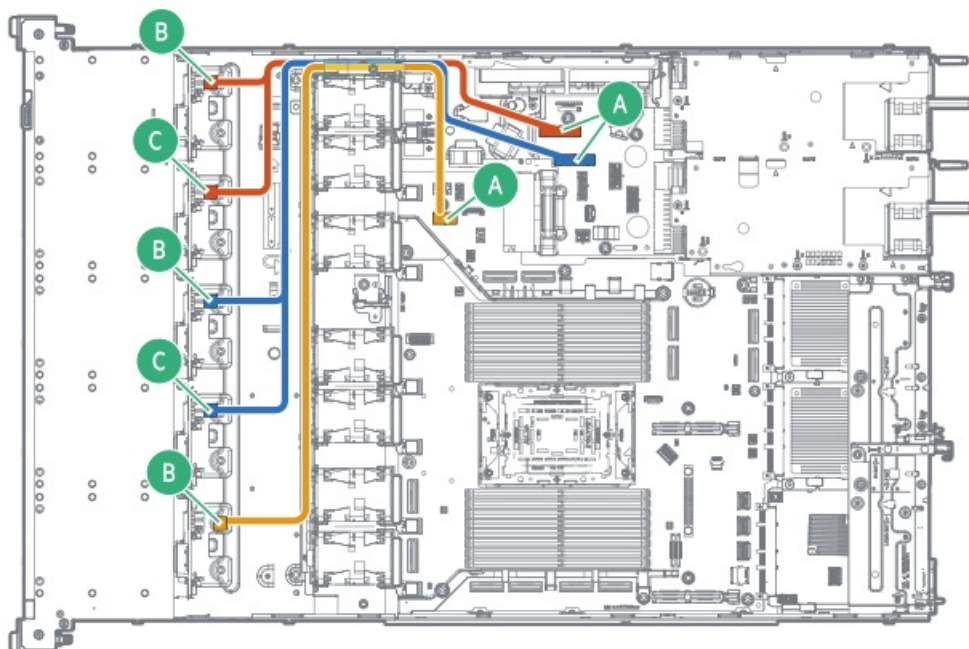
Cable part number	Color	From	To
P54591-001	Orange	2 SFF drive backplane power connector	8 SFF drive box 1 backplane power connector

8 SFF drive power cabling



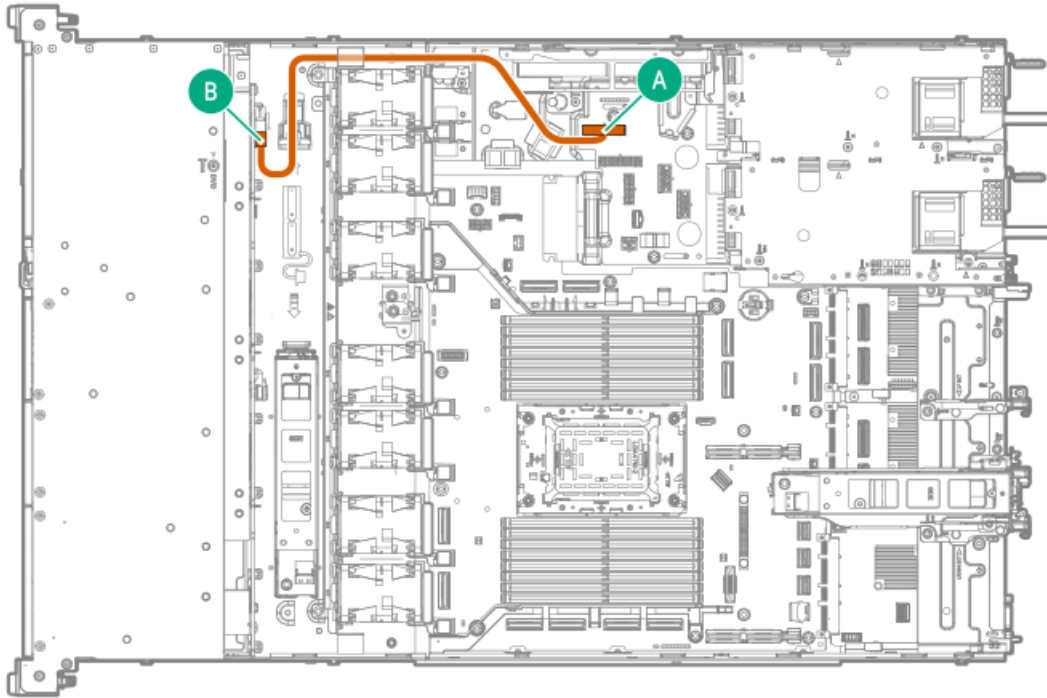
Cable part number	Color	From	To
P71911-001	Orange	8 SFF backplane power connector	Box 1, 2 drive backplane power connector

Mixed drive power cabling



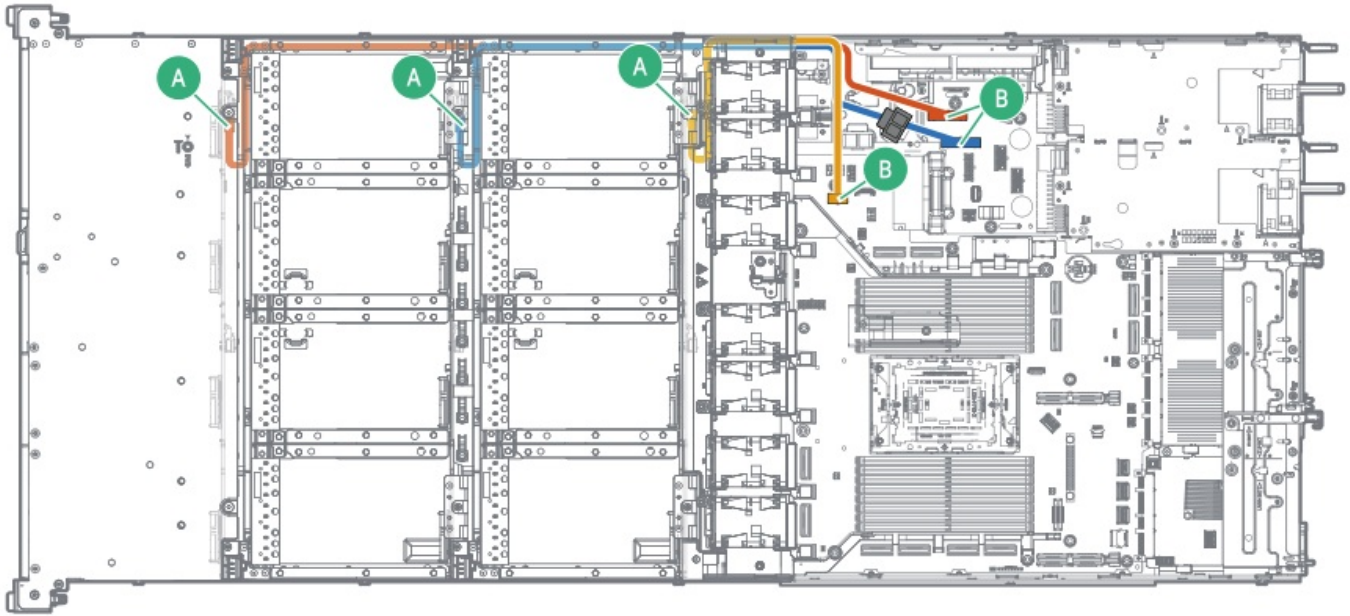
Cable part number	Color	From	To
P75582-001	Orange	Box 1 and box 2 drive power connector	Box 1, 2 drive backplane power connector
	Blue	Box 3 and 4 drive power connector	Box 3, 4 drive backplane power connector
P75586-001	Gold	Box 5 drive power connector	Box 5 drive backplane power connector

4 LFF drive power cabling



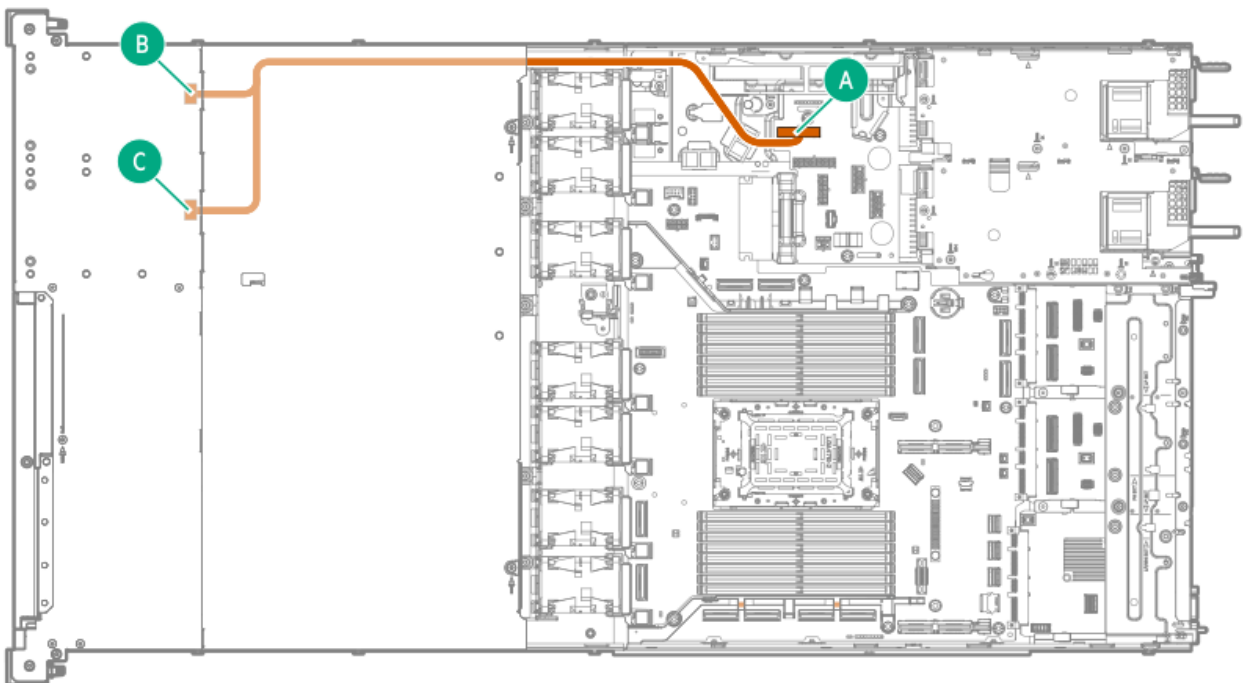
Cable part number	Color	From	To
P75584-001	Orange	4 LFF drive backplane power connector	Box 1, 2 drive backplane power connector

12 LFF drive power cabling



Cable part number	Color	From	To
P75585-001	Orange	4 LFF drive backplane power connector in box 1	Box 1, 2 drive backplane power connector
P75584-001	Blue	4 LFF drive backplane power connector in box 3	Box 3, 4 drive backplane power connector
P75583-001	Gold	4 LFF drive backplane power connector in box 5	Box 5 drive backplane power connector

GPU-optimized drive power cabling



Cable part number	Color	From	To
P75582-001	Orange	4 E3.S drive backplane drive power connector in box 1 and box 2	Box 1, 2 drive backplane power connector

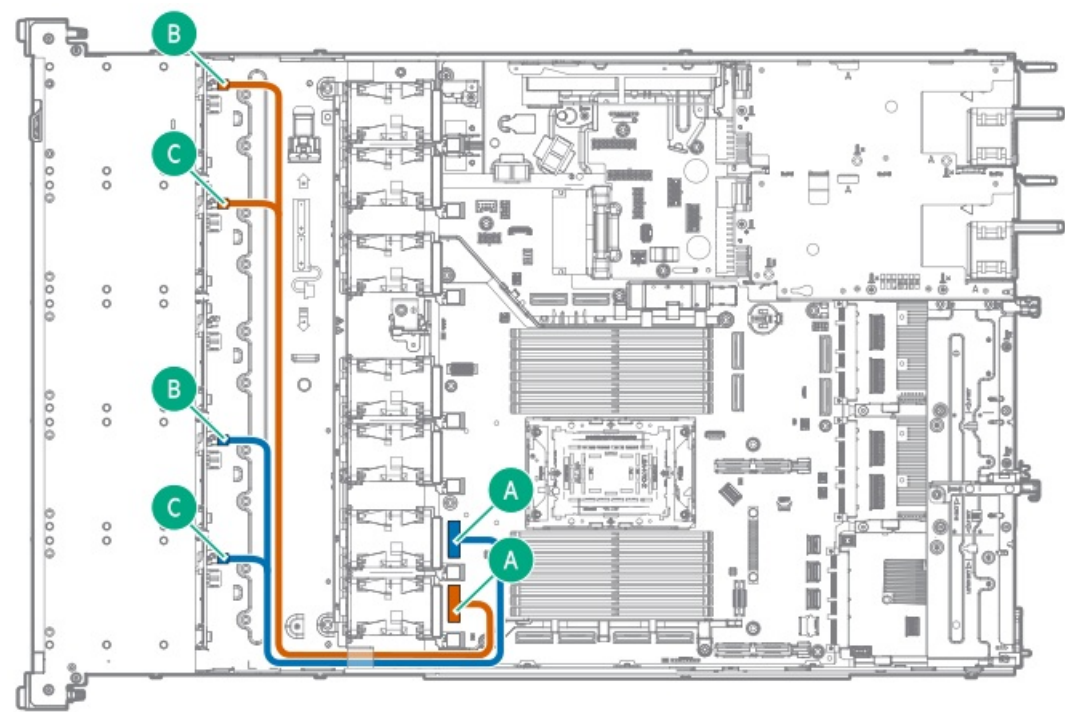
Storage controller cabling

Subtopics

- [SFF drive controller cabling](#)
- [LFF drive controller cabling](#)
- [E3.S drive controller cabling](#)
- [Mixed drive controller cabling](#)
- [GPU-optimized configuration drive controller cabling](#)
- [Energy pack cabling](#)
- [Storage controller backup power cabling](#)

SFF drive controller cabling

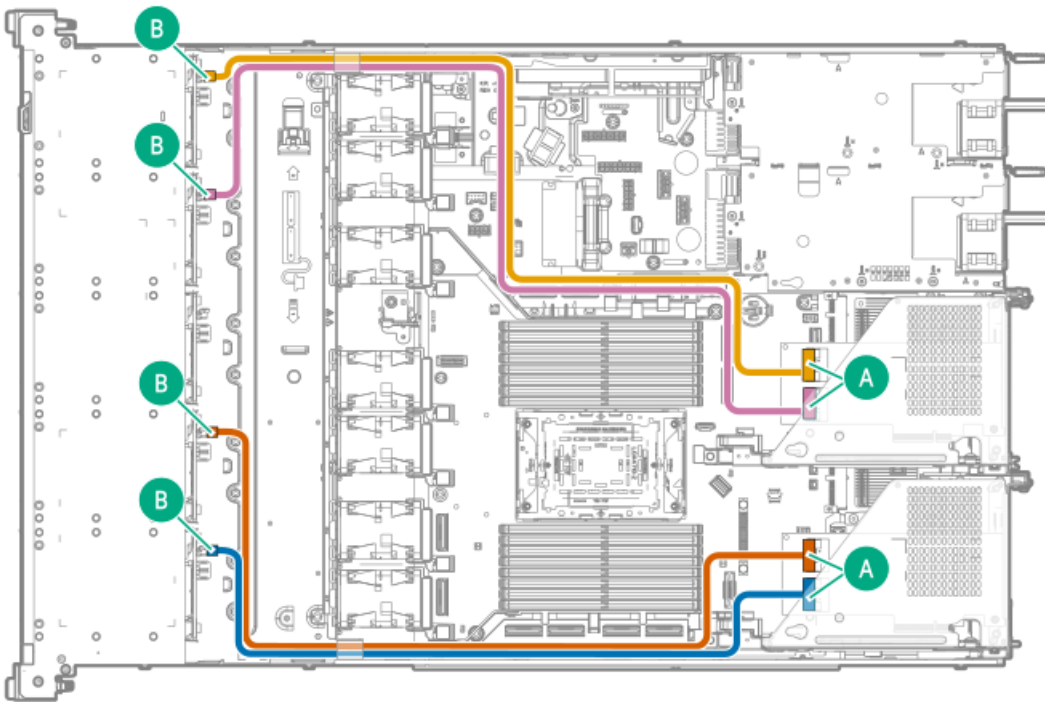
8 SFF drive: Direct-attached cabling



Cable part number	Color	From	To
P75908-001	Orange	2 SFF drive backplane in box 1 and 2	M-XIO port 0
	Blue	2 SFF drive backplane in box 4 and 5	M-XIO port 2

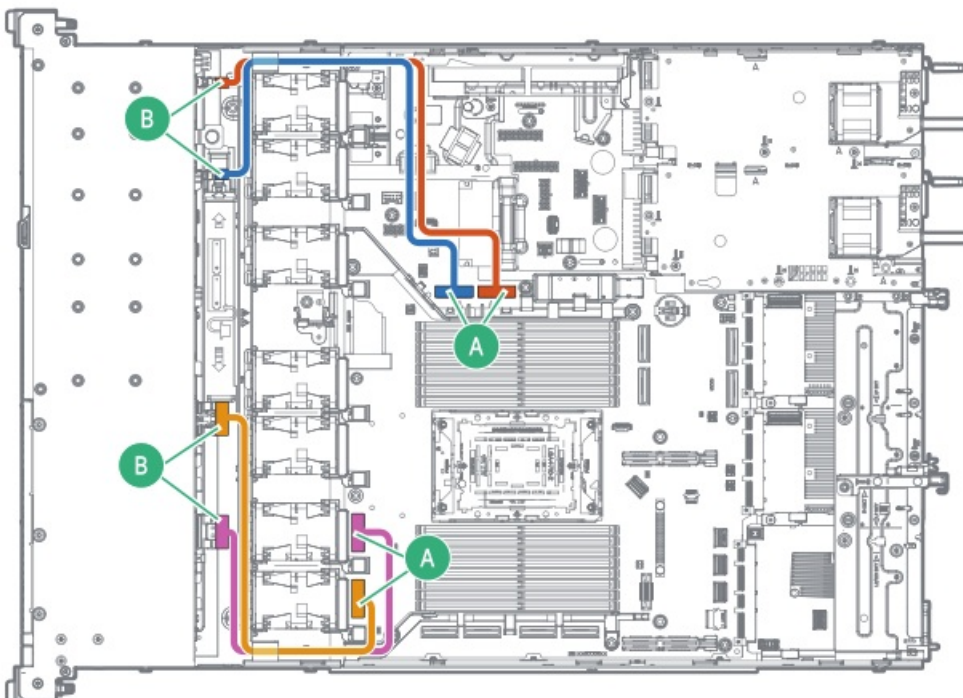
8 SFF drive: Type-p controller cabling





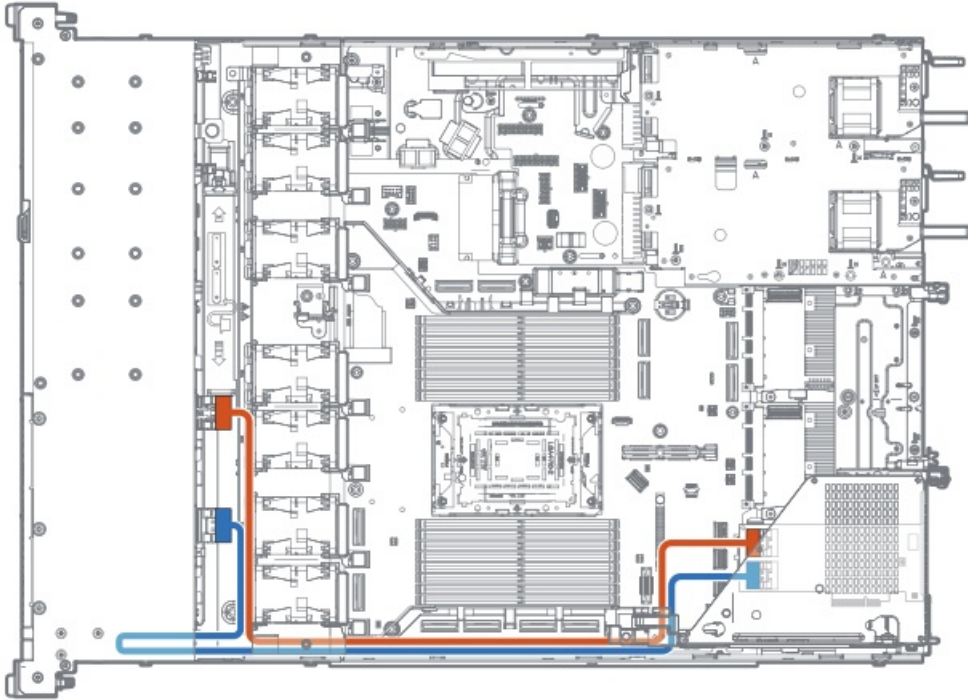
Cable part number	Color	From	To
P75590-001	Orange	2 SFF drive backplane in box 4	Primary type-p controller port 1
	Blue	2 SFF drive backplane in box 5	Primary type-p controller port 2
	Gold	2 SFF drive backplane in box 1	Secondary type-p controller port 1
	Pink	2 SFF drive backplane in box 2	Secondary type-p controller port 2

8 SFF drive: Direct attached cabling



Cable part number	Color	From	To
P71912-001	Orange	Port 4	M-XIO port 4
	Blue	Port 3	M-XIO port 6
P71910-001	Gold	Port 2	M-XIO port 0
	Pink	Port 1	M-XIO port 2

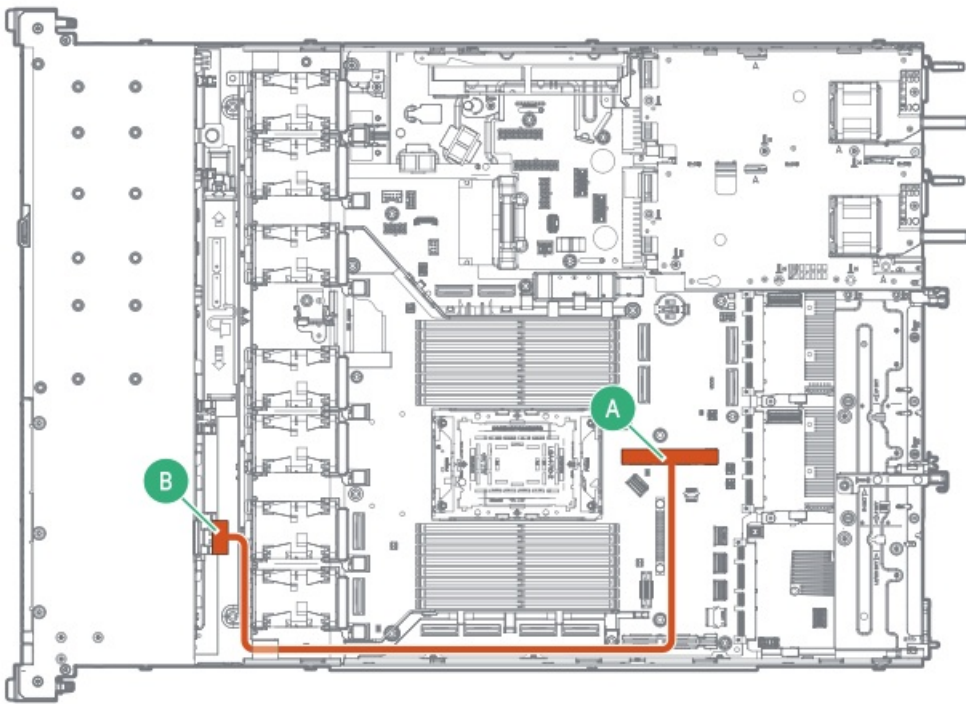
8 + 2 SFF drive: Primary type-p controller cabling



Cable part number	Color	From	To
P45611-001	Orange	8 SFF drive backplane	Type-p controller port 1
P53972-001	Blue	2 SFF drive backplane	Type-p controller port 2

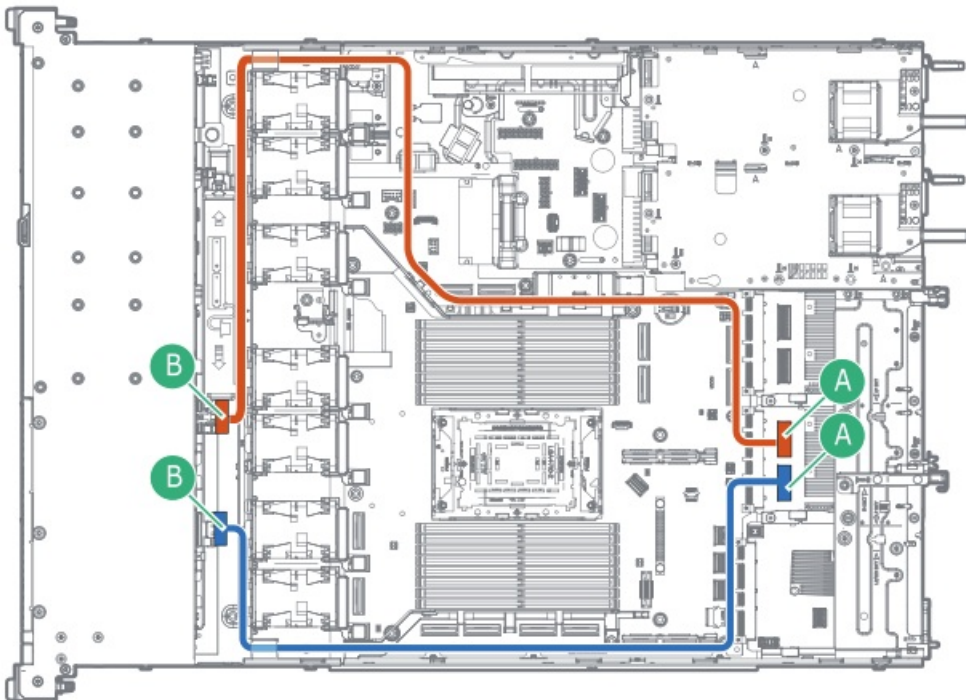
2 SFF drive: Secondary riser connector cabling

Full-height riser cage blanks are required for this connection.



Cable part number	Color	From	To
P74810-001	Orange	2 SFF backplane	Secondary riser connector

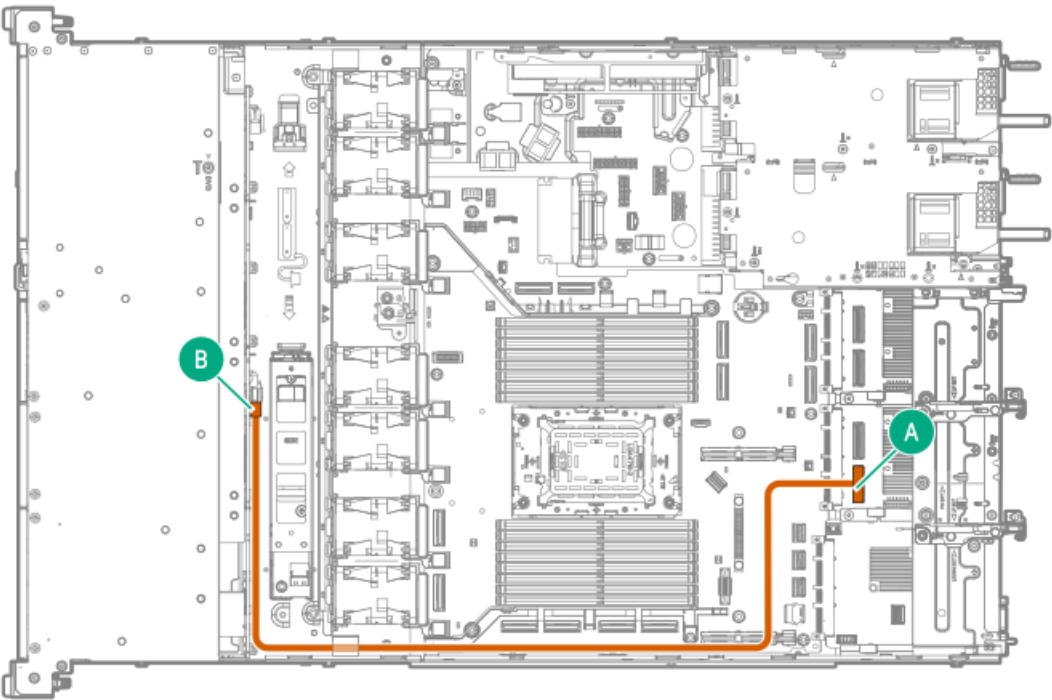
8 + 2 SFF drive: Type-o controller cabling



Cable part number	Color	From	To
P48961-001	Orange	8 SFF drive backplane port 1	Type-o controller port 2 in OCP A
P48960-001	Blue	2 SFF drive backplane port 1	Type-o controller port 1 in OCP A

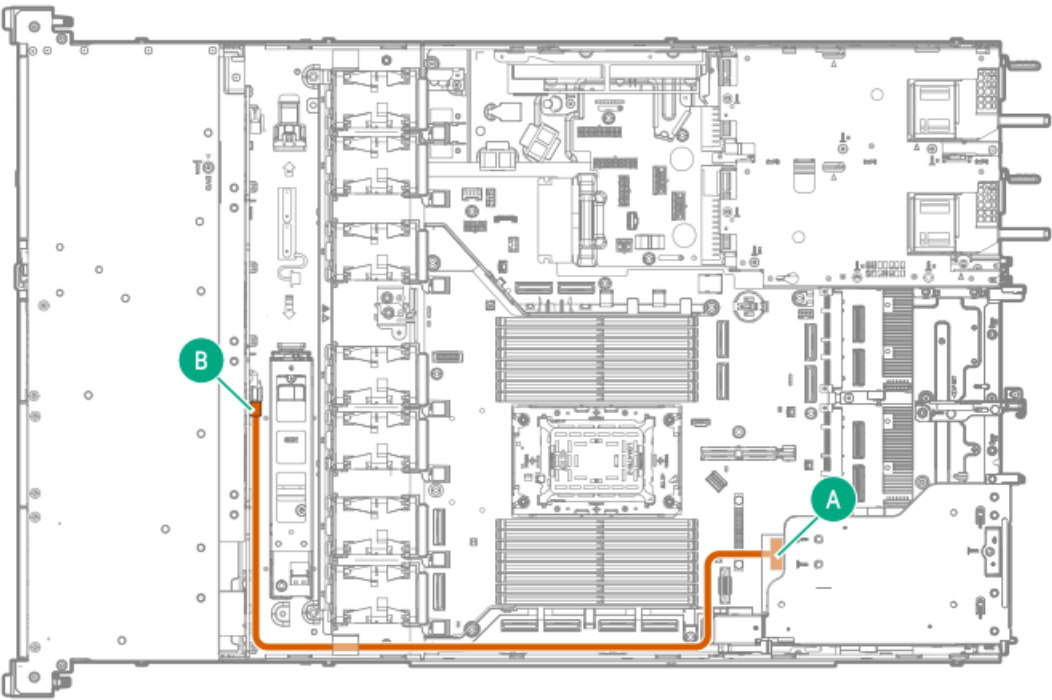
LFF drive controller cabling

4 LFF drive: Type-o controller cabling



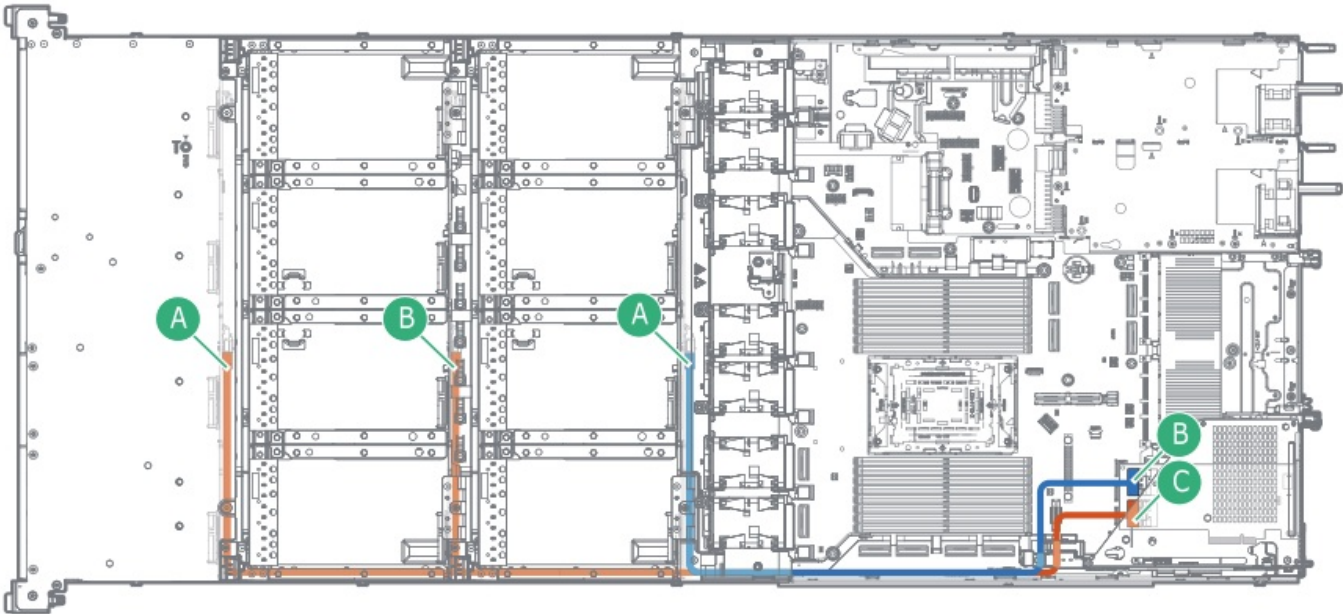
Cable part number	Color	From	To
P53989-001	Orange	4 LFF drive backplane port 1	Type-o controller port 1 in OCP A

4 LFF drive: Primary type-p controller cabling



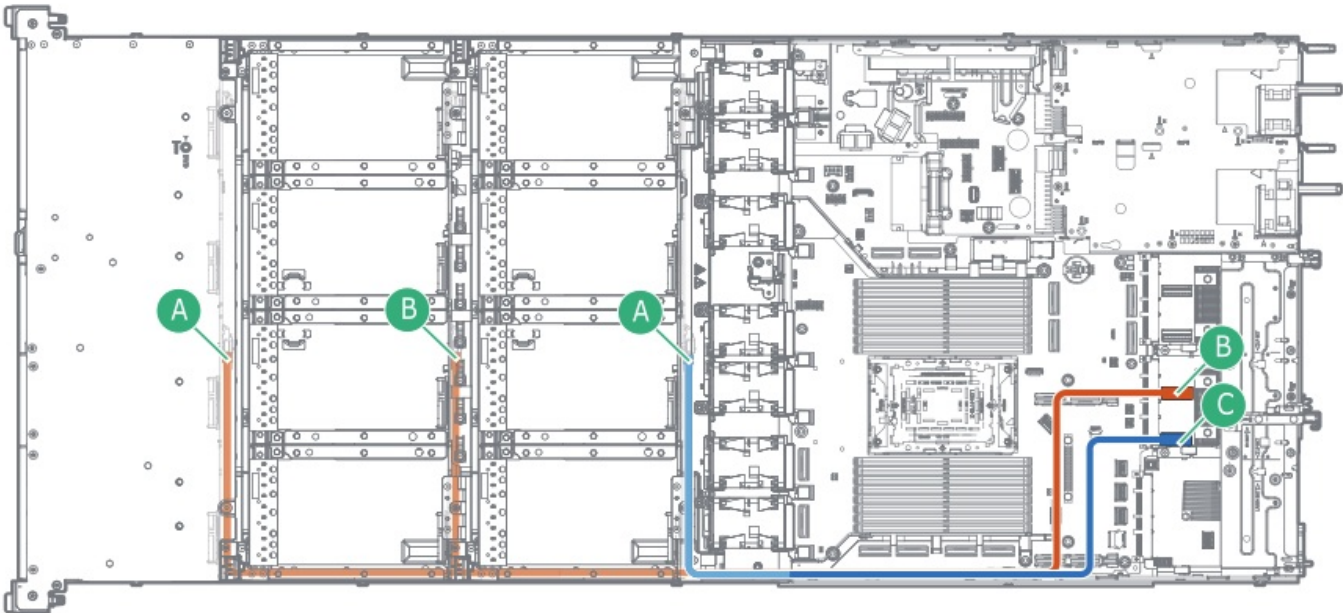
Cable part number	Color	From	To
P54931-001	Orange	4 LFF drive backplane port 1	Type-p controller port 1

12 LFF drive: Primary type-p controller cabling



Cable part number	Color	From	To
P54930-001	Orange	4 LFF drive backplane port 1 in box 1 and box 3	Type-p controller port 2
P54931-001	Blue	4 LFF drive backplane port 1 in box 5	Type-p controller port 1

12 LFF drive: Type-o controller cabling

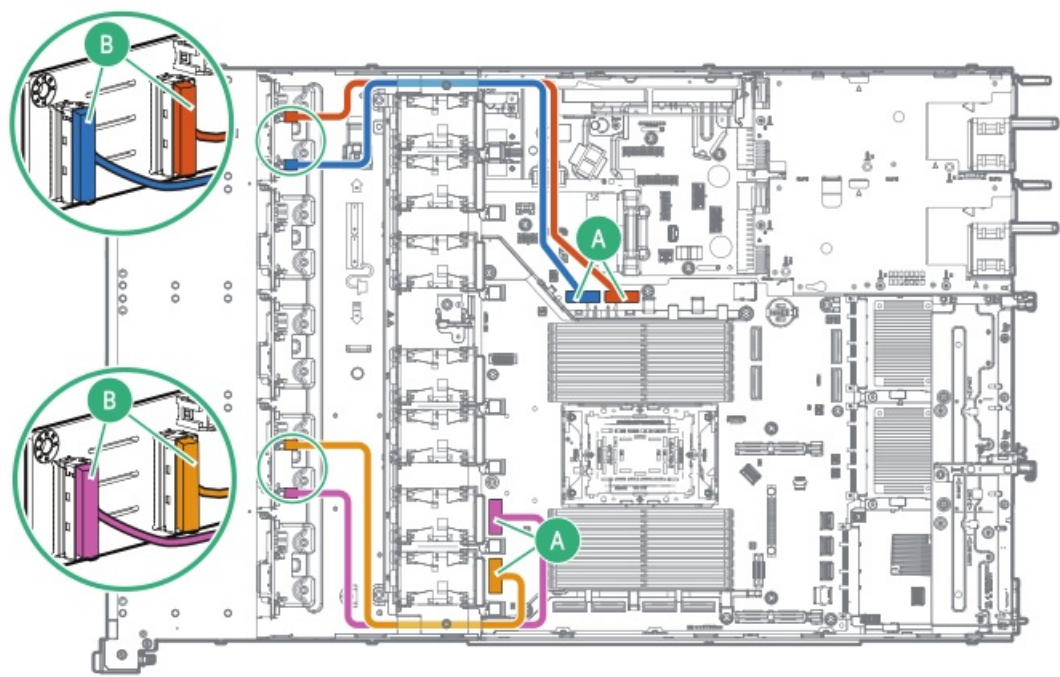


Cable part number	Color	From	To
P54928-001	Orange	4 LFF drive backplane port 1 in box 1 and box 3	Type-o controller port 2 in OCP A
P53989-001	Blue	4 LFF drive backplane port 1 in box 5	Type-o controller port 1 in OCP A

E3.S drive controller cabling

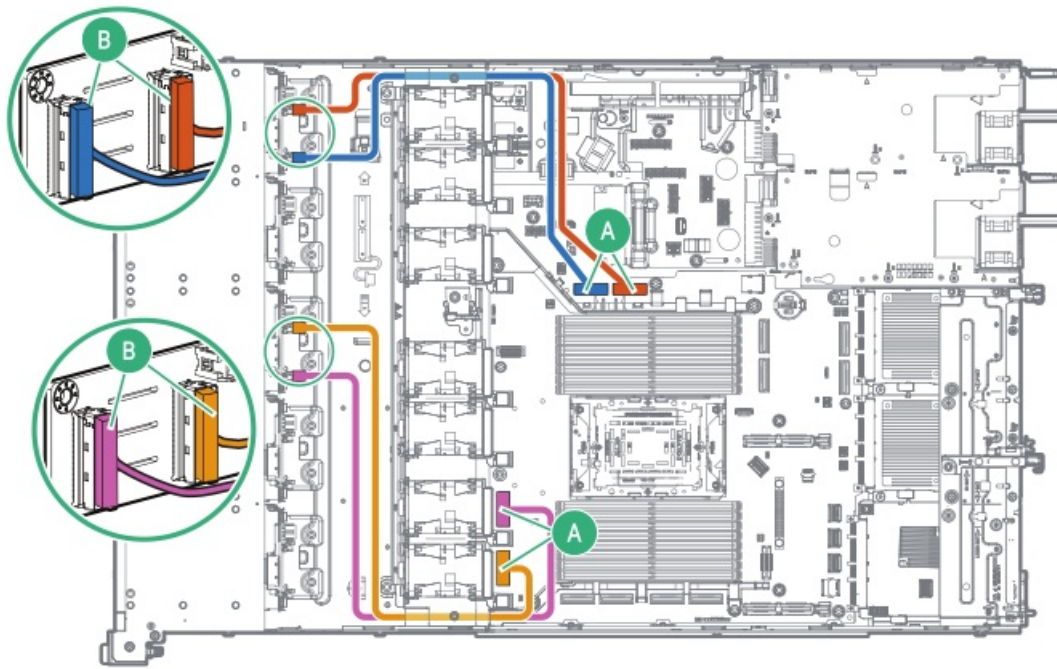
8 E3.S drive: Direct-attached cabling

- Box 1 and 4:



Cable part number	Color	From	To
P75592-001	Orange	Box 1 port 1	M-XIO port 4
	Blue	Box 1 port 2	M-XIO port 6
	Gold	Box 4 port 1	M-XIO port 0
	Pink	Box 4 port 2	M-XIO port 2

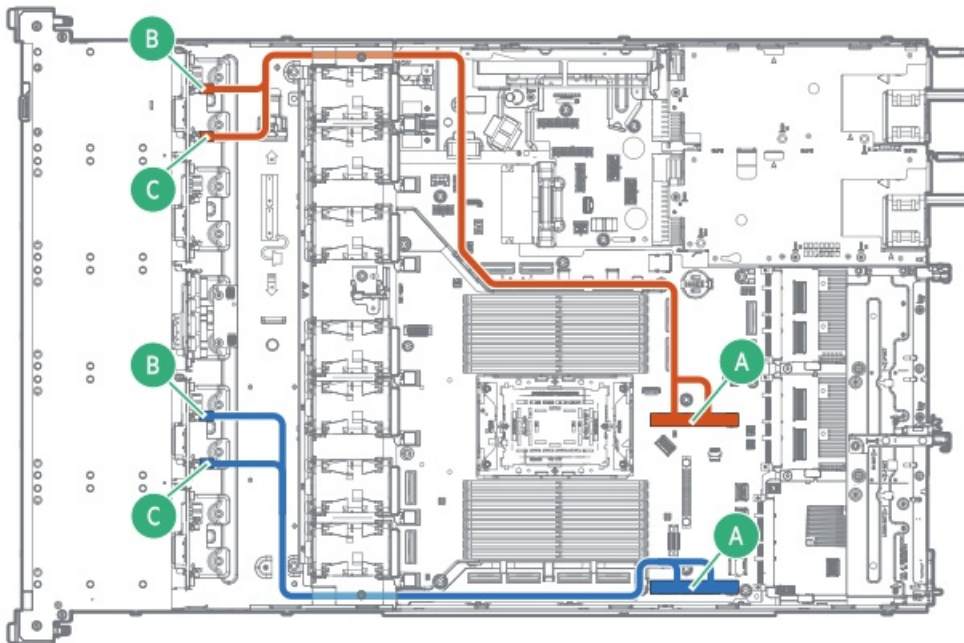
- Box 1 and 3:



Cable part number	Color	From	To
P75592-001	Orange	Box 1 port 1	M-XIO port 4
	Blue	Box 1 port 2	M-XIO port 6
	Gold	Box 3 port 1	M-XIO port 0
	Pink	Box 3 port 2	M-XIO port 2

8 E3.S drive: Primary and secondary riser connector cabling

Full-height riser cage blanks are required for this connection.



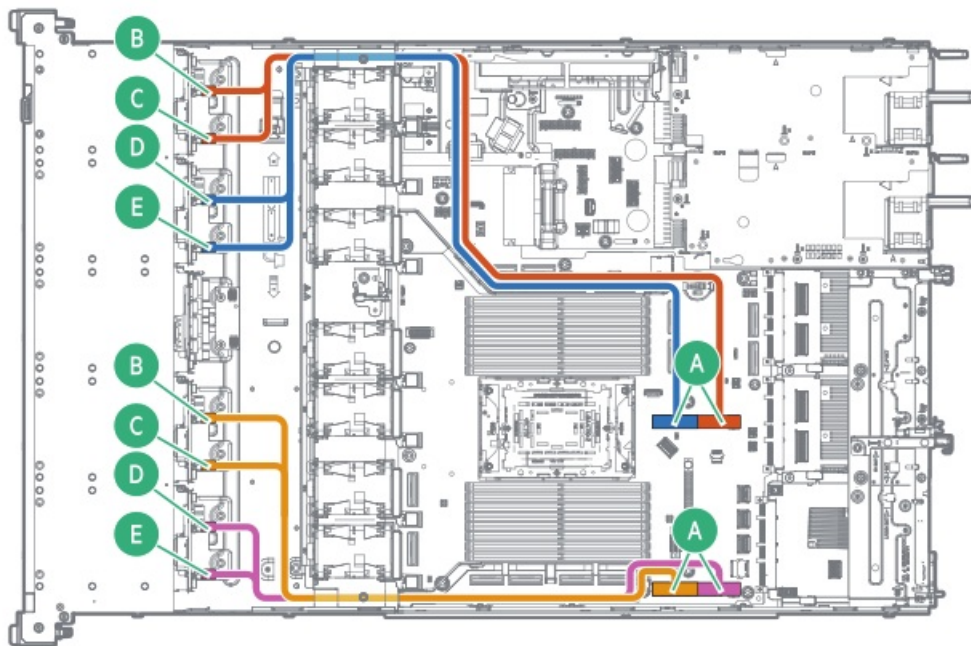
Cable part number	Color	From	To
P75580-001	Orange	Box 1 port 1 and 2	Secondary riser connector
P75577-001	Blue	Box 4 port 1 and 2	Primary riser connector

16 E3.S drive: Primary and secondary riser connector cabling

Full-height riser cage blanks are required for these connections.

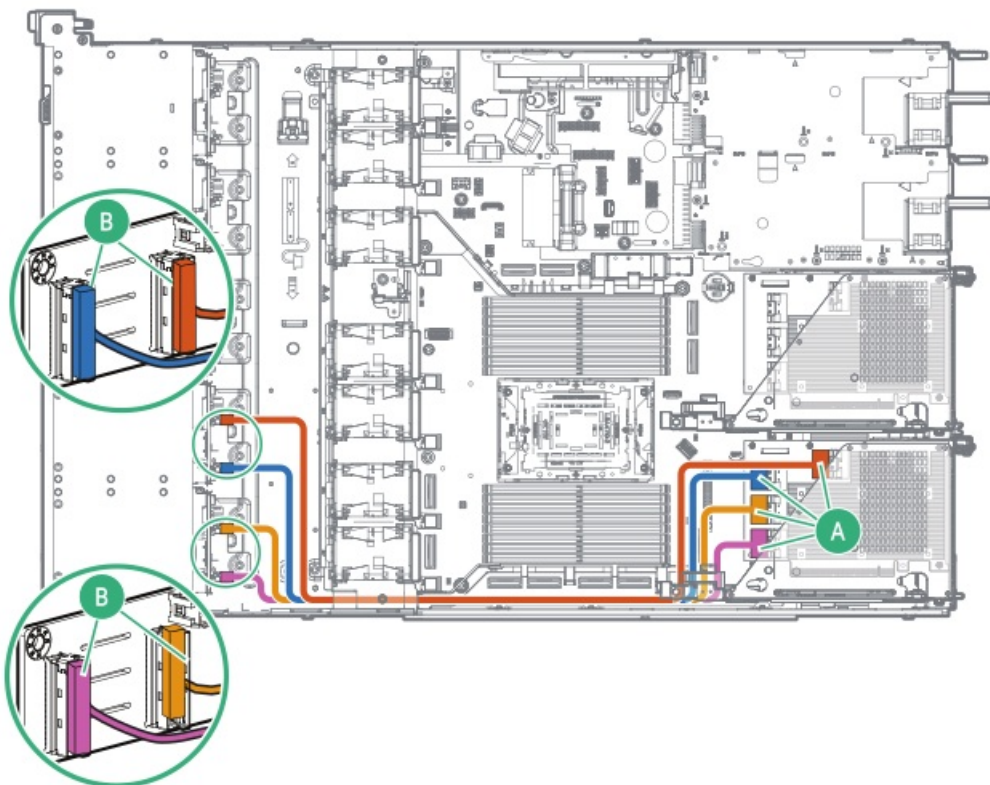


Cable part number	Color	From	To
P75580-001	Orange	Box 2 port 1 and 2	Secondary riser connector
P75577-001	Blue	Box 5 port 1 and 2	Primary riser connector
P75592-001	Gold	Box 1 port 1	M-XIO port 4
	Pink	Box 1 port 2	M-XIO port 6
	Green	Box 4 port 1	M-XIO port 2
	Purple	Box 4 port 2	M-XIO port 0



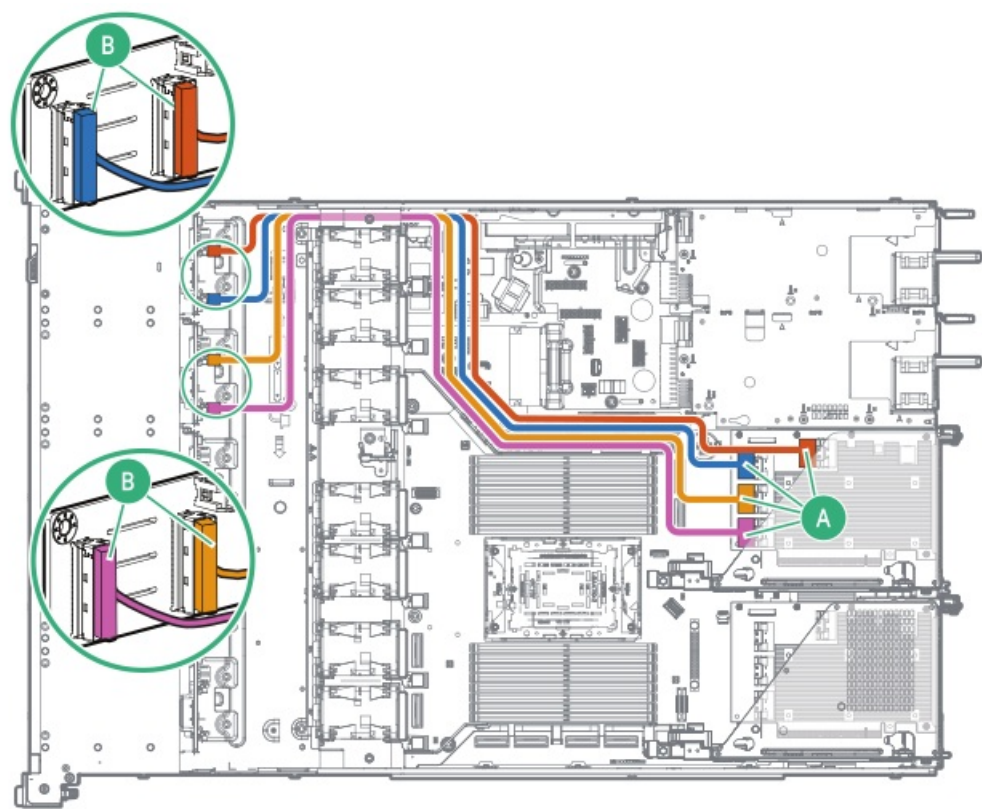
Cable part number	Color	From	To
P75578-001	Orange	Box 1 port 1 and 2	Secondary riser connector
	Blue	Box 2 port 1 and 2	
P75579-001	Gold	Box 4 port 1 and 2	Primary riser connector
	Pink	Box 5 port 1 and 2	

4/16 E3.S drive: Primary type-p controller cabling



Cable part number	Color	From	To
P75590-001	Orange	Box 4 port 1	Type-p controller port 4
	Blue	Box 4 port 2	Type-p controller port 3
	Gold	Box 5 port 1	Type-p controller port 2
	Pink	Box 5 port 2	Type-p controller port 1

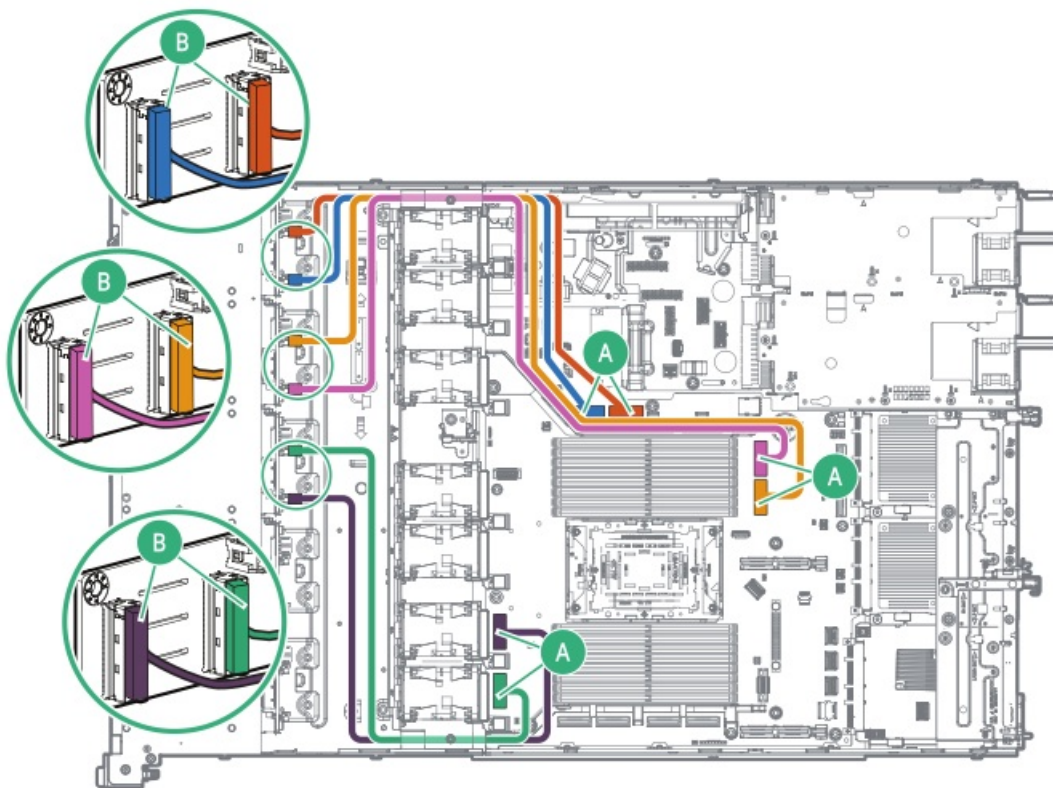
4/16 E3.S drive: Secondary type-p controller cabling



Cable part number	Color	From	To
P75590-001	Orange	Box 1 port 1	Port 1
	Blue	Box 1 port 2	Port 2
	Gold	Box 2 port 1	Port 3
	Pink	Box 2 port 2	Port 4

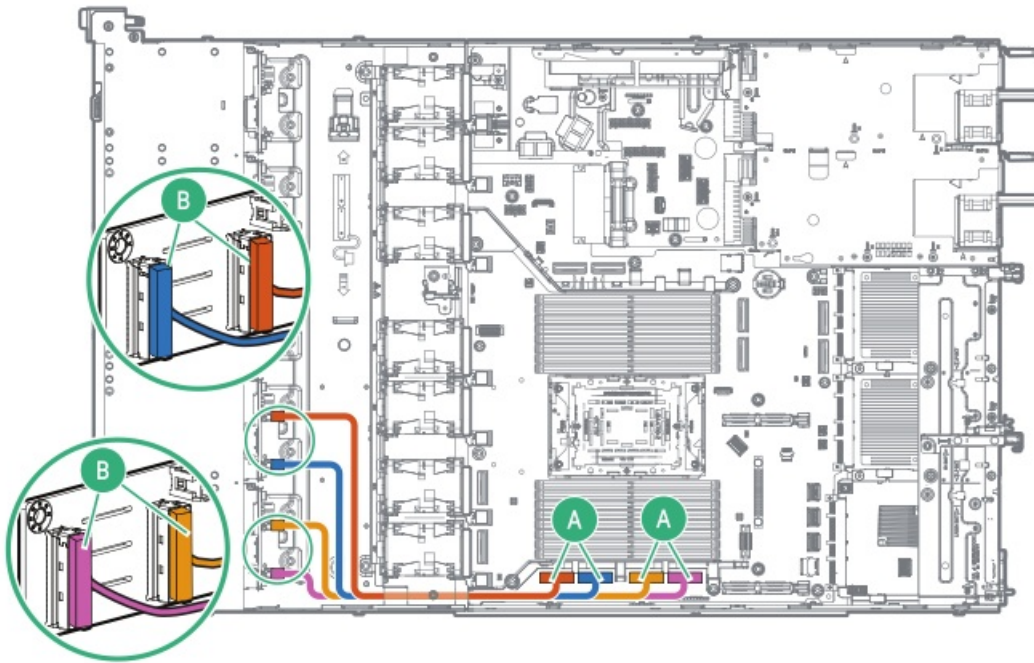
20 E3.S drive: Direct-attached cabling

- Box 1-3:



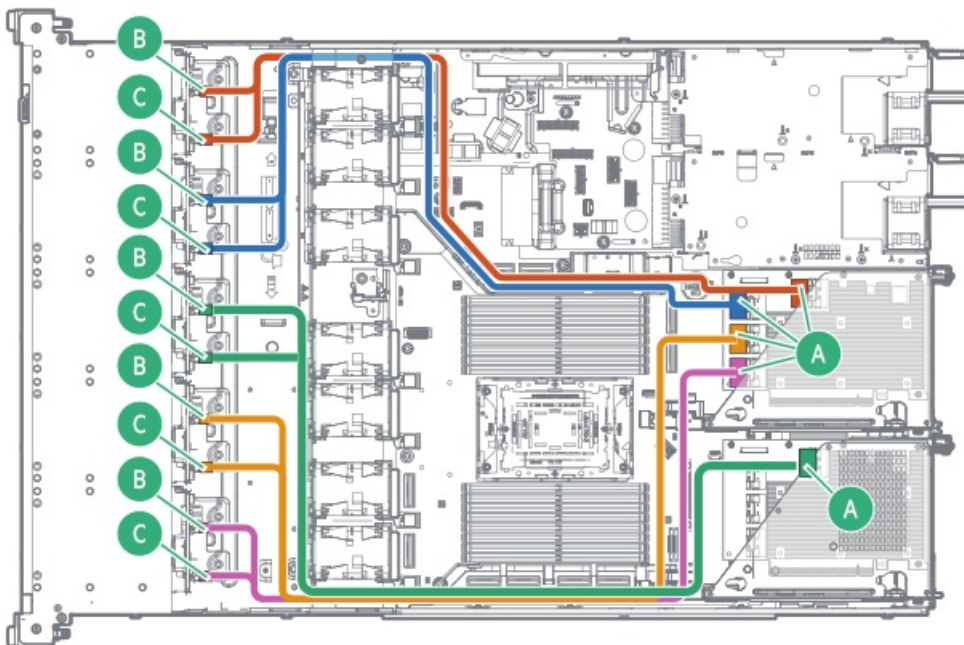
Cable part number	Color	From	To
P75592-001	Orange	Box 1 port 1	M-XIO port 4
	Blue	Box 1 port 2	M-XIO port 6
P75576-001	Gold	Box 2 port 1	M-XIO port 13
	Pink	Box 2 port 2	M-XIO port 17
P75504-001	Green	Box 3 port 1	M-XIO port 0
	Purple	Box 3 port 2	M-XIO port 2

- Box 4-5:



Cable part number	Color	From	To
P75505-001	Orange	Box 4 port 1	M-XIO port 7
	Blue	Box 4 port 2	M-XIO port 5
	Gold	Box 5 port 1	M-XIO port 1
	Pink	Box 5 port 2	M-XIO port 3

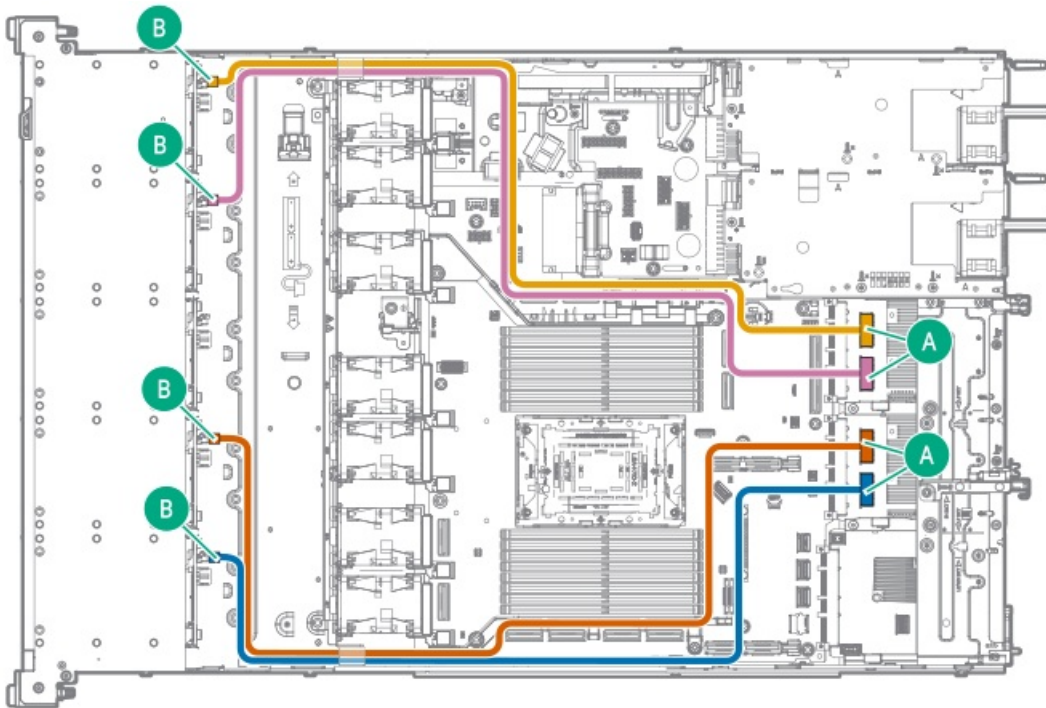
20 E3.S drive: Type-p controller cabling



Cable part number	Color	From	To
P75593-001	Orange	Box 1 port 1 and 2	Primary type-p controller port 1
	Blue	Box 2 port 1 and 2	Primary type-p controller port 2
	Green	Box 3 port 1 and 2	Secondary type-p controller port 1
	Gold	Box 4 port 1 and 2	Primary type-p controller port 3
	Pink	Box 5 port 1 and 2	Primary type-p controller port 4

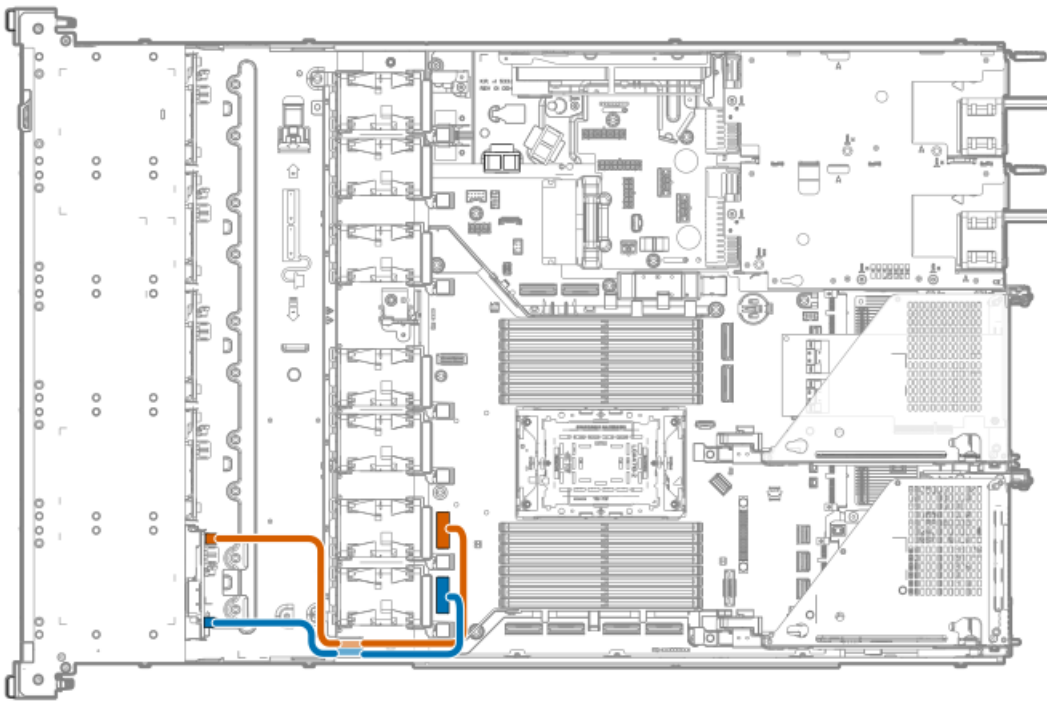
Mixed drive controller cabling

8 SFF drive: Type-o controller cabling



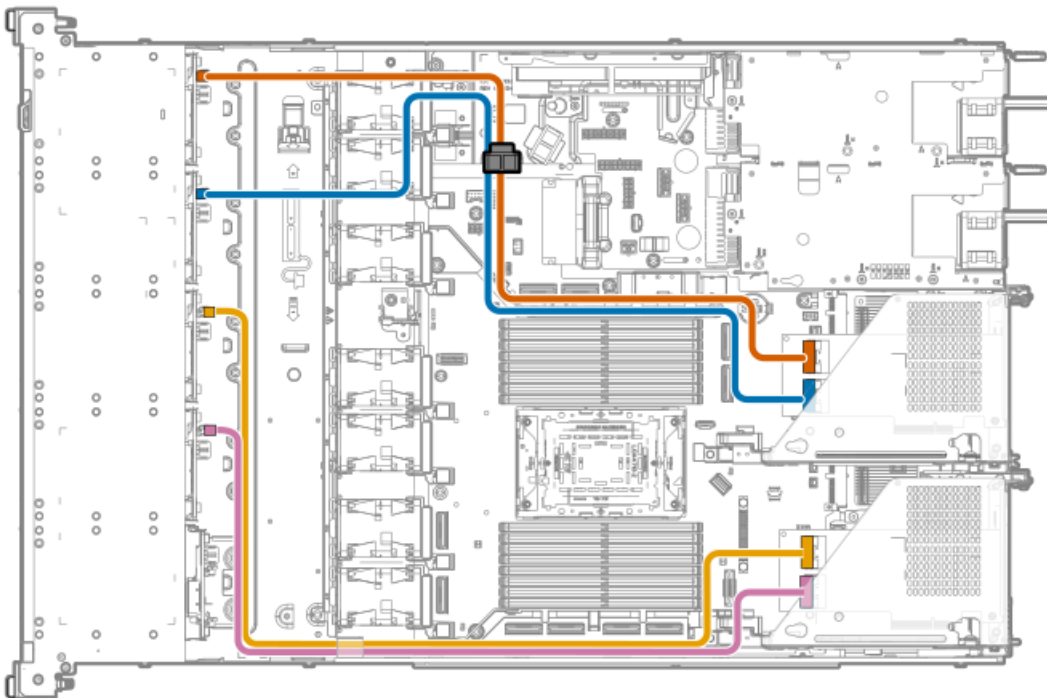
Cable part number	Color	From	To
P75589-001	Orange	2 SFF drive backplane in box 4	Type-o controller port 2 in OCP A
	Blue	2 SFF drive backplane in box 5	Type-o controller port 1 in OCP A
	Gold	2 SFF drive backplane in box 1	Type-o controller port 2 in OCP B
	Pink	2 SFF drive backplane in box 2	Type-o controller port 1 in OCP B

8 SFF + 4 E3.S drive: Onboard SAS/SATA/NVMe cabling



Cable part number	Color	From	To
P75594-001	Orange	4 E3.S drive backplane port 2 in box 5	
	Blue	4 E3.S drive backplane port 1 in box 5	

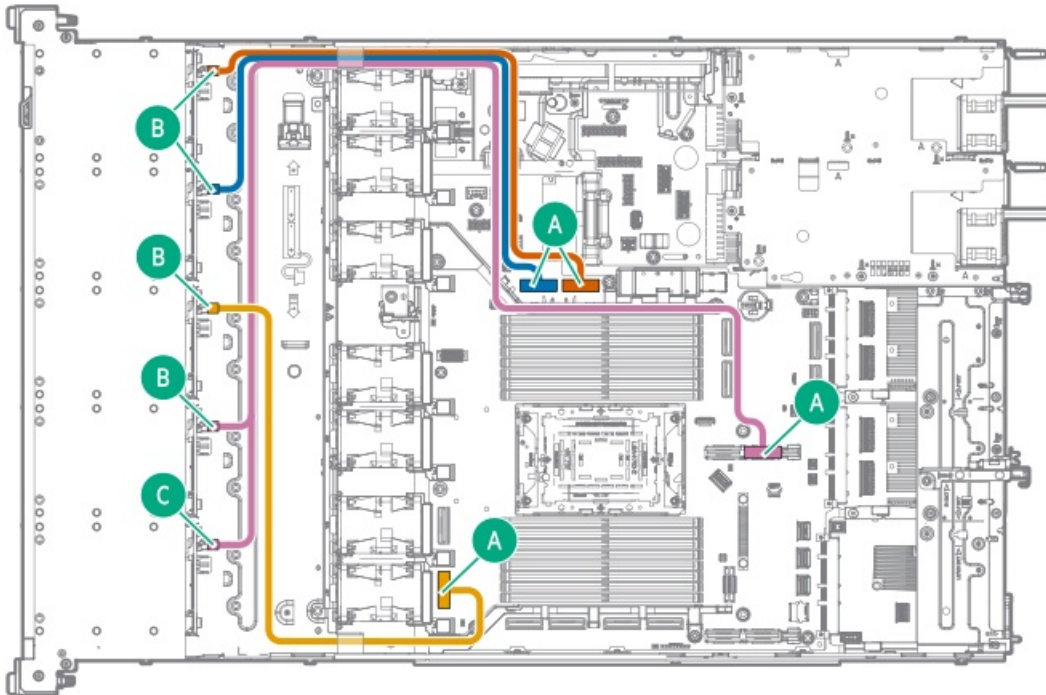
8 SFF + 4 E3.S drive: Type-p controller cabling



Cable part number	Color	From	To
P75590-001	Orange	2 SFF drive backplane in box 1	Secondary type-p controller port 1
	Blue	2 SFF drive backplane in box 2	Secondary type-p controller port 2
P75590-001	Gold	2 SFF drive backplane in box 3	Primary type-p controller port 1
	Pink	2 SFF drive backplane in box 4	Primary type-p controller port 2

10 SFF drive: Direct attached cabling

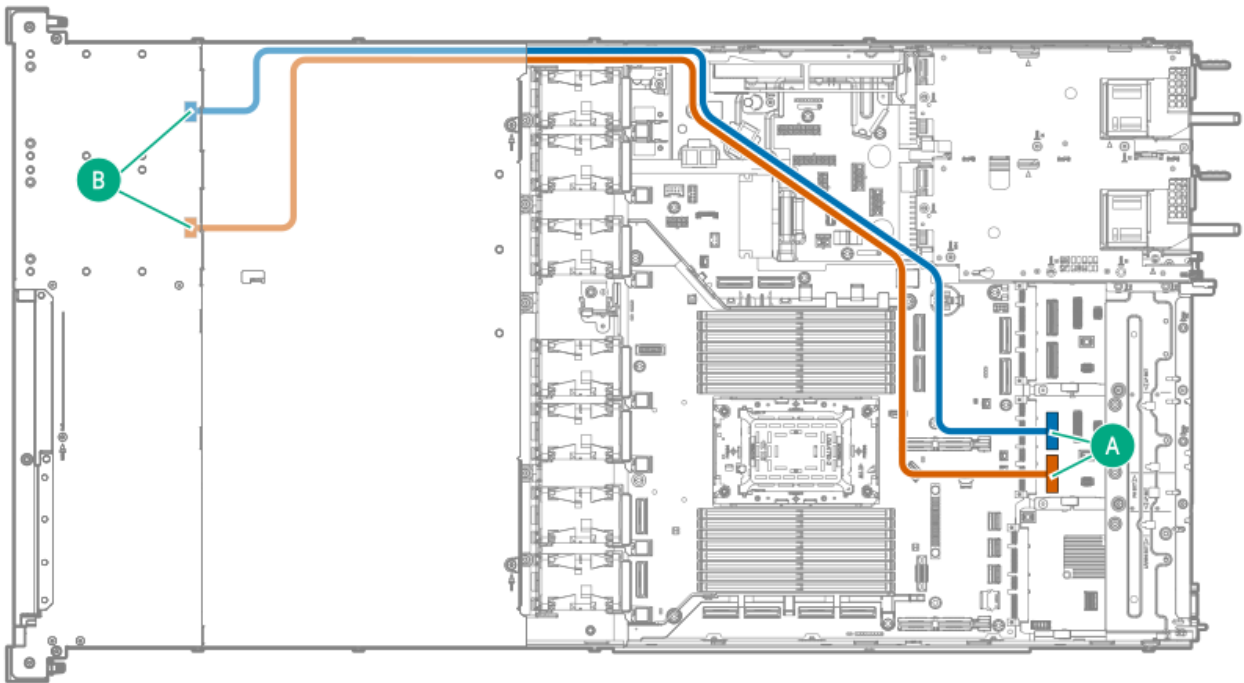
Full-height riser cage blanks are required for this connection.



Cable part number	Color	From	To
P75592-001	Orange	2 SFF drive backplane in box 1	M-XIO port 4
	Blue	2 SFF drive backplane in box 2	M-XIO port 6
	Gold	2 SFF drive backplane in box 3	M-XIO port 0
P75580-001	Pink	2 SFF drive backplane in box 4	Secondary riser connector and 5

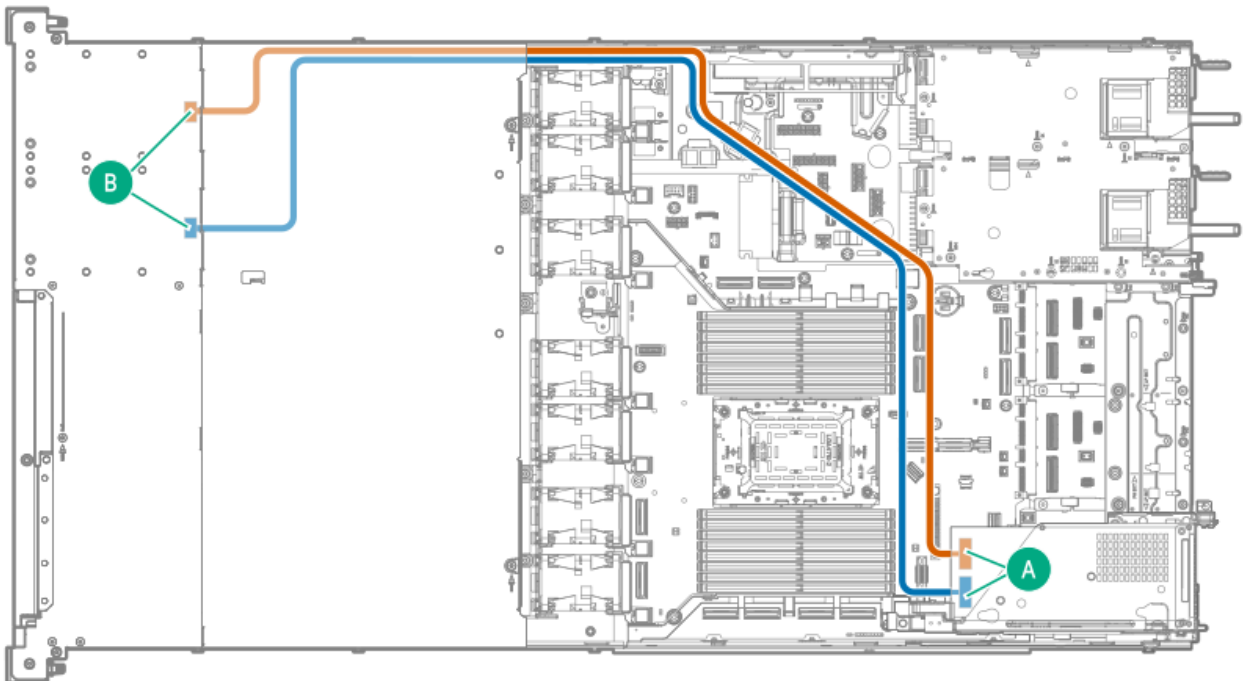
GPU-optimized configuration drive controller cabling

4 SFF drive: Type-o controller cabling



Cable part number	Color	From	To
P75587-001	Orange	Box 2 port 1	Type-o controller port 1 in OCP A
P75589-001	Blue	Box 1 port 1	Type-o controller port 2 in OCP A

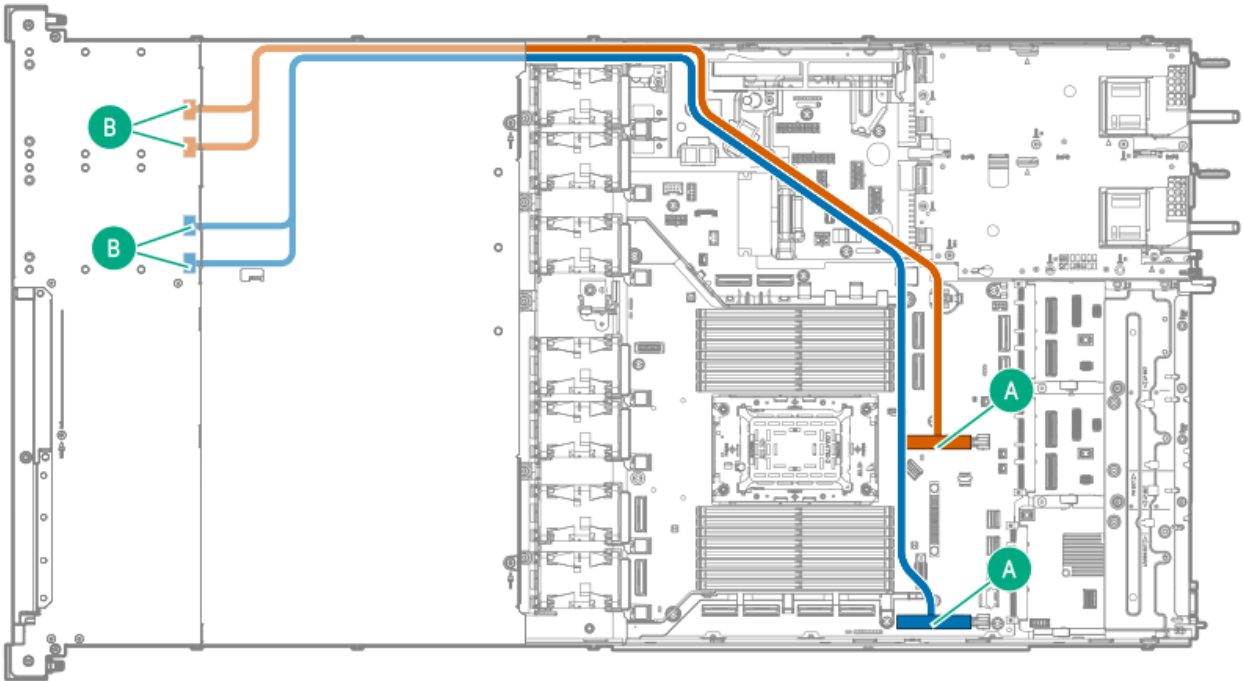
4 SFF drive: Primary type-p controller cabling



Cable part number	Color	From	To
P75588-001	Orange	2 SFF backplane port 1 in box 1	Type-p controller port 1
	Blue	2 SFF backplane port 1 in box 2	Type-p controller port 2

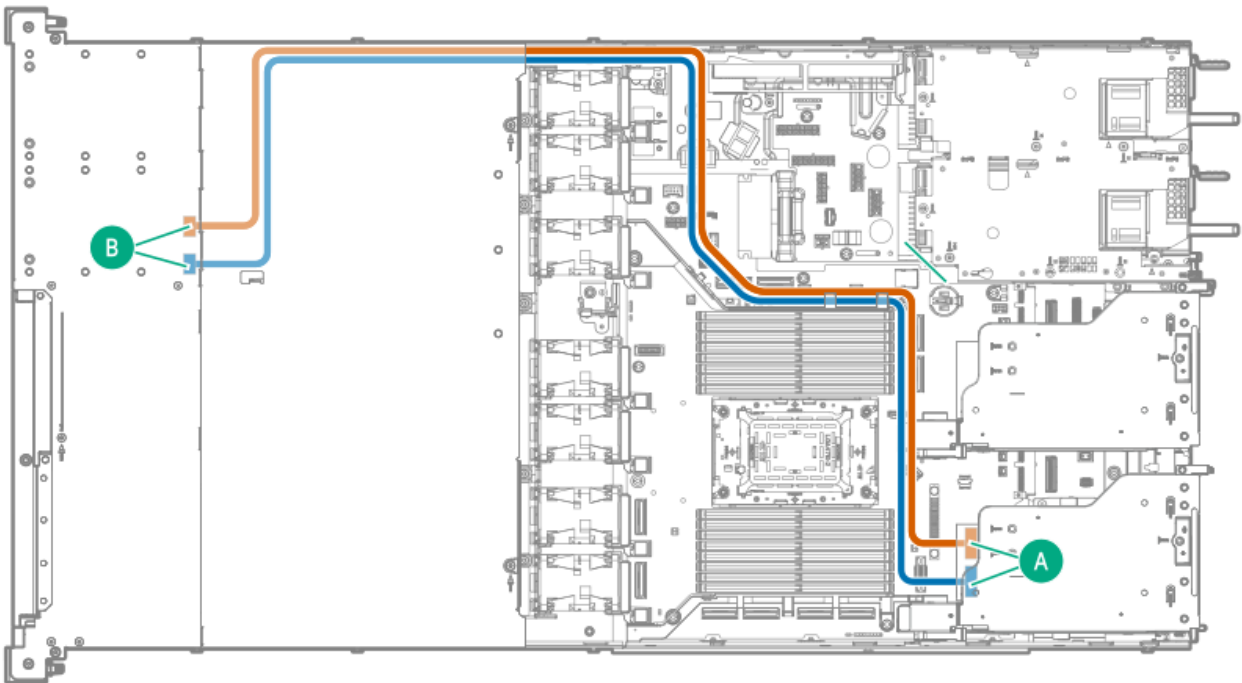
8 E3.S drive: Primary and secondary riser connector cabling

Full-height riser cage blanks are required for these connections.



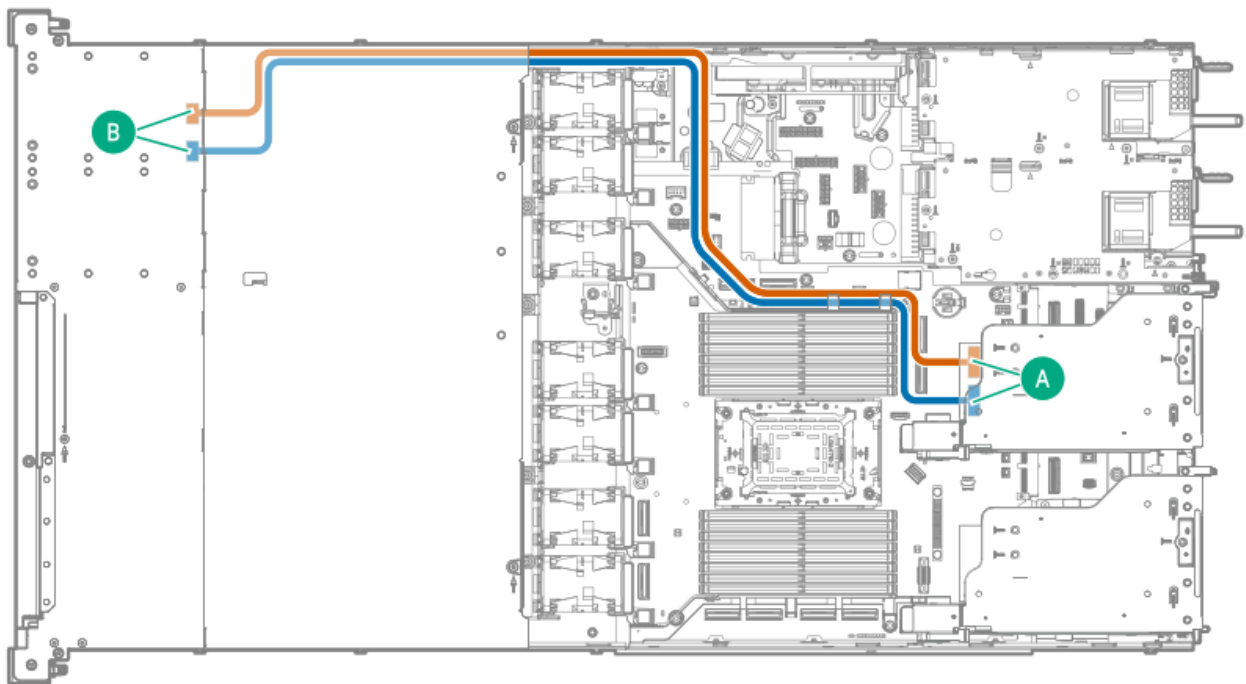
Cable part number	Color	From	To
P75580-001	Orange	Box 1 port 1 and 2	Primary riser connector
	Blue	Box 2 port 1 and 2	Secondary riser connector

8 E3.S drive: Primary riser type-p controller cabling

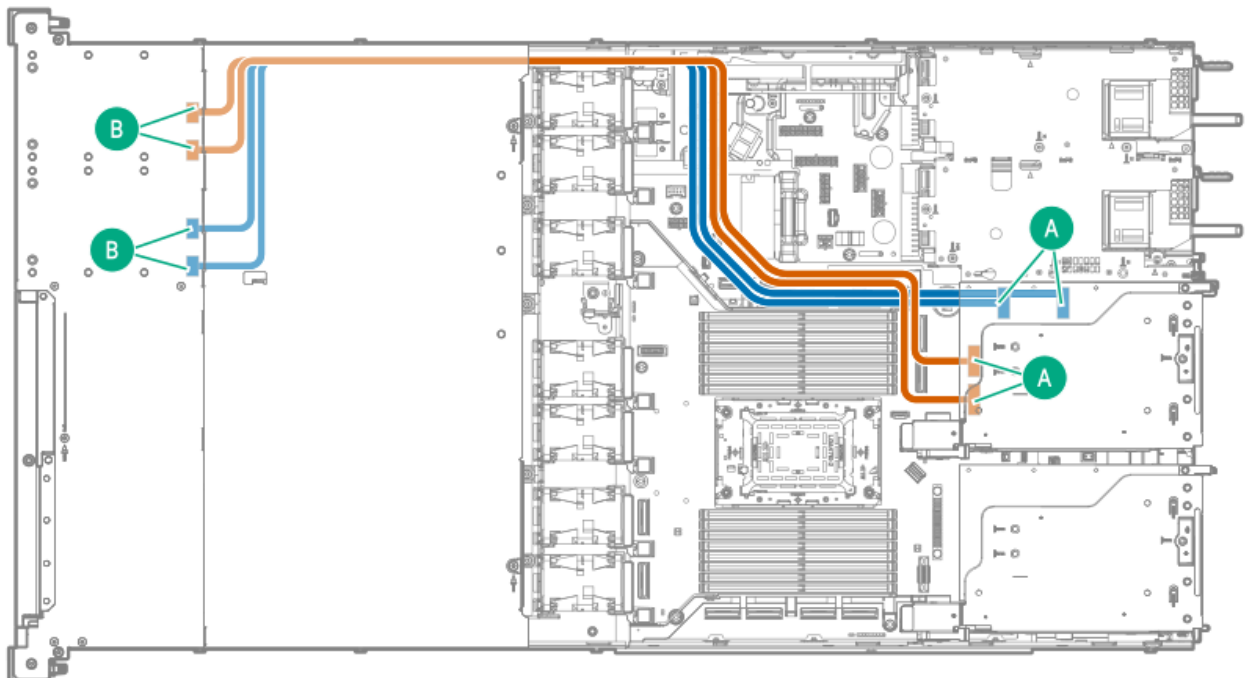


Cable part number	Color	From	To
P75588-001	Orange	Box 2 port 2	Type-p controller port 1
	Blue	Box 2 port 1	Type-p controller port 2

8 E3.S drive: Secondary type-p controller cabling

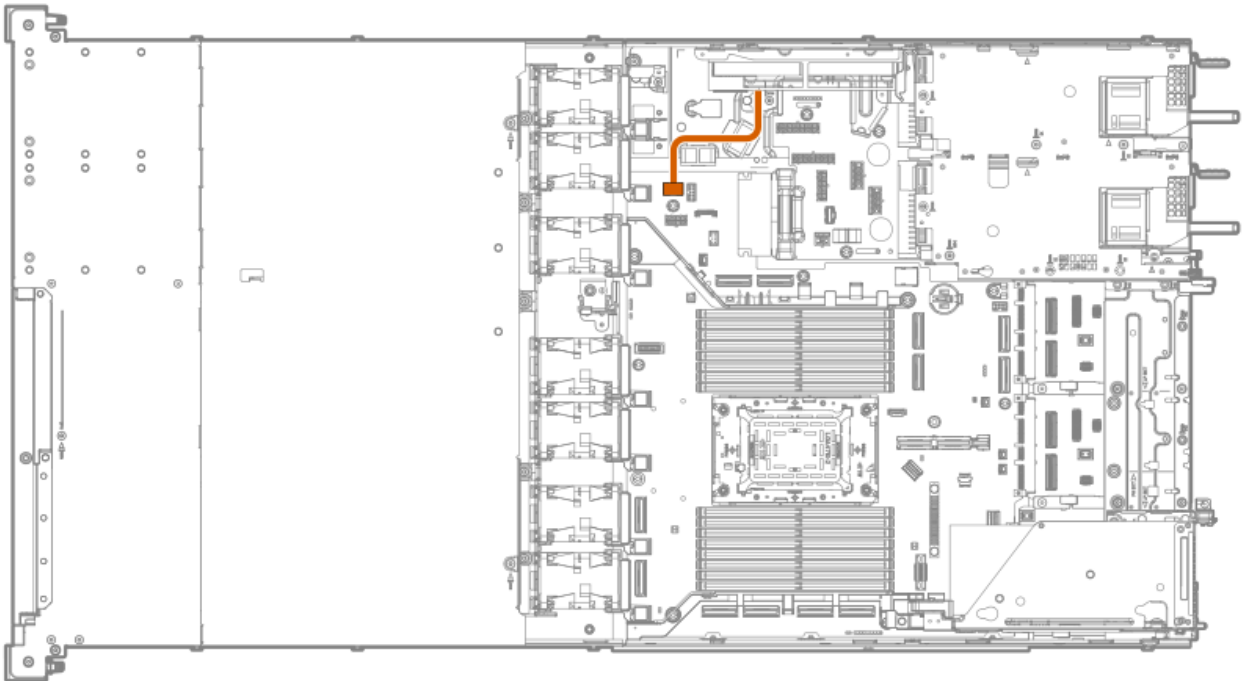


Cable part number	Color	From	To
P75590-001	Orange	Box 1 port 2	Type-p controller port 1
	Blue	Box 1 port 1	Type-p controller port 2



Cable part number	Color	From	To
P75575-001	Orange	Box 1 port 1 and 2	Port 3 and 4
	Blue	Box 2 port 1 and 2	Port 1 and 2

Energy pack cabling



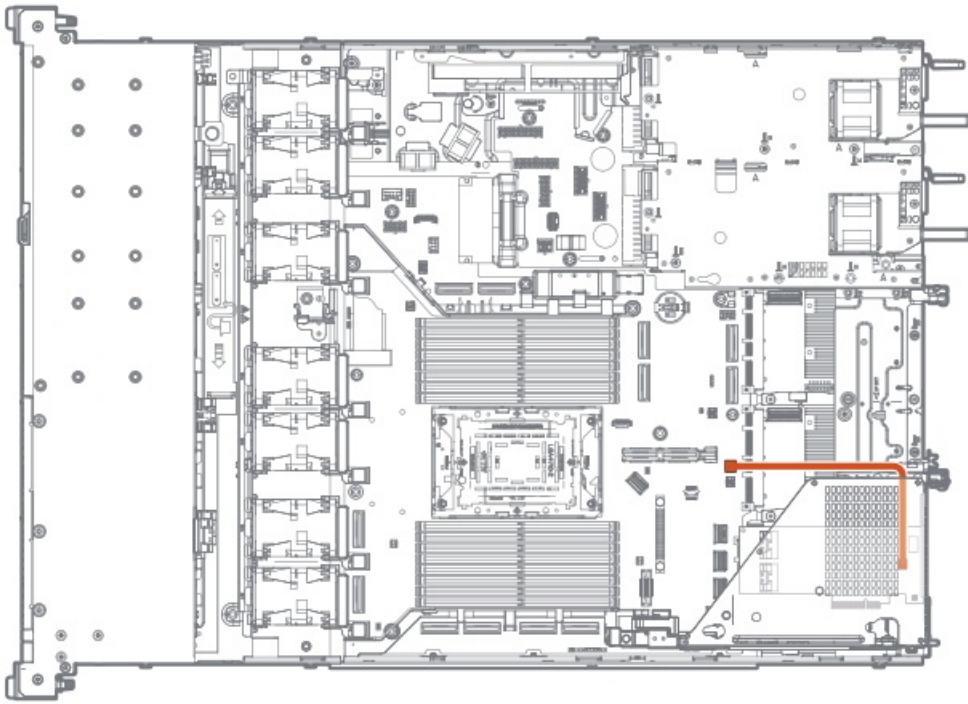
Cable part number	Color	From	To
—	Orange	Energy pack	Energy pack connector

Storage controller backup power cabling

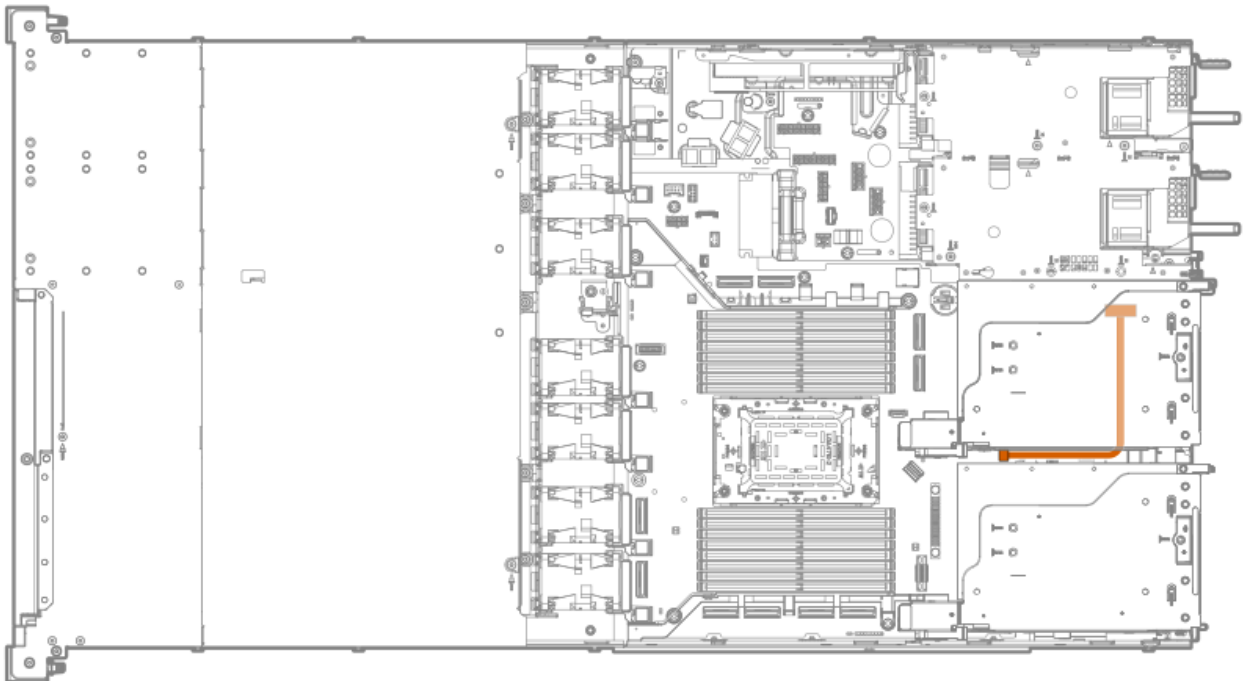
The exact route of the storage controller backup power cabling will depend on:

- 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.



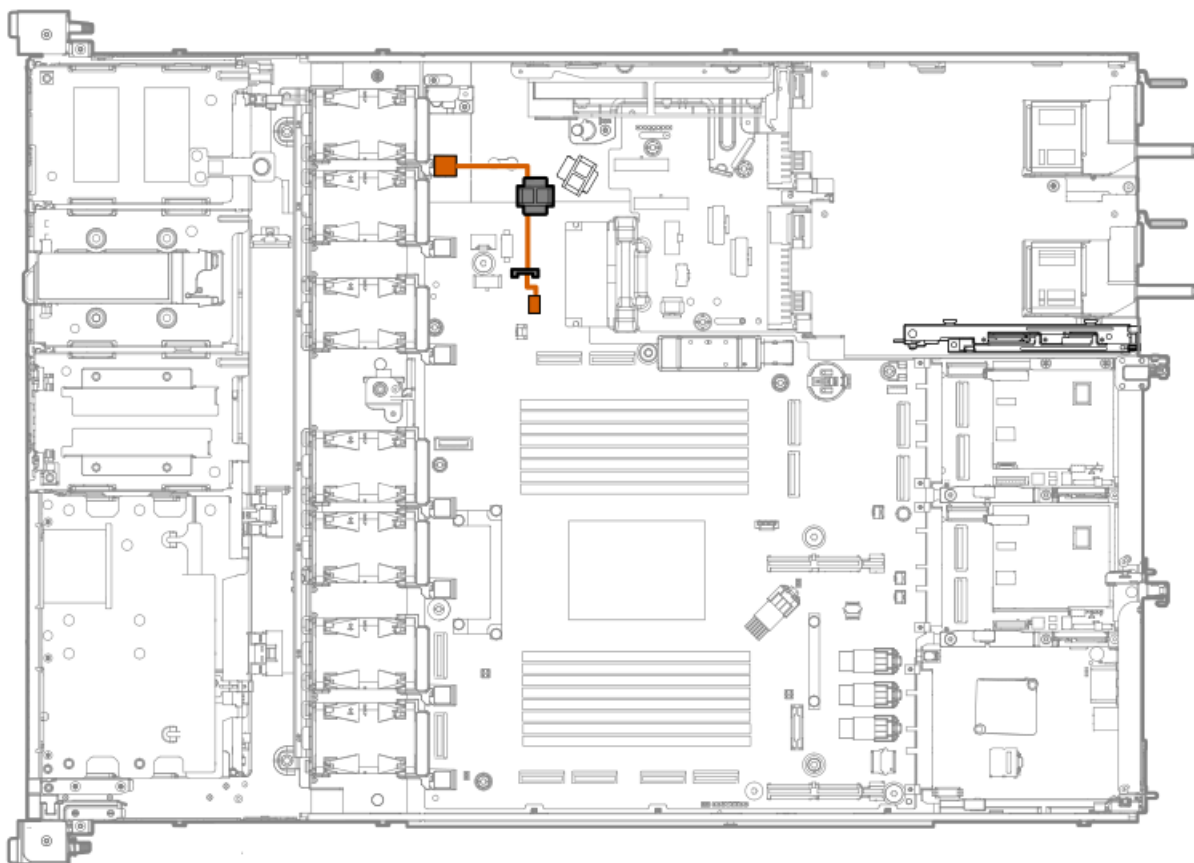
Cable part number	Color	From	To
—	Orange	Primary type-p controller	Storage controller backup power connector



Cable part number	Color	From	To
—	Orange	Secondary type-p controller	Storage controller backup power connector

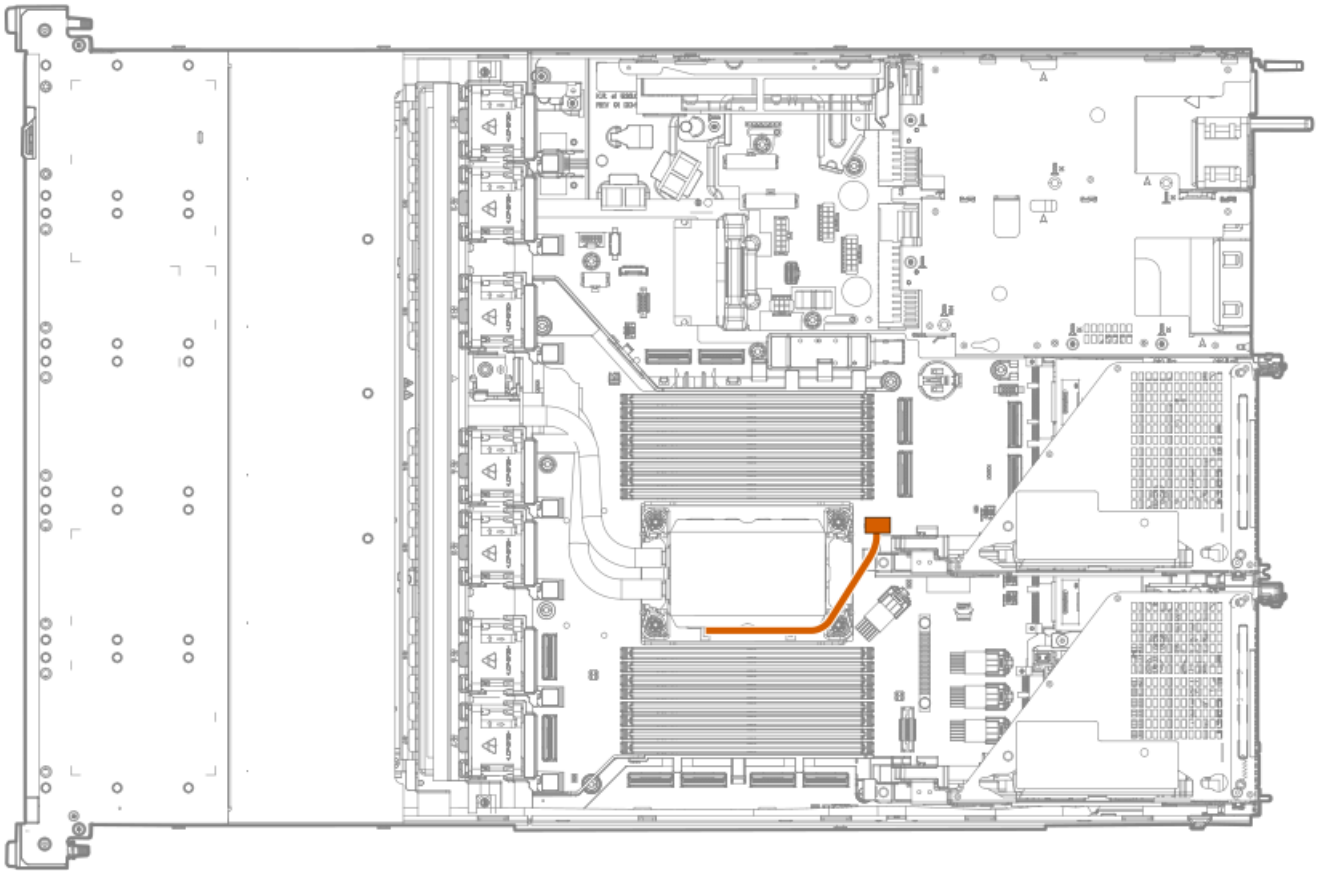
Fan cabling





Cable part number	Color	From	To
P71914-001	Orange	Fan connector	Fan connector 1

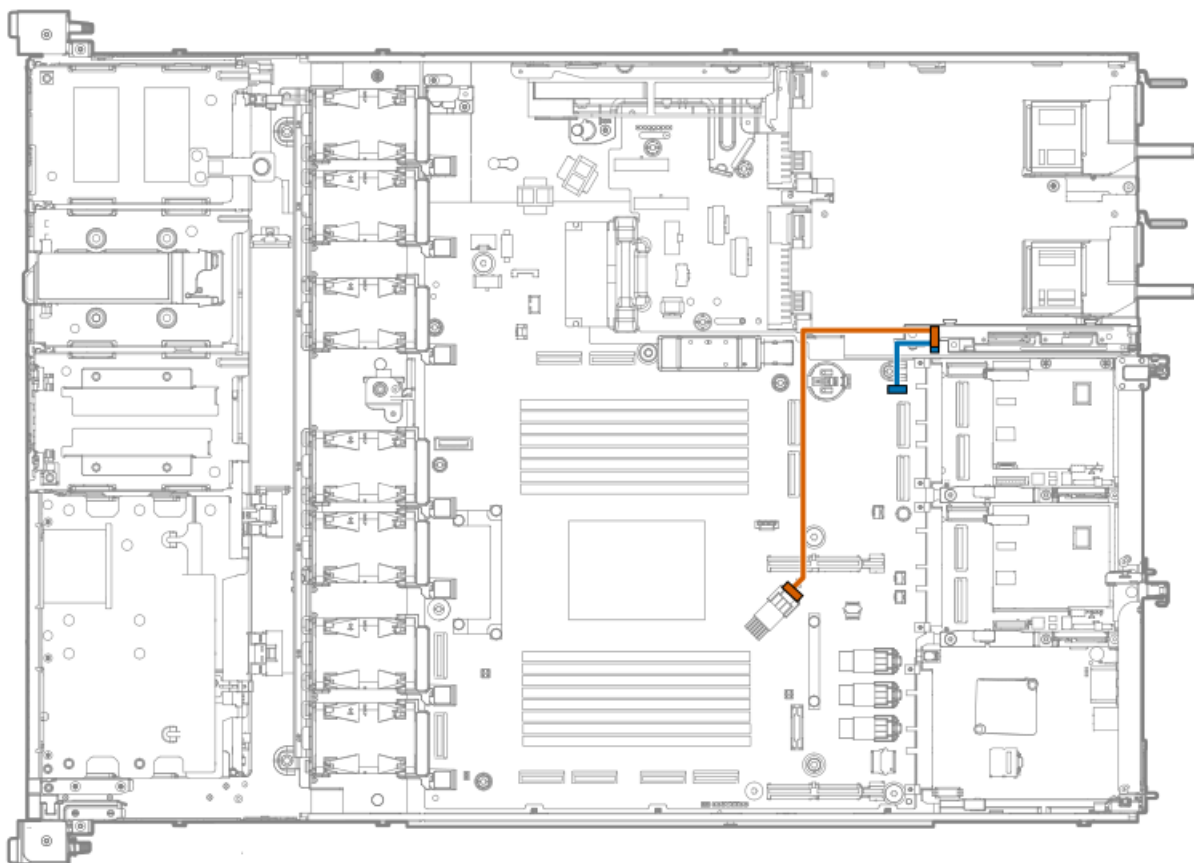
Closed-loop liquid cooling heatsink cabling



Cable part number	Color	From	To
—	Orange	Closed-loop liquid cooling heatsink	CLC connector

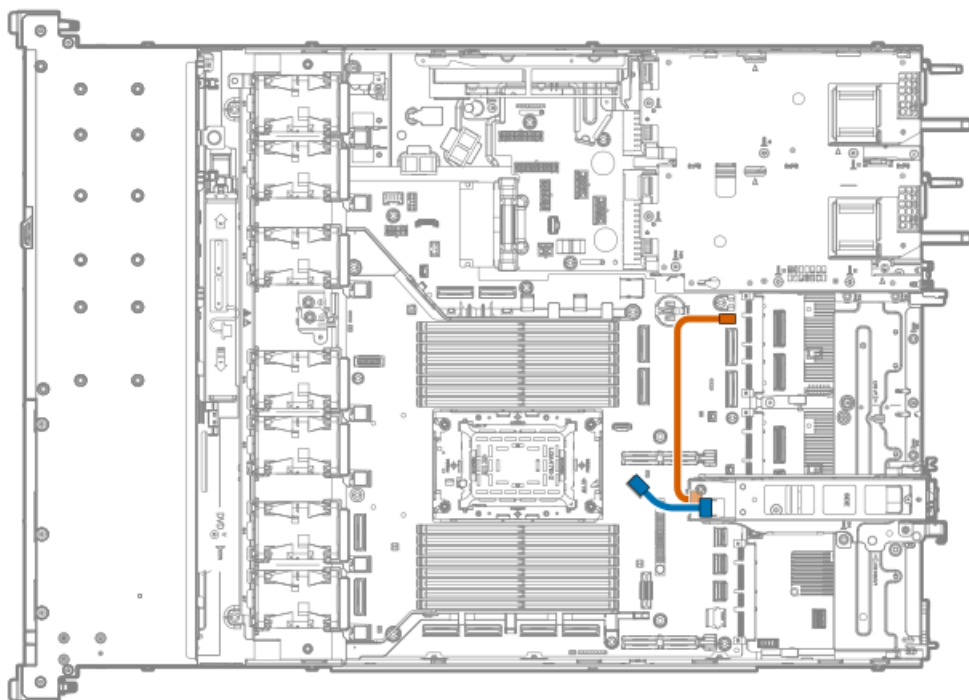
HPE NS204i-u Boot Device V2 cabling

In the power supply bay



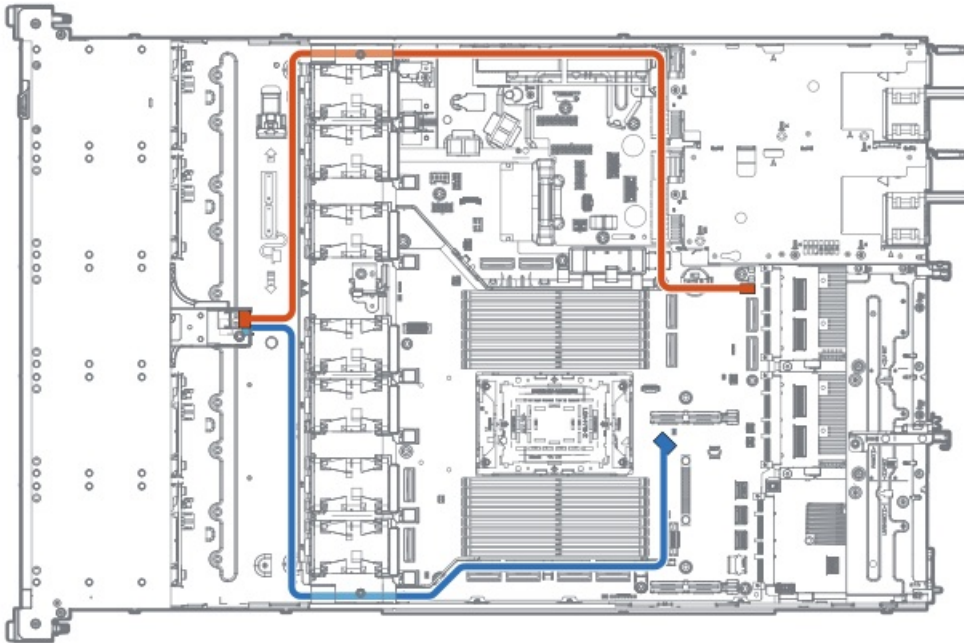
Cable part number	Color	From	To
P72024-001	Orange	Boot device carrier	NS204i-u signal connector
P63720-001	Blue	Boot device carrier	NS204i-u power connector

Between the riser cages



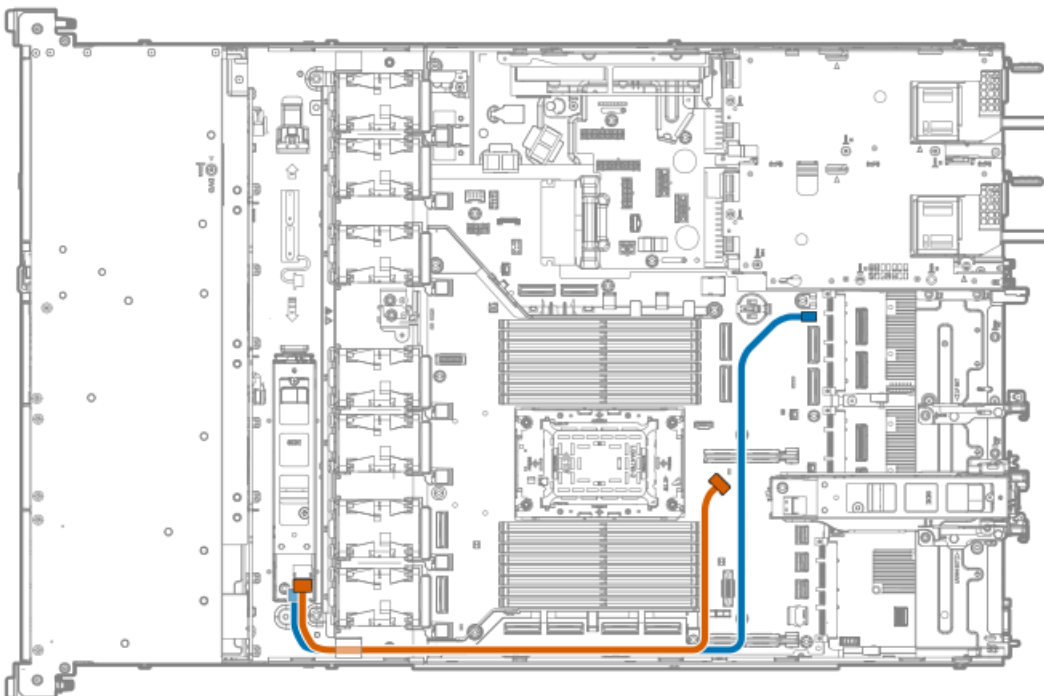
Cable part number	Color	From	To
P63720-001	Orange	Boot device carrier	NS204i-u power connector
P71913-001	Blue	Boot device carrier	NS204i-u signal connector

In box 3

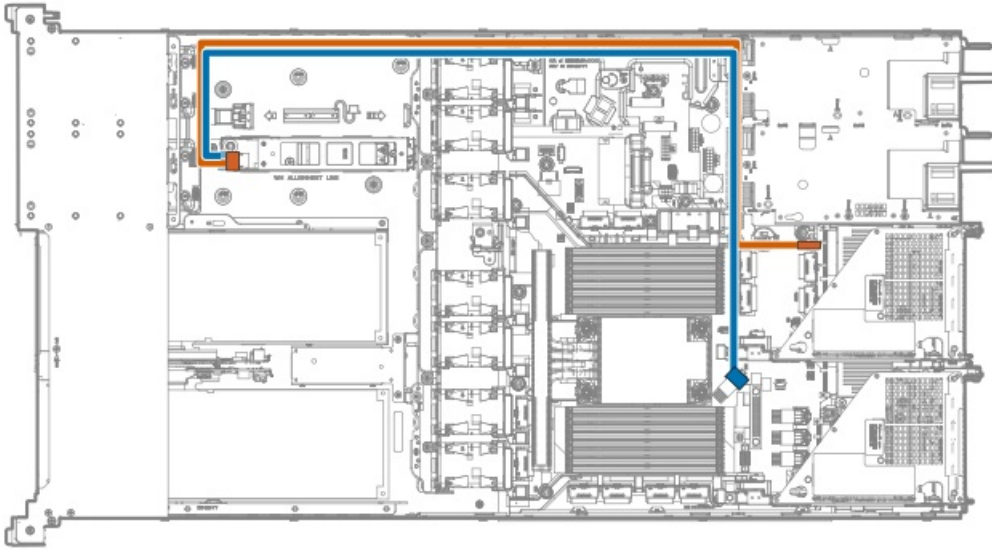


Cable part number	Color	From	To
P48956-001	Orange	Boot device carrier	NS204i-u power connector
P74730-001	Blue	Boot device carrier	NS204i-u signal connector

On the chassis



Cable part number	Color	From	To
P48956-001	Blue	Boot device carrier	NS204i-u power connector
P72024-001	Orange	Boot device carrier	NS204i-u signal connector



Cable part number	Color	From	To
P48956-001	Orange	Boot device carrier	NS204i-u power connector
P74730-001	Blue	Boot device carrier	NS204i-u signal connector

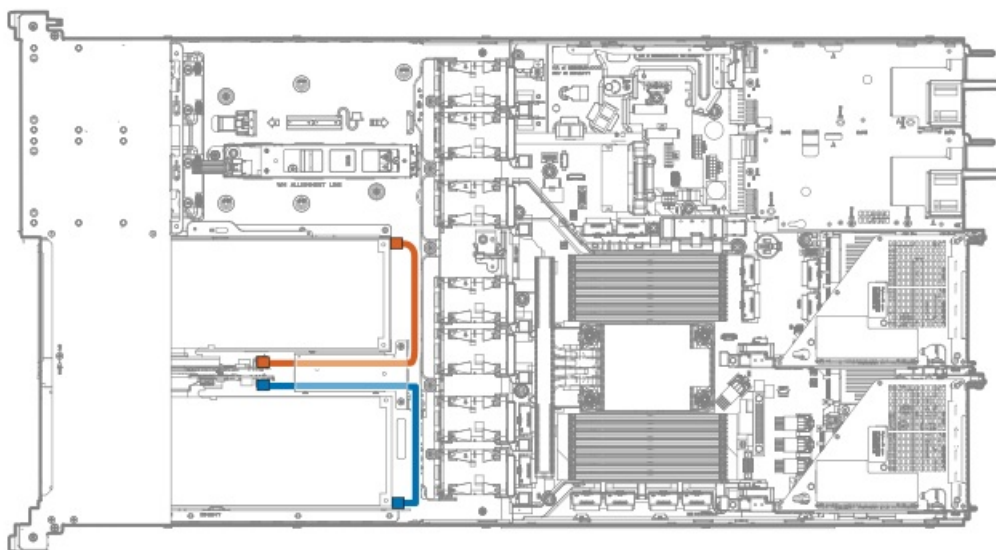
GPU cabling

Subtopics

[GPU auxiliary power cabling](#)

[GPU riser cabling](#)

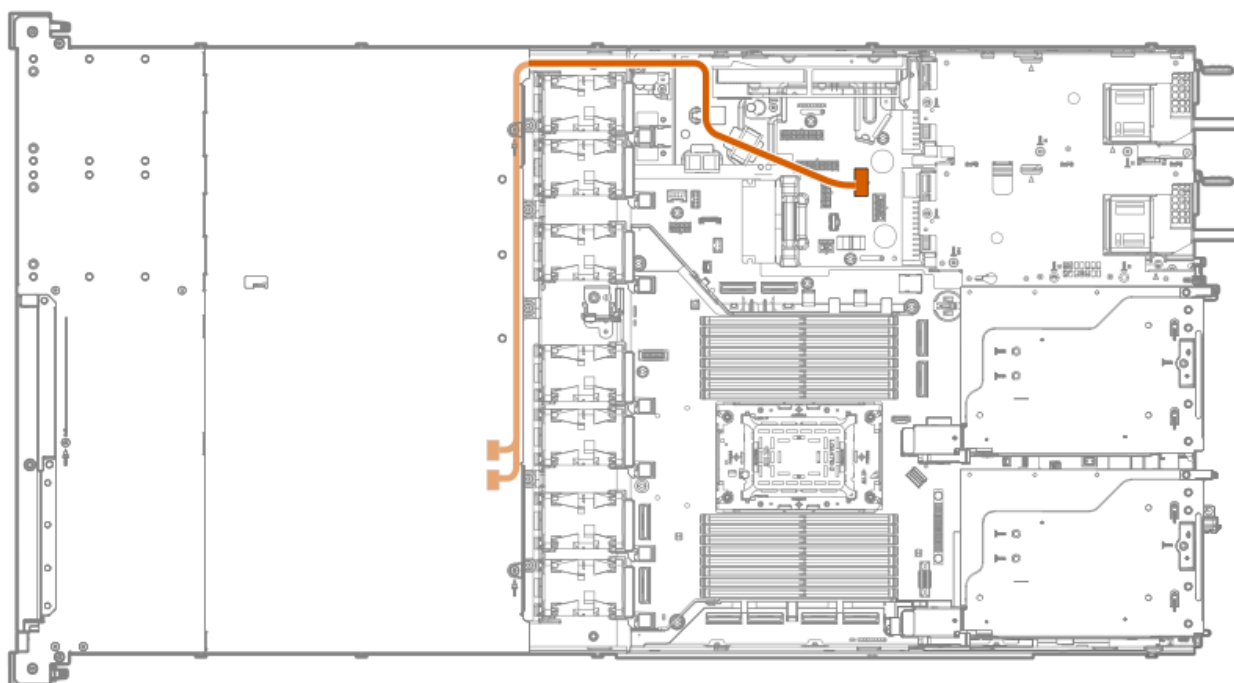
GPU auxiliary power cabling



Cable part number	Color	From	To
P75256-001	Orange	GPU auxiliary power connector	GPU power port
	Blue	GPU auxiliary power connector	GPU power port

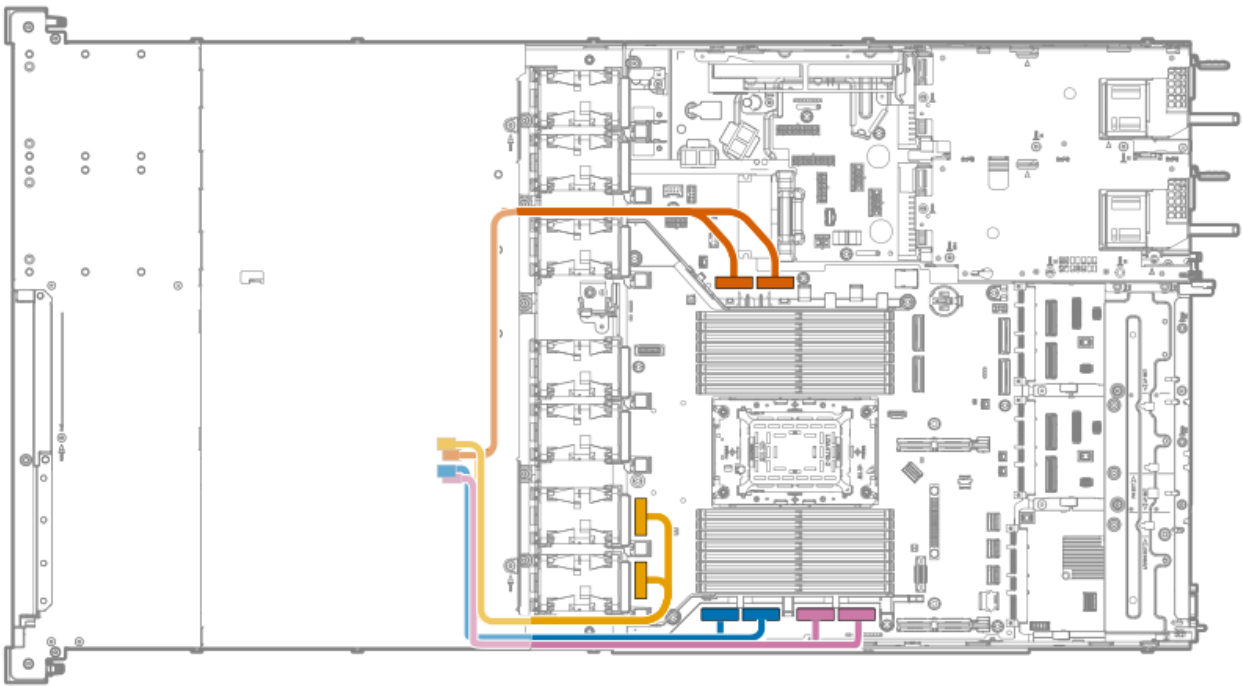
GPU riser cabling

GPU riser power cabling



Cable part number	Color	From	To
P75594-001	Orange	Captive riser power connectors	2 x 6 M-PIC power connectors

GPU riser signal cabling

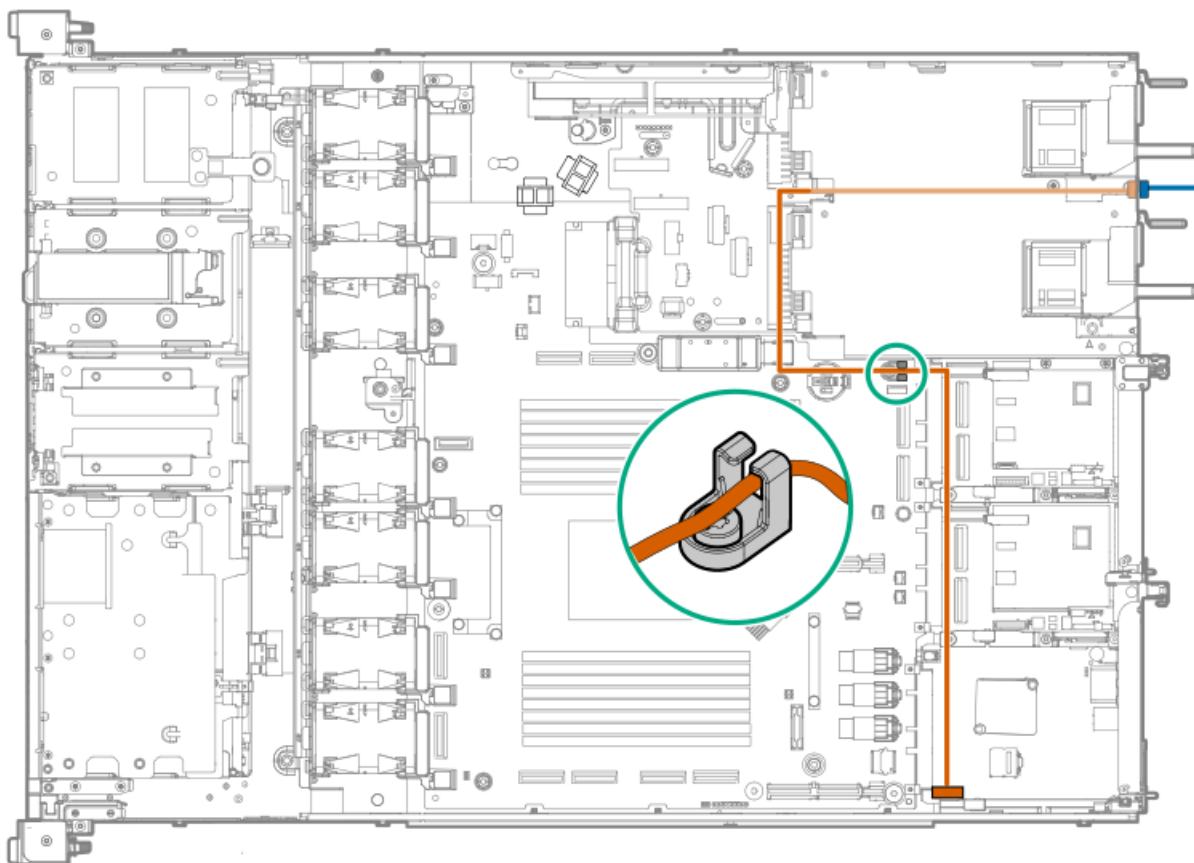


Cable part number	Color	From	To
P71886-001	Orange	Captive riser slot 3	M-XIO port 6 and M-XIO port 4
	Pink	Captive riser slot 6	M-XIO port 1 and M-XIO port 3
P73415-001	Gold	Captive riser slot 4	M-XIO port 0 and M-XIO port 2
	Blue	Captive riser slot 5	M-XIO port 7 and M-XIO port 5

Serial port cabling

Serial port cabling with the 60 mm power supply

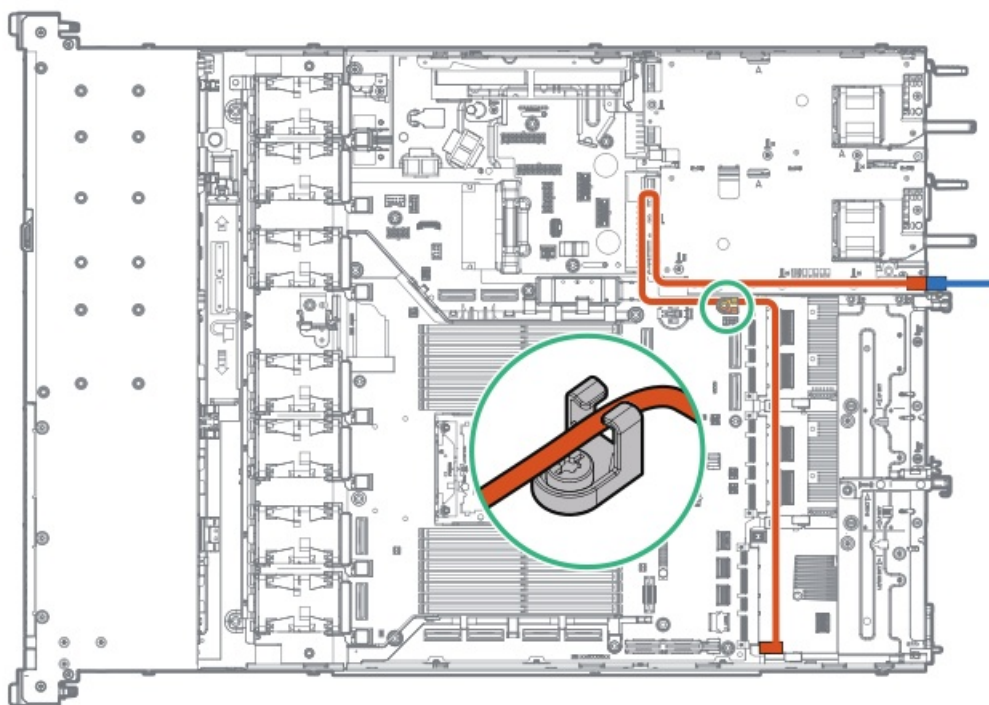




Cable part number	Color	From	To
P73744-001	Orange	ix port cable	Serial port cable connector ¹
P71826-001	Blue	Serial port dongle	ix port cable

¹ This port is located on the HPE ProLiant Compute iLO 6 DC-SCM.

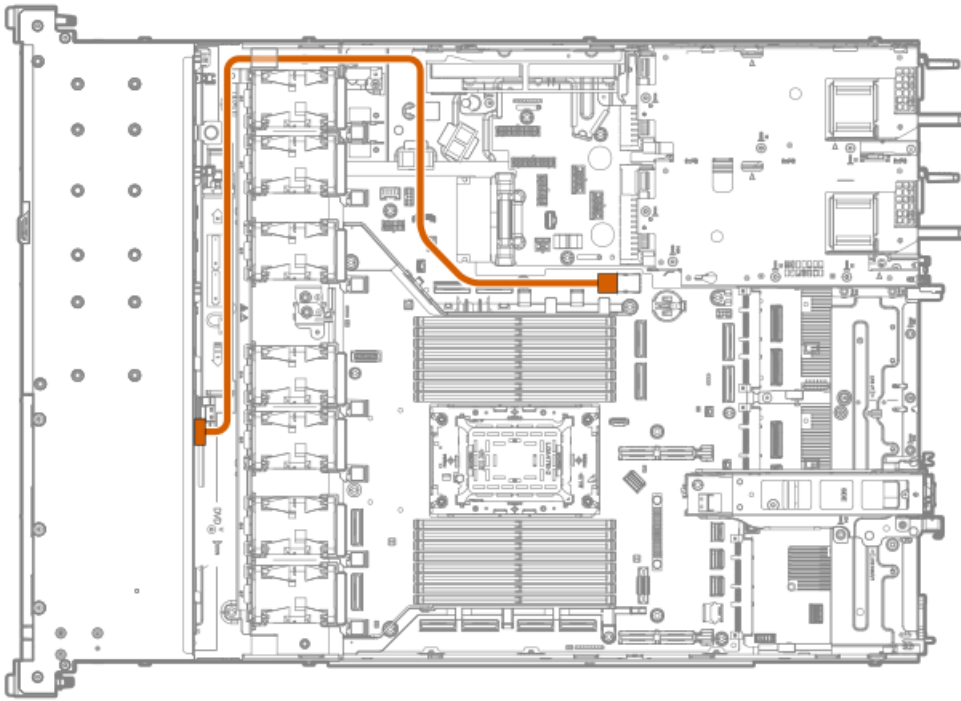
Serial port cabling with the 73.5 mm power supply



Cable part number	Color	From	To
P73744-001	Orange	ix port cable	Serial port cable connector
P71826-001	Blue	Serial port dongle	ix port cable

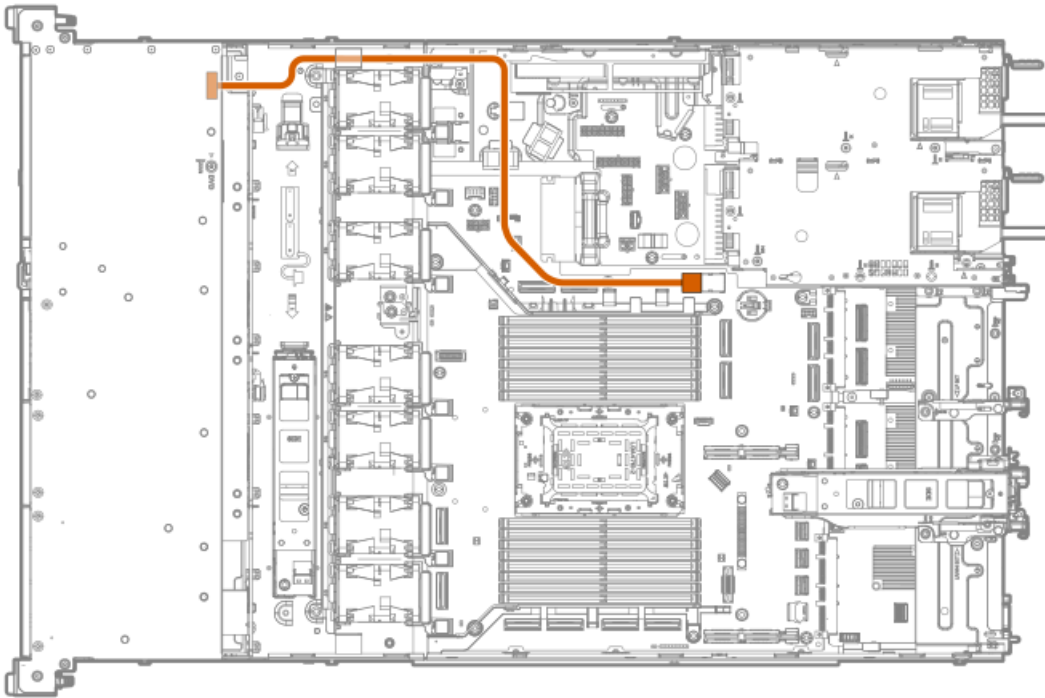
Optical drive cabling

8 SFF and mixed drive



Cable part number	Color	From	To
P73776-001	Orange	Optical drive	USB 3.2 Gen1 port

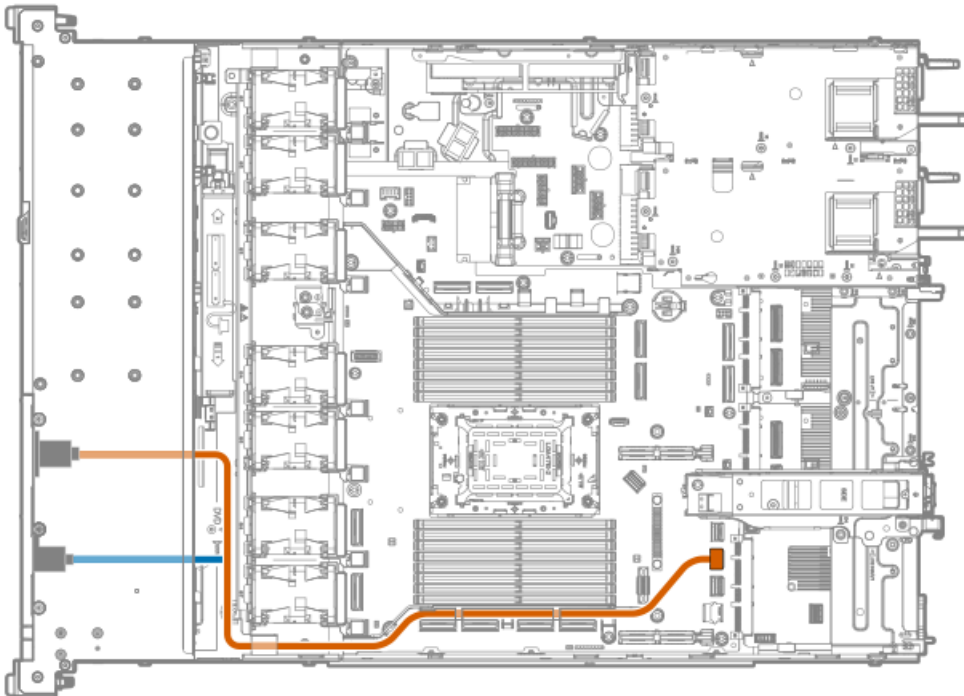
4 LFF drive



Cable part number	From	To
P73776-001	Optical drive	USB 3.2 Gen1 port

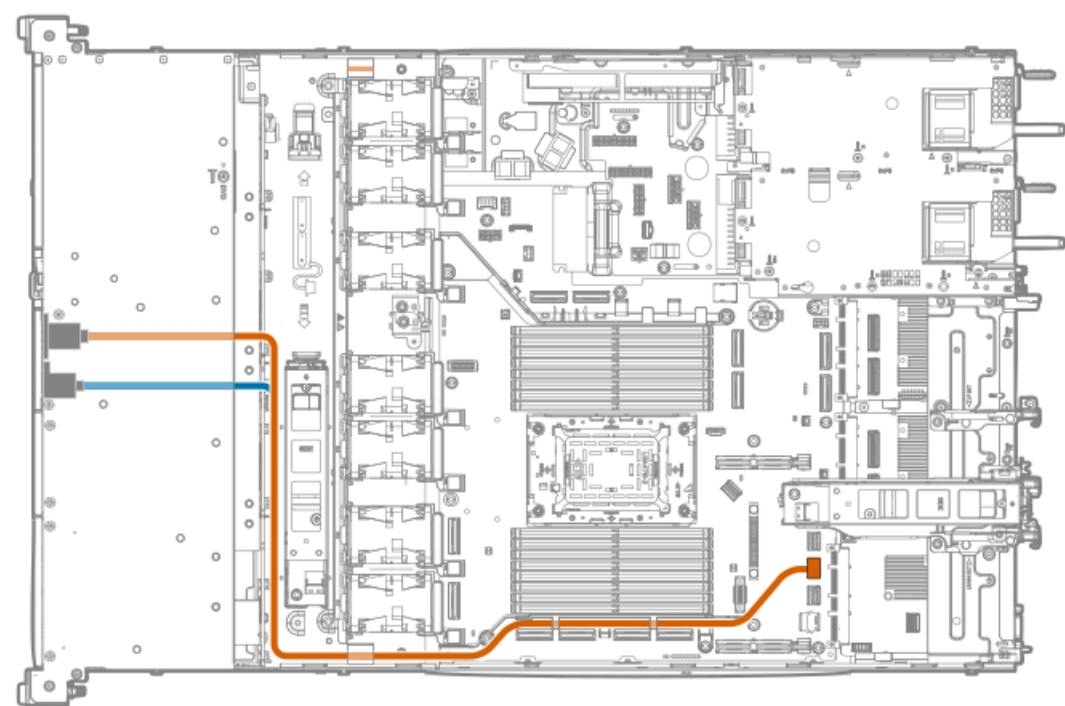
Display port cabling

SFF and E3.S drive



Cable part number	Color	From	To
P73948-001	Orange	Display port	USB 2.0 DisplayPort cable connector
	Blue	USB 2.0 port	

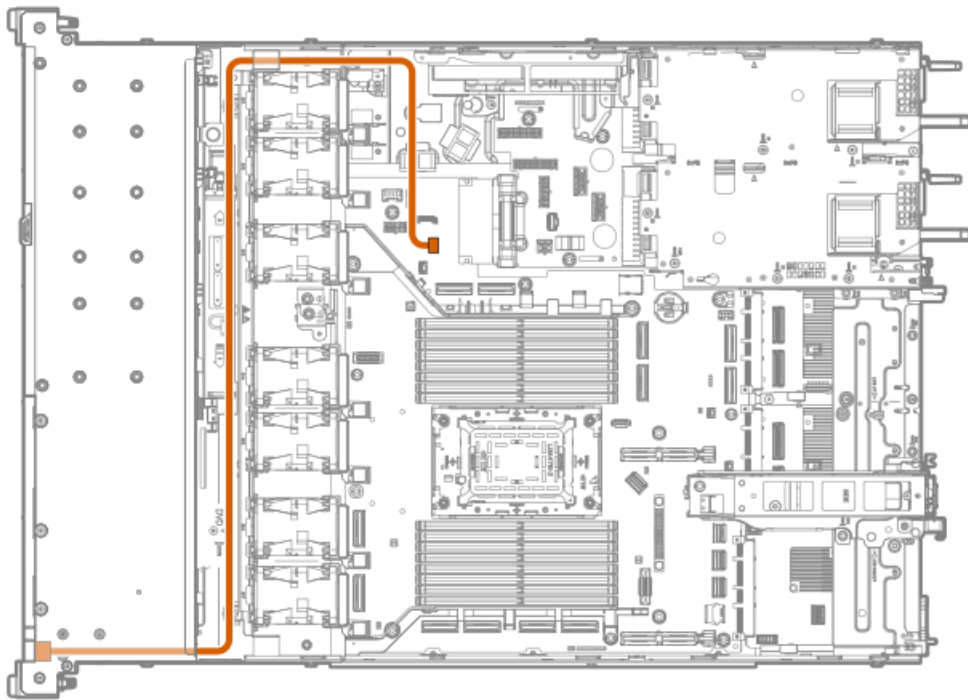
LFF drive



Cable part number	Color	From	To
P73948-001	Orange	Display port	USB 2.0 DisplayPort cable connector
	Blue	USB 2.0 port	

Systems Insight Display cabling

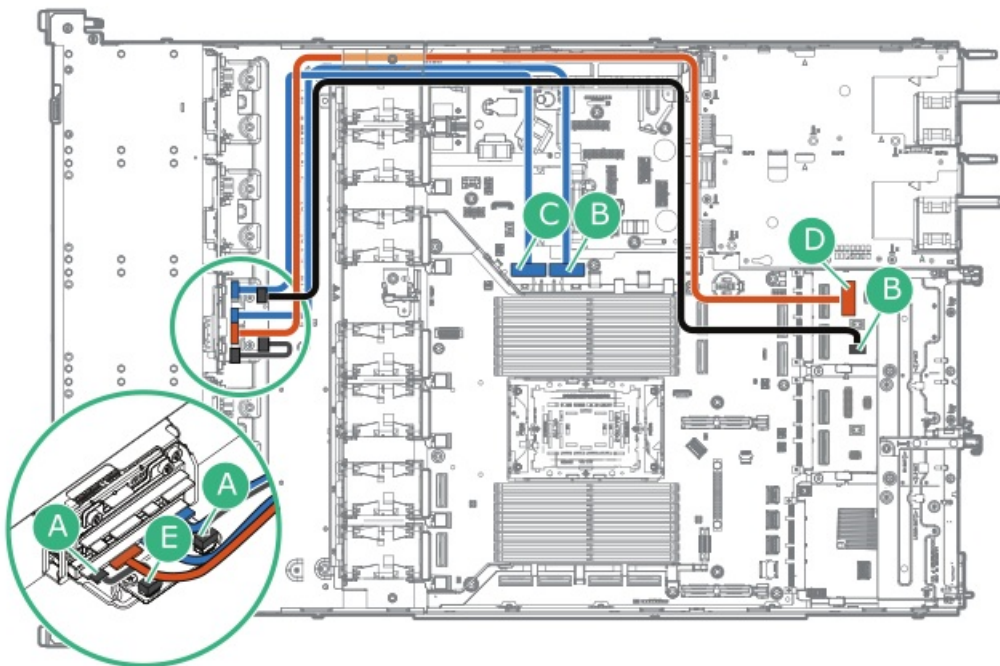




Cable part number	Color	From	To
P48971-001	Orange	SID	SID connector

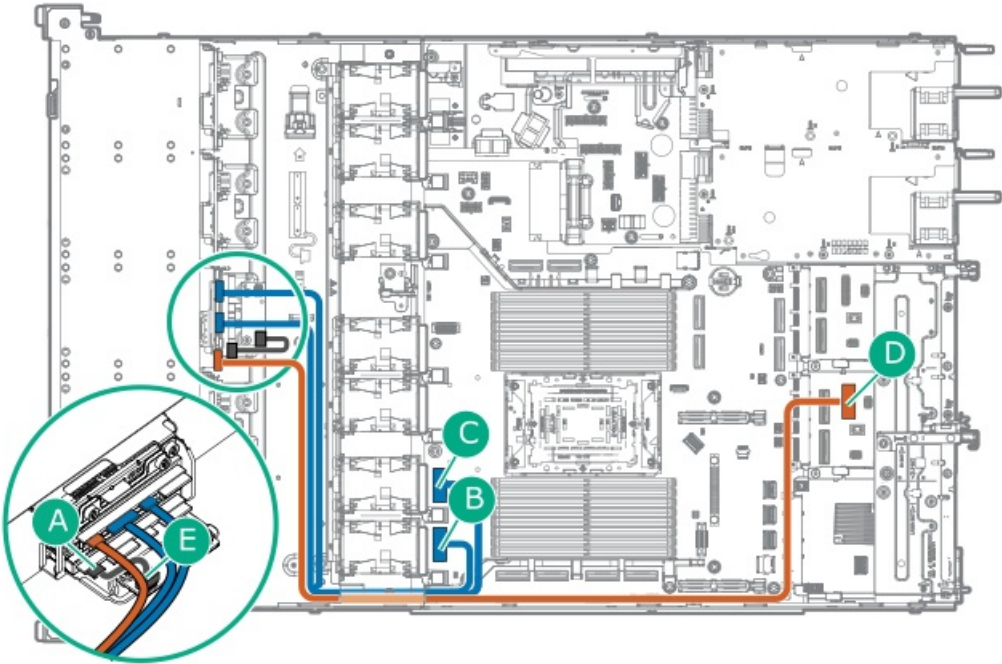
Front OCP NIC and PHY board cabling

Primary OCP



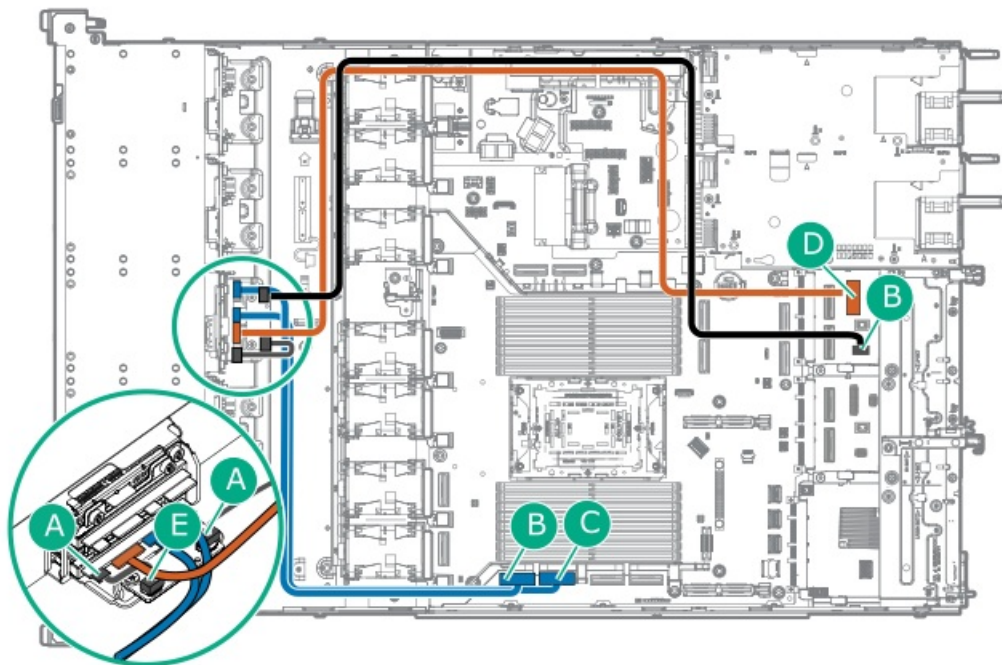
Cable part number	Color	From	To
P71941-001	Orange	Front OCP NIC cable	Front OCP NIC cable connector
	Blue	Front OCP NIC cable	M-XIO port 6 and M-XIO port 4
P73927-001	Black	PHY board cable connector	PHY board cable connector
—	Black	OCP NIC interposer connector	PHY board connector

Secondary OCP



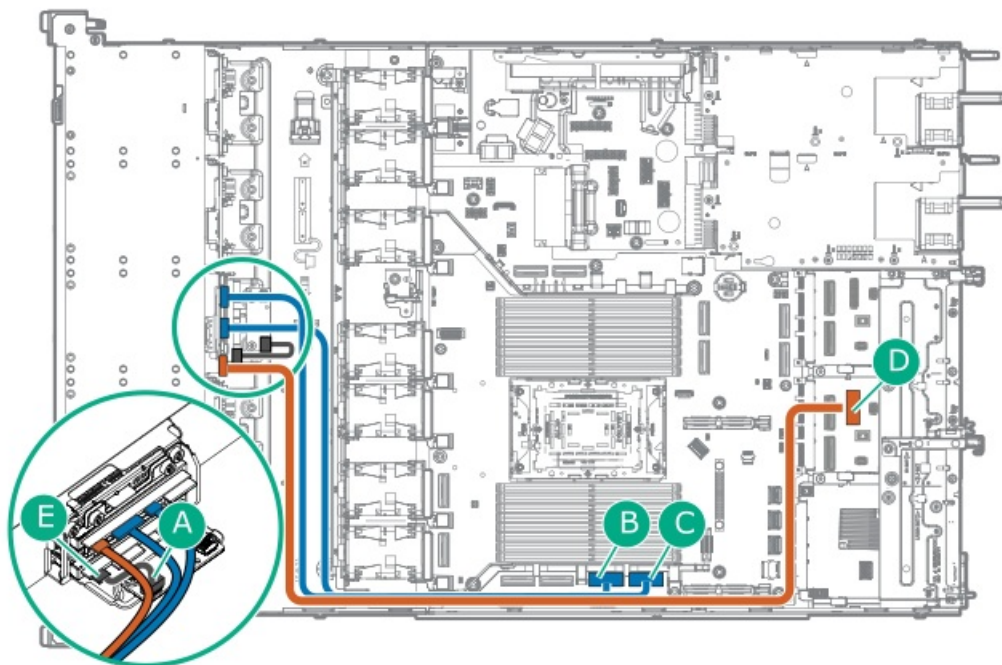
Cable part number	Color	From	To
P71941-001	Orange	Front OCP NIC cable	Front OCP NIC cable connector
	Blue	Front OCP NIC cable	M-XIO port 0 and M-XIO port 2
—	Black	OCP NIC interposer connector	PHY board connector

Rich I/O configuration: Primary OCP



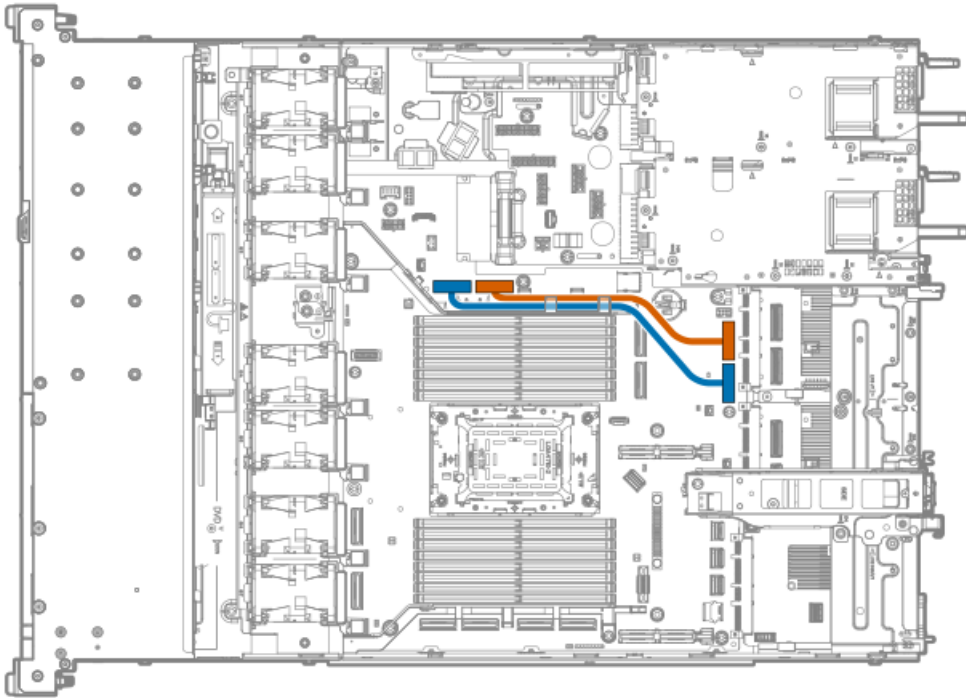
Cable part number	Color	From	To
P71941-001	Orange	Front OCP NIC cable	Front OCP NIC cable connector
	Blue	Front OCP NIC cable	M-XIO port 7 and M-XIO port 5
P73927-001	Black	PHY board	PHY board cable connector
—	Black	OCP NIC interposer connector	PHY board connector

Rich I/O configuration: Secondary OCP

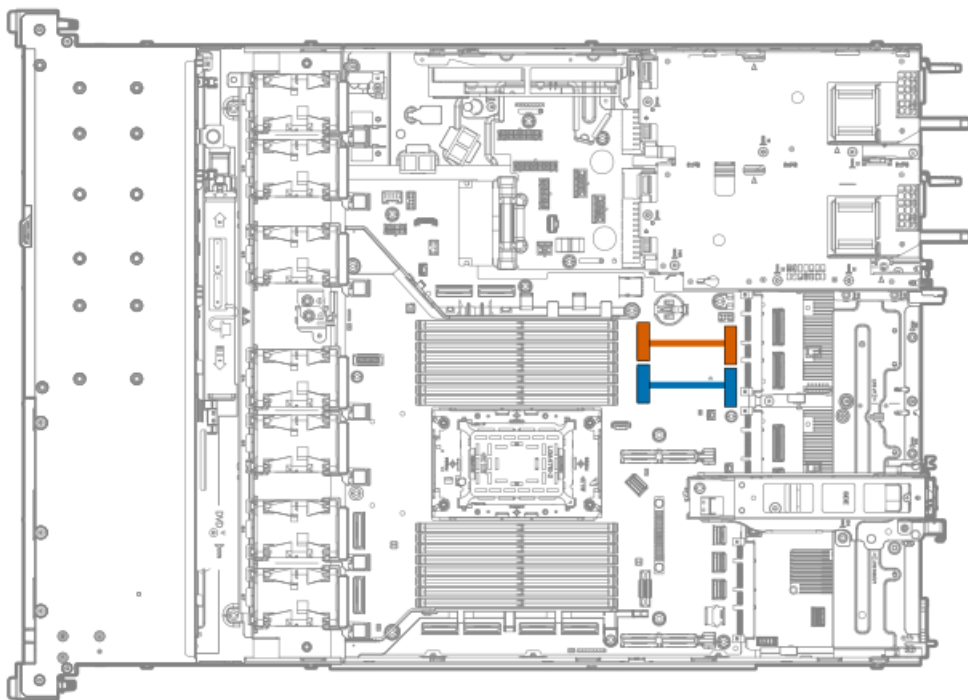


Cable part number	Color	From	To
P71941-001	Orange	Front OCP NIC cable	Front OCP NIC cable connector
	Blue	Front OCP NIC cable	M-XIO port 1 and M-XIO port 3
—	Black	OCP NIC interposer connector	PHY board cable connector

Rear OCP upgrade cabling

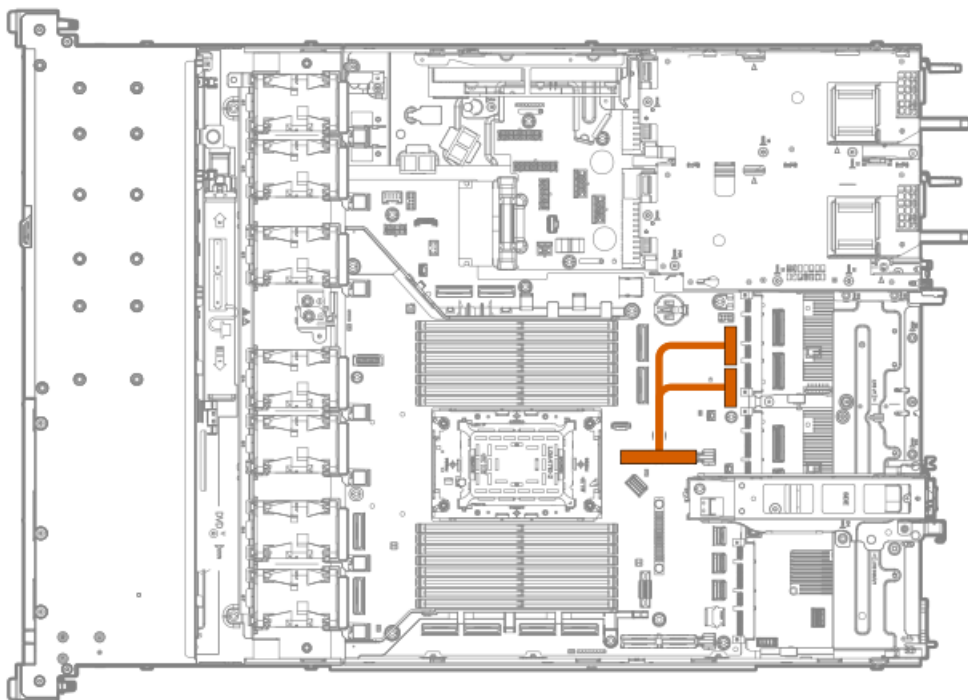


Cable part number	Color	From	To
P75506-001	Orange	M-XIO port 4	MCIO OCP B-1 input port
P75507-001	Blue	M-XIO port 6	MCIO OCP B-2 input port



Cable part number	Color	From	To
P75591-001	Orange	M-XIO port 17	MCIO OCP B-1 input port
	Blue	M-XIO port 13	MCIO OCP B-2 input port

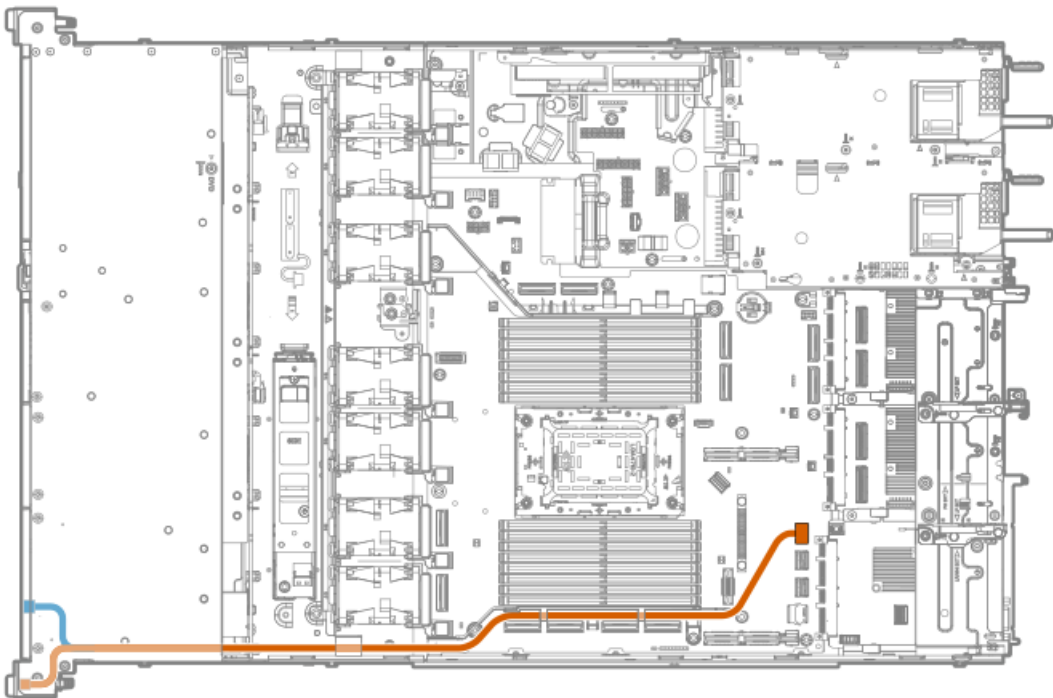
Full-height riser cage blanks are required for this connection.



Cable part number	Color	From	To
P73494-001	Orange	Secondary riser connector	MCIO OCP B-1 input port and MCIO OCP B-2 input port

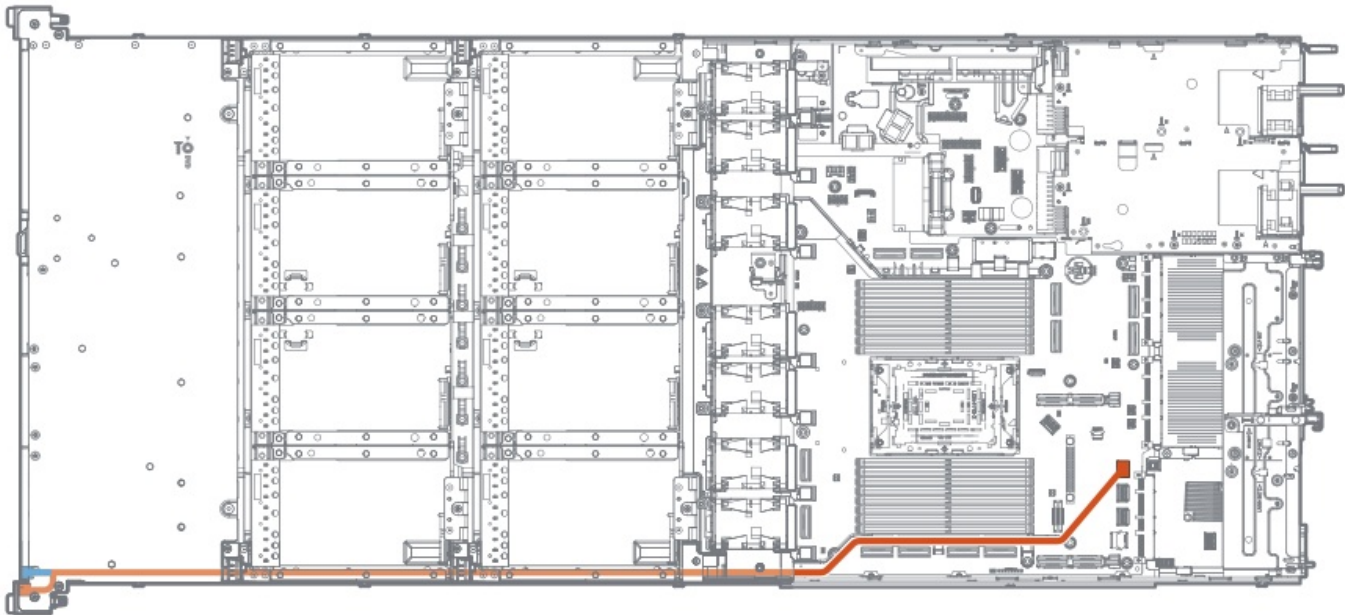
Front I/O cabling

SFF / E3.S / 4 LFF drive



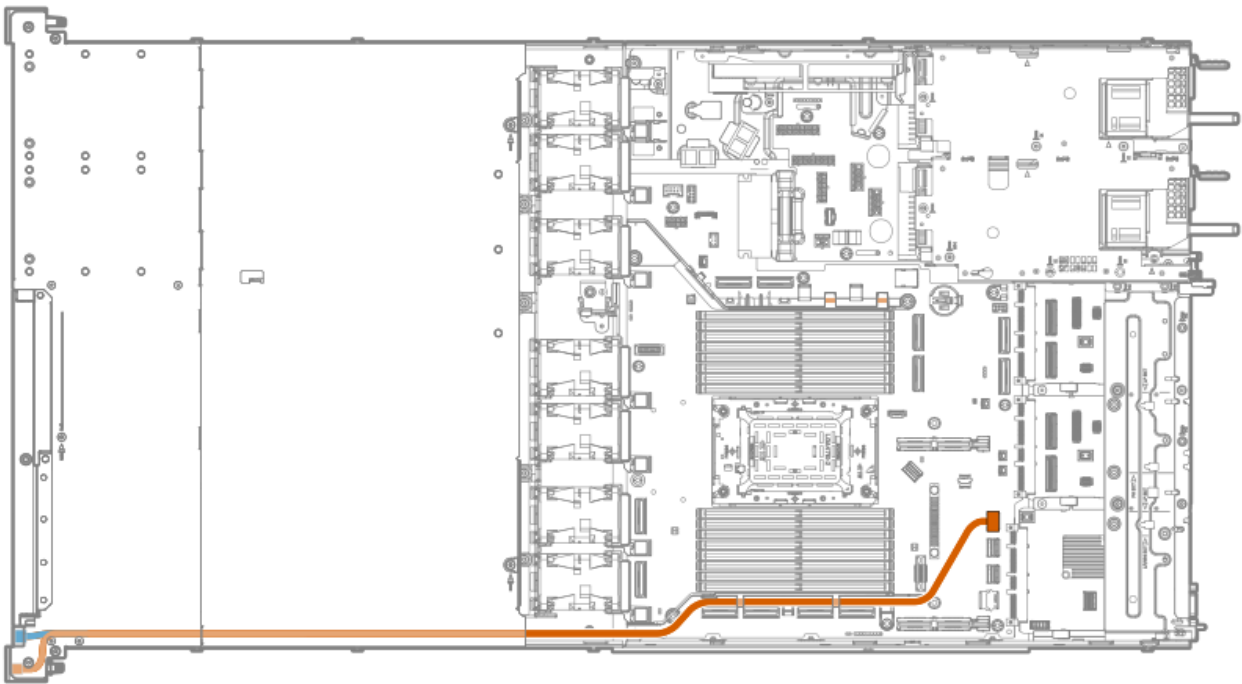
Cable part number	Color	From	To
P71909-001	Orange	USB 3.0	Front I/O connector
	Blue	Front I/O	

12 LFF drive



Cable part number	Color	From	To
P73417-001	Orange	USB 3.0	Front I/O connector
	Blue	Front I/O	

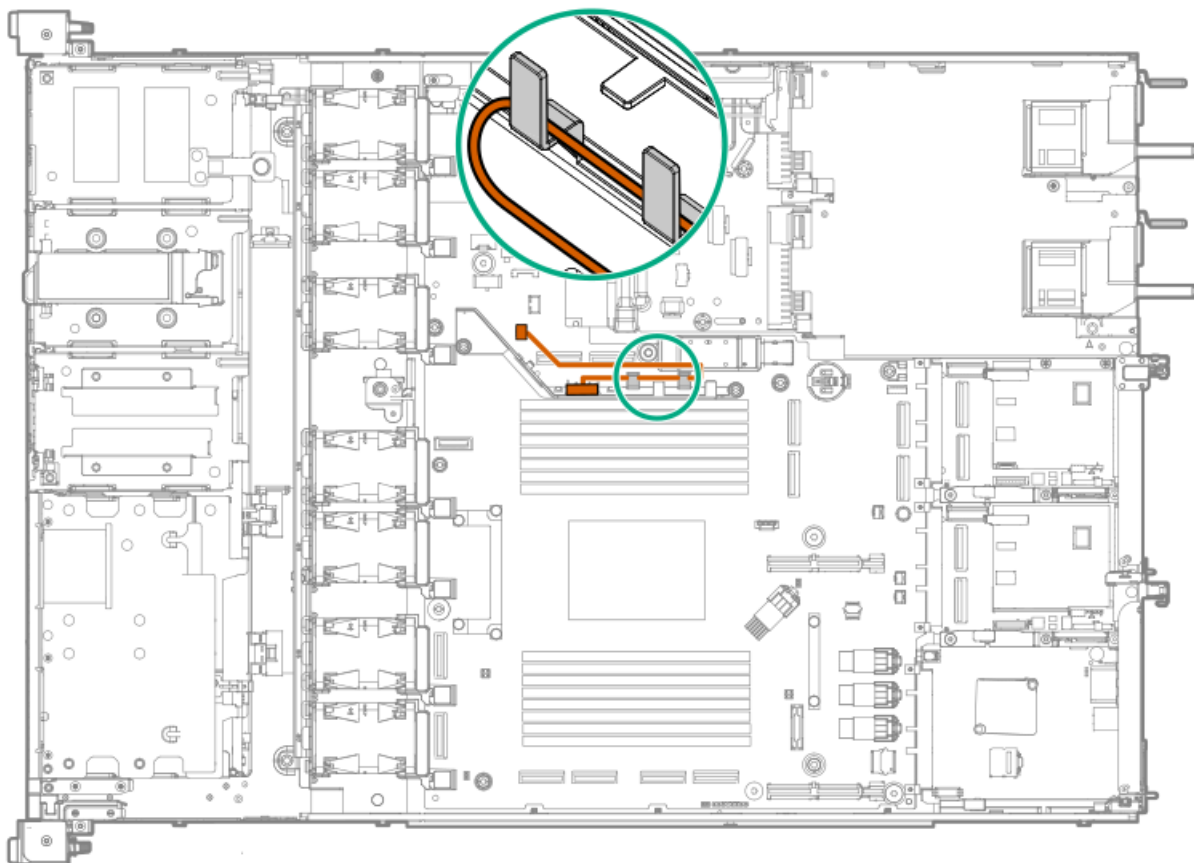
Mixed drive



Cable part number	Color	From	To
P73417-001	Orange	USB 3.0	Front I/O connector
	Blue	Front I/O	

Chassis intrusion detection switch cabling





Cable part number	Color	From	To
869413-001	Orange	Chassis intrusion switch	Chassis intrusion switch connector

Configuration resources

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

- Some utilities might not apply to your server. For information about server compatibility with the products listed in this chapter, see the product QuickSpecs (<https://www.hpe.com/info/quickspecs>).
- Products ordered from HPE 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 HPE Factory Express order.
- For one-stop access to version-specific software and firmware documentation, including the latest product release notes, see this quick links page:
<https://www.hpe.com/support/hpeproductdocs-quicklinks>

Subtopics

[Updating firmware or system ROM](#)

[Configuring the server](#)

[Configuring storage controllers](#)

[Deploying an OS](#)

[Configuring security](#)

[Server management](#)

[Managing Linux-based high performance compute clusters](#)

Updating firmware or system ROM

To	Use
Download service packs	<ul style="list-style-type: none">• Service Pack for ProLiant https://www.hpe.com/servers/spp/download• Get an overview of SPP and its ecosystem https://www.hpe.com/support/SPP-overview-videos-en
Deploy service packs to a single server	Smart Update Manager https://www.hpe.com/support/hpesmartupdatemanager-quicklinks
Deploy service packs to multiple servers	HPE OneView https://www.hpe.com/support/hpeoneview-quicklinks
Updating iLO or system firmware in a single server	iLO user guide https://www.hpe.com/support/hpeilodocs-quicklinks
<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	HPE Compute Ops Management https://www.hpe.com/support/hpe-gl-com-quicklinks

Configuring the server



To configure

Use

Single server (GUI)

- Intelligent Provisioning
<https://www.hpe.com/support/hpeintelligentprovisioning-quicklinks>
- iLO remote console or web interface
<https://www.hpe.com/support/hpeilodocs-quicklinks>
- UEFI System Utilities
<https://www.hpe.com/support/hpeuefisystemutilities-quicklinks>
- HPE Compute Ops Management
<https://www.hpe.com/support/hpe-gl-com-quicklinks>

Single server (scripting)

- RESTful Interface Tool
<https://www.hpe.com/support/restfulinterface/docs>
- Python iLO Redfish Library (python-ilorest-library)
<https://github.com/HewlettPackard/python-ilorest-library>
- Scripting Tools for Windows Powershell
<https://www.hpe.com/info/powershell/docs>
- iLO RESTful API
<https://servermanagementportal.ext.hpe.com/>
- HPE Compute Ops Management API
<https://developer.greenlake.hpe.com/>

Multiple servers (either UI or scripting)

- HPE OneView ¹
<https://www.hpe.com/support/hpeoneview-quicklinks>
- HPE Compute Ops Management
<https://www.hpe.com/support/hpe-gl-com-quicklinks>
 - **Server settings:** Define server-specific parameters such as firmware baselines, and then apply them to server groups.
 - **Server groups:** Organize servers into custom-defined sets with associated server settings, and then apply group-specific policies to create a consistent configuration across the servers in the group.

¹

For servers running HPE OneView, do not use another tool, such as iLO, to delete or change certain settings. For more information about using HPE OneView and iLO to manage the same server, see the iLO user guide at <https://www.hpe.com/support/hpeilodocs-quicklinks>.

Configuring storage controllers

Controller type	Documentation
HPE MR Gen11 controllers	<p>HPE MR Gen11 Controller User Guide</p> <p>https://hpe.com/support/MR-Gen11-UG</p> <p>Configuration guides:</p> <ul style="list-style-type: none"> • HPE MR Storage Administrator User Guide <p>https://www.hpe.com/support/MRSA</p> <ul style="list-style-type: none"> • HPE StorCLI User Guide <p>https://www.hpe.com/support/StorCLI</p>
HPE MR Gen12 controllers	<p>HPE MR Gen12 Controller User Guide</p> <p>https://hpe.com/support/MR-Gen12-UG</p> <p>Configuration guides:</p> <ul style="list-style-type: none"> • HPE MR Storage Administrator User Guide <p>https://www.hpe.com/support/MRSA</p> <ul style="list-style-type: none"> • HPE StorCLI User Guide <p>https://www.hpe.com/support/StorCLI</p>

Deploying an OS

For a list of supported operating systems, see the HPE Servers Support & Certification Matrices:

<https://www.hpe.com/support/Servers-Certification-Matrices>

To	See
Deploy an OS using HPE Compute Ops Management	<p>HPE Compute Ops Management User Guide</p> <p>https://www.hpe.com/support/hpe-gl-com-quicklinks</p>
Deploy an OS using Intelligent Provisioning	<p>Intelligent Provisioning user guide</p> <p>https://www.hpe.com/support/hpeintelligentprovisioning-quicklinks</p>
Deploy an OS using iLO virtual media	<p>iLO user guide</p> <p>https://www.hpe.com/support/hpeilodocs-quicklinks</p>
Configure the server to boot from a PXE server	<p>UEFI System Utilities User Guide for HPE Compute servers</p> <p>https://www.hpe.com/support/UEFIGen12-UG-en</p>
Configure the server to boot from a SAN	<p>HPE Boot from SAN Configuration Guide</p> <p>https://www.hpe.com/info/boot-from-san-config-guide</p>

Configuring security

To	See
Implement server security best practices.	<ul style="list-style-type: none"> HPE Compute Security Reference Guide https://www.hpe.com/info/server-security-reference-en HPE iLO 7 Security Technology Brief https://www.hpe.com/support/ilo7-security-en
Configure and use the Server Configuration Lock feature on HPE Trusted Supply Chain servers and other servers that have the Server Configuration Lock feature enabled.	Server Configuration Lock User Guide for HPE ProLiant servers and HPE Synergy https://www.hpe.com/info/server-config-lock-UG-en

Server management

To monitor	See
Single server	HPE iLO https://www.hpe.com/support/hpeilodocs-quicklinks
Multiple servers	HPE OneView https://www.hpe.com/support/hpeoneview-quicklinks
Single or multiple servers	HPE Compute Ops Management https://www.hpe.com/support/hpe-gl-com-quicklinks

Managing Linux-based high performance compute clusters

To	Use
Provision, manage, and monitor clusters.	HPE Performance Cluster Manager https://www.hpe.com/support/hpcm_manuals
Optimize your applications.	HPE Performance Analysis Tools https://www.hpe.com/info/perftools
Optimize software library for low latency and high bandwidth, both on-node and off-node, for point-to-point and collective communications.	HPE Cray Programming Environment User Guide https://www.hpe.com/info/cray-pe-user-guides

Troubleshooting

Subtopics

[NMI functionality](#)
[Front panel LED power fault codes](#)

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.

Front panel LED power fault codes

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

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

Troubleshooting resources

If you need help troubleshooting, see the latest articles for your server.

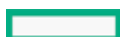
<https://www.hpe.com/info/dl320gen12-ts>

Safety, warranty, and regulatory information

Subtopics

[Regulatory information](#)

[Warranty information](#)



Regulatory information

To view the regulatory information for your product, view the [Safety and Compliance Information for Server, Storage, Power, Networking, and Rack Products](#), available at the Hewlett Packard Enterprise Support Center:

<https://www.hpe.com/support/Safety-Compliance-EnterpriseProducts>

Additional regulatory information

Hewlett Packard Enterprise 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). A chemical information report for this product can be found at:

<https://www.hpe.com/info/reach>

For Hewlett Packard Enterprise product environmental and safety information and compliance data, including RoHS and REACH, see:

<https://www.hpe.com/info/ecodata>

For Hewlett Packard Enterprise environmental information, including company programs, product recycling, and energy efficiency, see:

<https://www.hpe.com/info/environment>

Subtopics

[Notices for Eurasian Economic Union](#)

[Turkey RoHS material content declaration](#)

[Ukraine RoHS material content declaration](#)

Notices for Eurasian Economic Union



Manufacturer and Local Representative Information

Manufacturer information:

Hewlett Packard Enterprise Company, 1701 E Mossy Oaks Road, Spring, TX 77389 U.S.

Local representative information Russian:

- **Russia**
ООО "Хьюлетт Паккард Энтерпрайз", Российская Федерация, 125171, г. Москва, Ленинградское шоссе, 16А, стр.3, Телефон: +7 499 403 4248 Факс: +7 499 403 4677
- **Kazakhstan**
ТОО «Хьюлетт-Паккард (К)», Республика Казахстан, 050040, г. Алматы, Бостандыкский район, проспект Аль-Фараби, 77/7, Телефон/факс: + 7 727 355 35 50

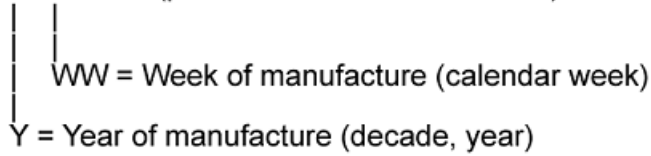
Local representative information Kazakh:

- **Russia**
ЖШС "Хьюлетт Паккард Энтерпрайз", Ресей Федерациясы, 125171, Мәскеу, Ленинград тас жолы, 16А блок 3, Телефон: +7 499 403 4248 Факс: +7 499 403 4677
- **Kazakhstan**
ЖШС «Хьюлетт-Паккард (К)», Қазақстан Республикасы, 050040, Алматы қ., Бостандық ауданы, Әл-Фараби даңғ ылы, 77/7, Телефон/факс: +7 727 355 35 50

Manufacturing date:

The manufacturing date is defined by the serial number.

CCSYWWZZZZ (product serial number format)



If you need help identifying the manufacturing date, contact tre@hpe.com.

Turkey RoHS material content declaration

Türkiye Cumhuriyeti: AEEE Yönetmeliğine Uygundur

Ukraine RoHS material content declaration

Обладнання відповідає вимогам Технічного регламенту щодо обмеження використання деяких небезпечних речовин в електричному та електронному обладнанні, затвердженого постановою Кабінету Міністрів України від 3 грудня 2008 № 1057

Warranty information

To view the warranty information for your product, see the [warranty check tool](#).

Specifications

Subtopics

[Environmental specifications](#)

[Mechanical specifications](#)

[Power supply specifications](#)

Environmental specifications



Specifications	Value
Temperature range	—
Operating	10°C to 35°C (50°F to 95°F)
Nonoperating	Air-cooled systems: -30°C to 60°C (-22°F to 140°F) Liquid-cooled systems (DLC, CLLC): -10 °C to 60°C (14°F to 140°F) CAUTION: To prevent freezing the coolant and damaging the liquid cooling module, do not keep the liquid-cooled systems below -10°C (14°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 might be limited by the type and number of options installed.

System performance under standard operating support might be reduced if operating above 30°C (86°F) or with a faulty fan installed.

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).

The approved hardware configurations for this system are listed in the Extended Ambient Temperature Guidelines for HPE Gen12 Servers: <https://www.hpe.com/support/ASHRAEGen12>

Mechanical specifications

Specification	Value
8 SFF drive configuration	—
Height	4.29 cm (1.69 in)
Depth	60.94 cm (23.92 in)
Width	43.46 cm (17.11 in)
Weight, minimum	11.05 kg (24.36 lb)
Weight, maximum	17.25 kg (38.03 lb)
10 SFF / 20 E3.S drive configuration	—
Height	4.29 cm (1.69 in)
Depth	66.70 cm (28.26 in)
Width	43.46 cm (17.11 in)
Weight, minimum	11.42 kg (25.18 lb)
Weight, maximum	18.71 kg (41.25 lb)
4 LFF drive configuration	—
Height	4.29 cm (1.69 in)
Depth	66.70 cm (28.26 in)
Width	43.46 cm (17.11 in)
Weight, minimum	12.34 kg (27.21 lb)
Weight, maximum	18.34 kg (40.43 lb)
12 LFF drive configuration	—
Height	4.29 cm (1.69 in)
Depth	99.74 cm (39.27 in)
Width	43.46 cm (17.11 in)
Weight, minimum	17.48 kg (38.54 lb)
Weight, maximum	28.93 kg (63.78 lb)
GPU configuration	—
Height	4.29 cm (1.69 in)
Depth	82.18 cm (32.35 in)
Weight, minimum	15.14 kg (33.38 lb)
Weight, maximum	21.53 kg (47.47 lb)

Power supply specifications

Depending on the installed options and the regional location where the server was purchased, the server can be configured with one of the following power supplies. For detailed power supply specifications, see the QuickSpecs on the [Hewlett Packard Enterprise website](#).

Subtopics

[HPE 1000 W M-CRPS Titanium Hot-plug Power Supply](#)

[HPE 1500 W M-CRPS Titanium Hot-plug Power Supply](#)

[HPE 2400 W M-CRPS Titanium Hot-plug Power Supply](#)

HP 1000 W M-CRPS Titanium Hot-plug Power Supply

HPE 1500 W M-CRPS Titanium Hot-plug Power Supply

Specification	Value
Energy efficiency certification	80 Plus Titanium, 96%
Input requirements	—
Rated input voltage	Low-line input voltage: 100 VAC to 120 VAC High-line input voltage: 200 VAC to 240 VAC 240 VDC for China
Rated input frequency	50 Hz to 60 Hz
Rated input current	10 A at 100 VAC 6 A at 200 VAC
Maximum rated input power	800 W at 100 VAC 1000 W at 200 VAC
BTUs per hour	3044 at 100 VAC 3680 at 200 VAC
Power supply output	—
Rated steady-state power	Low-line input voltage: 800 W at 100 VAC to 120 VAC High-line input voltage: 1000 W at 200 VAC to 240 VAC input
Maximum peak power	800 W at 100 VAC to 120 VAC 1000 W at 200 VAC to 240 VAC input
Dimensions	—
Height	40.00 mm (1.57 in)
Depth	185.00 mm (7.28 in)
Width	60.00 mm (2.36 in)

HPE 1500 W M-CRPS Titanium Hot-plug Power Supply



Specification	Value
Energy efficiency certification	80 Plus Titanium, 96%
Input requirements	—
Rated input voltage	Low-line input voltage: 100 VAC to 110 VAC Low-line input voltage: 110 VAC to 120 VAC High-line input voltage: 200 VAC to 240 VAC 240 VDC for China
Rated input frequency	50 Hz to 60 Hz
Rated input current	12 A at 100 VAC 12 A at 110 VAC 9 A at 200 VAC
Maximum rated input power	1000 W at 100 VAC 1100 W at 110 VAC 1500 W at 200 VAC
BTUs per hour	3792 at 100 VAC 5560 at 200 VAC
Power supply output	—
Rated steady-state power	Low-line input voltage: 1000 W at 100 VAC to 110 VAC Low-line input voltage: 1100 W at 110 VAC to 120 VAC High-line input voltage: 1500 W at 200 VAC to 240 VAC input
Maximum peak power	1000 W at 100 VAC to 110 VAC 1100 W at 110 VAC to 120 VAC 1500 W at 200 VAC to 240 VAC input
Dimensions	—
Height	40.00 mm (1.57 in)
Depth	185.00 mm (7.28 in)
Width	60.00 mm (2.36 in)

HPE 2400 W M-CRPS Titanium Hot-plug Power Supply



Specification	Value
Energy efficiency certification	80 Plus Titanium, 96%
Input requirements	—
Rated input voltage	Low-line input voltage: 100 VAC to 127 VAC High-line input voltage: 200 VAC to 240 VAC 240 VDC for China
Rated input frequency	50 Hz to 60 Hz
Rated input current	14.5 A at 100 to 127 VAC 14.5 A at 200 to 240 VAC
Maximum rated input power	1251 W at 100 VAC 1239 W at 120 VAC 1236 W at 127 VAC 2512 W at 200 VAC 2510 W at 208 VAC 2503 W at 230 VAC 2500 W at 240 VAC 2503 W at 240 VDC
BTUs per hour	4268 at 100 VAC 4228 at 120 VAC 4219 at 127 VAC 8572 at 200 VAC 8563 at 208 VAC 8540 at 230 VAC 8532 at 240 VAC 8539 at 240 VDC
Power supply output	—
Rated steady-state power	Low-line input voltage: 1200 W at 100 VAC to 127 VAC High-line input voltage: 2400 W at 200 VAC to 240 VAC input
Maximum peak power	1200 W at 100 VAC to 127 VAC 2400 W at 200 VAC to 240 VAC input
Dimensions	—
Height	40.00 mm (1.57 in)
Depth	185.00 mm (7.28 in)
Width	73.50 mm (2.89 in)

Websites

General websites

Single Point of Connectivity Knowledge (SPOCK) Storage compatibility matrix

<https://www.hpe.com/storage/spock>

Product white papers and analyst reports

<https://www.hpe.com/us/en/resource-library>

For additional websites, see [Support and other resources](#).

Product websites

HPE ProLiant Compute DL320 Gen12 user documents

<https://www.hpe.com/info/dl320gen12-docs>

Support and other resources

Subtopics

[Accessing Hewlett Packard Enterprise Support](#)

[HPE product registration](#)

[Accessing updates](#)

[Customer self repair](#)

[Remote support](#)

[Documentation feedback](#)

Accessing Hewlett Packard Enterprise Support

- For live assistance, go to the Contact Hewlett Packard Enterprise Worldwide website:

<https://www.hpe.com/info/assistance>

- To access documentation and support services, go to the Hewlett Packard Enterprise Support Center website:

<https://www.hpe.com/support/hpesc>

Information to collect

- Technical support registration number (if applicable)
- Product name, model or version, and serial number
- Operating system name and version
- Firmware version
- Error messages
- Product-specific reports and logs
- Add-on products or components
- Third-party products or components

HPE product registration

To gain the full benefits of the Hewlett Packard Enterprise Support Center and your purchased support services, add your contracts and products to your account on the HPESC.



- When you add your contracts and products, you receive enhanced personalization, workspace alerts, insights through the dashboards, and easier management of your environment.
- You will also receive recommendations and tailored product knowledge to self-solve any issues, as well as streamlined case creation for faster time to resolution when you must create a case.

To learn how to add your contracts and products, see <https://www.hpe.com/info/add-products-contracts>.

Accessing updates

- Some software products provide a mechanism for accessing software updates through the product interface. Review your product documentation to identify the recommended software update method.

- To download product updates:

Hewlett Packard Enterprise Support Center

<https://www.hpe.com/support/hpesc>

My HPE Software Center

<https://www.hpe.com/software/hpesoftwarecenter>

- To subscribe to eNewsletters and alerts:

<https://www.hpe.com/support/e-updates>

- To view and update your entitlements, and to link your contracts and warranties with your profile, go to the Hewlett Packard Enterprise Support Center More Information on Access to Support Materials page:

<https://www.hpe.com/support/AccessToSupportMaterials>



IMPORTANT

Access to some updates might require product entitlement when accessed through the Hewlett Packard Enterprise Support Center. You must have an HPE Account set up with relevant entitlements.

Customer self repair

Hewlett Packard Enterprise customer self repair (CSR) programs allow you to repair your product. If a CSR part needs to be replaced, it will be shipped directly to you so that you can install it at your convenience. Some parts do not qualify for CSR.

For more information about CSR, contact your local service provider.

Remote support

Remote support is available with supported devices as part of your warranty or contractual support agreement. It provides intelligent event diagnosis, and automatic, secure submission of hardware event notifications to Hewlett Packard Enterprise, which initiates a fast and accurate resolution based on the service level of your product. Hewlett Packard Enterprise strongly recommends that you register your device for remote support.

If your product includes additional remote support details, use search to locate that information.

HPE Get Connected



<https://www.hpe.com/services/getconnected>

HPE Tech Care Service

<https://www.hpe.com/services/techcare>

HPE Complete Care Service

<https://www.hpe.com/services/completecure>

Documentation feedback

Hewlett Packard Enterprise is committed to providing documentation that meets your needs. To help us improve the documentation, use the Feedback button and icons (at the bottom of an opened document) on the Hewlett Packard Enterprise Support Center portal (<https://www.hpe.com/support/hpesc>) to send any errors, suggestions, or comments. This process captures all document information.

