



**Hewlett Packard
Enterprise**

HPE ProLiant DL180 Gen10 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.

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Important product information

The available server configurations, hardware options, and scope of technical support for this server depend on the regional location where the server was purchased. For more information, see the product QuickSpecs on the Hewlett Packard Enterprise website (<http://www.hpe.com/info/qs>).

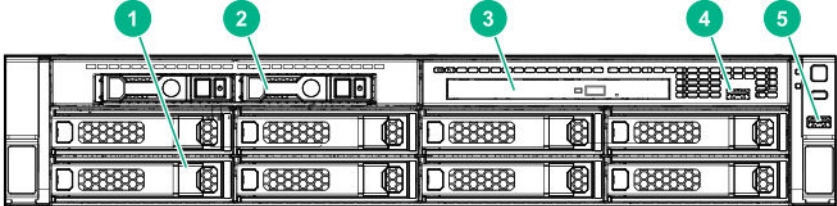
The links in this guide might not cover HPE ProLiant DL180 Gen10 Server information. For more information, contact HPE Authorized Resellers or HPE Authorized Service Partners.

The hardware features and options documented in this guide might not always be available in the server model you purchased.

Component identification

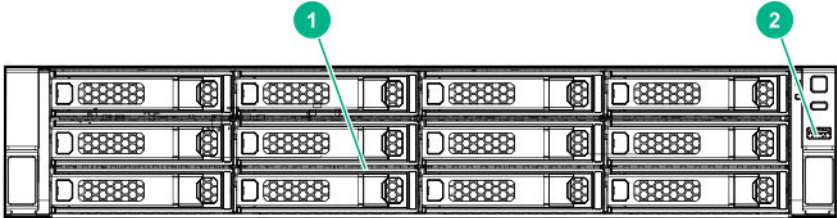
Front panel components

- 8-bay LFF drive model



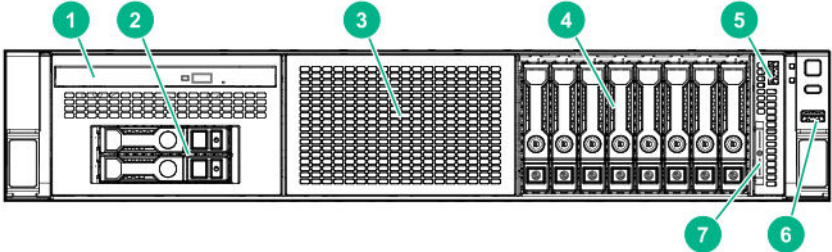
Item	Description
1	LFF drives
2	NVMe drives (optional)
3	Optical drive (optional)
4	iLO Service Port
5	USB 3.0 port

- 12-bay LFF drive model



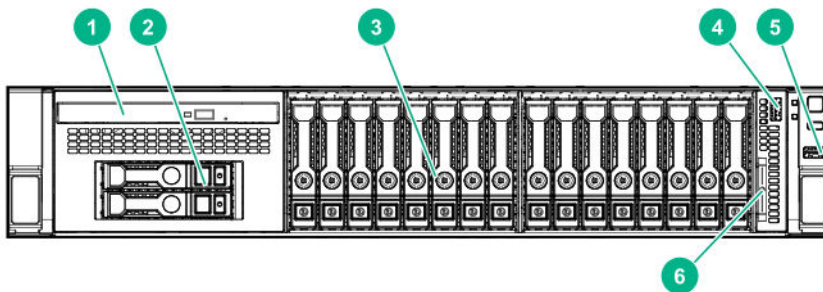
Item	Description
1	LFF drives
2	USB 3.0 port

- 8-bay SFF drive model



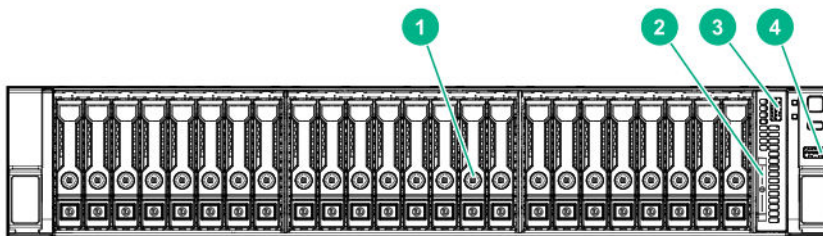
Item	Description
1	Optical drive (optional)
2	NVMe drives (optional)
3	8-bay SFF drive bays (optional)
4	SFF drives
5	iLO Service Port
6	USB 3.0 port
7	Serial number/iLO information pull tab

- 16-bay SFF drive model



Item	Description
1	Optical drive (optional)
2	NVMe drives (optional)
3	SFF drives
4	iLO Service Port
5	USB 3.0 port
6	Serial number/iLO information pull tab

- 24-bay SFF drive model



Item	Description
1	SFF drives
2	Serial number/iLO information pull tab

Table Continued

3	iLO Service Port
---	------------------

4	USB 3.0 port
---	--------------

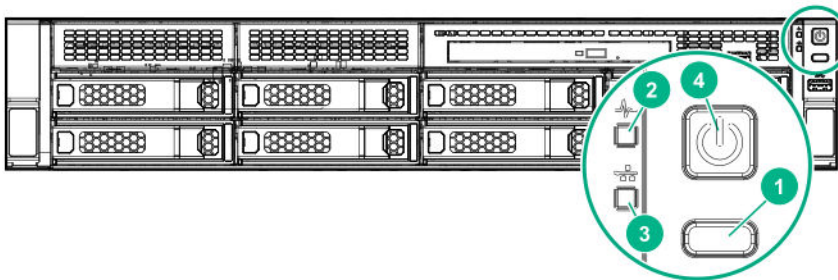
Serial number/iLO information pull tab

The serial number/iLO information pull tab is double-sided. One side shows the server serial number and the QR code labels. The other side shows the default iLO account information.

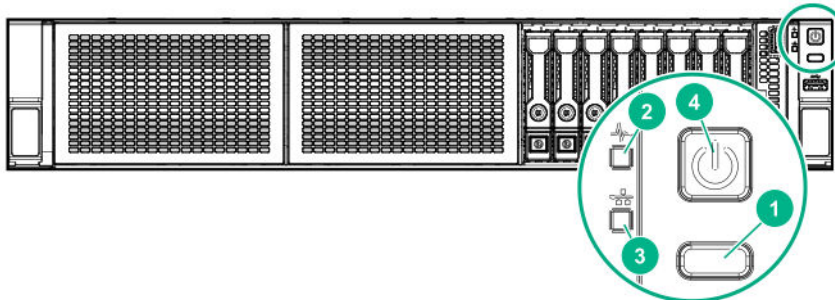
Use a mobile device to scan the QR code label to display the server mobile product page (<http://www.hpe.com/qref/dl180gen10>). This page contains links to server setup information, spare part numbers, QuickSpecs, troubleshooting resources, and other useful product links.

Front panel LEDs and buttons

- Front panel LEDs and buttons in an LFF chassis



- Front panel LEDs and buttons in an SFF chassis



Item	Description	Status
1	UID button/LED	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

Table Continued

2	Health LED	<p>Solid green = Normal</p> <p>Flashing green (1 flash per second) = iLO is rebooting</p> <p>Flashing amber = System degraded</p> <p>Flashing red (1 flash per second) = System critical</p> <p>If the health LED indicates a degraded or critical state, review the system IML ("Integrated Management Log" on page 129) or use iLO ("HPE iLO" on page 127) to review the system health status.</p>
3	NIC status LED	<p>Solid green = Link to network</p> <p>Flashing green (1 flash per second) = Network active</p> <p>Off = No network activity</p>
4	Power On/Standby button and system power LED	<p>Solid green = System on</p> <p>Flashing green (1 flash per second) = Performing power on sequence</p> <p>Solid amber = System in standby</p> <p>Off = No power present</p> <p>If the system power LED is off, verify the following conditions:</p> <ul style="list-style-type: none"> • The facility power is present. • The power supply is installed and is working correctly. • The power cord is attached and is connected to a power source. • The front I/O cable is connected.

When all four LEDs described in this table flash simultaneously, a power fault has occurred. For more information, see **Power fault LEDs**.

UID button functionality

The UID button can be used to display the Server Health Summary when the server will not power on. For more information, see the latest *HPE iLO 5 User Guide* on the [Hewlett Packard Enterprise website](#).

Power fault LEDs

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

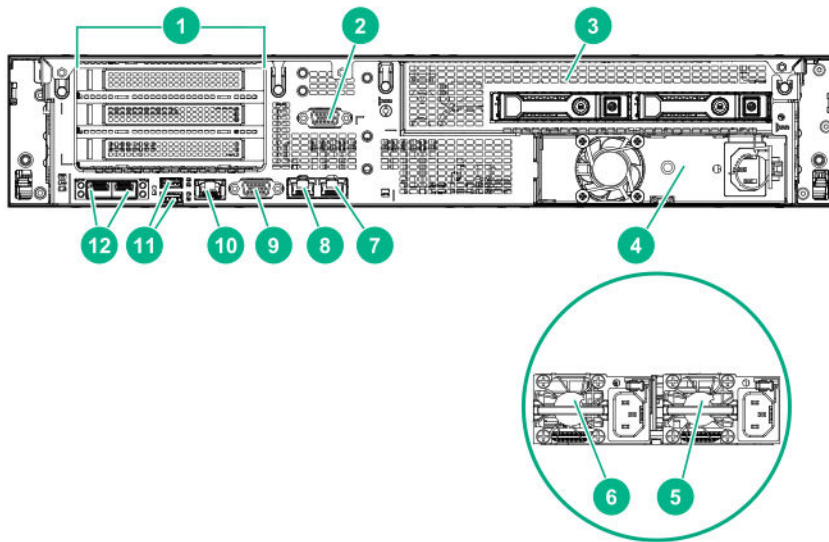
Subsystem	LED behavior
System board	1 flash
Processor	2 flashes
Memory	3 flashes
Riser board PCIe slots	4 flashes

Table Continued

Subsystem	LED behavior
FlexibleLOM	5 flashes
Removable HPE Flexible Smart Array controller	6 flashes
System board PCIe slots	7 flashes
Power backplane or storage backplane	8 flashes
Power supply	9 flashes

Rear panel components

Rear panel components with optional rear 2-bay SFF SAS/SATA drives

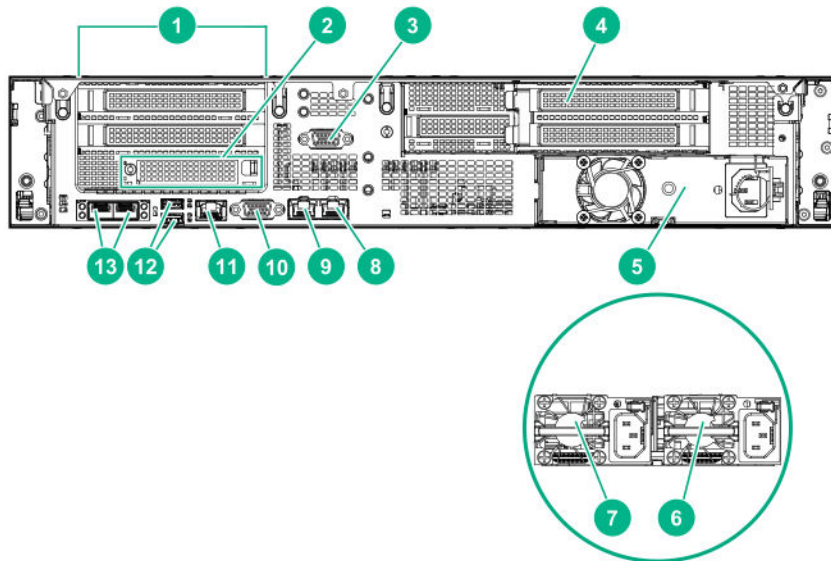


Item	Description
1	PCIe slots 1 - 3 top to bottom (primary riser for processor 1)
2	Serial port (optional)
3	Rear 2-bay SFF SAS/SATA drives (optional)
4	Standard power supply (non-hot-plug)
5	Flexible Slot power supply 1 (hot-plug)
6	Flexible Slot power supply 2 (hot-plug)
7	NIC port 2
8	NIC port 1
9	VGA port
10	iLO Management Port

Table Continued

11	USB 3.0 ports (2)
12	Media Module (optional NIC ports 3 - 4)

Rear panel components with optional secondary riser cage

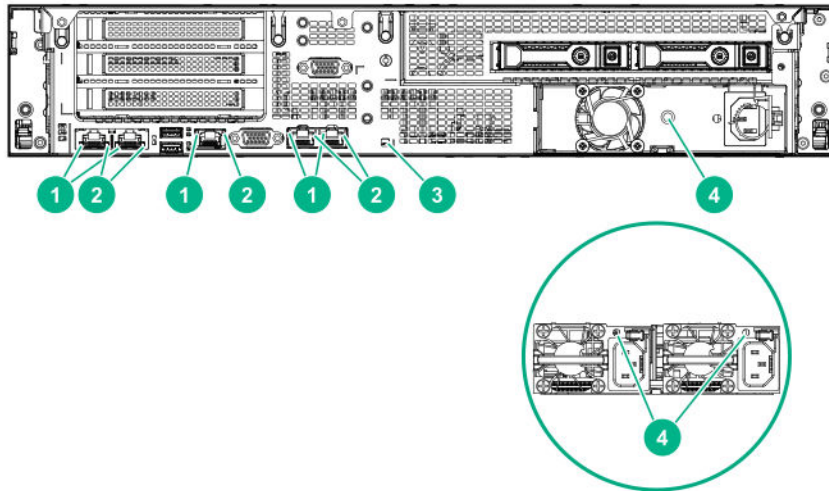


Item	Description
1	PCIe slots 1 - 3 top to bottom (primary riser for processor 1)
2	FlexibleLOM (optional)
3	Serial port (optional)
4	PCIe slots 4 - 6 (secondary riser for processor 2, optional)
5	Standard power supply (non-hot-plug)
6	Flexible Slot power supply 1 (hot-plug)
7	Flexible Slot power supply 2 (hot-plug)
8	NIC port 2
9	NIC port 1
10	VGA port
11	ILO Management Port

Table Continued

12	USB 3.0 ports (2)
13	Media Module (optional NIC ports 3 - 4)

Rear panel LEDs



Item	Description	Status
1	NIC link LED	Green = Network link Off = No network link
2	NIC activity LED	Solid green = Link to network Flashing green = Network active Off = No network activity

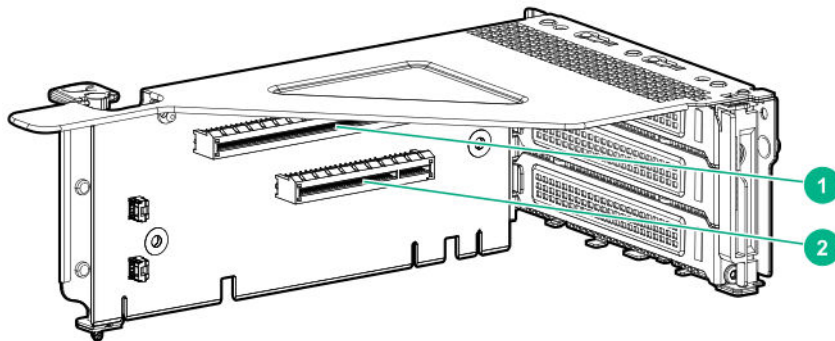
Table Continued

3	UID LED	<p>Solid blue = Activated</p> <p>Flashing blue:</p> <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 <p>Off = Deactivated</p>
4	Power supply LED	<p>Solid green = Normal</p> <p>Off = One or more of the following conditions exists:</p> <ul style="list-style-type: none"> • Power is unavailable • Power supply failed • Power supply is in standby mode • Power supply error

PCIe riser board slot definitions

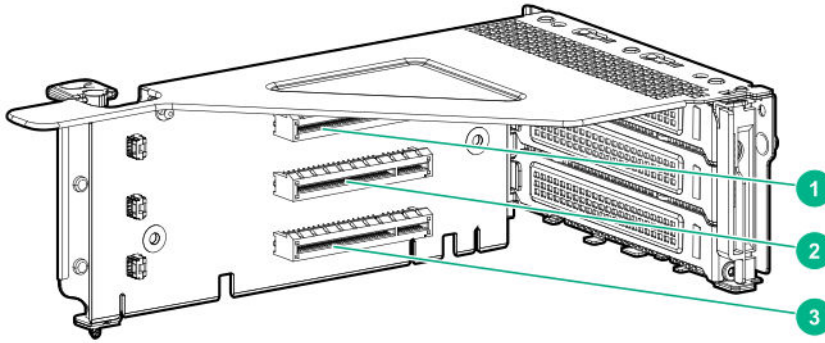
The server ships with a primary PCIe riser cage installed and a secondary PCIe riser cage blank. A second processor is required to support installation in the secondary PCIe riser location.

- Two-slot PCIe riser cage assembly: Install in the primary PCIe riser connector



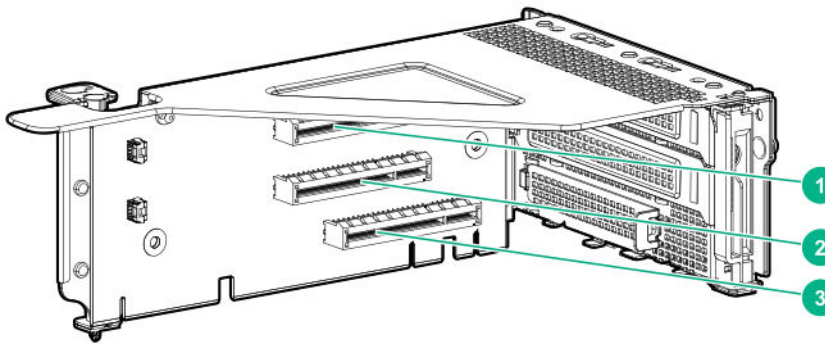
Item	Type	Form factor	Connector link width	Negotiable link width
1	PCIe 3.0	Full height, full length	x16	16, 8, 4, 1
2	PCIe 3.0	Full height, full length	x8	8, 4, 1

- Three-slot PCIe riser cage assembly: By default, installed in the primary PCIe riser connector



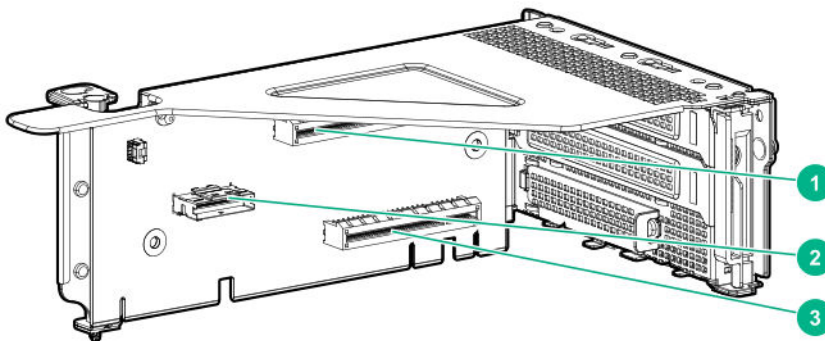
Item	Type	Form factor	Connector link width	Negotiable link width
1	PCIe 3.0	Full height, full length	x8	16, 8, 4, 1
2	PCIe 3.0	Full height, half length	x8	8, 4, 1
3	PCIe 3.0	Full height, half length	x8	8, 4, 1

- FlexibleLOM riser cage assembly: Install in the primary PCIe riser connector



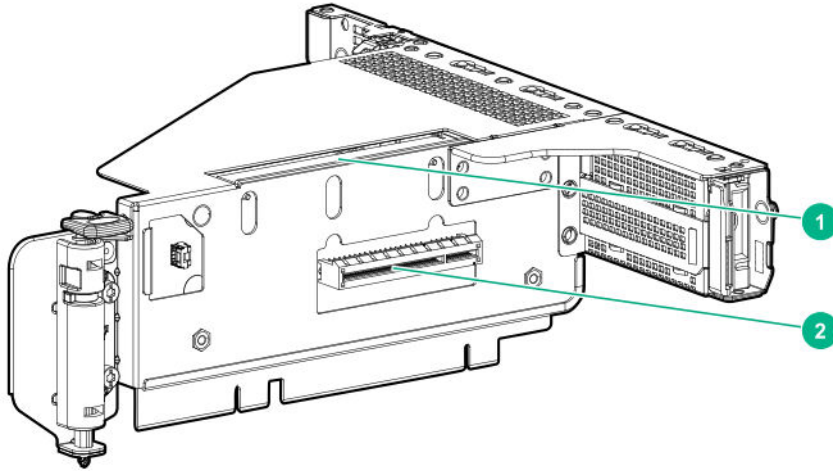
Item	Type	Form factor	Connector link width	Negotiable link width
1	PCIe 3.0	Full height, full length	x8	8, 4, 1
2	PCIe 3.0	Full height, half length	x8	8, 4, 1
3	PCIe 3.0	FlexibleLOM	x8	—

- NVMe and FlexibleLOM riser cage assembly: Install in the primary PCIe riser connector



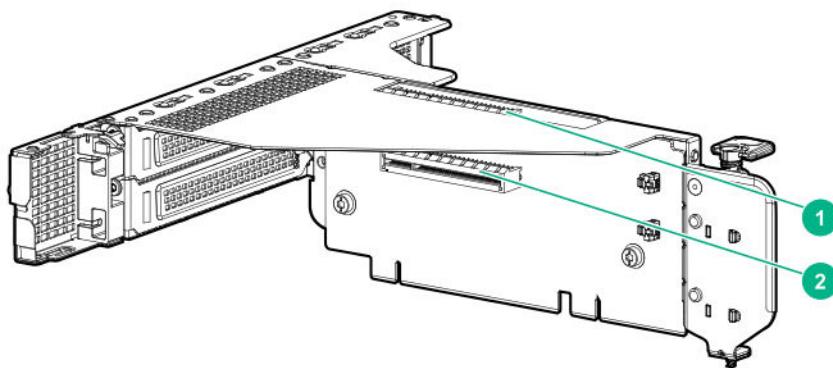
Item	Type	Form factor	Connector link width	Negotiable link width
1	PCIe 3.0	Full height, full length	x8	8, 4, 1
2	PCIe 3.0	Slim NVMe connector	x8	—
3	—	FlexibleLOM	x8	—

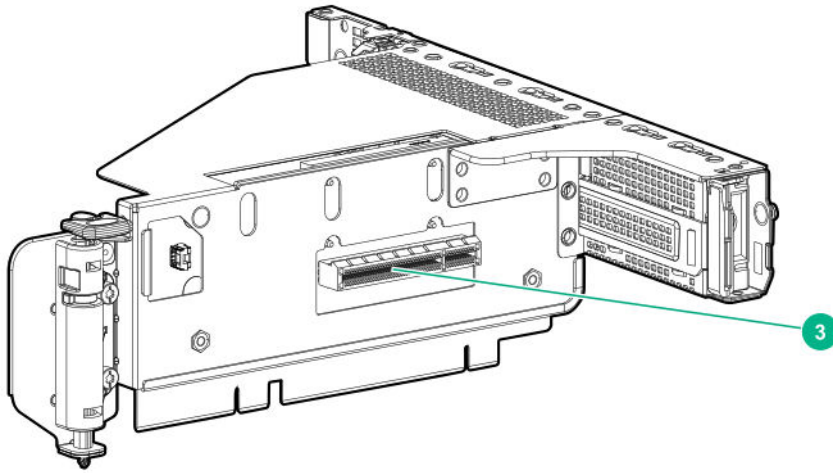
- x16, x8 secondary riser cage assembly: Install in the secondary PCIe riser connector



Item	Type	Form factor	Connector link width	Negotiable link width
1	PCIe 3.0	Full height, full length	x16	16, 8, 4, 1
2	PCIe 3.0	Half height, half length	x8	8, 4, 1

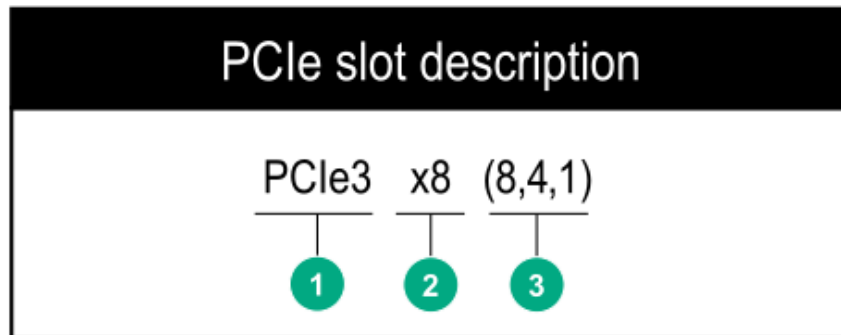
- x8, x8, x8 secondary riser cage assembly: Install in the secondary PCIe riser connector.





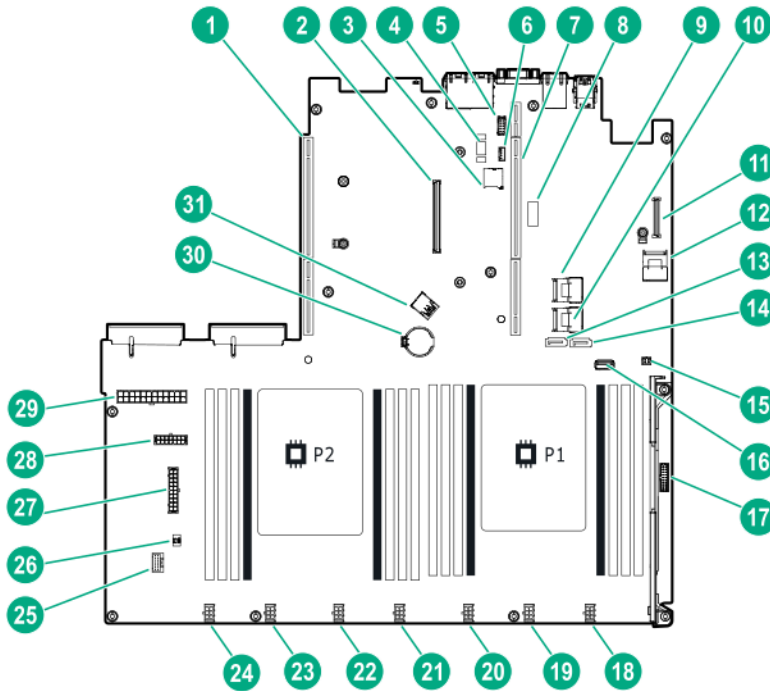
Item	Type	Form factor	Connector link width	Negotiable link width
1	PCIe 3.0	Full height, full length	x8	8, 4, 1
2	PCIe 3.0	Full height, half length	x8	8, 4, 1
3	PCIe 3.0	Half height, half length	x8	8, 4, 1

PCIe slot description



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

System board components



Item	Description
1	Secondary PCIe riser connector for processor 2
2	Smart Array modular controller connector
3	microSD card slot ¹
4	TPM connector
5	Serial port connector
6	iLO Service Port connector
7	Primary PCIe riser connector for processor 1
8	<u>System maintenance switch</u>
9	Mini-SAS port 1
10	Mini-SAS port 3
11	Media Module connector
12	Mini-SAS port 2
13	SATA port 5
14	SATA port 4
15	SATA management port
16	Front USB 3.0 connector

Table Continued

17	Front I/O cable connector
18	Fan connector 6
19	Fan connector 5
20	Fan connector 4
21	Fan connector (Reserved)
22	Fan connector 3
23	Fan connector 2
24	Fan connector 1
25	Smart Storage Battery connector
26	Chassis Intrusion Detection connector
27	Drive backplane power connector
28	GPU/rear drive power connector
29	Non-hot-plug power supply connector
30	System battery
31	Internal USB 3.0 port

¹ If the memory card connected to the microSD slot is not visible in Windows Device Manager, in the menu bar, click **View > Show hidden device**.

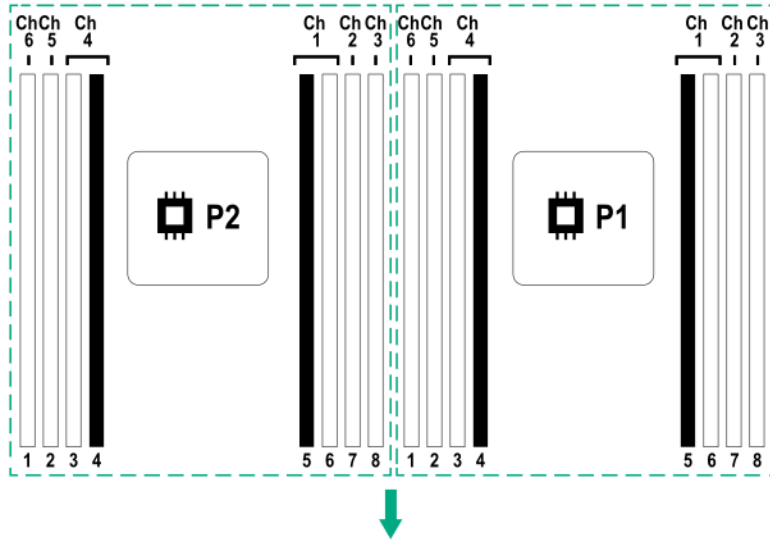
System maintenance switch descriptions

Position	Default	Function
S1 ¹	Off	Off = iLO 5 security is enabled. On = iLO 5 security is disabled.
S2	Off	Reserved
S3	Off	Reserved
S4	Off	Reserved
S5 ¹	Off	Off = Power-on password is enabled. On = Power-on password is disabled.
S6 ^{1, 2, 3}	Off	Off = No function On = Restore default manufacturing settings
S7	Off	Reserved
S8	—	Reserved
S9	—	Reserved
S10	—	Reserved
S11	—	Reserved
S12	—	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 [Secure Boot](#) on page 152.

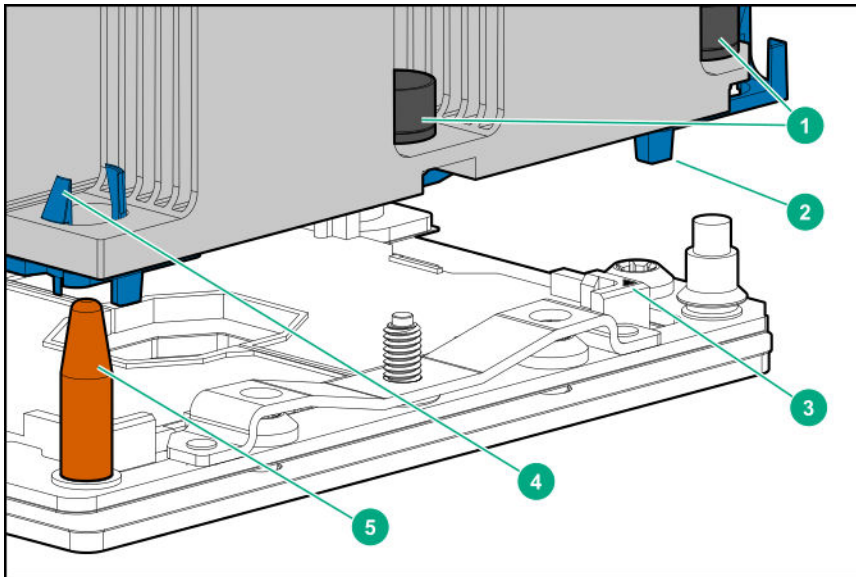
DIMM slot locations

DIMM slots are numbered sequentially (1 through 8) for each processor.



The arrow points to the front of the server.

Processor, heatsink, and socket components

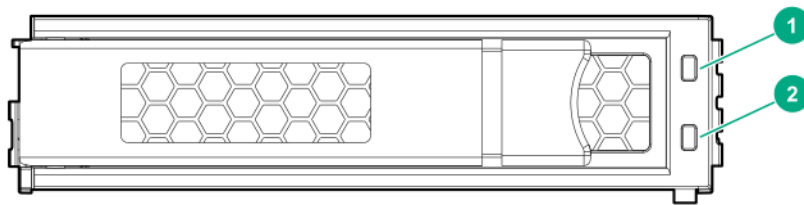


Item	Description
1	Heatsink nuts
2	Processor carrier
3	Pin 1 indicator ¹
4	Heatsink latch
5	Alignment post

¹ Symbol also on the processor and frame.

Drive LEDs and buttons

Low profile LFF drive LED definitions

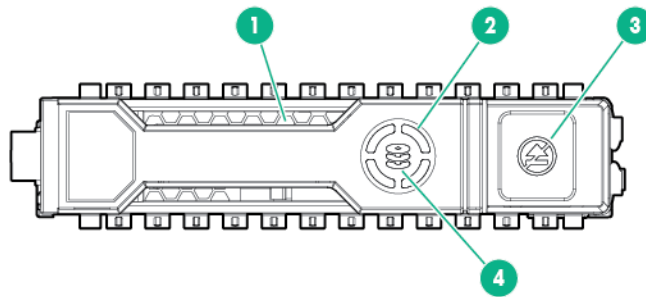


Item	LED	Status	Definition
1	Fault \Locate	Solid amber	The drive has failed.
		Solid blue	The drive is operating normally and being identified by a management application.
		Flashing amber/blue (1 flash per second)	The drive has failed, or a predictive failure alert has been received for this drive; it also has been identified by a management application.
		Flashing amber (1 flash per second)	A predictive failure alert has been received for this drive. Replace the drive as soon as possible.
2	Online Activity	Solid green	The drive is online and has no activity.
		Flashing green (4 flashes per second)	The drive is operating normally and has activity.

Table Continued

Item	LED	Status	Definition
		Flashing green (1 flash per second)	The drive is doing one of the following: <ul style="list-style-type: none"> • Rebuilding • Performing a RAID migration • Performing a strip size migration • Performing a capacity expansion • Performing a logical drive extension • Erasing • Spare part activation
		Off	The drive is not configured by a RAID controller or a spare drive.

Hot-plug drive LED definitions



Item	LED	Status	Definition
1	Locate	Solid blue	The drive is being identified by a host application.
		Flashing blue	The drive carrier firmware is being updated or requires an update.
2	Activity ring	Rotating green	Drive activity
		Off	No drive activity
3	Do not remove	Solid white	Do not remove the drive. Removing the drive causes one or more of the logical drives to fail.
		Off	Removing the drive does not cause a logical drive to fail.
4	Drive status	Solid green	The drive is a member of one or more logical drives.

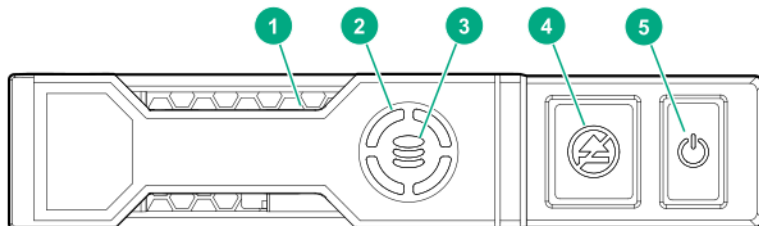
Table Continued

Item	LED	Status	Definition
		Flashing green	The drive is doing one of the following: <ul style="list-style-type: none"> • Rebuilding • Performing a RAID migration • Performing a strip size migration • Performing a capacity expansion • Performing a logical drive extension • Erasing • Spare part activation
		Flashing amber/ green	The drive is a member of one or more logical drives and predicts the drive will fail.
		Flashing amber	The drive is not configured and predicts the drive will fail.
		Solid amber	The drive has failed.
		Off	The drive is not configured by a RAID controller or a spare drive.

NVMe SSD LED definitions

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

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

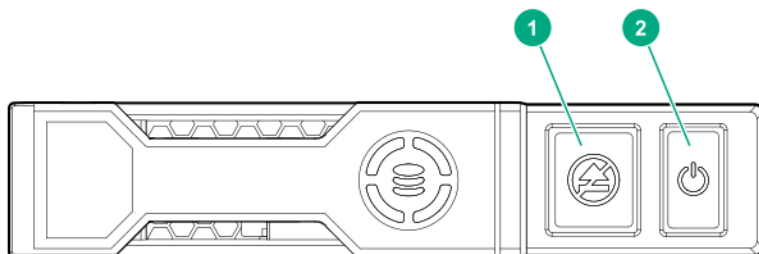


Item	LED	Status	Definition
1	Locate	Solid blue	The drive is being identified by a host application.
		Flashing blue	The drive carrier firmware is being updated or requires an update.
2	Activity ring	Rotating green	Drive activity
		Off	No drive activity
3	Drive status	Solid green	The drive is a member of one or more logical drives.

Table Continued

Item	LED	Status	Definition
		Flashing green	The drive is doing one of the following: <ul style="list-style-type: none"> • Rebuilding • Performing a RAID migration • Performing a stripe size migration • Performing a capacity expansion • Performing a logical drive extension • Erasing
		Flashing amber/green	The drive is a member of one or more logical drives and predicts the drive will fail.
		Flashing amber	The drive is not configured and predicts the drive will fail.
		Solid amber	The drive has failed.
		Off	The drive is not configured by a RAID controller.
4	Do not remove	Solid white	Do not remove the drive. The drive must be ejected from the PCIe bus prior to removal.
		Flashing white	The drive ejection request is pending.
		Off	The drive has been ejected.
5	Power	Solid green	Do not remove the drive. The drive must be ejected from the PCIe bus prior to removal.
		Flashing green	The drive ejection request is pending.
		Off	The drive has been ejected.

NVMe SSD button actions

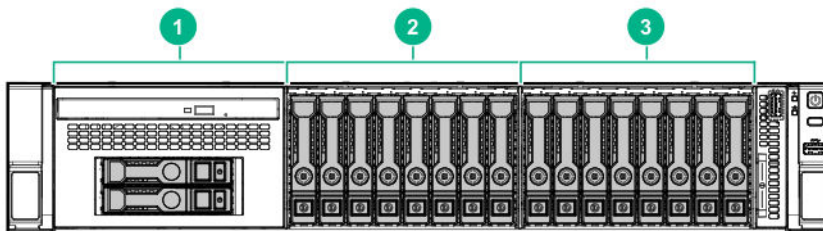


Item	Button	Action
1	Do Not Remove	Press to open the release lever.
2	Power	Press to request PCIe ejection. Removal request can be denied by the: <ul style="list-style-type: none"> • RAID controller (one or more of the logical drives could fail) • Operating system

Drive box identification

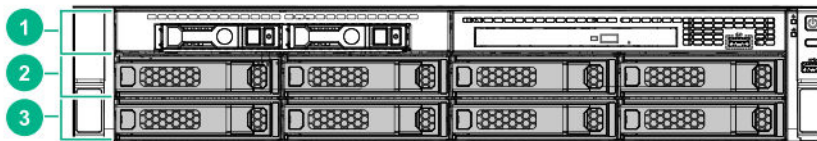
Front boxes

- SFF



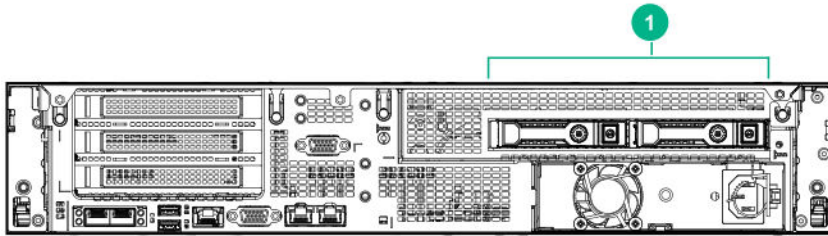
Item	Description
1	Box 1
2	Box 2
3	Box 3

- LFF



Item	Description
1	Box 1
2	Box 2
3	Box 3

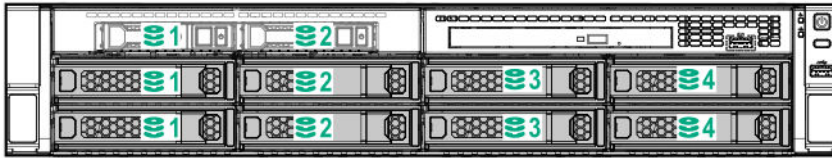
Rear box



Item	Description
1	Box 4

Drive bay numbering

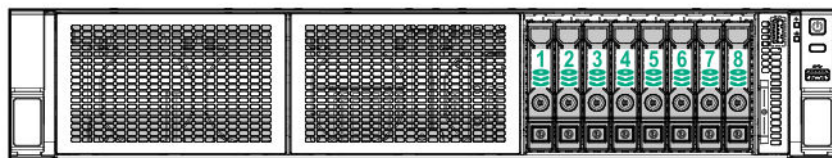
- 8-bay LFF hot-plug drive model



- 12-bay LFF hot-plug drive model



- 8-bay SFF hot-plug drive model



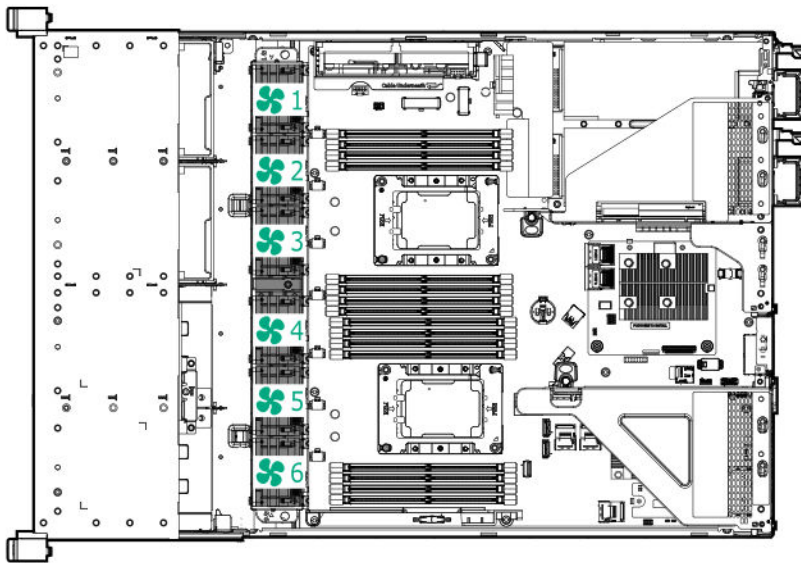
- 16-bay SFF hot-plug drive model



- 24-bay SFF hot-plug drive model



Fan bay numbering



Setup

Optional service

Delivered by experienced, certified engineers, Hewlett Packard Enterprise support services help you keep your servers up and running with support packages tailored specifically for HPE ProLiant systems. Hewlett Packard Enterprise support services let you integrate both hardware and software support into a single package. A number of service level options are available to meet your business and IT needs.

Hewlett Packard Enterprise support services offer upgraded service levels to expand the standard product warranty with easy-to-buy, easy-to-use support packages that will help you make the most of your server investments. Some of the Hewlett Packard Enterprise support services for hardware, software or both are:

- Foundation Care – Keep systems running.
 - 6-Hour Call-to-Repair¹
 - 4-Hour 24x7
 - Next Business Day
- Proactive Care – Help prevent service incidents and get you to technical experts when there is one.
 - 6-Hour Call-to-Repair¹
 - 4-Hour 24x7
 - Next Business Day
- Deployment service for both hardware and software
- Hewlett Packard Enterprise Education Services – Help train your IT staff.

¹The time commitment for this repair service might vary depending on the geographical region of site. For more service information available in your site, contact your local **Hewlett Packard Enterprise support center**.

For more information on Hewlett Packard Enterprise support services, see the **Hewlett Packard Enterprise website**.

Initial server installation

Depending on the user technical expertise and the complexity of the product, for the initial server installation, the user can choose to:

- **Order the HPE Installation Service.**
- **Perform the initial server setup procedure.**

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 Packard Enterprise website:

<http://www.hpe.com/support/installation-service>

Setting up the server

Prerequisites

Before setting up the server:

- Download the latest SPP:

<http://www.hpe.com/servers/spp/download>

Support validation required

- Verify that your OS or virtualization software is supported:

<http://www.hpe.com/info/ossupport>

- Read the HPE UEFI requirements for ProLiant servers on the [Hewlett Packard Enterprise website](#). If UEFI requirements are not met, you might experience boot failures or other errors when installing the operating system.

- Obtain the storage driver if needed:

- Download it from the HPE Support Center website:

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

- Extract it from the SPP.

- Read the operational requirements for the server:

[Operational requirements](#) on page 34

- Read the safety and compliance information on the HPE website:

<http://www.hpe.com/support/safety-compliance-enterpriseproducts>

Procedure

Unbox the server

1. Unbox the server and verify the contents:

- Server
- Power cord

- Rack-mounting hardware (optional)
- Documentation

The server does not ship with OS media. All system software and firmware is preloaded on the server.

Install the hardware options

2. (Optional) Install hardware options. For installation instructions, see [Hardware options installation](#) on page 55.

Rack the server

3. Install the server in a 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:

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

- The iLO Management Port is connected to a secure network.

b. Using a browser, navigate to the iLO web interface, and then log in.

`https://<iLO hostname or IP address>`

Note the following:

- The iLO hostname is on the serial number/iLO information pull tab.
- If a DHCP server assigns the IP address, the IP address appears on the boot screen.
- If a static IP address is assigned, use that IP address.
- The default login credentials are located on the serial number/iLO information pull tab.

c. In the side navigation, click the **Remote Console & Media** link, and then launch a remote console.

Power on the server

5. Press the Power On/Standby button.

For remote management, use the iLO virtual power button.

6. Using the SPP, update the following:

- System ROM
- Storage controller
- Network controller
- Intelligent Provisioning

Set up the storage

7. Do one of the following:

- To configure the server to boot from a SAN, see the following guide:
<https://www.hpe.com/info/boot-from-san-config-guide>
- If an HPE Smart Array SR controller is installed, use HPE Smart Storage Administrator to create arrays:
 - a. From the boot screen, press **F10** to run Intelligent Provisioning.
 - b. From Intelligent Provisioning, run **HPE Smart Storage Administrator**.
- If no controller is installed, do one of the following:
 - AHCI is enabled by default. You can deploy an OS or virtualization software.
 - Disable AHCI, enable software RAID, and then create an array:
 - a. From the boot screen, press **F9** to run UEFI System Utilities.
 - b. From the UEFI System Utilities screen, select **System Configurations > BIOS/Platform Configuration (RBSU) > Storage Options > SATA Controller Options > Embedded SATA configuration > Smart Array SW RAID Support**
 - c. Enable SW RAID.
 - d. Save the configuration and reboot the server.
 - e. Create an array:
 - I. From the boot screen, press **F9** to run UEFI System Utilities.
 - II. From the UEFI System Utilities screen, select **System Configuration > Embedded Storage: HPE Smart Storage S100i SR Gen10 > Array Configuration > Create Array**

Deploy an OS or virtualization software

8. Deploy an OS or virtualization software. Do one of the following:

- Press **F10** at the boot screen to run Intelligent Provisioning and deploy an OS.
- Manually deploy an OS.
 - a. Insert the installation media.

For remote management, click **Virtual Drives** in the iLO remote console to mount images, drivers, or files to a virtual folder. If a storage driver is required to install the OS, use the virtual folder to store the driver.
 - b. Press **F11** at boot screen to select the boot device.
 - c. After the OS installed, **update the drivers**.

Register the server

9. To experience quicker service and more efficient support, register the server at the HPE website:
<https://myenterpriselicence.hpe.com>

Operational requirements

Space and airflow requirements

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

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

Hewlett Packard Enterprise servers draw in cool air through the front door and expel warm air through the rear door. Therefore, the front and rear rack doors must be adequately ventilated to allow ambient room air to enter the cabinet, and the rear door must be adequately ventilated to allow the warm air to escape from the cabinet.

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

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

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

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

⚠ CAUTION: When using a Compaq branded 7000 series rack, install the high airflow rack door insert (PN 327281-B21 for 42U rack, PN 157847-B21 for 22U rack) to provide proper front-to-back airflow and cooling.

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

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

Temperature requirements

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

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

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

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

Power requirements

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

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

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

Electrical grounding requirements

The server must be grounded properly for proper operation and safety. In the United States, you must install the equipment in accordance with NFPA 70, 1999 Edition (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.

Server warnings and cautions

⚠ WARNING: This server is heavy. To reduce the risk of personal injury or damage to the equipment:

- 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. Hewlett Packard Enterprise recommends that a minimum of two people are required for all rack server installations. If the server is installed higher than chest level, a third person may be required to help align the server.
 - Use caution when installing the server in or removing the server from the rack; it is unstable when not fastened to the rails.
-

⚠ 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 personal injury, electric shock, or damage to the equipment, remove the power cord to remove power from the server. The front panel Power On/Standby button does not completely shut off system power. Portions of the power supply and some internal circuitry remain active until AC/DC power is removed.

⚠ 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.

⚠ 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.

Rack warnings

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

- The leveling jacks are extended to the floor.
 - The full weight of the rack rests on the leveling jacks.
 - The stabilizing feet are attached to the rack if it is a single-rack installation.
 - The racks are coupled together in multiple-rack installations.
 - Only one component is extended at a time. A rack may become unstable if more than one component is extended for any reason.
-

⚠ 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.
-

⚠ WARNING: To reduce the risk of personal injury or damage to the equipment, 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.

⚠ WARNING: When installing a server in a telco rack, be sure that the rack frame is adequately secured at the top and bottom to the building structure.

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.


Installing the server into the rack

Procedure

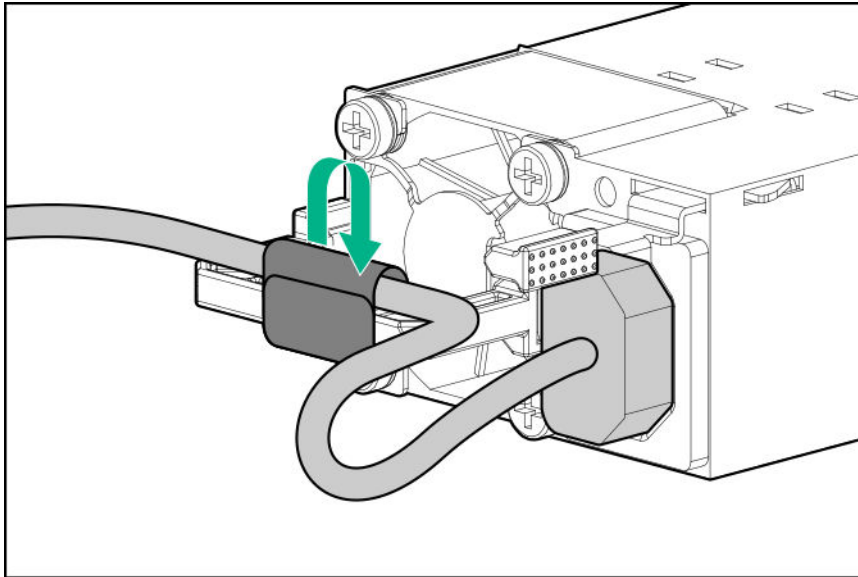
1. Observe the following alert:

 **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.

2. Install the server and cable management arm into the rack. For more information, see the installation instructions that ship with the 2U Quick Deploy Rail System.
3. Connect peripheral devices to the server. For information on identifying connectors, see **Rear panel components**.

 **WARNING:** To reduce the risk of electric shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into RJ-45 connectors.

4. Connect the power cord to the rear of the server.
5. Install the power cord anchors.

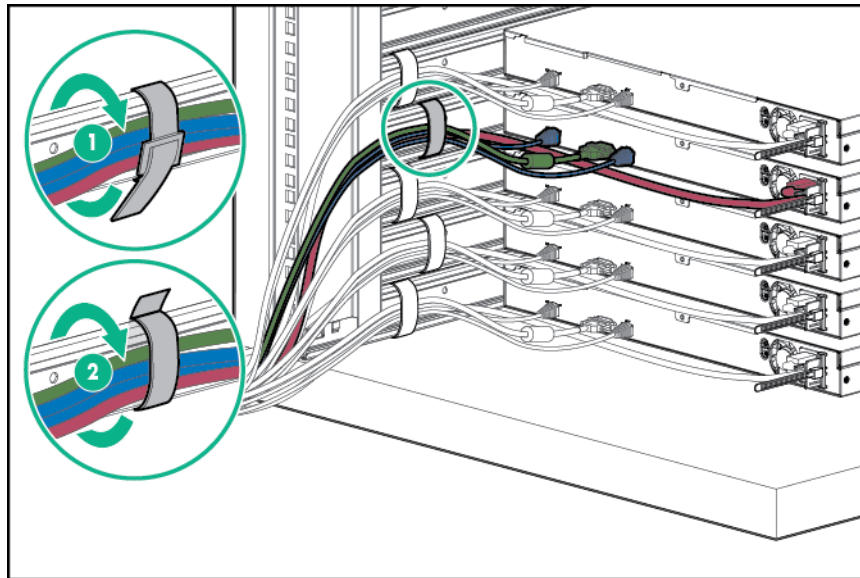


6. Install the rack rail hook-and-loop strap:

- a. Hold the rear panel cables against the rack rail, and then wrap the strap around the rack rail.

⚠ CAUTION: Prevent the thermal or mechanical obstruction on full-length servers installed in the rack. Ensure that the extra length and buckle part of the strap must be facing the outside of the rack rail.

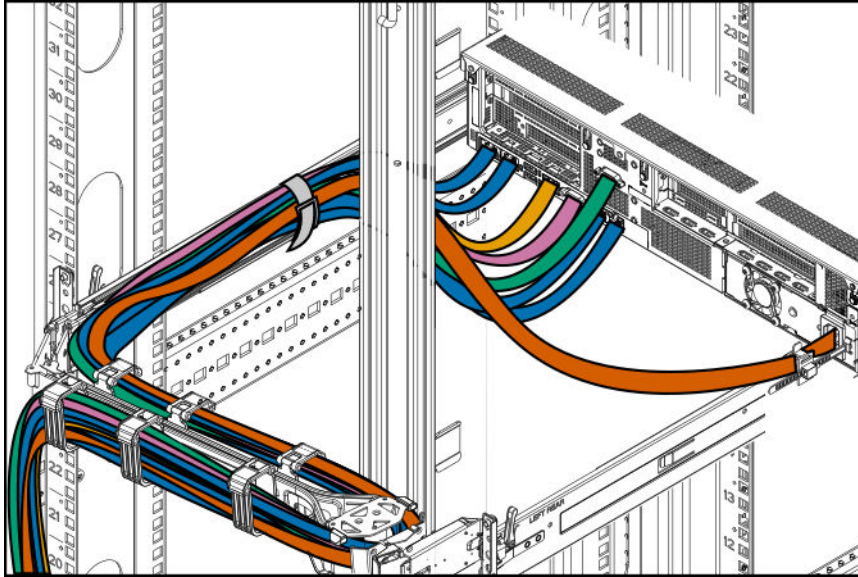
- b. Loop the end of the hook-and-loop strap through the buckle.



When multiple hook-and-loop straps are used in the same rack, stagger the strap location. Ensure that the straps are adjacent to each other when viewed from top to bottom. This positioning will enable the rack rail to slide easily in and out of the rack.

7. Secure the cables to the cable management arm.

-
- ❗ **IMPORTANT:** When using cable management arm components, leave enough slack in each of the cables to prevent damage to the cables when the server is extended from the rack.
-



8. Connect the power cord to the AC power source.

- ⚠ **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.
 - To disconnect power to the equipment, unplug the power cord from the power supply.
 - 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.
-

POST screen options

When the server is powered on, the POST screen is displayed. The following options are displayed:

- **System Utilities (F9)**
Use this option to configure the system BIOS.
- **Intelligent Provisioning (F10)**
Use this option to deploy an operating system or configure storage.
- **Boot order (F11)**
Use this option to make a one-time boot selection.
- **Network boot (F12)**
Use this option to boot the server from the network.

Operating system

This ProLiant server does not ship with provisioning media. Everything required to manage and install the system software and firmware is preloaded on the server.

To operate properly, the server must have a supported operating system. Attempting to run an unsupported operating system can cause serious and unpredictable results. For the latest information on operating system support, see the [Hewlett Packard Enterprise website](#).

Failure to observe UEFI requirements for ProLiant Gen10 servers can result in errors installing the operating system, failure to recognize boot media, and other boot failures. For more information on these requirements, see the *HPE UEFI Requirements* on the [Hewlett Packard Enterprise website](#).

To install an operating system on the server, use one of the following methods:

- Intelligent Provisioning—For single-server deployment, updating, and provisioning capabilities. For more information, see [Installing the operating system with Intelligent Provisioning](#) on page 41.
- Insight Control server provisioning—For multiserver remote OS deployment, use Insight Control server provisioning for an automated solution. For more information, see the Insight Control documentation on the [Hewlett Packard Enterprise website](#).

For additional system software and firmware updates, download the Service Pack for ProLiant from the [Hewlett Packard Enterprise website](#). Software and firmware must be updated before using the server for the first time, unless any installed software or components require an older version.

For more information, see [Keeping the system current](#) on page 154.

For more information on using these installation methods, see the [Hewlett Packard Enterprise website](#).

Installing the operating system with Intelligent Provisioning

Procedure

1. Connect the Ethernet cable between the network connector on the server and a network jack.
2. Press the Power On/Standby button.
3. During server POST, press **F10**.
4. Complete the initial Preferences and Registration portion of [Intelligent Provisioning](#).
5. At the 1 Start screen, click **Configure and Install**.
6. To finish the installation, follow the onscreen prompts. An Internet connection is required to update the firmware and systems software.

Installing or deploying an operating system

Before installing an operating system, observe the following:

- Be sure to read the HPE UEFI requirements for ProLiant servers on the [Hewlett Packard Enterprise website](#). If UEFI requirements are not met, you might experience boot failures or other errors when installing the operating system.
- Update firmware before using the server for the first time, unless software or components require an older version. For more information, see "[Keeping the system current](#) on page 154."

- For the latest information on supported operating systems, see the **Hewlett Packard Enterprise website**.
- The server does not ship with OS media. All system software and firmware is preloaded on the server.

Operations


Power up the server

Procedure

1. To power up the server, use one of the following methods:
 - Press the Power On/Standby button.
 - Use the virtual power button through iLO.

Powering 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 initiates a controlled shutdown of applications and the OS before the server enters standby mode.
- 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 5 .
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.

Extending the server from the rack

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

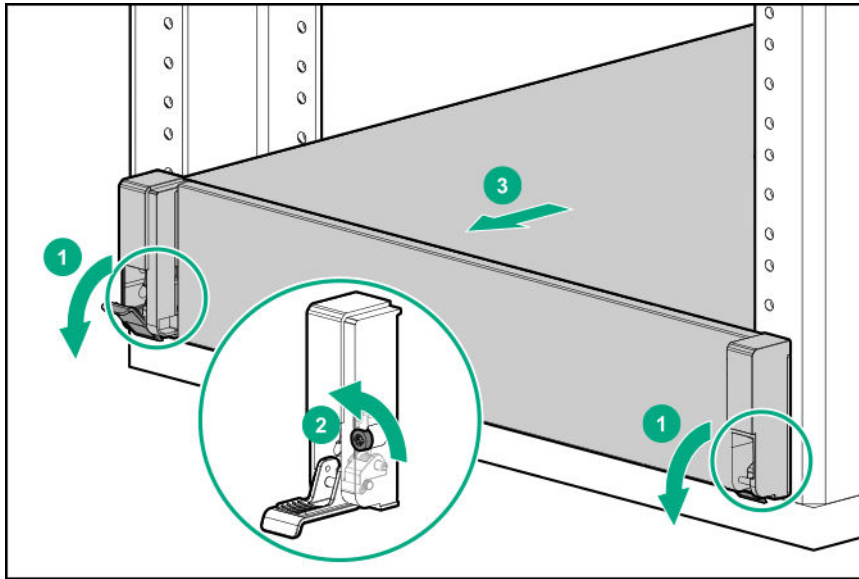
Prerequisites

T-25 Torx screwdriver

Procedure

1. If the rear panel cables are not secured with a cable management arm, do the following:

- a. **Power down the server.**
 - b. Disconnect all peripheral cables from the server.
 - c. Disconnect each power cord from the server.
2. Disengage the server from the rack:
 - a. Pull down the quick release levers on each side of the server.
 - b. If necessary, use a T-25 Torx screwdriver to loosen the shipping screws.
 - c. Slide the server out of the rack.



Removing the server from the rack



WARNING:

This server is heavy. To reduce the risk of personal injury or damage to the equipment:

- 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. Hewlett Packard Enterprise recommends that a minimum of two people are required for all rack server installations. A third person may be required to help align the server when the server is installed higher than chest level.
- Use caution when installing the server in or removing the server from the rack; it is unstable when not fastened to the rails.

To remove the server from a Hewlett Packard Enterprise, Compaq-branded, Telco, or a third-party rack:

Procedure

1. **Power down the server.**
2. Remove all power.

- a. Disconnect all peripheral cables from the server.
- b. Disconnect each power cord from the server.

3. Extend the server from the rack.

4. Remove the server from the rack.

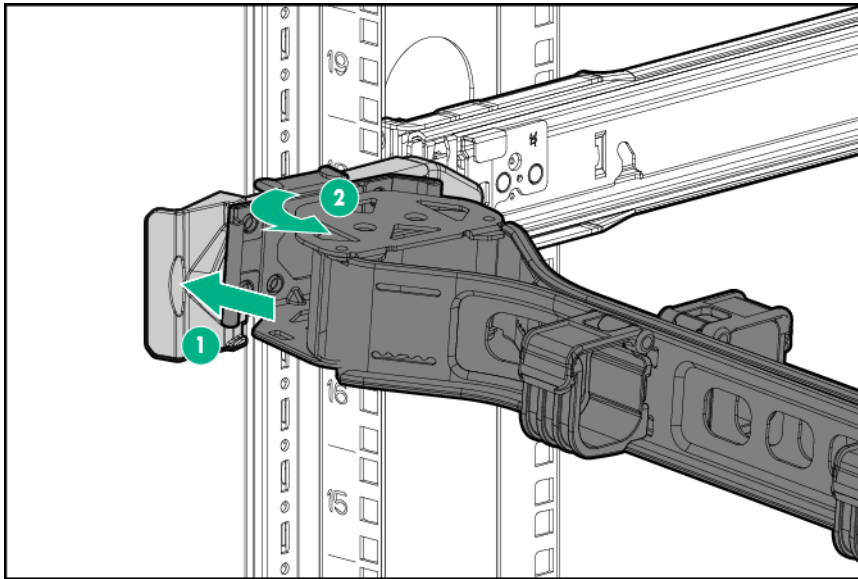
For instructions on how to extend or remove the server from the rack, see the documentation that ships with the rack rail system.

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

Releasing the cable management arm

Procedure

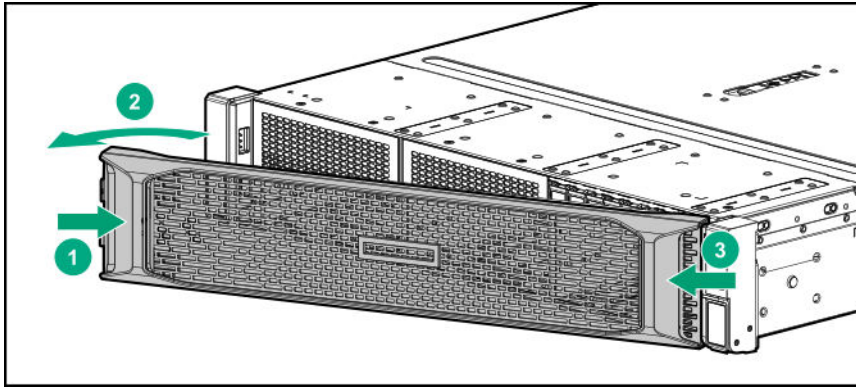
1. Remove the cable tie if installed.
2. Release the cable management arm and then swing the arm away from the rack.



Removing the bezel

Procedure

1. Remove the Kensington security lock.
2. Remove the front bezel.



Removing the access panel

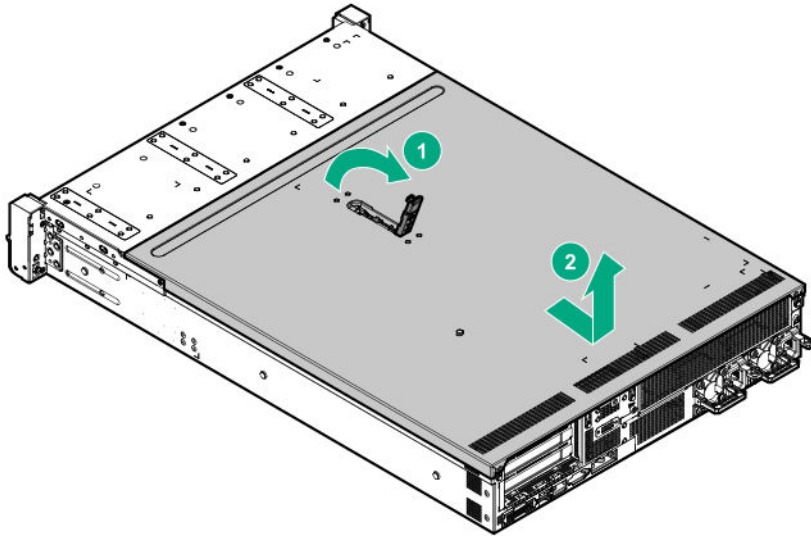
-
- ⚠ WARNING:** To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.
-
- ⚠ CAUTION:** To prevent damage to electrical components, take the appropriate anti-static precautions before beginning any installation, removal, 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.
-

Prerequisites

T-15 Torx screwdriver

Procedure

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



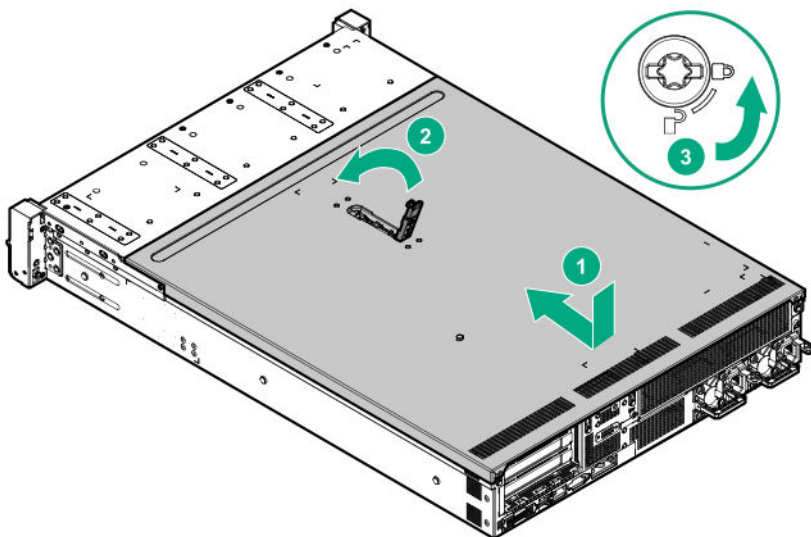
Installing the access panel

Prerequisites

- T-15 Torx screwdriver
- All internal cables must be connected and secured with clips.

Procedure

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

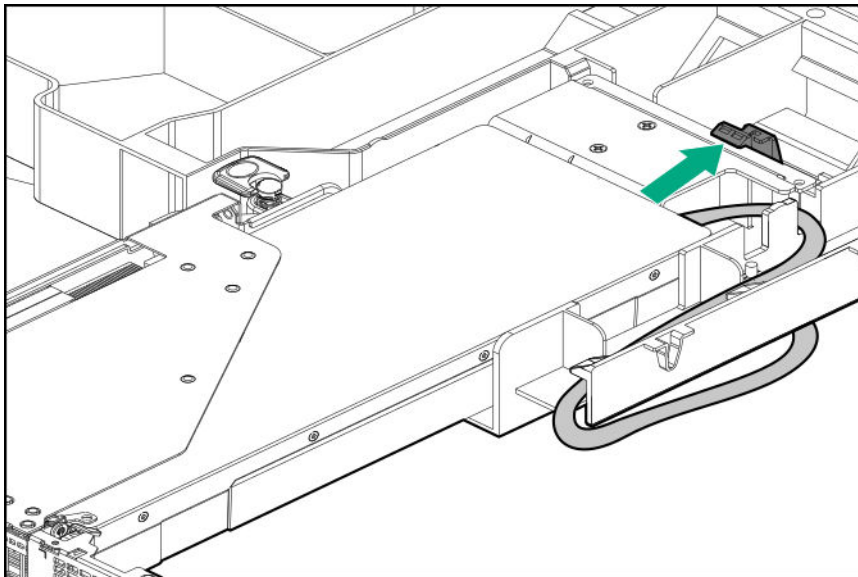


Removing a riser cage

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

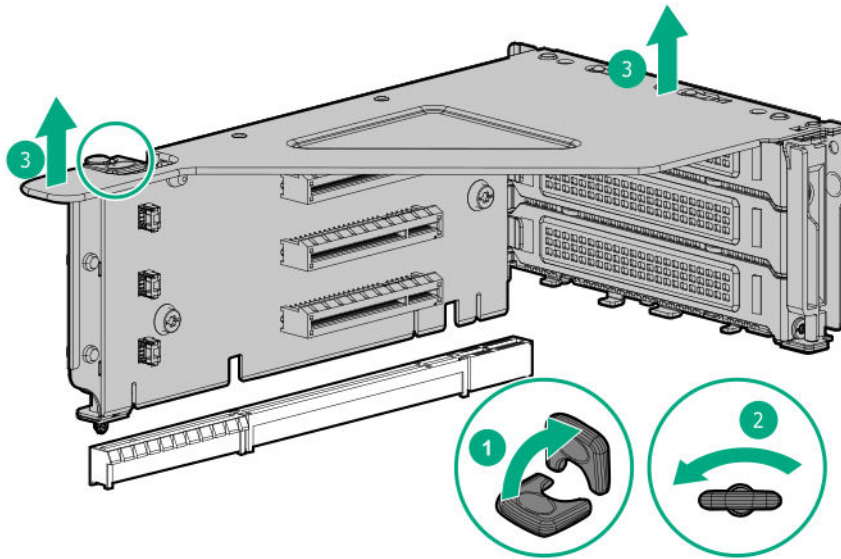
Procedure

1. If installed, **remove the front bezel.**
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:
 - **Extend the server from the rack.**
 - **Remove the server from the rack.**
6. **Remove the access panel.**
7. Disconnect any internal cables that are connected to the expansion board.
8. If the GPU is installed in the secondary riser cage, do the following:
 - a. **Disconnect the power cable from GPU.**
 - b. To release GPU, press the latch on the air baffle.

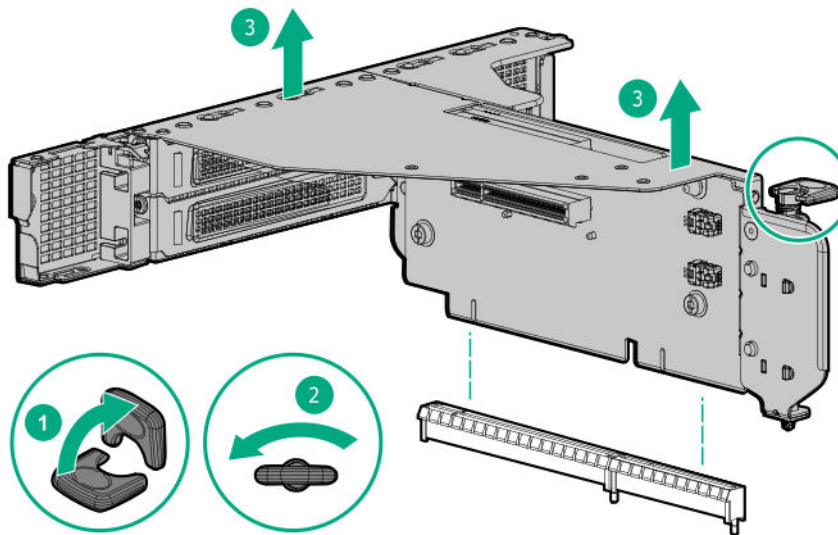


9. Remove the riser cage:

- a. Lift the release tab and then rotate it 180° counterclockwise.
 - b. Grasp the riser cage at the touch points and lift it out of the chassis.
- Primary riser cage



- Secondary riser cage

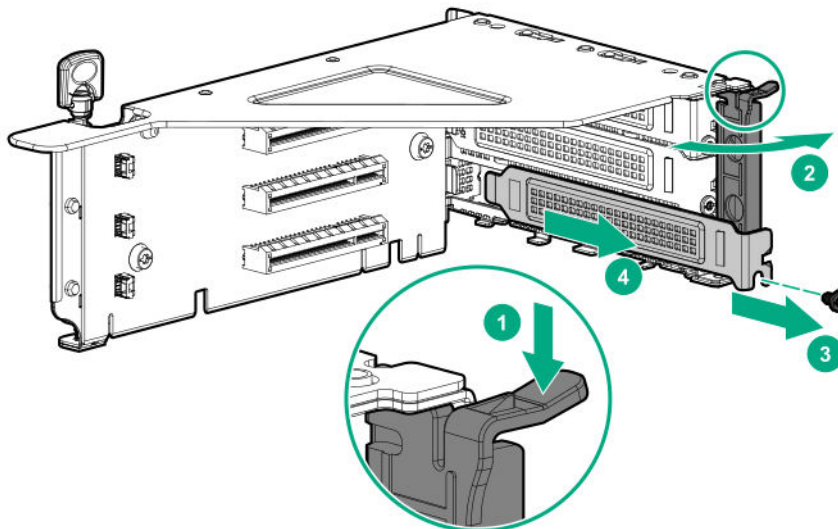


Removing an expansion slot blank

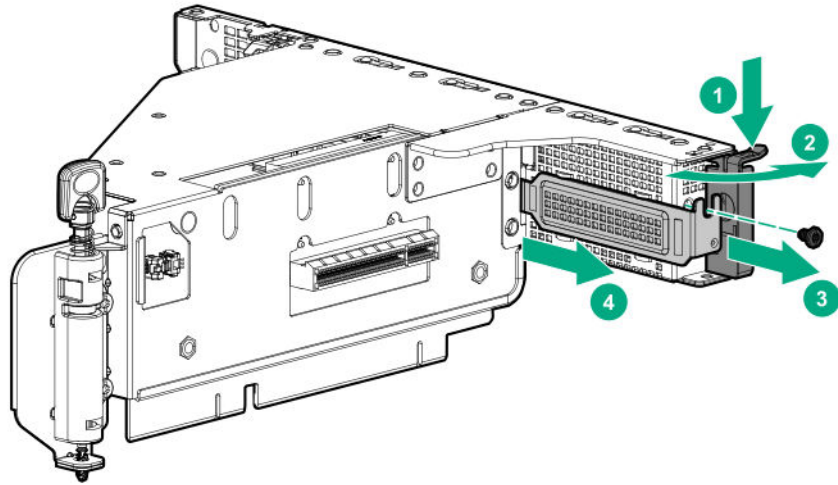
Prerequisites
T-10 Torx screwdriver

Procedure

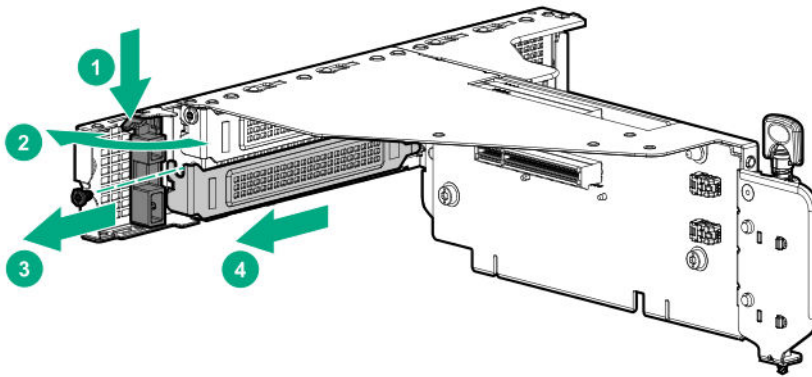
1. **Power down the server.**
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Do one of the following:
 - **Extend the server from the rack.**
 - **Remove the server from the rack.**
4. **Remove the access panel.**
5. **Remove the riser cage.**
6. Remove the slot blank:
 - a. Press the latch on the slot blank retainer.
 - b. Open the slot blank retainer.
 - c. Remove one T-10 screw on the slot.
 - d. Remove the slot blank and retain it for future use.
 - Primary riser cage



- Secondary riser cage
 - Slot 4



- Slot 5 or 6



Removing a riser board

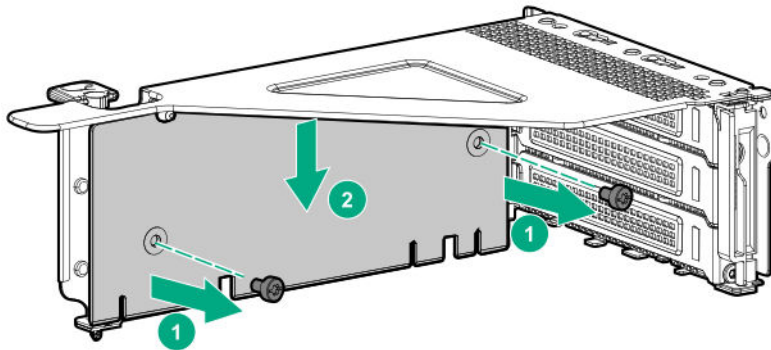
Prerequisites

T-15 Torx screwdriver

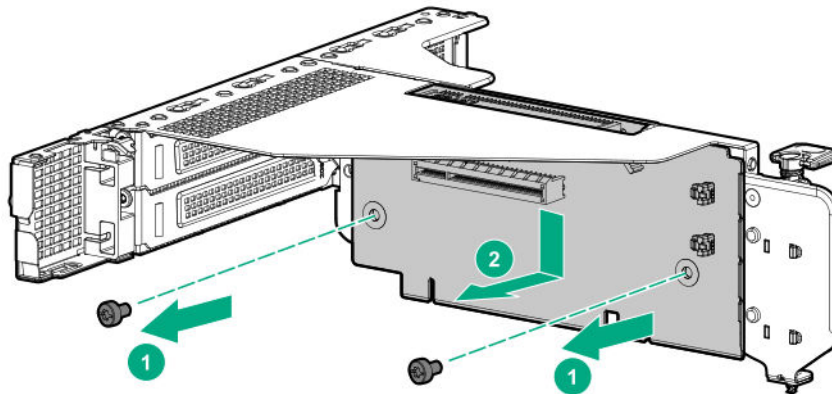
Procedure

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

- **Extend the server from the rack.**
 - **Remove the server from the rack.**
4. **Remove the access panel.**
 5. **Remove the riser cage.**
 6. Remove the expansion boards from the riser cage, if any.
 7. Remove the riser board.
 - Primary riser cage



- Secondary riser cage



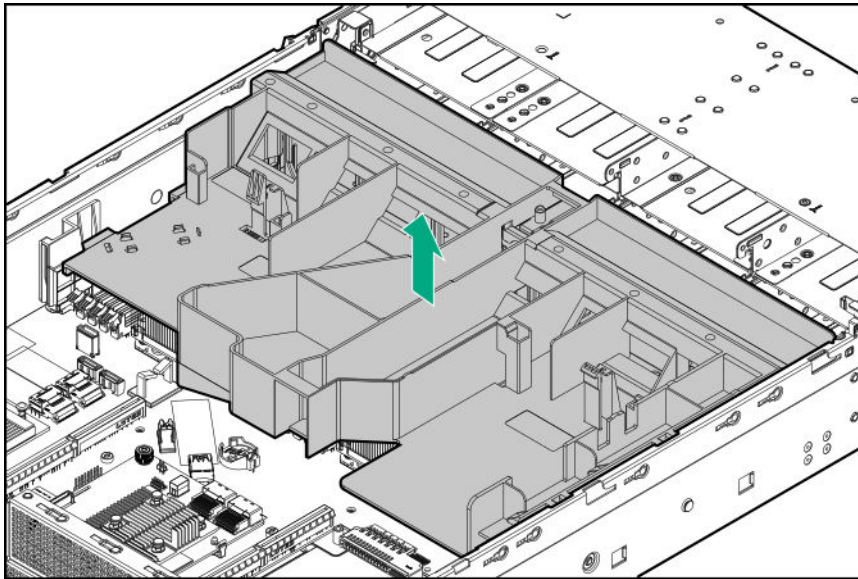
Removing the air baffle

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

Procedure

1. If installed, **remove the front bezel.**
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:
 - **Extend the server from the rack.**
 - **Remove the server from the rack.**
 6. **Remove the access panel.**
 7. If the full-length GPU or the 12G SAS expander is installed, **remove the riser cage.**
 8. Remove the air baffle.

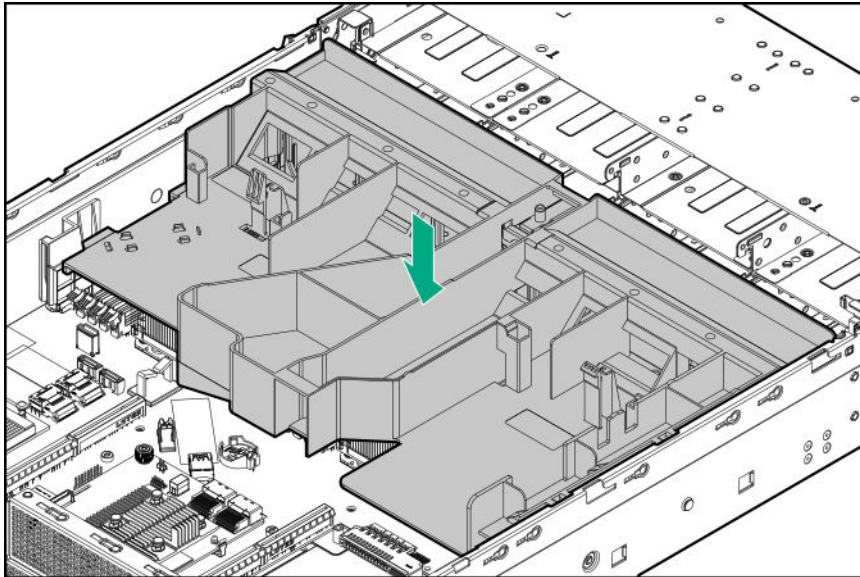


Installing the air baffle

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

Procedure

1. Install the air baffle.



2. If removed, **install the riser cage.**
3. **Install the access panel.**
4. **Install the server into the rack.**
5. Connect all peripheral cables 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** on page 43.
9. If removed, **install the front bezel.**

Hardware options installation

This chapter provides detailed instructions on how to install hardware options.

For more information on supported options, see the product QuickSpecs on the website at:

<http://www.hpe.com/info/qs>

To view the warranty for your server and supported options, see [Warranty information](#) on page 169.

Introduction

Install any hardware options before initializing the server. For options installation information, see the option documentation. For server-specific information, use the procedures in this section.

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

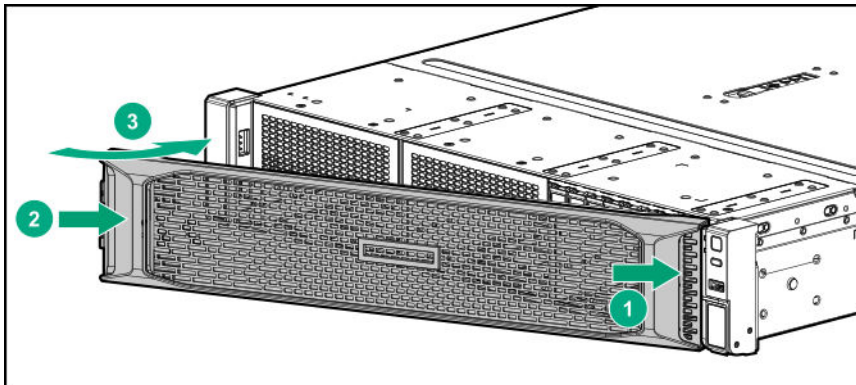
⚠ WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

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

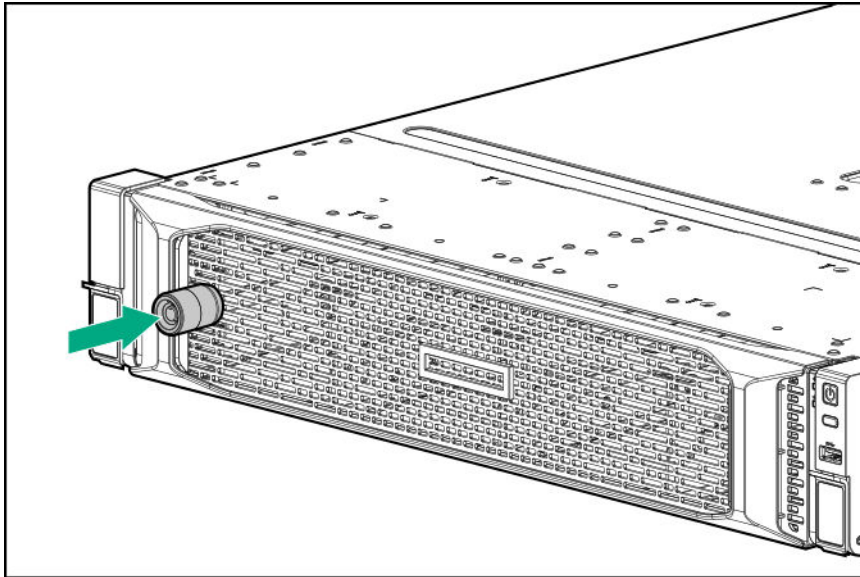
Installing the bezel and the bezel lock

Procedure

1. Install the bezel.
 - a. Attach the bezel to the right latch ear.
 - b. Press the latch on the bezel.
 - c. While pressing the latch, rotate the bezel to attach bezel to left latch ear.



2. Install the Kensington lock.



Drive options

Drive guidelines

Depending on the configuration, the server supports SAS, SATA, and NVMe drives.

Observe the following general guidelines:

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

For drive numbering, see **Drive bay numbering** on page 29.

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

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

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

Drive support information

Depending on the drive cage option installed, the server supports the following drive types:

- Hot-plug LFF SATA or SAS drives
- Hot-plug SFF SATA or SAS drives
- Hot-plug NVMe SSDs

The embedded HPE Smart Array S100i SR Gen10 Controller supports SATA drive installation. For SAS support, install a Smart Array Gen10 type-a or type-p controller option.

Installing a hot-plug SAS or SATA drive

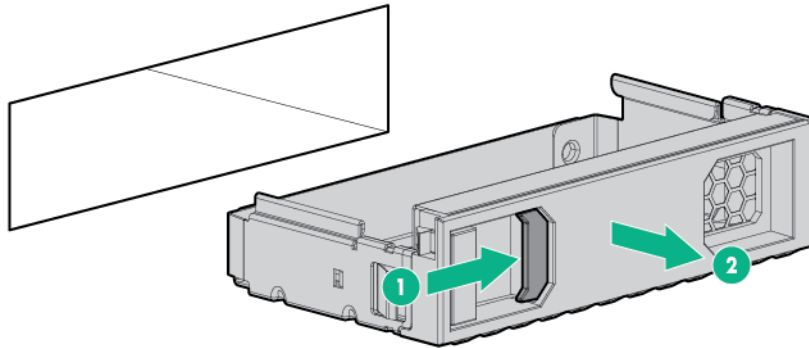
Prerequisites

If rear 2-SFF drives are installed, review [Fan population guidelines](#) on page 86 to make sure that the server has adequate fans installed.

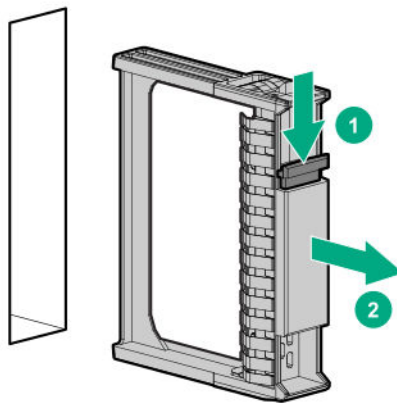
Procedure

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

- LFF

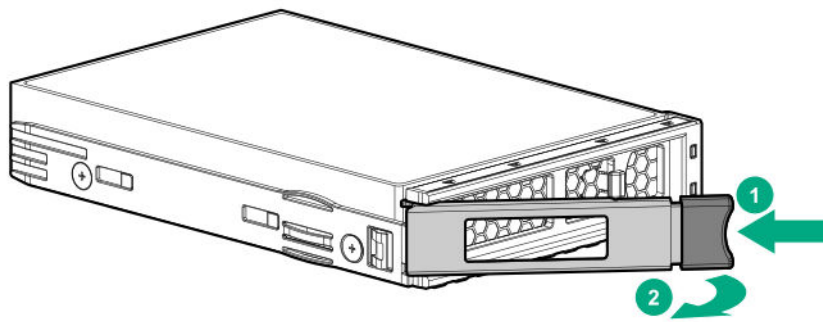


- SFF

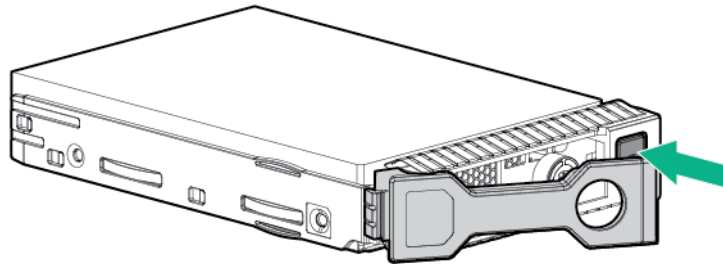


3. Prepare the drive.

- LFF

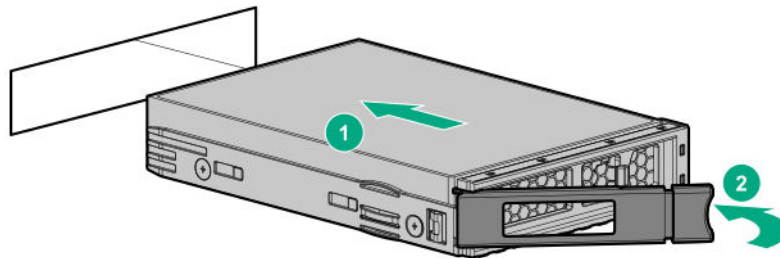


- SFF

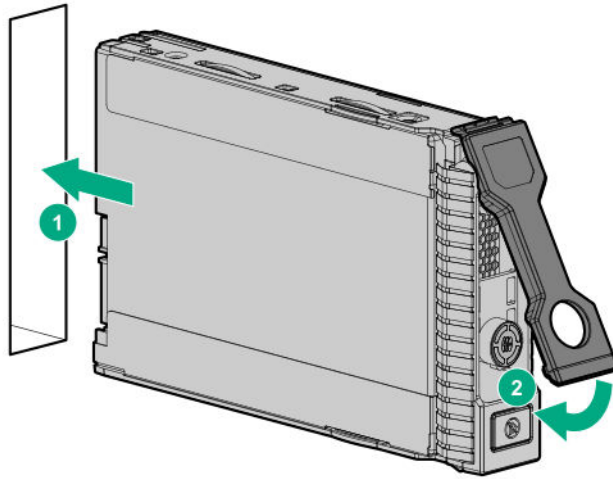


4. Install the drive.

- LFF



- SFF



5. If removed, **install the front bezel**.
6. **Determine the status of the drive from the drive LED definitions.**

The installation is complete.

To configure arrays, see the *HPE Smart Array SR Gen10 Configuration Guide* at the [Hewlett Packard Enterprise website](#).

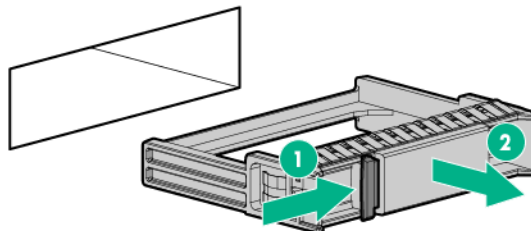
Installing an NVMe drive

Prerequisites

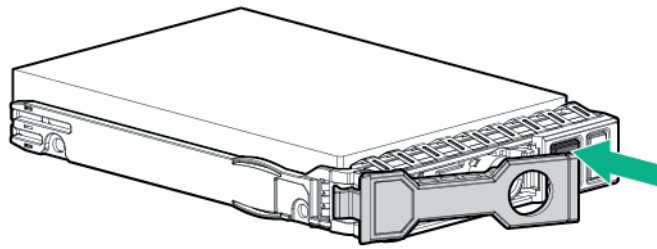
If NVMe drives are installed, review [Fan population guidelines](#) on page 86 to make sure that the server has adequate fans installed.

Procedure

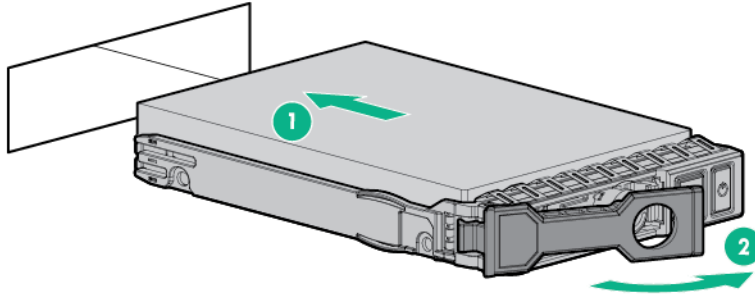
1. If installed, **remove the front bezel**.
2. Remove the drive blank.



3. Prepare the drive.



4. Install the drive.



5. If removed, **install the front bezel**.

6. **Determine the status of the drive from the drive LED definitions.**

The installation is complete.

Most current operating systems provide an NVMe SSD driver natively. Use this native (inbox) driver to configure and deploy NVMe SSDs.

The SmartSSD Wear Gauge reports in the HPE Smart Storage Administrator contain information about the current usage level and remaining expected lifetime of SSDs attached to the system. For more information, see the *HPE Smart Array SR Gen10 Configuration Guide* at the [Hewlett Packard Enterprise website](https://www.hpe.com/enterprise).

Drive cage options

The server supports the following drive cage options:

- **8-bay SFF drive cage**
- **Rear 2-bay SFF drive cage**
- **NVMe drive cage in the LFF chassis**
- **NVMe-optical drive cage in the SFF chassis**

The 8 LFF chassis can be upgraded to 12 LFF chassis with **8 to 12 upgrade option installed**.

Installing the 8-bay SFF drive cage

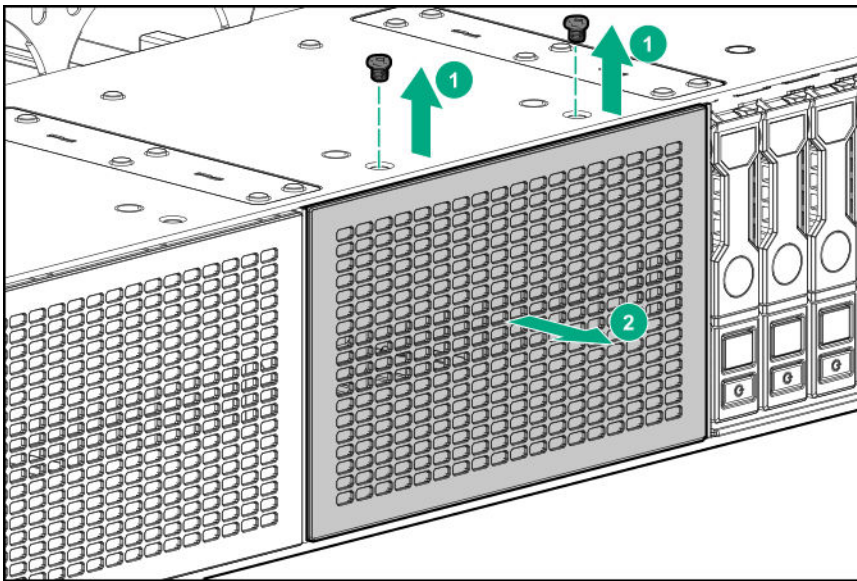
This option can be installed in boxes 1 and 2.

Prerequisites

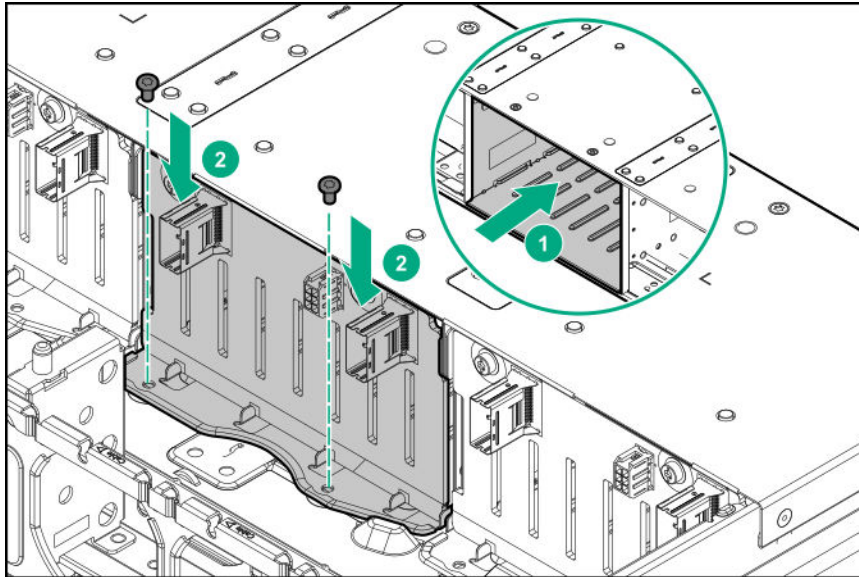
Before you perform this procedure, make sure that you have a T-15 Torx screwdriver available.

Procedure

1. If installed, **remove the front bezel**.
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:
 - **Extend the server from the rack.**
 - **Remove the server from the rack.**
6. **Remove the access panel.**
7. **Remove the air baffle.**
8. Remove the 8-bay SFF drive box blank.



9. Install the 8-bay SFF drive cage.



10. **Connect the Mini-SAS cables.**
11. **Install the drives.**
12. Disconnect the existing power cable.
13. **Connect the power cable.**
14. **Install the air baffle.**
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 each power cord to the power source.
20. **Power up the server** on page 43.
21. If removed, **install the front bezel.**

The installation is complete.

Installing the rear 2-bay SFF drive cage

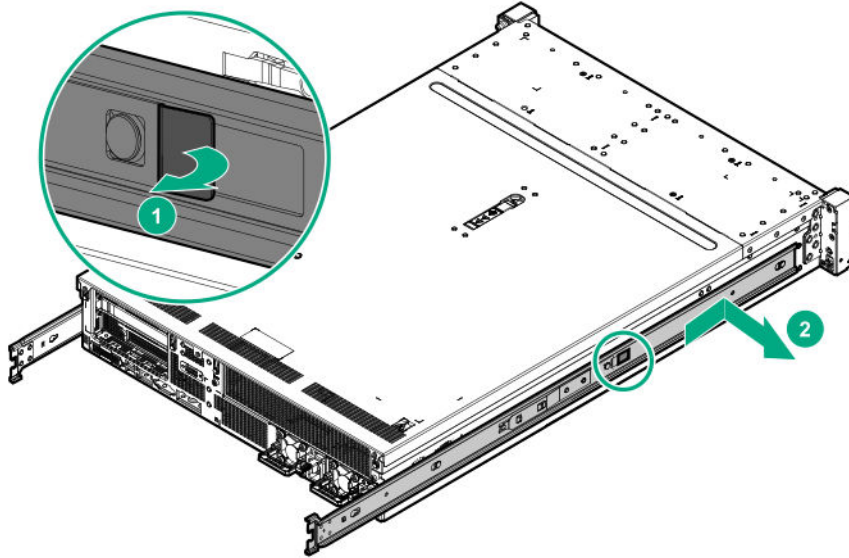
Prerequisites

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

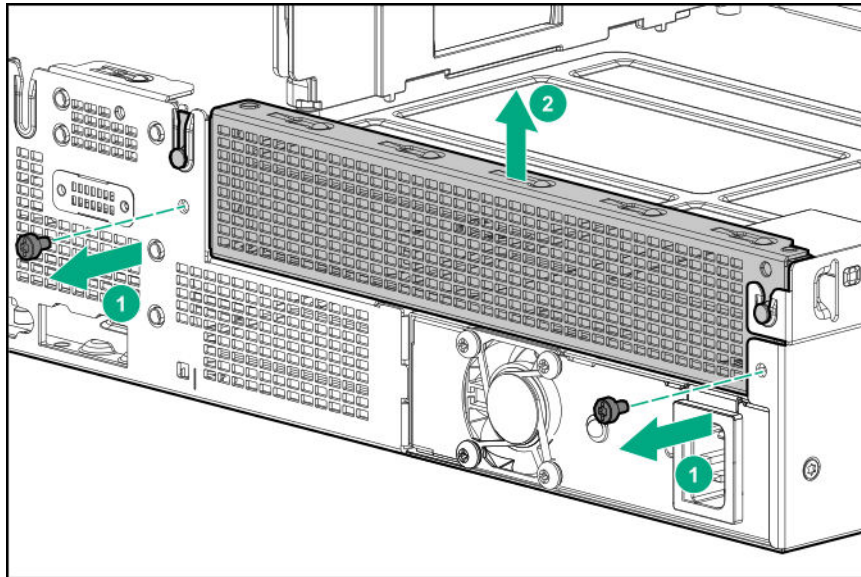
Procedure

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. To access side screws of rear 2-bay SFF drive cage, remove the left inner rail.

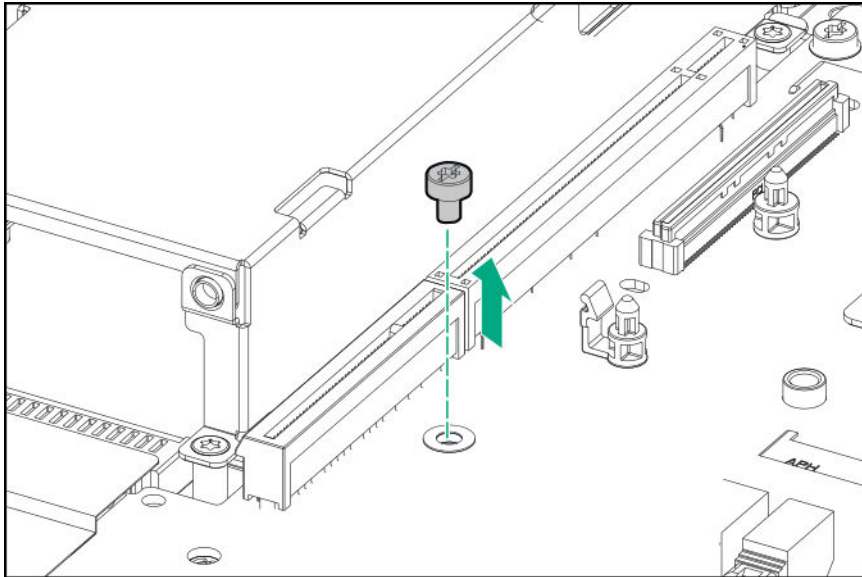


6. **Remove the access panel.**
7. **Remove the air baffle.**
8. If installed, remove one of the following components:
 - a. Secondary riser cage blank

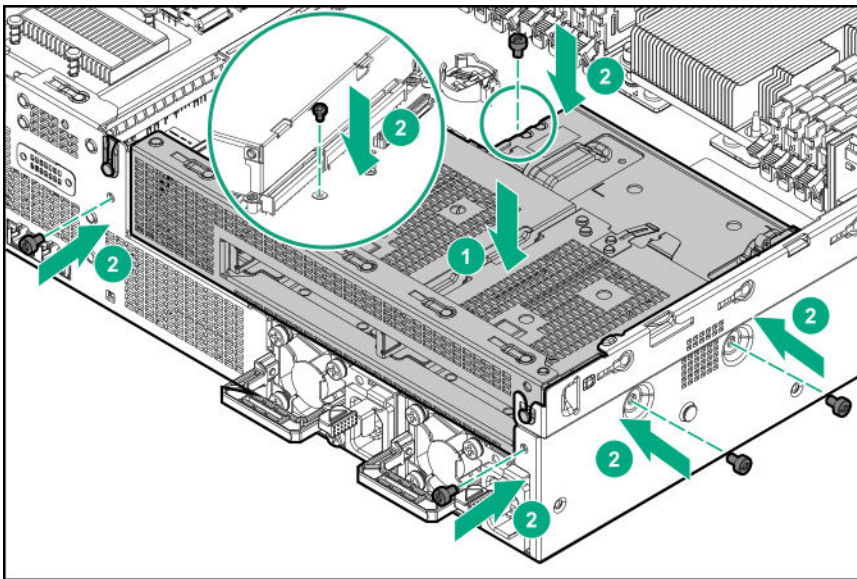


b. Secondary riser cage

9. Install the rear 2-bay SFF drive cage:
 - a. Remove the screw from the system board.



b. Install the rear 2-bay SFF drive cage, and then install the screws.



10. **Connect the Mini-SAS cable or the SATA and the SATA management port cables.**
11. **Connect GPU and rear 2-bay SFF power cable.**
12. **Install the drives.**
13. **Install the air baffle.**
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. Connect each power cord to the power source.
19. **Power up the server** on page 43.

The installation is complete.

Installing the NVMe drive cage in the LFF chassis

This option only can be installed in box 1.

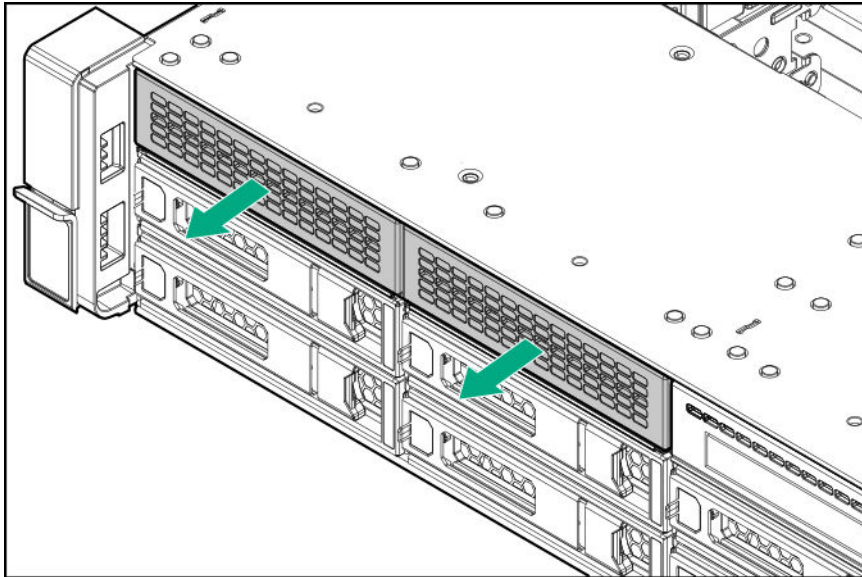
Prerequisites

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

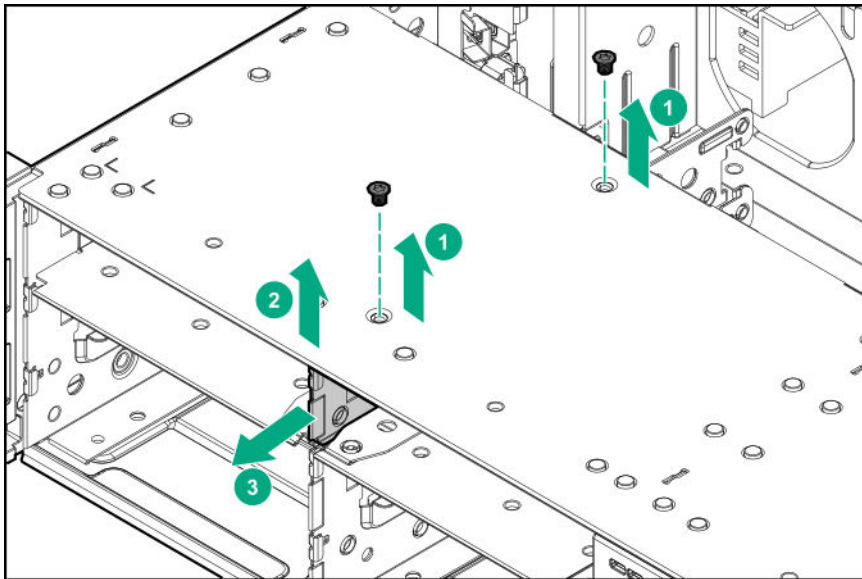
- Flat-headed screwdriver
- T-10 Torx screwdriver

Procedure

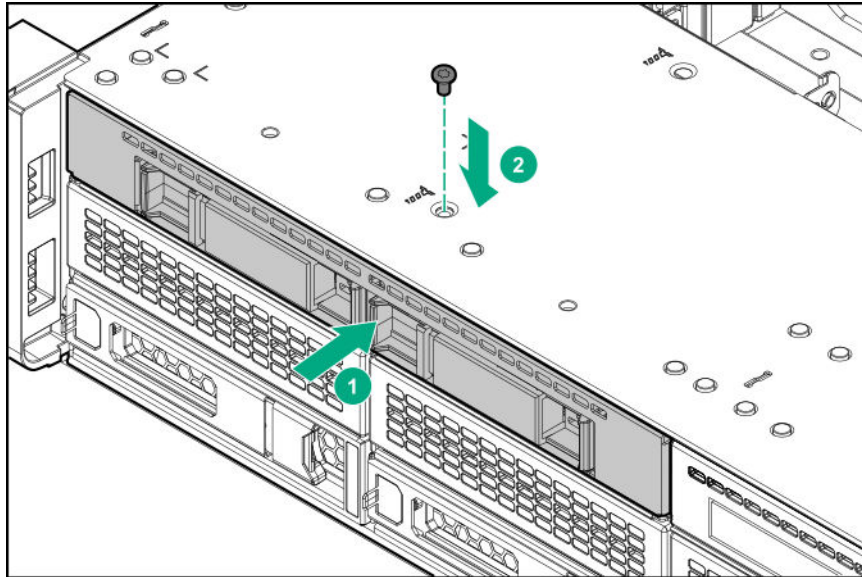
1. If installed, **remove the front bezel**.
2. **Power down the server**.
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. Do one of the following:
 - **Extend the server from the rack**.
 - **Remove the server from the rack**.
6. **Remove the access panel**.
7. **Remove the air baffle**.
8. Install the NVMe drive cage.
 - a. Use flat-head screwdriver to pry the two box 1 fillers.



b. Remove the screws, lift the top cover slightly, and then pull out the partition.



c. Install the NVMe drive cage, and then install the screw on the top of the chassis.



9. Disconnect existing drive power cable.
10. **Connect the NVMe signal and power cables.**
11. **Install the NVMe drives.**
12. **Install the air baffle.**
13. **Install the access panel.**
14. **Install the server into the rack.**
15. Connect all peripheral cables to the server.
16. Connect each power cord to the server.
17. Connect each power cord to the power source.
18. **Power up the server** on page 43.
19. If removed, **install the front bezel.**

The installation is complete.

Installing the 8 to 12 upgrade option in the LFF chassis

The 8 LFF chassis can be upgraded to 12 LFF chassis with this option installed. This option cannot be installed when the NVMe drive cage is installed in the box 1.

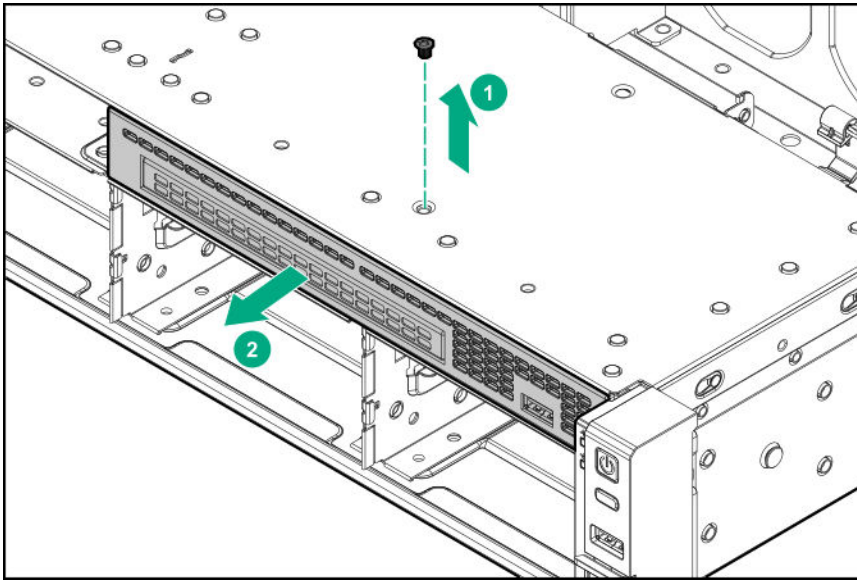
Prerequisites

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

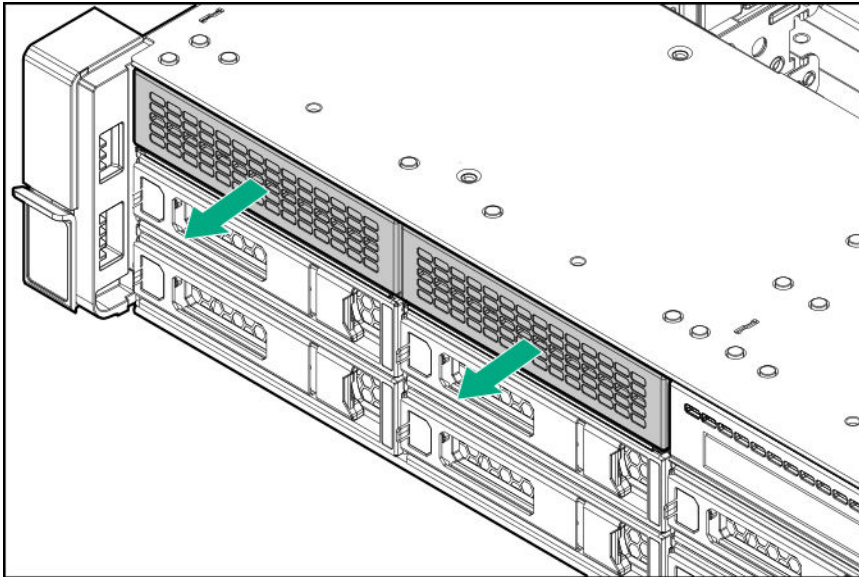
- T-10 Torx screwdriver
- Flat-headed screwdriver

Procedure

1. If installed, **remove the front bezel.**
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:
 - **Extend the server from the rack.**
 - **Remove the server from the rack.**
6. **Remove the access panel.**
7. **Remove the air baffle.**
8. **Disconnect the iLO service port cable from the system board.**
9. If installed, **disconnect the ODD cable.**
10. Remove the LFF optical drive cage.



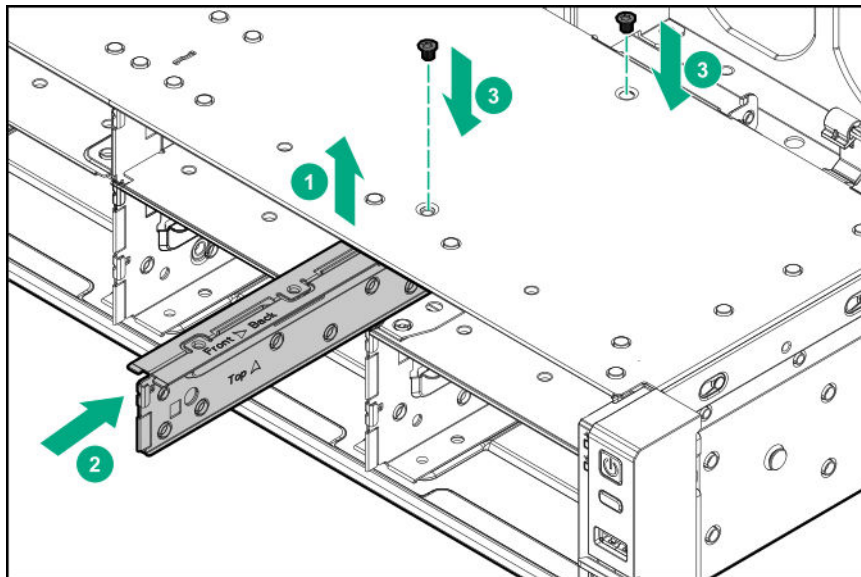
11. Use a flat-headed screwdriver to pry the fillers from box 1.



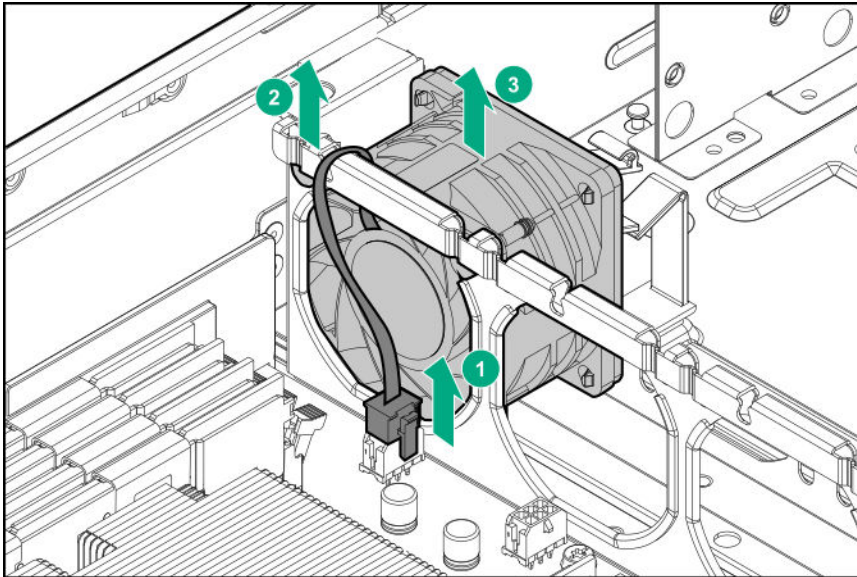
Retain the fillers for future use.

12. Install the partition.

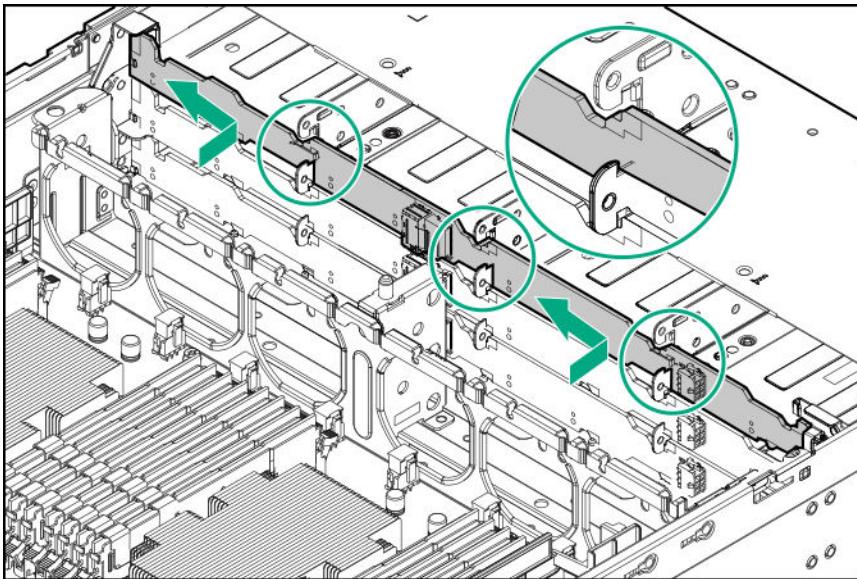
- a. Lift the top cover upward slightly.
- b. Insert the partition.
- c. Secure the partition with two screws.



13. Remove all fans.



14. Install the drive backplane.



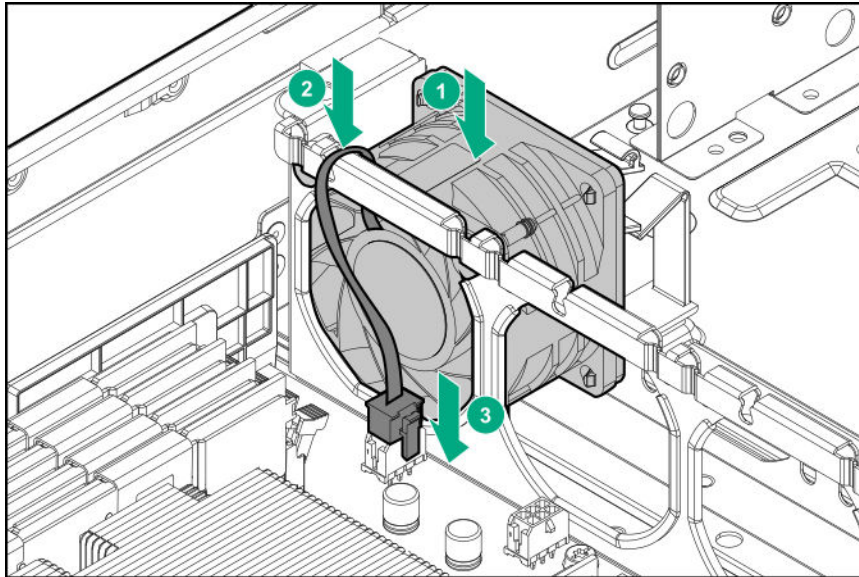
15. **Connect the Mini-SAS cable.**

16. Disconnect the existing power cable.

17. **Connect the power cable.**

18. **Install the drive in box 1.**

19. Install all fans.



20. **Install the air baffle.**
21. **Install the access panel.**
22. **Install the server into the rack.**
23. Connect all peripheral cables to the server.
24. Connect each power cord to the server.
25. Connect each power cord to the power source.
26. **Power up the server** on page 43.
27. If removed, **install the front bezel.**

The installation is complete.

Optical drive cage and optical drive options

Installing the optical drive in the LFF chassis

Prerequisites

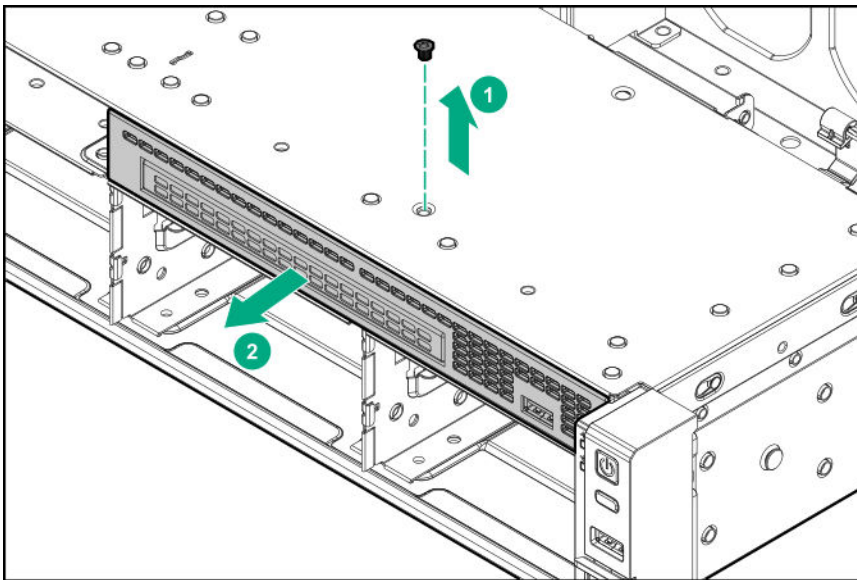
Before you perform this procedure, make sure that you have the following items available:

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

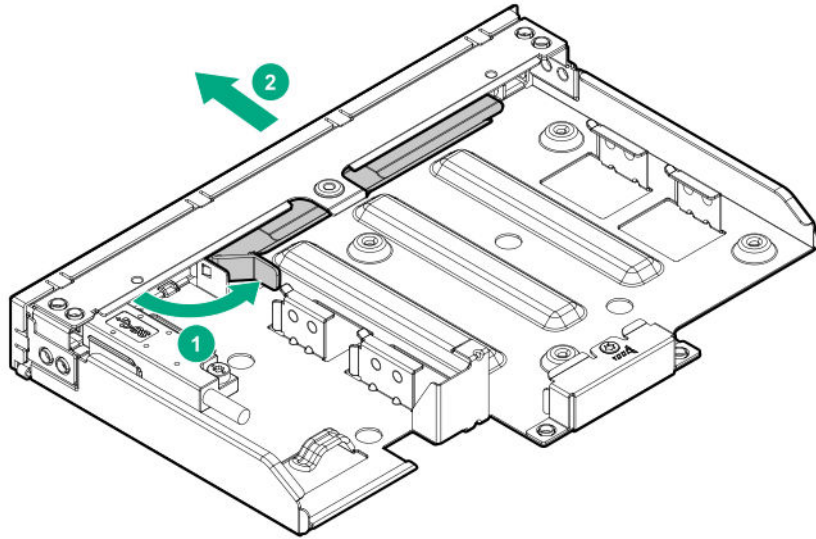
Procedure

1. If installed, **remove the front bezel.**
2. **Power down the server.**
3. Remove all power:

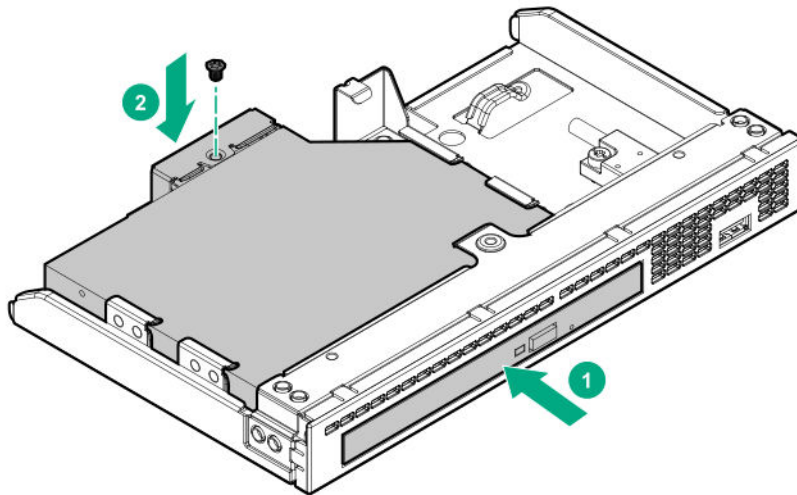
- a. Disconnect each power cord from the power source.
- b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. Do one of the following:
 - **Extend the server from the rack.**
 - **Remove the server from the rack.**
6. **Remove the access panel.**
7. **Remove the air baffle.**
8. **Disconnect the iLO service port cable from system board.**
9. Remove the optical drive cage.



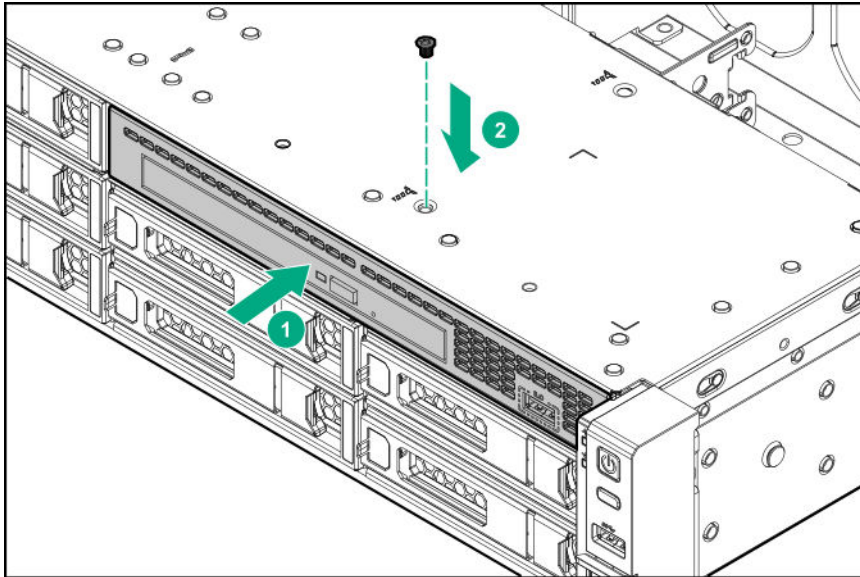
10. Install the optical drive:
 - a. Remove the optical drive blank.



b. Install the optical drive into cage.



c. Install the optical drive cage into the box 1.



d. Connect the optical drive cable.

- 11. Connect the iLO service port cable to system board.**
- 12. Install the air baffle.**
- 13. Install the access panel.**
- 14. Install the server into the rack.**
15. Connect all peripheral cables to the server.
16. Connect each power cord to the server.
17. Connect each power cord to the power source.
18. **Power up the server** on page 43.
19. If removed, **install the front bezel.**

The installation is complete.

Installing the optical drive or NVMe drives in the SFF chassis

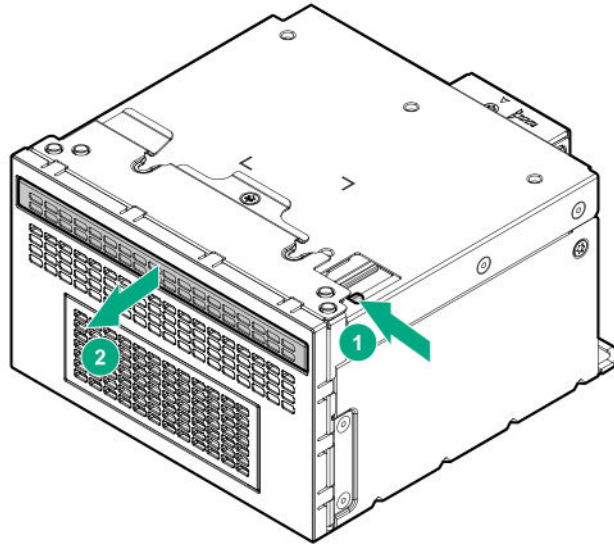
Prerequisites

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

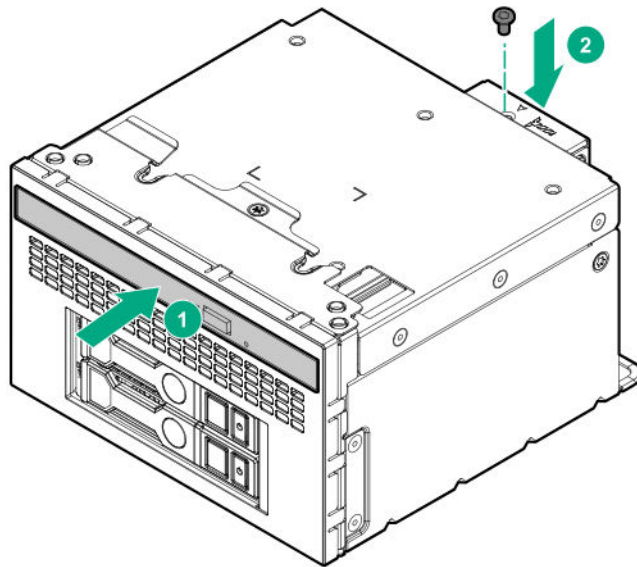
- Optical drive option
- One of the following:
 - Optical drive cage option
 - NVMe-optical drive cage option
- T-15 Torx screwdriver

Procedure

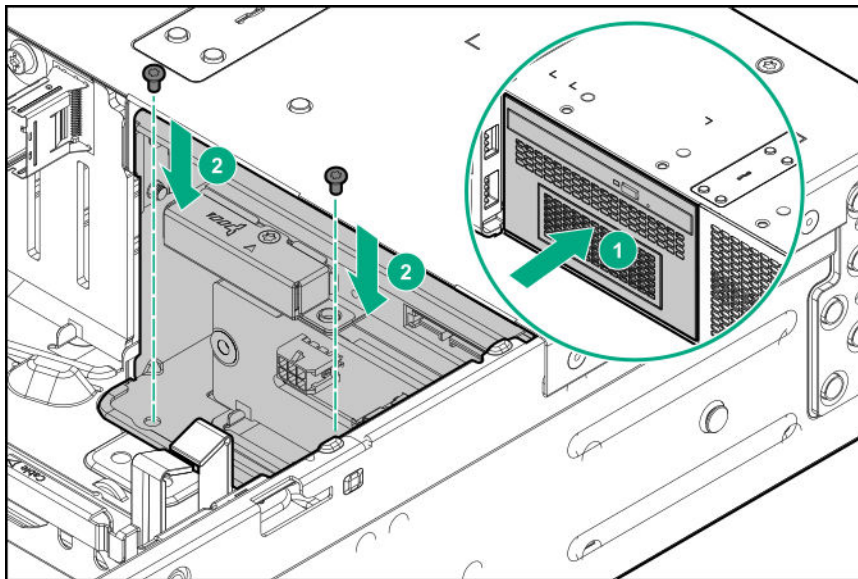
1. If installed, **remove the front bezel.**
2. **Power down the server.**
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. Do one of the following:
 - **Extend the server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



- b. Install the optical drive into the cage.



10. Install the cage assembly into box 1.



11. **Connect the optical drive cable.**

12. If installing the NVMe drives into the NVMe-optical drive cage, do the following:

- a. **Install the NVMe drives.**
- b. **Remove the primary riser cage.**
- c. **Install the NVMe and FlexibleLOM riser cage.**
- d. Disconnect the existing drive power cable.
- e. **Connect the NVMe signal and power cables.**

13. **Install the air baffle.**

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. Connect each power cord to the power source.
19. **Power up the server** on page 43.
20. If removed, **install the front bezel**.

The installation is complete.

Storage controller options

The server supports the following storage controllers:

- For SATA drives only – Embedded HPE Smart Array S100i SR Gen10 Controller
- For SAS and SATA drives:
 - Smart Array type-a modular controller
 - Smart Array PCIe plug-in controller

For more information on PCIe slot descriptions, see **PCIe riser board slot definitions** on page 16.

Storage controller installation guidelines

The following table shows the PCIe riser board slots compatible with the storage controllers supported by this server.

Storage controller option	Compatible PCIe slot
E208i-p P408i-p	Slot 1 and 2 ¹
E208e-p P408e-p	Slot 1, 2, 3, 4, 5, and 6 ¹²

¹ If the optional primary NVMe and FlexibleLOM riser board is installed, the controller is not supported in slot 2 and 3.

² If the optional primary FlexibleLOM riser board is installed, the controller is not supported in slot 3.

For the location and description of the PCIe3 expansion slots, see **Rear panel components** on page 13 and **PCIe riser board slot definitions** on page 16.

Installing an HPE Smart Array controller

Prerequisites

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

- Smart Array controller option
- Compatible controller cable option
- T-15 Torx screwdriver

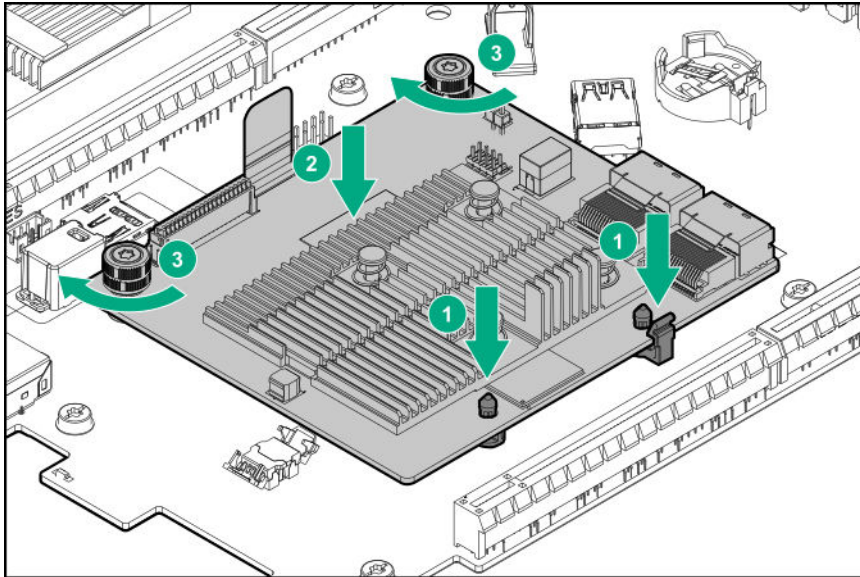
Before you perform this procedure, perform the following steps:

1. Back up data on the system.
2. Close all applications.
3. **Update the server firmware if it is not the latest revision.**
4. Do one of the following:
 - If the new Smart Array is the new boot device, install the device drivers.
 - If the new Smart Array is not the new boot device, go to the next step.
5. 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.

Procedure

1. If installed, **remove the front bezel.**
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:
 - **Extend the server from the rack.**
 - **Remove the server from the rack.**
6. **Remove the access panel.**
7. If installing a Smart Array PCIe plug-in controller, **remove the air baffle.**
8. Do one of the following:
 - For the Smart Array type-a modular controller, install the controller into the connector.



- For the Smart Array PCIe plug-in controller, **install the controller into an expansion slot.**

9. **Cable the controller.**
10. **Install the air baffle.**
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** on page 43.
17. If removed, **install the front bezel.**
18. **Configure the storage controller.**

The installation is complete.

Configuring an HPE Smart Array Gen10 controller

Procedure

1. **Power up the server** on page 43.
2. If you are running the server in UEFI Boot Mode, select the boot options.
3. **Update the drive firmware if it is not the latest revision.**
4. (Optional) If running the server in Legacy Boot Mode, set the controller as the boot controller.
5. (Optional) If running the server in Legacy Boot Mode, change the controller boot order.
6. If the new controller is not the new boot device, install the device drivers.

7. If the controller firmware is not the latest version, use SPP to update it.
8. Use UEFI System Utilities or HPE Smart Storage Administrator (HPE SSA) to create arrays and logical drives.

See the following resources for more information:

- SPP – See the product documentation in the information library:
<http://www.hpe.com/info/spp/docs>
- UEFI System Utilities or HPE Smart Storage Administrator – See the following guide in the information library (<http://www.hpe.com/info/smartstorage-docs>):
HPE Smart Array SR Gen10 Configuration Guide

Smart Storage Battery option

The Smart Storage Battery is a centralized backup source and is required to back up the write cache content onto flash memory on the HPE Smart Array P-class controllers in case of an unplanned server power loss.

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

Installing the Smart Storage Battery

Prerequisites

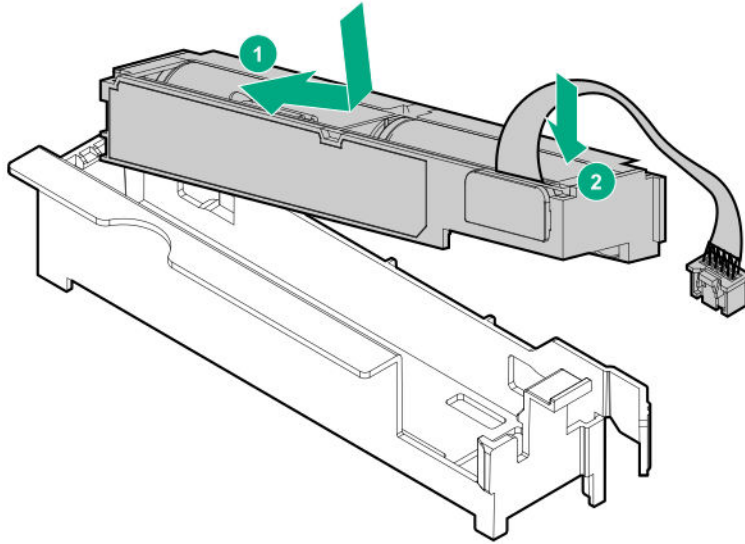
Before you perform this procedure:

- **Make sure that a Smart Array P-class controller is installed.**
- Make sure that you have the following items available:
 - Storage controller backup power cable (ships with the controller)
 - Smart Storage Battery option

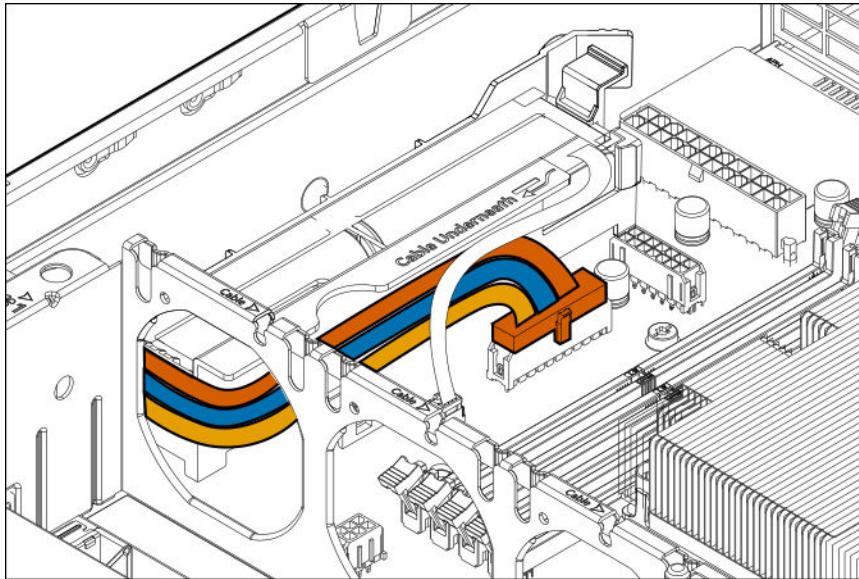
Procedure

1. If installed, **remove the front bezel.**
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:
 - **Extend the server from the rack.**
 - **Remove the server from the rack.**
6. **Remove the access panel.**

7. If the GPU is installed on secondary cage, **remove the secondary riser cage.**
8. **Remove the air baffle.**
9. Install the Smart Storage Battery.



10. Route the battery cable as shown in below illustration.



11. **Connect the controller backup power cable.**
12. **Install the air baffle.**
13. If removed, **install the secondary riser cage.**
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. Connect each power cord to the power source.
19. **Power up the server** on page 43.
20. If removed, **install the front bezel**.

The installation is complete.

M.2 SSD enablement option

The server supports the installation of one M.2 SSD enablement board. Each enablement board can support two M.2 SSDs. The M.2 SSD enablement board is supported in the PCIe3 expansion slots 1–4.

Use the embedded HPE Smart Array S100i SR Gen10 Controller to manage the M.2 SATA SSDs. The S100i SR Gen10 SW RAID support requires that the server boot mode be set to UEFI.

Installing an M.2 SSD enablement option

The DL180 Gen10 M.2 cable kit is required to meet the system thermal requirement. Do not use the M.2 cable that ships with the M.2 SSD enablement option.

Prerequisites

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

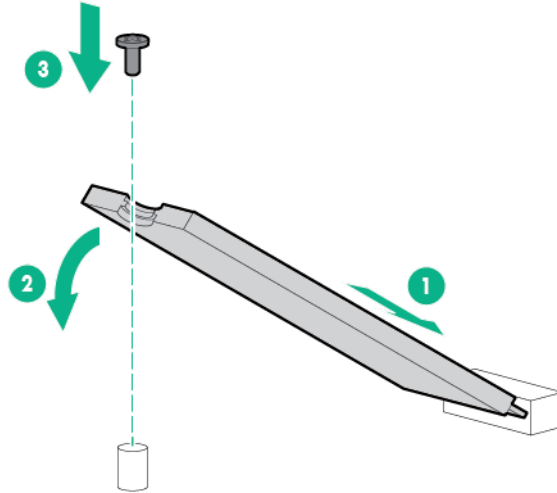
- M.2 SSD enablement option
- M.2 SSD
- DL180 Gen10 M.2 cable kit (PN 875135-B21)
- T-10 Torx screwdriver
- Phillips No. 1 screwdriver – required only if the M.2 SSD is not preinstalled on the enablement board.

Procedure

1. If installed, **remove the front bezel**.
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:
 - **Extend the server from the rack**.
 - **Remove the server from the rack**.
6. **Remove the access panel**.
7. **Remove the riser cage**.
8. **Remove the expansion slot blank**.
9. If the SSD is not preinstalled on the M.2 SSD enablement board, do the following:

If only one SSD is being installed, install the SSD in port 1.

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



- d. If you are installing a second SSD, repeat steps a–c.
10. Connect the SATA cable to enablement board.
 11. **Install the M.2 enablement board.**
 12. **Install the riser cage.**
 13. **Connect the SATA cable to system board according to the label indication.**
 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. Connect each power cord to the power source.
 19. **Power up the server** on page 43.
 20. If removed, **install the front bezel.**

The installation is complete.

To configure the M.2 SATA SSDs, see the *HPE Smart Array SR Gen10 Configuration Guide* at the [Hewlett Packard Enterprise website](#).

Processor heatsink assembly option

Processor cautions

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

-
- ⚠ **CAUTION:** If installing a processor with a faster speed, update the system ROM before installing the processor.

To download firmware and view installation instructions, see the [Hewlett Packard Enterprise Support Center website](#).

- ⚠ **CAUTION: THE CONTACTS ARE VERY FRAGILE AND EASILY DAMAGED.** To avoid damage to the socket or processor, do not touch the contacts.
-

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

Installing the processor heatsink assembly

Prerequisites

Before installing this option, ensure that you have the following:

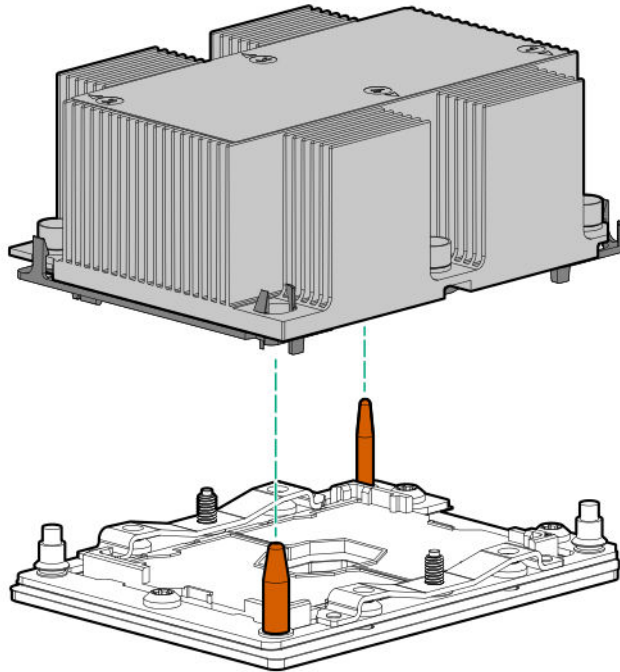
- The components included with the hardware option kit
- T-30 Torx screwdriver

Procedure

1. **Identify the processor, heatsink, and socket module components.**
2. **Review the processor cautions.**
3. If installed, **remove the front bezel.**
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. Do one of the following:
 - **Extend the server from the rack.**
 - **Remove the server from the rack.**
8. **Remove the access panel.**
9. **Remove the air baffle.**
10. Install the processor heatsink assembly:
 - a. Locate and align the Pin 1 indicator on the processor frame and the socket.
 - b. Align the processor heatsink assembly with the heatsink alignment posts and gently lower it down until it sits evenly on the socket.

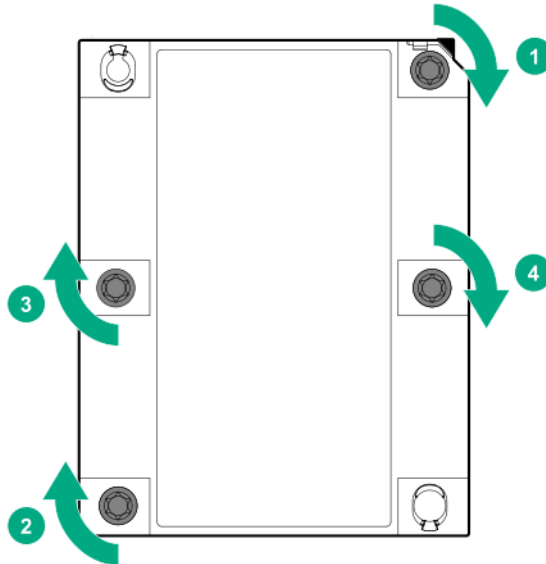
The heatsink alignment posts are keyed. The processor will only install one way.

A standard heatsink is shown, your heatsink might look different.



⚠ CAUTION: Be sure to tighten each heatsink nut fully in the order indicated. Otherwise, boot failure or intermittent shutdowns might occur.

c. Using a T-30 Torx screwdriver, tighten the nuts until they stop.



11. **Install the air baffle.**
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** on page 43.
18. If removed, **install the front bezel**.

The installation is complete.

Fan option

Fan population guidelines

The number of fans installed in the server determines fan redundancy.

Configuration	Fan redundancy	Bay 1	Bay 2	Bay 3	Bay 4	Bay 5	Bay 6
One processor, without NVMe drives and rear 2-SFF drives installed	No	Blank	Blank	Blank	Fan	Fan	Fan
One processor, without NVMe drives and rear 2-SFF drives installed	Yes	Blank	Fan	Blank	Fan	Fan	Fan
One processor, with NVMe drives or rear 2-SFF drives installed	No	Blank	Fan	Fan	Fan	Fan	Fan
One processor, with NVMe drives or rear 2-SFF drives installed	Yes	Fan	Fan	Fan	Fan	Fan	Fan
Two processors	No	Blank	Fan	Fan	Fan	Fan	Fan
Two processors	Yes	Fan	Fan	Fan	Fan	Fan	Fan

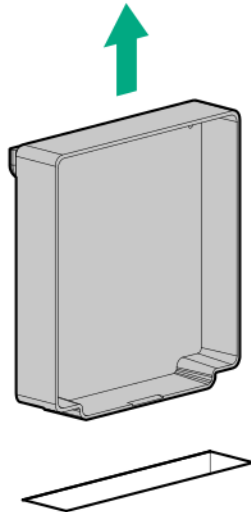
Fan mode behavior

- In nonredundant fan mode, a fan failure or a missing fan causes:
 - The system Health LED to flash amber.
 - The operating system to orderly shutdown.
- In redundant fan mode:
 - A fan rotor failure will switch the system to nonredundant fan mode.
This change is indicated by the Health LED flashing amber. The system continues to operate normally in this mode.
 - A second fan rotor failure or a missing fan causes the operating system to orderly shutdown.

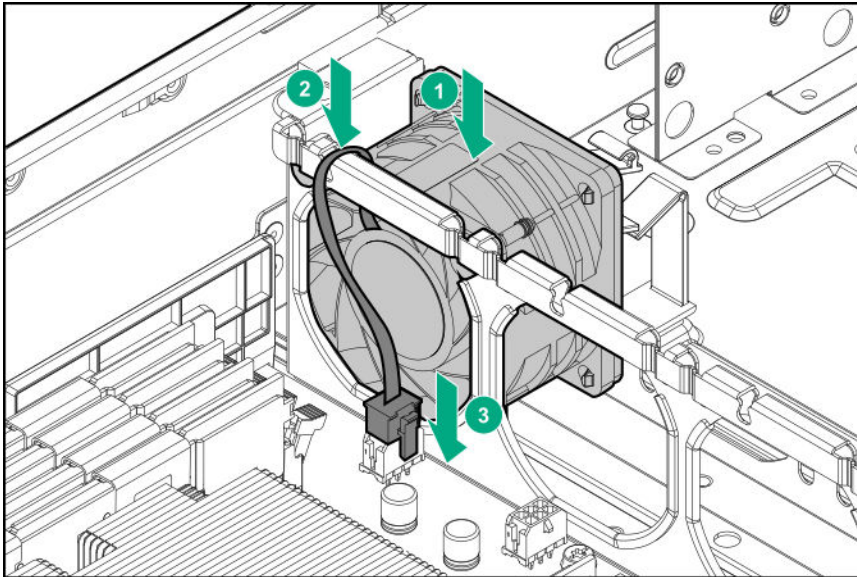
Installing a fan

Procedure

1. If installed, remove the front bezel.
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:
 - Extend the server from the rack.
 - Remove the server from the rack.
6. Remove the access panel.
7. Remove the air baffle.
8. Determine which fan blanks need to be removed to install the additional fans.
9. Remove the fan blank.



10. Install the fan:
 - a. Install the fan into the fan cage.
 - b. Route the fan cable through the groove on the fan cage.
 - c. Connect the fan cable to the system board.



11. **Install the air baffle.**
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** on page 43.
18. If removed, **install the front bezel.**

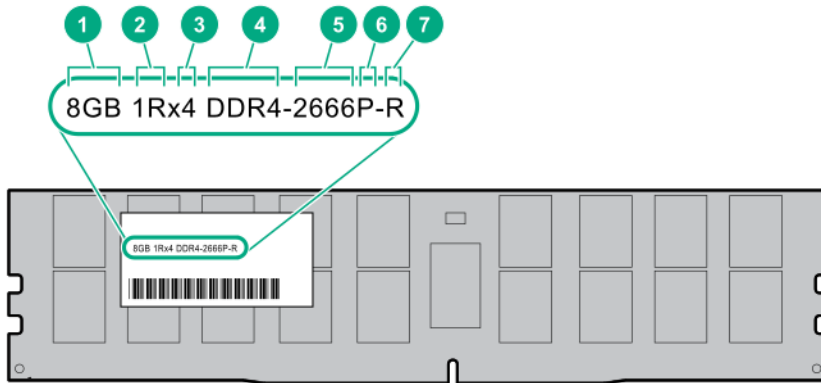
The installation is complete.

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.
-

DIMM label identification

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



Item	Description	Example
1	Capacity	8 GB 16 GB 32 GB 64 GB 128 GB
2	Rank	1R = Single rank 2R = Dual rank 4R = Quad rank 8R = Octal rank
3	Data width on DRAM	x4 = 4-bit x8 = 8-bit x16 = 16-bit
4	Memory generation	PC4 = DDR4
5	Maximum memory speed	2133 MT/s 2400 MT/s 2666 MT/s
6	CAS latency	P = CAS 15-15-15 T = CAS 17-17-17 U = CAS 20-18-18 V = CAS 19-19-19 (for RDIMM, LRDIMM) V = CAS 22-19-19 (for 3DS TSV LRDIMM)
7	DIMM type	R = RDIMM (registered) L = LRDIMM (load reduced) E = Unbuffered ECC (UDIMM)

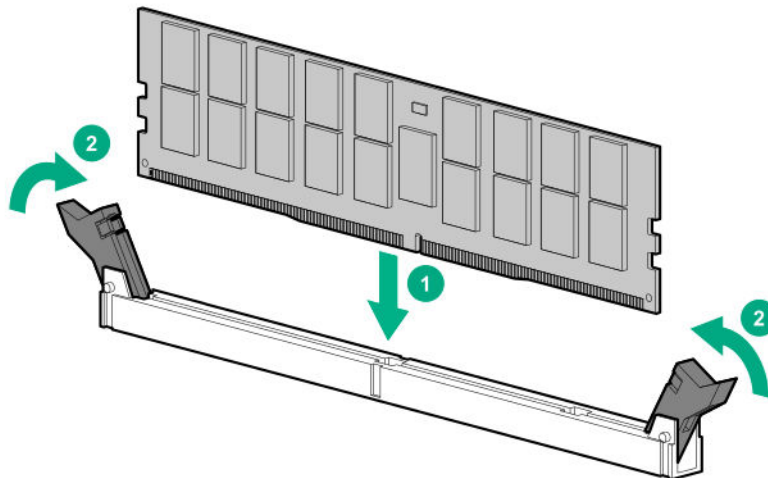
For more information about product features, specifications, options, configurations, and compatibility, see the product QuickSpecs on the Hewlett Packard Enterprise website (<http://www.hpe.com/info/qs>).

Installing a DIMM

For specific DIMM population and memory speed information, see the product QuickSpecs on the Hewlett Packard Enterprise website (<http://www.hpe.com/info/qs>).

Procedure

1. If installed, **remove the front bezel**.
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:
 - **Extend the server from the rack**.
 - **Remove the server from the rack**.
6. **Remove the access panel**.
7. **Remove the air baffle**.
8. 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.

9. **Install the air baffle.**
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. Connect each power cord to the power source.
15. **Power up the server** on page 43.
16. If removed, **install the front bezel.**

The installation is complete.

After installing the DIMMs, use the **System Utilities > System Configuration > BIOS/Platform Configuration (RBSU) > Memory Options** to configure the memory settings.

Riser board and riser cage options

Installing a riser board

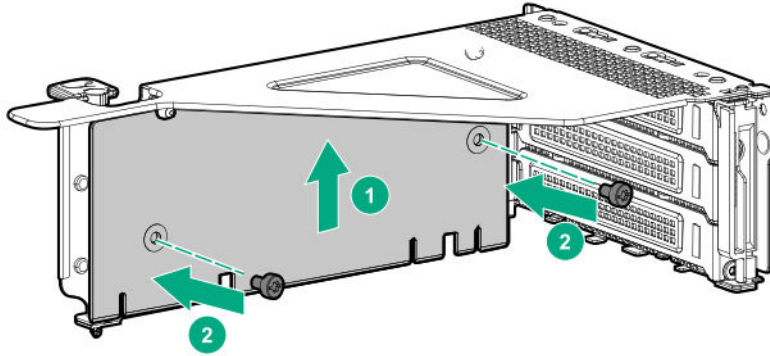
Prerequisites

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

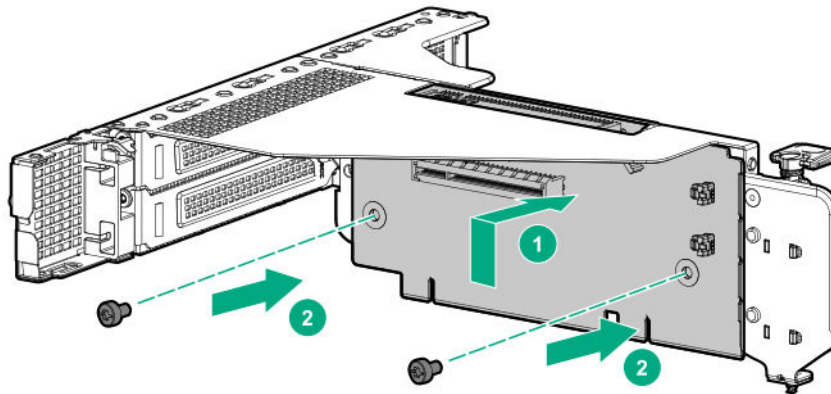
Procedure

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. 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 riser cage.**
7. **Remove the existing riser board.**
8. Mount the riser board with the guiding pins on the riser cage, and then install the screws.

- Primary riser cage



- Secondary riser cage



9. If installing the expansion board, **do it now**.
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. Connect each power cord to the power source.
16. **Power up the server** on page 43.

The installation is complete.

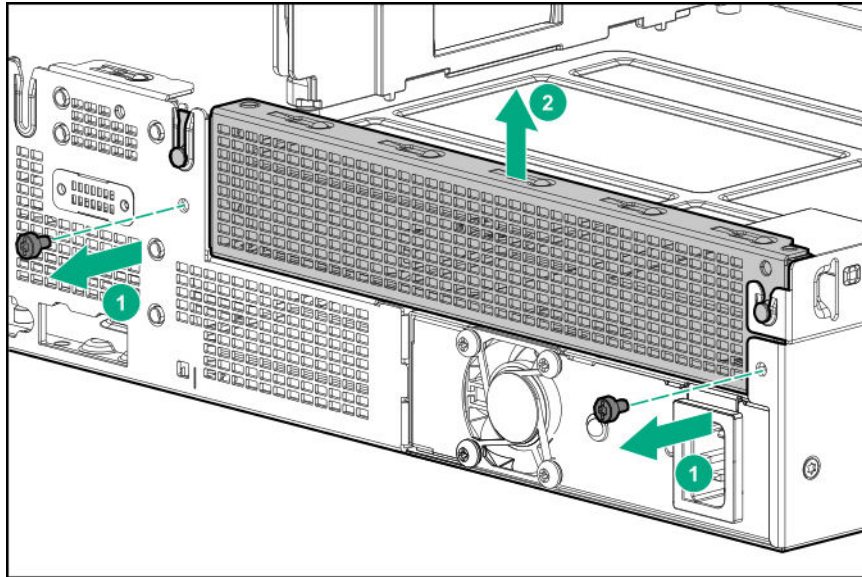
Installing a PCIe riser cage

Prerequisites

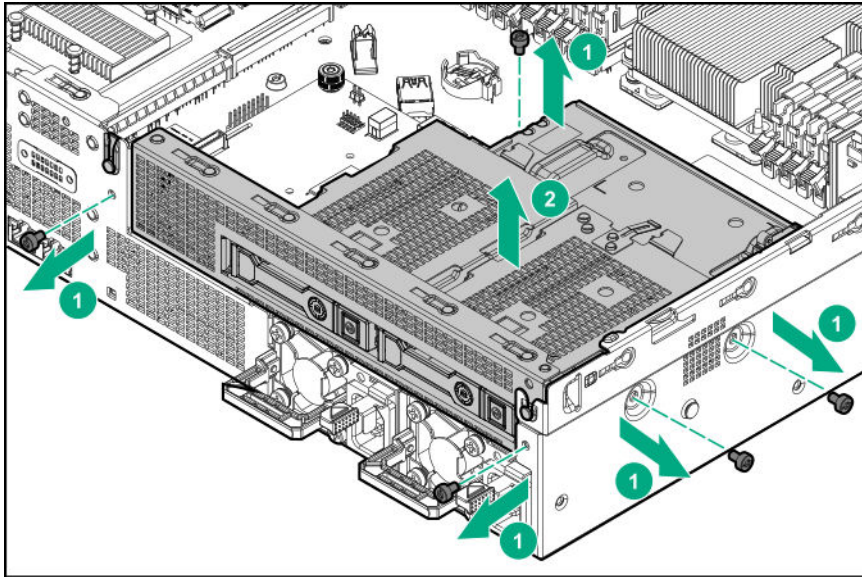
Before you perform this procedure, make sure that you have a T-15 Torx screwdriver available.

Procedure

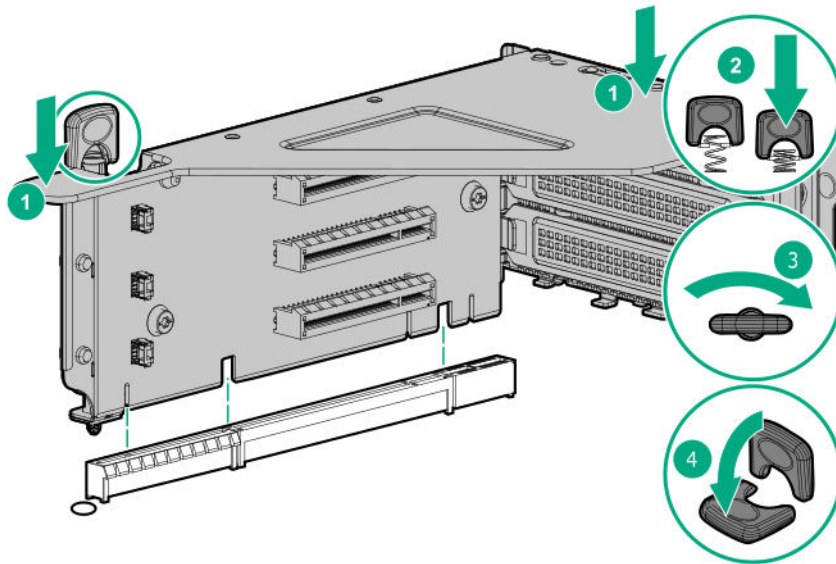
1. **Power down the server.**
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Disconnect all peripheral cables from the server.
4. Do one of the following:
 - **Extend the server from the rack.**
 - **Remove the server from the rack.**
5. **Remove the access panel.**
6. If installing secondary riser cage, remove one of the following:
 - Secondary riser cage blank



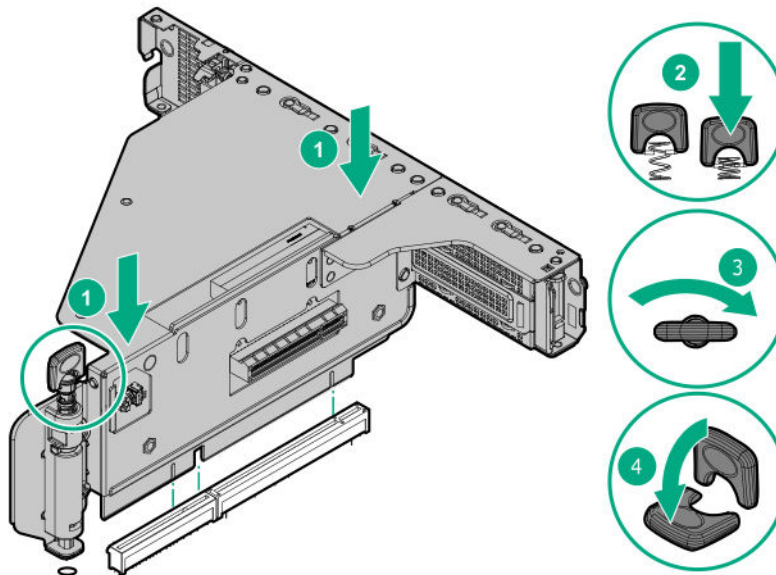
- Rear 2-bay SFF drive cage



7. If installing the expansion board, **do it now**.
8. Install the riser cage:
 - a. Align the riser board with the corresponding connectors on the system board, and then press down the PCIe riser cage.
 - b. Push down the release tab, rotate it 180° clockwise, and then press it flat on the PCIe riser cage.
 - Primary riser cage



- Secondary riser cage



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.
13. Connect each power cord to the power source.
14. **Power up the server** on page 43.

The installation is complete.

Expansion board options

PCIe slot guidelines for network cards and PCIe workload accelerator options

The following table shows the PCIe riser board slots supported with the network cards and the PCIe workload accelerator options of the server.

Component	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6
HPE Ethernet networking card	Yes	Yes	Yes	Yes	No	Yes
HPE Ethernet 4-port networking card	Yes	Yes	Yes	No	No	Yes
HPE 10 Gb networking card (Supported up to max 3 pcs)	Yes	No	No	Yes	Yes	No

Table Continued

HPE 25/40/100 Gb networking card (Supported up to max 1 pc)	No	No	No	Yes	Yes	No
HPE PCIe Workload Accelerator options (Supported up to max 3 pcs)	Yes	No	No	Yes	Yes	No

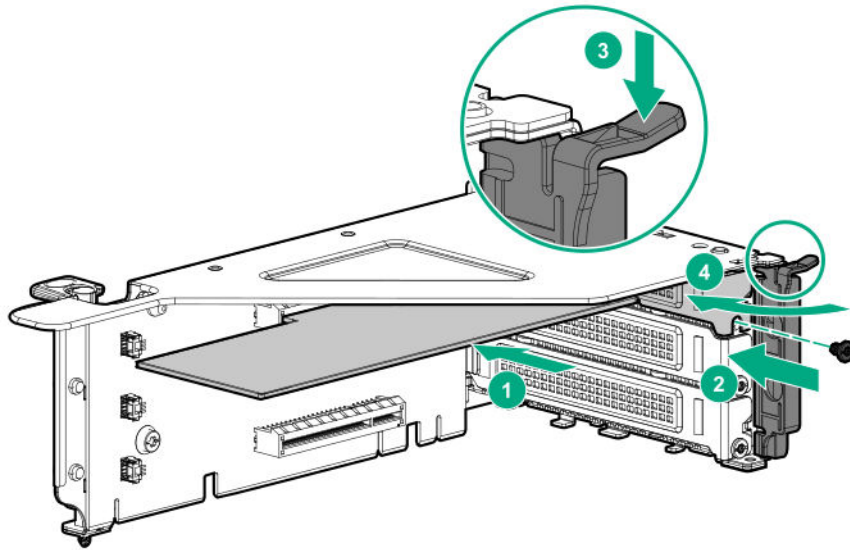
Installing an expansion board

Prerequisites

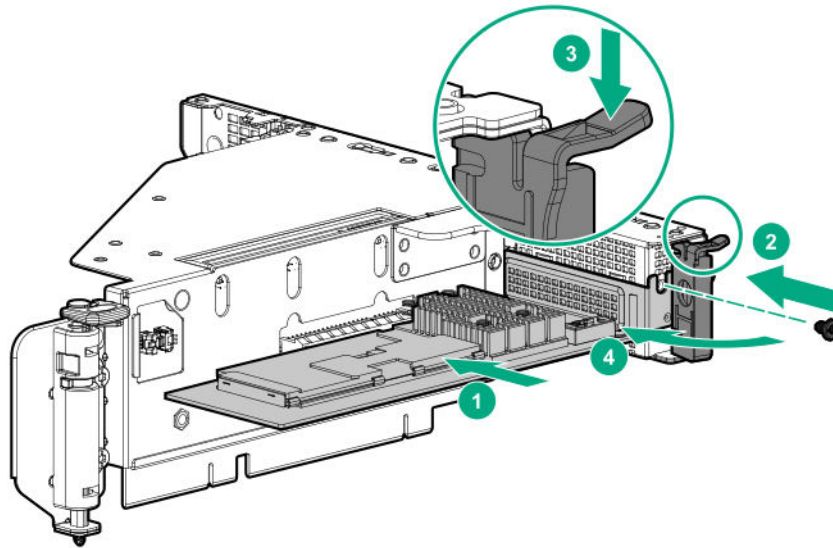
Before you perform this procedure, make sure that you have a T-10 Torx screwdriver available.

Procedure

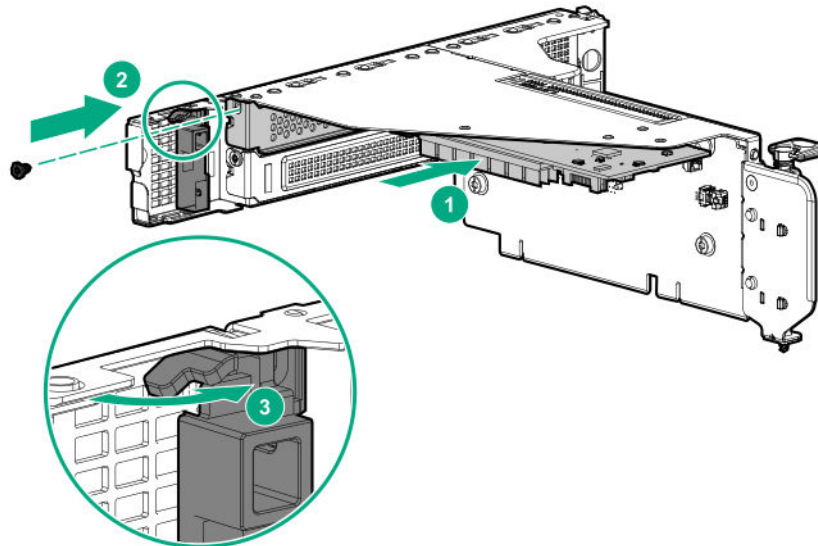
1. If installed, **remove the front bezel**.
2. **Power down the server**.
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. Do one of the following:
 - **Extend the server from the rack**.
 - **Remove the server from the rack**.
6. **Remove the access panel**.
7. **Remove the riser cage**.
8. If required, **remove the air baffle**.
9. **Identify** and then **remove the slot blank** from the riser cage.
10. If installing expansion board on a low-profile slot on the secondary riser cage, replace the full-height bracket with the low-profile bracket. See the expansion board document for model-specific support bracket information.
11. Install the expansion board.
 - Primary riser cage



- Secondary riser cage
 - Slot 4



- Slot 5 or 6



12. If internal cables are required for the expansion board, **connect the cables**.
13. If removed, **install the air baffle**.
14. **Install the riser cage**.
15. **Connect all cables to system board/backplane**.
16. **Install the access panel**.
17. **Install the server into the rack**.
18. Connect all peripheral cables to the server.
19. Connect each power cord to the server.
20. Connect each power cord to the power source.
21. **Power up the server** on page 43.

The installation is complete.

Installing the HPE 12G SAS Expander Card option

The HPE 12G SAS expander card is supported in the PCIe3 expansion slot 1.

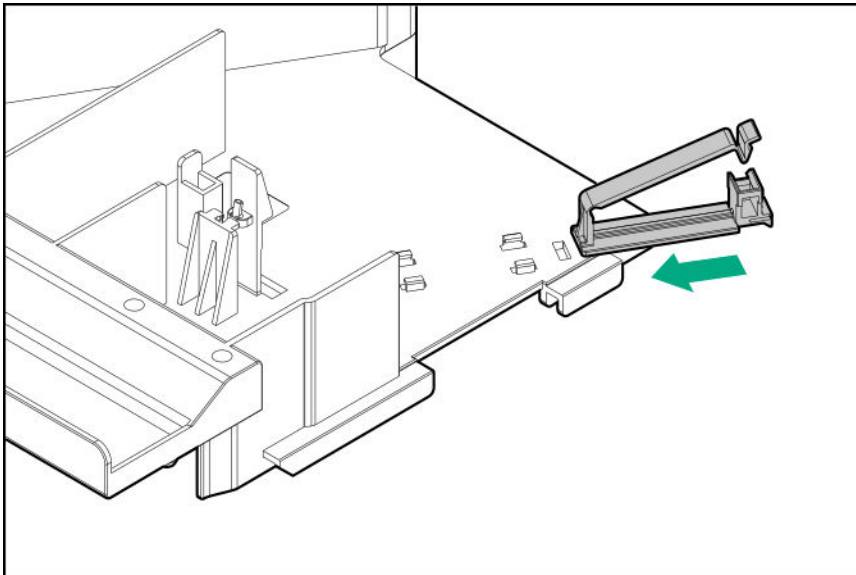
Prerequisites

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:
 - **Extend the server from the rack.**
 - **Remove the server from the rack.**
5. **Remove the access panel.**
6. **Remove the primary riser cage.**
7. **Remove the air baffle.**
8. **Remove the expansion slot blank.**
9. Connect all Mini-SAS cables to the SAS expander according to the labels on cables.
10. **Install the 12G SAS expander card.**
11. **Install a Smart Array controller.**
12. **Connect the Mini-SAS cables between the SAS expander and the controller according to the labels on cables.**
13. Install the cable clip on the air baffle.



14. **Install the air baffle.**
15. **Install the primary riser cage.**
16. **Connect the Mini-SAS cables to SFF drives.**
17. **Route the Mini-SAS cables along the chassis and cable clip on the air baffle.**
18. Close the cable clip on the air baffle.
19. **Install the access panel.**
20. **Install the server into the rack.**
21. Connect all peripheral cables to the server.
22. Connect each power cord to the server.

23. Connect each power cord to the power source.

24. **Power up the server** on page 43.

The installation is complete.

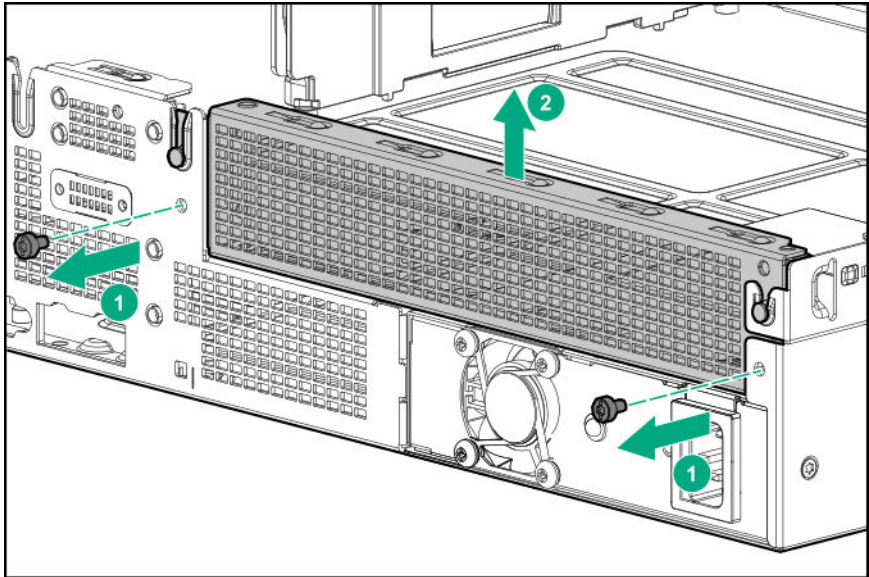
Installing a GPU card

Prerequisites

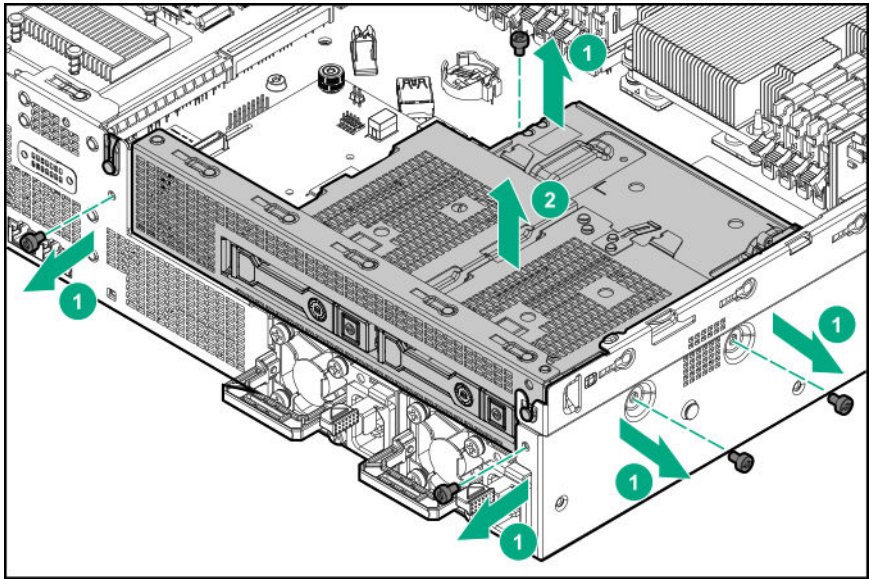
Before you perform this procedure, make sure that you have a T-10 Torx screwdriver available.

Procedure

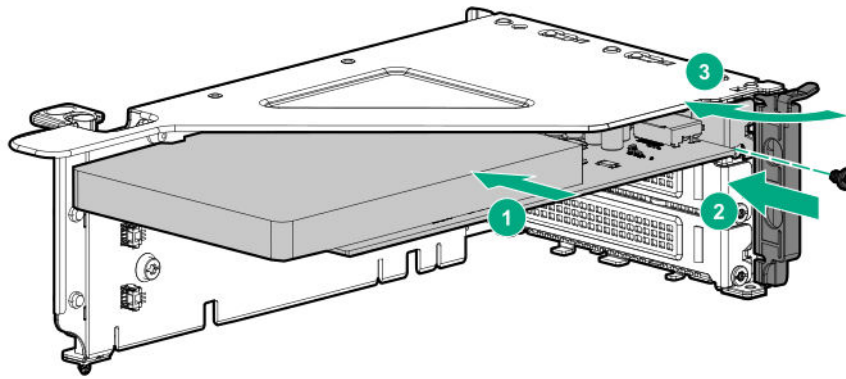
1. If installed, **remove the front bezel**.
2. **Power down the server**.
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. Do one of the following:
 - **Extend the server from the rack**.
 - **Remove the server from the rack**.
6. **Remove the access panel**.
7. **Remove the air baffle**.
8. If installed, remove one of the following components:
 - **Primary riser cage**
 - Secondary riser cage blank



- **Secondary riser cage**
- Rear 2-bay SFF SAS/SATA drive cage



9. Install the GPU:
 - a. **Remove the expansion slot blank.**
 - b. Install the GPU into the riser cage:
 - Primary riser cage

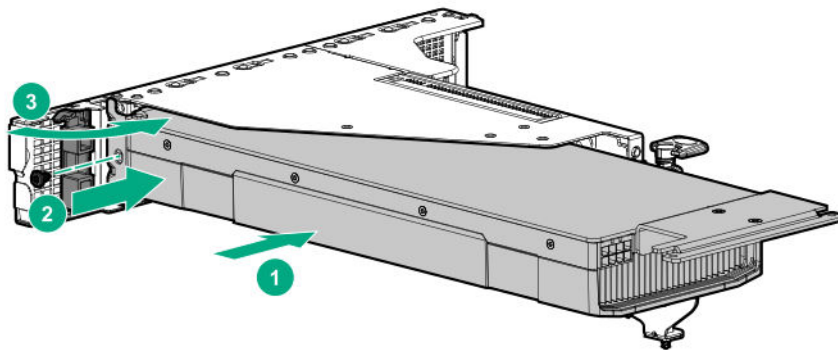


In general, GPUs that have a power requirement higher than 75W require an external auxiliary power cable connection. Due to thermal considerations, the use of an auxiliary power cable in the primary riser cage area is not supported. To prevent improper thermal conditions in the server, only install GPU options that do not require an external auxiliary power cable in the primary PCI riser cage.

For specific information about power requirements of a GPU, see the GPU user documentation.

For a list of specific GPU models supported by this server, see the server QuickSpecs on the Hewlett Packard Enterprise website (<http://www.hpe.com/info/qs>).

- Secondary riser cage

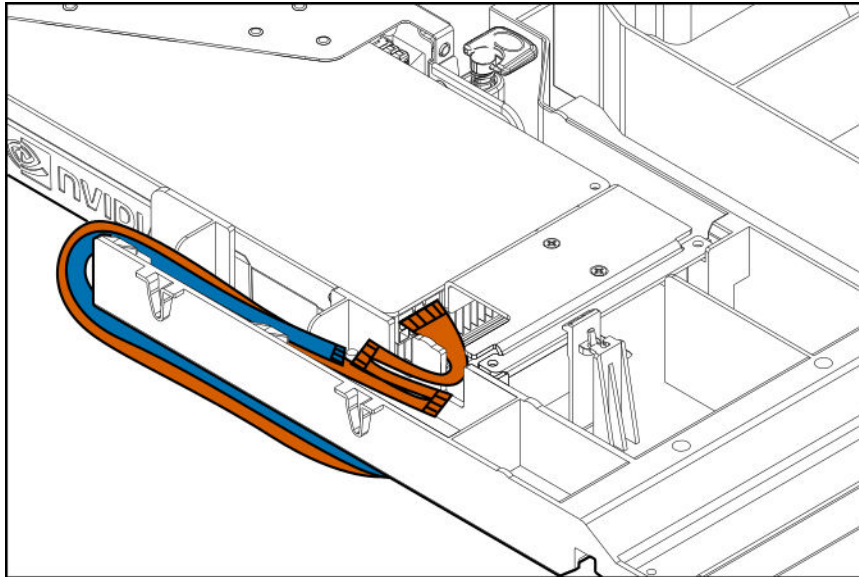


10. Identify the cable connector on system board.

11. Connect the GPU and rear 2-SFF power cable to system board.

12. Install the air baffle.

13. Store and route the GPU and rear 2-SFF power cables in the slot on the air baffle.



14. **Install the riser cage.**
15. Ensure that the GPU bracket is secured with the latch on the air baffle.
16. **Connect the power cable to GPU installed in secondary riser cage.**
17. **Install the access panel.**
18. **Install the server into the rack.**
19. Connect all peripheral cables to the server.
20. Connect each power cord to the server.
21. Connect each power cord to the power source.
22. **Power up the server** on page 43.

The installation is complete.

Installing the FlexibleLOM adapter

Prerequisites

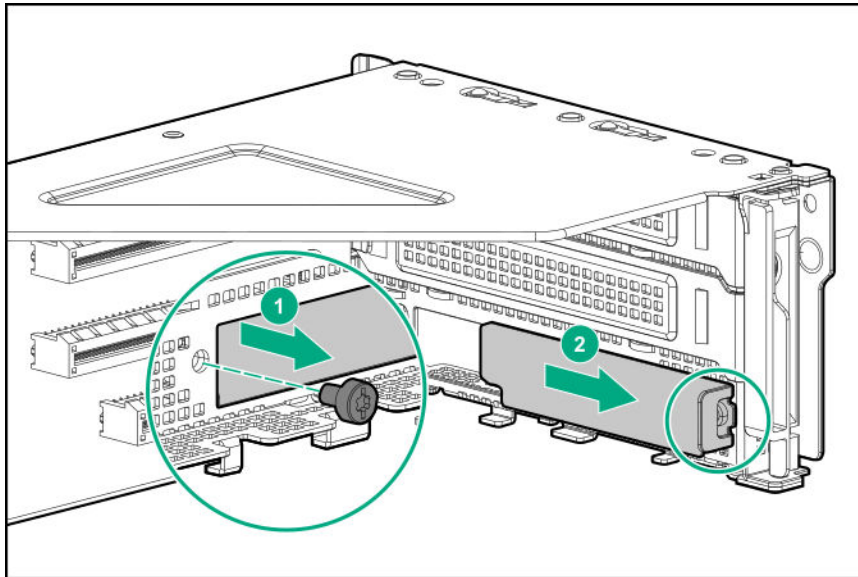
Before you perform this procedure, make sure that you have the following items available:

- T-15 Torx screwdriver
- T-10 Torx screwdriver
- FlexibleLOM riser cage

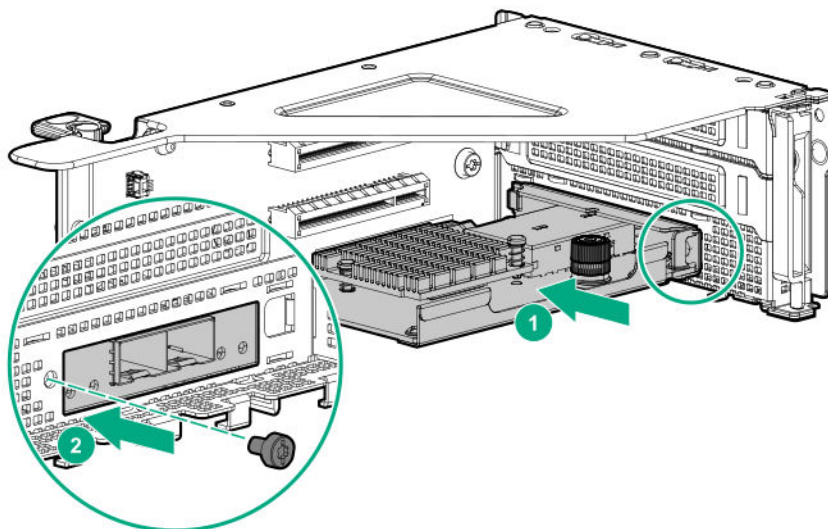
Procedure

1. If installed, **remove the front bezel.**
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:
 - **Extend the server from the rack.**
 - **Remove the server from the rack.**
 6. **Remove the access panel.**
 7. **Remove the primary riser cage.**
 8. Remove the FlexibleLOM blank.



9. Install the FlexibleLOM adapter.



10. **Install the FlexibleLOM riser cage.**
11. **Install the access panel.**
12. **Install the server into the rack.**
13. Connect the LAN segment cables.
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** on page 43.
18. If removed, **install the front bezel.**

The installation is complete.

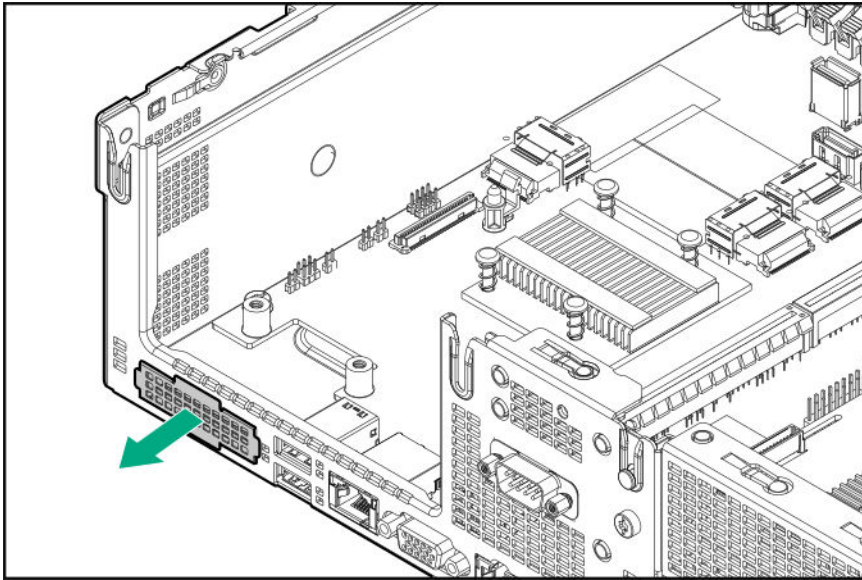
Installing the Media Module

Prerequisites

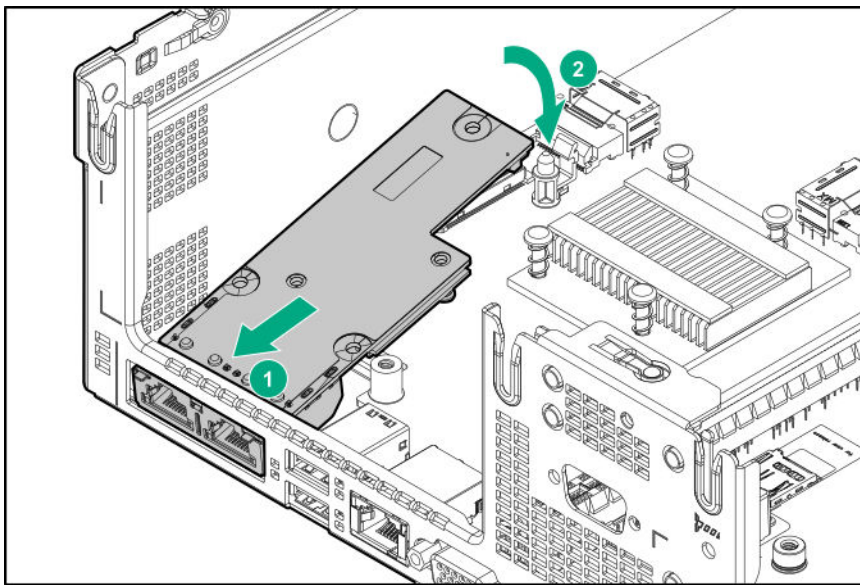
Before you perform this procedure, make sure that you have a T-15 Torx screwdriver available.

Procedure

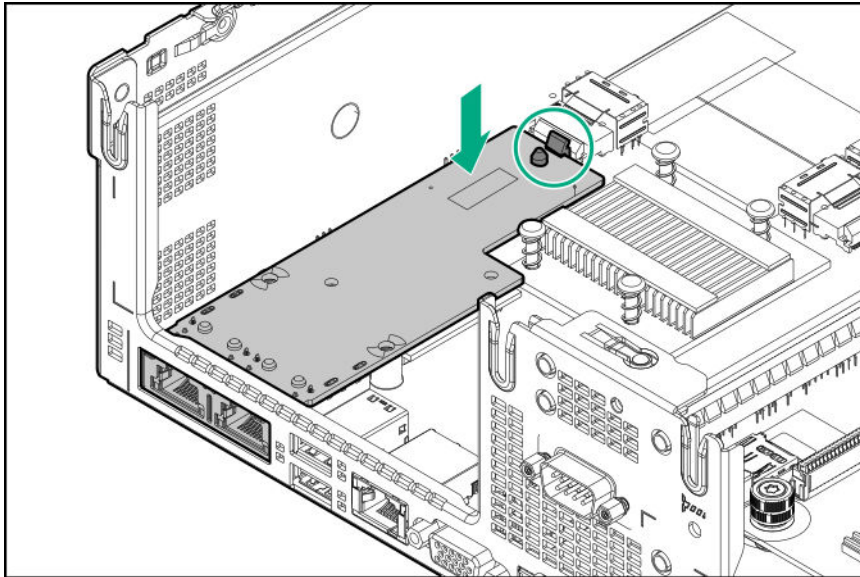
1. If installed, **remove the front bezel.**
2. **Power down the server.**
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. Do one of the following:
 - **Extend the server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



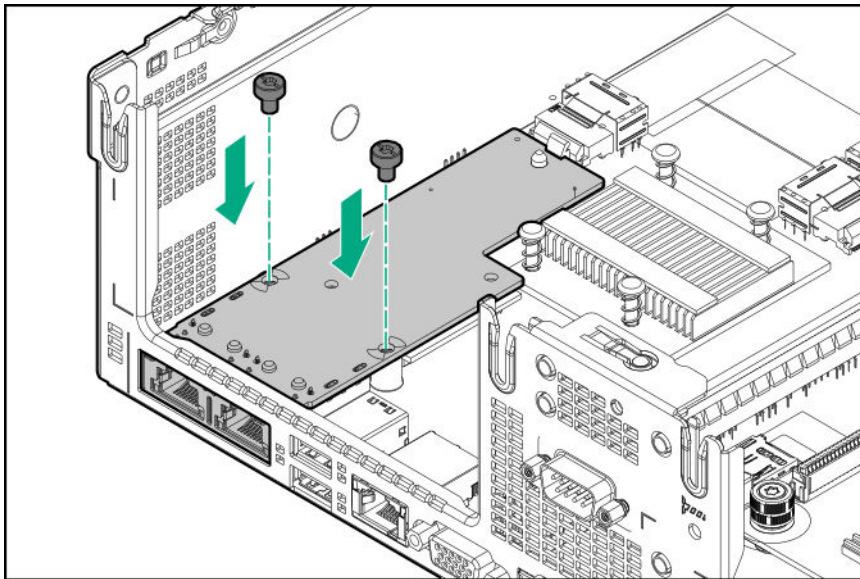
9. Install the Media Module:
 - a. Align the Media Module to the opening on the rear panel.
 - b. Press the other end of the Media Module down to connect on the system board.



- c. Firmly seat the Media Module in the connector and ensure that it is secured with the latch.



d. Install the screws on the Media Module.



10. **Install the primary 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. Connect each power cord to the power source.
16. **Power up the server** on page 43.
17. If removed, **install the front bezel.**

The installation is complete.

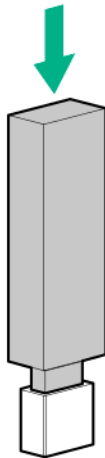
Internal USB device option

The server has one internal one USB 3.0 port. You can use this port to install internal USB device, that is intended to be rarely removed, such as USB flash media devices for booting up from flash solutions or for data backup/redundancy.

Installing an internal USB device

Procedure

1. If installed, **remove the front bezel**.
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:
 - **Extend the server from the rack**.
 - **Remove the server from the rack**.
6. **Remove the access panel**.
7. **Locate the internal USB connector**.
8. Plug in the USB device into the internal USB port.



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.
13. Connect each power cord to the power source.

14. **Power up the server** on page 43.

15. If removed, **install the front bezel**.

The installation is complete.

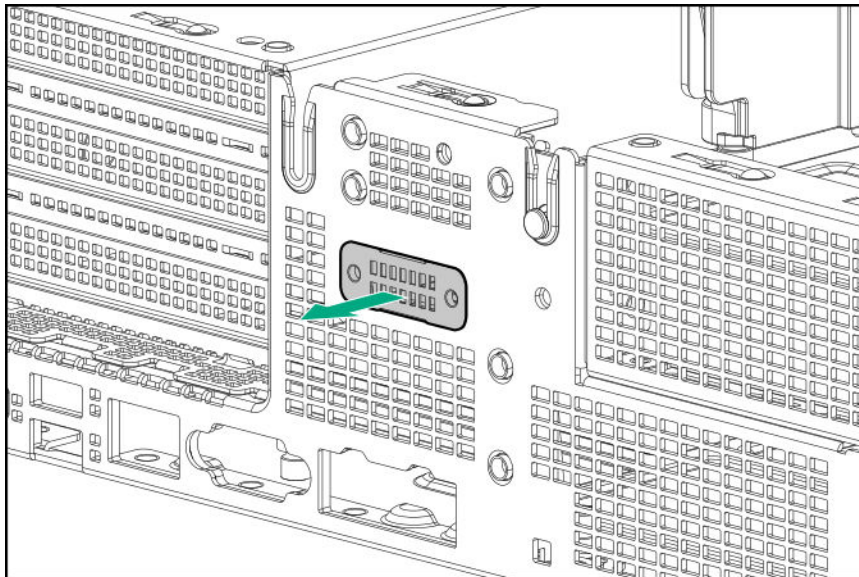
Installing the serial port

Prerequisites

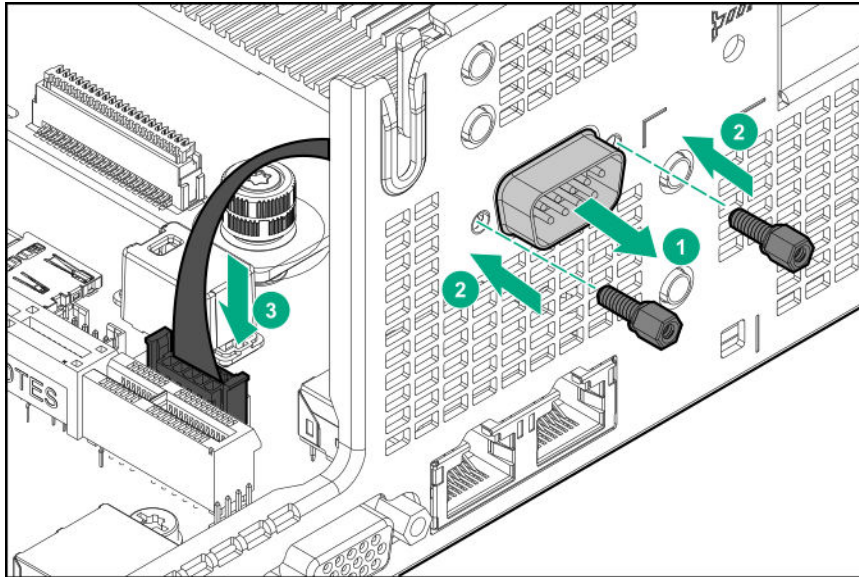
Before you perform this procedure, make sure that you have a hex nut screwdriver available.

Procedure

1. If installed, **remove the front bezel**.
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 serial port blank from rear panel.



6. Install the serial port:
 - a. Insert the serial port on the rear panel.
 - b. Install the screws.
 - c. Connect the serial port cable to the system board.



7. **Install the access panel.**
8. **Install the server into the rack.**
9. Connect all peripheral cables to the server.
10. Connect each power cord to the server.
11. Connect each power cord to the power source.
12. **Power up the server** on page 43.
13. If removed, **install the front bezel.**

The installation is complete.

Power supply option

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 (<http://www.hpe.com/info/poweradvisor/online>).

Installing the redundant power supply assembly

-
- ⚠ **CAUTION:** All power supplies installed in the server must have the same output power capacity. Verify that all power supplies have the same part number and label color. The system becomes unstable and might shut down when it detects different power supplies.
-
- ⚠ **CAUTION:** To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.
-
- ⚠ **WARNING:** To reduce the risk of personal injury from hot surfaces, allow the power supply or power supply blank to cool before touching it.
-

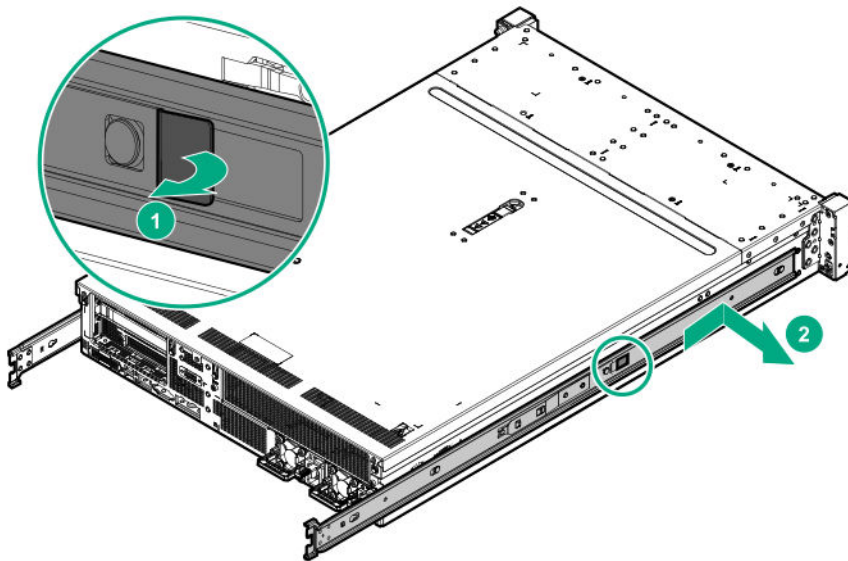
Prerequisites

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

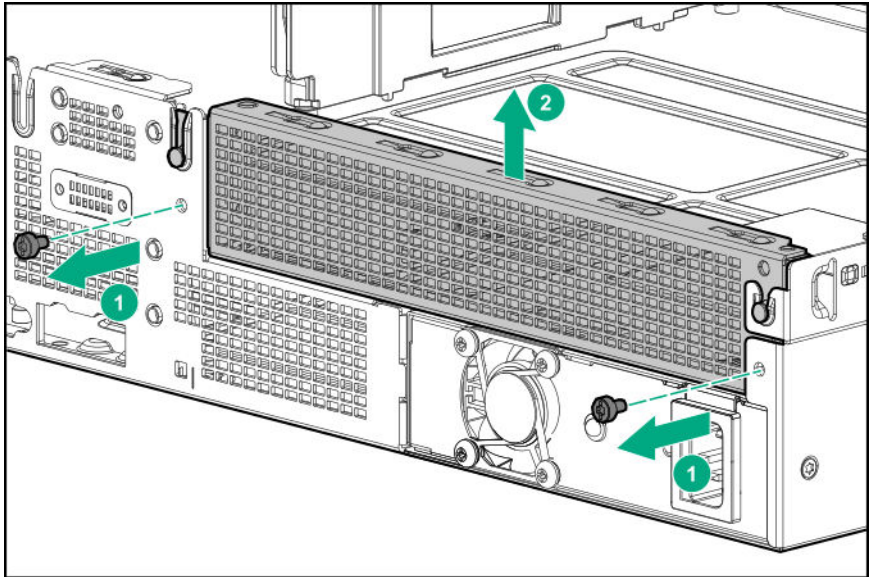
- T-10 Torx screwdriver
- T-15 Torx screwdriver

Procedure

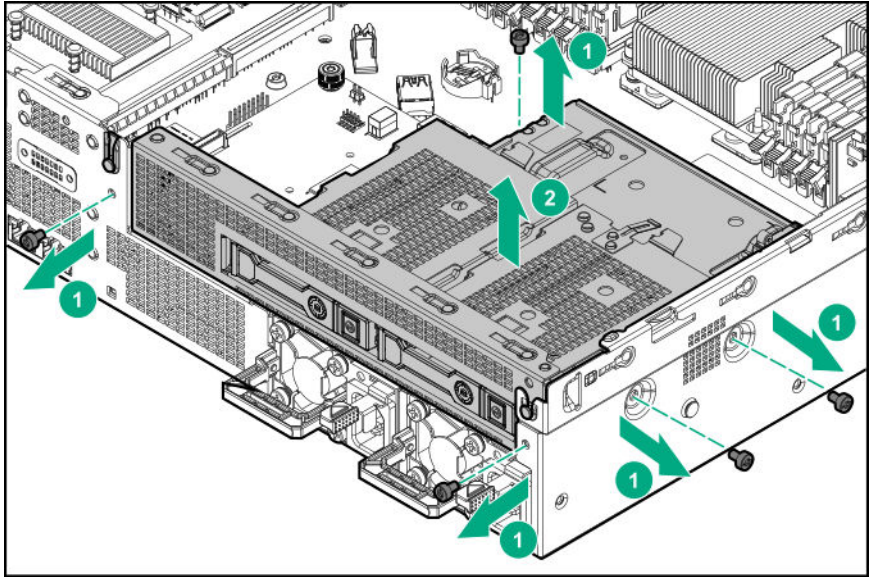
1. If installed, **remove the front bezel**.
2. **Power down the server**.
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Disconnect all peripheral cables from the server.
5. **Remove the server from the rack**.
6. Remove the left inner rail.



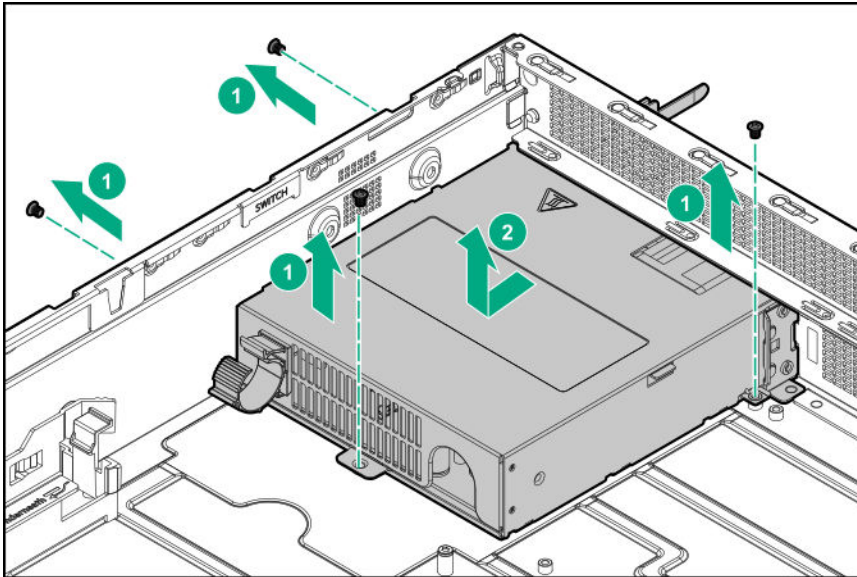
7. **Remove the access panel**.
8. **Remove the air baffle**.
9. If installed, remove one of the following items:
 - Secondary riser cage blank



- **Secondary riser cage**
- Rear 2-bay SFF drive cage

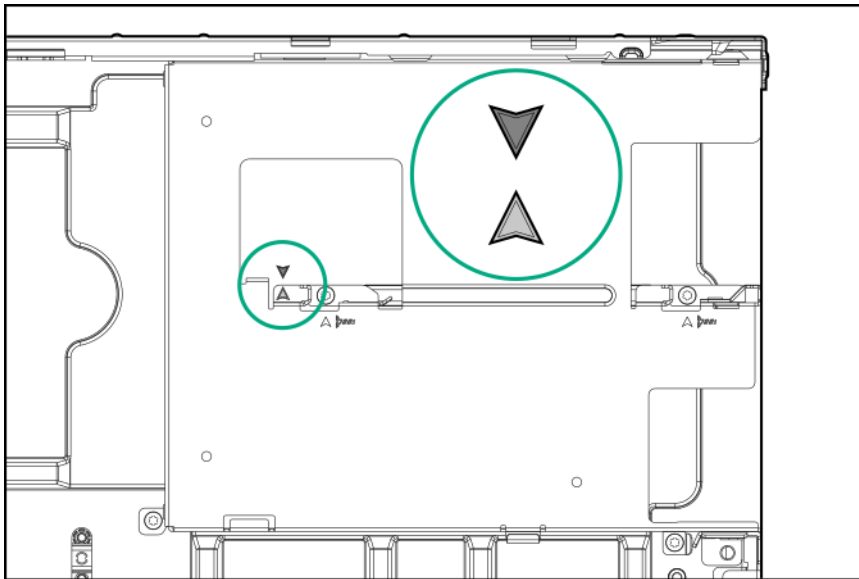


10. Remove the nonredundant power supply.

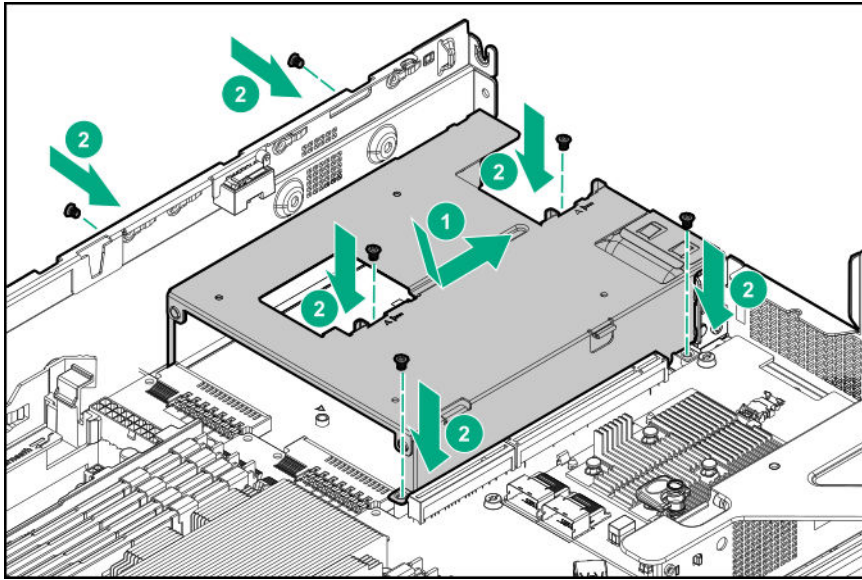


11. Install the power supply cage:

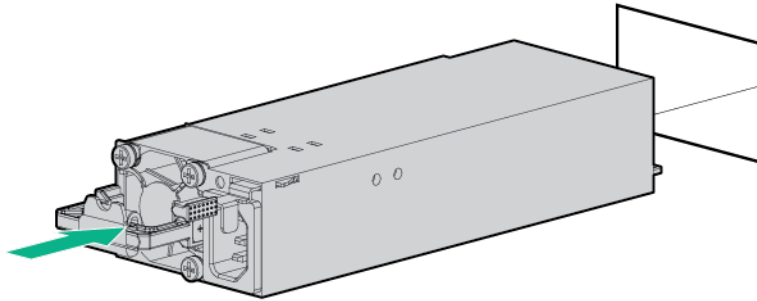
- a. Align the arrow on the power supply cage with the arrow on the chassis as shown in following illustration.



- b. Install the power supply cage.

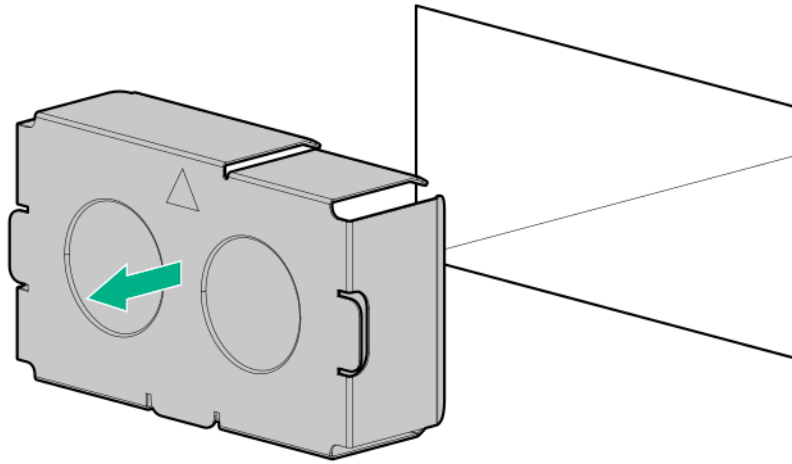


12. Install the power supply in bay 1.

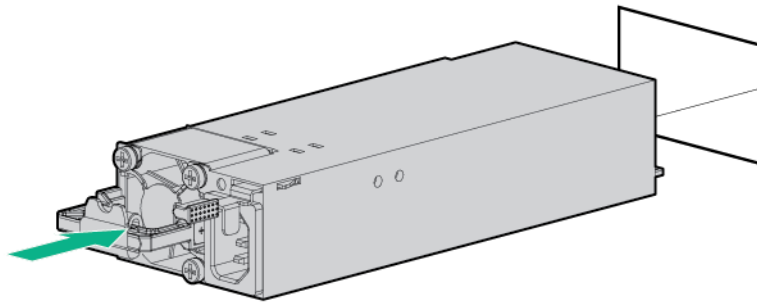


13. If enabling redundant power supply mode, do the following:

- a. Remove the power supply bay 2 blank.



b. Install the power supply in bay 2.



14. If removed, install one of the following items:

- Secondary riser cage blank
- **Secondary riser cage**
- **Rear 2-bay SFF SAS/SATA drive cage**

15. **Install the air baffle.**

16. **Install the access panel.**

17. **Install the server into the rack.**

18. Connect all peripheral cables to the server.

19. Connect each power cord to the server.

20. Connect each power cord to the power source.

21. **Power up the server** on page 43.

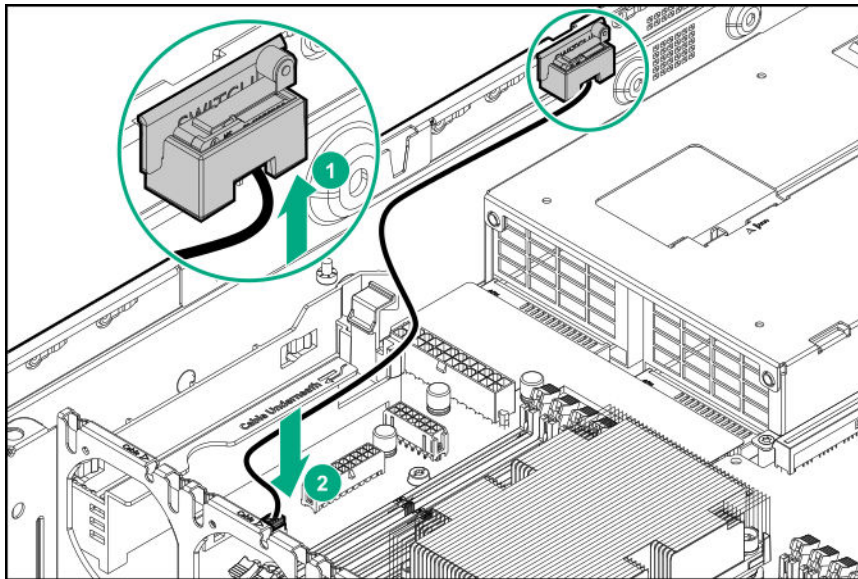
22. If removed, **install the front bezel.**

The installation is complete.

Installing the Chassis Intrusion Detection switch

Procedure

1. If installed, **remove the front bezel**.
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. If the full-length GPU is installed on the secondary riser cage, **remove the secondary riser cage**.
6. **Remove the air baffle**.
7. Attach the Chassis Intrusion Detection switch to the chassis, connect the cable to the system board, and then route the cable as shown in following illustration.



8. If removed, **install the secondary riser cage**.
9. **Install the air baffle**.
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. Connect each power cord to the power source.
15. **Power up the server** on page 43.
16. If removed, **install the front bezel**.

The installation is complete.

HPE Trusted Platform Module 2.0 Gen10 option

Overview

Use these instructions to install and enable an HPE TPM 2.0 Gen10 Kit in a supported server. This option is not supported on Gen9 and earlier servers.

This procedure includes three sections:

1. Installing the Trusted Platform Module board.
2. Enabling the Trusted Platform Module.
3. Retaining the recovery key/password.

HPE TPM 2.0 installation 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 (<http://www.hpe.com/info/qs>). For more information about Microsoft® Windows® BitLocker Drive Encryption feature, see the Microsoft website (<http://www.microsoft.com>).

⚠ CAUTION: If the TPM is removed from the original server and powered up on a different server, data stored in the TPM including keys will be erased.

❗ IMPORTANT: In UEFI Boot Mode, the HPE TPM 2.0 Gen10 Kit can be configured to operate as TPM 2.0 (default) or TPM 1.2 on a supported server. In Legacy Boot Mode, the configuration can be changed between TPM 1.2 and TPM 2.0, but only TPM 1.2 operation is supported.

HPE Trusted Platform Module 2.0 Guidelines

⚠ CAUTION: Always observe the guidelines in this document. Failure to follow these guidelines can cause hardware damage or halt data access.

Hewlett Packard Enterprise SPECIAL REMINDER: Before enabling TPM functionality on this system, you must ensure that your intended use of TPM complies with relevant local laws, regulations and policies, and approvals or licenses must be obtained if applicable.

For any compliance issues arising from your operation/usage of TPM which violates the above mentioned requirement, you shall bear all the liabilities wholly and solely. Hewlett Packard Enterprise will not be responsible for any related liabilities.

慧与特别提醒：在您启用系统中的TPM功能前，请务必确认您对TPM的使用遵守当地相关法律、法规及政策，并已事先获得所需的一切批准及许可（如适用），因您未获得相应的操作/使用许可而导致的违规问题，皆由您自行承担全部责任，与慧与无涉。

When installing or replacing a TPM, observe the following guidelines:

- Do not remove an installed TPM. Once installed, the TPM becomes a permanent part of the system board.
- When installing or replacing hardware, Hewlett Packard Enterprise service providers cannot enable the TPM or the encryption technology. For security reasons, only the customer can enable these features.

- When returning a system board for service replacement, do not remove the TPM from the system board. When requested, Hewlett Packard Enterprise Service provides a TPM with the spare system board.
- Any attempt to remove the cover of an installed TPM from the system board can damage the TPM cover, the TPM, and the system board.
- If the TPM is removed from the original server and powered up on a different server, data stored in the TPM including keys will be erased.
- When using BitLocker, always retain the recovery key/password. The recovery key/password is required to complete Recovery Mode after BitLocker detects a possible compromise of system integrity.
- Hewlett Packard Enterprise is not liable for blocked data access caused by improper TPM use. For operating instructions, see the TPM documentation or the encryption technology feature documentation provided by the operating system.


Installing and enabling the HPE TPM 2.0 Gen10 Kit

Installing the Trusted Platform Module board

Preparing the server for installation

Procedure


1. Observe the following warnings:

 **WARNING:** The front panel Power On/Standby button does not shut off system power. Portions of the power supply and some internal circuitry remain active until AC power is removed.

To reduce the risk of personal injury, electric shock, or damage to the equipment, remove power from the server:

For rack and tower servers, remove the power cord.

For server blades and compute modules, remove the server blade or compute module from the enclosure.

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

2. Update the system ROM.

Locate and download the latest ROM version from the [Hewlett Packard Enterprise Support Center website](#). Follow the instructions on the website to update the system ROM.

3. Power down the server (**Power down the server**).

4. Remove all power:

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

5. Do one of the following:

- Extend the server from the rack.
 - Remove the server from the rack.
6. Place the server on a flat, level work surface.
 7. **Remove the access panel.**
 8. Remove any components or cables that may prevent access to the TPM connector.
 9. Proceed to **Installing the TPM board and cover** on page 119.

Installing the TPM board and cover

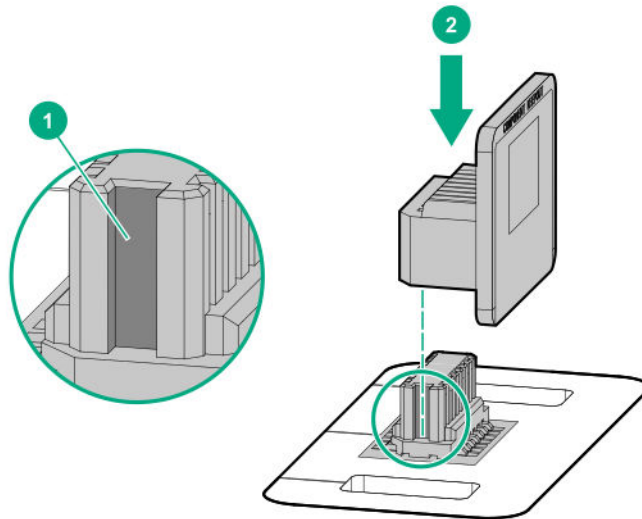
Procedure

1. Observe the following alerts:

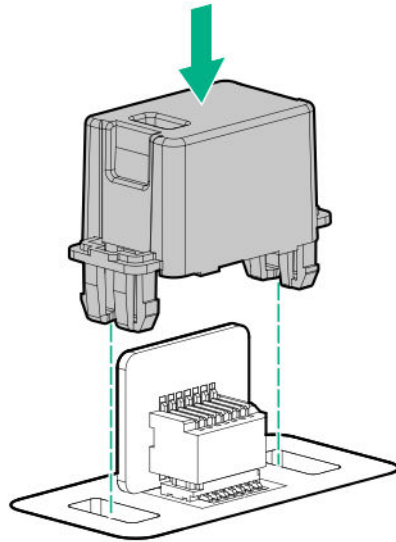
⚠ CAUTION: If the TPM is removed from the original server and powered up on a different server, data stored in the TPM including keys will be erased.

⚠ CAUTION: The TPM is keyed to install only in the orientation shown. Any attempt to install the TPM in a different orientation might result in damage to the TPM or system board.

2. Align the TPM board with the key on the connector, and then install the TPM board. To seat the board, press the TPM board firmly into the connector. To locate the TPM connector on the system board, see the server label on the access panel.



3. Install the TPM cover:
 - a. Line up the tabs on the cover with the openings on either side of the TPM connector.
 - b. To snap the cover into place, firmly press straight down on the middle of the cover.



4. Proceed to **Preparing the server for operation**.

Preparing the server for operation

Procedure

1. Install any options or cables previously removed to access the TPM connector.
2. **Install the access panel.**
3. **Install the server into the rack.**
4. Connect each power cord to the server.
5. Connect each power cord to the power source.
6. **Power up the server.**

Enabling the Trusted Platform Module

When enabling the Trusted Platform module, observe the following guidelines:

- By default, the Trusted Platform Module is enabled as TPM 2.0 when the server is powered on after installing it.
- In UEFI Boot Mode, the Trusted Platform Module can be configured to operate as TPM 2.0 or TPM 1.2.
- In Legacy Boot Mode, the Trusted Platform Module configuration can be changed between TPM 1.2 and TPM 2.0, but only TPM 1.2 operation is supported.

Enabling the Trusted Platform Module as TPM 2.0

Procedure

1. During the server startup sequence, press the **F9** key to access **System Utilities**.
2. From the System Utilities screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Trusted Platform Module options**.

3. Verify the following:
 - "Current TPM Type" is set to **TPM 2.0**.
 - "Current TPM State" is set to **Present and Enabled**.
 - "TPM Visibility" is set to **Visible**.
4. If changes were made in the previous step, press the **F10** key to save your selection.
5. If F10 was pressed in the previous step, do one of the following:
 - If in graphical mode, click **Yes**.
 - If in text mode, press the **Y** key.
6. Press the **ESC** key to exit System Utilities.
7. If changes were made and saved, the server prompts for reboot request. Press the **Enter** key to confirm reboot.

If the following actions were performed, the server reboots a second time without user input. During this reboot, the TPM setting becomes effective.

 - Changing from TPM 1.2 and TPM 2.0
 - Changing TPM bus from FIFO to CRB
 - Enabling or disabling TPM
 - Clearing the TPM
8. Enable TPM functionality in the OS, such as Microsoft Windows BitLocker or measured boot.

For more information, see the [Microsoft website](#).

Enabling the Trusted Platform Module as TPM 1.2

Procedure

1. During the server startup sequence, press the **F9** key to access **System Utilities**.
2. From the System Utilities screen select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Trusted Platform Module options**.
3. Change the "TPM Mode Switch Operation" to **TPM 1.2**.
4. Verify "TPM Visibility" is **Visible**.
5. Press the **F10** key to save your selection.
6. When prompted to save the change in System Utilities, do one of the following:
 - If in graphical mode, click **Yes**.
 - If in text mode, press the **Y** key.
7. Press the **ESC** key to exit System Utilities.

The server reboots a second time without user input. During this reboot, the TPM setting becomes effective.

8. Enable TPM functionality in the OS, such as Microsoft Windows BitLocker or measured boot.

For more information, see the [Microsoft website](#).

Retaining the recovery key/password

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

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

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

Cabling

Cabling guidelines

The cable colors in the cabling diagrams used in this chapter are for illustration purposes only. Most of the server cables are black.

Observe the following guidelines when working with server cables.

Before connecting cables

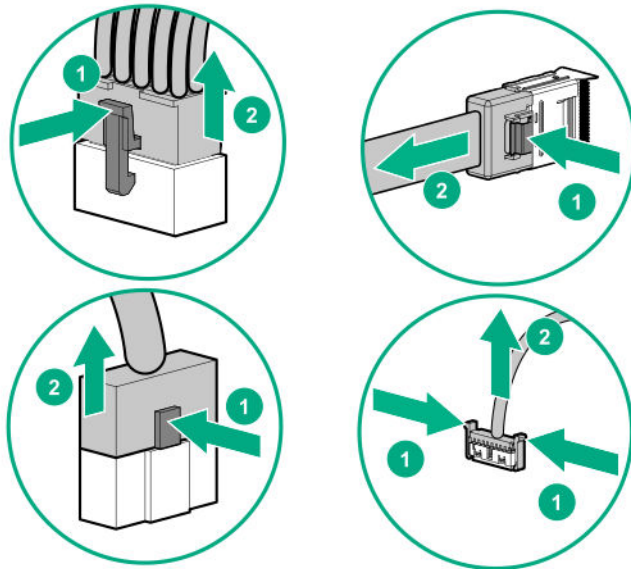
- Note the port labels on the PCA components. Not all of these components are used by all servers:
 - System board ports
 - Drive and power supply backplane ports
 - Expansion board ports (controllers, adapters, expanders, risers, and similar boards)
- Note the label near each cable connector. This label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

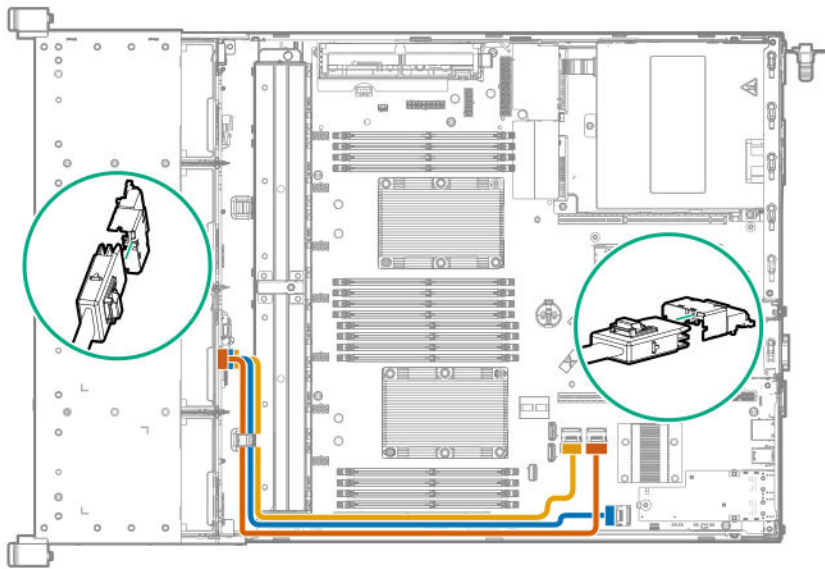
- Grip the body of the cable connector. Do not pull on the cable itself because this action can damage the internal wires of the cable or the pins on the port.
- If a cable does not disconnect easily, check for any release latch that must be pressed to disconnect the cable.



- 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.

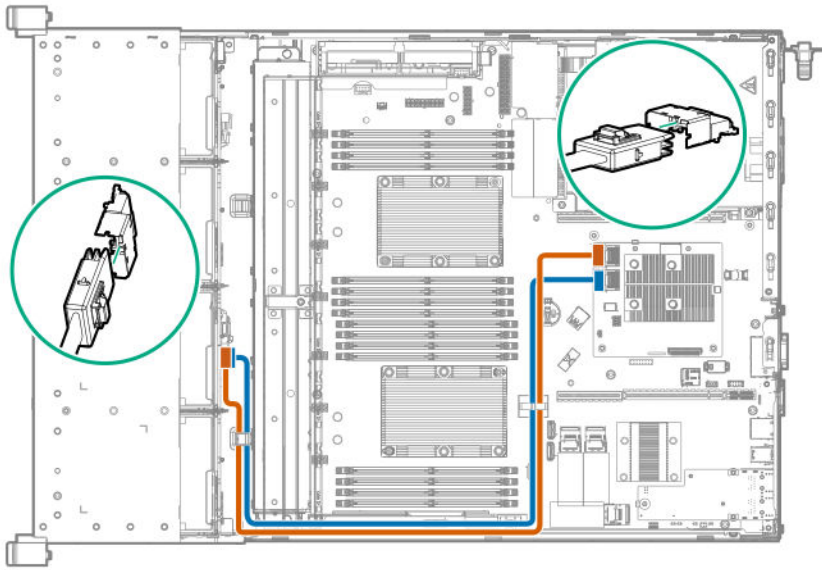
Cable routing: LFF drive model

LFF drive to system board



Color	Description
Orange	LFF box 1 to Mini-SAS port 1
Blue	LFF box 2 to Mini-SAS port 2
Yellow	LFF box 3 to Mini-SAS port 3

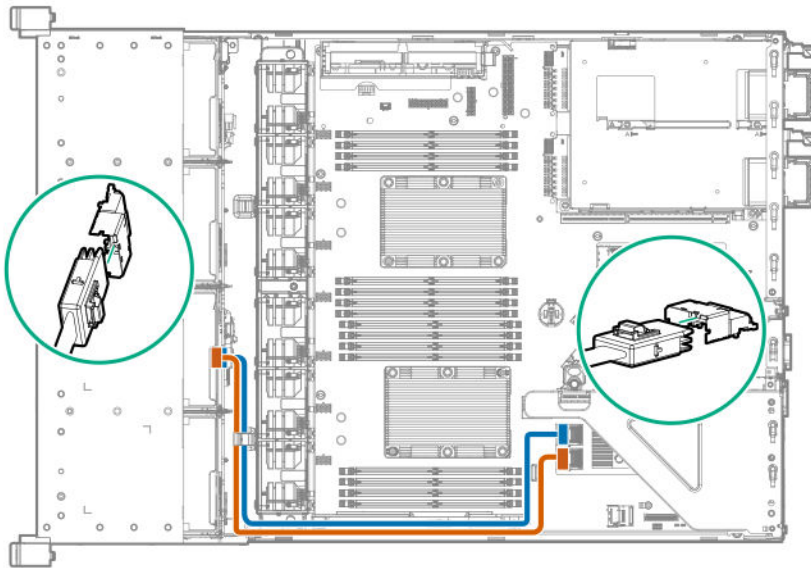
LFF drive to type-a controller



Color	Description
Orange	LFF box 2 to the controller port 1
Blue	LFF box 3 to the controller port 2

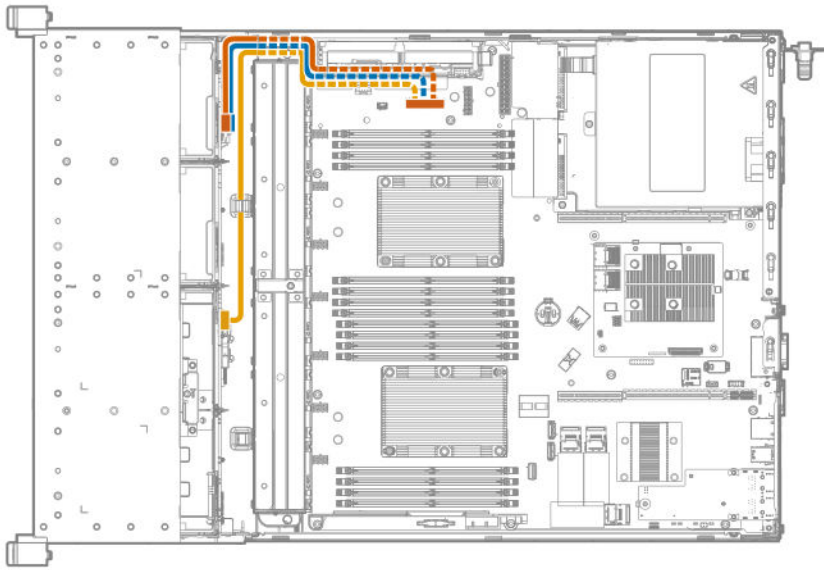
LFF drive to type-p controller

To support 12-bay LFF, the box 1 is connected to the port 1 of second controller.



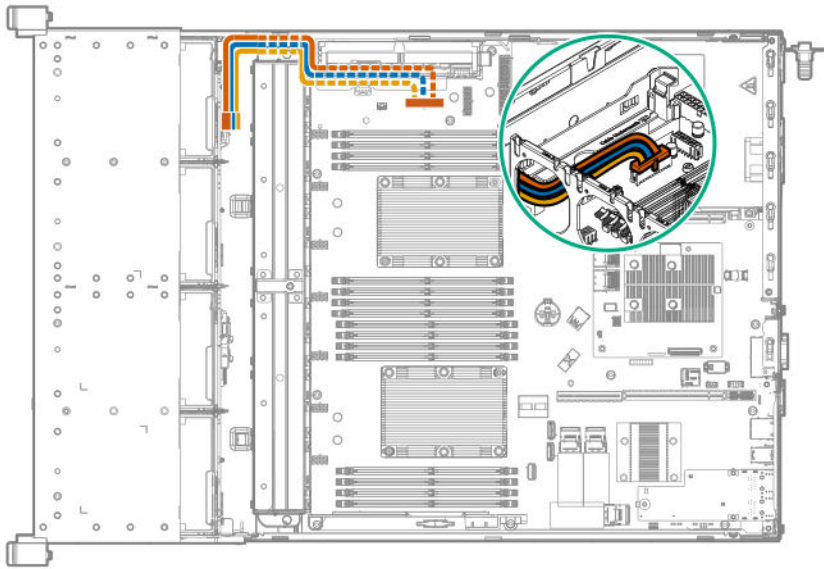
Color	Description
Orange	LFF box 2 to the first controller port 1
Blue	LFF box 3 to the first controller port 2

8-bay LFF and optical drive power cable



Color	Description
Orange	P2 power cable to LFF box 2
Blue	P3 power cable to LFF box 3
Yellow	P4 power cable to the optical drive

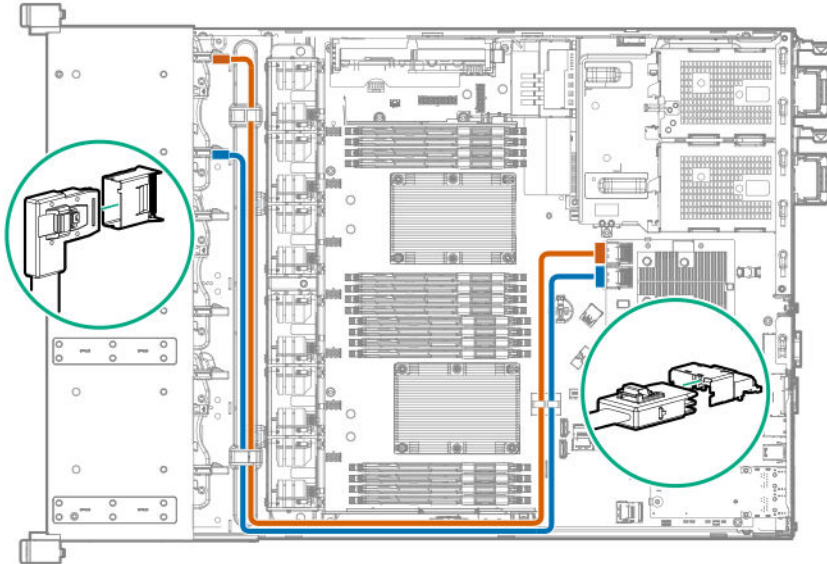
12-bay LFF power cable



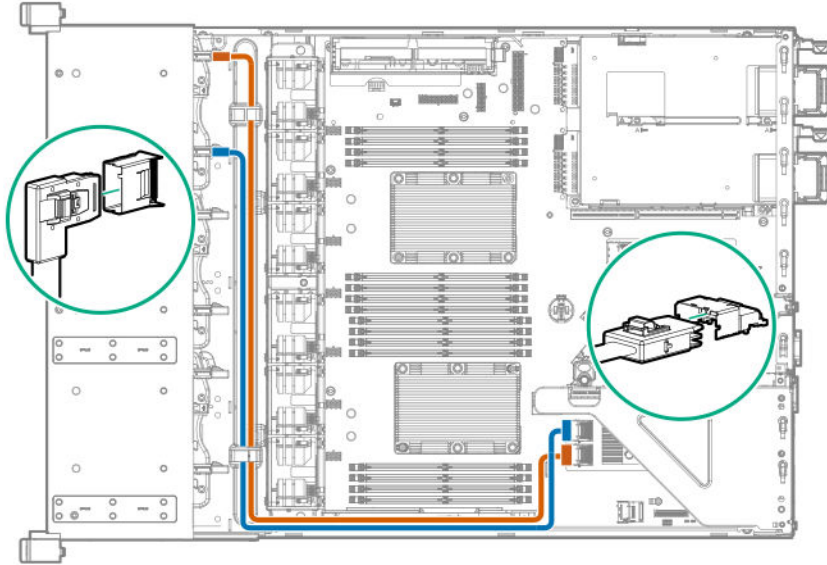
Color	Description
Orange	P2 power cable to LFF box 1
Blue	P3 power cable to LFF box 2
Yellow	P4 power cable to LFF box 3

Cable routing: SFF drive model

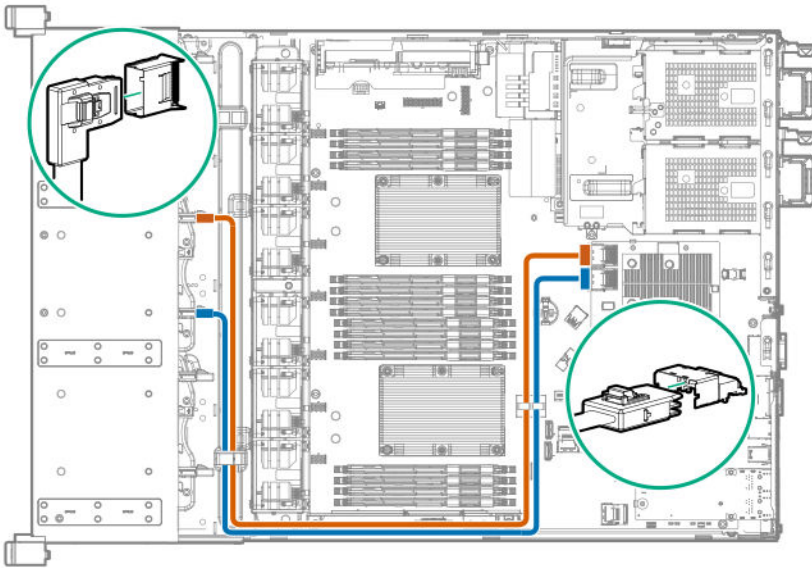
Box 1 to type-a controller



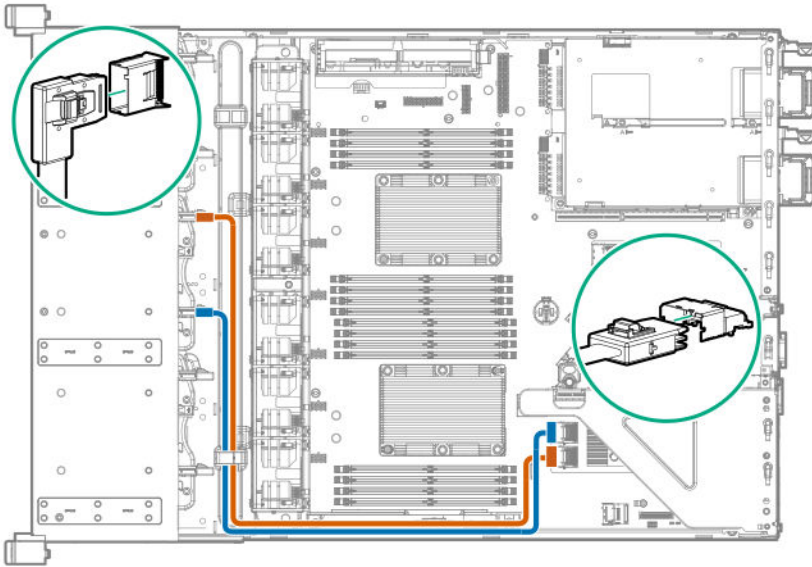
Box 1 to type-p controller



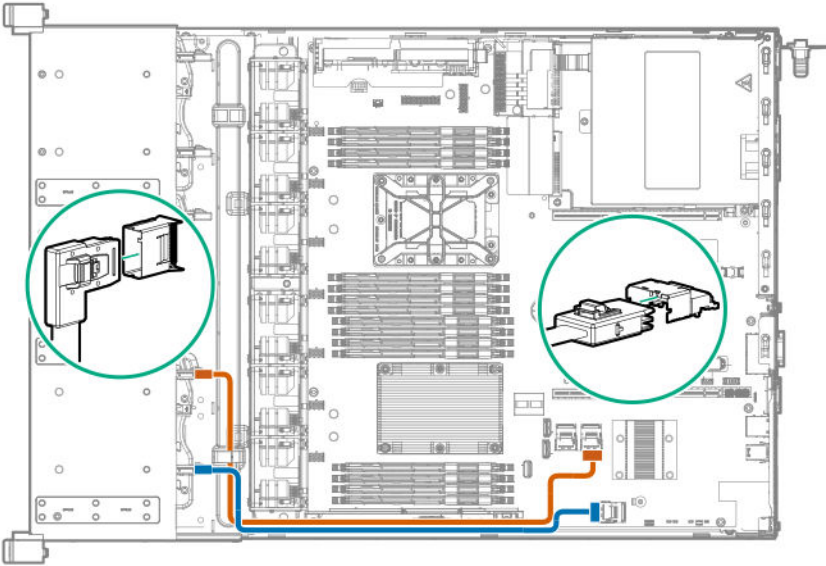
Box 2 to type-a controller



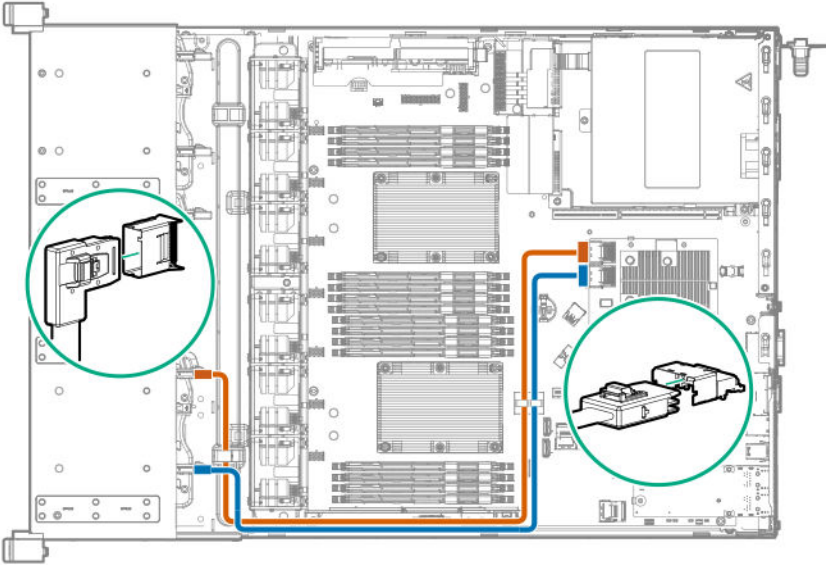
Box 2 to type-p controller



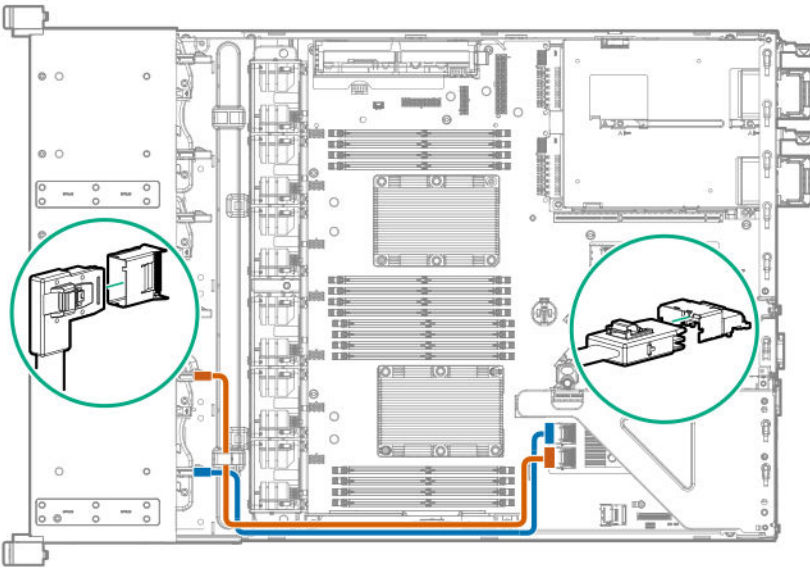
Box 3 to system board



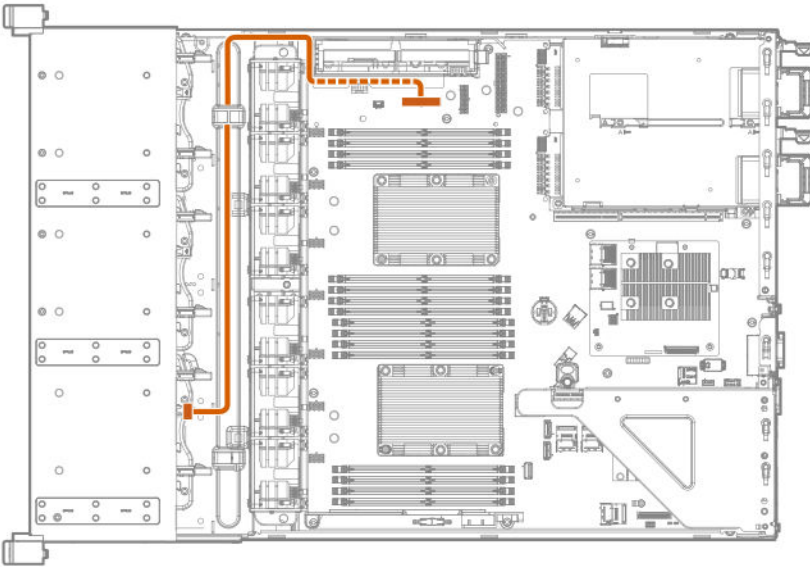
Box 3 to type-a controller



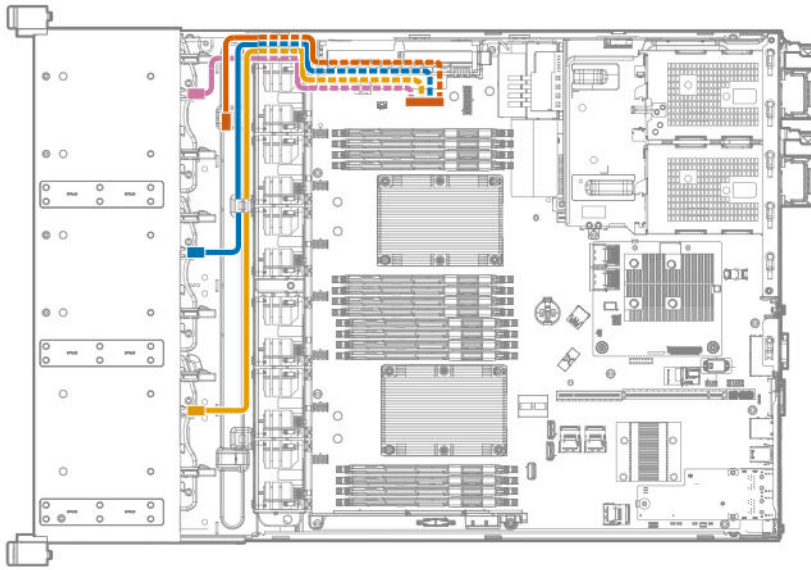
Box 3 to type-p controller



8-bay SFF power cable (default)



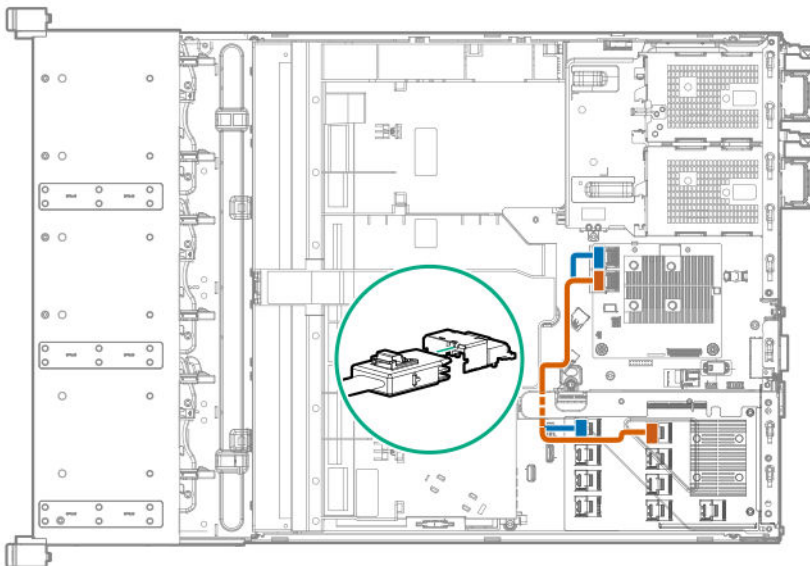
16-bay/24-bay SFF power cable



Color	Description
Pink	P2 power cable to SFF box 1 or two NVMe drives
Blue	P3 power cable to SFF box 2
Yellow	P4 power cable to SFF box 3
Orange	P5 power cable to optical drive

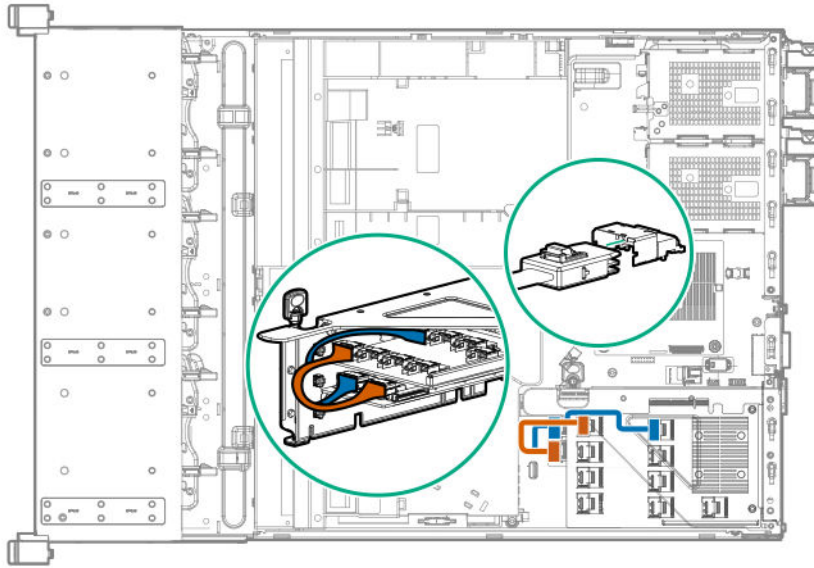
Cable routing: 12G SAS expander

- Type-a controller to SAS expander



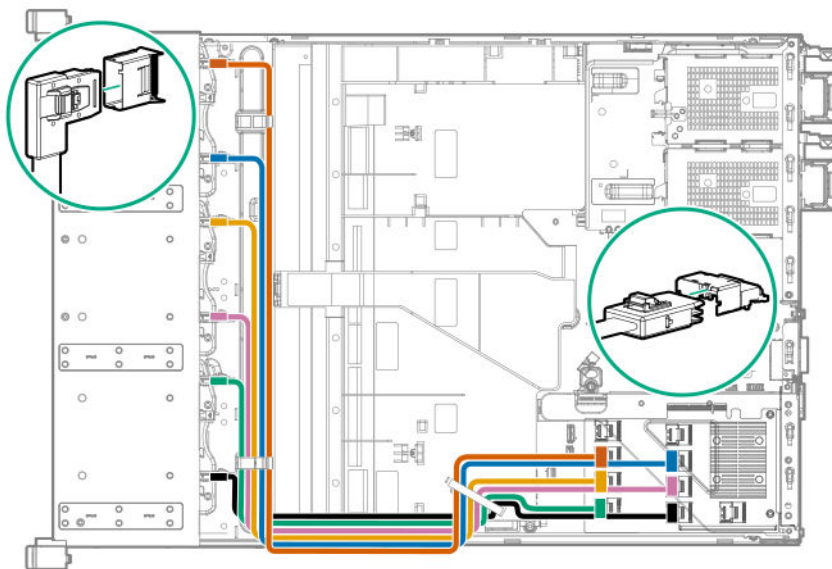
Color	Description
Blue	Type-a controller port 1 to 12G SAS expander port 1
Orange	Type-a controller port 2 to 12G SAS expander port 2

- Type-p controller to SAS expander



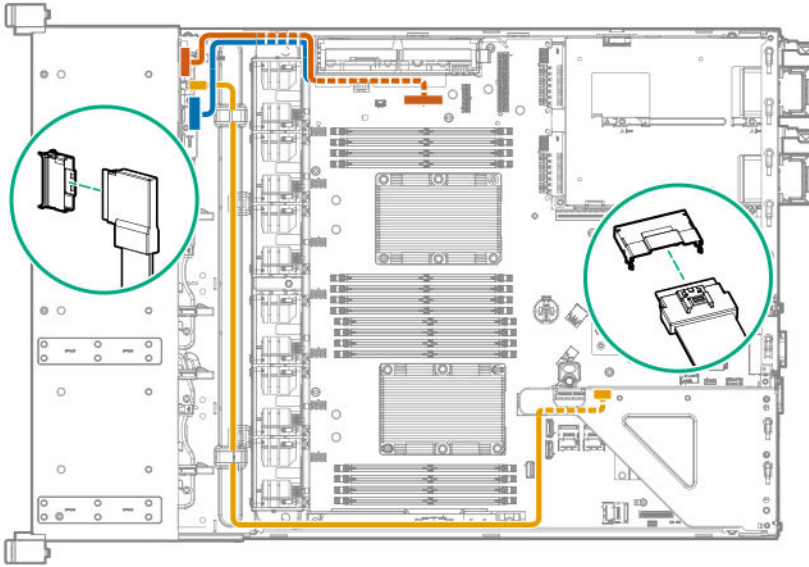
Color	Description
Orange	Type-p controller port 1 to 12G SAS expander port 1
Blue	Type-p controller port 2 to 12G SAS expander port 2

- SAS expander to SFF drives



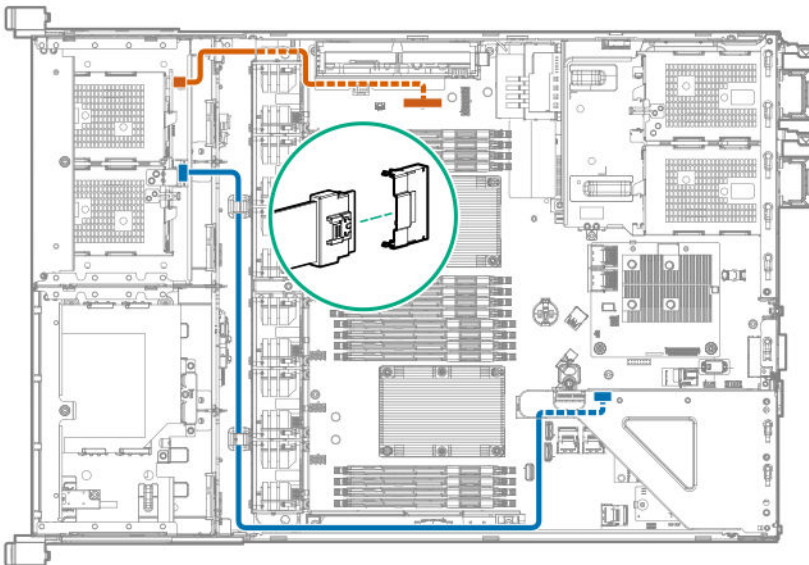
Color	Description
Orange and Blue	12G SAS expander ports 3 & 4 to SFF box 1 ports 1 & 2
Yellow and Pink	12G SAS expander ports 5 & 6 to SFF box 2 ports 1 & 2
Green and Black	12G SAS expander ports 7 & 8 to SFF box 3 ports 1 & 2

Cable routing: SFF NVMe and optical drive cage



Color	Description
Orange	P2 power cable to two NVMe drives
Blue	P5 power cable to the optical drive
Yellow	SFF NVMe drive signal cable to the primary NVMe and FlexibleLOM riser board

Cable routing: LFF NVMe drive cage

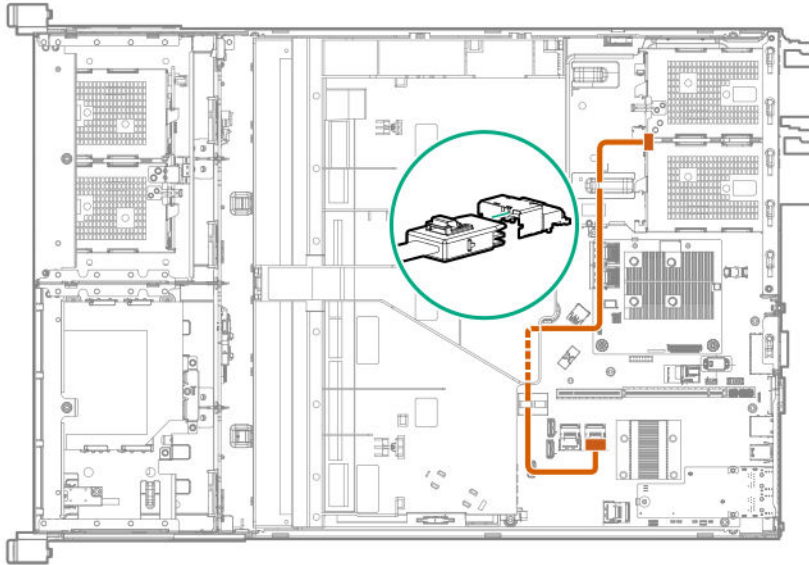


Color	Description
Orange	P2 power cable to two NVMe drives
Blue	LFF NVMe drive signal cable to the primary NVMe and FlexibleLOM riser board

Cable routing: Rear 2-bay SFF drive

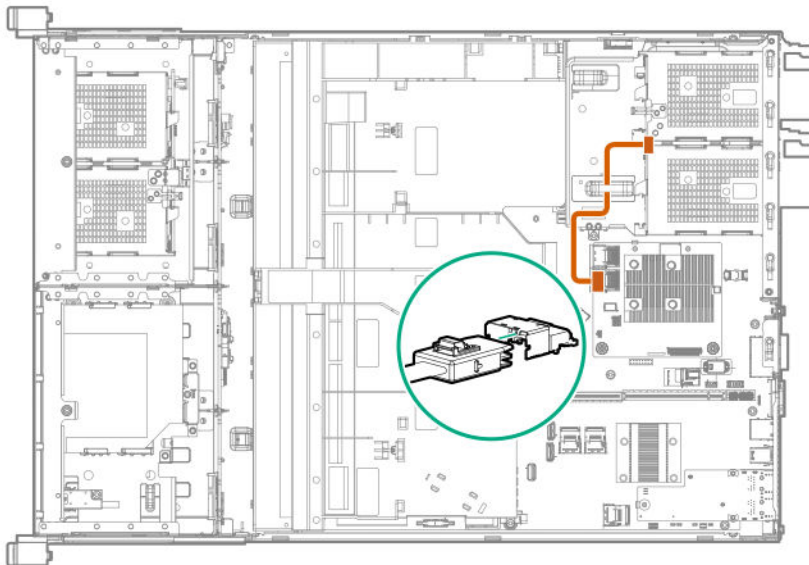
Mini-SAS cable to system board

You can connect the rear 2-bay SFF drive to all Mini-SAS ports, 1, 2, or 3.



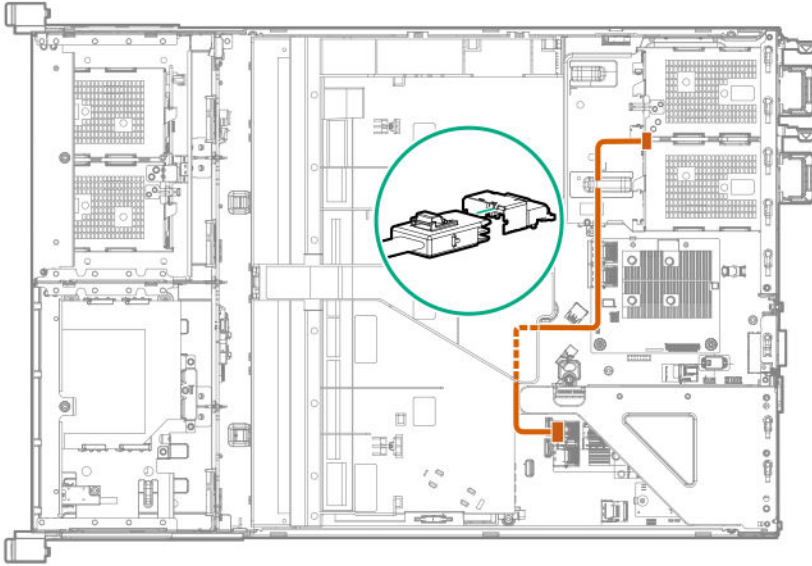
Mini-SAS cable to type-a controller

You can connect the rear 2-bay SFF drive to any port of a Smart Array controller.

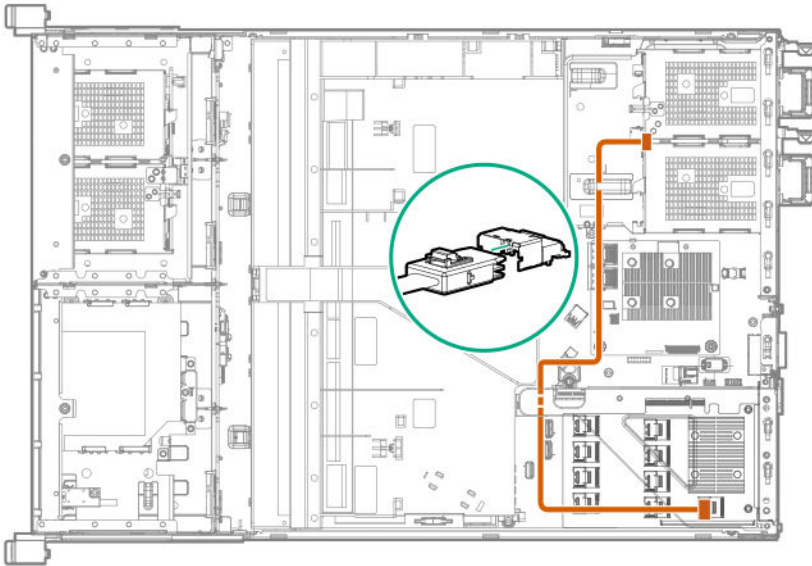


Mini-SAS cable to type-p controller

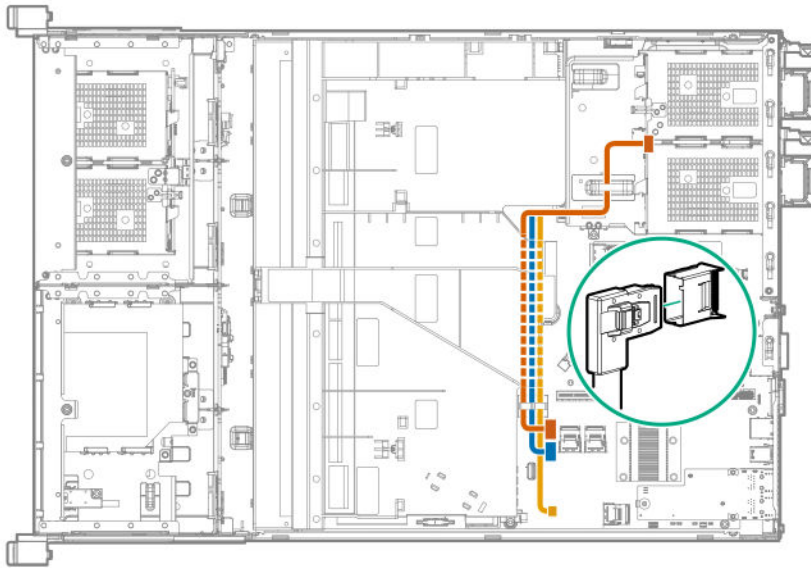
You can connect the rear 2-bay SFF drive to any port of a Smart Array controller.



Mini-SAS cable to SAS expander

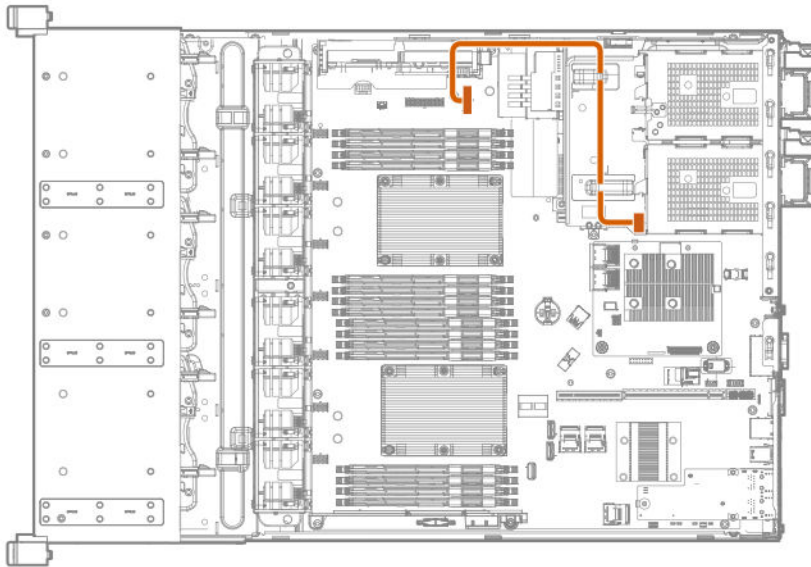


SATA cable to system board



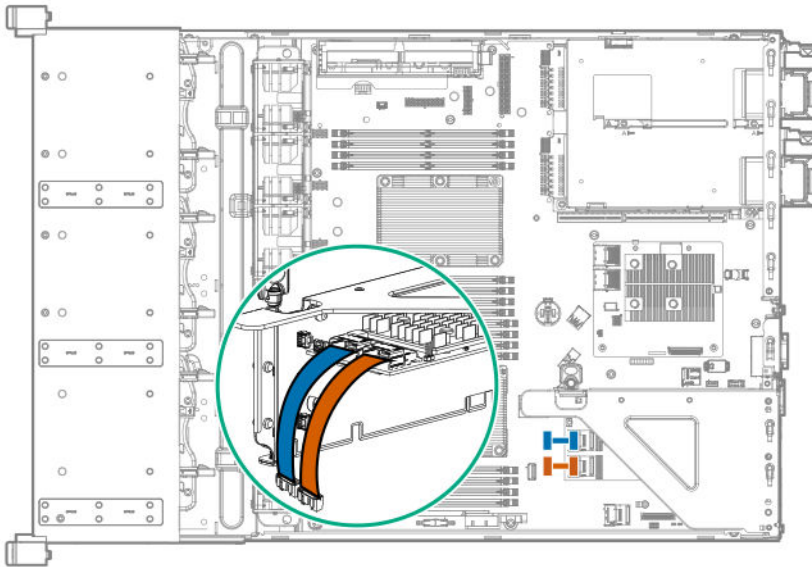
Color	Description
Orange	Rear 2-bay SFF drive backplane to SATA port 5
Blue	Rear 2-bay SFF drive backplane to SATA port 4
Yellow	Rear 2-bay SFF drive backplane to SATA management port

Rear 2-bay SFF power cable

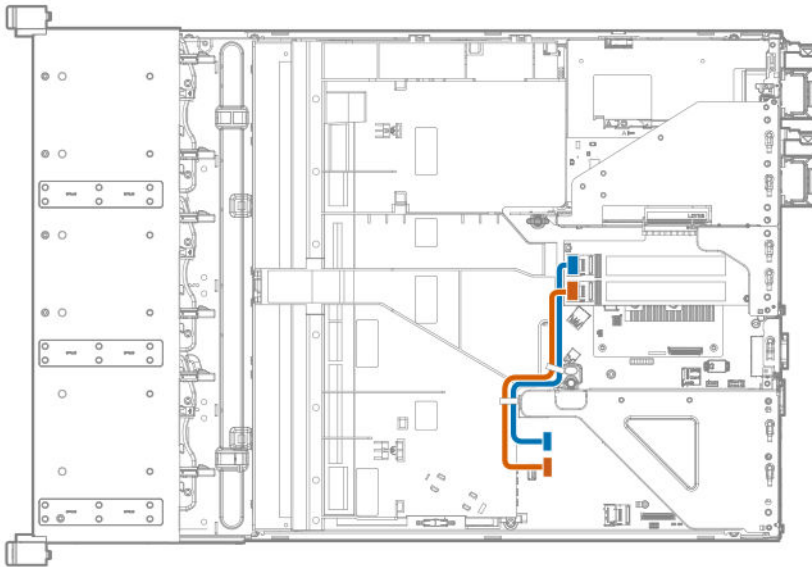


Cable routing: M.2 SSD

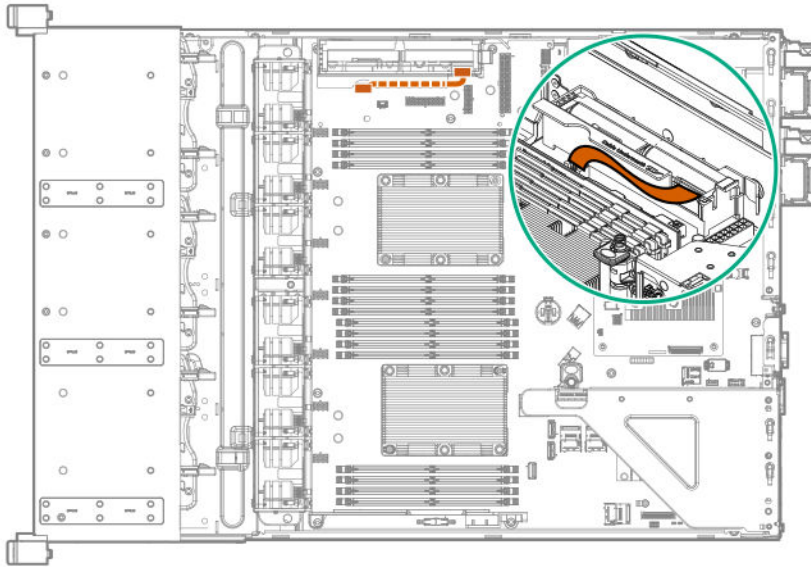
- M.2 SSD enablement board installed in primary riser



- M.2 SSD enablement board installed in secondary riser

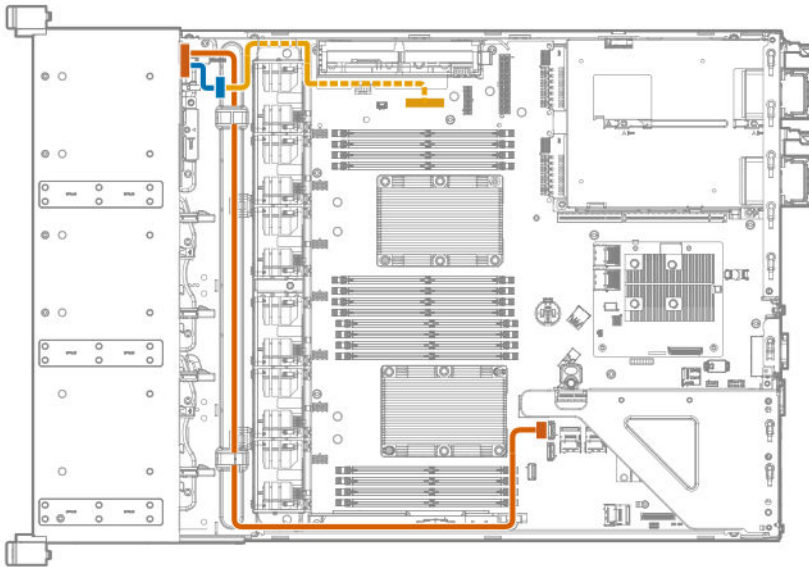


Cable routing: Smart Storage Battery



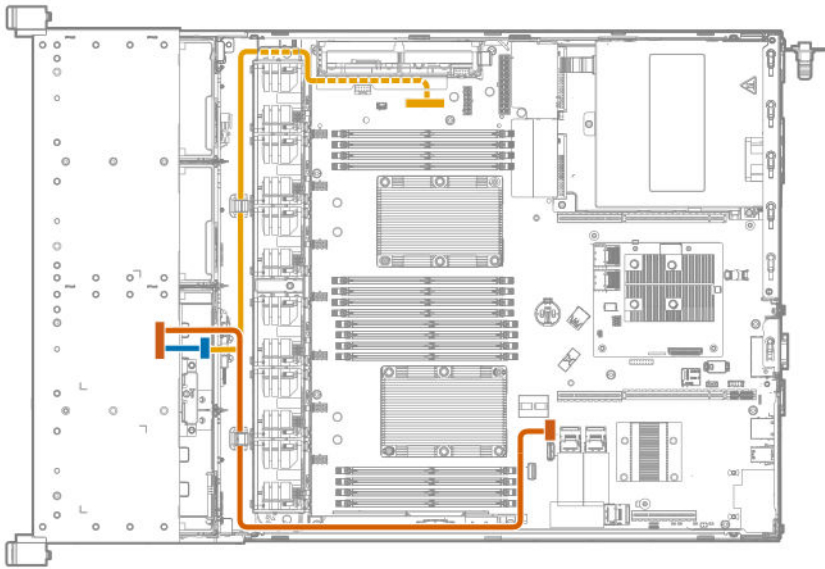
Cable routing: Optical drive

- SFF



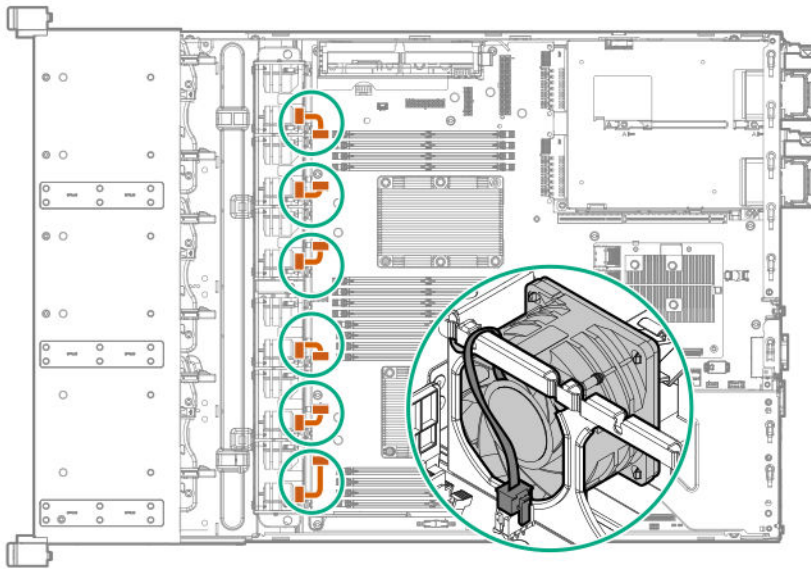
Color	Description
Orange	Optical drive signal cable to SATA port 5
Blue	Optical drive power cable
Yellow	Optical drive power cable

- LFF



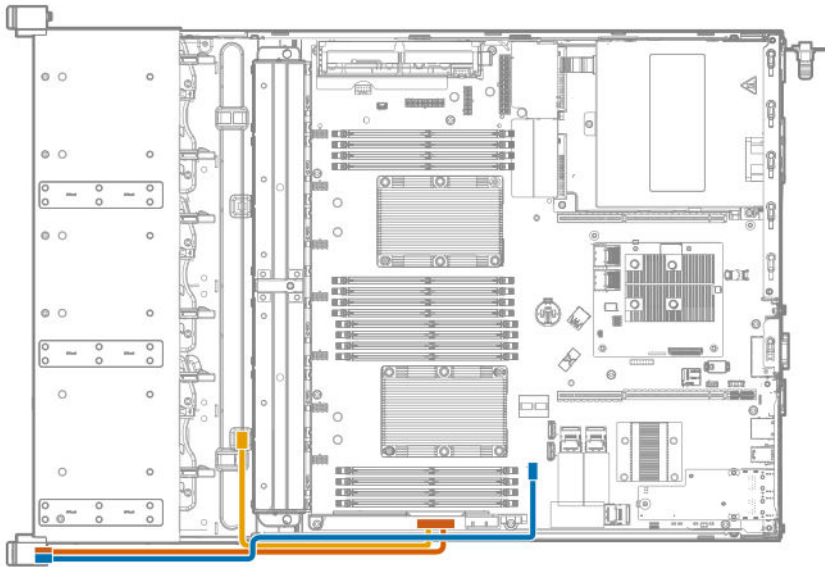
Color	Description
Orange	Optical drive signal cable to SATA port 5
Blue	Optical drive power cable
Yellow	Optical drive power cable

Cable routing: Fan



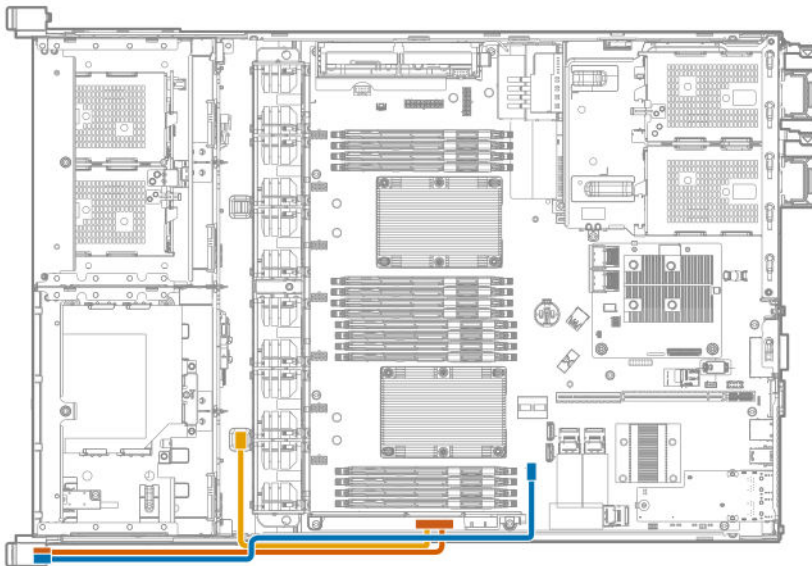
Cable routing: Front I/O

- SFF



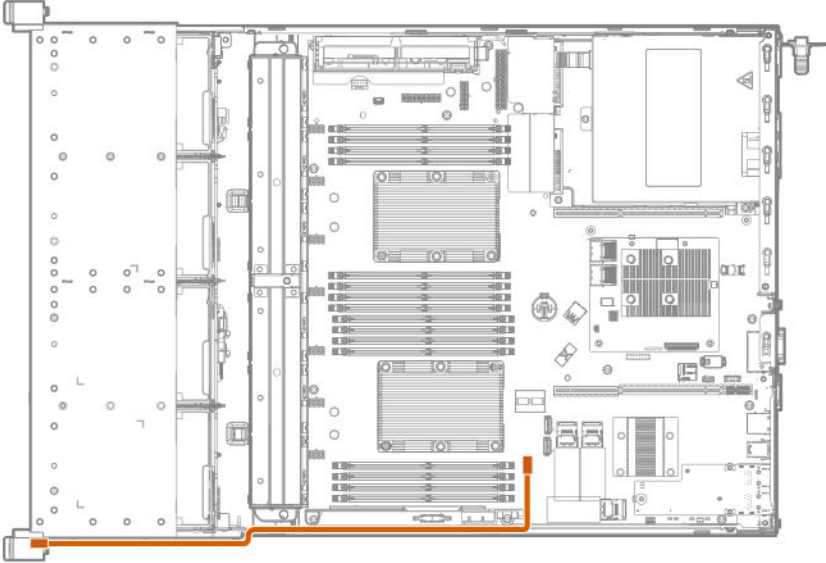
Color	Description
Orange	Front I/O cable
Blue	USB cable
Yellow	Thermal sensor cable

- LFF



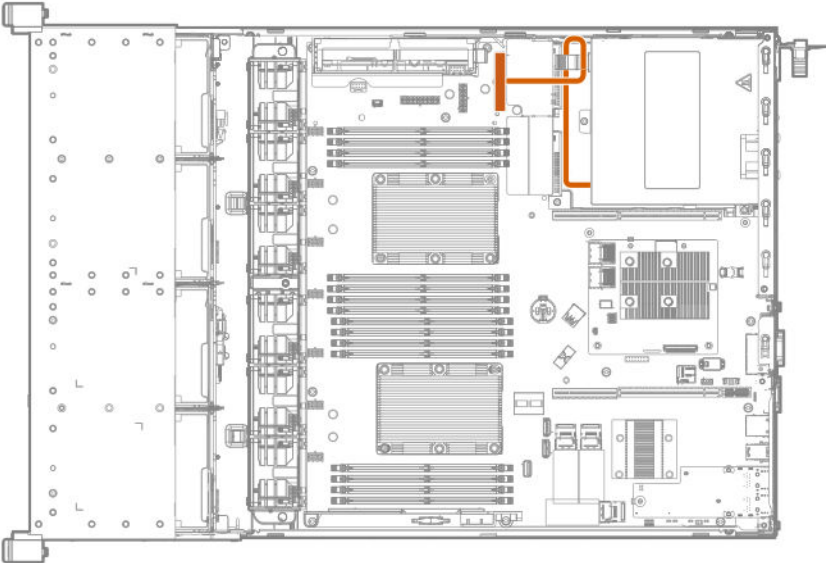
Color	Description
Orange	Front I/O cable
Blue	USB cable
Yellow	Thermal sensor cable

Cable routing: USB 3.0

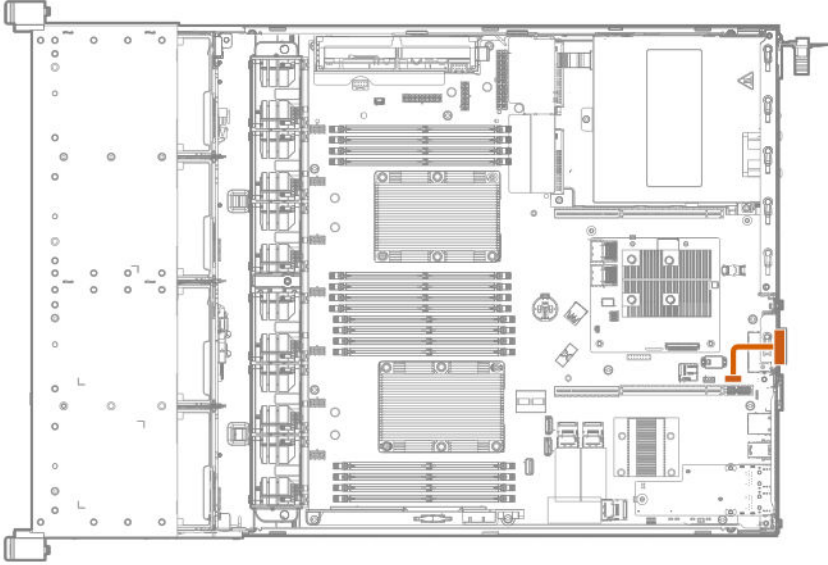


Cable routing: Power supply

HPE 500W power supply cabling (non-hot-plug)

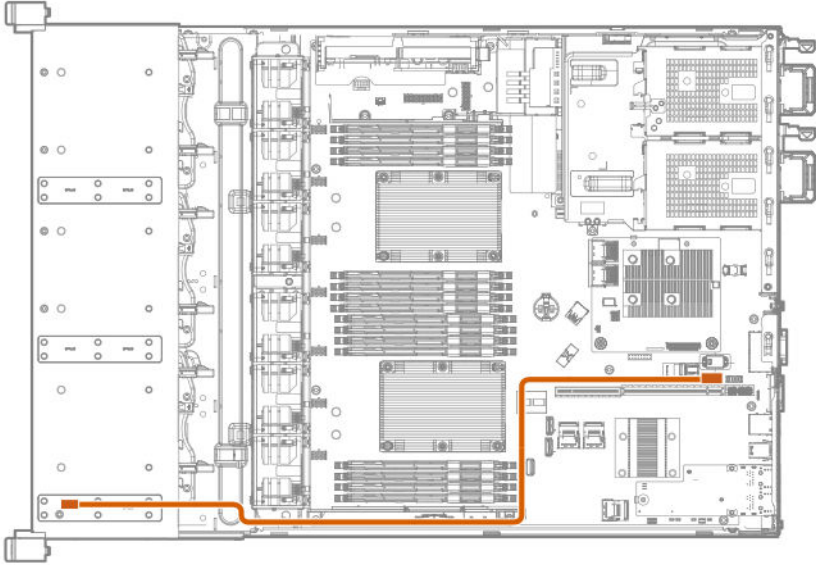


Cable routing: Serial port

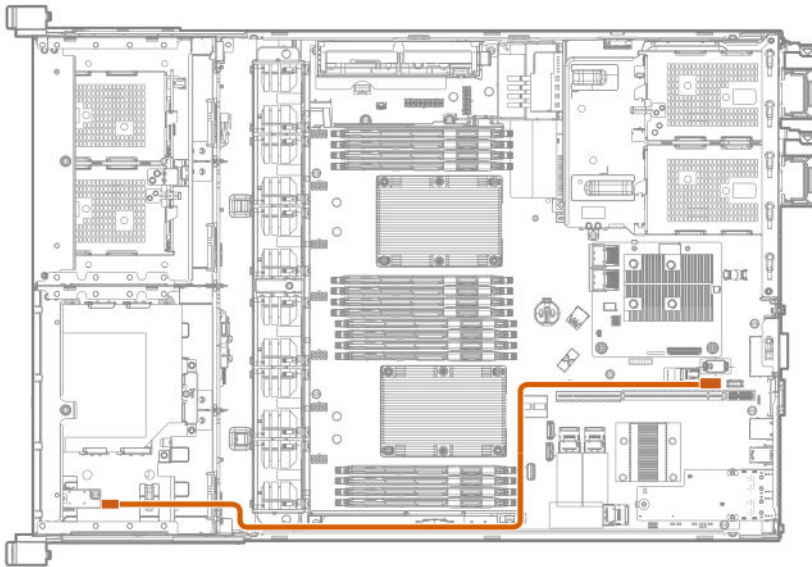


Cable routing: iLO Service Port

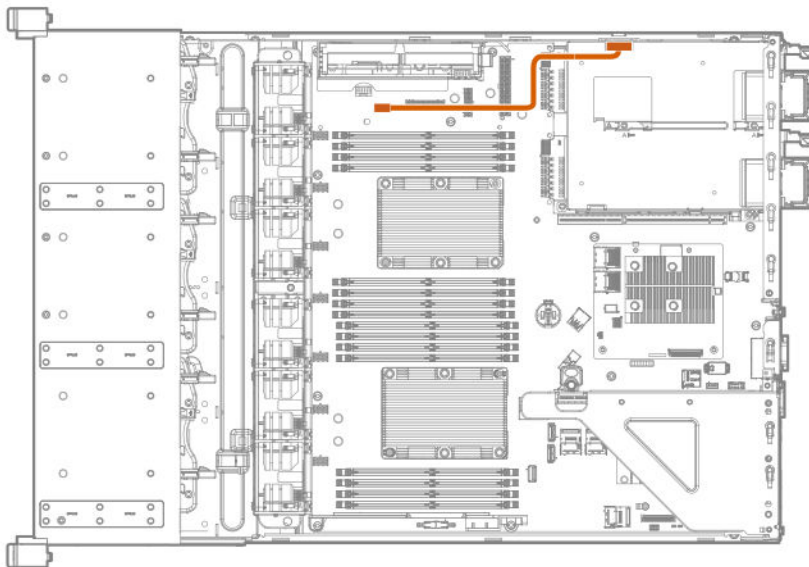
- SFF



- LFF

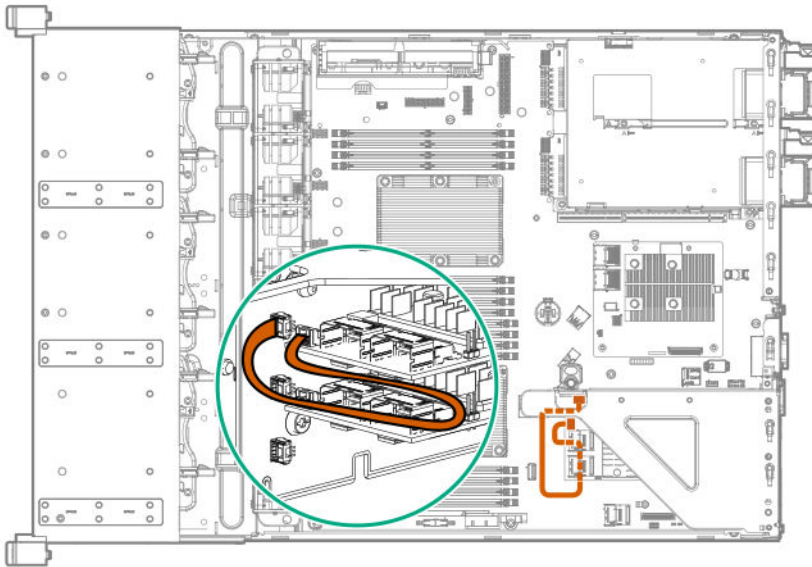


Cable routing: Chassis Intrusion Detection switch

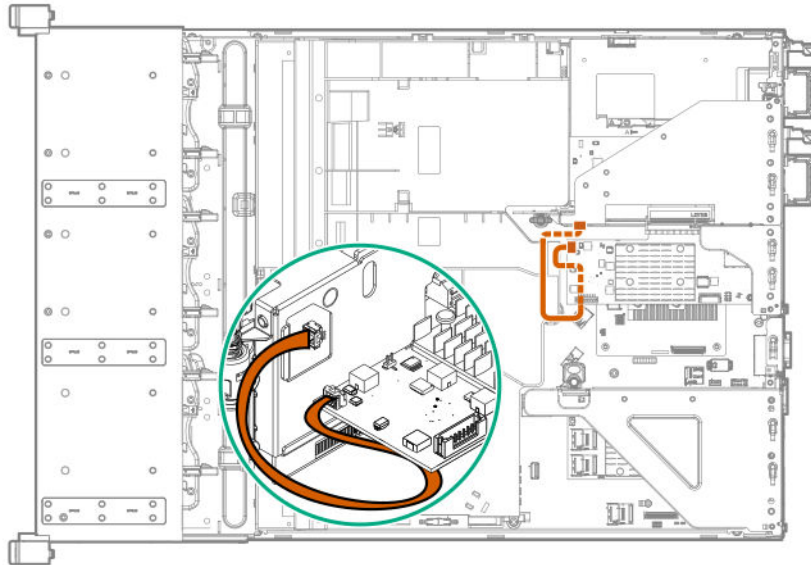


Cable routing: Controller backup power cable

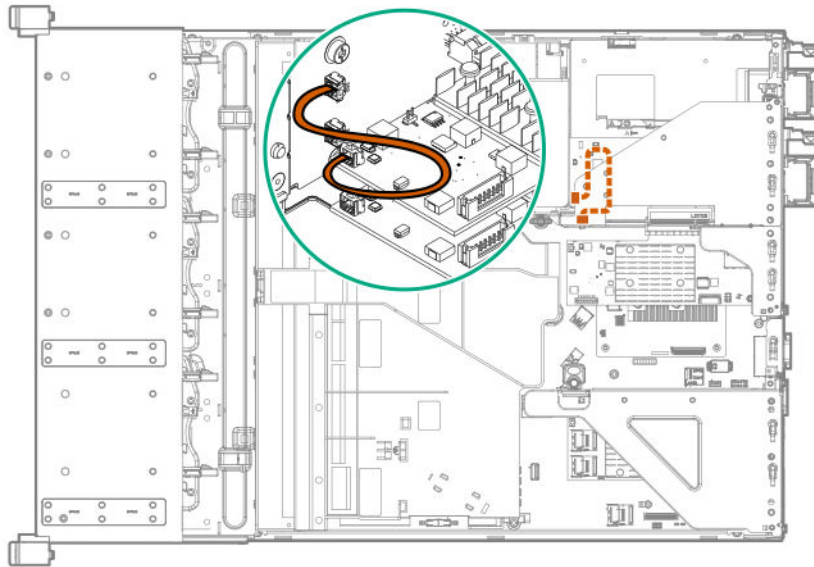
- Primary riser cage



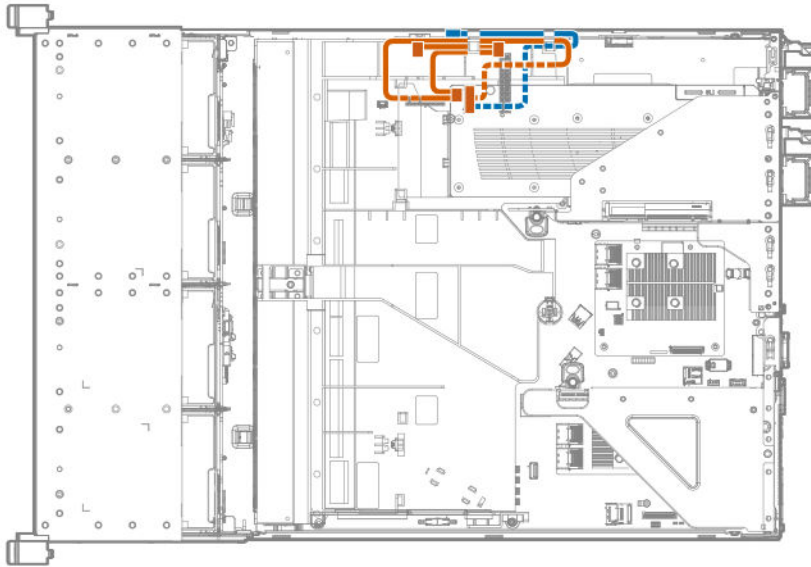
- Secondary riser cage
 - Slot 4



- Slot 5 or 6



Cable routing: GPU



Color	Description
Orange	GPU power cable
Blue	Rear 2-bay SFF power cable

Software and configuration utilities

Server mode

The software and configuration utilities presented in this section operate in online mode, offline mode, or in both modes.

Software or configuration utility	Server mode
Active Health System on page 146	Online and Offline
HPE iLO 5 on page 147	Online and Offline
HPE Smart Storage Administrator on page 153	Online and Offline
iLO RESTful API on page 149	Online and Offline
Intelligent Provisioning on page 149	Online and Offline
Scripting Toolkit for Windows and Linux on page 151	Online
Service Pack for ProLiant on page 155	Online and Offline
Smart Update Manager on page 155	Online and Offline
UEFI System Utilities on page 151	Offline

Product QuickSpecs

For more information about product features, specifications, options, configurations, and compatibility, see the product QuickSpecs on the Hewlett Packard Enterprise website (<http://www.hpe.com/info/qs>).

Active Health System Viewer

Active Health System Viewer (AHSV) is an online tool used to read, diagnose, and resolve server issues quickly using AHS uploaded data. AHSV provides Hewlett Packard Enterprise recommended repair actions based on experience and best practices. AHSV provides the ability to:

- Read server configuration information
- View Driver/Firmware inventory
- Review Event Logs
- Respond to Fault Detection Analytics alerts
- Open new and update existing support cases

Active Health System

The Active Health System monitors and records changes in the server hardware and system configuration.

The Active Health System provides:

- Continuous health monitoring of over 1600 system parameters
- Logging of all configuration changes
- Consolidated health and service alerts with precise time stamps
- Agentless monitoring that does not affect application performance

For more information about the Active Health System, see the iLO user guide at the following website: <http://www.hpe.com/support/ilo-docs>.

Active Health System data collection

The Active Health System does not collect information about your operations, finances, customers, employees, or partners.

Examples of information that is collected:

- Server model and serial number
- Processor model and speed
- Storage capacity and speed
- Memory capacity and speed
- Firmware/BIOS and driver versions and settings

The Active Health System does not parse or change OS data from third-party error event log activities (for example, content created or passed through the OS).

Active Health System Log

The data collected by the Active Health System is stored in the Active Health System Log. The data is logged securely, isolated from the operating system, and separate from customer data.

When the Active Health System Log is full, new data overwrites the oldest data in the log.

It takes less than 5 minutes to download the Active Health System Log and send it to a support professional to help you resolve an issue.

When you download and send Active Health System data to Hewlett Packard Enterprise, you agree to have the data used for analysis, technical resolution, and quality improvements. The data that is collected is managed according to the privacy statement, available at <http://www.hpe.com/info/privacy>.

HPE iLO 5

iLO 5 is a remote server management processor embedded on the system boards of HPE ProLiant servers and Synergy compute modules. iLO enables the monitoring and controlling of servers from remote locations. iLO management is a powerful tool that provides multiple ways to configure, update, monitor, and repair servers remotely. iLO (Standard) comes preconfigured on Hewlett Packard Enterprise servers without an additional cost or license.

Features that enhance server administrator productivity and additional new security features are licensed. For more information, see the iLO licensing guide at the following website: <http://www.hpe.com/support/ilo-docs>.

For more information about iLO, see the iLO user guide at the following website: <http://www.hpe.com/support/ilo-docs>.

iLO Federation

iLO Federation enables you to manage multiple servers from one system using the iLO web interface.

When configured for iLO Federation, iLO uses multicast discovery and peer-to-peer communication to enable communication between the systems in iLO Federation groups.

When you navigate to one of the iLO Federation pages, a data request is sent from the iLO system running the web interface to its peers, and from those peers to other peers until all data for the selected iLO Federation group is retrieved.

iLO supports the following features:

- Group health status—View server health and model information.
- Group Virtual Media—Connect URL-based media for access by a group of servers.
- Group power control—Manage the power status of a group of servers.
- Group power capping—Set dynamic power caps for a group of servers.
- Group firmware update—Update the firmware of a group of servers.
- Group license installation—Enter a license key to activate iLO licensed features on a group of servers.
- Group configuration—Add iLO Federation group memberships for multiple iLO systems.

Any user can view information on iLO Federation pages, but a license is required for using the following features: Group Virtual Media, Group power control, Group power capping, Group configuration, and Group firmware update.

For more information about iLO Federation, see the iLO user guide at the following website: <http://www.hpe.com/support/ilo-docs>.

iLO Service Port

To find out if your server model supports this feature, see the server specifications document at the following website: <http://www.hpe.com/info/qs>.

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

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

When you use this feature, the connected USB flash drive is not accessible by the host operating system.

When you use the iLO Service Port:

- Actions are logged in the iLO Event Log.
- The server UID flashes to indicate the Service Port status.
You can also retrieve the Service Port status by using a REST client and the iLO RESTful API.
- You cannot use the Service Port to boot any device within the server, or the server itself.
- You cannot access the server by connecting to the Service Port.
- You cannot access the connected device from the server.

For more information about the iLO Service Port, see the iLO user guide at the following website: <http://www.hpe.com/support/ilo-docs>.

iLO RESTful API

iLO includes the iLO RESTful API, which is Redfish API conformant. The iLO RESTful API is a management interface that server management tools can use to perform configuration, inventory, and monitoring tasks by sending basic HTTPS operations (GET, PUT, POST, DELETE, and PATCH) to the iLO web server.

To learn more about the iLO RESTful API, see the Hewlett Packard Enterprise website (<http://www.hpe.com/support/restfulinterface/docs>).

For specific information about automating tasks using the iLO RESTful API, see libraries and sample code at <http://www.hpe.com/info/redfish>.

RESTful Interface Tool

The RESTful Interface Tool (iLOREST) is a scripting tool that allows you to automate HPE server management tasks. It provides a set of simplified commands that take advantage of the iLO RESTful API. You can install the tool on your computer for remote use or install it locally on a server with a Windows or Linux Operating System. The RESTful Interface Tool offers an interactive mode, a scriptable mode, and a file-based mode similar to CONREP to help decrease automation times.

For more information, see the following website: <http://www.hpe.com/info/resttool>.

iLO Amplifier Pack

The iLO Amplifier Pack is an advanced server inventory, firmware and driver update solution that enables rapid discovery, detailed inventory reporting, firmware, and driver updates by leveraging iLO advanced functionality. The iLO Amplifier Pack performs rapid server discovery and inventory for thousands of supported servers for the purpose of updating firmware and drivers at scale.

For more information about iLO Amplifier Pack, see the *iLO Amplifier Pack User Guide* at the following website: <http://www.hpe.com/support/ilo-ap-ug-en>.

Integrated Management Log

The IML records hundreds of events and stores them in an easy-to-view form. The IML timestamps each event with one-minute granularity.

You can view recorded events in the IML in several ways, including the following:

- From within HPE SIM
- From within the UEFI System Utilities
- From within the Embedded UEFI shell
- From within the iLO web interface

Intelligent Provisioning

Intelligent Provisioning is a single-server deployment tool embedded in ProLiant servers and HPE Synergy compute modules. Intelligent Provisioning simplifies server setup, providing a reliable and consistent way to deploy servers.

Intelligent Provisioning prepares the system for installing original, licensed vendor media and Hewlett Packard Enterprise-branded versions of OS software. Intelligent Provisioning also prepares the system to integrate optimized server support software from the Service Pack for ProLiant (SPP). SPP is a comprehensive systems software and firmware solution for ProLiant servers, server blades, their enclosures, and HPE Synergy compute modules. These components are preloaded with a basic set of firmware and OS components that are installed along with Intelligent Provisioning.

-
- ❗ **IMPORTANT:** HPE ProLiant XL servers do not support operating system installation with Intelligent Provisioning, but they do support the maintenance features. For more information, see "Performing Maintenance" in the *Intelligent Provisioning User Guide* and online help.
-

After the server is running, you can update the firmware to install additional components. You can also update any components that have been outdated since the server was manufactured.

To access Intelligent Provisioning:

- Press **F10** from the POST screen.
- From the iLO web interface using **Always On**. **Always On** allows you to access Intelligent Provisioning without rebooting your server.

Intelligent Provisioning operation

Intelligent Provisioning includes the following components:

- Critical boot drivers
- Active Health System (AHS)
- Erase Utility
- Deployment Settings

❗ **IMPORTANT:**

- Although your server is pre-loaded with firmware and drivers, you should update the firmware upon initial setup to ensure you have the latest versions. Also, downloading and updating the latest version of Intelligent Provisioning ensures the latest supported features are available.
 - For ProLiant servers, firmware is updated using the Intelligent Provisioning Firmware Update utility.
 - Do not update firmware if the version you are currently running is required for compatibility.
-

NOTE: Intelligent Provisioning does not function within multihomed configurations. A multihomed host is one that is connected to two or more networks or has two or more IP addresses.

Intelligent Provisioning provides installation help for the following operating systems:

- Microsoft Windows Server
- Red Hat Enterprise Linux
- SUSE Linux Enterprise Server
- VMware ESXi/vSphere Custom Image

Not all versions of an OS are supported. For information about specific versions of a supported operating system, see the OS Support Matrix on the Hewlett Packard Enterprise website (<http://www.hpe.com/info/ossupport>).

Management Security

HPE ProLiant Gen10 servers are built with some of the industry's most advanced security capabilities, out of the box, with a foundation of secure embedded management applications and firmware. The

management security provided by HPE embedded management products enables secure support of modern workloads, protecting your components from unauthorized access and unapproved use. The range of embedded management and optional software and firmware available with the iLO Advanced and iLO Advanced Premium Security Edition licenses provides security features that help ensure protection, detection, and recovery from advanced cyber-attacks. For more information, see the *HPE Gen10 Server Security Reference Guide* on the Hewlett Packard Enterprise Information Library at <http://www.hpe.com/support/gen10-security-ref-en>.

For information about the iLO Advanced Premium Security Edition license, see <http://www.hpe.com/servers/ilopremium>.

Scripting Toolkit for Windows and Linux

The STK for Windows and Linux is a server deployment product that delivers an unattended automated installation for high-volume server deployments. The STK is designed to support ProLiant servers. The toolkit includes a modular set of utilities and important documentation that describes how to apply these tools to build an automated server deployment process.

The STK provides a flexible way to create standard server configuration scripts. These scripts are used to automate many of the manual steps in the server configuration process. This automated server configuration process cuts time from each deployment, making it possible to scale rapid, high-volume server deployments.

For more information or to download the STK, see the [Hewlett Packard Enterprise website](#).

UEFI System Utilities

The UEFI System Utilities is embedded in the system ROM. Its features enable you to perform a wide range of configuration activities, including:

- Configuring system devices and installed options.
- Enabling and disabling system features.
- Displaying system information.
- Selecting the primary boot controller or partition.
- Configuring memory options.
- Launching other preboot environments.

HPE servers with UEFI can provide:

- Support for boot partitions larger than 2.2 TB. Such configurations could previously only be used for boot drives when using RAID solutions.
- Secure Boot that enables the system firmware, option card firmware, operating systems, and software collaborate to enhance platform security.
- UEFI Graphical User Interface (GUI)
- An Embedded UEFI Shell that provides a preboot environment for running scripts and tools.
- Boot support for option cards that only support a UEFI option ROM.

Selecting the boot mode

This server provides two **Boot Mode** configurations: UEFI Mode and Legacy BIOS Mode. Certain boot options require that you select a specific boot mode. By default, the boot mode is set to **UEFI Mode**. The system must boot in **UEFI Mode** to use certain options, including:

- Secure Boot, UEFI Optimized Boot, Generic USB Boot, IPv6 PXE Boot, iSCSI Boot, and Boot from URL
- Fibre Channel/FCoE Scan Policy

NOTE: The boot mode you use must match the operating system installation. If not, changing the boot mode can impact the ability of the server to boot to the installed operating system.

Prerequisite

When booting to **UEFI Mode**, leave **UEFI Optimized Boot** enabled.

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Boot Options > Boot Mode**.
2. Select a setting.
 - **UEFI Mode** (default)—Configures the system to boot to a UEFI compatible operating system.
 - **Legacy BIOS Mode**—Configures the system to boot to a traditional operating system in Legacy BIOS compatibility mode.
3. Save your setting.
4. Reboot the server.

Secure Boot

Secure Boot is a server security feature that is implemented in the BIOS and does not require special hardware. Secure Boot ensures that each component launched during the boot process is digitally signed and that the signature is validated against a set of trusted certificates embedded in the UEFI BIOS. Secure Boot validates the software identity of the following components in the boot process:

- UEFI drivers loaded from PCIe cards
- UEFI drivers loaded from mass storage devices
- Preboot UEFI Shell applications
- OS UEFI boot loaders

When Secure Boot is enabled:

- Firmware components and operating systems with boot loaders must have an appropriate digital signature to execute during the boot process.
- Operating systems must support Secure Boot and have an EFI boot loader signed with one of the authorized keys to boot. For more information about supported operating systems, see <http://www.hpe.com/servers/ossupport>.

You can customize the certificates embedded in the UEFI BIOS by adding or removing your own certificates, either from a management console directly attached to the server, or by remotely connecting to the server using the iLO Remote Console.

You can configure Secure Boot:

- Using the **System Utilities** options described in the following sections.
- Using the iLO RESTful API to clear and restore certificates. For more information, see the Hewlett Packard Enterprise website (<http://www.hpe.com/info/redfish>).
- Using the `secboot` command in the Embedded UEFI Shell to display Secure Boot databases, keys, and security reports.

Launching the Embedded UEFI Shell

Use the **Embedded UEFI Shell** option to launch the Embedded UEFI Shell. The Embedded UEFI Shell is a preboot command-line environment for scripting and running UEFI applications, including UEFI boot loaders. The Shell also provides CLI-based commands you can use to obtain system information, and to configure and update the system BIOS.

Prerequisites

Embedded UEFI Shell is set to **Enabled**.

Procedure

1. From the **System Utilities** screen, select **Embedded Applications > Embedded UEFI Shell**.

The **Embedded UEFI Shell** screen appears.

2. Press any key to acknowledge that you are physically present.

This step ensures that certain features, such as disabling **Secure Boot** or managing the **Secure Boot** certificates using third-party UEFI tools, are not restricted.

3. If an administrator password is set, enter it at the prompt and press **Enter**.

The `Shell>` prompt appears.

4. Enter the commands required to complete your task.

5. Enter the `exit` command to exit the Shell.

HPE Smart Storage Administrator

HPE SSA is the main tool for configuring arrays on HPE Smart Array SR controllers. It exists in three interface formats: the HPE SSA GUI, the HPE SSA CLI, and HPE SSA Scripting. All formats provide support for configuration tasks. Some of the advanced tasks are available in only one format.

The diagnostic features in HPE SSA are also available in the standalone software HPE Smart Storage Administrator Diagnostics Utility CLI.

During the initial provisioning of the server or compute module, an array is required to be configured before the operating system can be installed. You can configure the array using SSA.

HPE SSA is accessible both offline (either through HPE Intelligent Provisioning or as a standalone bootable ISO image) and online:

- Accessing HPE SSA in the offline environment

! **IMPORTANT:** If you are updating an existing server in an offline environment, obtain the latest version of HPE SSA through Service Pack for ProLiant before performing configuration procedures.

Using one of multiple methods, you can run HPE SSA before launching the host operating system. In offline mode, users can configure or maintain detected and supported devices, such as optional Smart Array controllers and integrated Smart Array controllers. Some HPE SSA features are only available in the offline environment, such as setting the boot controller and boot volume.

- Accessing HPE SSA in the online environment

This method requires an administrator to download the HPE SSA executables and install them. You can run HPE SSA online after launching the host operating system.

For more information, see *HPE Smart Array SR Gen10 Configuration Guide* at the [Hewlett Packard Enterprise website](#).

USB support

Hewlett Packard Enterprise Gen10 servers support all USB operating speeds depending on the device that is connected to the server.

External USB functionality

Hewlett Packard Enterprise provides external USB support to enable local connection of USB devices for server administration, configuration, and diagnostic procedures.

For additional security, external USB functionality can be disabled through USB options in UEFI System Utilities.

Redundant ROM support

The server enables you to upgrade or configure the ROM safely with redundant ROM support. The server has a single ROM that acts as two separate ROM images. In the standard implementation, one side of the ROM contains the current ROM program version, while the other side of the ROM contains a backup version.

NOTE: The server ships with the same version programmed on each side of the ROM.

Safety and security benefits

When you flash the system ROM, the flashing mechanism writes over the backup ROM and saves the current ROM as a backup, enabling you to switch easily to the alternate ROM version if the new ROM becomes corrupted for any reason. This feature protects the existing ROM version, even if you experience a power failure while flashing the ROM.

Keeping the system current

Updating firmware or system ROM

To update firmware or system ROM, use one of the following methods:

- The **Firmware Update** option in the System Utilities.
- The `fwupdate` command in the **Embedded UEFI Shell**.
- Service Pack for ProLiant (SPP)
- HPE online flash components
- Moonshot Component Pack

Service Pack for ProLiant

SPP is a systems software and firmware solution delivered as a single ISO file download. This solution uses SUM as the deployment tool and is tested and supports HPE ProLiant, HPE BladeSystem, HPE Synergy, and HPE Apollo servers and infrastructure.

SPP, along with SUM and iSUT, provides Smart Update system maintenance tools that systematically update HPE ProLiant, HPE BladeSystem, HPE Synergy, and HPE Apollo servers and infrastructure.

SPP can be used in an online mode on a server running Windows, Linux, or VMware vSphere ESXi, or in an offline mode where the server is booted to an operating system included in the ISO file.

The preferred method for downloading an SPP is using the SPP Custom Download at <https://www.hpe.com/servers/spp/custom>.

The SPP is also available for download from the SPP download page at <https://www.hpe.com/servers/spp/download>.

Smart Update Manager

SUM is an innovative tool for maintaining and updating the firmware, drivers, and system software of HPE ProLiant, HPE BladeSystem, HPE Synergy, and HPE Apollo servers, infrastructure, and associated options.

SUM identifies associated nodes you can update at the same time to avoid interdependency issues.

Key features of SUM include:

- Discovery engine that finds installed versions of hardware, firmware, and software on nodes.
- SUM deploys updates in the correct order and ensures that all dependencies are met before deploying an update.
- Interdependency checking.
- Automatic and step-by-step Localhost Guided Update process.
- Web browser-based user interface.
- Ability to create custom baselines and ISOs.
- Support for iLO Repository (Gen10 iLO 5 nodes only).
- Simultaneous firmware and software deployment for multiple remote nodes.
- Local offline firmware deployments with SPP deliverables.
- Extensive logging in all modes.

NOTE: SUM does not support third-party controllers, including flashing hard drives behind the controllers.

Integrated Smart Update Tools

Integrated Smart Update Tools (iSUT) is a software utility used with iLO 4, iLO 5, iLO Amplifier Pack, Service Pack for ProLiant (SPP), and Smart Update Manager (SUM) to stage, install, and activate firmware and driver updates.

- **iSUT:** Polls iLO to check for requests from SUM or iLO Amplifier Pack for updates through the management network and orchestrates staging, deploying, and activating updates. You can adjust the

polling interval by issuing the appropriate command-line option provided by iSUT. Performs inventory on target servers, stages deployment, deploys updates, and then reboots the servers.

- **iLO 5 with integrated Smart Update** (Gen10 servers only): Performs iLO Repository-based updates by downloading the components from iLO Repository when iLO Installation Queue has the components which can be updated by iSUT.
- **iLO Amplifier Pack**: Displays available updates for servers. Communicates with iSUT (or SUT 1.x) to initiate updates using the iLO Redfish interface. iSUT reports the status of updates to iLO Amplifier Pack via iLO Restful Interface.
- **SPP**: A comprehensive systems software and firmware update solution, which is delivered as a single ISO image.
- **SUM**: A tool for firmware and driver maintenance for HPE ProLiant servers and associated options.

NOTE: SUM and iLO Amplifier Pack should not manage the same nodes.

Updating firmware from the System Utilities

Use the **Firmware Updates** option to update firmware components in the system, including the system BIOS, NICs, and storage cards.

Procedure

1. Access the System ROM Flash Binary component for your server from the Hewlett Packard Enterprise Support Center.
2. Copy the binary file to a USB media or iLO virtual media.
3. Attach the media to the server.
4. Launch the **System Utilities**, and select **Embedded Applications > Firmware Update**.
5. Select a device.

The **Firmware Updates** screen lists details about your selected device, including the current firmware version in use.

6. Select **Select Firmware File**.
7. Select the flash file in the **File Explorer** list.
The firmware file is loaded and the **Firmware Updates** screen lists details of the file in the **Selected firmware file** field.
8. Select **Image Description**, and then select a firmware image.
A device can have multiple firmware images.
9. Select **Start firmware update**.

Updating the firmware from the UEFI Embedded Shell

Procedure

1. Access the System ROM Flash Binary component for your server from the Hewlett Packard Enterprise Support Center (<http://www.hpe.com/support/hpesc>).
2. Copy the binary file to a USB media or iLO virtual media.
3. Attach the media to the server.

4. Boot to the UEFI Embedded Shell.
5. To obtain the assigned file system volume for the USB key, enter `map -r`.
6. Change to the file system that contains the System ROM Flash Binary component for your server. Enter one of the `fsx` file systems available, such as `fs0:` or `fs1:`, and press **Enter**.
7. Use the `cd` command to change from the current directory to the directory that contains the binary file.
8. Flash the system ROM by entering `fwupdate -d BIOS -f filename`.
9. Reboot the server. A reboot is required after the firmware update in order for the updates to take effect and for hardware stability to be maintained.

Online Flash components

This component provides updated system firmware that can be installed directly on supported operating systems. Additionally, when used in conjunction with SUM, this Smart Component allows the user to update firmware on remote servers from a central location. This remote deployment capability eliminates the need for the user to be physically present at the server to perform a firmware update.

Drivers

 **IMPORTANT:** Always perform a backup before installing or updating device drivers.

Update drivers using any of the following **Smart Update Solutions**:

- Download the latest Service Pack for ProLiant (includes Smart Update Manager)
- Create a custom SPP download
- Download Smart Update Manager for Linux
- Download specific drivers

To locate the drivers for a server, go to the **Hewlett Packard Enterprise Support Center website**, and then search for the product name/number.

Software and firmware

Update software and firmware before using the server for the first time, unless any installed software or components require an older version.

For system software and firmware updates, use one of the following sources:

- Download the SPP from the Hewlett Packard Enterprise website (<http://www.hpe.com/servers/spp/download>).
- Download individual drivers, firmware, or other system software components from the server product page in the Hewlett Packard Enterprise Support Center website (<http://www.hpe.com/support/hpesc>).

Operating system version support

For information about specific versions of a supported operating system, refer to the **operating system support matrix**.

HPE Pointnext Portfolio

HPE Pointnext delivers confidence, reduces risk, and helps customers realize agility and stability. Hewlett Packard Enterprise helps customers succeed through Hybrid IT by simplifying and enriching the on-premise experience, informed by public cloud qualities and attributes.

Operational Support Services enable you to choose the right service level, length of coverage, and response time to fit your business needs. For more information, see the Hewlett Packard Enterprise website:

<https://www.hpe.com/us/en/services/operational.html>

Utilize the Advisory and Transformation Services in the following areas:

- Private or hybrid cloud computing
- Big data and mobility requirements
- Improving data center infrastructure
- Better use of server, storage, and networking technology

For more information, see the Hewlett Packard Enterprise website:

<http://www.hpe.com/services/consulting>

Proactive notifications

30 to 60 days in advance, Hewlett Packard Enterprise sends notifications to subscribed customers on upcoming:

- Hardware, firmware, and software changes
- Bulletins
- Patches
- Security alerts

You can subscribe to proactive notifications on the [Hewlett Packard Enterprise website](#).

Troubleshooting

NMI functionality

An NMI crash dump enables administrators to create crash dump files when a system is hung and 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 invoke the NMI handler and generate a crash dump log, the administrator can use the iLO Virtual NMI feature.

Troubleshooting resources

Troubleshooting resources are available for HPE Gen10 server products in the following documents:

- *Troubleshooting Guide for HPE ProLiant Gen10 servers* provides procedures for resolving common problems and comprehensive courses of action for fault isolation and identification, issue resolution, and software maintenance.
- *Error Message Guide for HPE ProLiant Gen10 servers and HPE Synergy* provides a list of error messages and information to assist with interpreting and resolving error messages.
- *Integrated Management Log Messages and Troubleshooting Guide for HPE ProLiant Gen10 and HPE Synergy* provides IML messages and associated troubleshooting information to resolve critical and cautionary IML events.

To access the troubleshooting resources, see the Hewlett Packard Enterprise Information Library (<http://www.hpe.com/info/gen10-troubleshooting>).

System battery replacement

System battery information

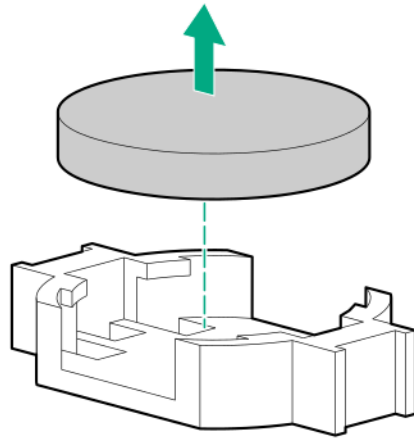
The server contains an internal lithium manganese dioxide, a vanadium pentoxide, or an alkaline battery that provides power to the real-time clock. If this battery is not properly handled, a risk of the fire and burns exists. To reduce the risk of personal injury:

- Do not attempt to recharge the battery.
- Do not expose the battery to temperatures higher than 60°C (140°F).
- Do not disassemble, crush, puncture, short external contacts, or dispose the battery in fire or water.
- If the server no longer automatically displays the correct date and time, then replace the battery that provides power to the real-time clock. Under normal use, battery life is 5 to 10 years.

Removing and replacing the system battery

Procedure

1. **Power down the server.**
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Disconnect all peripheral cables from the server.
4. Do one of the following:
 - **Extend the server from the rack.**
 - **Remove the server from the rack.**
5. **Remove the access panel.**
6. If installed, **remove the secondary riser cage.**
7. **Locate the system battery on the system board.**
8. Remove the system battery.



9. To replace the component, reverse the removal procedure.
10. Properly dispose of the old battery. For more information about battery replacement or proper disposal, contact an authorized reseller or an authorized service provider.

Specifications

Environmental specifications

Specification	Value
Temperature range¹	—
Operating	10°C to 35°C (50°F to 95°F)
Nonoperating	-30°C to 60°C (-22°F to 140°F)
Relative humidity (noncondensing)	—
Operating	8% to 90% 28°C (82.4°F), maximum wet bulb temperature
Nonoperating	5% to 95% 38.7°C (101.7°F), maximum wet bulb temperature

¹ All temperature ratings shown are for sea level. An altitude derating of 1.0°C per 305 m (1.8°F per 1000 ft) to 3050 m (10,000 ft) is applicable. No direct sunlight allowed. Maximum rate of change is 20°C per hour (36°F per hour). The upper limit and rate of change might be limited by the type and number of options installed.

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

- 5°C to 10°C (41°F to 50°F) and 35°C to 40°C (95°F to 104°F) at sea level with an altitude derating of 1.0°C per every 175 m (1.8°F per every 574 ft) above 900 m (2953 ft) to a maximum of 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 3050 m (10,000 ft).

The approved hardware configurations for this system are listed on the [Hewlett Packard Enterprise website](#).

Mechanical specifications

Dimension	Value
Height*	8.75 cm (3.44 in)
Depth*	63.47 cm (24.99 in)
Width*	44.54 cm (17.54 in)
Weight (approximate range)	13 kg to 26 kg (28 lb to 58 lb)

* These dimensions apply to all server models.

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:

- [HPE 500W Low Halogen Non-hot-plug Power Supply](#) on page 163
- [HPE 500W Flex Slot Platinum Hot-plug Low Halogen Power Supply](#) on page 163
- [HPE 800W Flex Slot Platinum Hot-plug Low Halogen Power Supply](#) on page 164
- [HPE 800W Flex Slot Titanium Hot-plug Low Halogen Power Supply](#) on page 165
- [HPE 800W Flex Slot Universal Hot-plug Low Halogen Power Supply](#) on page 166
- [HPE 1600W Flex Slot Platinum Hot-plug Low Halogen Power Supply](#) on page 166

For detailed power supply specifications, see the QuickSpecs on the [Hewlett Packard Enterprise website](#).

HPE 500W Low Halogen Non-hot-plug Power Supply

Specification	Value
Input requirements	—
Rated input voltage	100 VAC to 240 VAC 240 VDC for China only
Rated input frequency	50 Hz to 60 Hz
Rated input current	5.8 A at 100 VAC 2.3 A at 240 VAC 2.7 A at 240 VDC for China only
Maximum rated input power	578 W at 100 VAC 557 W at 240 VAC
BTUs per hour	1953 at 100 VAC 1882 at 240 VAC
Power supply output	—
Rated steady-state power	500 W at 100 VAC to 240 VAC input 500 W at 240 VDC input for China only
Maximum peak power	500 W at 100 VAC to 240 VAC input 500 W at 240 VDC input for China only

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

Specification	Value
Input requirements	—
Rated input voltage	100 VAC to 240 VAC 240 VDC for China only

Table Continued

Specification	Value
Rated input frequency	50 Hz to 60 Hz Not applicable to 240 VDC
Rated input current	5.8 A at 100 VAC 2.8 A at 200 VAC 2.4 A at 240 VDC for China only
Maximum rated input power	557 W at 100 VAC 539 W at 200 VAC 537 W at 240 VDC for China only
BTUs per hour	1902 at 100 VAC 1840 at 200 VAC 1832 at 240 VDC for China only
Power supply output	—
Rated steady-state power	500 W at 100 VAC to 127 VAC input 500 W at 100 VAC to 240 VAC input 500 W at 240 VDC input for China only
Maximum peak power	500 W at 100 VAC to 127 VAC input 500 W at 100 VAC to 240 VAC input 500 W at 240 VDC input for China only

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

Specification	Value
Input requirements	—
Rated input voltage	100 VAC to 127 VAC 200 VAC to 240 VAC 240 VDC for China only
Rated input frequency	50 Hz to 60 Hz Not applicable to 240 VDC
Rated input current	9.1 A at 100 VAC 4.4 A at 200 VAC 3.6 A at 240 VDC for China only

Table Continued

Specification	Value
Maximum rated input power	899 W at 100 VAC 867 W at 200 VAC 864 W at 240 VDC for China only
BTUs per hour	3067 at 100 VAC 2958 at 200 VAC 2949 at 240 VAC for China only
Power supply output	—
Rated steady-state power	800 W at 100 VAC to 127 VAC input 800 W at 100 VAC to 240 VAC input 800 W at 240 VDC input for China only
Maximum peak power	800 W at 100 VAC to 127 VAC input 800 W at 100 VAC to 240 VAC input 800 W at 240 VDC input for China only

HPE 800W Flex Slot Titanium Hot-plug Low Halogen Power Supply

Specification	Value
Input requirements	—
Rated input voltage	200 VAC to 240 VAC 240 VDC for China only
Rated input frequency	50 Hz to 60 Hz Not applicable to 240 VDC
Rated input current	4.35 A at 200 VAC 3.62 A at 240 VAC 3.62 A at 240 VDC for China only
Maximum rated input power	851 W at 200 VAC 848 W at 240 VAC 848 W at 240 VDC for China only
BTUs per hour	2905 at 200 VAC 2893 at 240 VAC 2893 at 240 VDC for China only
Power supply output	—

Table Continued

Specification	Value
Rated steady-state power	800 W at 200 VAC to 240 VAC input 800 W at 240 VDC input for China only
Maximum peak power	800 W at 200 VAC to 240 VAC input 800 W at 240 VDC input for China only

HPE 800W Flex Slot Universal Hot-plug Low Halogen Power Supply

Specification	Value
Input requirements	—
Rated input voltage	200 VAC to 277 VAC 380 VDC
Rated input frequency	50 Hz to 60 Hz
Rated input current	4.4 A at 200 VAC 3.1 A at 277 VAC 2.3 A at 380 VDC
Maximum rated input power	869 W at 200 VAC 865 W at 230 VAC 861 W at 277 VAC 863 W at 380 VDC
BTUs per hour	2964 at 200 VAC 2951 at 230 VAC 2936 at 277 VAC 2943 at 380 VDC
Power supply output	—
Rated steady-state power	800 W at 200 VAC to 277 VAC input
Maximum peak power	800 W at 200 VAC to 277 VAC input

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

Specification	Value
Input requirements	
Rated input voltage	200 VAC to 240 VAC 240 VDC for China only

Table Continued

Specification	Value
Rated input frequency	50 Hz to 60 Hz
Rated input current	8.7 A at 200 VAC 7.2 A at 240 VAC
Maximum rated input power	1734 W at 200 VAC 1725 W at 240 VAC
BTUs per hour	5918 at 200 VAC 5884 at 240 VAC
Power supply output	
Rated steady-state power	1600 W at 200 VAC to 240 VAC input 1600 W at 240 VDC input
Maximum peak power	2200 W for 1 ms (turbo mode) at 200 VAC to 240 VAC input

Safety, warranty, and regulatory 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:

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:

www.hpe.com/info/reach

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

www.hpe.com/info/ecodata

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

www.hpe.com/info/environment

Notices for Eurasian Economic Union



Manufacturer and Local Representative Information

Manufacturer information:

Hewlett Packard Enterprise, 6280 America Center Drive, San Jose, CA 95002 U.S.

Local representative information Russian:

- **Russia**

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- **Kazakhstan**

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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

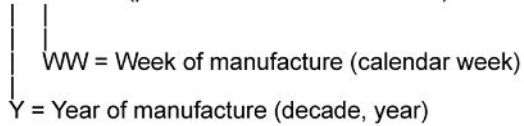
- **Kazakhstan**

ЖШС «Хьюлетт-Паккард (К)», Қазақстан Республикасы, 050040, Алматы қ., Бостандық ауданы,
Әл-Фараби даңғылы, 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 links provided below:

HPE ProLiant and IA-32 Servers and Options

www.hpe.com/support/ProLiantServers-Warranties

HPE Enterprise and Cloudline Servers

www.hpe.com/support/EnterpriseServers-Warranties

HPE Storage Products

www.hpe.com/support/Storage-Warranties

HPE Networking Products

www.hpe.com/support/Networking-Warranties

Websites

General websites

Hewlett Packard Enterprise Information Library

www.hpe.com/info/EIL

Subscription Service/Support Alerts

www.hpe.com/support/e-updates

Single Point of Connectivity Knowledge (SPOCK) Storage compatibility matrix

www.hpe.com/storage/spock

Storage white papers and analyst reports

www.hpe.com/storage/whitepapers

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

Product websites

HPE ProLiant DL180 Gen10 support page

<http://www.hpe.com/support/dl180gen10>

HPE ProLiant DL180 Gen10 documents

<http://www.hpe.com/info/DL180Gen10-docs>

Support and other resources

Accessing Hewlett Packard Enterprise Support

- For live assistance, go to the Contact Hewlett Packard Enterprise Worldwide website:
<http://www.hpe.com/assistance>
- To access documentation and support services, go to the Hewlett Packard Enterprise Support Center website:
<http://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

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

www.hpe.com/support/hpesc

Hewlett Packard Enterprise Support Center: Software downloads

www.hpe.com/support/downloads

Software Depot

www.hpe.com/support/softwaredepot

- To subscribe to eNewsletters and alerts:

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:

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 Passport 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. Your Hewlett Packard Enterprise authorized service provider will determine whether a repair can be accomplished by CSR.

For more information about CSR, contact your local service provider or go to the CSR website:

<http://www.hpe.com/support/selfrepair>

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 will initiate a fast and accurate resolution based on your product's service level. 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.

Remote support and Proactive Care information

HPE Get Connected

www.hpe.com/services/getconnected

HPE Proactive Care services

www.hpe.com/services/proactivecare

HPE Proactive Care service: Supported products list

www.hpe.com/services/proactivecaresupportedproducts

HPE Proactive Care advanced service: Supported products list

www.hpe.com/services/proactivecareadvancedsupportedproducts

Proactive Care customer information

Proactive Care central

www.hpe.com/services/proactivecarecentral

Proactive Care service activation

www.hpe.com/services/proactivecarecentralgetstarted

Documentation feedback

Hewlett Packard Enterprise is committed to providing documentation that meets your needs. To help us improve the documentation, send any errors, suggestions, or comments to Documentation Feedback (docsfeedback@hpe.com). When submitting your feedback, include the document title, part number, edition, and publication date located on the front cover of the document. For online help content, include the product name, product version, help edition, and publication date located on the legal notices page.