



Hewlett Packard
Enterprise

HPE Apollo 4200 Gen10 System User Guide

Abstract

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

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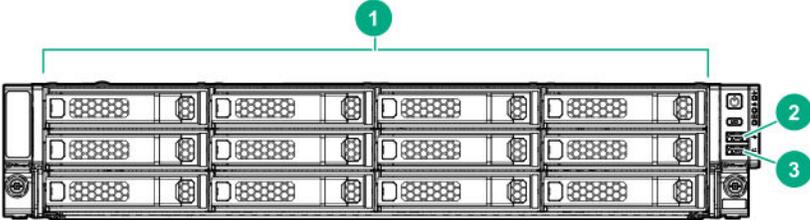
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Component identification

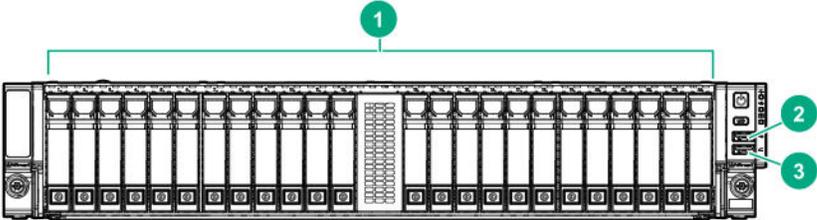
Front panel components

12LFF dual cage configuration



Item	Description
1	LFF hot-plug drives
2	USB 2.0 port
3	iLO Service Port

24SFF dual cage configuration

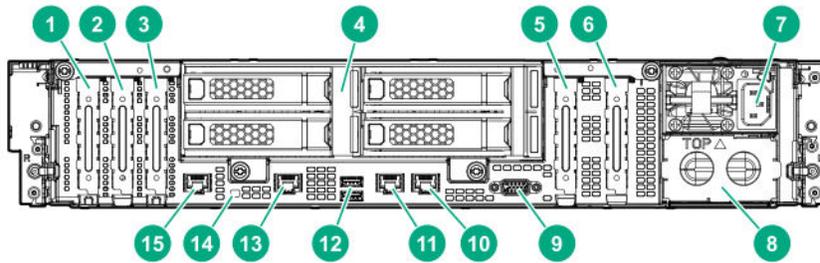


Item	Description
1	SFF hot-plug drives
2	USB 2.0 port
3	iLO Service Port



Rear panel components

Rear panel with the 4LFF hot-plug rear drive cage option

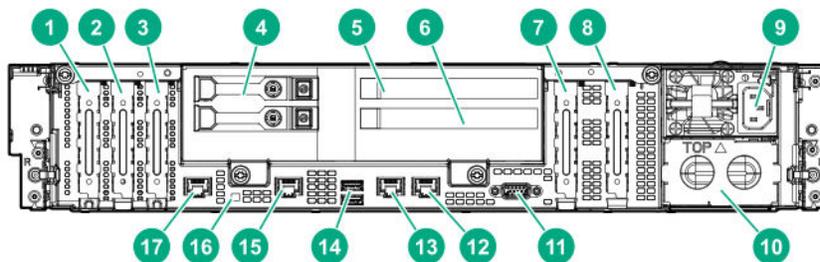


Item	Description
1	PCIe3 x16 slot 7 for low-profile, standup expansion board ¹
2	PCIe3 x24 slot 6 for low-profile, standup expansion board ¹
3	PCIe3 x8 slot 5 for low-profile, standup expansion board ¹
4	Low-profile LFF hot-plug drives
5	PCIe3 x24 slot 2 for low-profile, standup expansion board or riser cage options ²
6	PCIe3 x16 slot 1 for low-profile, standup expansion board ²
7	Hot-plug power supply (bay 1)
8	Power supply blank (bay 2)
9	Video connector
10	NIC 2 port
11	NIC 1 port
12	USB 3.0 ports
13	iLO Management port 2
14	UID LED
15	iLO Management port 1

¹ The PCIe3 expansion slots 5-7 are associated with processor 2.

² The PCIe3 expansion slots 1-4 are associated with processor 1.

Rear panel with the 2SFF/uFF hot-plug rear drive cage and two-slot PCIe riser cage options

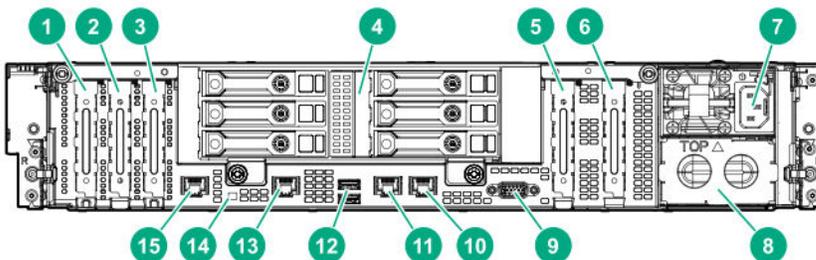


Item	Description
1	PCIe3 x16 slot 7 for low-profile, standup expansion board ¹
2	PCIe3 x24 slot 6 for low-profile, standup expansion board ¹
3	PCIe3 x8 slot 5 for low-profile, standup expansion board ¹
4	SFF/uFF hot-plug drives
5	PCIe3 x16 slot 3 for full-height riser cage ²
6	PCIe3 x8 slot 4 for full-height riser cage ²
7	PCIe3 x24 slot 2 for low-profile, standup expansion board or riser cage options ²
8	PCIe3 x16 slot 1 for low-profile, standup expansion board ²
9	Hot-plug power supply (bay 1)
10	Power supply blank (bay 2)
11	Video connector
12	NIC 2 port
13	NIC 1 port
14	USB 3.0 ports
15	iLO Management port 2
16	UID LED
17	iLO Management port 1

¹ The PCIe3 expansion slots 5-7 are associated with processor 2.

² The PCIe3 expansion slots 1-4 are associated with processor 1.

Rear panel with the 6SFF NVMe hot-plug rear drive cage option with pass-through riser



Item	Description
1	PCIe3 x16 slot 7 for low-profile, standup expansion board ¹
2	PCIe3 x24 slot 6 for low-profile, standup expansion board ¹
3	PCIe3 x8 slot 5 for low-profile, standup expansion board ¹
4	SFF NVMe hot-plug drives
5	PCIe3 x24 slot 2 for low-profile, standup expansion board or NVMe pass-through board ²
6	PCIe3 x16 slot 1 for low-profile, standup expansion board ²

Table Continued

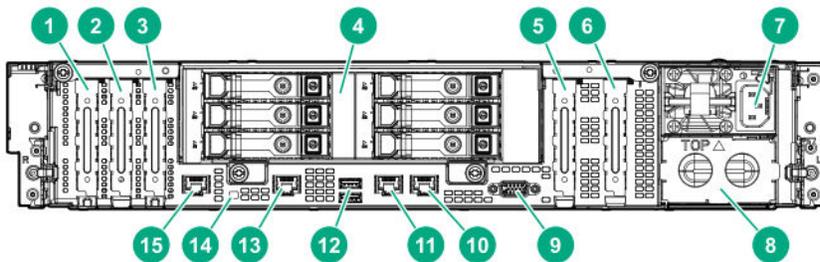


Item	Description
7	Hot-plug power supply (bay 1)
8	Power supply blank (bay 2)
9	Video connector
10	NIC port 2
11	NIC port 1
12	USB 3.0 ports
13	iLO Management port 2
14	UID LED
15	iLO Management port 1

¹ The PCIe3 expansion slots 5-7 are associated with processor 2.

² The PCIe3 expansion slots 1-4 are associated with processor 1.

Rear panel with the 6SFF SAS or SATA hot-plug rear drive cage option with pass-through riser

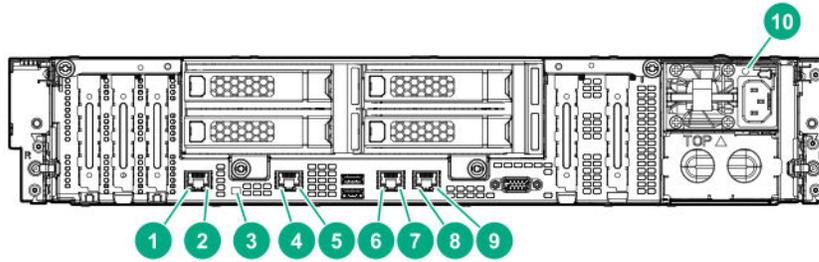


Item	Description
1	PCIe3 x16 slot 7 for low-profile, standup expansion board ¹
2	PCIe3 x24 slot 6 for low-profile, standup expansion board ¹
3	PCIe3 x8 slot 5 for low-profile, standup expansion board ¹
4	SFF SAS or SATA hot-plug drives
5	PCIe3 x24 slot 2 for low-profile, standup expansion board or NVMe pass-through board ²
6	PCIe3 x16 slot 1 for low-profile, standup expansion board ²
7	Hot-plug power supply (bay 1)
8	Power supply blank (bay 2)
9	Video connector
10	NIC port 2
11	NIC port 1
12	USB 3.0 ports
13	iLO Management port 2
14	UID LED
15	iLO Management port 1



- 1 The PCIe3 expansion slots 5-7 are associated with processor 2.
- 2 The PCIe3 expansion slots 1-4 are associated with processor 1.

Rear panel LEDs



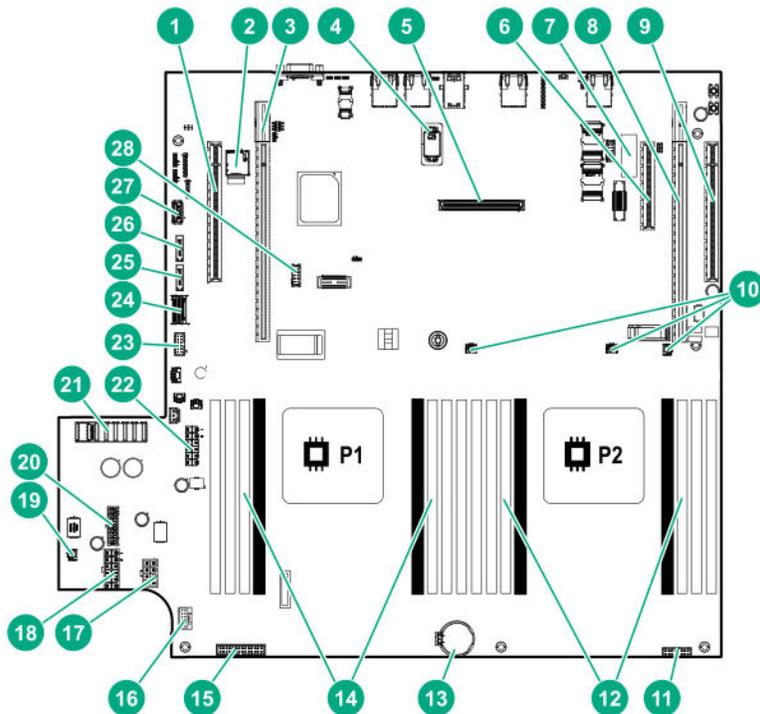
Item	Description	Status
1	iLO port 1 link LED	Green = Network link Off = No network link
2	iLO port 1 activity LED	Solid green = Link to network Flashing green = Network active Off = No network activity
3	UID LED	Solid blue = Activated Flashing blue: <ul style="list-style-type: none"> • 1 flash per second = 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
4	iLO port 2 link LED	Green = Network link Off = No network link
5	iLO port 2 activity LED	Solid green = Link to network Flashing green = Network active Off = No network activity
6	NIC port 1 link LED	Green = Network link Off = No network link

Table Continued



Item	Description	Status
7	NIC port 1 activity LED	Solid green = Link to network Flashing green = Network active Off = No network activity
8	NIC port 2 link LED	Green = Network link Off = No network link
9	NIC port 2 activity LED	Solid green = Link to network Flashing green = Network active Off = No network activity
10	Power supply LED	Solid green = Normal Off = One or more of the following conditions exists: <ul style="list-style-type: none"> • Power is unavailable. • Power supply failed • Power supply is in standby mode. • Power supply error

System board components



Item	Description
1	PCIe3 x16 slot 1 for low-profile, standup expansion board or riser cage options ¹
2	microSD card slot
3	PCIe3 x24 slot 2 for low-profile, standup expansion board, riser cage option, or NVMe pass-through board ¹
4	TPM 2.0 connector
5	Flexible Smart Array Controller slot
6	PCIe3 x8 slot 5 for low-profile, standup expansion board ²
7	System maintenance switch
8	PCIe3 x24 slot 6 for low-profile, standup expansion board, riser cage options, or NVMe pass-through board ²
9	PCIe3 x16 slot 7 for low-profile, standup expansion board or riser cage options ²
10	Controller backup power connectors for expansion slots 3-7
11	Front LED connector
12	Processor 2 DIMM slots
13	System battery
14	Processor 1 DIMM slots
15	Fan signal connector
16	Energy pack connector
17	Fan power connector
18	Internal drive cage backplane power connector
19	Controller backup power connectors for expansion slots 1-2
20	Front drive cage backplane power connector
21	Power supply backplane connector
22	Rear drive cage backplane power connector
23	Rear 6SFF NVMe drive cage fan connector
24	Mini SAS connector 1
25	SATA connector 2
26	SATA connector 1
27	Internal USB 3.0 port
28	Front USB 2.0 port

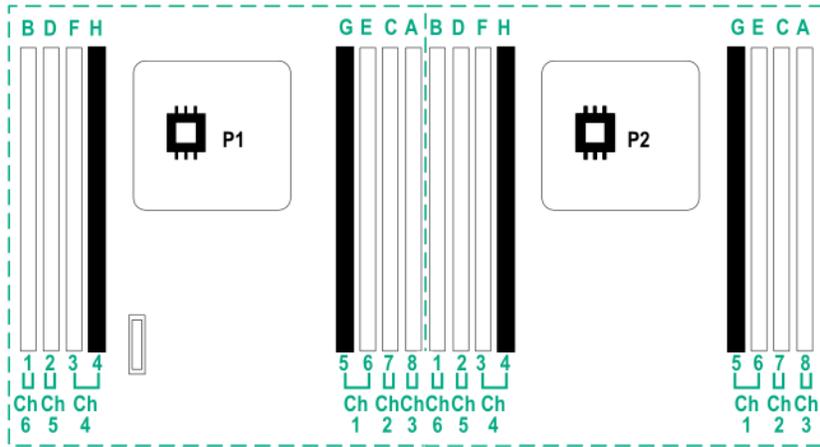
¹ The PCIe3 expansion slots 1-2 are associated with processor 1.

² The PCIe3 expansion slots 5-7 are associated with processor 2.

DIMM slot locations

DIMM slots are numbered sequentially (1 through 8) for each processor. The supported AMP modes use the letter assignments for population guidelines.

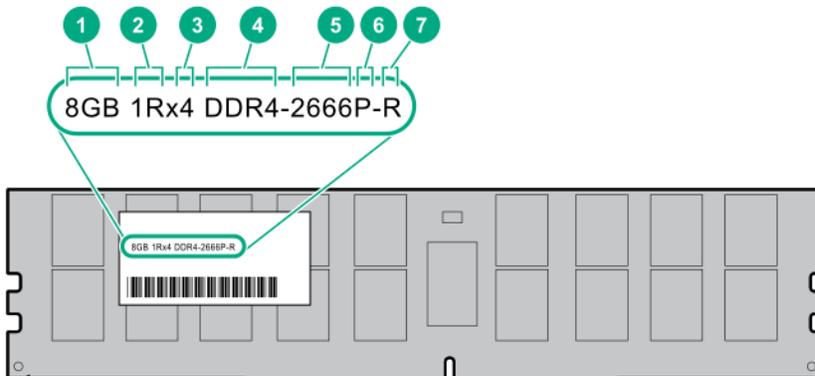




The arrow points to the front of the system.

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.

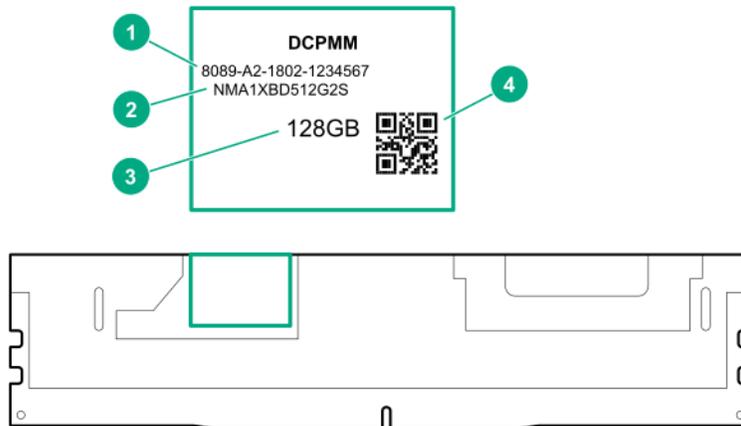


Item	Description	Example
1	Capacity	8 GB 16 GB 32 GB 64 GB 128 GB
2	Rank	1R = Single rank 2R = Dual rank 4R = Quad rank 8R = Octal rank
3	Data width on DRAM	x4 = 4-bit x8 = 8-bit x16 = 16-bit
4	Memory generation	PC4 = DDR4
5	Maximum memory speed	2133 MT/s 2400 MT/s 2666 MT/s
6	CAS latency	P = CAS 15-15-15 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>).



Intel Optane persistent memory 100 series for HPE label identification



Item	Description	Example
1	Unique ID number	8089-A2-1802-1234567
2	Model number	NMA1XBD512G2S
3	Capacity	128 GB 256 GB 512 GB
4	QR code	Includes part number and serial number

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

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

Table Continued

Position	Default	Function
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**.

Disabling the HPE Smart Array S100i Controller

Before changing the boot mode to Legacy BIOS Mode, you must first disable the HPE Smart Array S100i Controller.

NOTE: When you use the software to update, maintain, or monitor the HPE Apollo 4200 Gen10 system, you will see **HPE ProLiant XL420 Gen10 Server** as the product name in the interface.

Procedure

1. Reboot the system.

The system restarts and the POST screen appears.

2. Press **F9**.

The System Utilities screen appears.

3. Select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > SATA Controller Options > Embedded SATA Configuration**, and then press **Enter**.

4. Select **Enable SATA AHCI Support**, and then press **Enter**.

5. To save the selection, press **F10**.

6. To save the changes, press **Y**.

The `Change saved` confirmation prompt appears.

7. Select **Exit and resume system boot**, and press **Enter**.

The system continues the normal boot process.

For more information, see the product QuickSpecs on the Hewlett Packard Enterprise website (<http://www.hpe.com/info/qs>).

NMI functionality

An NMI crash dump creates a crash dump log before resetting a system which is not responding.

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

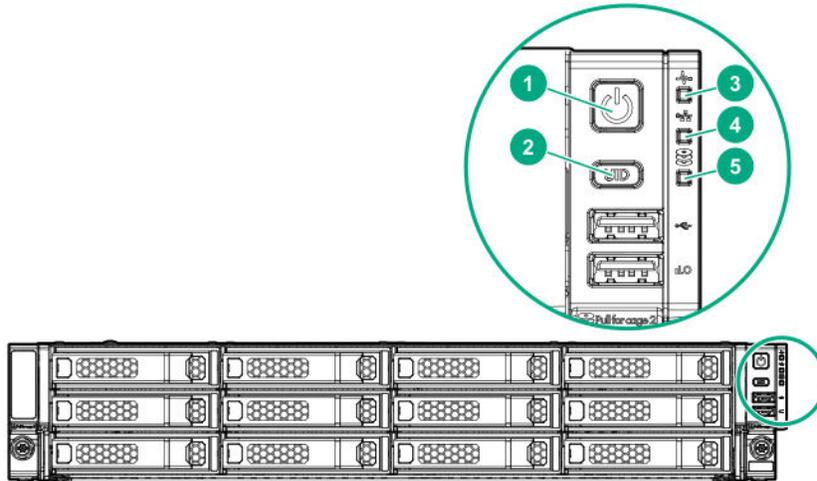


To force the system to initiate the NMI handler and generate a crash dump log, do one of the following:

- Use the iLO Virtual NMI feature.
- Short the NMI header.

For more information, see the Hewlett Packard Enterprise website (<http://www.hpe.com/support/ilo-docs>).

Front panel LEDs and buttons



Item	Description	Status
1	Power On/Standby button and system power LED ¹	<ul style="list-style-type: none"> • Solid green = System on • Flashing green (1 flash per second) = Performing power on sequence • Solid amber = System in standby • Off = No power present²
2	UID button/LED ¹	<ul style="list-style-type: none"> • 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 ◦ 1 fast flash and then off for 3 seconds = iLO Service Port status is Complete ◦ 4 medium flashes and then off for 1 second = iLO Service Port status is Busy ◦ 8 fast flashes and then off for 1 second = iLO Service Port status is Error • Off = Deactivated
3	Health LED ¹	<ul style="list-style-type: none"> • Solid green = Normal • Flashing green (1 flash per sec) = iLO is rebooting • Flashing amber = System degraded³ • Flashing red (1 flash per sec) = System critical³
4	NIC status LED ¹	<ul style="list-style-type: none"> • Solid green = Link to network • Flashing green (1 flash per second) = Network active • Off = No network activity
5	Front drive health/thermal LED	<ul style="list-style-type: none"> • Solid green = Drives supported by the SAS expander are functional.⁴ • Solid amber = Failure or predictive failure of one or more drives supported by the SAS expander⁴ • Off = No power present²

¹ When these four LEDs flash simultaneously, a power fault has occurred.

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

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

⁴ This LED behavior applies to all front drives, as well as to the rear drives connected to the internal drive cage backplane.



UID button functionality

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

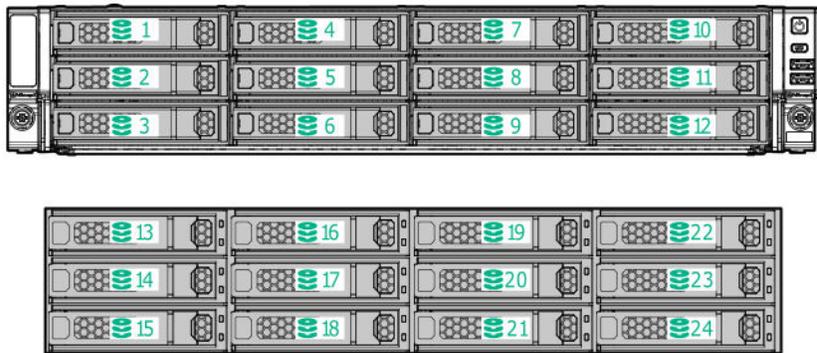
Front panel LED power fault codes

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

Subsystem	LED behavior
System board	1 flash
Processor	2 flashes
Memory	3 flashes
Riser board PCIe slots	4 flashes
FlexibleLOM	5 flashes
Storage controllers	6 flashes
System board PCIe slots	7 flashes
Power backplane or storage backplane	8 flashes
Power supply	9 flashes

Drive numbering

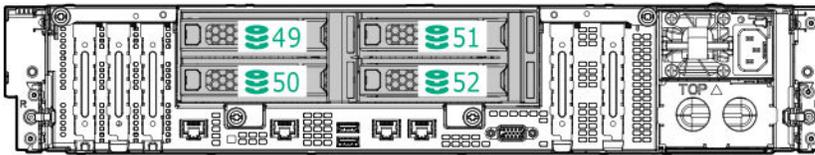
24LFF hot-plug front drive numbering



48SFF hot-plug front drive numbering

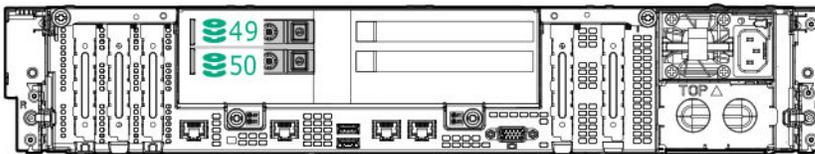


4LFF hot-plug rear drive numbering



2SFF hot-plug rear drive numbering

The drive numbering for the 2SFF rear drive cage varies depending on where it is connected.

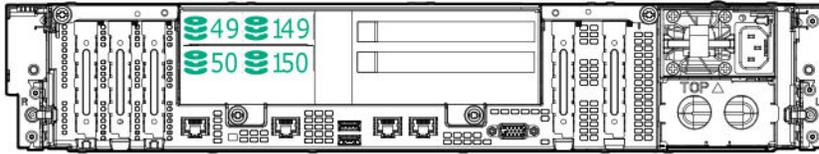


Item	Drive numbering
Internal drive cage	49, 51
HPE Smart Storage S100i SR Gen10 controller (RAID)	49, 50
HPE Smart Storage S100i SR Gen10 controller (HBA mode)	1, 3
Directly attached to controller	49, 50

2uFF hot-plug rear drive numbering

The drive numbering for the 2uFF rear drive cage varies depending on where it is connected.

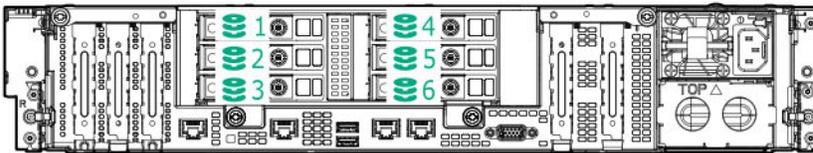




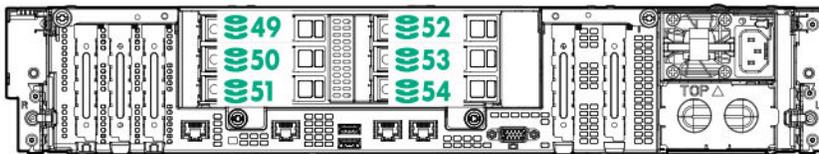
Item Drive numbering

Internal drive cage	49, 50, 51, 52
HPE Smart Storage S100i SR Gen10 controller (RAID)	49, 149, 50, 150
HPE Smart Storage S100i SR Gen10 controller (HBA mode)	1, 2, 3, 4
Directly attached to controller	49, 149, 50, 150

6SFF NVMe rear drive numbering



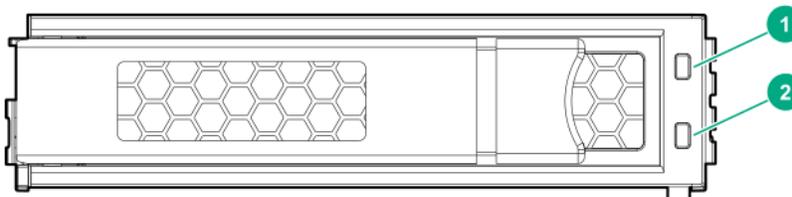
6SFF rear drive numbering (SAS, SATA)



Drive LEDs

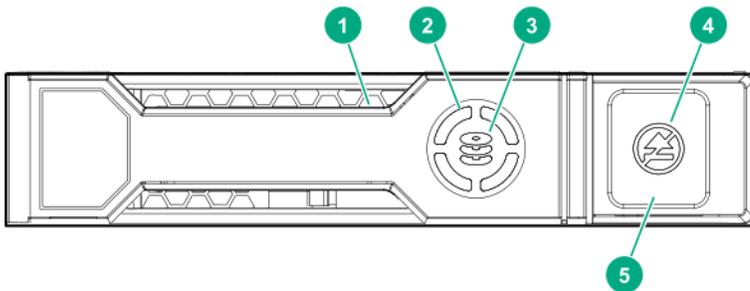
LFF, SFF, NVMe, and uFF drives have different sets of LEDs to reflect the drive status.

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.
		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.

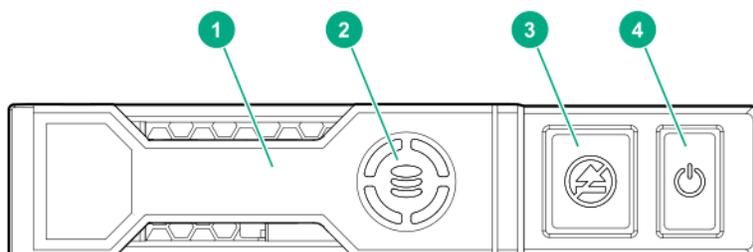
SFF drive components and LEDs



Item	Description	Status
1	Locate LED ¹	<p>Solid blue = The drive is being identified by a host application.</p> <p>Flashing blue = The drive carrier firmware is being updated or requires an update.</p>
2	Activity ring LED	<p>Rotating green = Drive activity</p> <p>Off = No drive activity</p>
3	Drive status LED	<p>Solid green = The drive is a member of one or more logical drives.</p> <p>Flashing green = The drive is rebuilding or performing a RAID migration, stripe size migration, capacity expansion, or logical drive extension, or is erasing.</p> <p>Flashing amber/green = The drive is a member of one or more logical drives and predicts the drive will fail.</p> <p>Flashing amber = The drive is not configured and predicts the drive will fail.</p> <p>Solid amber = The drive has failed.</p> <p>Off = The drive is not configured by a RAID controller.</p>
4	Do not remove LED	<p>Solid white = Do not remove the drive. Removing the drive causes one or more of the logical drives to fail.</p> <p>Off = The drive can be removed. Removing the drive does not cause a logical drive to fail.</p>
5	Do not remove button	Press to open the release lever.

¹ The blue locate LED is behind the release lever and is visible when illuminated.

NVMe drive components and LEDs



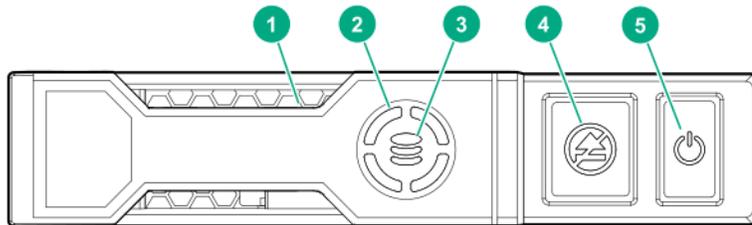
Item	Description
1	Release lever
2	Activity ring
3	Do Not Remove LED ¹
4	Request to Remove NVMe Drive button

¹Do not remove an NVMe SSD from the drive bay while the Do Not Remove button LED is flashing. The Do Not Remove button LED flashes to indicate 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.

Smart Carrier NVMe (SCN) drive LED definitions

The NVMe drive 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 drive 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 drive before the device has completed and ceased signal/traffic flow can cause loss of data.



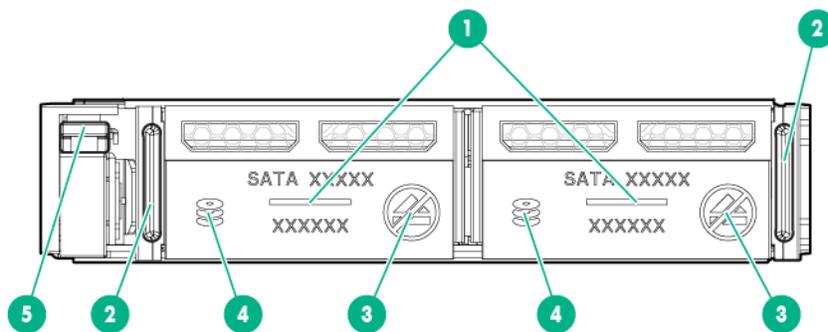
Item	LED	Status	Definition
1	Locate	Solid blue	The drive is being identified by a host application.
		Flashing blue	The drive carrier firmware is being updated or requires an update.
2	Activity ring	Rotating green	Drive activity
		Off	No drive activity
3	Drive status	Solid green	The drive is a member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

Table Continued



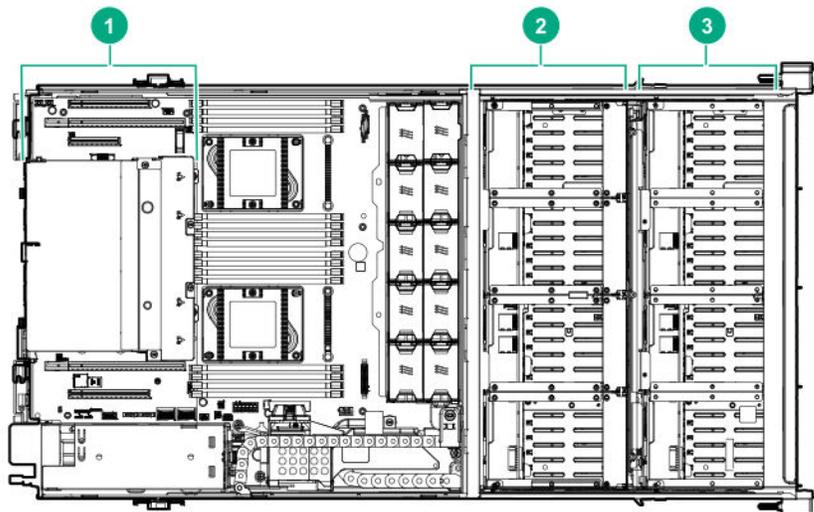
Item	LED	Status	Definition
		Flashing green	The drive is doing one of the following: <ul style="list-style-type: none"> Rebuilding Performing a RAID migration Performing a stripe size migration Performing a capacity expansion Performing a logical drive extension Erasing
		Flashing amber/ green	The drive 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.

SFF flash adapter components and LED definitions



Item	Component	Description
1	Locate	<ul style="list-style-type: none"> Off—Norma Solid blue—The drive is being identified by a host application. Flashing blue—The drive firmware is being updated or requires an update.
2	uFF drive ejection latch	Removes the uFF drive when released.
3	Do not remove LED	<ul style="list-style-type: none"> Off—O to remove the drive. Removing the drive does not cause a logical drive to fail. Solid white—Do not remove the drive. Removing the drive causes one or more of the logical drives to fail.
4	Drive status LED	<ul style="list-style-type: none"> Off—Th drive is not configured by a RAID controller or a spare drive. Solid green—The drive is a member of one or more logical drives. Flashing green (4 Hz)—The drive is operating normally and has activity. Flashing green (1 Hz)—The drive is rebuilding, erasing, or performing a RAID migration, stripe size migration, capacity expansion, logical drive extension, or spare activation. Flashing amber/green (1 Hz)—The drive is a member of one or more logical drives that predicts the drive will fail. Solid amber—The drive has failed. Flashing amber (1 Hz)—The drive is not configured and predicts the drive will fail.
5	Adapter ejection release latch and handle	Removes the SFF flash adapter when released.

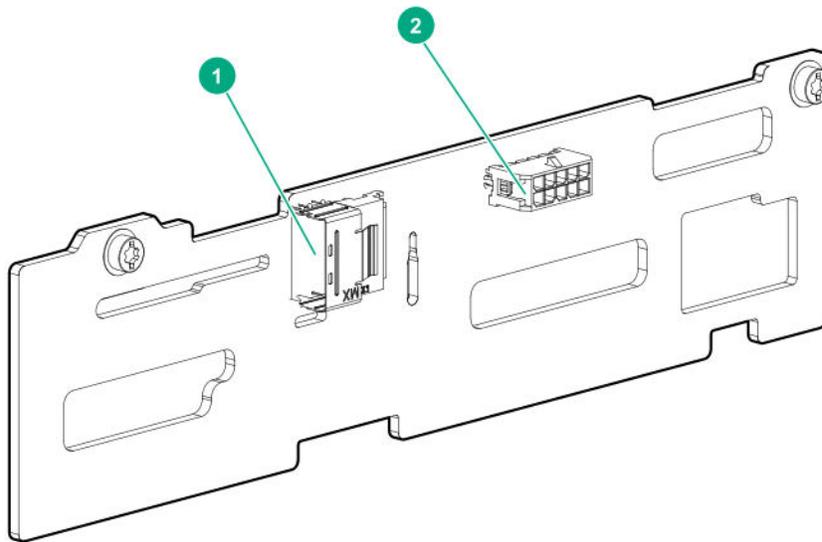
Drive cage identification



Item	Description
1	Rear drive cage (LFF, SFF, NVMe, or uFF)
2	Internal drive cage
3	Front drive cage

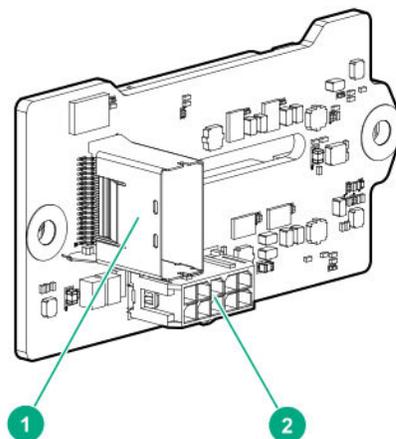
Drive cage backplane identification

4LFF rear drive cage backplane



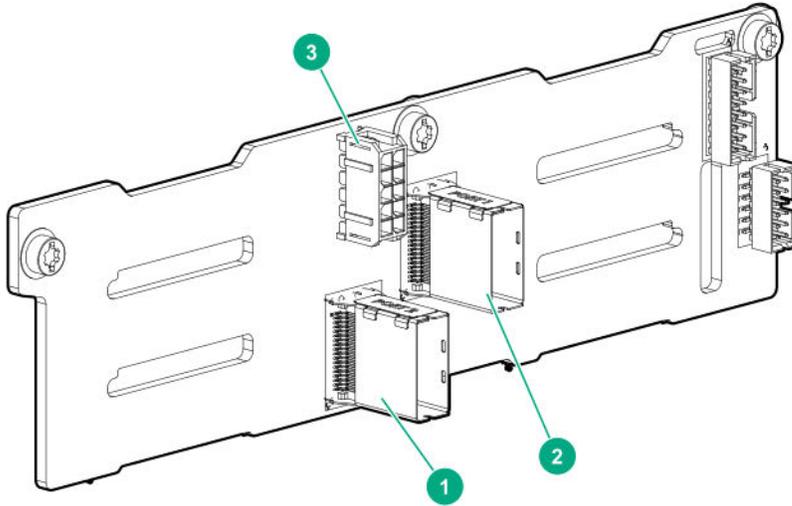
Item	Description
1	x4 Mini SAS connector
2	Power input connector

2SFF rear drive cage backplane



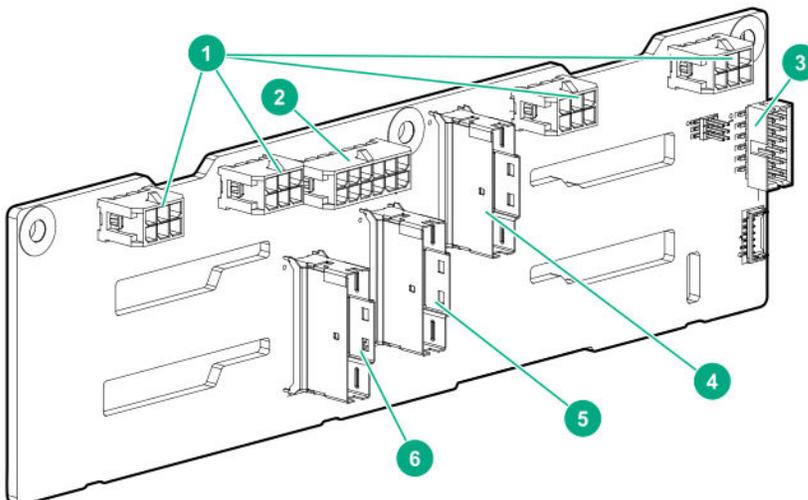
Item	Description
1	x4 Mini SAS connector
2	Power input connector

Six-bay SFF rear drive cage backplane (SAS, SATA)



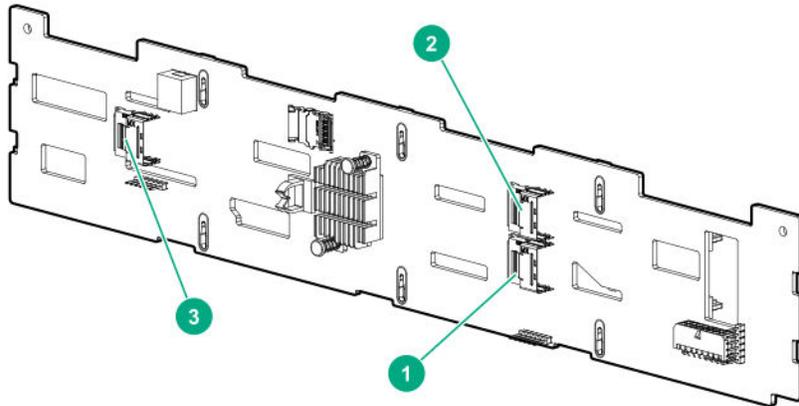
Item	Description
1	P2 connector
2	P1 connector
3	Power input connector

Six-bay SFF NVMe rear drive cage backplane



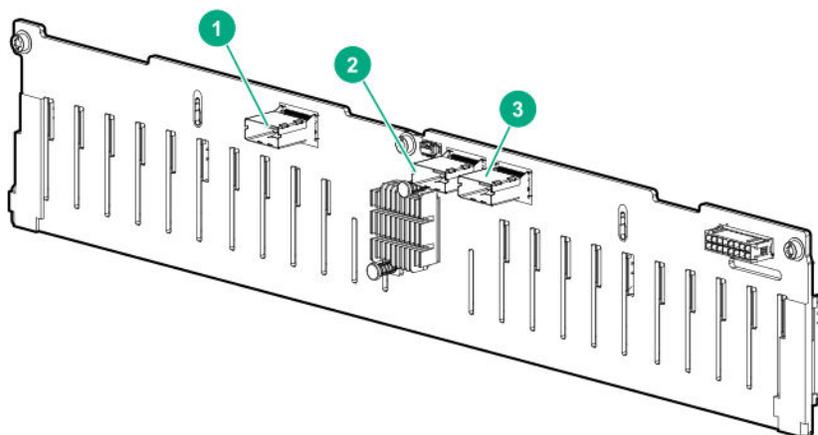
Item	Description
1	Fan connectors
2	Power cable connector
3	Backplane sideband cable connector
4	NVMe port 1 connector
5	NVMe port 2 connector
6	NVMe port 3 connector

Front and internal LFF drive cage backplane



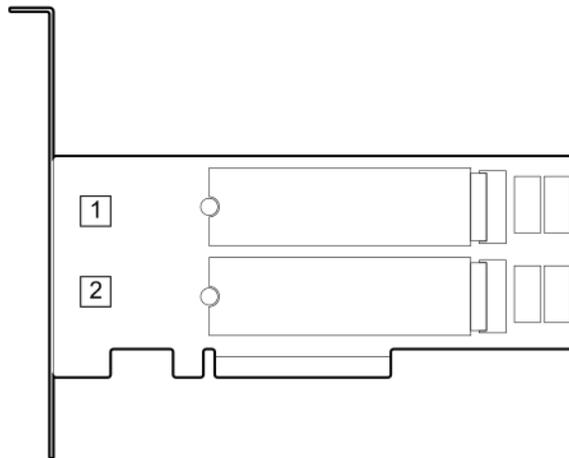
Item	Front drive cage backplane	Internal drive cage backplane
1	P1 connector	P1 connector
2	P2 connector	P2 connector
3	P3 connector (reserved)	P3 connector

Front and internal SFF drive cage backplane



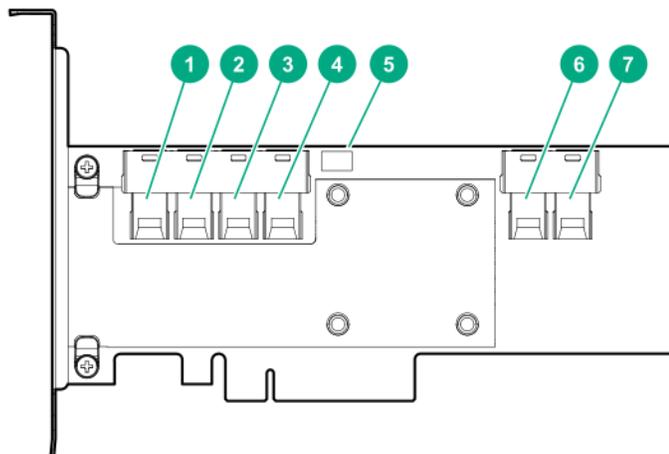
Item	Front drive cage backplane	Internal drive cage backplane
1	P3 connector (reserved)	P3 connector
2	P1 connector	P1 connector
3	P2 connector	P2 connector

M.2 SSD slot numbering



Item	Description
1	M.2 slot 1, port 1i
2	M.2 slot 2, port 2i

HPE Smart Array P824i-p MR Gen10 Controller



Components

Item	Description
1	Internal SAS port 1i
2	Internal SAS port 2i
3	Internal SAS port 3i
4	Internal SAS port 4i
5	Controller backup power cable connector
6	Internal SAS port 5i
7	Internal SAS port 6i

HPE InfiniBand HDR/Ethernet 940QSFP 56x16 adapter LEDs



Link LED status ¹	Description
Off	A link has not been established.
Solid amber	Active physical link exists
Blinking amber	4 Hz blinking amber indicates a problem with the physical link.
Solid green	A valid logical (data activity) link exists with no active traffic
Blinking green	A valid logical link exists with active traffic

¹ 2-port adapter LEDs are shown. The 1-port adapters have only a single LED.



DSC-25 2-port SFP28 card ports and LEDs

Ports

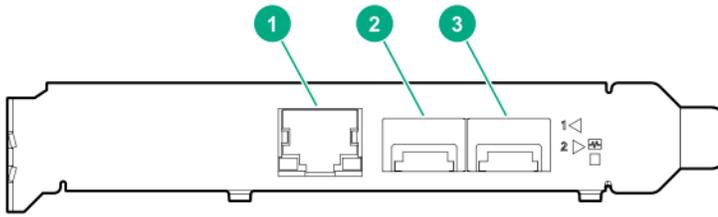


Table 1: Ports

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

LEDs

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

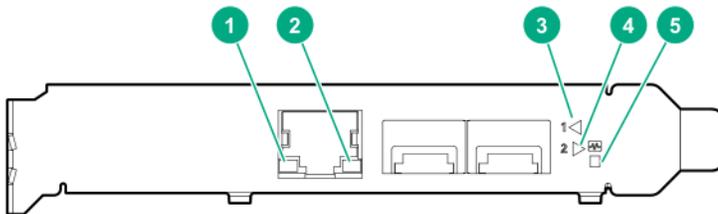


Table 2: LED indicators

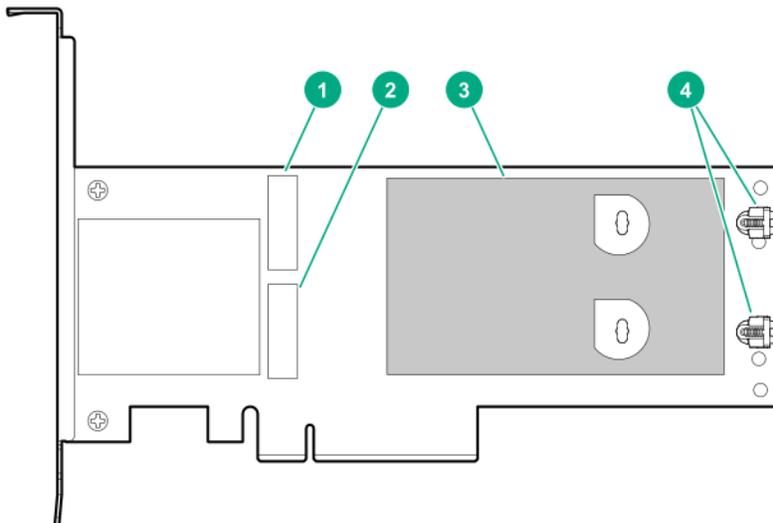
Item	LED	Status	Description
1	Management Port Activity LED	Off	No activity
		Flashing	Passing traffic flashing frequency indicates traffic intensity
2	Management Port Link LED	Off	A link has not been established
		Solid green	Valid Ethernet link

Table Continued



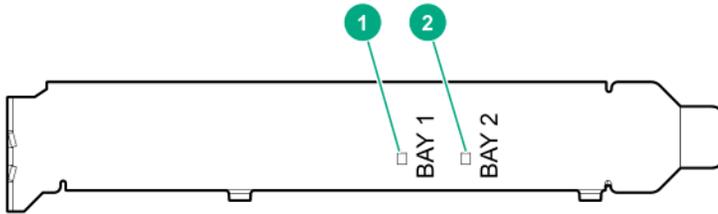
Item	LED	Status	Description
3	SFP Port 1 Link/Activity LED	Off	A link has not been established
		Solid green	Valid Ethernet link
		Flashing green	Passing traffic flashing frequency indicates traffic intensity
		Solid amber	Link fault
4	SFP Port 2 Link/Activity LED	Off	A link has not been established
		Solid green	Valid Ethernet link
		Flashing green	Passing traffic flashing frequency indicates traffic intensity
		Solid amber	Link fault
5	System status LED	Off	System is not powered
		Solid amber	Power is up, software has not booted yet
		Solid green	System is up and fully operational

HPE NS204i-p NVMe OS Boot Device components



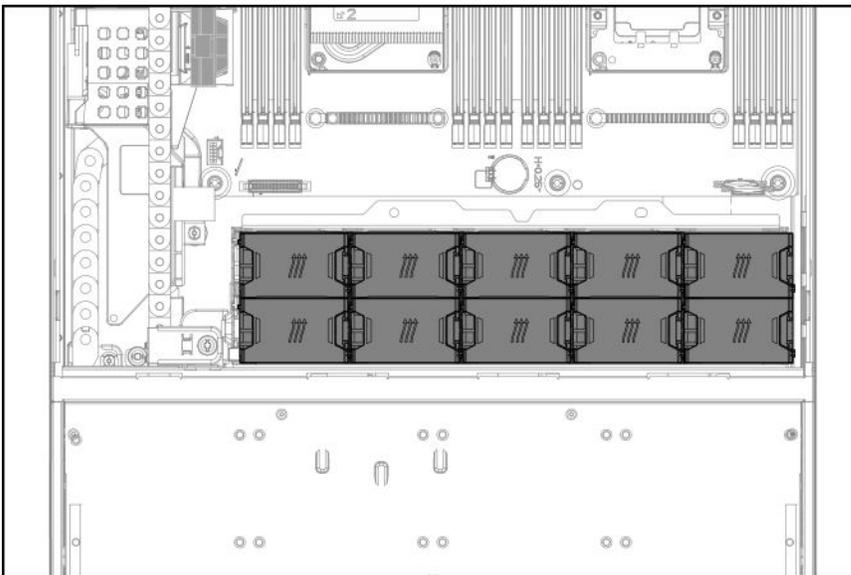
Item	Description
1	Drive bay 1
2	Drive bay 2
3	Thermal interface pad with removable liner
4	M.2 drive retaining latches

HPE NS204i-p NVMe OS Boot Device LED definitions



Item	Description	Fault LED status
1	Bay 1 LED	Off Normal
2	Bay 2 LED	Flashing 1Hz: Drive predictive failure Amber: Drive failure

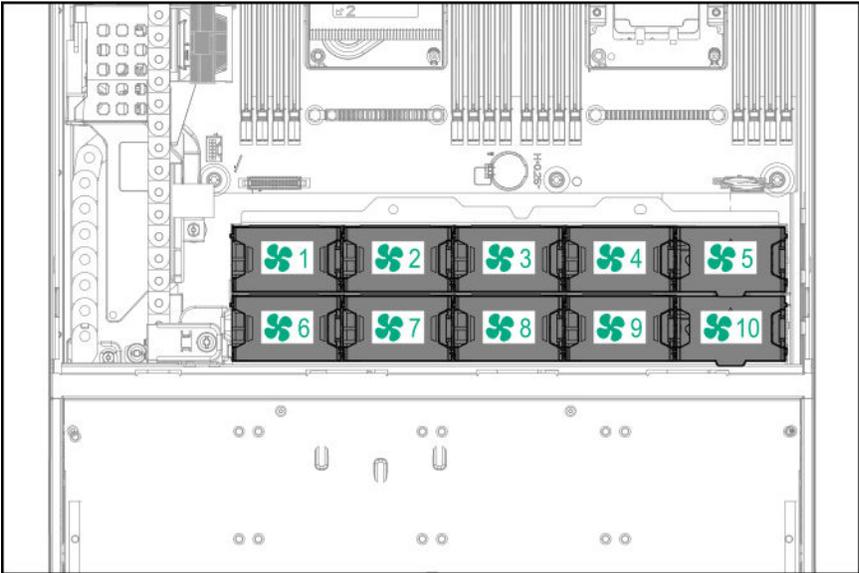
Fan locations



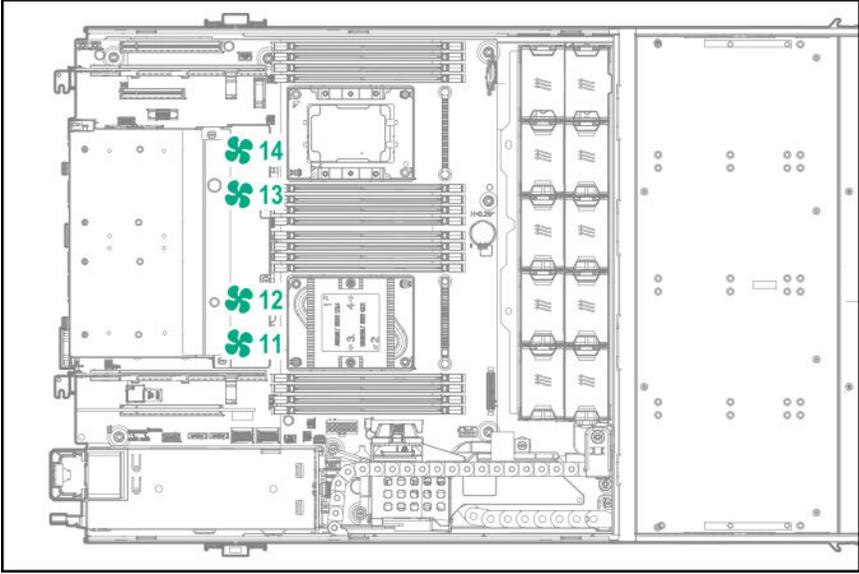
Fan numbering

System fan numbering





NVMe rear drive cage fan numbering



Operations

Power down the system

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

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

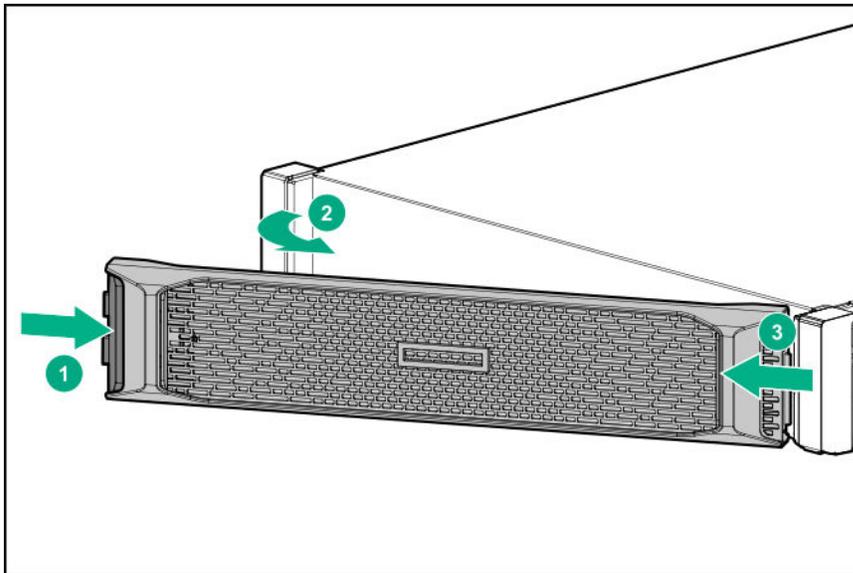
To power down the system, use one of the following methods:

- Press and release the Power On/Standby button.
This method initiates a controlled shutdown of applications and the OS before the system enters standby mode.
- Press and hold the Power On/Standby button for more than 4 seconds to force the system to enter standby mode.
This method forces the system 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 system enters standby mode.

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

Remove the bezel

To access the front panel components, unlock and then remove the bezel.



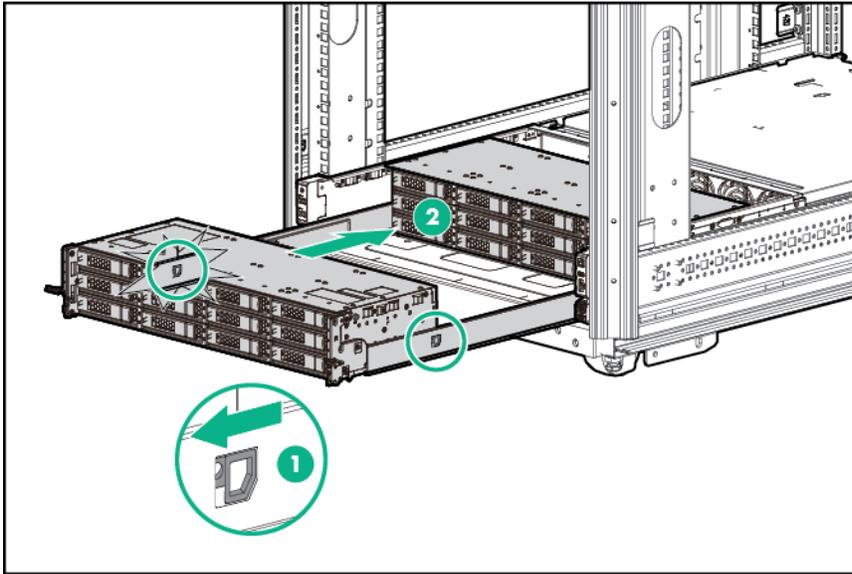
Extend the front drive cages out of the chassis

The front drive cages are secured to the chassis by shipping screws upon product delivery. The location and number of these shipping screws depend on how the system was shipped during product delivery. All installed shipping screws will be indicated by a removable label. Remove these shipping screws before extending the front drive cages for the first time.



Slide the front drive cages into the chassis

After installation or maintenance, pull and hold the front drive cage rail release latches, and then slide the drive cages back into the chassis.



Removing a drive

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

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.

CAUTION: Do not operate the system for long periods with the front drive cages extended. When the front drive cages are extended while the system is powered on, monitor the status of the front drive temp sensor (O8-HD Max) in iLO. If the iLO temp sensor (O8-HD Max) reading is reporting an N/A value, monitor how long the drive cages have been out of the chassis. Before reaching the 110 second mark, slide the drive cages back into the chassis and keep them there for at least 300 seconds before extending them again.

Failure to observe this caution will result in improper airflow and insufficient cooling that can lead to thermal damage.

CAUTION: Do not operate the system with any of the front or rear drive cage bays empty. To maintain proper airflow and sufficient cooling, all drive bays in the front and rear cage must have a drive or a drive blank.

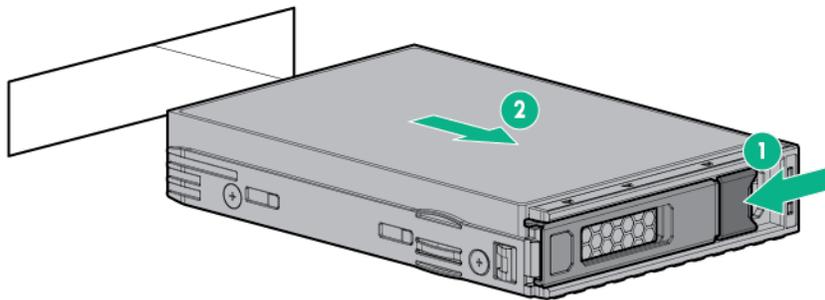
Procedure

1. Back up all system data.
2. Do one of the following:

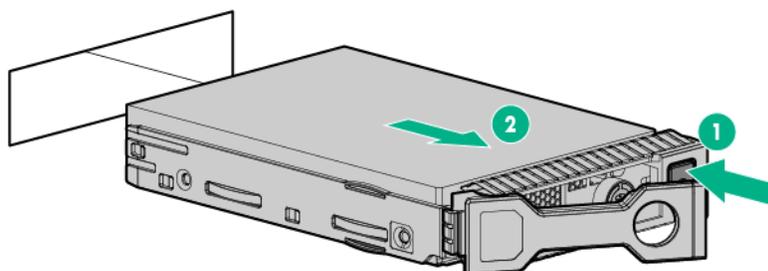
- If removing a drive from the front drive cage and the security bezel is installed, remove the bezel (**Remove the bezel**).
- If removing a drive from the internal drive cage, extend the front and internal drive cages out of the chassis (**Extend the front drive cages out of the chassis**).
- If removing a drive from the rear drive cage, access the product rear panel.

3. Depending on the type of drive in the cage, do one of the following:

- Remove an LFF drive:
 - a. Determine the status of the drive from the low profile LFF drive LEDs (**Low-profile LFF drive LED definitions**).
 - b. Wait until the Online/Activity LED stops flashing.
 - c. To open the release lever, press the latch.
 - d. Pull the release lever to disengage the drive from the backplane, and then slide the drive out of the bay.



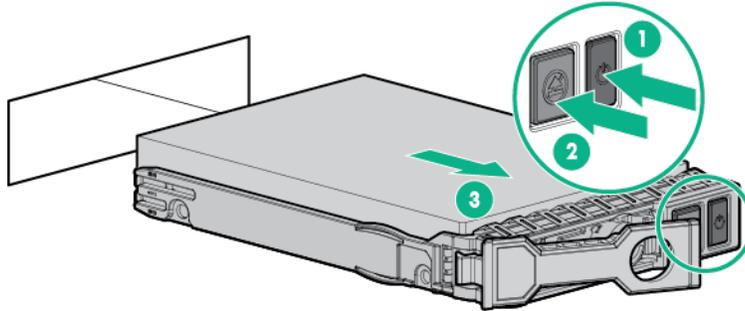
- Remove an SFF drive:
 - a. Determine the status of the drive from the SFF LEDs (**SFF drive components and LEDs**).
 - b. Wait until the icon in the Do Not Remove button stops flashing and is no longer illuminated.
 - c. Press the Do Not Remove button to open the release lever.
 - d. Pull the release lever to disengage the drive from the backplane, and then slide the drive out of the bay.



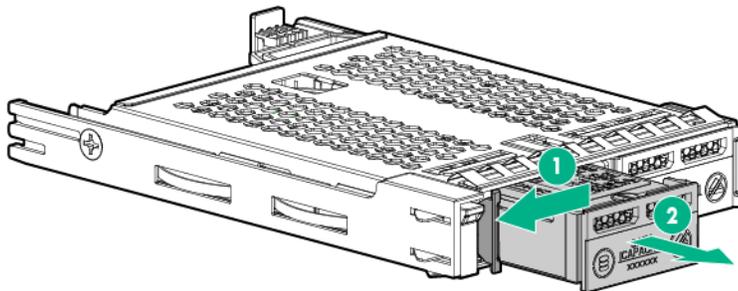
- Remove an NVMe drive (rear drive cage only):



- a. Determine the status of the drive from the NVMe LEDs (**NVMe drive components and LEDs**).
- b. Press the power button.
The Do Not Remove button illuminates and flashes.
- c. When the Do Not Remove button stops flashing and the icon on the button is no longer illuminated, press the Do Not Remove button to release the release lever.
- d. Pull the release lever to disengage the drive from the backplane, and slide the drive out of the drive bay.



- Remove a uFF drive
 - a. Observe the LED status of the drive and determine if it can be removed (**SFF flash adapter components and LED definitions**).
 - b. Remove the drive.



Remove the system from the rack



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



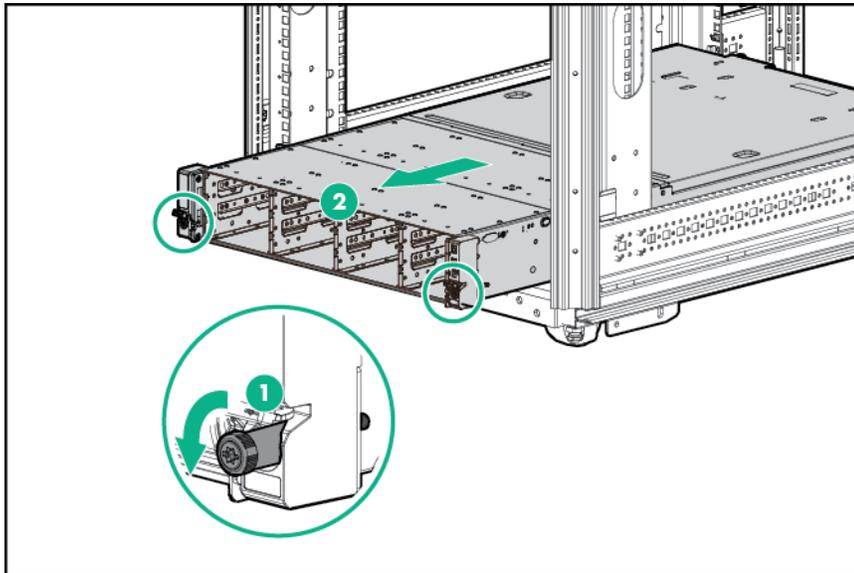


WARNING: To reduce the risk of personal injury or damage to the equipment, be sure that:

- The rack is bolted to the floor using the concrete anchor kit.
- The leveling feet extend to the floor.
- The full weight of the rack rests on the leveling feet.
- The racks are coupled together in multiple rack installations.
- Only one component is extended at a time. If more than one component is extended, a rack might become unstable.

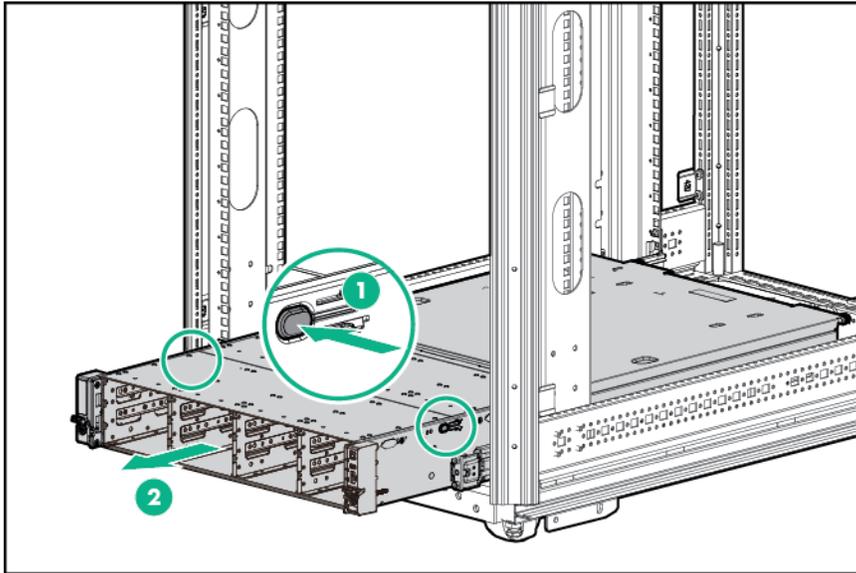
Procedure

1. Back up all system data.
2. Power down the system (**Power down the system**).
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the system.
4. Disconnect all peripheral cables from the system.
5. Remove the system from the rack:
 - a. Loosen the rack ear thumbscrews.
 - b. Pull the thumbscrews to extend the system out of the rack until the rack rail lock is engaged.



- c. Press the system release latches, and then slide the system out of the rack.





6. Place the system on a flat, level surface.

Remove the access panel

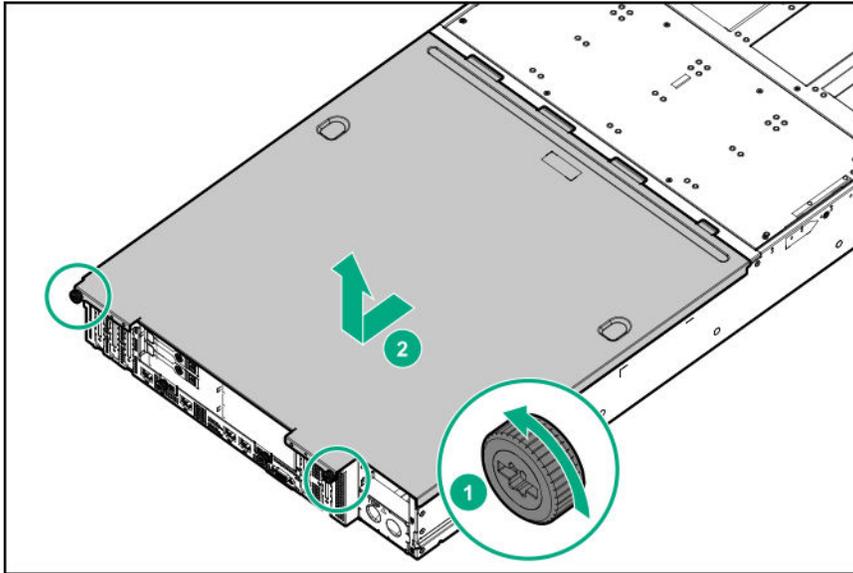


WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives, power supplies, and internal system components to cool before touching them.

Procedure

1. Power down the system (**Power down the system**).
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the system.
3. Remove the system from the rack (**Remove the system from the rack**).
4. Place the system on a flat, level work surface.
5. Remove the access panel.

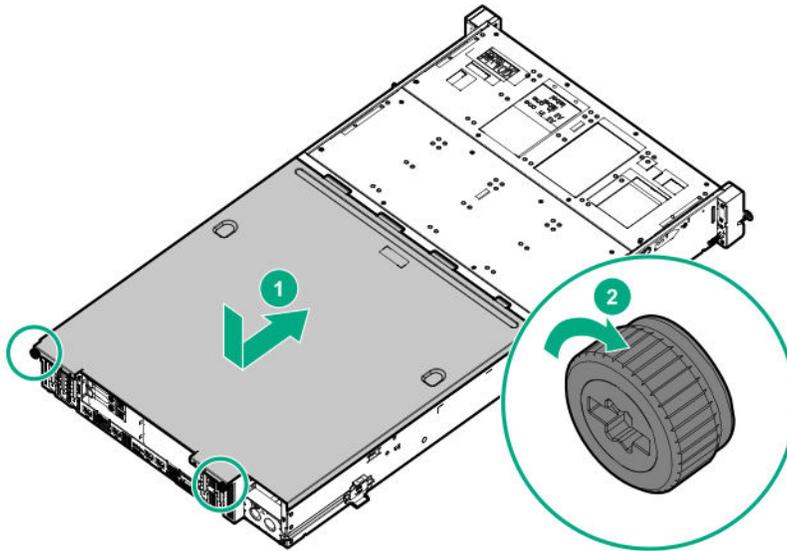




Install the access panel

Procedure

1. Place the access panel on top of the system, and then insert the tabs into the corresponding slots on the system.
2. Tighten the access panel screws.



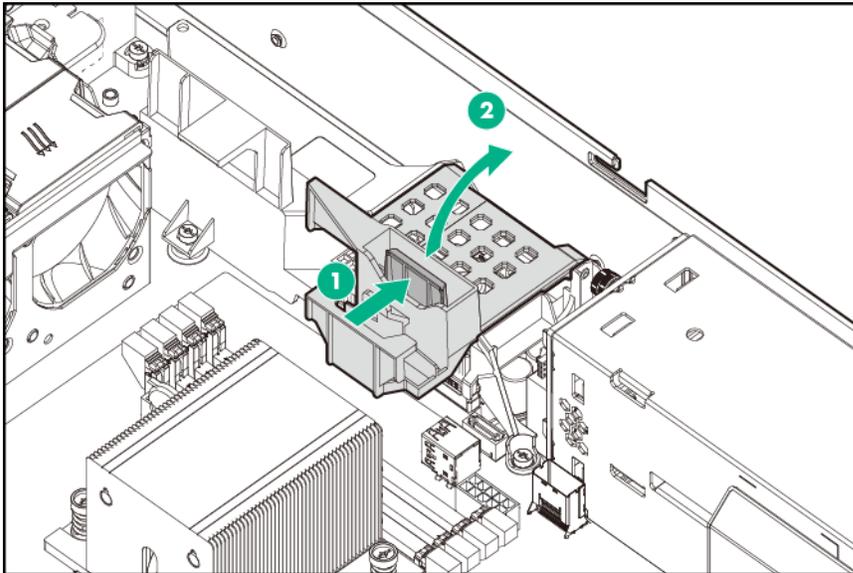
Open the cable management holder

Procedure

1. Power down the system (**Power down the system**).
2. Remove all power:



- a. Disconnect each power cord from the power source.
- b. Disconnect each power cord from the system.
3. Remove the system from the rack (**Remove the system from the rack**).
4. Place the system on a flat, level work surface.
5. Remove the access panel (**Remove the access panel**).
6. Extend the front drive cages out of the chassis (**Extend the front drive cages out of the chassis**).
7. Press and hold the cable management holder release latch, and then open the holder.



8. Remove the cables from the cable management holder.

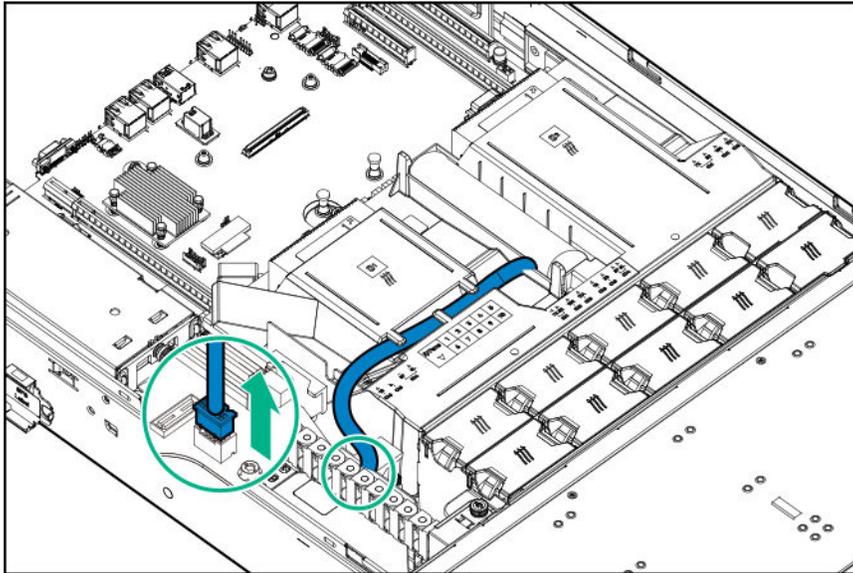
Remove the HPE Smart Storage Battery

NOTE: System ROM and firmware messages might display "energy pack" in place of "Smart Storage Battery." Energy pack refers to both HPE Smart Storage batteries and HPE Smart Storage Hybrid capacitors.

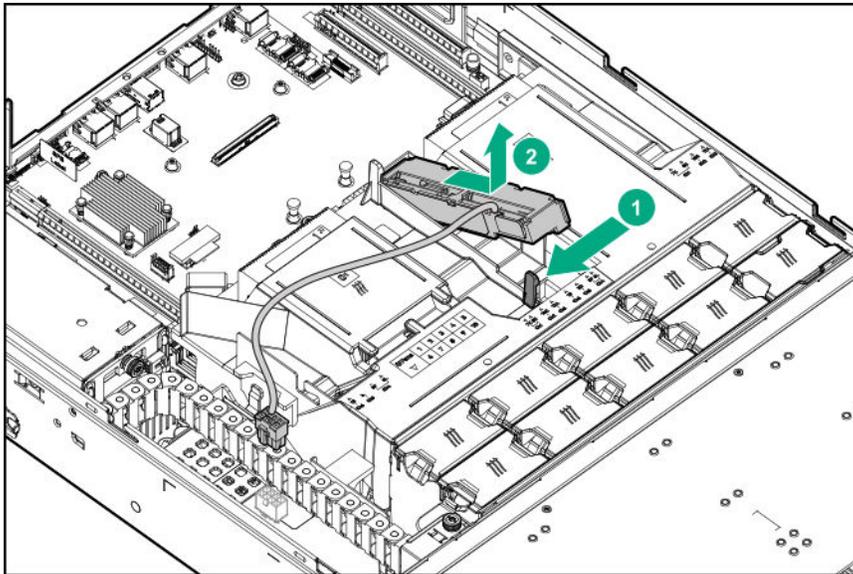
Procedure

1. Power down the system (**Power down the system**).
2. Remove the system from the rack (**Remove the system from the rack**).
3. Place the system on a flat, level work surface.
4. Remove the access panel (**Remove the access panel**).
5. Extend the front drive cages out of the chassis (**Extend the front drive cages out of the chassis**).
6. Open the cable management holder, and then remove the cables from the cable management holder (**Open the cable management holder**).
7. Disconnect the cable from the system board.





8. Remove the cable from the air baffle clips, then remove the HPE Smart Storage Battery from the air baffle



Remove the air baffle

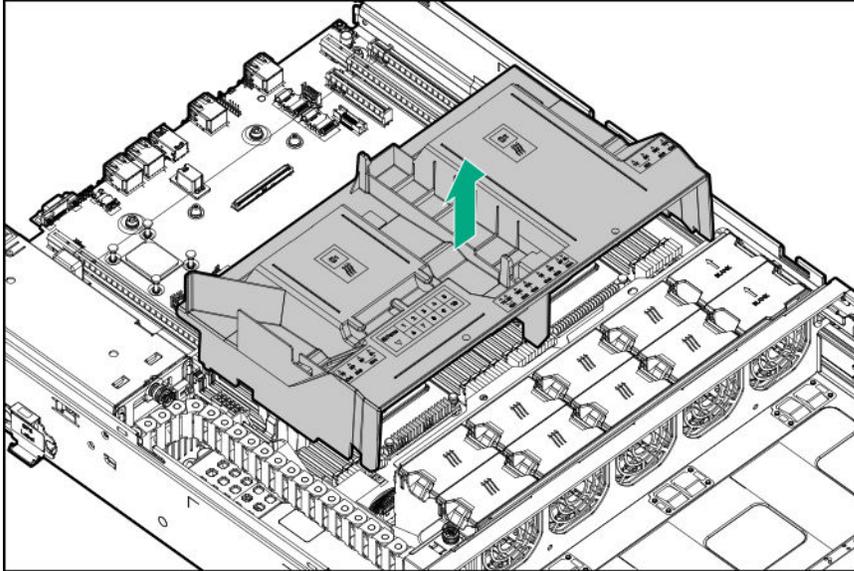
Procedure

1. Power down the system (**Power down the system**).
2. Remove the system from the rack (**Remove the system from the rack**).
3. Place the system on a flat, level work surface.
4. Remove the access panel (**Remove the access panel**).
5. Open the cable management holder, and then remove the cables from the cable management holder (**Open the cable management holder**).



6. Remove the HPE Smart Storage Battery if it is installed on the air baffl (**Remove the HPE Smart Storage Battery**).

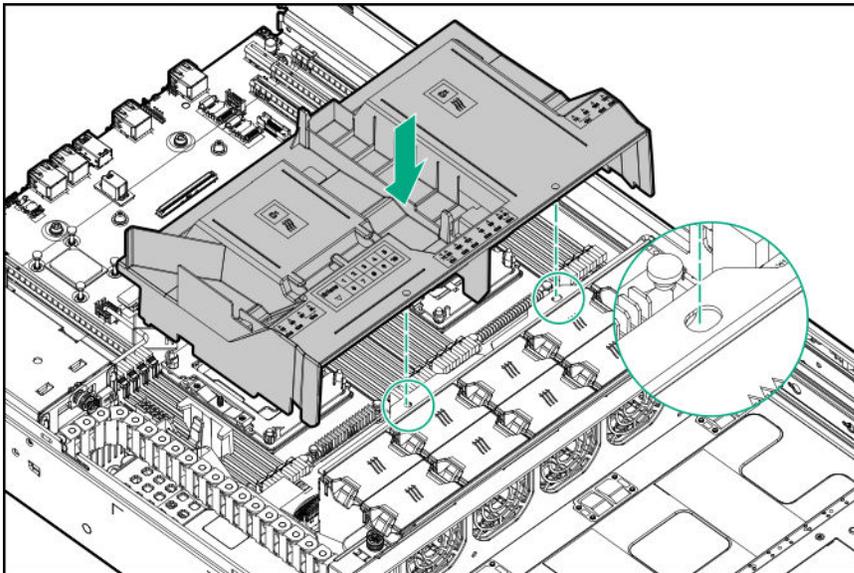
7. Remove the air baffl



Install the air baffl

Procedure

1. Insert the guide pins on the front edge of the air baffl into the holes located on the rear edge of the fan cage.



2. If applicable, reinstall the HPE Smart Storage Battery on the air baffl (**Installing the HPE Smart Storage Battery**).

3. Install the access panel (**Install the access panel**).

4. Install the system into the rack (**Installing the system into the rack**).

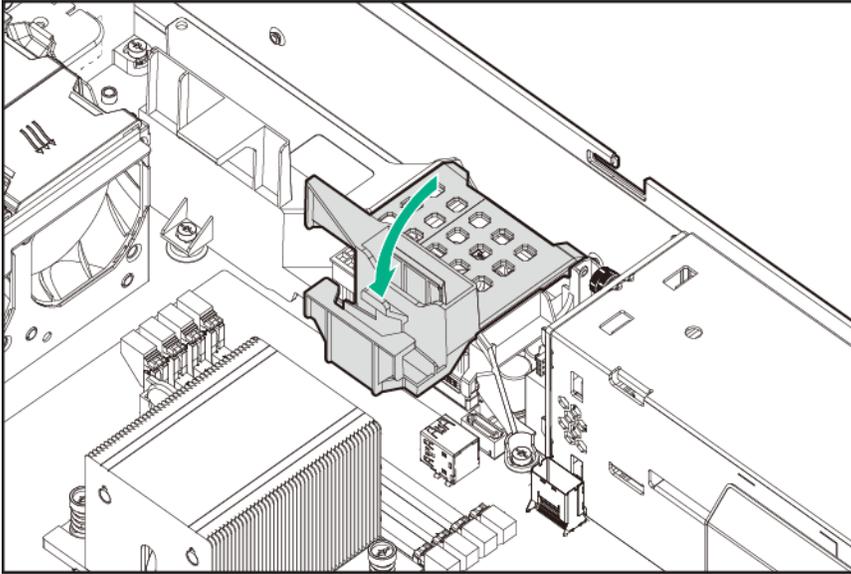
5. Power up the system (**Power up the system**).



Close the cable management holder

Procedure

1. Secure all system cables in the cable management holder, and then connect them to the system board or controller board.
2. Return the cable management holder to its original position.



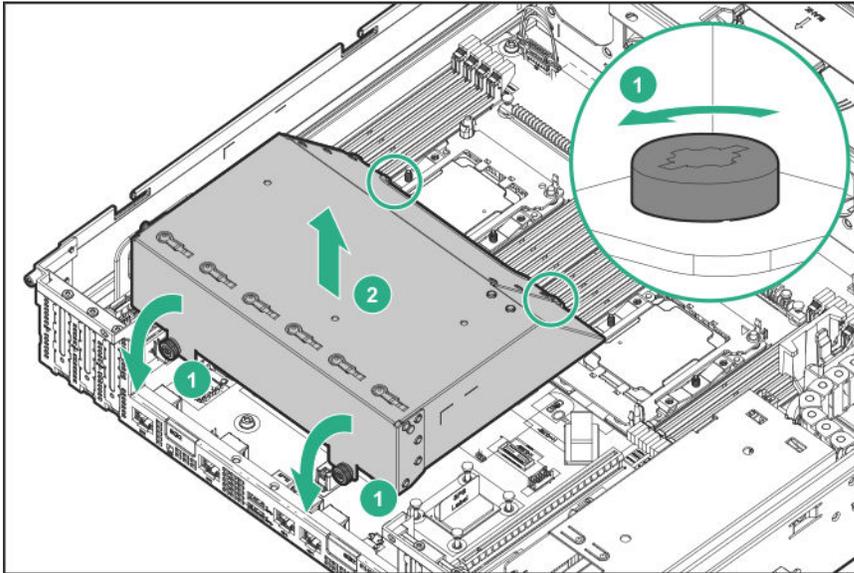
3. Install the air baffl (Install the air baffl).

Remove the rear drive cage blank

Procedure

1. Power down the system (**Power down the system**).
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the system.
3. Remove the system from the rack (**Remove the system from the rack**).
4. Place the system on a flat, level work surface.
5. Remove the access panel (**Remove the access panel**).
6. Remove the rear drive cage blank.





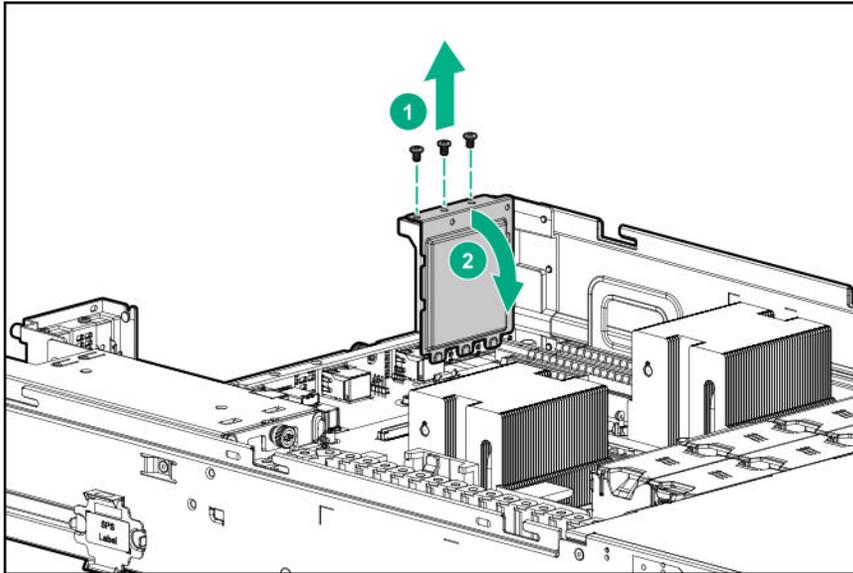
Remove the air blocker from PCIe expansion slots 5–7

The PCIe expansion slots 5–7 are associated with processor 2. To enable expansion board installation in these slots, remove the slot cover air blocker.

Procedure

1. Power down the system (**Power down the system**).
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the system.
3. Remove the system from the rack (**Remove the system from the rack**).
4. Place the system on a flat, level work surface.
5. Remove the access panel (**Remove the access panel**).
6. Remove the air blocker from the system.





Remove the PCIe riser cage

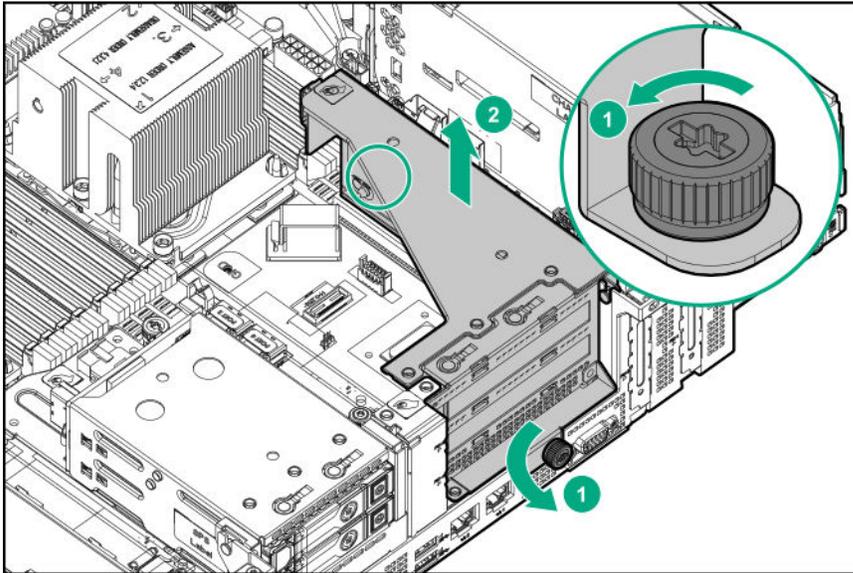
⚠ WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

⚠ 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.

Procedure

1. Power down the system (**Power down the system**).
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the system.
3. Remove the system from the rack (**Remove the system from the rack**).
4. Place the system on a flat, level work surface.
5. Remove the access panel (**Remove the access panel**).
6. If expansion boards with internal cabling are installed in the PCIe riser cage, disconnect all internal cables from the expansion boards to remove the cage from the system.
7. Remove the PCIe riser cage.





Remove a rear drive 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.

⚠ 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.

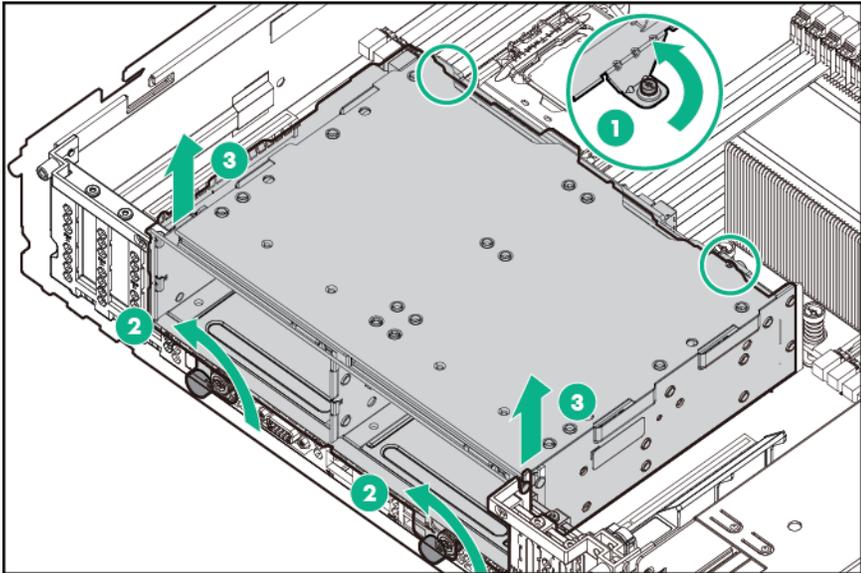
Prerequisites

Before you perform this procedure, make sure that you have the components included with the hardware kit.

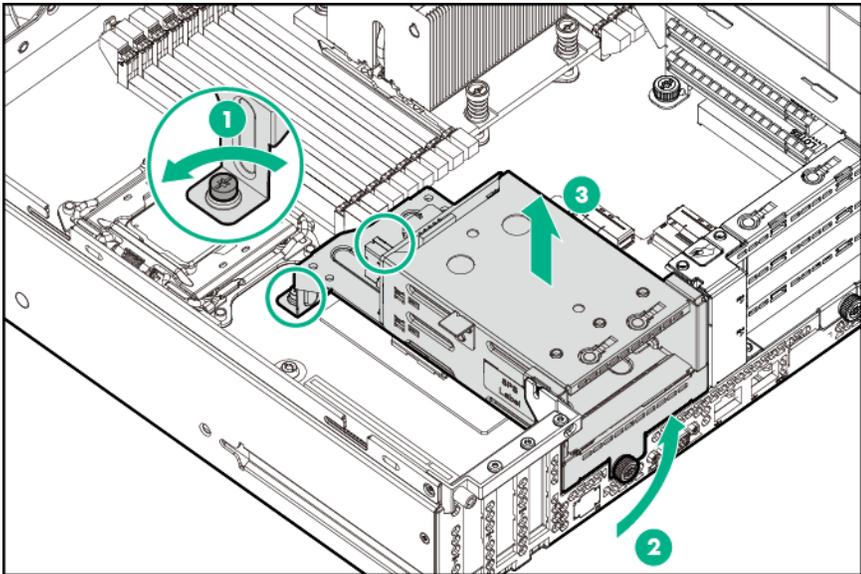
Procedure

1. Power down the system (**Power down the system**).
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the system.
3. Remove the system from the rack (**Remove the system from the rack**).
4. Place the system on a flat, level surface.
5. Remove the access panel (**Remove the access panel**).
6. Disconnect all cables from the drive backplane.
7. Remove the rear drive cage:
 - Four-bay LFF hot-plug rear drive cage removal



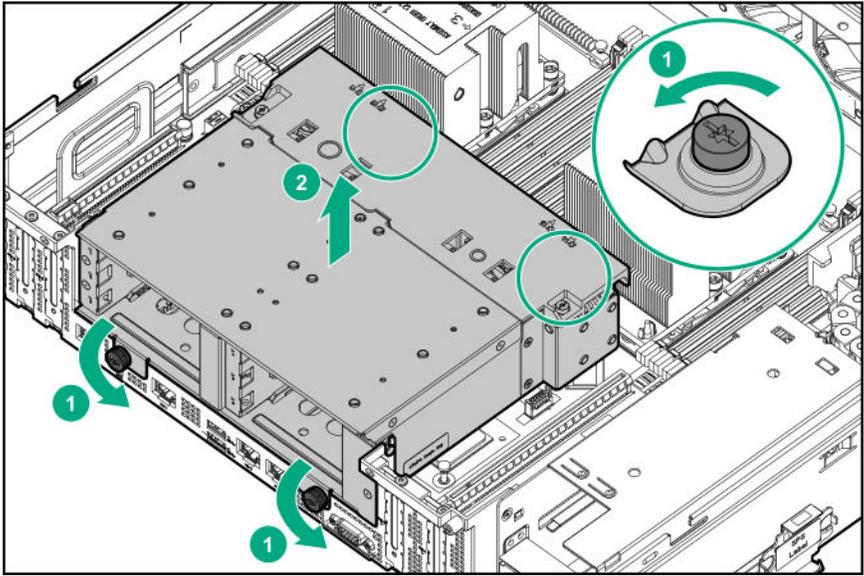


- Two-bay SFF hot-plug rear drive cage removal

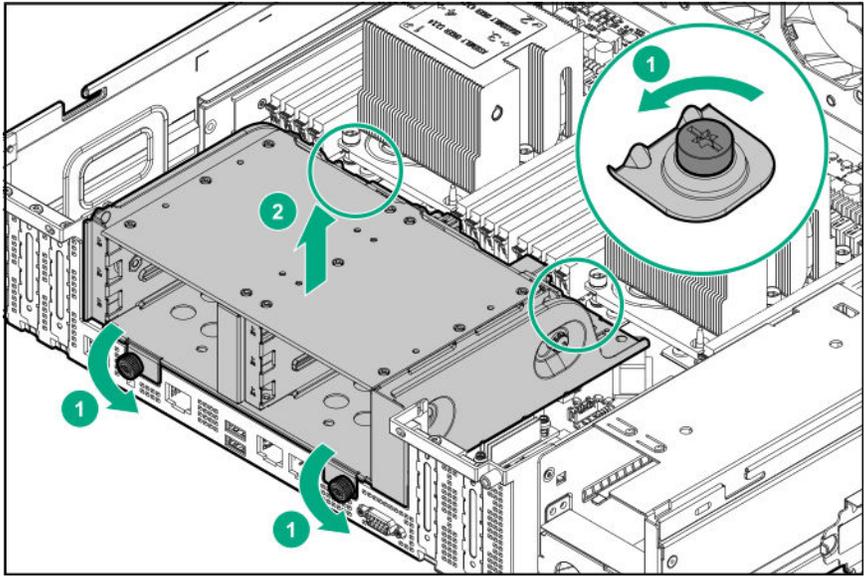


- Six-bay SFF NVMe drive cage removal





- Six-bay SFF rear drive cage (SAS or SATA)



To replace the component, reverse the removal procedure.



Setup

HPE support services

Delivered by experienced, certified engineers, HPE support services help you keep your servers up and running with support packages tailored specifically for HPE ProLiant systems. HPE 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.

HPE 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 HPE support services for hardware, software or both are:

- Foundation Care – Keep systems running.
 - 6-Hour Call-to-Repair
 - 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-Repair
 - 4-Hour 24x7
 - Next Business Day
- Startup and implementation services for both hardware and software
- HPE Education Services – Help train your IT staff

For more information on HPE support services, see the [Hewlett Packard Enterprise website](#).

Set up the system

Prerequisites

Before setting up the system:

- 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 operational requirements for the system:
[Operational requirements](#)
- Read the safety and compliance information on the HPE website:
<http://www.hpe.com/support/safety-compliance-enterpriseproducts>
- Obtain the storage driver if needed:

- Download it from the HPE support center website.
- Extract it from the SPP.

Procedure

Unbox the system

1. Unbox the system and verify the contents:

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

2. (Optional) Install hardware options.

For installation instructions, see "Hardware options installation."

Rack the system

3. Install the system in a rack.

The racking procedures are included with the rack rails.

- a.** Connect devices, cables, and cords to the system.
- b.** Secure cables using the cable management arm.

4. Decide how to manage the system:

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

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

Power on the system

5. Press the Power On/Standby button.



For remote management, use the iLO virtual power button.

Update the firmware

6. Using the SPP, **update the following:**

- System ROM
- Storage controller
- Network adapters

Set up 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 a smart array controller is installed:
 - For smart array SR controllers, 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**.

 **IMPORTANT:** Smart array MR controllers are not supported by Intelligent Provisioning or Smart Storage Administrator.

- For smart array MR controllers, use the UEFI System Configuration to create arrays.
For procedures on creating arrays with MR controllers, see the following guide in the **information library**:
HPE Smart Array P824i-p MR Gen10 User Guide
- 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

! **IMPORTANT:** Before you install an OS on drives connected to the HPE Smart Array P824i-p MR Gen10 Controller, configure the drives using **UEFI System Utilities (F9)**. If the drives are not configured, the OS will not detect the drives during installation. For more information, see *HPE Smart Array P824i-p MR Gen10 User Guide* at the Hewlett Packard Enterprise website <https://www.hpe.com/info/P824i-p-docs>.

8. Do one of the following:

- Run Intelligent Provisioning to deploy an OS.
Press **F10** at the boot screen to run 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 *HPE Intelligent Provisioning User Guide* and online help.

- 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 the boot screen to select the boot device.
 - c. After the OS is installed, **update the drivers**.

9. Register the server (<http://www.hpe.com/info/register>).

Operational requirements

When installing the system in a rack, select a location that meets the environmental standards described in this section.

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 systems 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 system or rack component, the gaps between the components cause changes in airflow through the rack and across the systems. 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 system from power fluctuations and temporary interruptions with a regulating UPS. This device protects the hardware from damage caused by power surges and voltage spikes and keeps the system in operation during a power failure.

When installing more than one system, you might need to use additional power distribution devices to safely provide power to all devices. Observe the following guidelines:

- Balance the power load between available AC supply branch circuits.
- Do not allow the overall system AC current load to exceed 80% of the branch circuit AC current rating.

- Do not use common power outlet strips for this equipment.
- Provide a separate electrical circuit for the system.

For more information on the hot-plug power supply and calculators to determine power consumption in various system configurations, see the Hewlett Packard Enterprise website (<http://www.hpe.com/info/poweradvisor/online>).

Electrical grounding requirements

The system 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 regions, 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 systems connected to the same power source, Hewlett Packard Enterprise recommends the use of a PDU that is either permanently wired to the branch circuit of the building or includes a nondetachable cord that is wired to an industrial-style plug. NEMA locking-style plugs or plugs complying with IEC 60309 are considered suitable for this purpose. Using common power outlet strips for the system is not recommended.

System warnings and cautions



WARNING: This system 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 system installations. A third person may be required to help align the system if the system is installed higher than chest level.
- Use caution when installing the system in or removing the system 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, power supplies, and internal system components to cool before touching them.



WARNING: To reduce the risk of personal injury, electric shock, or damage to the equipment, remove power from the system by removing the power cord. 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.



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

- Do not disassemble, crush, or puncture the energy pack.
- Do not short external contacts.
- Do not dispose of the energy pack in fire or water.

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

AVERTISSEMENT: Pour réduire les risques d'incendie ou de brûlures après le retrait du module batterie :

- N'essayez pas de démonter, d'écraser ou de percer le module batterie.
- Ne court-circuitiez pas ses contacts externes.
- Ne jetez pas le module batterie dans le feu ou dans l'eau.

Après avoir déconnecté l'alimentation, une tension peut subsister dans la batterie durant 1 à 160 secondes.



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



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

Rack warnings and cautions



WARNING: When all components are removed, the system weighs 22.34 kg (49.25 lb). When all components are installed, the system can weigh up to 40.60 kg (89.51 lb).

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



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

- Observe local occupational health and safety requirements and guidelines for manual material handling.
 - Get help to lift and stabilize the product during installation or removal, especially when the product is not fastened to the rails. The system weighs more than 22.34 kg (49.25 lb), so at least two people must lift the system into the rack together. An additional person may be required to help align the system if the system is installed higher than chest level.
 - Use caution when installing the system in or removing the system from the rack.
 - Adequately stabilized the rack before extending a component outside the rack. Extend only one component at a time. A rack may become unstable if more than one component is extended.
 - Do not stack anything on top of rail-mounted component or use it as a work surface when extended from the rack.
-



WARNING: To reduce the risk of personal injury or damage to the equipment, observe the following precautions:

- 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.



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

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



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



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

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



IMPORTANT: The HPE Apollo 4200 Gen10 System cable management arm is not supported on Compaq-branded 7000 series racks.

Remove the shipping screws

The system is secured with shipping hardware during the original product shipment. Remove shipping hardware prior to initial system setup.

Prerequisites

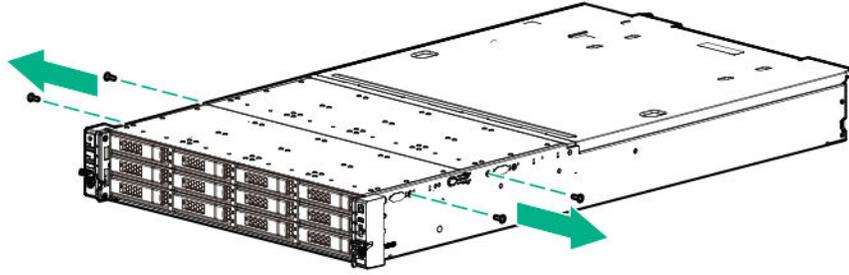
Before you perform this procedure, make sure that you have the following items available:

- The components included with the hardware kit
- Torx T-15 screwdriver

Procedure

1. Carefully remove the system from its packaging.
2. To allow the front drive cages to be extended out of the chassis during system operation, remove the shipping screws.





Keep the shipping screws and the system packaging materials in case there is a need to ship or transport the system at a later date.

Installing hardware options

Install any hardware options before initializing the system. For options installation information, refer to the option documentation. For product-specific information, see **[Hardware options installation](#)**.

Installing the system into the rack

To install the system into a rack with square, round, or threaded holes, refer to the instructions that ship with the rack hardware kit.

If you are installing the system into a telco rack, order the appropriate option kit at the Rack Solutions website (<https://www.hpe.com/us/en/integrated-systems/rack-power-cooling.html>). Follow the system-specific instructions on the website to install the rack brackets.

Use the following information when connecting peripheral cables and power cords to the system.



WARNING: This system 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 system installations. A third person may be required to help align the system if the system is installed higher than chest level.
- Use caution when installing the system in or removing the system from the rack; it is unstable when not fastened to the rails.



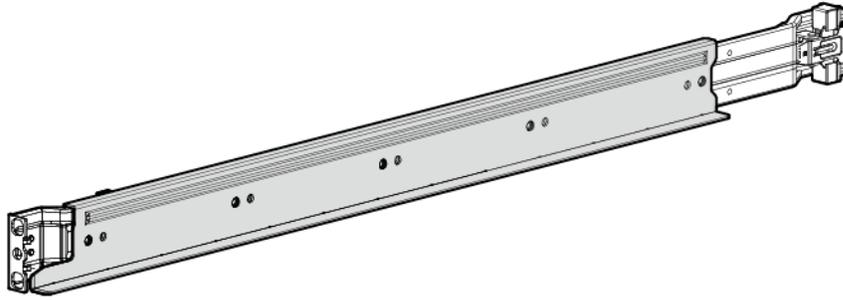
CAUTION: Always plan the rack installation so that the heaviest item is on the bottom of the rack. Install the heaviest item first, and continue to populate the rack from the bottom to the top.

NOTE: Steps 1 and 2 in this section only apply to the first-time installation of the system into the rack.

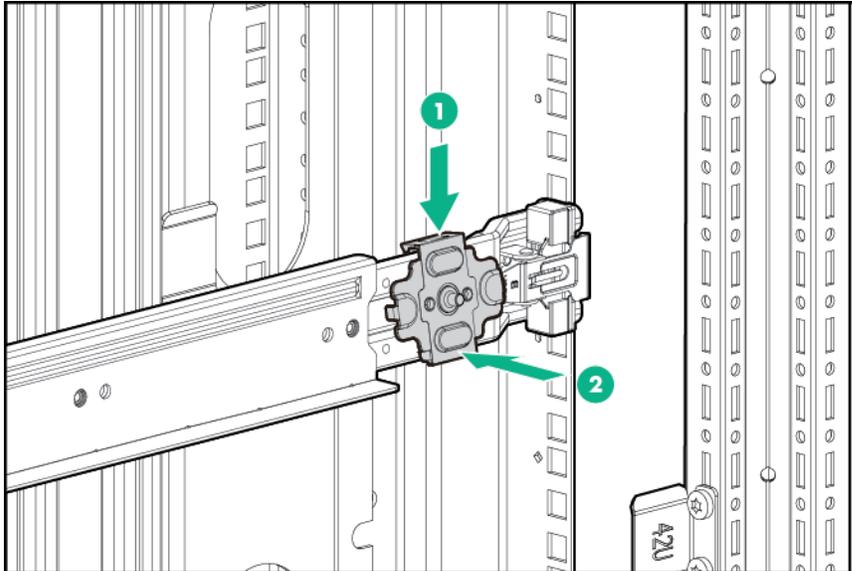
Procedure

1. Install the system rack rail in the rack.
See the documentation that ships with the 2U Shelf-Mount Adjustable Rail Kit.
2. The chassis retention brackets help to stabilize the system when the front drive cages are extended.

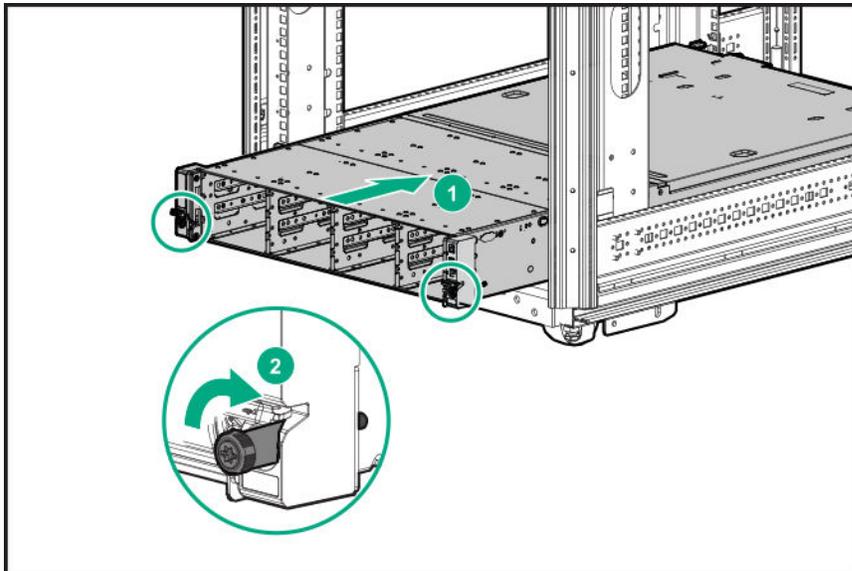
The following illustration shows the rack rail with the shelf portion highlighted in gray.



Install the chassis retention brackets on the non-shelf portion of the rack rail.

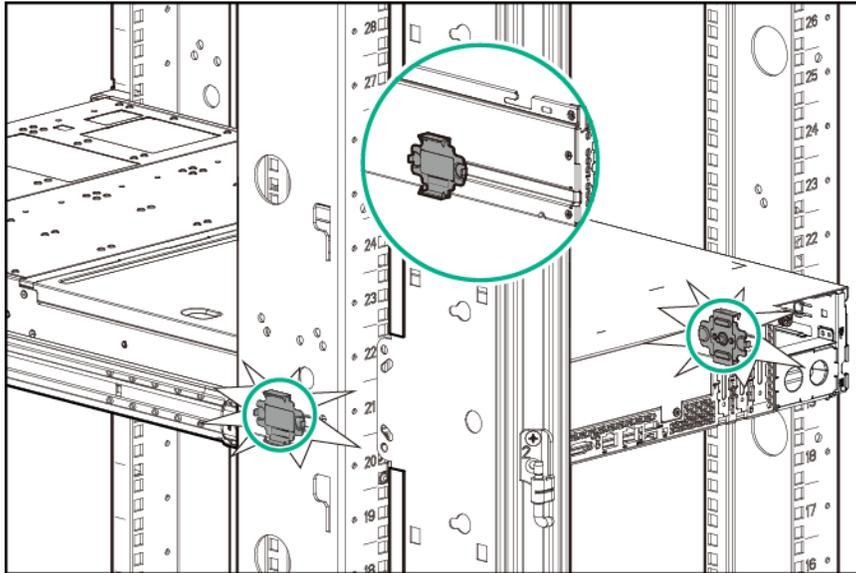


3. Install the system into the rack.
4. Tighten the rack ear thumbscrews.



5. Make sure the pins on the chassis retention brackets slot into the notches located on both sides of the chassis.



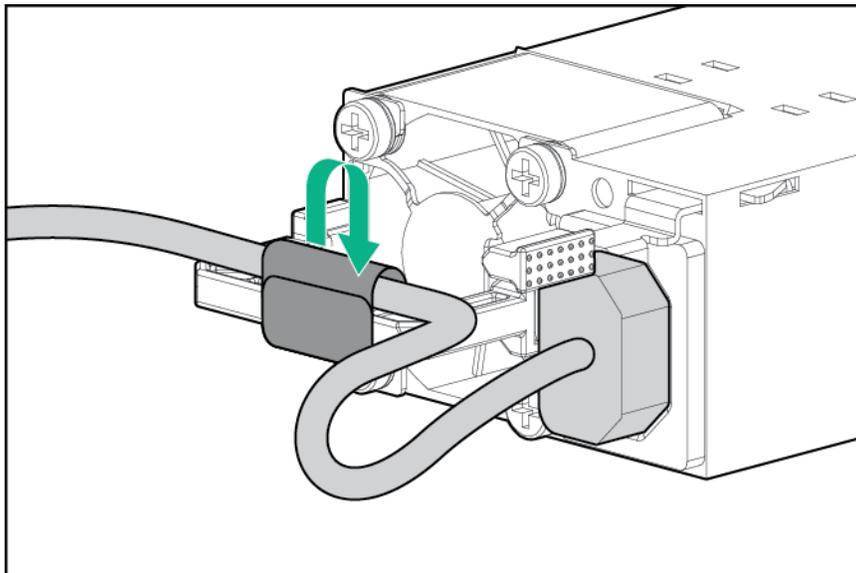


6. Install the drives in the front drive cages.
7. Optional: Install the security bezel.
8. Optional: Install the drives in the rear drive cage.



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.

9. Connect peripheral devices to the system.
For information on identifying connectors, see **Rear panel components**.
10. Install the power supply.
11. To prevent accidental power cord disconnection when sliding the system in and out of the rack, secure the power cord in the strain relief strap attached to the power supply handle.



12. Connect the power cord to the 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 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 system.
-

Power up the system

To power up the system, press the Power On/Standby button.

Installing the operating system

To operate properly, the server must have a supported operating system. For the latest information on operating system support, see the Hewlett Packard Enterprise website (<https://www.hpe.com/us/en/servers/server-operating-systems.html>).



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 *HPE Intelligent Provisioning User Guide* and online help.

For additional system software and firmware updates, download the Service Pack for ProLiant from the Hewlett Packard Enterprise website (<http://www.hpe.com/servers/spp/download>). 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 on using these installation methods, see the Hewlett Packard Enterprise website (<https://www.hpe.com/us/en/servers/integrated-lights-out-ilo.html>).

Selecting boot options in UEFI Boot Mode

On servers operating in UEFI Boot Mode, the boot controller and boot order are set automatically.

Procedure

1. Press the Power On/Standby button.
2. During the initial boot:
 - To modify the server configuration ROM default settings, press the **F9** key in the ProLiant POST screen to enter the UEFI System Utilities screen. By default, the System Utilities menus are in the English language.
 - If you do not need to modify the server configuration and are ready to install the system software, press the **F10** key to access Intelligent Provisioning.

For more information on automatic configuration, see the UEFI documentation on the [Hewlett Packard Enterprise website](#).



Registering the server

To experience quicker service and more efficient support, register the product at the [Hewlett Packard Enterprise Product Registration website](#).



Hardware options installation

Product QuickSpecs

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

Introduction

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

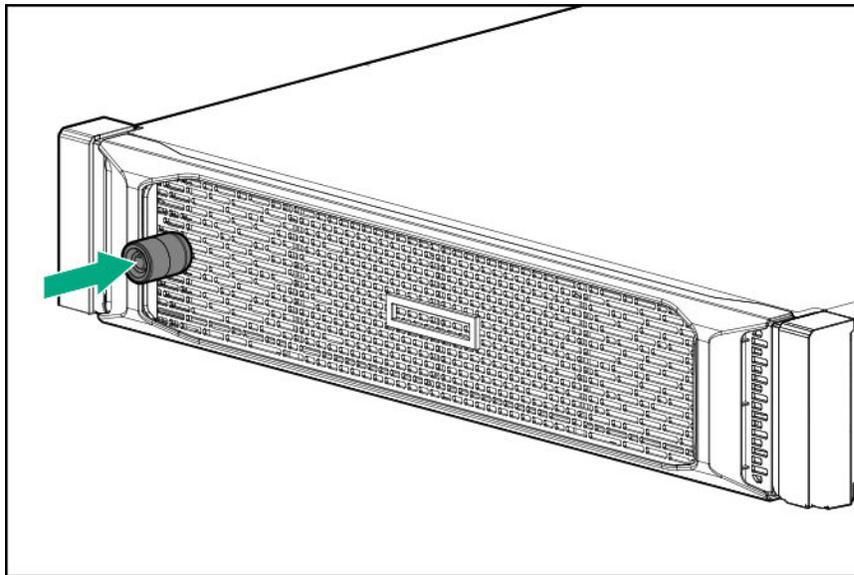
If multiple options are being installed, read the installation instructions for all the hardware options to identify similar steps and streamline the installation process.

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 system before beginning any installation procedure. Improper grounding can cause electrostatic discharge.

Installing the security bezel

The security bezel helps prevent unauthorized physical access to the front panel components. Install the security bezel and then lock it with the key provided with the kit.



Drive options

Depending on the configuration, this system supports SAS, SATA, NVMe, and uFF drives. When adding drives to the system, observe the following general guidelines.



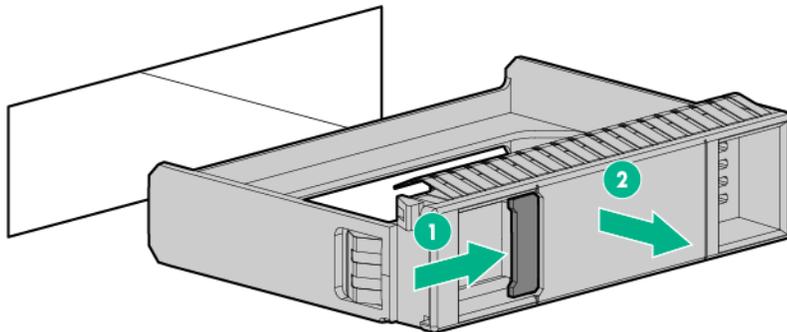
- The system automatically sets all device numbers.
- If only one drive is used, install the drive in the drive bay with the lowest device number (**Drive numbering**).
- Drives must be the same capacity to provide the greatest storage space efficiency when drives are grouped together into the same drive array.

Installing a drive

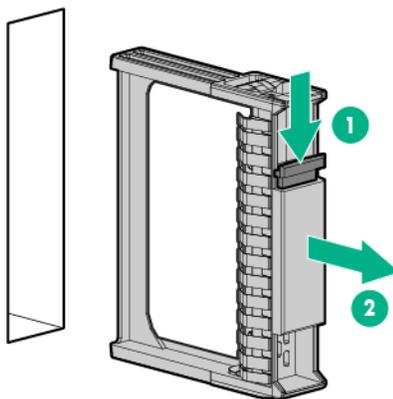
⚠ CAUTION: Do not operate the system with any of the front or rear drive cage bays empty. To maintain proper airflow and sufficient cooling, all drive bays in the front and rear cage must have a drive or a drive blank.

Procedure

1. If installed, remove the security bezel (**Remove the bezel**).
2. If you are installing a drive into the internal drive cage, extend the front drive cage from the chassis (**Extend the front drive cages out of the chassis**).
3. Remove the drive blank:
 - LFF drive blank



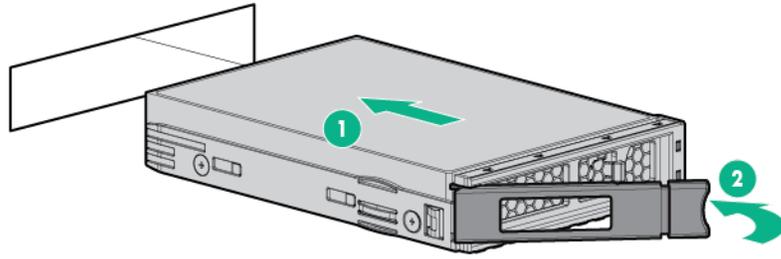
- SFF drive blank



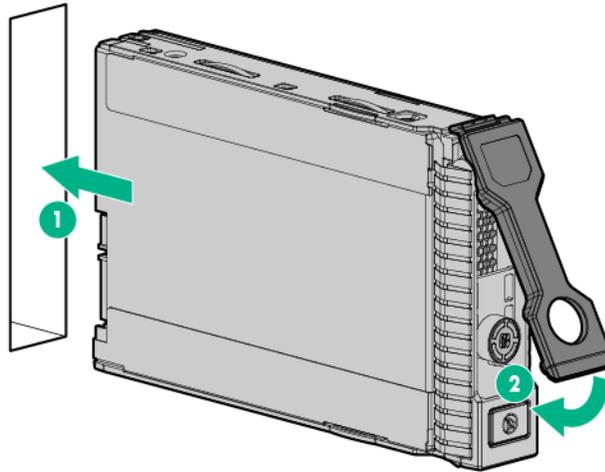
4. Install the drive:



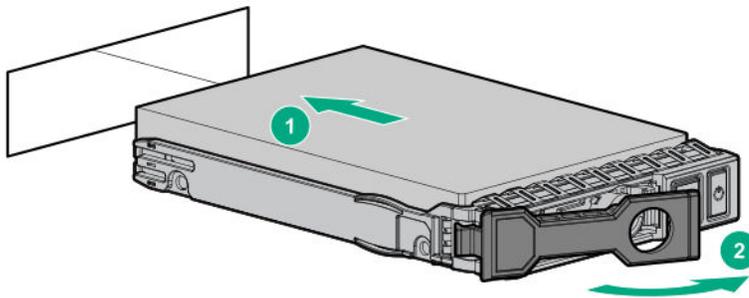
- LFF drive



- SFF drive

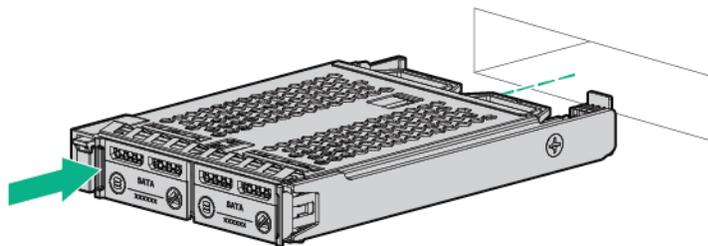


- NVMe drive (rear drive cage only)



- uFF drive (rear drive cage only)





5. Determine the status of the drive from the drive LED definitions (**Drive LEDs**).
6. If extended, slide the front drive cages into the chassis (**Slide the front drive cages into the chassis**).
7. If removed, install the security bezel.

Drive cage options

Drive cage installation alerts

-
- ⚠ 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 system with any of the rear drive bays empty. To maintain proper airflow and sufficient cooling in the rear drive cage, all drive bays in this cage must have a drive or a drive blank. Hewlett Packard Enterprise recommends installing at least one drive in the rear drive cage before operating the system.
-

Installing the four-bay LFF hot-plug rear drive cage

- ⓘ IMPORTANT:** Hewlett Packard Enterprise recommends installing at least one drive in the rear drive cage. Populate drive bays based on the drive numbering sequence. Start from the drive bay with the lowest device number (**Drive numbering**).
-

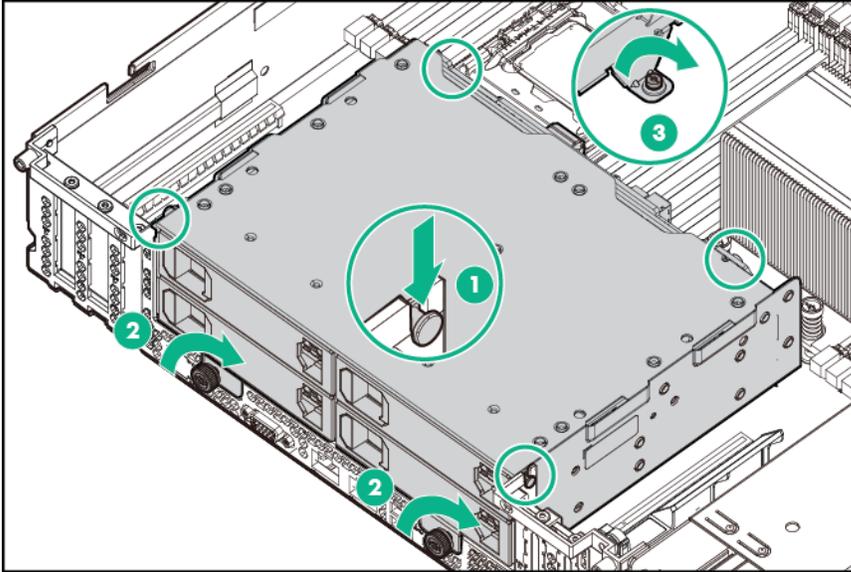
This rear drive cage option supports low-profile LFF SAS and SATA drives. These drives are assigned the drive numbers 49–52.

Procedure

1. Power down the system (**Power down the system**).
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the system.
3. Remove the system from the rack (**Remove the system from the rack**).
4. Place the system on a flat, level work surface.
5. Remove the access panel (**Remove the access panel**).



6. Remove the air baffl (**Remove the air baffl**).
7. Remove the rear option blank (**Remove the rear drive cage blank**).
Retain the rear option blank for future use.
8. Install the four-bay LFF hot-plug rear drive cage.



9. If you are connecting the rear drive cage to an expansion board or type -p controller, connect the cables now (**Rear LFF drive cage cabling**).
10. Install the expansion board or type -p controller (**Installing an expansion board or type -p controller**).
11. Install the air baffl (**Install the air baffl**).
12. Install the access panel (**Install the access panel**).
13. Install the system into the rack (**Installing the system into the rack**).
14. Power up the system (**Power up the system**).

Installing the two-bay SFF hot-plug rear drive cage and two-slot PCIe riser cage

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

IMPORTANT: Hewlett Packard Enterprise recommends installing at least one drive in the rear drive cage. Populate drive bays based on the drive numbering sequence. Start from the drive bay with the lowest device number (**Drive numbering**).

This drive cage option supports SFF SAS, SATA, and uFF drives. The SAS and SATA drives are assigned the drive numbers 49–50. The uFF drives are assigned 49-50 and 149-150 (**Drive numbering**).

The PCIe riser cage option has two slots:

- PCIe3 x8 full-height, half-length slot
- PCIe3 x16 full-height, half-length slot

Installing the two-slot PCIe riser cage

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

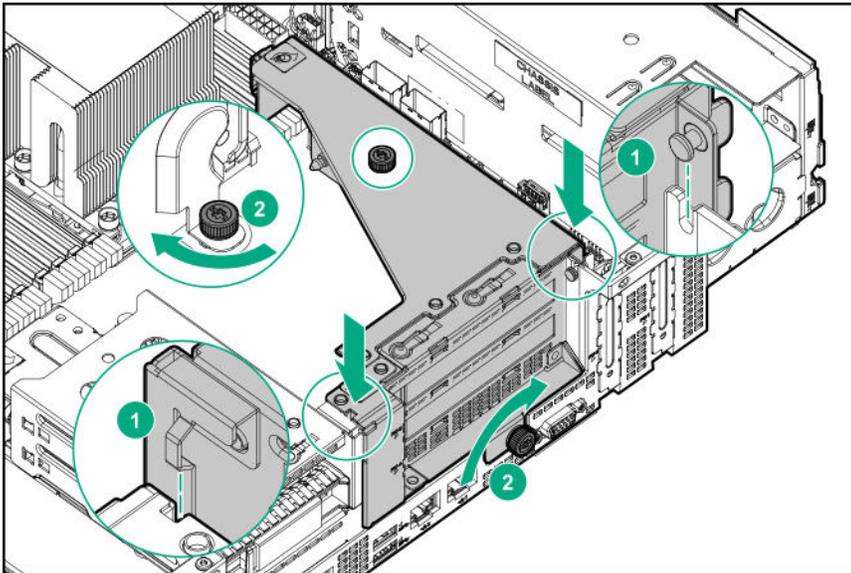
Prerequisites

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

- The components included with the hardware kit
- Torx T-15 screwdriver

Procedure

1. Power down the system (**Power down the system**).
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the system.
3. Remove the system from the rack (**Remove the system from the rack**).
4. Place the system on a flat, level work surface.
5. Remove the access panel (**Remove the access panel**).
6. If there is a controller or expansion board to be installed in the riser cage, connect the cabling (**Cabling**).
7. Install the controller into the PCIe riser cage (**Installing a storage controller**).
8. Install the PCIe riser cage.



9. Install the access panel (**Install the access panel**).
10. Install the system into the rack (**Installing the system into the rack**).
11. Power up the system (**Power up the system**).



Installing two-bay SFF hot-plug rear drive cage

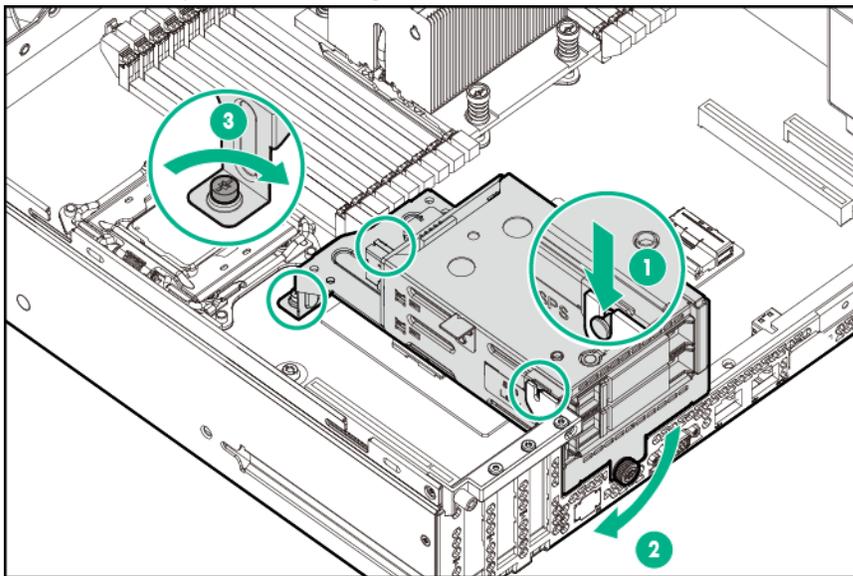
Prerequisites

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

- The components included with the hardware kit
- Torx T-15 screwdriver

Procedure

1. Power down the system (**Power down the system**).
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the system.
3. Remove the system from the rack (**Remove the system from the rack**).
4. Place the system on a flat, level work surface.
5. Remove the access panel (**Remove the access panel**).
6. Remove the air baffl (**Remove the air baffl**).
7. Remove the rear option blank (**Remove the rear drive cage blank**).
8. Install the two-bay SFF rear drive cage:



9. Connect the cables depending on your system configuration (**Rear SFF drive cage cabling**).
10. Install the air baffl (**Install the air baffl**).
11. Install the access panel (**Install the access panel**).
12. Install the system into the rack (**Installing the system into the rack**).
13. Power up the system (**Power up the system**).

Installing the six-bay SFF NVMe rear drive cage

- ❗ **IMPORTANT:** Hewlett Packard Enterprise recommends installing at least one drive in the rear drive cage. Populate drive bays based on the drive numbering sequence. Start from the drive bay with the lowest device number (**Drive numbering**).
-

This drive cage option supports NVMe drives. These drives are assigned the drive numbers 1–6 (**Drive numbering**).

Depending on the system configuration, the NVMe rear drive cage may connect only to PCIe slot 2, PCIe slots 2 and 6, or only to slot 6. The number of processors required depends on which slots will be used.

- If the NVMe rear drive cage will connect only to slot 2, then only one processor is required.
- If the NVMe rear drive cage will connect to PCIe slots 2 and 6, or only to slot 6, then two processors are required.

Prerequisites

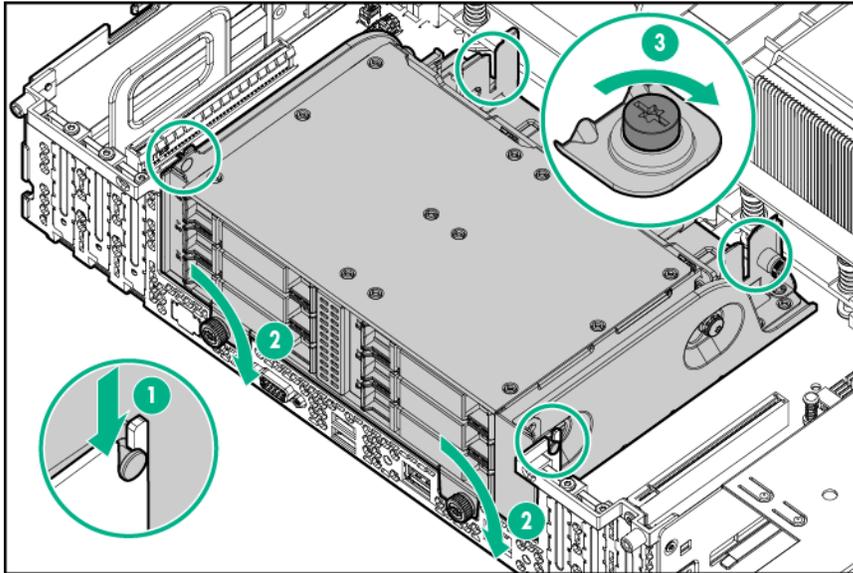
Before you perform this procedure, make sure that you have the following items available:

- The components included with the hardware kit
- Torx T-15 screwdriver

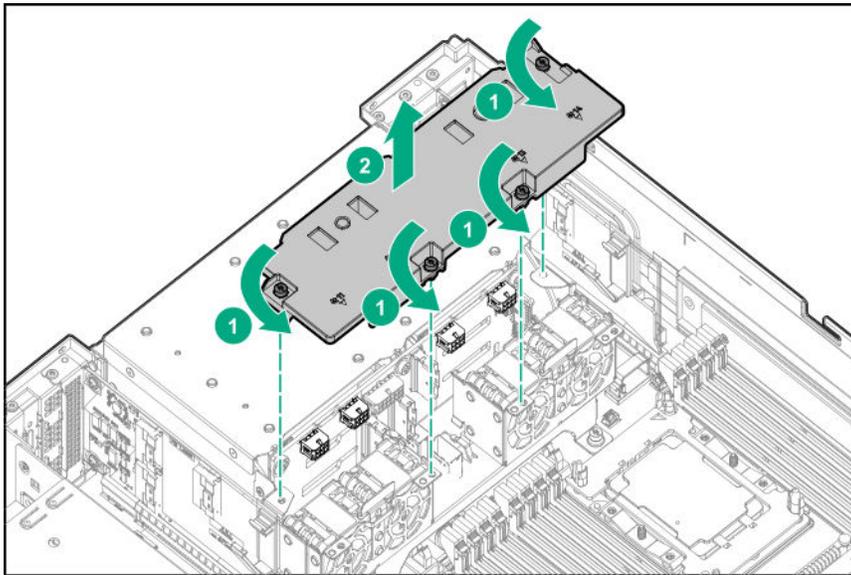
Procedure

1. Power down the system (**Power down the system**).
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the system.
3. Remove the system from the rack (**Remove the system from the rack**).
4. Place the system on a flat, level work surface.
5. Remove the access panel (**Remove the access panel**).
6. Remove the air baffl (**Remove the air baffl**).
7. Remove the rear option blank (**Remove the rear drive cage blank**).
8. Align the pins on the drive cage with the notches on the rear panel and install the drive cage.





9. If the preinstalled cables must be moved from one side of the drive cage to the other side, do the following:
 - a. Loosen the screws from the plastic cover.
 - b. Remove the plastic cover from the rear of the drive cage.



- c. Move the cables to the side closest to the slot where they will be connected.
 - d. Replace the plastic cover.
10. Connect the cables to one of the following:
 - A pass-through board installed in slot 2 (**NVMe rear drive cage cabling**)
 - A pass-through board installed in slot 6 (**NVMe rear drive cage cabling**)
 - Pass-through boards installed in both slot 2 and slot 6 (**NVMe rear drive cage cabling**)
11. Install one or more NVMe pass-through boards in the appropriate slots (**Installing an expansion board or type -p controller**).



12. Install the air baffl ([Install the air baffl](#)).
13. Install the access panel ([Install the access panel](#)).
14. Install the system into the rack ([Installing the system into the rack](#)).
15. Power up the system ([Power up the system](#)).

Installing the six-bay SFF rear drive cage (SAS, SATA)

- !** **IMPORTANT:** Hewlett Packard Enterprise recommends installing at least one drive in the rear drive cage. Populate drive bays based on the drive numbering sequence. Start from the drive bay with the lowest device number ([Drive numbering](#)).
-

This drive cage option supports SAS or SATA drives. These drives are assigned the drive numbers 49–54 ([Drive numbering](#)). The six-bay SFF rear drive cage connects only to PCIe slot 2.

Prerequisites

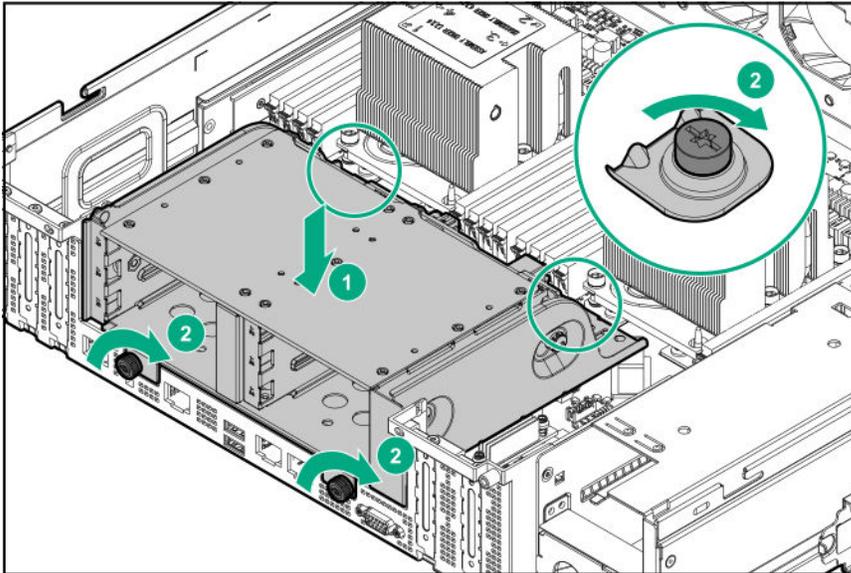
Before you perform this procedure, make sure that you have the following items available:

- The components included with the hardware kit
- Torx T-15 screwdriver

Procedure

1. Power down the system ([Power down the system](#)).
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the system.
3. Remove the system from the rack ([Remove the system from the rack](#)).
4. Place the system on a flat, level work surface.
5. Remove the access panel ([Remove the access panel](#)).
6. Remove the air baffl ([Remove the air baffl](#)).
7. Remove the rear option blank ([Remove the rear drive cage blank](#)).
8. Install the six-bay rear drive cage.





9. Connect the cables to the PCIe in slot 2.
10. Install the air baffl ([Install the air baffl](#)).
11. Install the access panel ([Install the access panel](#)).
12. Install the system into the rack ([Installing the system into the rack](#)).
13. Power up the system ([Power up the system](#)).

M.2 SSD enablement board option

The M.2 SSD enablement board is supported in the following expansion slots:

- For standup installation: PCIe3 x16 expansion slot 1, PCIe3 x24 expansion slot 2.
- For horizontal installation (two-slot PCI riser cage option required): PCIe3 x 8 riser board slot 3 and 4

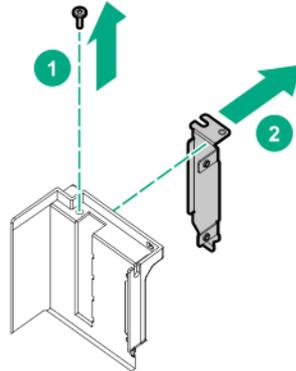
For more information about product features, specifications, options, configurations, and compatibility, see the product QuickSpecs on the [Hewlett Packard Enterprise website](#).

Installing the M.2 SSD enablement board

Procedure

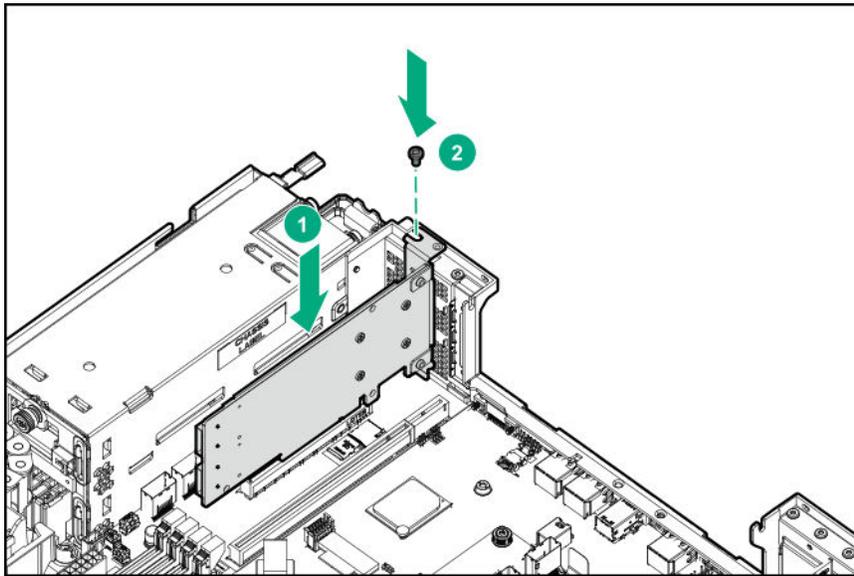
1. Power down the system ([Power down the system](#)).
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the system.
3. Remove the system from the rack ([Remove the system from the rack](#)).
4. Place the system on a flat, level work surface.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

6. Remove the air baffl (**Remove the air baffl**).
7. To install the M.2 SSD enablement board in the expansion slots 1 or 2, do the following:
 - a. Remove the onboard PCIe expansion slot cover from the appropriate PCIe expansion slot.



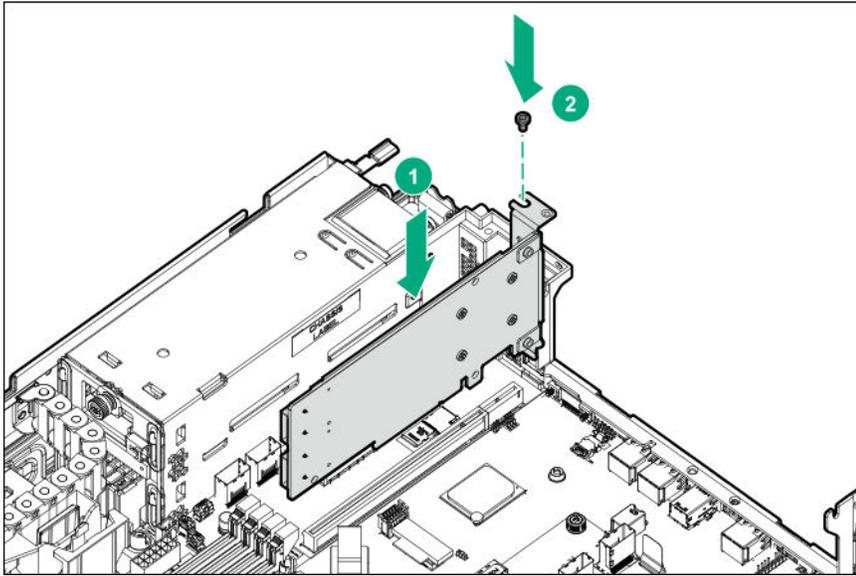
- b. Install the M.2 SSD enablement board. Verify that the board is firmly seated in the slot.

- M.2 SSD enablement board installed in the onboard PCIe3 x16 expansion slot 1

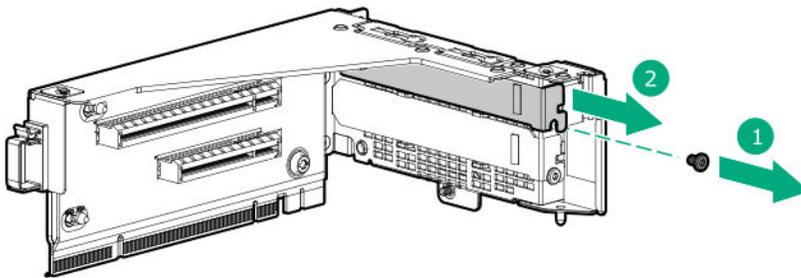


- M.2 SSD enablement board installed in the onboard PCIe3 x24 expansion slot 2



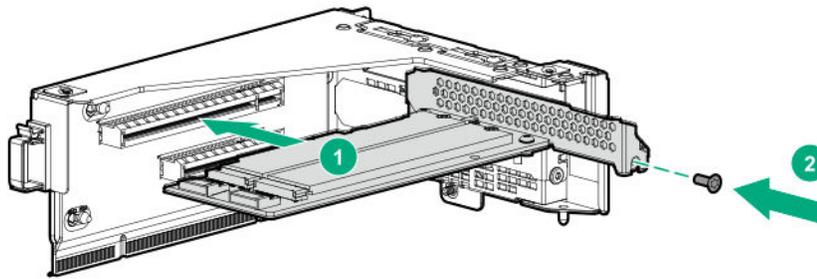


- c. Open the cable management holder (**Open the cable management holder**).
 - d. Connect the SATA cables to the M.2 SSD enablement board and the system board.
 - e. Secure the extra length of the SATA cables in the cable management holder.
8. To install the M.2 SSD enablement board in the PCI riser cage, do the following:
- a. Remove the PCI riser cage (**Remove the PCIe riser cage**).
 - b. Remove the riser slot cover.



- c. Install the M.2 SSD enablement board into either slot. Verify that the board is firmly seated in the slot. The board is supported in either slot. The procedure shows slot 3.



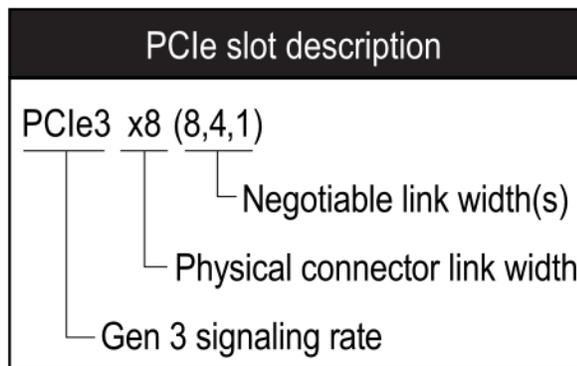


- d. Install the PCIe riser cage (**Installing the two-slot PCIe riser cage**).
- 9. Open the cable management holder (**Open the cable management holder**).
- 10. Secure the extra length of the SATA cables in the cable management holder.
- 11. Close the cable management holder (**Close the cable management holder**).
- 12. Install the air baffl (**Install the air baffl**).
- 13. Install the access panel (**Install the access panel**).
- 14. Install the system into the rack (**Installing the system into the rack**).
- 15. Power up the system (**Power up the system**).

Expansion slots

Supported PCIe form factors

Slot description example



Processor 1

PCIe slot and card length	Description
Slot 1 - 1/2 length/Half-height (½L/HH)	PCIe3 x16 (16, 8, 4, 2, 1)
Slot 2 - 1/2 length/Half-height (½L/HH)	PCIe3 x24 (32, 16, 8, 4, 2, 1)



Processor 2 (required)

PCIe slot and card length	Description
Slot 5 - 1/2 length/Half-height (½L/HH)	PCIe3 x8 (8, 4, 2, 1)
Slot 6 - 1/2 length/Half-height (½L/HH)	PCIe3 x24 (32, 16, 8, 4, 2, 1)
Slot 7 - 1/2 length/Half-height (½L/HH)	PCIe3 x16 (16, 8, 4, 2, 1)

Installing an expansion board or type -p controller

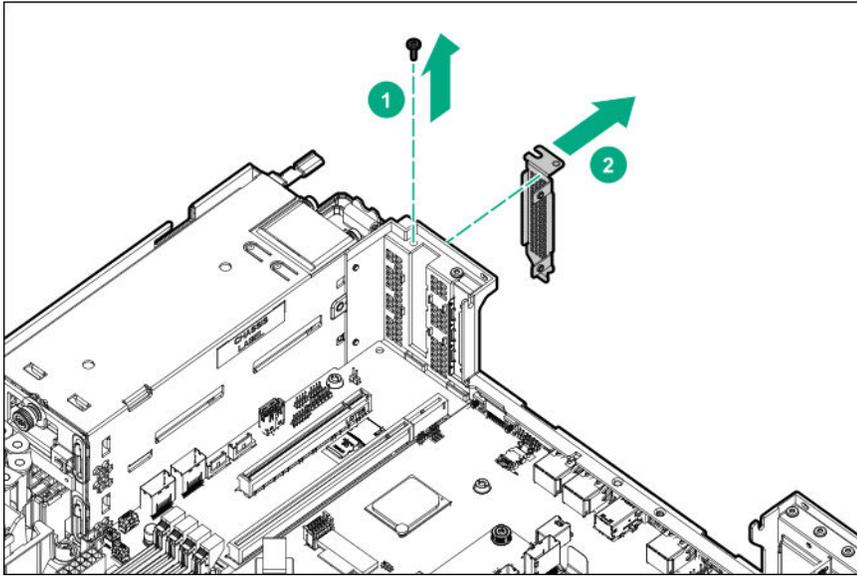
CAUTION: To prevent damage to electrical components, take the appropriate anti-static precautions before beginning any installation, removal, or replacement procedure. Improper grounding can cause electrostatic discharge.

CAUTION: For proper cooling, do not operate the system without the access panel, baffles expansion slot covers, or blanks installed.

The steps shown apply to both installing an expansion board and installing a type -p controller.

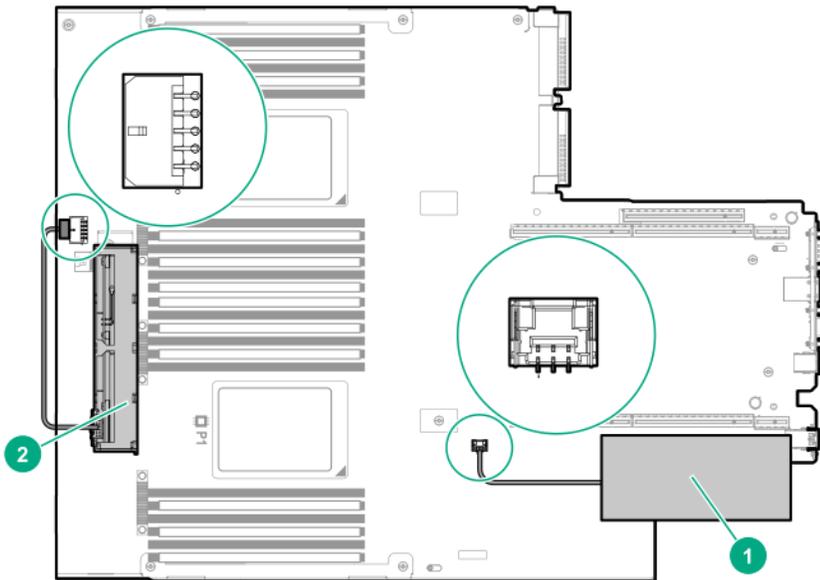
Procedure

1. Power down the system (**Power down the system**).
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the system.
3. Remove the system from the rack (**Remove the system from the rack**).
4. Place the system on a flat, level work surface.
5. Remove the access panel (**Remove the access panel**).
6. Remove the air baffl (**Remove the air baffl**).
7. If you are installing an expansion board in PCIe slots 5, 6, or 7, remove the air blocker for those slots (**Remove the air blocker from PCIe expansion slots 5–7**).
8. To install a low-profile, standup expansion board or type -p controller on the system board, do the following:
 - a. If the option ships with a full-height bracket, remove that bracket and attach a low profile one. For more information, see the documentation that ships with the option.
 - b. Remove the onboard PCIe expansion slot cover.



- c. If installing an expansion board, verify that any switches or jumpers on the expansion board are set properly. For more information, see the documentation that ships with the option.
- d. Connect the cables to the expansion board or type -p controller (**Cabling**).
- e. If installing a type -p controller, connect the controller backup power cable to the system board (**Cabling**).

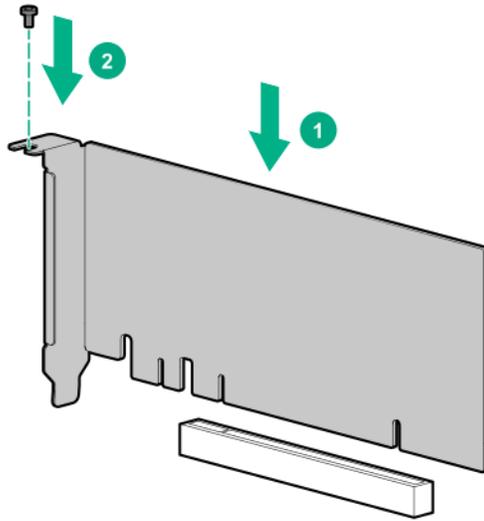
-
- ❗ **IMPORTANT:** To enable SmartCache or CacheCade in a P-class type-p Smart Array controller, you must:
- Connect the controller backup power cable to the controller backup power connector on the system or riser board.
 - Connect the energy pack cable to the energy pack connector on the system board.
-



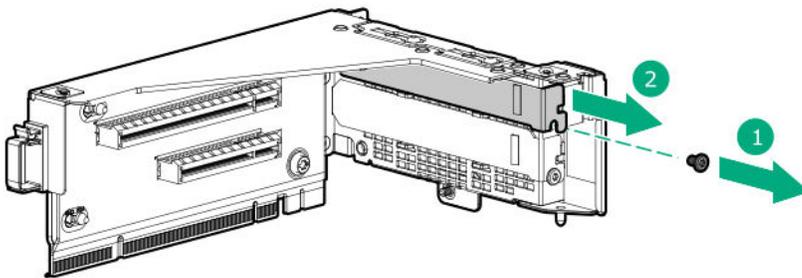
Item	Description ¹
1	Type-p Smart Array controller connected to the controller backup power connector
2	Energy pack connected to the energy pack connector

¹ Your server might appear different

- f. Install the expansion board or controller. Verify that it is firmly seated in the slot.

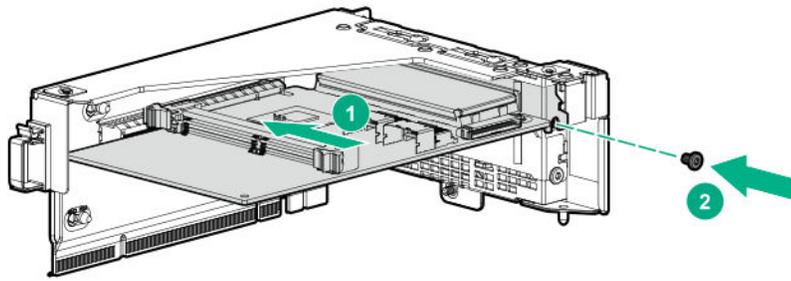


- 9. To install a full-height, half-length PCIe x16 expansion board, the two-slot PCIe riser cage option is required. To install an expansion board or type -p controller in this riser cage, do the following:
 - a. Remove the PCIe riser cage (**Remove the PCIe riser cage**).
 - b. Remove the riser slot cover.



- c. If installing an expansion board, verify that any switches or jumpers on the expansion board are set properly. For more information, see the documentation that ships with the option.
- d. Connect the cables to the expansion board or type -p controller (**Cabling**).
- e. Install the expansion board or controller. Verify that it is firmly seated in the slot.





- f. Install the PCIe riser cage (**Installing the two-slot PCIe riser cage**).
10. Install any other options that connect to the expansion board or to the type -p controller.
11. Install the air baffl (**Install the air baffl**).
12. Install the access panel (**Install the access panel**).
13. Install the system into the rack (**Installing the system into the rack**).
14. Power up the system (**Power up the system**).
15. To configure a controller, see **HPE Smart Storage Administrator**.

Installing an HPE InfiniBand HDR/Ethernet 200Gb 1-port 940QSFP56 x16 Adapter

The system supports installing one adapter in a two-processor configuration. The adapter requires the installation of an auxiliary card.

-
- WARNING:** To reduce the risk of personal injury, electric shock, or damage to the equipment, remove power from the system by removing the power cord. 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.
-
- CAUTION:** To prevent improper cooling and thermal damage, do not operate the server unless all PCI slots have either an expansion slot cover or an expansion board installed.
-
- CAUTION:** The connector pins are fragile and easily damaged. To avoid damaging the connector pins, do not use excessive force when connecting the cables.
-

Prerequisites

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

- The components included with the hardware option kit
- T-10 Torx screwdriver
- HPE InfiniBand HDR PCIe G3 Auxiliary card with 350mm cable kit

Before you install the option, choose the best PCIe slot pairs for your system:

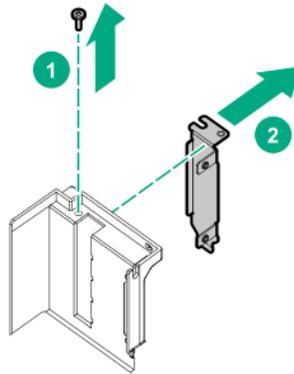
- Slots 2 and 6
- Slots 2 and 7



- Slots 3 and 6
- Slots 3 and 7

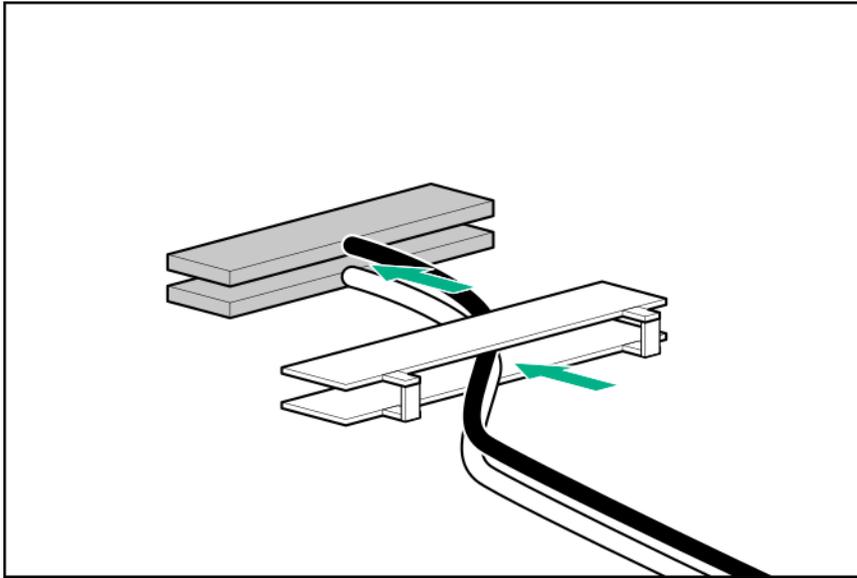
Procedure

1. Power down the system (**Power down the system**).
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the system.
3. Remove the system from the rack (**Remove the system from the rack**).
4. Place the system on a flat, level work surface.
5. Remove the access panel (**Remove the access panel**).
6. Remove the air baffl (**Remove the air baffl**).
7. Remove the PCIe riser slot covers from two supported slots.

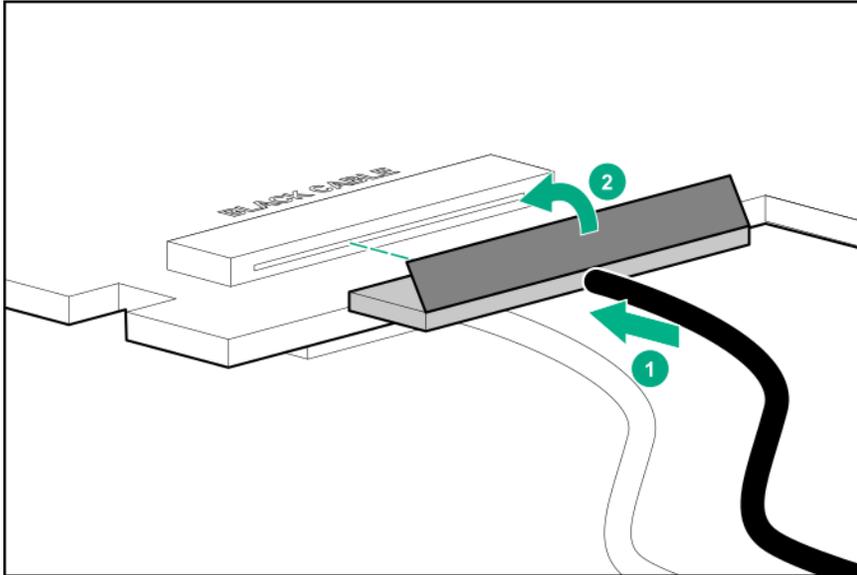


8. Connect the black and white cables to the adapter card.
 - a. Thread the cable retention clip onto both cables making sure that the clip posts are pointing toward the cable ends.



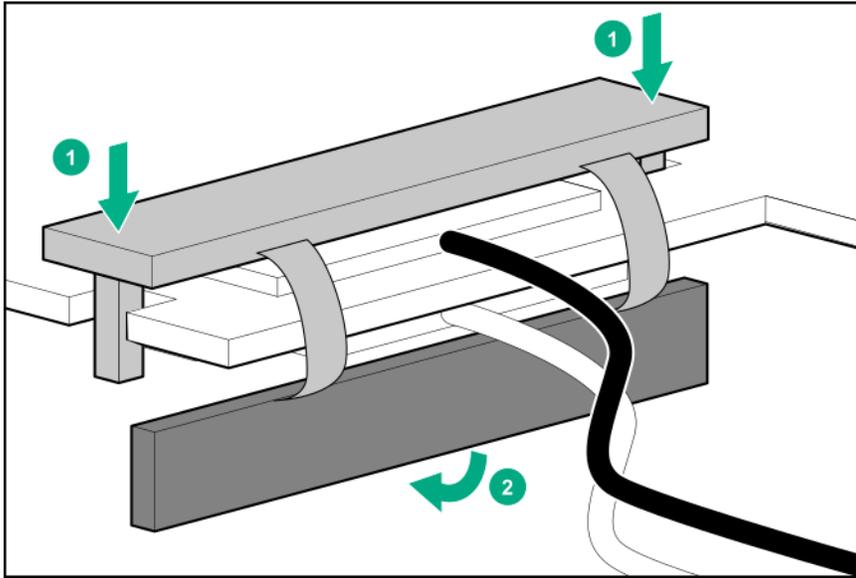


- b.** The white and black cables from the auxiliary card connect to the adapter board ports labeled WHITE CABLE and BLACK CABLE, respectively. The cable latch door must be open when connecting the cables. Close the cable latch door after connecting the cable.

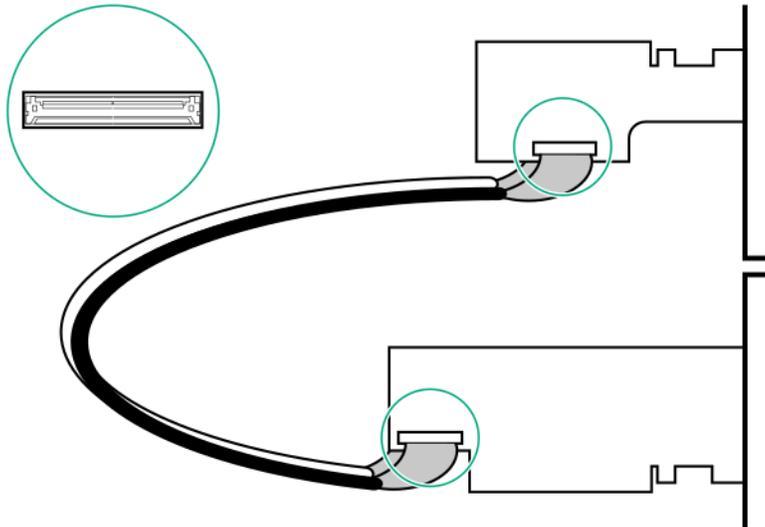


- c.** Slide the cable retention clip up and connect it to the adapter board over the cable connectors.





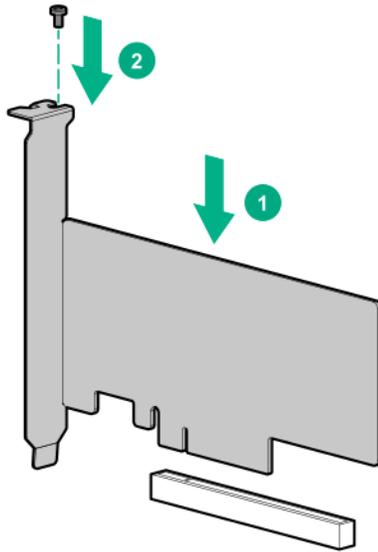
- d. Connect the other end of the black and white cables to the auxiliary card. Be sure that the cables on both cards are angled in the same direction after installation.



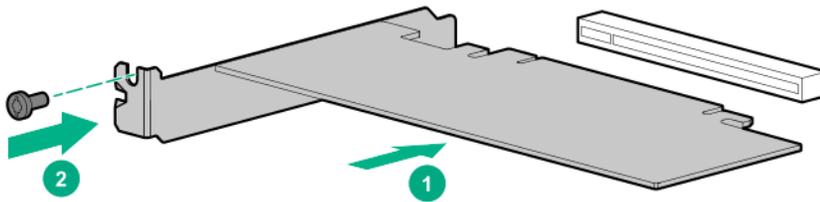
CAUTION: Avoid routing the cables over any components in the system that may become hot such as the heatsink.

9. Install the adapter in the appropriate slot for processor 1.
- Installing the adapter in slot 2

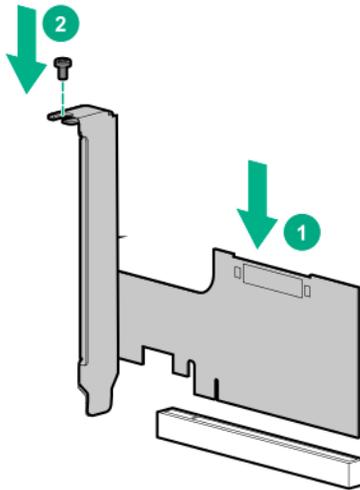




- Installing the adapter in slot 3 in the riser cage



10. Install the auxiliary card in the appropriate slot for processor 2 (PCIe slots 6 or 7).



11. Install the air baffl ([Install the air baffl](#)).
12. Install the access panel ([Install the access panel](#)).



13. Install the system into the rack (**Installing the system into the rack**).

14. Power up the system (**Power up the system**).

Installing the HPE NS204i-p NVMe OS Boot Device option

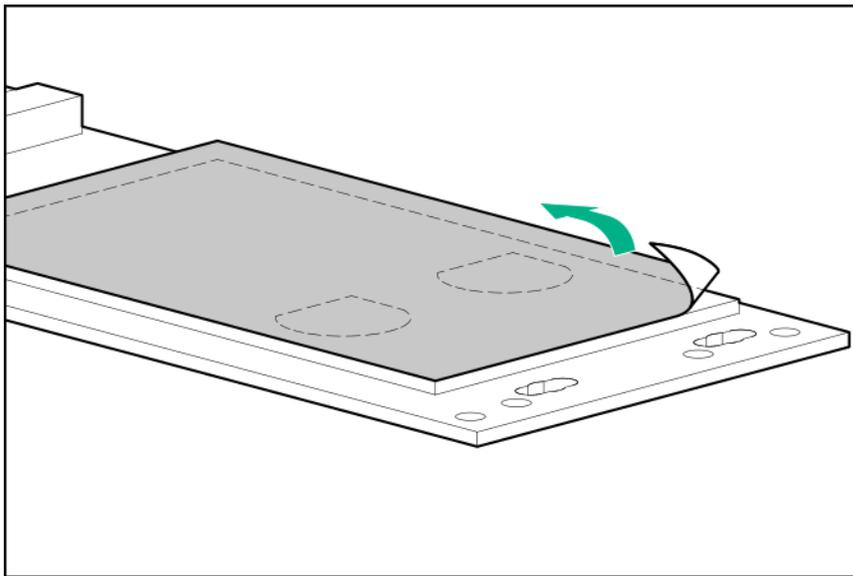
Prerequisites

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

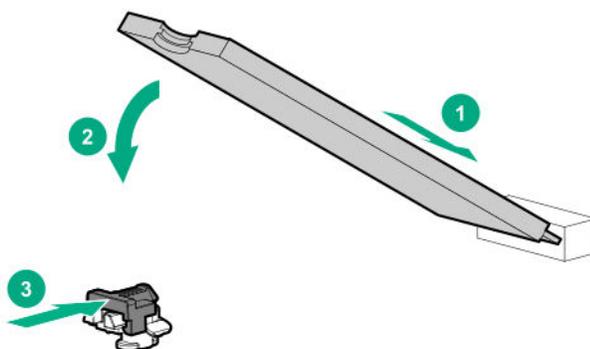
Procedure

Installing drives onto the boot device

1. Remove the liner from the thermal interface pad.



2. Install the drives.



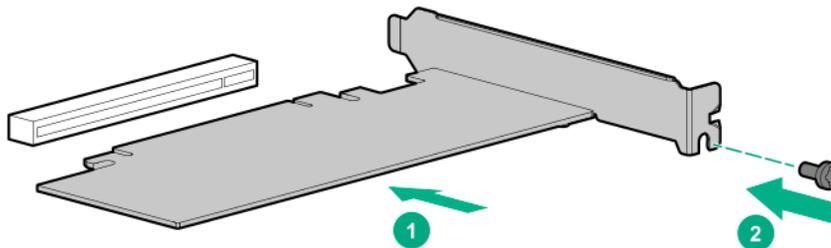
Installing the boot device

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

4. Remove all power:



- a. Disconnect each power cord from the power source.
- b. Disconnect each power cord from the system.
5. Remove the system from the rack (**Remove the system from the rack**).
6. Place the system on a flat, level work surface.
7. Remove the access panel (**Remove the access panel**).
8. Select an available PCIe expansion slot that is x8 physical size and x4 electrical.
9. Remove the expansion slot cover.
Save the retaining screw, if one is present.
10. Install the boot device.



11. Install any components that were removed to access the expansion slot.
12. Install the access panel (**Install the access panel**).
13. Do one of the following:
 - Slide the server into the rack.
 - Install the server into the rack.
14. Power up the server.

Deploying an operating system

15. Deploy a supported operating system to the boot device drive.

For more information, see the product QuickSpecs (<https://www.hpe.com/info/qs>).

After the OS installation completes, the system automatically copies the operating system to the second, mirrored drive on the boot device.

16. Proceed with normal system setup and operation.

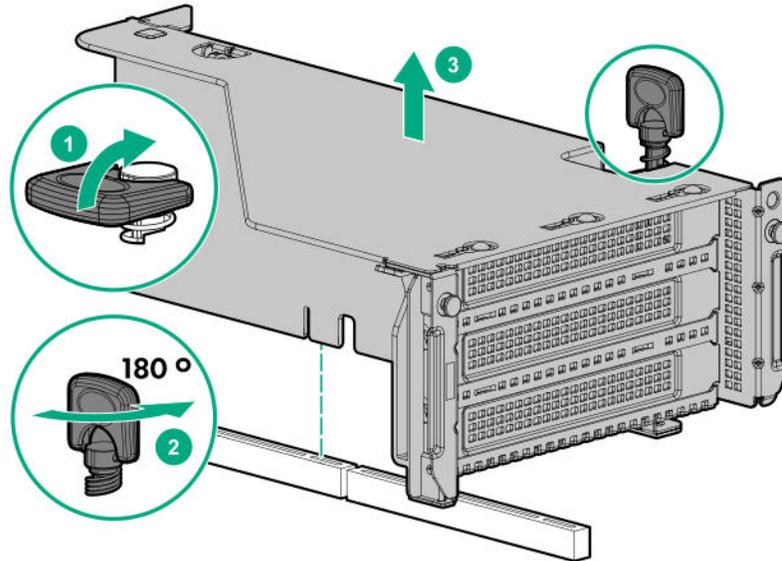
Installing the Pensando DSP DSC-25 2p SFP28 card

Procedure

1. Power down the system (**Power down the system**).
2. Remove all power:

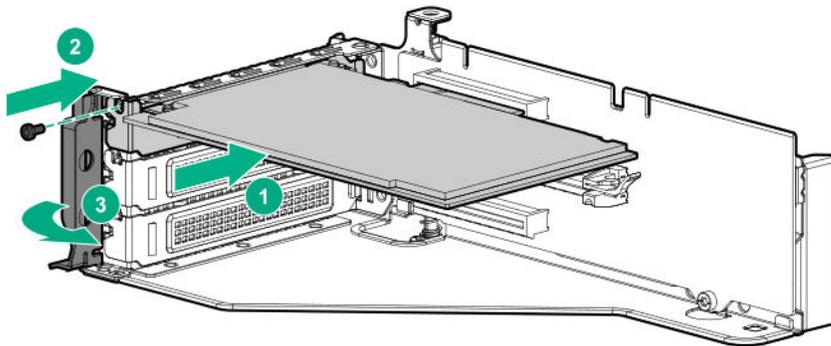


- a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the system.
3. Remove the system from the rack (**Remove the system from the rack**).
 4. Place the system on a flat, level work surface.
 5. Remove the access panel (**Remove the access panel**).
 6. Remove the PCIe riser cage, if applicable.



NOTE: Image may differ from actual product.

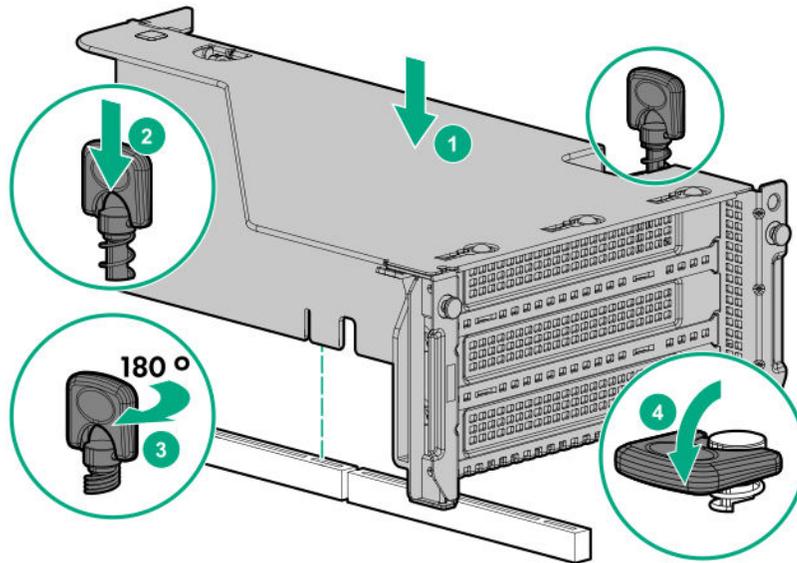
7. Install the Pensando DSP DSC-25 2p SFP28 card into the PCIe slot.



NOTE: Image may differ from actual product.

8. Install the PCIe riser cage into the server.





NOTE: Image may differ from actual product.

9. Install the access panel.
10. Slide the server into the rack.
11. Connect each power cord to the server.
12. Connect each power cord to the power source.
13. Power up the server.
14. Admit the new DSC-25 card to the Pensando Policy and Services Manager (PSM).

For more information, see the *PSM Enterprise Edition User Guide*.

Controller options

The system supports the following storage controllers:

- Embedded controllers—Enabled through System Utilities and configured through HPE Smart Storage Administrator (Intelligent Provisioning)
- Type-a controllers—Type-a controllers install in the type-a Smart Array connector.
- Type-p controllers—Type-p controllers install in a PCIe expansion slot.

For more information on controllers, see the following documentation:

- The controller family data sheet on the Hewlett Packard Enterprise website (<https://www.hpe.com/h20195/V2/Getdocument.aspx?docname=a00017196enw>)
- The controller QuickSpecs on the Hewlett Packard Enterprise website (<http://www.hpe.com/info/qs>)

To configure the controller, see **HPE Smart Storage Administrator**.



Installing a storage controller

This section only covers the installation of a storage controller board option for the internal drive cage. The front drive cage is always connected to port 1 and port 2 of the onboard controller.

Prerequisites



WARNING: To reduce the risk of personal injury, electric shock, or damage to the equipment, remove power from the system by removing the power cord. 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.



CAUTION: To prevent improper cooling and thermal damage, do not operate the server unless all PCI slots have either an expansion slot cover or an expansion board installed.



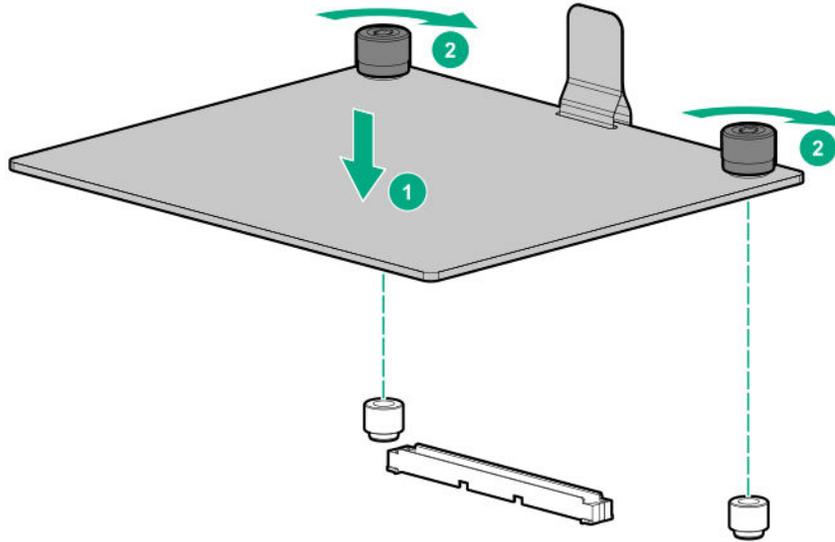
CAUTION: Hewlett Packard Enterprise recommends performing a backup of all server data before installing or removing a controller or adapter.

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

Procedure

1. Power down the system (**Power down the system**).
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the system.
3. Remove the system from the rack (**Remove the system from the rack**).
4. Place the system on a flat, level work surface.
5. Remove the access panel (**Remove the access panel**).
6. Remove the air baffle (**Remove the air baffle**).
7. Do one of the following:
 - For type-a Smart Array controllers, install the controller into the Smart Array connector on the system board.





- For type-p Smart Array controllers, install the controller into an expansion slot (**Installing an expansion board or type -p controller**).
8. Connect all necessary cables to the controller depending on your system configuration (**Cabling**).
 9. Connect the controller backup power cable to the connector on the system or riser board.
 10. Install the air baffl (**Install the air baffl**).
 11. Install the access panel (**Install the access panel**).
 12. Install the system into the rack (**Installing the system into the rack**).
 13. Power up the system (**Power up the system**).
 14. To configure a controller, see **HPE Smart Storage Administrator**.

For more information about storage controller features, select the relevant user documentation on the Hewlett Packard Enterprise website (<http://www.hpe.com/info/enterprise-docs>).

Installing a processor-heatsink assembly

-
- ⚠ **CAUTION: THE PINS ON THE SYSTEM BOARD ARE VERY FRAGILE AND EASILY DAMAGED.** To avoid damage to the system board, do not touch the processor or the processor socket contacts.
-
- ⚠ **CAUTION:** Heatsink screws must be tightened and loosened in sequence. Do not overtighten the screws as this can damage the system board, connectors, or screws.
-
- ⚠ **CAUTION:** To avoid damage to the processor and system board, only authorized personnel should attempt to replace or install the processor in this system.
-
- ⚠ **CAUTION:** To prevent possible system overheating, always populate each processor socket with a processor socket cover and a processor blank, or a processor and a heatsink.
-



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

❗ IMPORTANT: If installing a processor with a faster speed, update the system ROM before installing the processor.

❗ IMPORTANT: Processor socket 1 must be populated at all times or the system does not function.

For optimum performance, Hewlett Packard Enterprise recommends:

- Use DIMMs that match the speed of the processor installed in the system.
 - In a multiprocessor configuration, balance the total capacity of the DIMMs across the processors.
-

❗ IMPORTANT: Existing HPE ProLiant and HPE Synergy Gen10 server products containing first-generation Intel Xeon Scalable processors may not be upgraded to second-generation Intel Xeon Scalable processors at this time.

For more information, see the product QuickSpecs on the Hewlett Packard Enterprise website (<https://www.hpe.com/info/qs>).

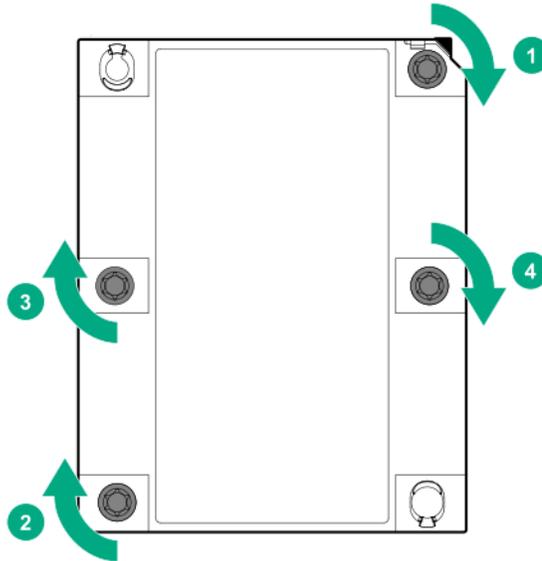
Prerequisites

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

- Processor or heatsink kit contents
- T-30 Torx screwdriver

Procedure

1. Power down the system (**Power down the system**).
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the system.
3. Remove the system from the rack (**Remove the system from the rack**).
4. Place the system on a flat, level work surface.
5. Remove the access panel (**Remove the access panel**).
6. Remove the air baffl (**Remove the air baffl**).
7. Remove the dust cover from the processor socket you are going to upgrade.
8. Install the processor heatsink assembly.
 - a. Using a T-30 Torx screwdriver, fully tighten each heatsink nut in the order indicated on the heatsink label (1 -2 -3 -4) until it no longer turns.



b. If you are installing the processor-heatsink to socket 2 to install an expansion board in PCIe slots 5, 6, or 7, remove the air blocker for those slots (**Remove the air blocker from PCIe expansion slots 5-7**).

9. Install the air baffl (**Install the air baffl**).
10. Install the access panel (**Install the access panel**).
11. Install the system into the rack (**Installing the system into the rack**).
12. Power up the system (**Power up the system**).

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>).

Memory options

- ⓘ **IMPORTANT:** This system 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 system must be of the same type.

DIMM population information

For specific DIMM population information, see the DIMM population guidelines on the Hewlett Packard Enterprise website (<https://www.hpe.com/docs/memory-population-rules>).

DIMM-processor compatibility

The installed processor determines the type of DIMM that is supported in the system:

- First-generation Intel Xeon Scalable processors support DDR4-2666 DIMMs.
- Second-generation Intel Xeon Scalable processors support DDR4-2933 DIMMs.

Mixing DIMM types is not supported. Install only the supported DDR4-2666 or DDR4-2933 DIMMs in the system.

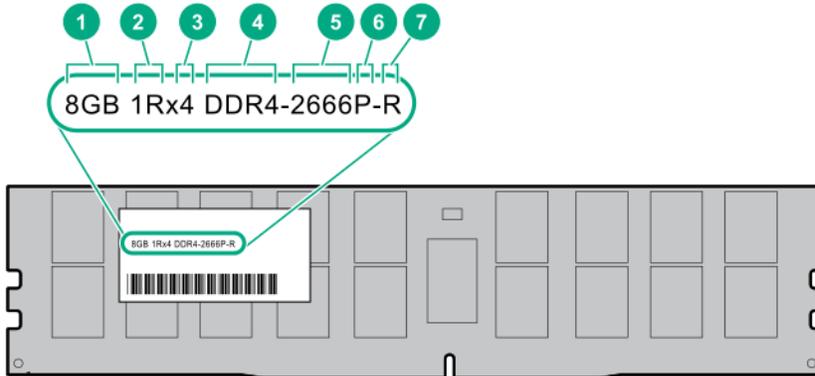


HPE SmartMemory speed information

For more information about memory speed information, see the Hewlett Packard Enterprise website (<https://www.hpe.com/docs/memory-speed-table>).

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

Table Continued



Item	Description	Example
5	Maximum memory speed	2133 MT/s 2400 MT/s 2666 MT/s 2933 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) Y = CAS 21-21-21 (for RDIMM, LRDIMM) Y = CAS 24-21-21 (for 3DS TSV LRDIMM)
7	DIMM type	R = RDIMM (registered) L = LRDIMM (load reduced) E = Unbuffered ECC (UDIMM)

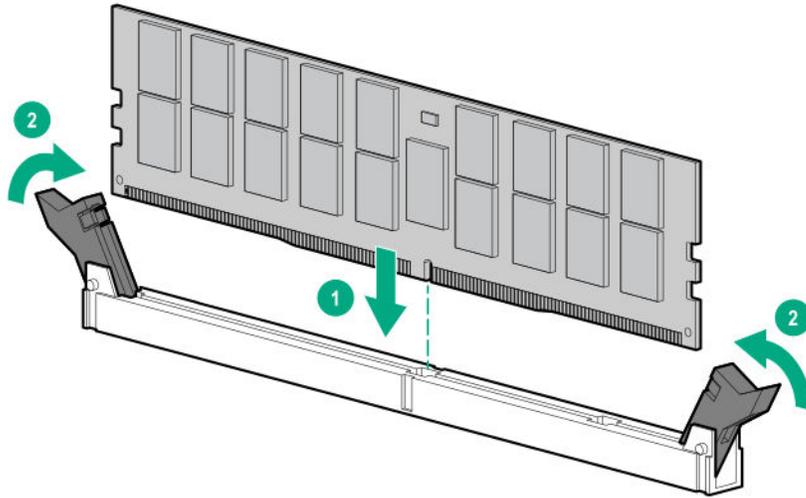
For more information about product features, specifications, options, configurations, and compatibility, see the HPE DDR4 SmartMemory QuickSpecs on the Hewlett Packard Enterprise website (<https://www.hpe.com/support/DDR4SmartMemoryQS>).

Installing a DIMM

Procedure

1. Power down the system (**Power down the system**).
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the system.
3. Remove the system from the rack (**Remove the system from the rack**).
4. Place the system on a flat, level work surface.
5. Remove the access panel (**Remove the access panel**).
6. Remove the air baffle (**Remove the air baffle**).
7. Open the DIMM slot latches.
8. Install the DIMM.





9. Install the air baffle ([Install the air baffle](#)).
10. Install the access panel ([Install the access panel](#)).
11. Install the system into the rack ([Installing the system into the rack](#)).
12. Power up the system ([Power up the system](#)).

After installing the DIMMs, use BIOS/Platform Configuration (RBSU) in the UEFI System Utilities to configure the memory protection mode.

Intel Optane persistent memory 100 series for HPE

Intel Optane persistent memory 100 series for HPE offer the flexibility to deploy as dense memory (Memory mode) or fast storage (App Direct mode) and enables per-socket memory capacity of up to 3.0 TB. Persistent memory modules, together with traditional volatile DRAM DIMMs, provide fast, high-capacity, cost-effective memory and storage to transform big data workloads and analytics by enabling data to be stored, moved, and processed quickly.

Persistent memory modules use the standard DIMM form factor and are installed alongside DIMMs in a system memory slot. Intel Optane persistent memory 100 series for HPE is designed for use only with second-generation Intel Xeon Scalable processors, and is available in the following capacities:

- 128 GB
- 256 GB
- 512 GB

Persistent memory module-processor compatibility

Intel Optane persistent memory 100 series for HPE is supported only in servers with second-generation Intel Xeon Scalable processors installed.

Intel Optane persistent memory for HPE population information

For specific population and configuration information, see the memory population guidelines on the Hewlett Packard Enterprise website (<http://www.hpe.com/docs/memory-population-rules>).



System requirements for persistent memory module support

- ❗ **IMPORTANT:** Hewlett Packard Enterprise recommends that you implement best-practice configurations such as clustered configurations for high availability (HA).
-

Before installing persistent memory modules, make sure that the following components and software are available:

- A supported HPE ProLiant Gen10 Plus server or Synergy compute module using third-generation Intel Xeon Scalable processors.
For more information, see the product QuickSpecs on the Hewlett Packard Enterprise website (<https://www.hpe.com/support/persistentmemoryQS>).
- HPE DDR4 Standard Memory RDIMMs or LRDIMMs (the number will vary based on your chosen configuration).
- Supported firmware and drivers:
 - System ROM version 1.40 or later
 - Server Platform Services (SPS) Firmware version 04.04.04.053
 - HPE iLO 5 Firmware version 2.44
 - HPE Innovation Engine Firmware version 1.0.0.20 or laterDownload the required firmware and drivers from the Hewlett Packard Enterprise website (<https://www.hpe.com/info/persistentmemory>).
- A supported operating system:
 - Windows Server 2016 with persistent memory drivers from Hewlett Packard Enterprise
 - Windows Server 2019
 - Red Hat Enterprise Linux 7.9 and later
 - Red Hat Enterprise Linux 8.2 and later
 - SUSE Linux Enterprise Server 12 SP5 and later
 - SUSE Linux Enterprise Server 15 SP2 and later
 - VMware vSphere 7.0 U2 and later
 - VMware vSphere 6.7 U3 with P03
- Hardware and licensing requirements for optional encryption of the persistent memory modules:
 - HPE TPM 2.0 (local key encryption)
 - HPE iLO Advanced License (remote key encryption)
 - Key management server (remote key encryption)

For more information, see the *Intel Optane persistent memory 100 series for HPE User Guide* on the Hewlett Packard Enterprise website (<https://www.hpe.com/info/persistentmemory-docs>).

Installing persistent memory modules

Use this procedure only for new persistent memory module installations. If you are migrating this persistent memory module from another system, see the *Intel Optane persistent memory 100 series for HPE User Guide* on the Hewlett Packard Enterprise website (<https://www.hpe.com/info/persistentmemory-docs>).



Prerequisites

- Before beginning the installation, review the memory population guidelines on the Hewlett Packard Enterprise website (<https://www.hpe.com/docs/memory-population-rules>).
- Before you perform this procedure, make sure that you have the following items available:
 - The components included with the hardware option kit
 - A T-10 Torx screwdriver might be needed to unlock the access panel.

Procedure

1. Observe the following alerts:

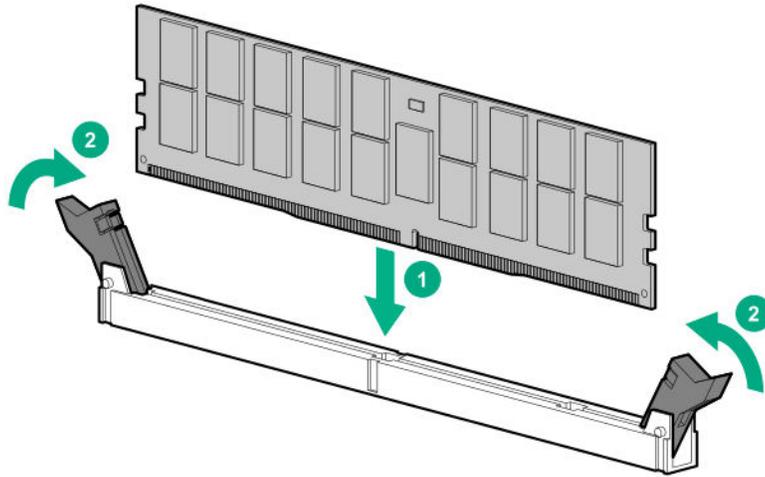
 **CAUTION:** DIMMs and persistent memory modules are keyed for proper alignment. Align notches on the DIMM or persistent memory module with the corresponding notches in the slot before installing the component. Do not force the DIMM or persistent memory module into the slot. When installed properly, not all DIMMs or persistent memory modules will face in the same direction.

 **CAUTION:** Electrostatic discharge can damage electronic components. Be sure you are properly grounded before beginning this procedure.

 **CAUTION:** Failure to properly handle persistent memory modules can damage the component and the system board connector.

 **IMPORTANT:** Hewlett Packard Enterprise recommends that you implement best-practice configurations such as clustered configurations for high availability (HA).

2. Power down the system (**Power down the system**).
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the system.
4. Remove the system from the rack (**Remove the system from the rack**).
5. Place the system on a flat, level work surface.
6. Remove the access panel (**Remove the access panel**).
7. Remove the air baffle (**Remove the air baffle**).
8. Install the persistent memory module.



9. Install any components removed to access the DIMM slots.
10. Install the access panel.
11. Slide or install the system into the rack.
12. If removed, reconnect all power cables.
13. Power up the system.
14. **Configure the system for Intel Optane persistent memory for HPE.**

Configuring the system for Intel Optane persistent memory 100 series for HPE

After installing persistent memory modules, configure the system for Intel Optane persistent memory for HPE.

! **IMPORTANT:** Always follow recommendations from your software application provider for high-availability best practices to ensure maximum uptime and data protection.

A number of configuration tools are available, including:

- UEFI System Utilities—Access System Utilities through the Remote Console to configure the system by pressing the **F9** key during POST.
- iLO RESTful API—Use the iLO RESTful API through tools such as the RESTful Interface Tool (ilorest) or other third-party tools.
- HPE Persistent Memory Management Utility—The HPE Persistent Memory Management Utility is a desktop application used to configure the system for Intel Optane persistent memory 100 series for HPE, as well as evaluate and monitor the system memory configuration layout.

For more information, see the *Intel Optane persistent memory 100 series for HPE User Guide* on the Hewlett Packard Enterprise website (<https://www.hpe.com/info/persistentmemory-docs>).

Internal USB device option

The server has one internal USB 3.0 port. You can use this port to install USB devices that are intended to be rarely removed, such as a USB dongle for Bluetooth or Wi-Fi support.

This server also supports the installation of the Dual 8Gb microSD Enterprise Midline USB device on the server internal USB connector. This USB storage device contains a dual-microSD card module that supports up to two SD, SDHC, or SDXC storage



cards providing data redundancy through a mirrored RAID-1 configuration. This USB storage device connects to an internal USB connector and is configured upon boot.

To locate the internal and USB connector, see **System board components**. For more information, see the Dual 8Gb microSD EM USB storage device documentation on the Hewlett Packard Enterprise website (<http://www.hpe.com/info/enterprise-docs>).

Power supply option



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

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



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



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: To maintain proper airflow and cooling in the power enclosure, always install a power supply blank into each bay. Improper airflow can lead to thermal damage.



IMPORTANT: Mixing different types of power supplies in the same system might limit or disable some power supply features including support for power redundancy. To ensure access to all available features, all power supplies in the same system must have the same output and efficiency ratings.

Installing a DC hot-plug power supply

Prerequisites

- If you are not using an input power cord option, the power supply cabling must be made in consultation with a licensed electrician and be compliant with local code.
- If you are replacing the factory installed ground lug, use the KST RNB5-5 crimp terminal ring or equivalent. Use an M5-0.80 x 8 screw to attach the ground lug to the power supply.

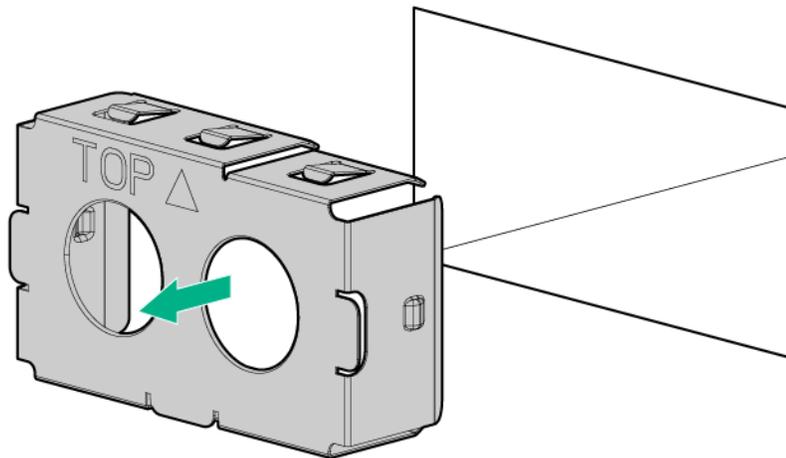


WARNING: To reduce the risk of electric shock, fire, and damage to the equipment, you must install this product in accordance with the following guidelines:

- This power supply is intended only for installation in Hewlett Packard Enterprise systems located in a restricted access location.
- This power supply is not intended for direct connection to the DC supply branch circuit. Only connect this power supply to a power distribution unit (PDU) that provides an independent overcurrent-protected output for each DC power supply. Each output overcurrent-protected device in the PDU must be suitable for interrupting fault current available from the DC power source and must be rated no more than 40A.
- The PDU output must have a shutoff switch or a circuit breaker to disconnect power for each power supply. To completely remove power from the power supply, disconnect power at the PDU. The end product may have multiple power supplies. To remove all power from the product, disconnect the power for each power supply.
- In accordance with applicable national requirements for Information Technology Equipment and Telecommunications Equipment, this power supply only connects to DC power sources that are classified as SELV or TNV. Generally, these requirements are based on the International Standard for Information Technology Equipment, IEC 60950-1. In accordance with local and regional electric codes and regulations, the DC source must have one pole (Neutral/Return) reliably connected to earth ground.
- Connect the power supply ground screw located on the front of the power supply to a suitable ground (earth) terminal. In accordance with local and regional electric codes and regulations, this terminal must be connected to a suitable building ground (earth) terminal. Do not rely on the rack or cabinet chassis to provide adequate ground (earth) continuity.

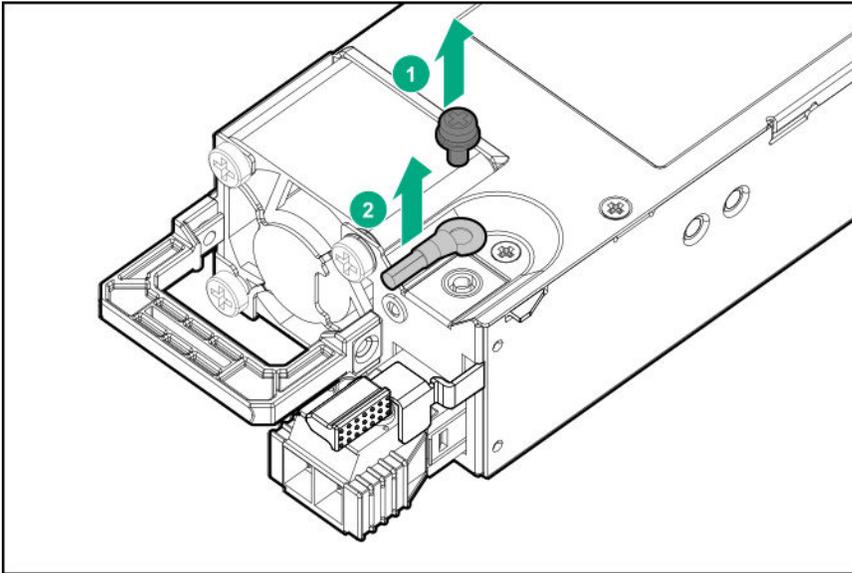
Procedure

1. Remove the power supply blank (**Rear panel components**).

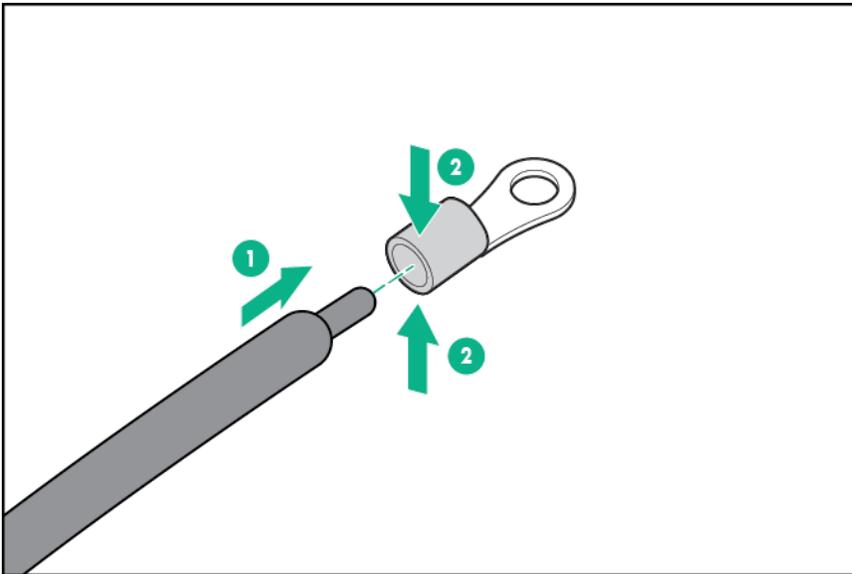


2. Remove the ring tongue.



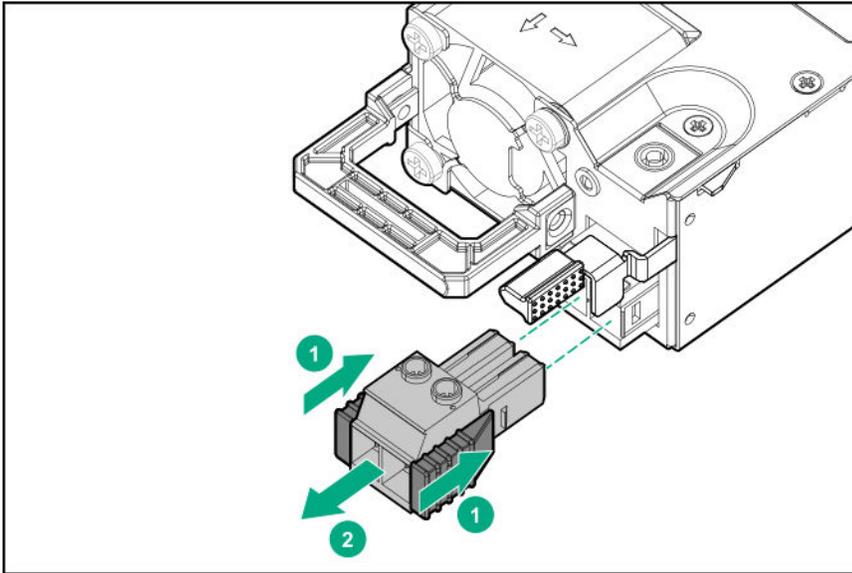


3. Crimp the ring tongue to the ground cable from the -48 V DC power source.

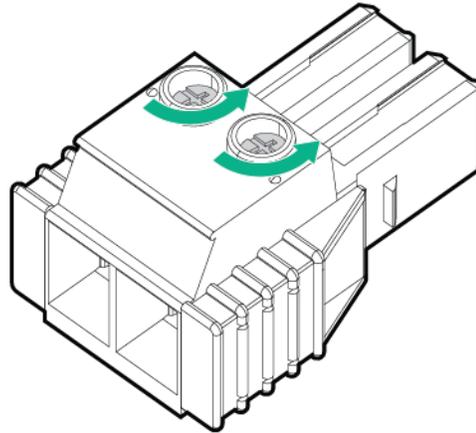


4. Remove the terminal block connector.



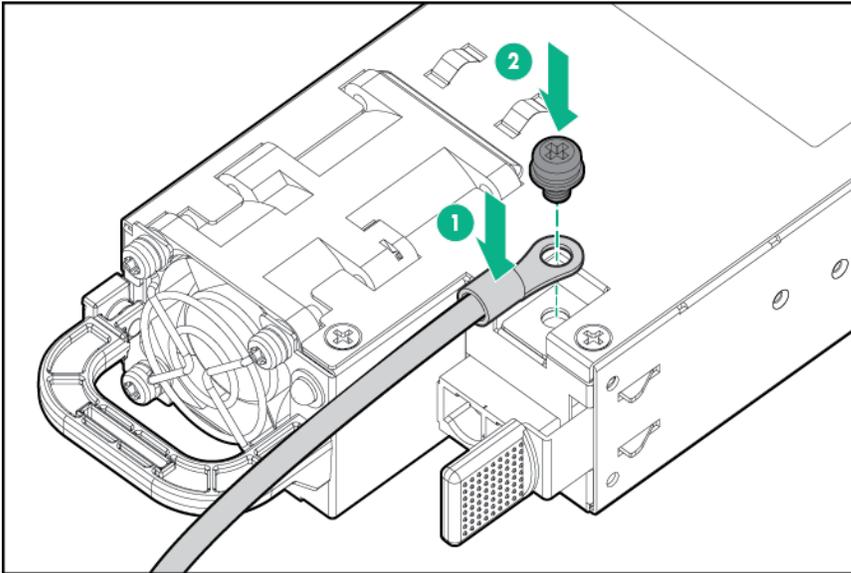


5. Loosen the screws on the terminal block connector.

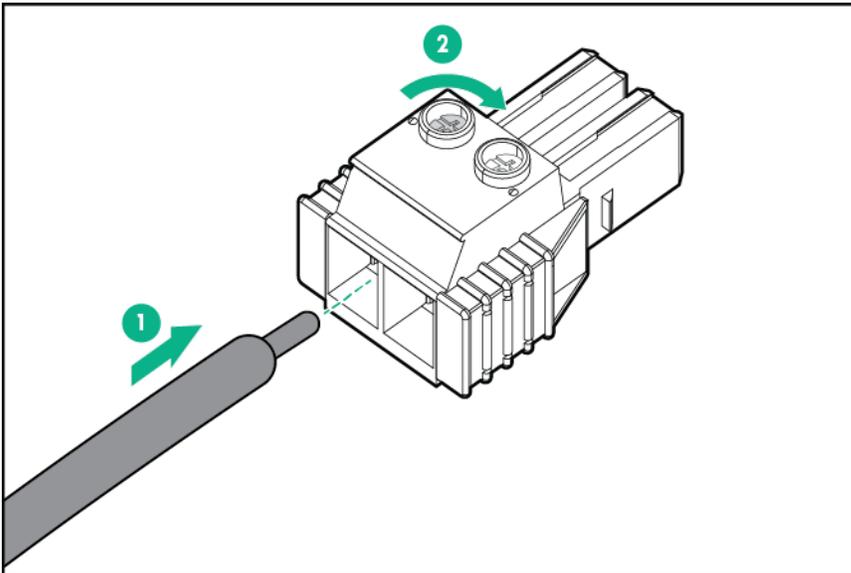


6. Attach the ground (earthed) wire to the ground screw and washer and tighten to 1.47 N m (13 lb-in) of torque. The ground wire must be connected before the -48 V wire and the return wire.



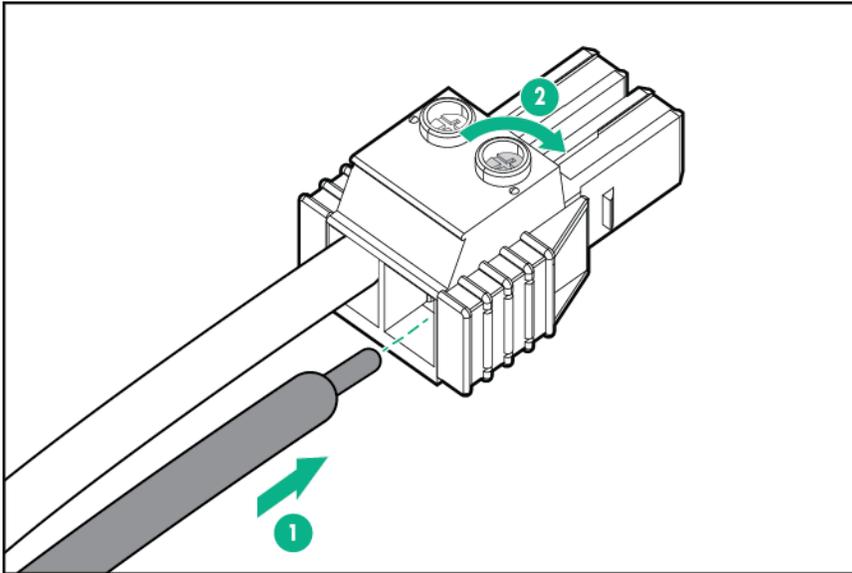


7. Insert the -48 V wire into the left side of the terminal block connector, and then tighten the screw to 1.3 N m (10 lb-in) of torque.

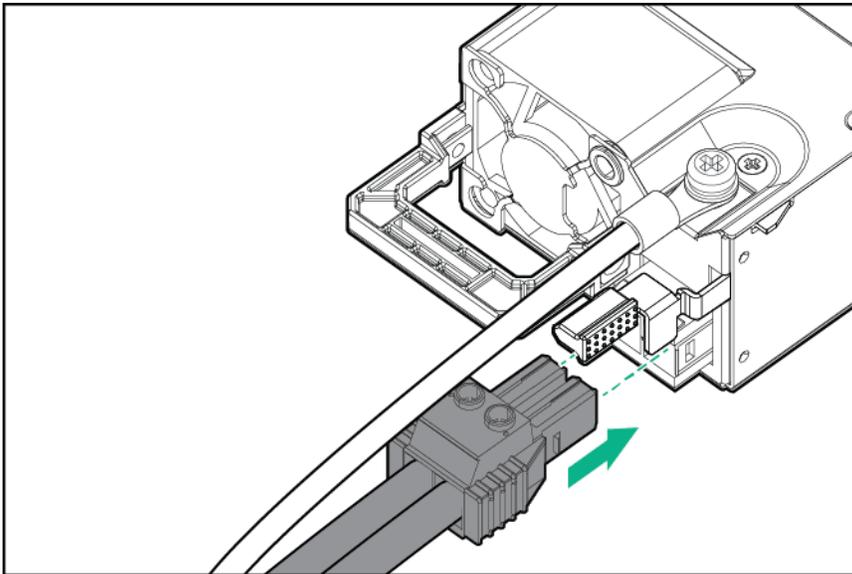


8. Insert the return wire into the right side of the connector, and then tighten the screw to 1.3 N m (10 lb-in) of torque.





9. Install the terminal block connector in the power supply.



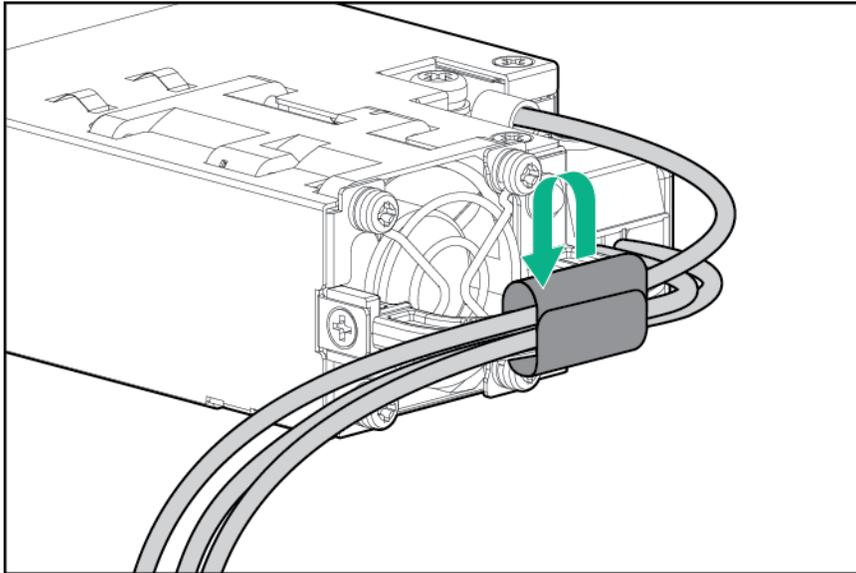
10. To prevent accidental power cord disconnection when sliding the system in and out of the rack, secure the power cord, wires, and/or cables in the strain relief strap attached to the power supply handle:

- a. Unwrap the strain relief strap from the power supply handle.

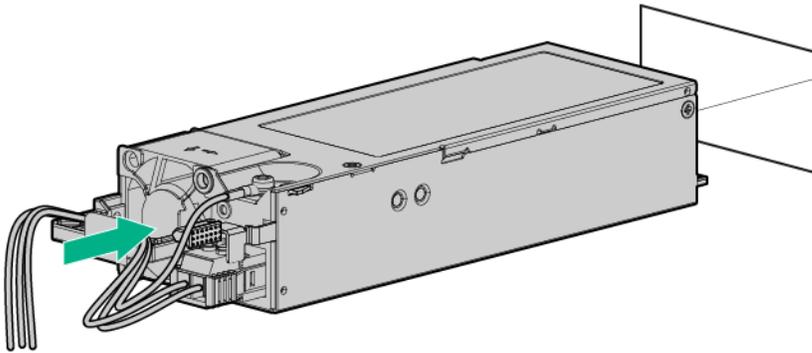
⚠ CAUTION: Avoid tight bend radii to prevent damaging the internal wires of a power cord or a system cable. Never bend power cords and system cables tight enough to cause a crease in the sheathing.

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





11. Slide the power supply into the bay until it clicks into place.



12. Make sure the -48 V DC power source is off or the PDU breaker is in the off position, and then connect the power cord to the -48 V DC power source or PDU.
13. To supply -48 V to the power supply, turn on the -48 V power source or switch the PDU breaker to the on position.
14. Be sure that the power supply LED is green.

Connecting a DC power cable to a DC power source



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

- This equipment must be installed by trained service personnel, as defined by the NEC and IEC 60950-1, Second Edition, the standard for Safety of Information Technology Equipment.
- Connect the equipment to a reliably grounded Secondary circuit source. A Secondary circuit has no direct connection to a Primary circuit and derives its power from a transformer, converter, or equivalent isolation device.
- The branch circuit overcurrent protection must be rated 27 A.



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

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

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

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

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

Procedure

1. Cut the DC power cord ends no shorter than 150 cm (59.06 in).
2. If the power source requires ring tongues, use a crimping tool to install the ring tongues on the power cord wires.

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

ⓘ IMPORTANT: The minimum nominal thread diameter of a pillar or stud type terminal must be 3.5 mm (0.138 in); the diameter of a screw type terminal must be 4.0 mm (0.157 in).

3. Stack each same-colored pair of wires and then attach them to the same power source. The power cord consists of three wires (black, red, and green).

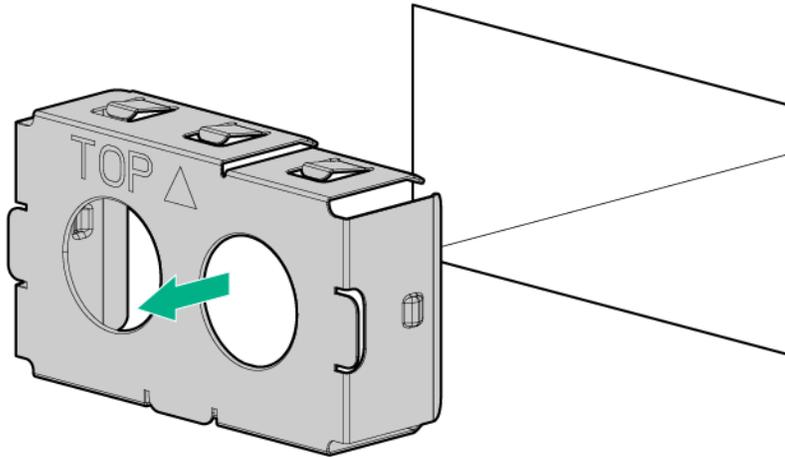
For more information, see the documentation that ships with the power supply.

Installing an AC hot-plug power supply

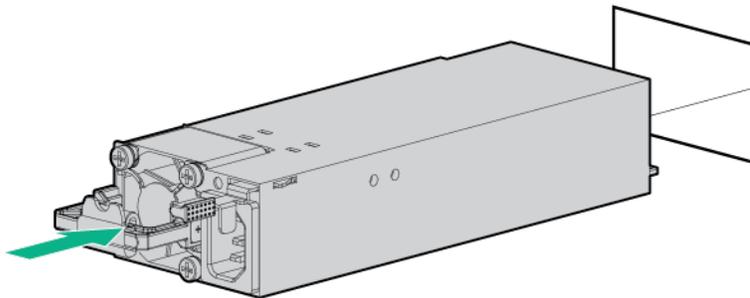
Procedure

1. Remove the power supply blank (**Rear panel components**).





2. Slide the power supply into the bay until it clicks into place.

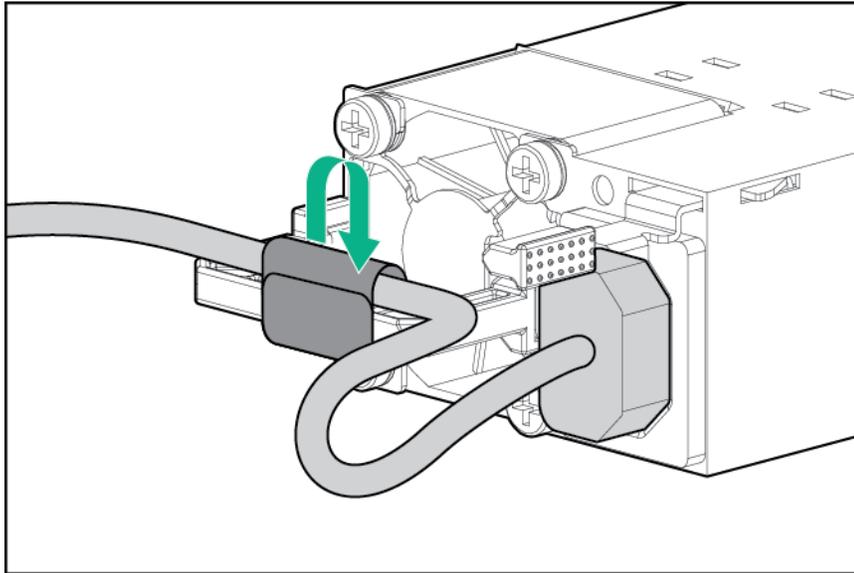


3. Connect the power cord to the power supply.
4. To prevent the power cord from disconnecting when sliding the system in and out of the rack, secure the power cord in the strain relief strap attached to the power supply handle:
 - a. Unwrap the strain relief strap from the power supply handle.

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

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





5. Connect the power cord to the power source.
6. Be sure that the power supply LED is green.

HPE Smart Storage Battery

The HPE Smart Storage Battery supports the following devices:

- HPE Smart Array SR controllers
- HPE Smart Array MR controllers

A single 96W battery can support up to 24 devices.

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

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

Installing the HPE Smart Storage Battery

⚠ CAUTION: In systems that use external data storage, be sure that the system 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 external drives as failed when the system is powered up.

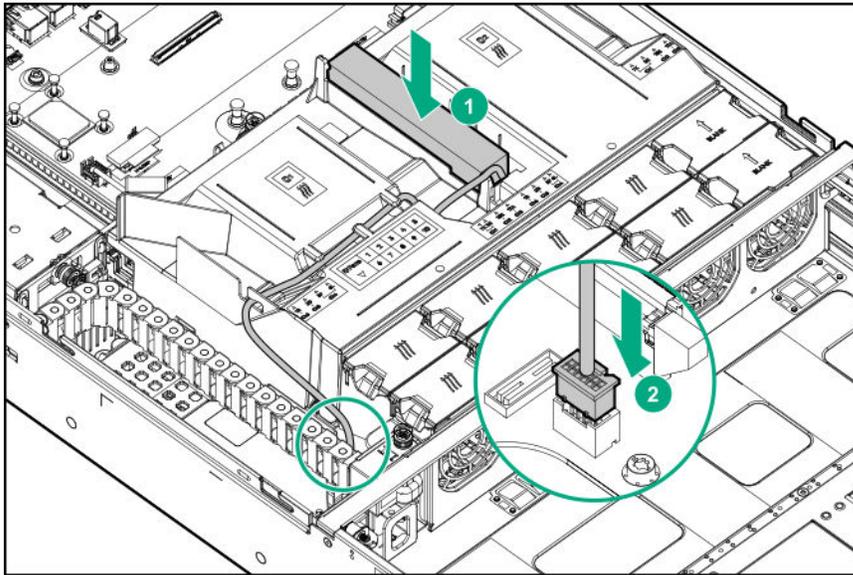
NOTE: System ROM and firmware messages might display "energy pack" in place of "Smart Storage Battery." Energy pack refers to both HPE Smart Storage batteries and HPE Smart Storage Hybrid capacitors.

Procedure

1. Power down the system (**Power down the system**).
2. Remove all power:

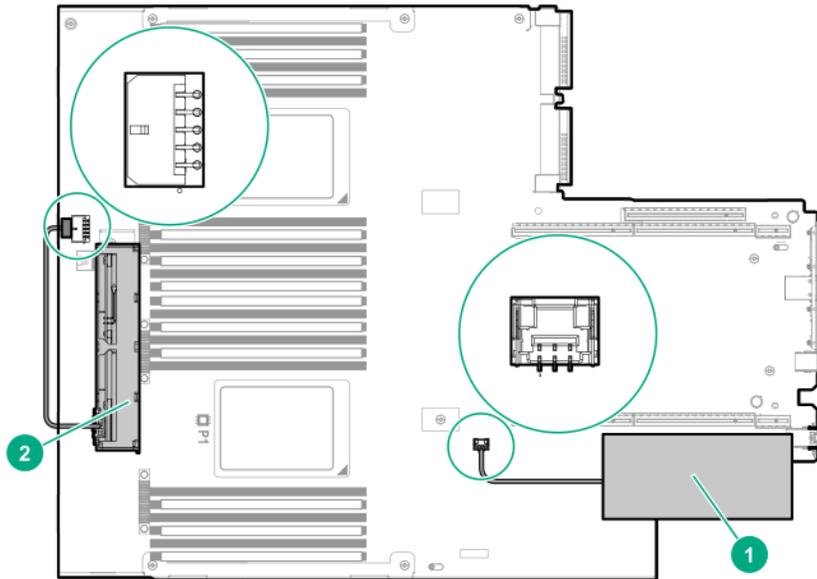


- a. Disconnect each power cord from the power source.
- b. Disconnect each power cord from the system.
3. Remove the system from the rack (**Remove the system from the rack**).
4. Place the system on a flat, level work surface.
5. Remove the access panel (**Remove the access panel**).
6. Extend the front drive cages out of the chassis (**Extend the front drive cages out of the chassis**).
7. Open the cable management holder (**Open the cable management holder**).
8. Install the HPE Smart Storage Battery on the air baffle
9. Secure the HPE Smart Storage Battery cable under the air baffle clips, and then connect the cable to the system board.



! **IMPORTANT:** To enable SmartCache or CacheCade in a P-class type-p Smart Array controller, you must:

- Connect the controller backup power cable to the controller backup power connector on the system or riser board.
 - Connect the energy pack cable to the energy pack connector on the system board.
-



Item	Description ¹
1	Type-p Smart Array controller connected to the controller backup power connector
2	Energy pack connected to the energy pack connector

¹ Your server might appear different

10. Close the cable management holder (**Close the cable management holder**).
11. Slide the front drive cages into the chassis (**Slide the front drive cages into the chassis**).
12. Install the access panel (**Install the access panel**).
13. Install the system into the rack (**Installing the system into the rack**).
14. Power up the system (**Power up the system**).

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 system. This option is not supported on a Gen9 and earlier system.

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 (<https://www.hpe.com/info/qs>). For more information about Microsoft Windows BitLocker Drive Encryption feature, see the Microsoft website (<https://www.microsoft.com>).



⚠ CAUTION: If the TPM is removed from the original system and powered up on a different system, 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 system. 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, all 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 option

Installing the Trusted Platform Module board

Preparing the system 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 system:

- For rack and tower servers, remove the power cord.
 - For server blades and compute modules, remove the server blade or compute module from the rack.
-



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. Update the system ROM.

Locate and download the latest ROM version from the Hewlett Packard Enterprise Support Center website (<http://www.hpe.com/support/hpesc>). To update the system ROM, follow the instructions on the website.

4. Power down the system.

- a. Shut down the OS as directed by the OS documentation.
- b. To place the system in standby mode, press the Power On/Standby button. When the system enters standby power mode, the system power LED changes to amber.
- c. Disconnect the power cords (rack and tower servers).

5. Do one of the following:

- Remove the system from the rack, if necessary.
- Remove the system or system blade from the rack.

6. Place the system on a flat, level work surface.

7. Remove the access panel.

8. Remove any options or cables that may prevent access to the TPM connector.

9. Proceed to [Installing the TPM board and cover](#).

Installing the TPM board and cover

Procedure

1. Observe the following alerts:

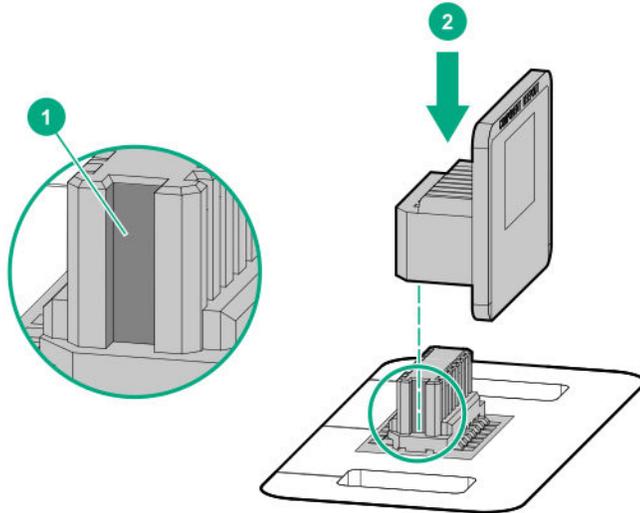


CAUTION: If the TPM is removed from the original system and powered up on a different system, data stored in the TPM including keys will be erased.

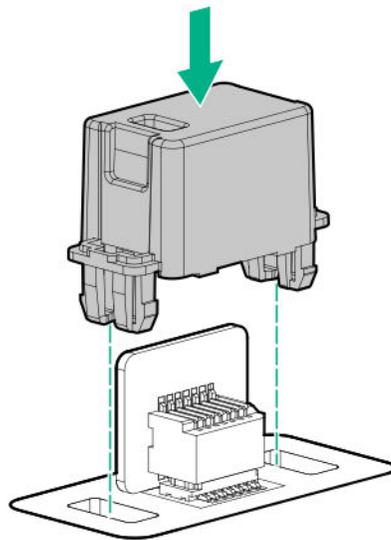


CAUTION: The TPM is keyed to install only in the orientation shown. Any attempt to install the TPM in a different orientation might result in damage to the TPM or system board.

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 system 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 system for operation**.



Preparing the system for operation

Procedure

1. Install any options or cables previously removed to access the TPM connector.
2. Install the access panel.
3. Do one of the following:
 - Slide or install the server into the rack.
 - Install the system into the rack.
4. Power up the system.
 - a. Connect the power cords (rack and tower servers).
 - b. Press the Power On/Standby button.

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

Enabling the Trusted Platform Module as TPM 2.0

Procedure

1. During the system 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 system prompts for reboot request. Press the **Enter** key to confirm reboot.



If the following actions were performed, the system 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 system 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 that "TPM Visibility" is set to **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 system 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 BitLocker 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 system.
- Do not save the recovery key/password on the encrypted hard drive.



Cabling

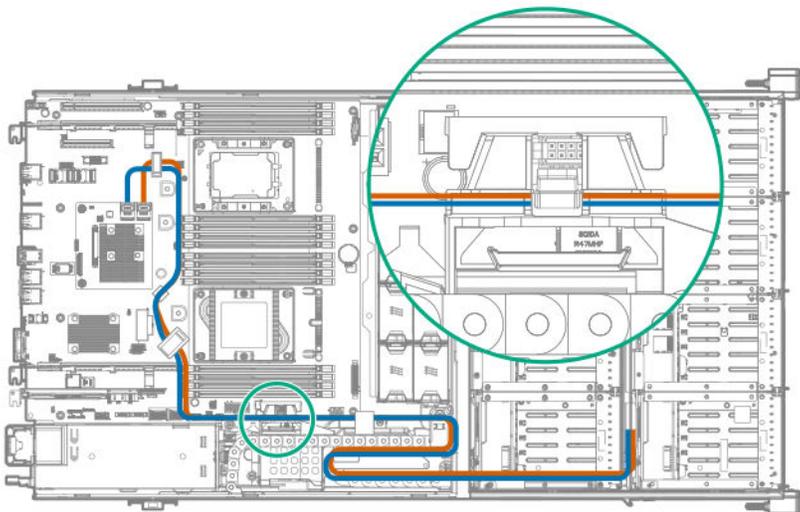
Cabling overview

This section provides cabling diagrams. When you are cabling the system, refer to the appropriate section based on your system configuration. For information on connector location, see [Component identification](#).

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

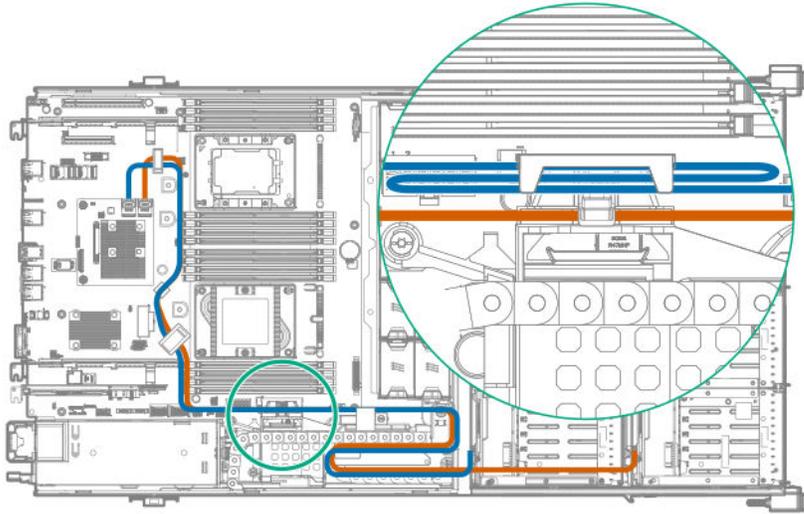
Front drive cage cabling

- Front drive cage P1 and P2 cables connected to P1 and P2 on one of the following options installed on the system board:
 - HPE Smart Array E208i-a SR Gen10 controller
 - HPE Smart Array P408i-a SR Gen10 controller
 - HPE Smart Array P816i-a SR Gen10 controller

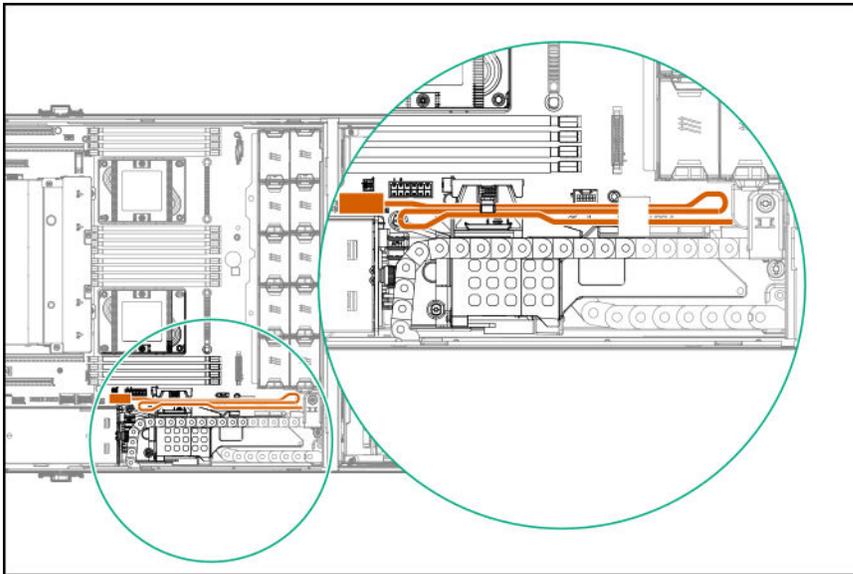


Front and internal drive cage cabling

- Front drive cage P1 and internal drive cage P1 connected to P1 and P2 on an HPE Smart Array E208i-a SR Gen10 controller or an HPE Smart Array P408i-a SR Gen10 controller installed on the system board

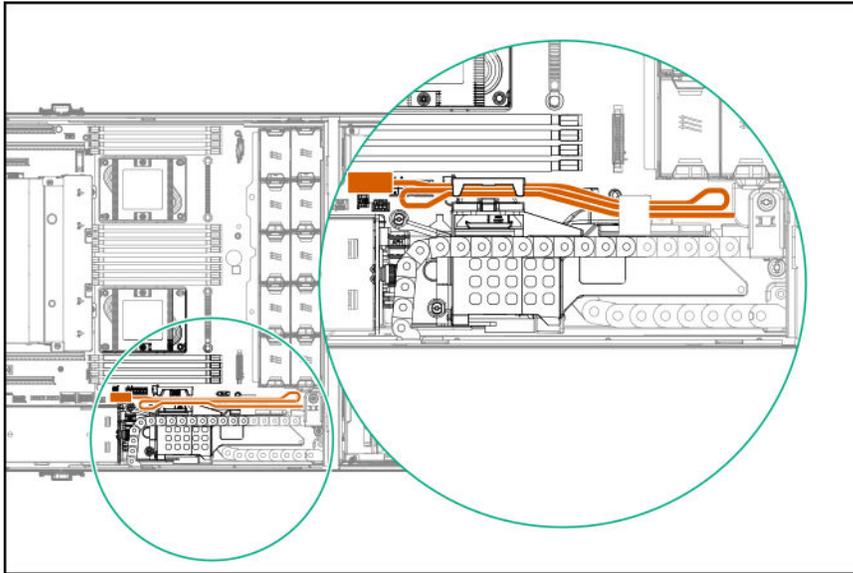


- Unused front drive cage P2 cable folded and stored in the narrow slot of the cable guard

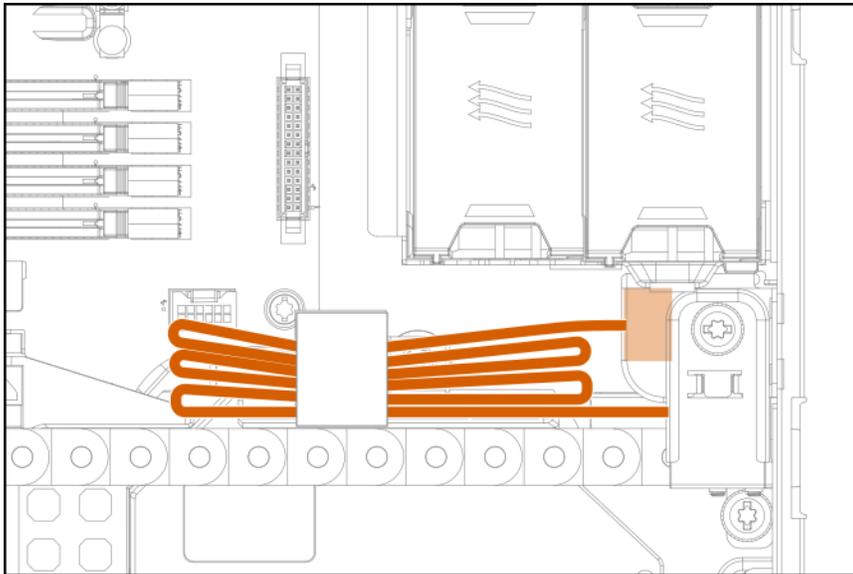


- Unused internal drive cage P2 cable folded and stored in the wider slot of the cable guard





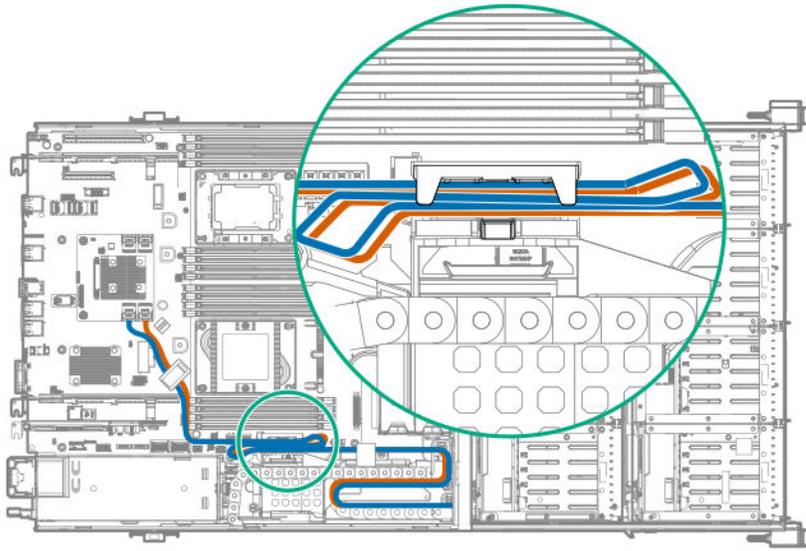
- Unused P3 cable (not routed through either slot on the cable guard)



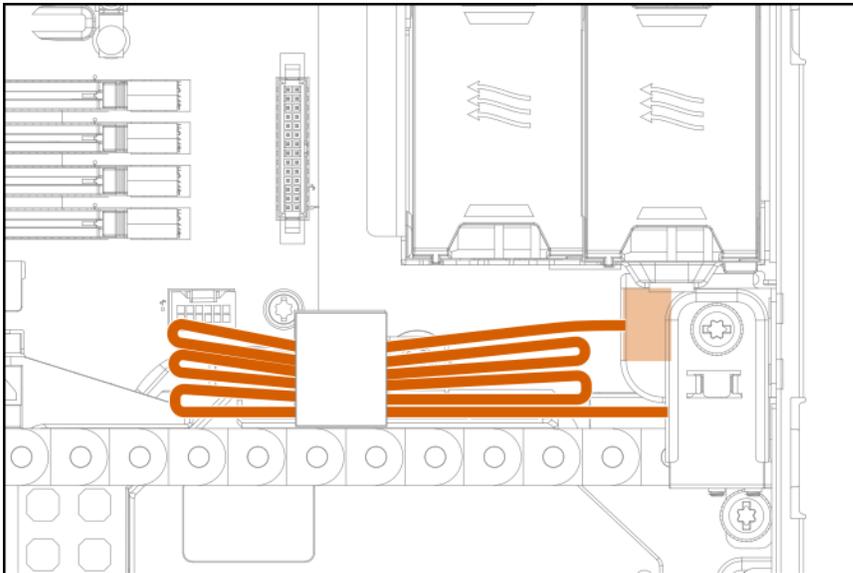
Internal drive cage cabling

- Internal drive cage P1 and P2 connected to P3 and P4 on an HPE Smart Array P816i-a SR Gen10 controller installed on the system board



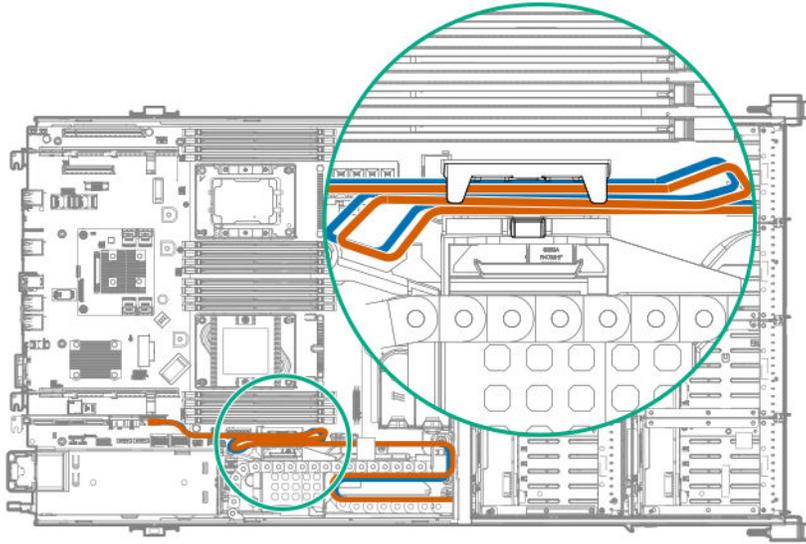


Unused P3 cable (not routed through either slot on the cable guard)

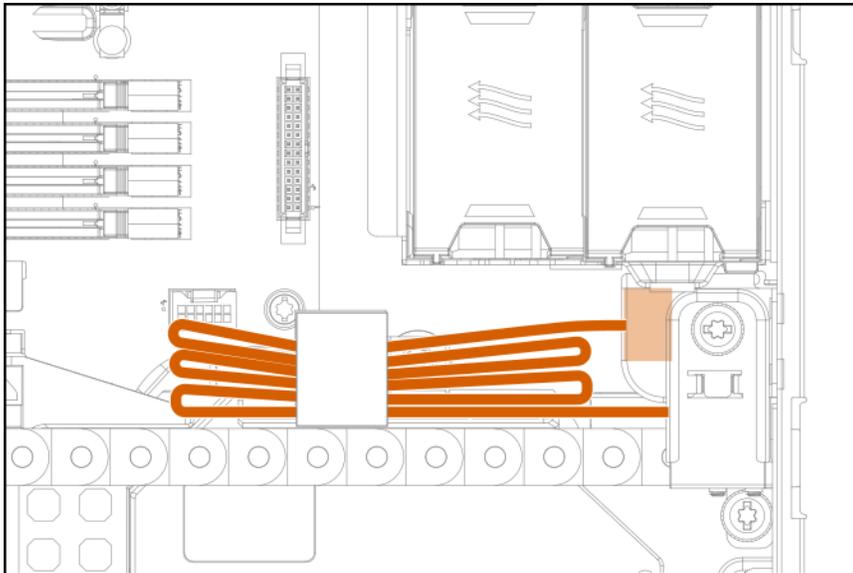


- Internal drive cage P1 and P2 connected to P1 and P2 on a PCIe card in slot 1



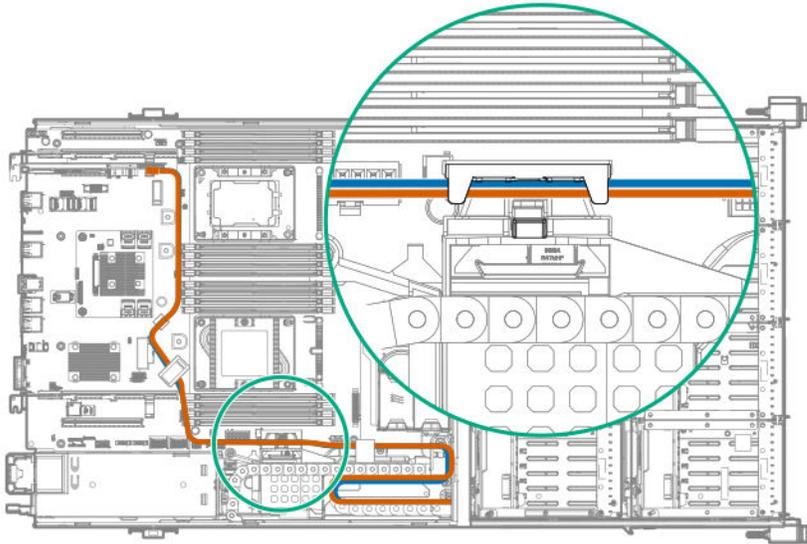


Unused P3 cable (not routed through either slot on the cable guard)

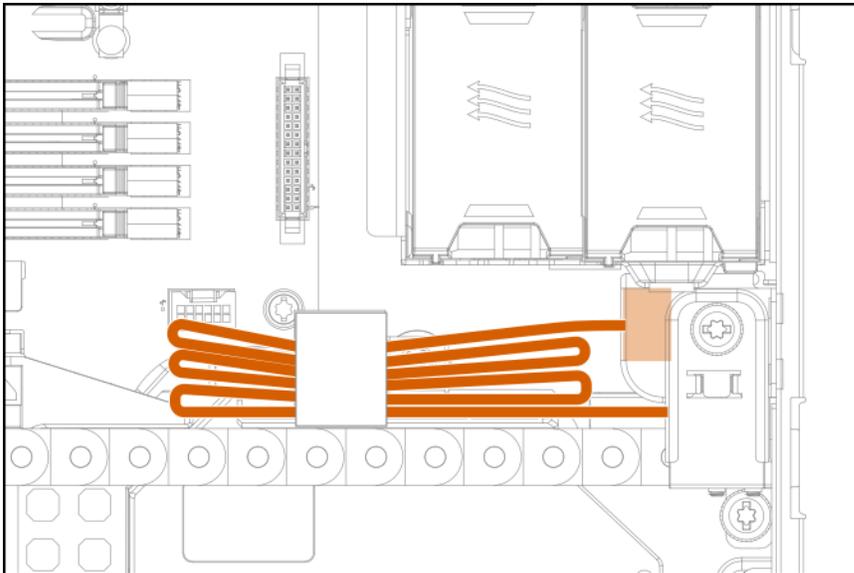


- Internal drive cage P1 and P2 connected to P1 and P2 on a PCIe card in slot 5



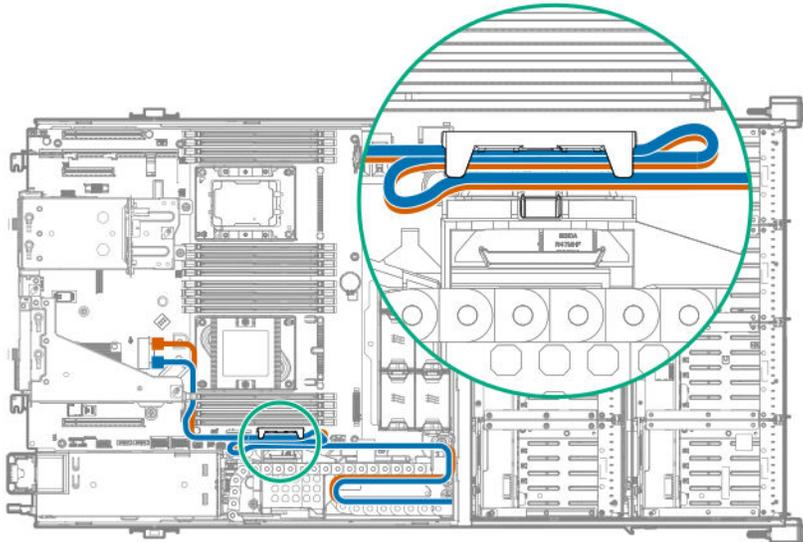


Unused P3 cable (not routed through either slot on the cable guard)

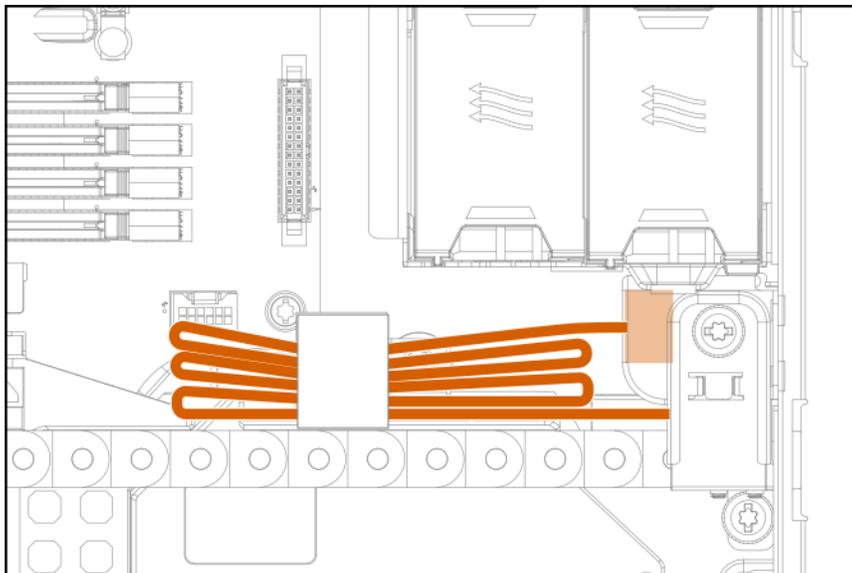


- Internal drive cage P1 and P2 connected to P1 and P2 on a PCIe card located in slot 3 or 4 in riser



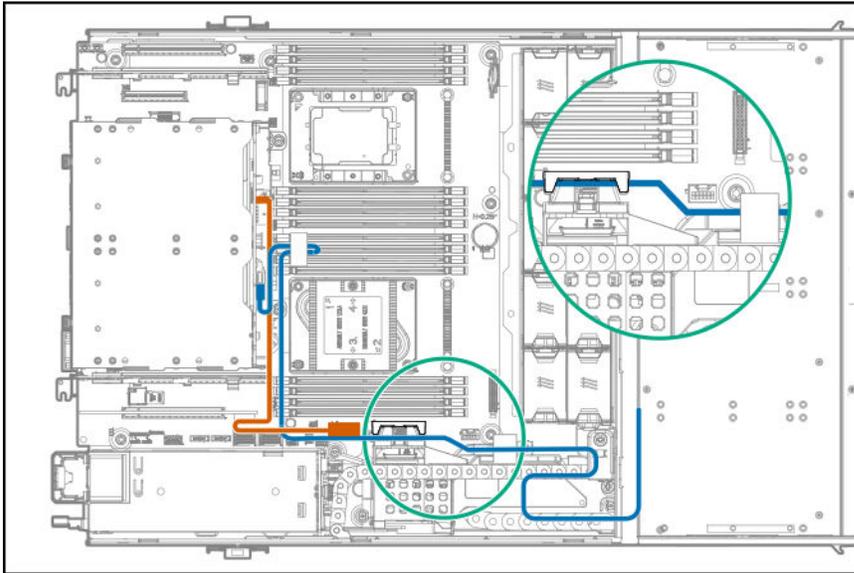


Unused P3 cable (not routed through either slot on the cable guard)

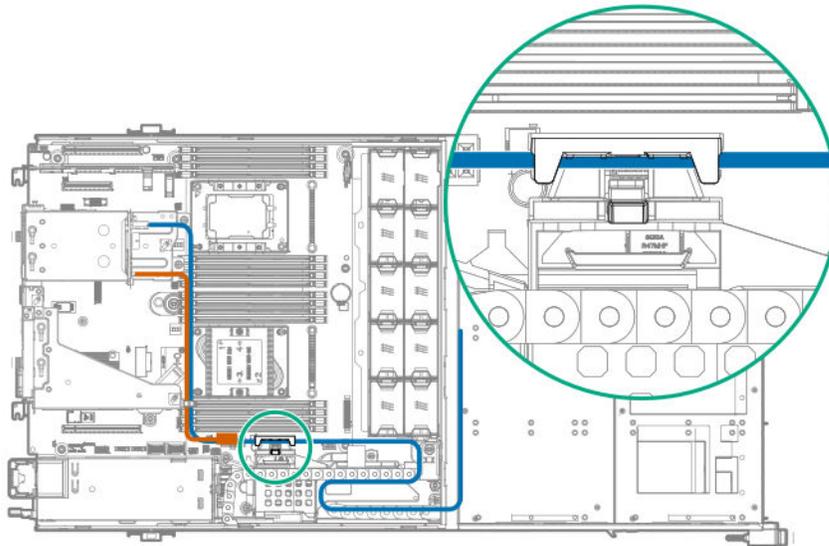


- Internal drive cage P3 connected to rear LFF drive cage





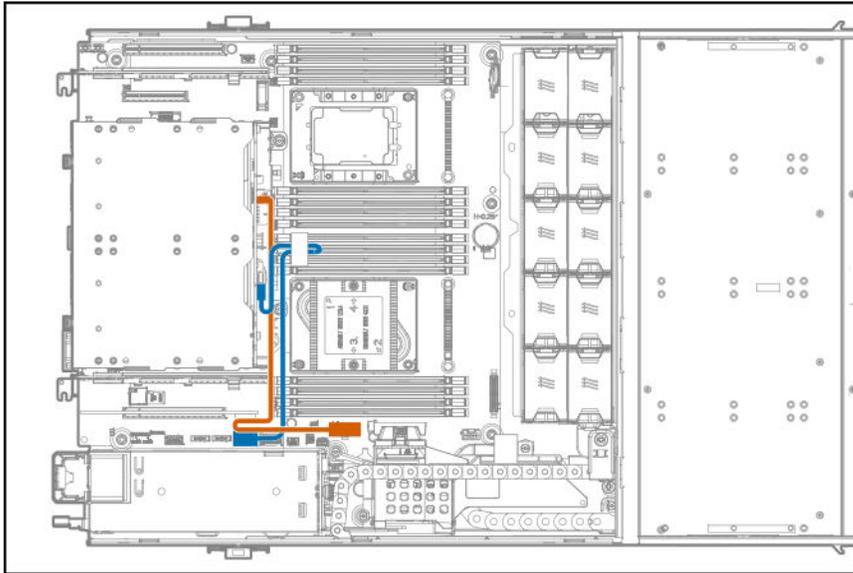
- Internal drive cage P3 connected to the rear SFF drive cage



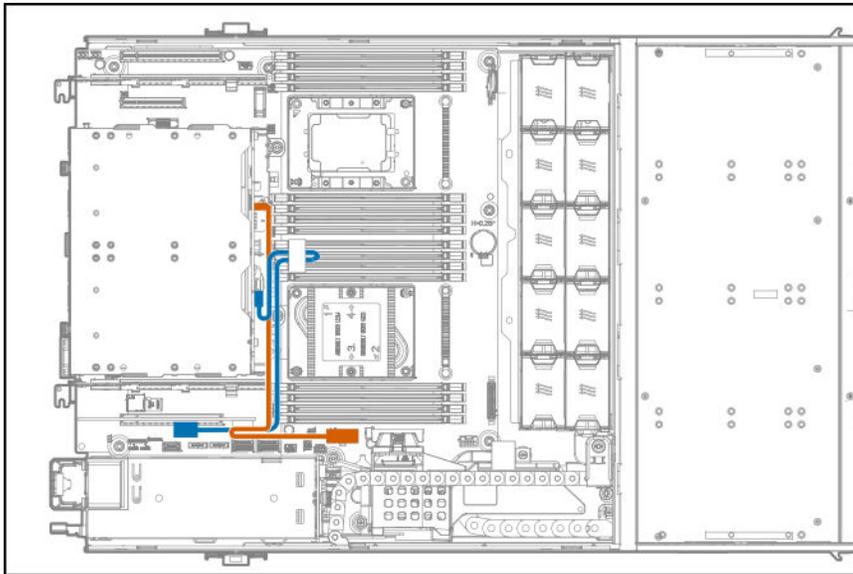
Rear LFF drive cage cabling

- Rear LFF drive cage connected to system board





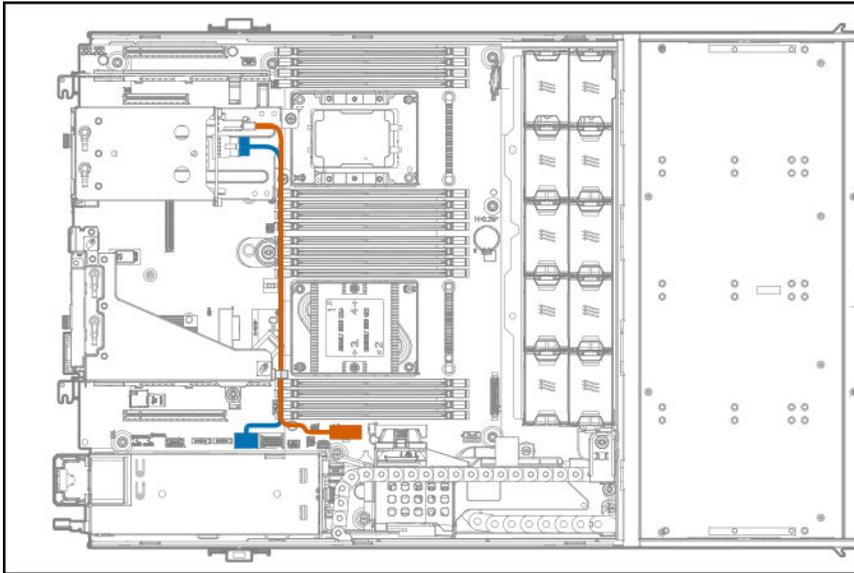
- Rear LFF drive cage connected to PCIe card in slot 1 or 2



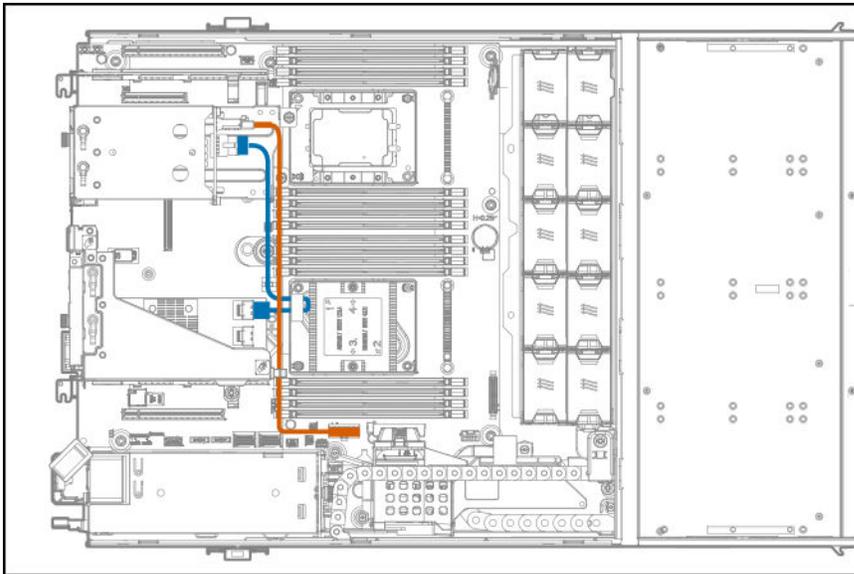
Rear SFF drive cage cabling

- Rear SFF drive cage connected to the system board





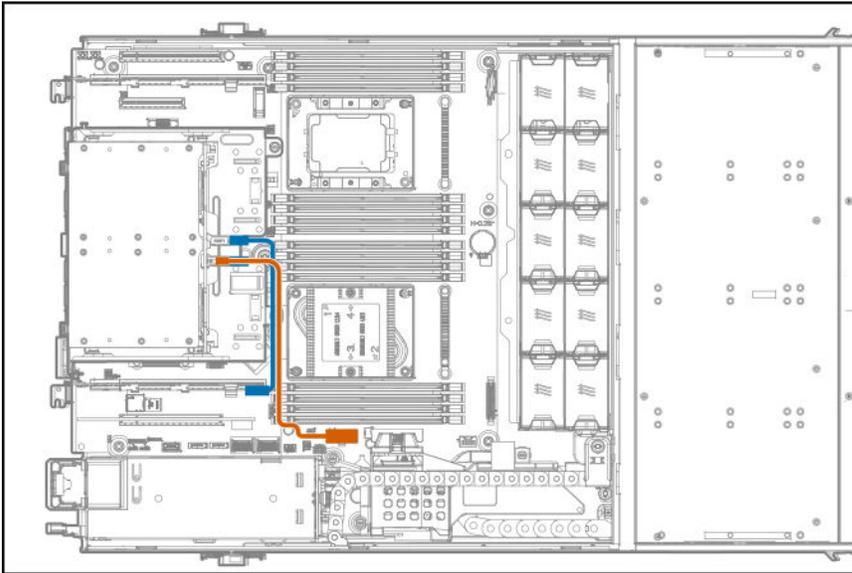
- Rear SFF drive cage connected to PCIe card in riser slot 4



Rear six-bay SFF drive cage cabling (SAS, SATA)

- Rear six-bay SFF drive cage connected to PCIe card in riser slot 2

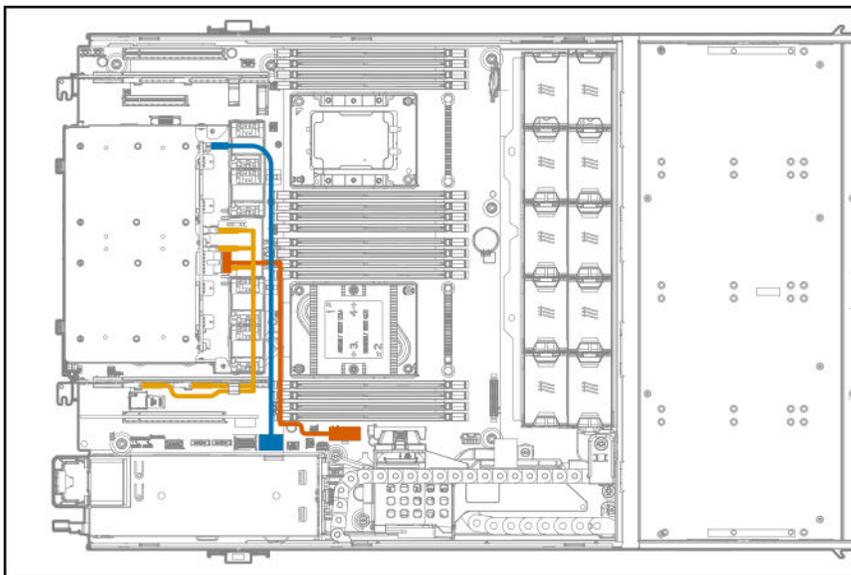




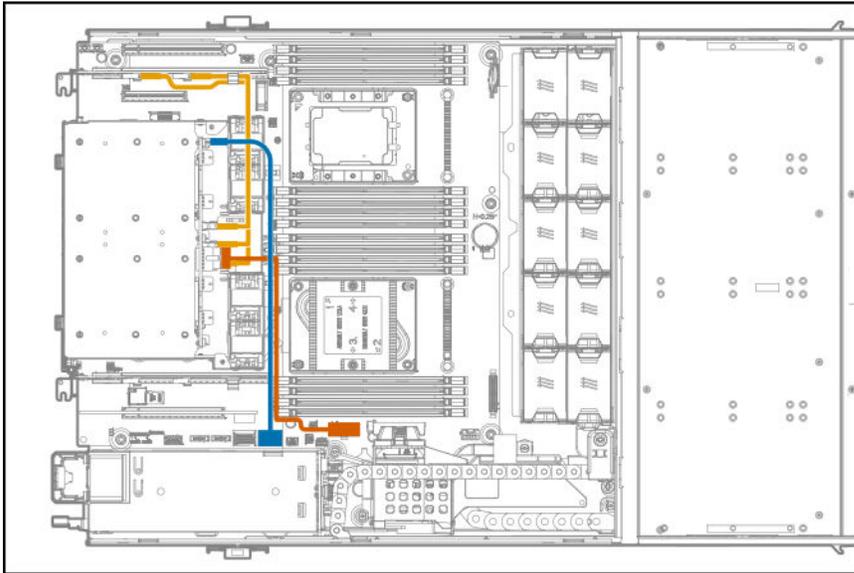
NVMe rear drive cage cabling

The six-bay SFF NVMe rear drive cage comes with preinstalled cabling. Connectors on the cables will connect to corresponding connectors on an NVMe pass-through assembly installed in slot 2, slot 6, or slots 2 and 6.

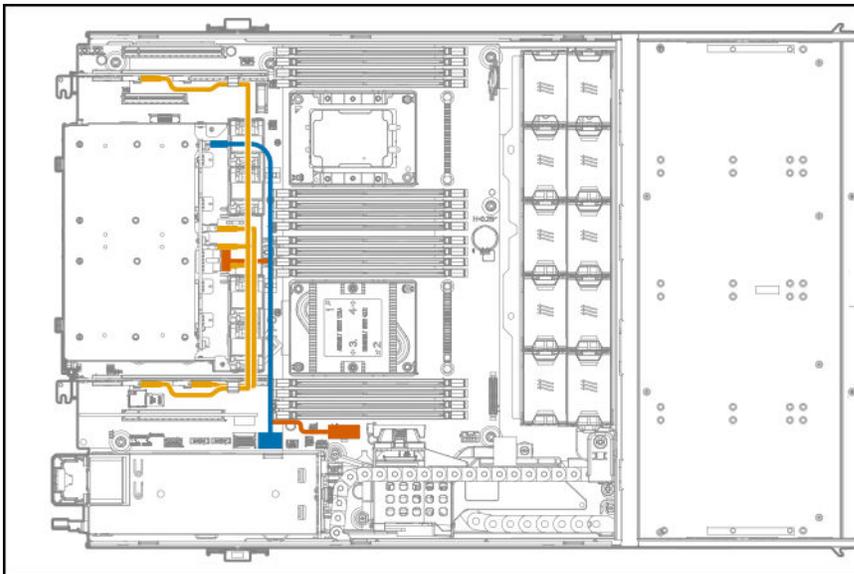
- NVMe rear drive cage cabling to pass-through board in slot 2
 - NVMe P1 to pass-through P1 in slot 2
 - NVMe P2 to pass-through P2 in slot 2
 - NVMe P3 to pass-through P3 in slot 2



- NVMe rear drive cage cabling to pass-through board in slot 6
 - NVMe P1 to pass-through P1 in slot 6
 - NVMe P2 to pass-through P2 in slot 6
 - NVMe P3 to pass-through P3 in slot 6



- NVMe rear drive cage cabling to pass-through boards in slots 2 and 6
 - NVMe P1 to pass-through P1 in slot 6
 - NVMe P2 to pass-through P2 in slot 2
 - NVMe P3 to pass-through P3 in slot 2



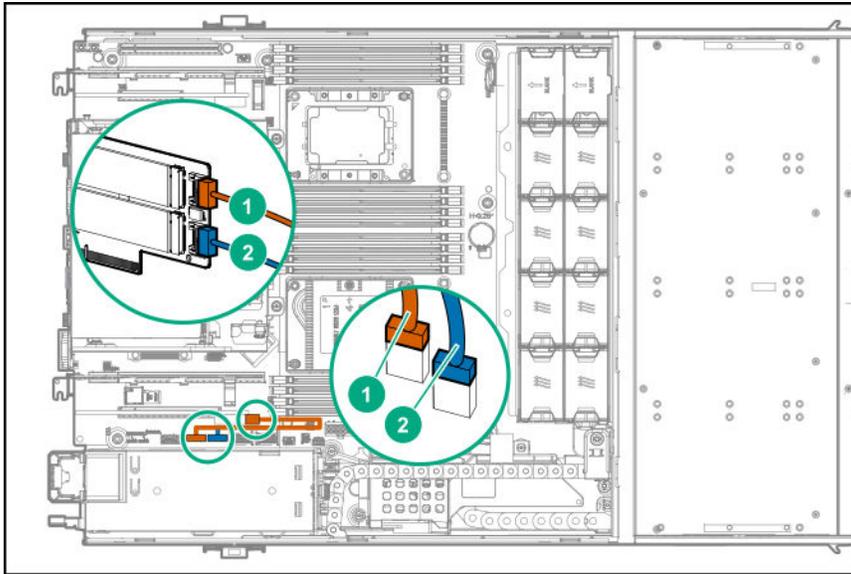
M.2 SSD Enablement option cabling

The M.2 SSD Enablement option is supported in the following slots:

- Expansion slot 1 on the system board
- Expansion slot 2 on the system board
- Expansion slot 3 in the PCI3 riser cage
- Expansion slot 4 in the PCI3 riser cage



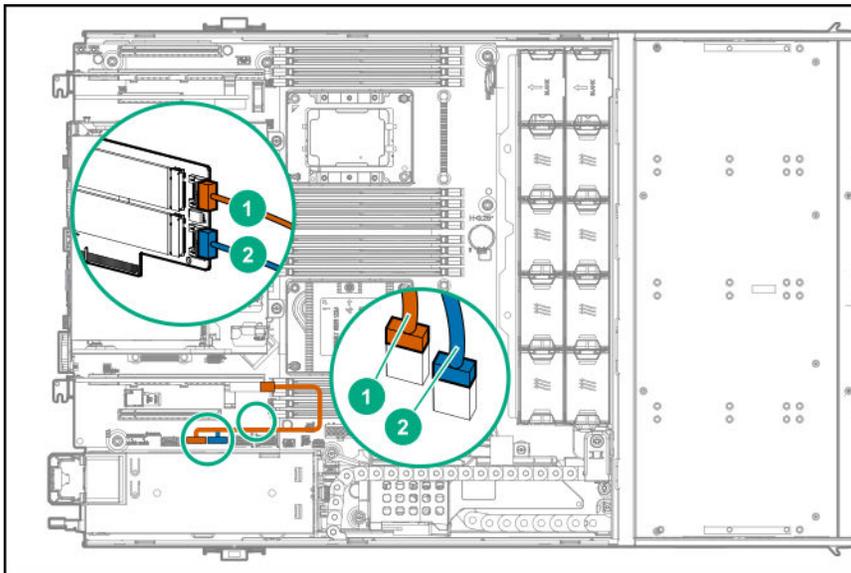
- M.2 SSD cabling from the onboard PCIe x16 expansion slot 1



Item	Description
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1	M.2 SSD 1 SATA cable
2	M.2 SSD 2 SATA cable

- M.2 SSD cabling from the onboard PCIe x24 expansion slot 2

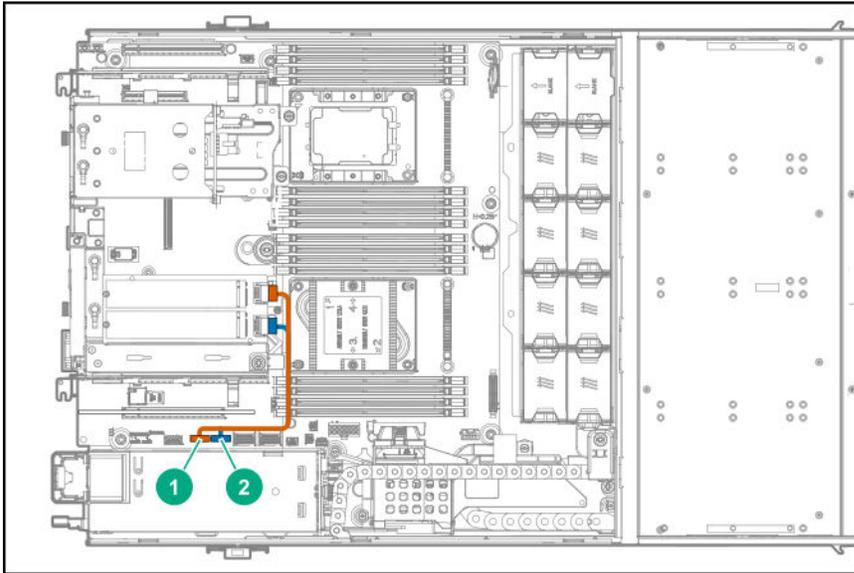


Item	Description
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1	M.2 SSD 1 SATA cable
2	M.2 SSD 2 SATA cable

- M.2 SSD cabling from the onboard PCIe x24 expansion slot 3 or 4 in the PCIe riser cage





Item	Description
1	M.2 SSD 1 SATA cable
2	M.2 SSD 2 SATA cable

HPE Smart Array P824i-p MR Gen10 cabling

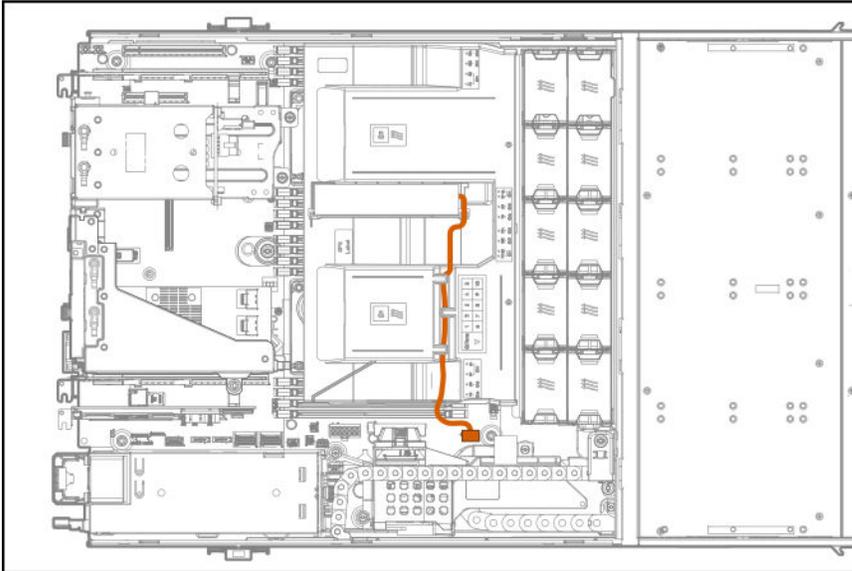
HPE Smart Array P824i-p MR Gen10 controller connected to pass-through board installed on the system board

- ⓘ **IMPORTANT:** Hewlett Packard Enterprise supports only one HPE Smart Array P824i-p MR Gen10 controller to be installed in either slot 3 or 4.





HPE Smart Storage Battery cabling

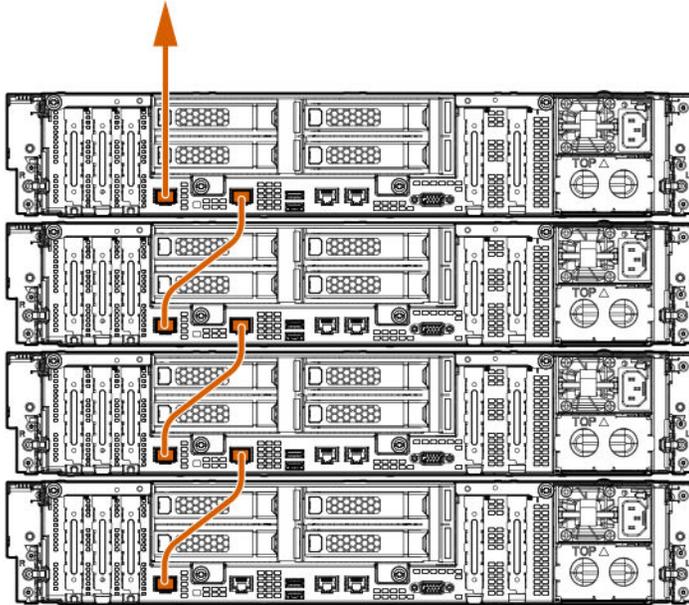


iLO ports to network cabling

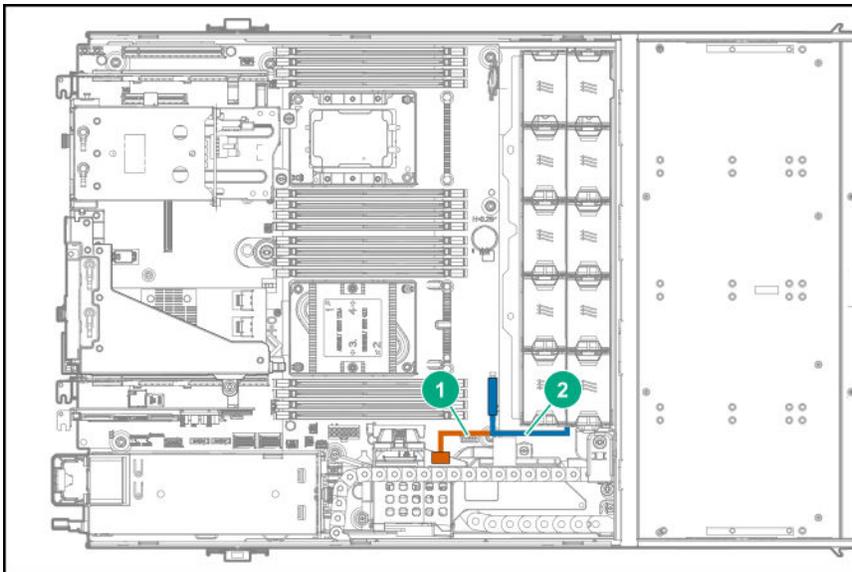
Connecting multiple systems to the network using the iLO management ports

The arrow indicates the connection to the network.





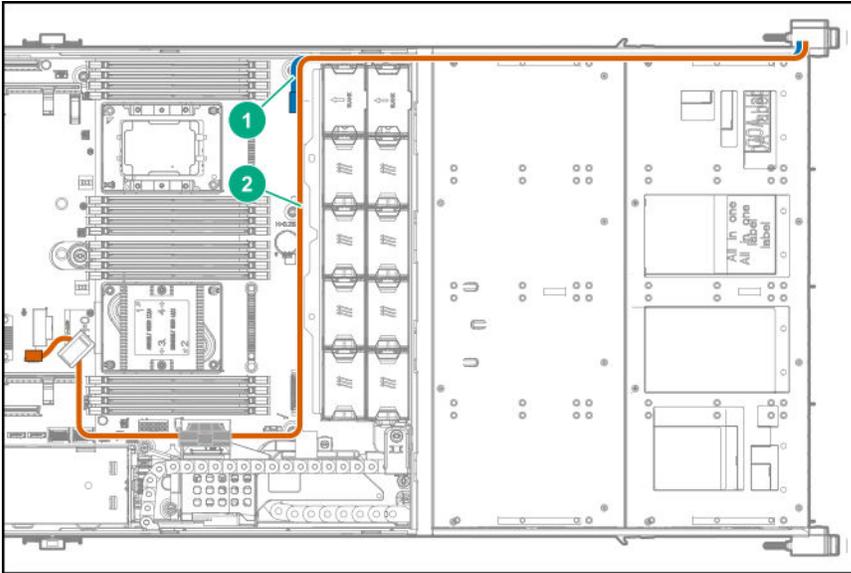
Fan assembly cabling



Item	Description
1	Fan assembly power cable
2	Fan assembly signal cable



Front panel cabling



Item	Description
1	Front I/O cable
2	Front USB 2.0 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
<u>Active Health System</u>	Online and Offline
<u>HPE iLO 5</u>	Online and Offline
<u>iLO RESTful API</u>	Online and Offline
<u>Intelligent Provisioning</u>	Online and Offline
<u>Scripting Toolkit for Windows and Linux</u>	Online
<u>Service Pack for ProLiant</u>	Online and Offline
<u>Smart Update Manager</u>	Online and Offline
<u>UEFI System Utilities</u>	Offline
<u>HPE Smart Storage Administrator</u>	Online and Offline
<u>HPE MR Storage Administrator</u>	Offline
<u>StorCLI</u>	Offline

Product QuickSpecs

For more information about product features, specifications, options, configurations, and compatibility, see the product QuickSpecs on the Hewlett Packard Enterprise website (<https://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: <https://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. Host resources are not consumed in the collection and logging of Active Health System 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 <https://www.hpe.com/info/privacy>.

You can also upload the log to the Active Health System Viewer. For more information, see the Active Health System Viewer documentation at the following website: <https://www.hpe.com/support/ahsv-docs>.



HPE iLO 5

iLO 5 is a remote server management processor embedded on the system boards of supported HPE servers and 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.

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

iLO Service Port

The Service Port is a USB port with the label **iLO** on supported servers and compute modules.

To find out if your server or compute module supports this feature, see the server specifications document at the following website: <https://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.
- Connect a client (such as a laptop) with a supported USB to Ethernet adapter to access the following:
 - iLO web interface
 - Remote console
 - iLO RESTful API
 - CLI

Hewlett Packard Enterprise recommends the HPE USB to Ethernet Adapter (part number Q7Y55A).



Some servers, such as the XL170r, require an adapter to connect a USB to Ethernet adapter to the iLO Service Port. Hewlett Packard Enterprise recommends the HPE Micro USB to USB Adapter (part number 789904-B21).

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: <https://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 (<https://www.hpe.com/support/restfulinterface/docs>).

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

 For more information, watch the [Redfish & How it works with HPE Server Management](#) video.

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

iLO Amplifier Pack

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. 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: <https://www.hpe.com/support/iLO-ap-ug-en>.

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.



NOTE:

- Rapid Setup Software is only available on the ProLiant 300 Series servers or below. When you launch F10 mode from the POST screen, you are prompted to select whether you want to enter the Intelligent Provisioning or HPE Rapid Setup Software mode.
- After you have selected a mode, you must reprogram the server to change the mode that launches when you boot to F10.

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 DX/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 and enter either Intelligent Provisioning or HPE Rapid Setup Software.
- From the iLO web interface using **Lifecycle Management**. **Lifecycle Management** allows you to access Intelligent Provisioning without rebooting your server.

Management security

HPE ProLiant Gen10, HPE ProLiant Gen10 Plus, and HPE Apollo 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 license provides security features that help ensure protection, detection, and recovery from advanced cyber attacks. For more information, see the *HPE Gen10 and Gen10 Plus Security Reference Guide* on the Hewlett Packard Enterprise Information Library at <https://www.hpe.com/support/gen10-security-ref-en>.

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 <https://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 (<https://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 system 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](#).

HPE MR Storage Administrator

HPE MR Storage Administrator is a web-based application that enables you to monitor, configure, maintain, and troubleshoot the HPE Smart Array MR controller. MR Storage Administrator enables you to view, create, and manage storage configurations.

! **IMPORTANT:** The HPE MR Storage Administrator manages **only** the HPE Smart Array MR controllers. It does not manage HPE Smart Array SR controllers.

- **Monitoring and configuring:** MR Storage Administrator enables you to monitor the controllers and configure the drives on the controller. It displays the status of the controller cards, logical drives, and drives on the controller. The device status icons notify you if there are drive failures and other events that require your immediate attention. Email notifications about the status of the server are sent based on your alert settings. The system errors and events are recorded and displayed in an event log file. You can also import or clear foreign configurations.

! **IMPORTANT:** Limited alerting and monitoring is available through iLO when HPE Agentless Management Service is installed. The HPE Smart Array P824i-p MR Gen10 controller supports limited alerts through iLO using the AMS agent.



- **Maintaining:** Using MR Storage Administrator, you can perform system maintenance tasks, such as updating the controller firmware.
- **Troubleshooting:** MR Storage Administrator displays information related to drive failures, device failures, and other issues. It also provides recommendations and displays contextual links, helping you to locate the drives/devices that have issues and troubleshoot them. You can also download a report of the devices and their configurations, properties, and settings and send it to Hewlett Packard Enterprise Support for further troubleshooting.

Obtain MR Storage Administrator installation files through the Service Pack for ProLiant, or SPP, which you can download from the Hewlett Packard Enterprise website (<https://www.hpe.com/servers/spp/download>). Be sure to use the latest SPP version for the server.

For more information about the MR Storage Administrator, see *MR Storage Administrator User Guide* on the Hewlett Packard Enterprise website (<https://www.hpe.com/info/P824i-pdocs>).

HPE InfoSight for servers

The HPE InfoSight portal is a secure web interface hosted by HPE that allows you to monitor supported devices through a graphical interface.

HPE InfoSight for servers:

- Combines the machine learning and predictive analytics of HPE InfoSight with the health and performance monitoring of Active Health System (AHS) and HPE iLO to optimize performance and predict and prevent problems
- Provides automatic collection and analysis of the sensor and telemetry data from AHS to derive insights from the behaviors of the install base to provide recommendations to resolve problems and improve performance

For more information on getting started and using HPE InfoSight for servers, go to: <https://www.hpe.com/info/infosight-servers-docs>.

StorCLI

The Storage Command Line Interface (StorCLI) tool is the command line management software designed for the HPE Smart Array MR controller. StorCLI is a command line interface that is designed to be easy to use, consistent, and easy to script.

Obtain StorCLI through the Service Pack for ProLiant, or SPP, which you can download from <https://www.hpe.com/servers/spp/download>. Be sure to use the latest SPP version for the server.

For more information about StorCLI, see *StorCLI User Guide* on the Hewlett Packard Enterprise website <https://www.hpe.com/info/P824i-pdocs>.

USB support

Hewlett Packard Enterprise Gen10 and Gen10 Plus systems support all USB operating speeds depending on the device that is connected to the system.

External USB functionality

Hewlett Packard Enterprise provides external USB support to enable local connection of USB devices for system 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 system enables you to upgrade or configure the ROM safely with redundant ROM support. The system 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 system 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 SUT, 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, HPE Superdome Flex servers, 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 or later 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: Support for HPE Integrity servers has been discontinued from SUM 8.x.

Integrated Smart Update Tools

Integrated Smart Update Tools (SUT) is the smart update solution for performing online firmware and driver updates. SUT is used with iLO 4, iLO 5, and with update solutions (management appliances such as iLO Amplifier Pack or HPE OneView and Smart Update Manager (SUM) to stage, install, and activate firmware and driver updates.

The solution must be installed on the operating system, where it updates results through Rich Infrastructure Services (RIS) communication.

- **SUT:** Polls iLO to check for requests from SUM, iLO Amplifier Pack, or HPE OneView for updates through local iLO using the iLO channel interface driver installed on the OS and orchestrates staging, deploying, and activating updates. You can adjust the polling interval by issuing the appropriate command-line option provided by SUT. Performs inventory on target servers, stages deployment, deploys updates, and then reboots the servers.
- **iLO 5 with integrated Smart Update** (Gen10 or later 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 SUT.
- **iLO Amplifier Pack and HPE OneView:** Displays available updates for servers. Communicates with SUT (or SUT 1.x) to initiate updates using the iLO Redfish interface. SUT reports the status of updates to iLO Amplifier Pack through iLO Restful Interface.
- **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 (<https://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 system 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 (<https://www.hpe.com/servers/spp/download>).
- Download individual drivers, firmware, or other system software components from the system product page in the Hewlett Packard Enterprise Support Center website (<https://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:

<https://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

Troubleshooting resources

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

- *Troubleshooting Guide for HPE ProLiant Gen10 and Gen10 Plus 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.
- *Error Message Guide for HPE ProLiant Gen10 Plus 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 Gen10 Plus servers and HPE Synergy* provides IML messages and associated troubleshooting information to resolve critical and cautionary IML events.

To access troubleshooting resources for your product, see the Hewlett Packard Enterprise Information Library :

- For Gen10 servers, see <https://www.hpe.com/info/gen10-troubleshooting>.
- For Gen10 Plus servers, see <https://www.hpe.com/info/gen10plus-troubleshooting>.



System battery replacement

Replace the system battery



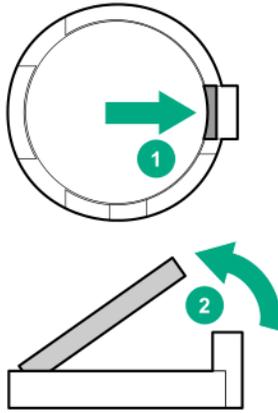
WARNING: The computer contains an internal lithium manganese dioxide, a vanadium pentoxide, or an alkaline battery pack. A risk of fire and burns exists if the battery pack is not properly handled. To reduce the risk of personal injury:

- 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 of in fire or water.
 - Replace only with the spare designated for this product.
-

Procedure

1. If installed, remove the bezel (**Remove the bezel**).
2. Power down the system (**Power down the system**).
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the system.
4. Remove the system from the rack (**Remove the system from the rack**).
5. Place the system on a flat, level surface.
6. Extend the front drive cages out of the chassis (**Extend the front drive cages out of the chassis**).
7. Remove the access panel (**Remove the access panel**).
8. Open the cable management holder, and then remove the cables from the cable management holder (**Open the cable management holder**).
9. Remove the HPE Smart Storage Battery (**Remove the HPE Smart Storage Battery**).
10. Remove the air baffl (**Remove the air baffl**).
11. Locate the battery (**System board components**).
12. To remove the system battery from its socket, slightly push the metal tab, and then pry it gently from the socket.





Properly dispose of the old battery.

For more information about battery replacement or proper disposal, contact an authorized reseller or an authorized service provider.



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.



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 1,000 ft) to 3,050 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 (2,953 ft) to a maximum of 3,050 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 (2,953 ft) to a maximum of 3,050 m (10,000 ft).

The approved hardware configurations for this system are listed on the Hewlett Packard Enterprise website (<http://www.hpe.com/servers/ASHRAE>).

Mechanical specifications

Specification	Value
Height	87.50 mm (3.44 in)
Depth	825.50 mm (32.50 in)
Width	448.0 mm (17.63 in)
Weight (approximate values)	—
24-bay LFF drive models	—
Without the four-bay rear LFF drive cage option, minimum	22.34 kg (49.25 lb)
Without the four-bay rear LFF drive cage option, maximum	39.74 kg (87.63 lb)

Table Continued



Specification	Value
With the four-bay LFF rear drive cage option, minimum	23.20 kg (51.15 lb)
With the four-bay LFF rear drive cage option, maximum	40.60 kg (89.51 lb)
48-bay SFF drive models	—
Without the two- or six-bay rear SFF drive cage option, minimum	23.40 kg (51.59 lb)
Without the two- or six-bay rear SFF drive cage option, maximum	34.72 kg (76.54 lb)
With the two-bay SFF rear drive cage option, minimum	23.68 kg (52.21 lb)
With the two-bay SFF rear drive cage option, maximum	35.00 kg (77.16 lb)
With the six-bay SFF NVMe rear drive cage option, minimum	24.89 kg (54.87 lb)
With the six-bay SFF NVMe rear drive cage option, maximum	36.87 kg (81.28 lb)
With the six-bay SFF rear drive cage option (SAS or SATA), minimum	24.89 kg (54.87 lb)
With the six-bay SFF rear drive cage option (SAS or SATA), maximum	36.87 kg (81.28 lb)

Power supply specifications

Depending on the installed options and/or the regional location where the system was purchased, the system is configured with one of the following power supplies:

- HPE 800 W Flex Slot Titanium Hot-plug power supply (PN 866793-001)
- HPE 800 W Flex Slot -48 V DC Hot-plug power supply (PN 866728-001)
- HPE 800 W Flex Slot Universal Hot-plug power supply (PN 866727-001)
- HPE 800 W Flex Slot Platinum Hot-plug Power Supply (PN 866730-001)
- HPE 1600 W Flex Slot Platinum Plus Hot-plug Power Supply (PN 863373-001)

These power supplies are Flexible Slot Power Supply products for ProLiant servers. For more information about the power supply features, specifications, and compatibility, see the Hewlett Packard Enterprise website (<http://www.hpe.com/servers/powersupplies>).

CAUTION: Check the system and power supply input ratings before powering up the system.



ⓘ **IMPORTANT:** Mixing different types of power supplies in the same system might limit or disable some power supply features including support for power redundancy. To ensure access to all available features, all power supplies in the same system must have the same output and efficiency ratings.

Hot-plug power supply calculations

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



Websites

General websites

Hewlett Packard Enterprise Information Library

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

Single Point of Connectivity Knowledge (SPOCK) Storage compatibility matrix

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

Storage white papers and analyst reports

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

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



Support and other resources

Accessing Hewlett Packard Enterprise Support

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

Information to collect

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

Accessing updates

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

Hewlett Packard Enterprise Support Center

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

Hewlett Packard Enterprise Support Center: Software downloads

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

My HPE Software Center

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

- To subscribe to eNewsletters and alerts:
<https://www.hpe.com/support/e-updates>
- To view and update your entitlements, and to link your contracts and warranties with your profile, go to the Hewlett Packard Enterprise Support Center **More Information on Access to Support Materials** page:
<https://www.hpe.com/support/AccessToSupportMaterials>





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

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

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

HPE Proactive Care services

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

HPE Datacenter Care services

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

HPE Proactive Care service: Supported products list

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

HPE Proactive Care advanced service: Supported products list

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

Proactive Care customer information

Proactive Care central

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

Proactive Care service activation

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

Warranty information

To view the warranty information for your product, see the links provided below:

HPE ProLiant and IA-32 Servers and Options

<https://www.hpe.com/support/ProLiantServers-Warranties>

HPE Enterprise and Cloudline Servers

<https://www.hpe.com/support/EnterpriseServers-Warranties>

HPE Storage Products

<https://www.hpe.com/support/Storage-Warranties>

HPE Networking Products

<https://www.hpe.com/support/Networking-Warranties>

Regulatory information

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

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



Additional regulatory information

Hewlett Packard Enterprise is committed to providing our customers with information about the chemical substances in our products as needed to comply with legal requirements such as REACH (Regulation EC No 1907/2006 of the European Parliament and the Council). A chemical information report for this product can be found at:

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

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

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

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

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

Documentation feedback

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

