



**Hewlett Packard
Enterprise**

HPE Apollo 6500 Gen10 System/HPE ProLiant XL270d Gen10 Server User Guide

Abstract

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

Part Number: P05100-005
Published: December 2019
Edition: 6

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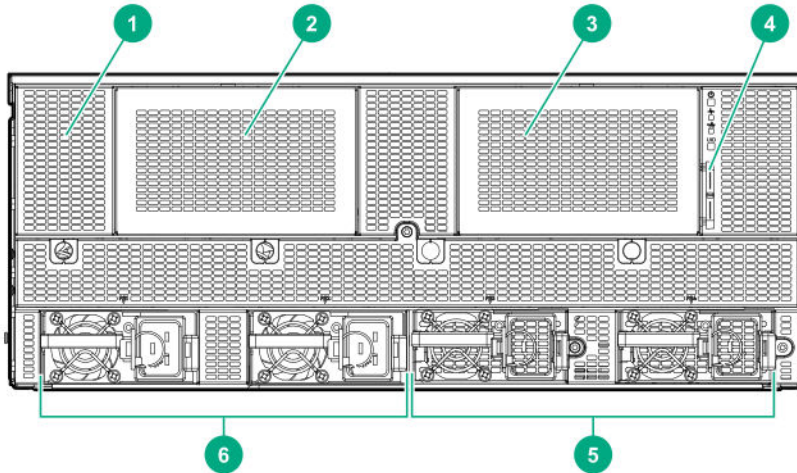
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Component identification

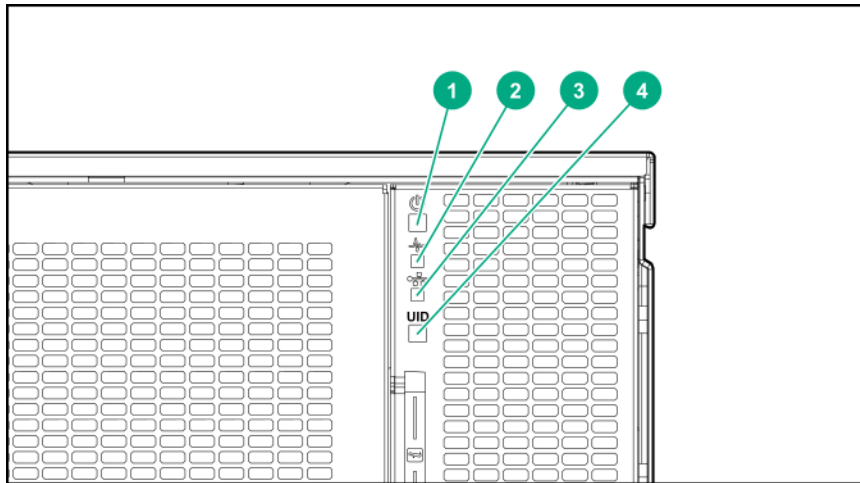
This chapter describes the external and internal server features and components.

Front panel components



Item	Description
1	HPE Smart Storage battery (located behind the chassis grill)
2	Drive bay 1 (for optional 8SFF drive cage)
3	Drive bay 2 (for optional 8SFF drive cage)
4	Serial label pull tab
5	Power supply bays 3 and 4 (for optional HPE 2200 W Platinum Hot Plug Power Supplies)
6	HPE 2200W Platinum Hot Plug Power Supplies 1 and 2 (standard)

Front panel LEDs and buttons



Item	Description	Status
1	Power on/Standby button and system power LED	Solid green = System on Flashing green = Performing power on sequence Solid amber = System in standby Off = No power present
2	Health LED	Solid green = Normal Flashing amber = System degraded Flashing red = System critical
3	NIC status LED	Solid green = Link to network Flashing green = Network active Flashing red = System critical
4	UID button LED	Solid blue = Activated Flashing blue = Remote management or firmware upgrade in progress Off = Deactivated

UID button functionality

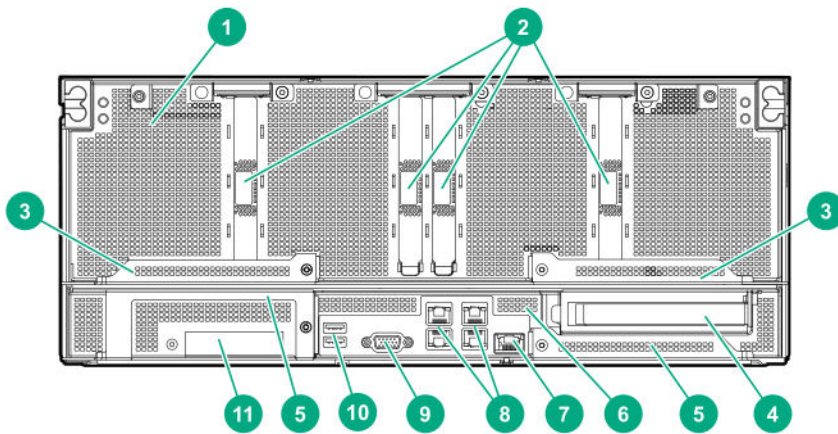
The UID button can be used to display the Server Health Summary when the server will not power on. For more information, see the latest *HPE iLO 5 User Guide* on the [Hewlett Packard Enterprise website](https://www.hpe.com/enterprise).

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.

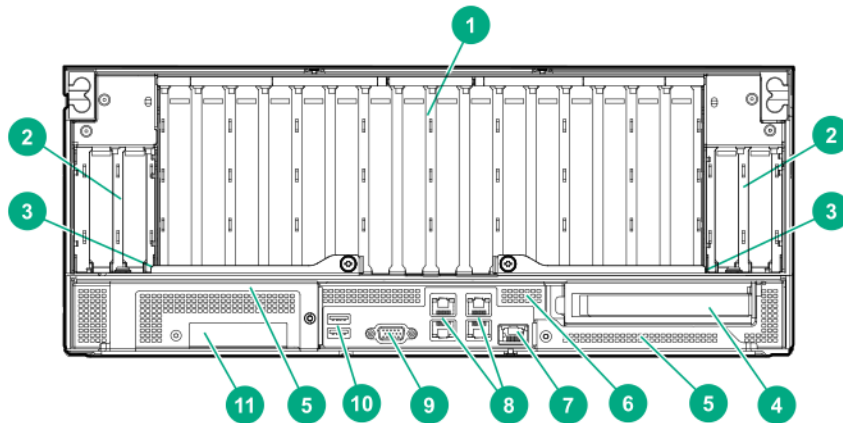
Subsystem	LED behavior
System board	1 flash
Processor	2 flashes
Memory	3 flashes
Riser board PCIe slots	4 flashes
FlexibleLOM	5 flashes
Removable HPE Smart Array SR Gen10 controller	6 flashes
System board PCIe slots	7 flashes
Power backplane or storage backplane	8 flashes
Power supply	9 flashes

Rear panel components (SXM2 GPU module)



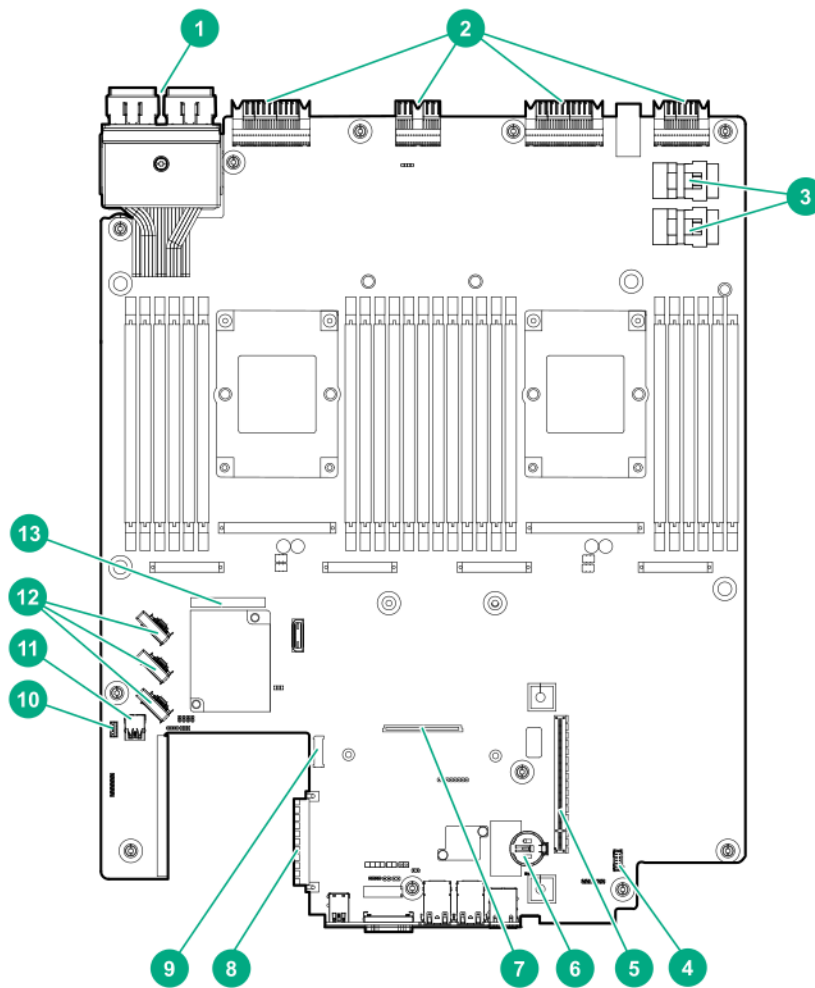
Item	Description
1	GPU module
2	PCIe slots 9-12
3	GPU module latches
4	Full Height Half Length PCIe Gen3 slot (system board module)
5	System board module latches
6	System board module
7	Dedicated iLO management port
8	Embedded 4 x 1GbE Network Adapter
9	Video connector
10	USB 3.0 ports
11	FlexibleLOM slot

Rear panel components (PCIe GPU module)



Item	Description
1	GPU slots 1-8
2	Low-profile PCIe Gen3 slots 9-12 (GPU module)
3	GPU module latches
4	Full Height Half Length PCIe Gen3 slot (system board module)
5	System board module latches
6	System board module
7	Dedicated iLO management port
8	Embedded 4 x 1GbE Network Adapter
9	Video connector
10	USB 3.0 ports
11	FlexibleLOM slot

System board components



Item	Description
1	Storage connector
2	Midplane connectors
3	NVMe drive ports
4	Internal communication port
5	PCIe riser cage connector
6	System battery
7	Type -a storage controller connector
8	FlexibleLOM connector
9	M.2 riser connector
10	iLO USB connector
11	Internal USB 3.0 connector

Table Continued

Item	Description
12	X4 embedded SATA ports 1-3
13	System Maintenance Switch

System maintenance switch descriptions

Position	Default	Function
S1 ¹	Off	Off = security is enabled. On = security is disabled.
S2	Off	Reserved
S3	Off	Reserved
S4	Off	Reserved
S5 ¹	Off	Off = Power-on password is enabled. On = Power-on password is disabled.
S6 ^{1, 2, 3}	Off	Off = No function On = Restore default manufacturing settings
S7	Off	Reserved
S8	—	Reserved
S9	—	Reserved
S10	—	Reserved
S11	—	Reserved
S12	—	Reserved

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

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

³ When the system maintenance switch position 6 is set to the On position and Secure Boot is enabled, some configurations cannot be restored. For more information, see **Secure Boot**.

NMI functionality

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

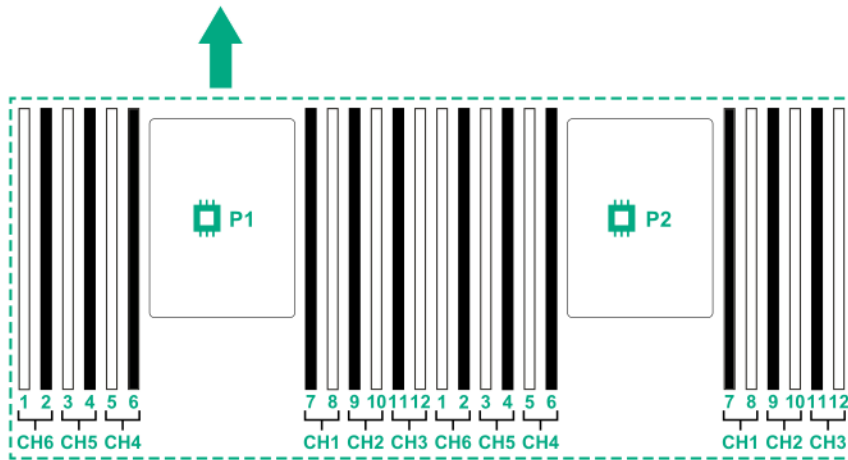
An analysis of the crash dump log is an essential part of diagnosing reliability problems, such as hanging operating systems, device drivers, and applications. Many crashes freeze a system, and the only available action for administrators is to cycle the system power. Resetting the system erases any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

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

DIMM slot locations

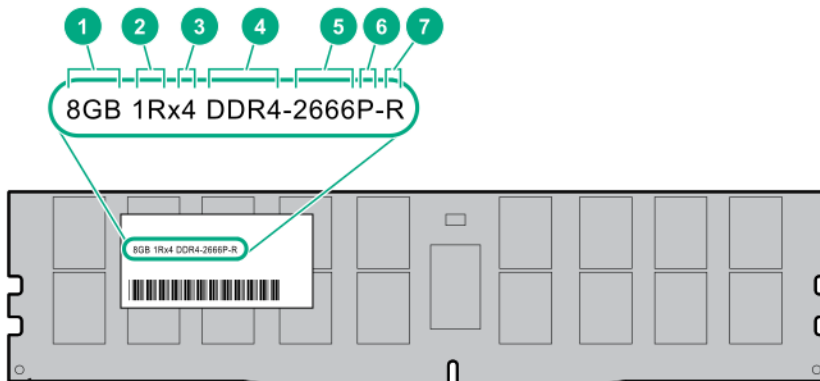
DIMM slots are numbered sequentially (1 through 12) for each processor. The supported AMP modes use the letter assignments for population guidelines.

The arrow indicates the front of the server.



DIMM label identification

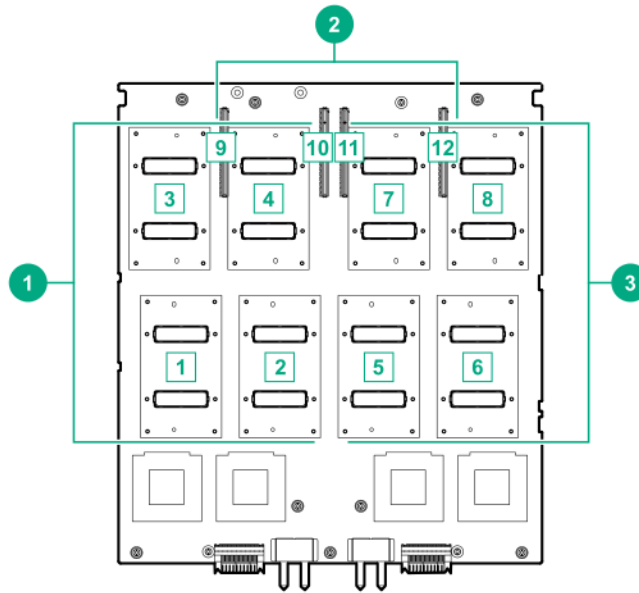
To determine DIMM characteristics, see the label attached to the DIMM. The information in this section helps you to use the label to locate specific information about the DIMM.



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 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)

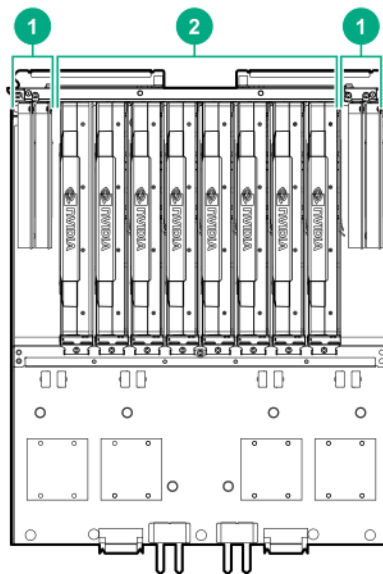
For more information about product features, specifications, options, configurations, and compatibility, see the HPE DDR4 SmartMemory QuickSpecs on the Hewlett Packard Enterprise website (<http://www.hpe.com/support/DDR4SmartMemoryQS>).

SXM2 GPU module components



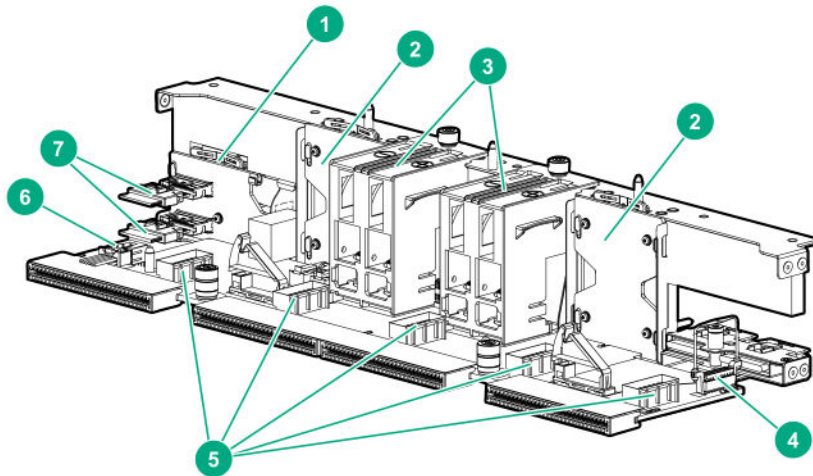
Item	Description
1	SXM2 GPU slots 1-4
2	PCIe slots 9-12
3	SXM2 GPU slots 5-8

PCIe GPU module components



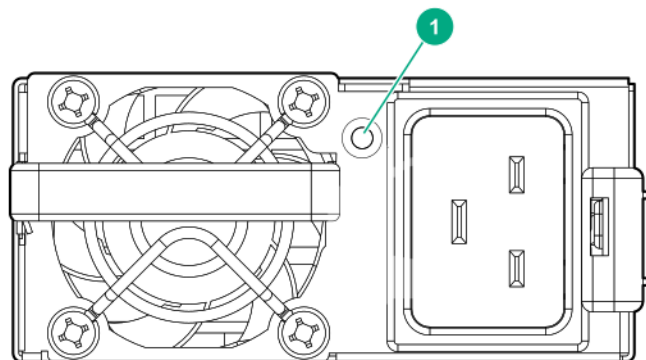
Item	Description
1	Low-profile PCIe Gen3 slots 9-12
2	PCIe GPU slots 1-8

Power distribution board and bus bar components



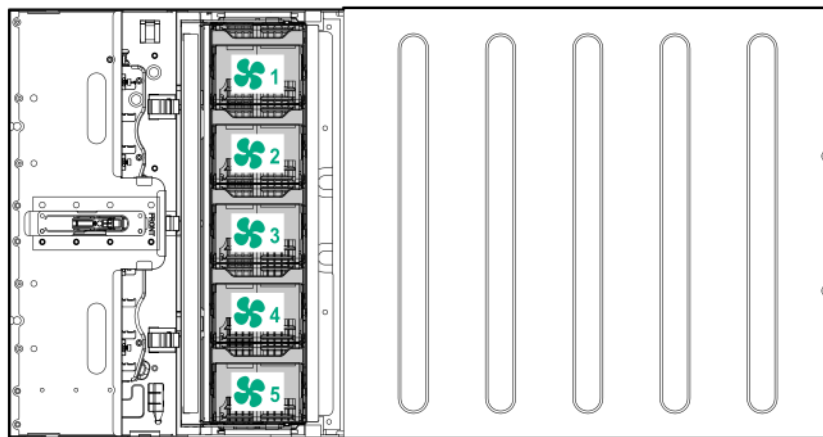
Item	Description
1	NVMe midplane
2	Processor/GPU midplane
3	Power busbars to GPU module
4	Front panel LED connector
5	Fan connectors 1-5
6	Energy pack connector
7	NVMe port cable connectors

Power supply LED



Status	Description
Solid green	Power supply is on and is operating normally.
Flashing green (0.5 Hz)	12 V standby power present (Power supply off)
Flashing green (2 Hz)	Power supply is in Smart redundant state or offline mode.
Solid amber	12 V fault caused a shutdown; power supply failed (overvoltage/undervoltage, overtemperature, overcurrent, short-circuit), fan failed, or input overvoltage protection
Off	No power present or standby power failed (overvoltage/undervoltage, overtemperature, overcurrent, short-circuit, fan lock)

Fan module numbering



Supported drives

When one drive cage is installed, the following drive configurations are supported:

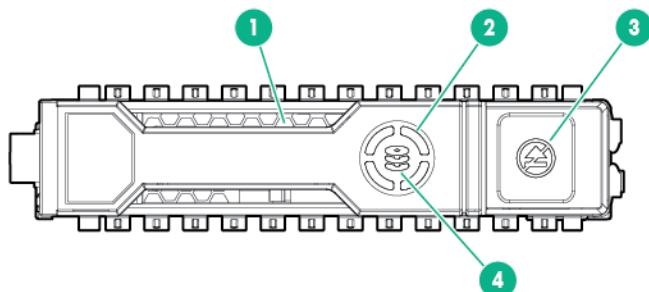
- 2 NVMe + 6 SATA
- 2 NVMe + 6 SAS
- 8 SAS/SATA when one of the following controllers is installed
 - P408i-p
 - P408i-a
 - P816i-a
- Embedded SATA: 6 SATA drives

When two drive cages are installed, the following drive configurations are supported:

- 4 NVMe (2/2) + 12 SATA (6/4)
- 4 NVMe (2/2) + 12 SAS (6/6)

- 16 SATA (p816i-a)
- 16 SAS/SATA (p408i-a + p408i-p)
- Embedded SATA: 12 SATA (6/6)

Hot-plug drive LED definitions



Item	LED	Status	Definition
1	Locate	Solid blue	The drive is being identified by a host application.
		Flashing blue	The drive carrier firmware is being updated or requires an update.
2	Activity ring	Rotating green	Drive activity.
		Off	No drive activity.
3	Do not remove	Solid white	Do not remove the drive. Removing the drive causes one or more of the logical drives to fail.
		Off	Removing the drive does not cause a logical drive to fail.
4	Drive status	Solid green	The drive is a member of one or more logical drives.
		Flashing green	The drive is doing one of the following: <ul style="list-style-type: none"> • Rebuilding • Performing a RAID migration • Performing a strip size migration • Performing a capacity expansion • Performing a logical drive extension • Erasing • Spare part activation
		Flashing amber/green	The drive is a member of one or more logical drives and predicts the drive will fail.
		Flashing amber	The drive is not configured and predicts the drive will fail.

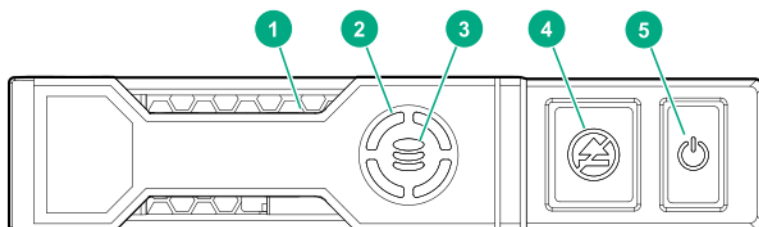
Table Continued

Item	LED	Status	Definition
		Solid amber	The drive has failed.
		Off	The drive is not configured by a RAID controller or a spare drive.

NVMe SSD LED definitions

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

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



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

Table Continued

Item	LED	Status	Definition
		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.

Operations

Power up the server

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

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

Powering down the server

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

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

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

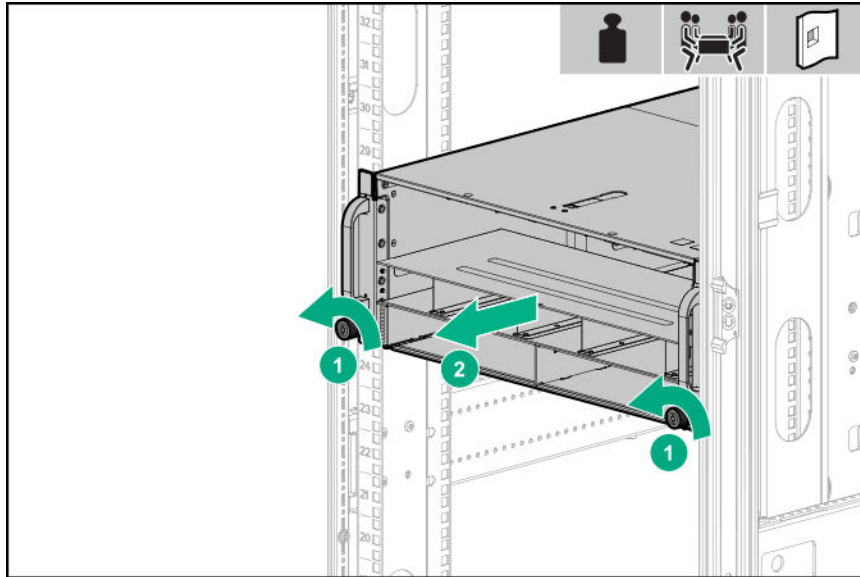
- Press and release the Power On/Standby button.
This method initiates a controlled shutdown of applications and the OS before the server enters standby mode.
- Press and hold the Power On/Standby button for more than 4 seconds to force the server to enter standby mode.
This method forces the server to enter standby mode without properly exiting applications and the OS. If an application stops responding, you can use this method to force a shutdown.
- Use a virtual power button selection through .
This method initiates a controlled remote shutdown of applications and the OS before the server enters standby mode.

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

Extending the chassis from the rack

Procedure

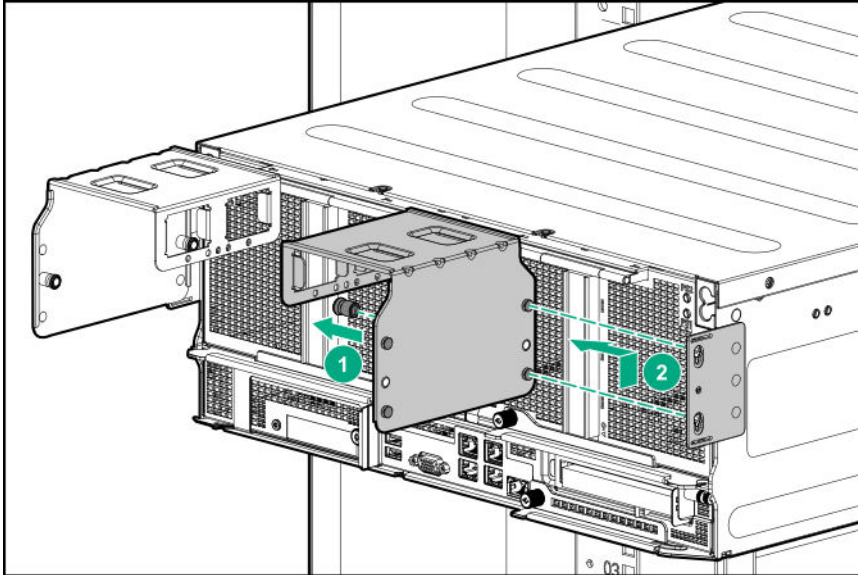
Loosen the thumbscrews on either side of the chassis, and then extend the chassis from the rack.



Removing the GPU tray from the chassis

Procedure

1. Power down the server (**Powering down the server**).
2. Disconnect all peripheral cables from the GPU tray.
3. If installed, remove the power cord guides.



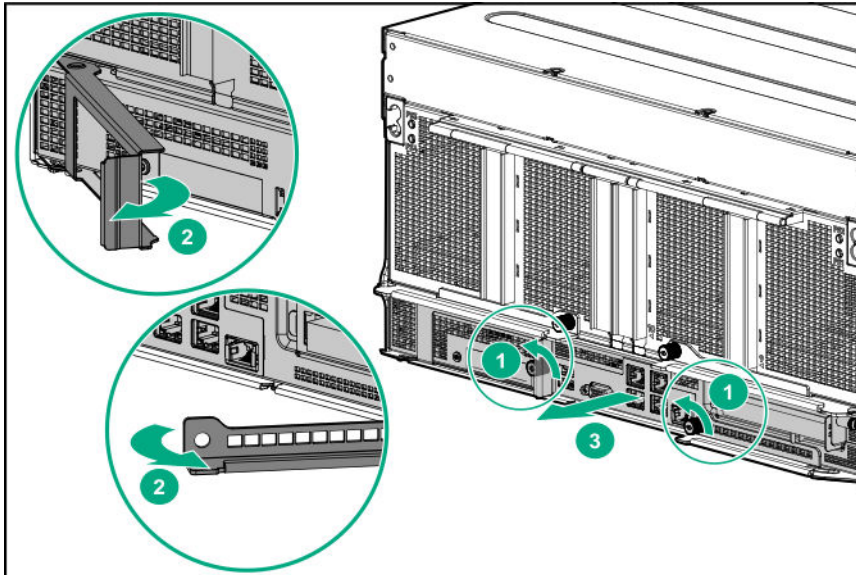
4. Remove the GPU tray from the chassis.

Depending on the chassis configuration, your GPU tray might look different.

Removing the system board module from the chassis

Procedure

1. Back up all server data.
2. Power down the server (**Powering down the server**).
3. Disconnect all peripheral cables from the server.
4. Remove the server from the chassis.



5. Place the module on a flat, level work surface.

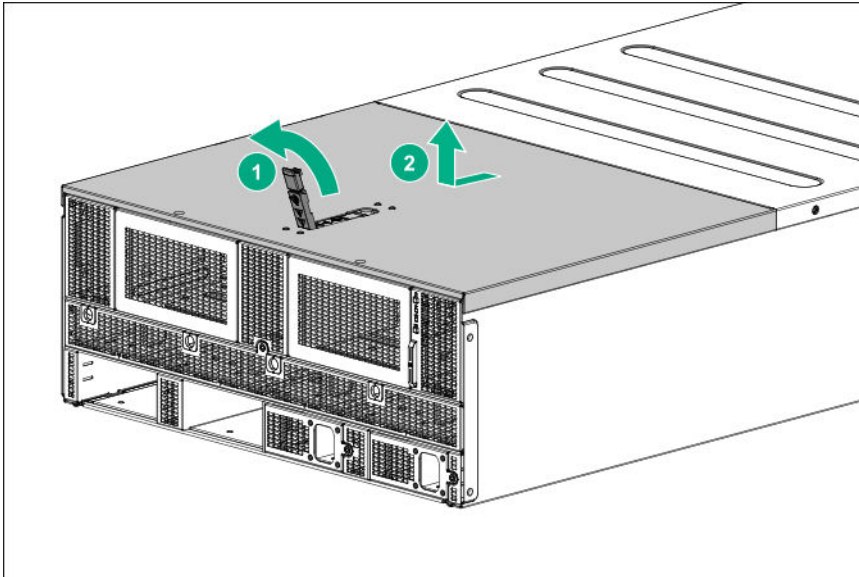
Removing the access panel

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

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

Procedure

1. Power down the server if a cable management arm is not installed (**Powering down the server**).
If a cable management arm is installed, the server does not need to be powered down before removing the access panel.
2. Extend the chassis from the rack (**Extending the chassis from the rack**).
3. If the locking latch is locked, unlock the latch with a T-15 Torx screwdriver.
4. Remove the access panel.



Removing the fan cage



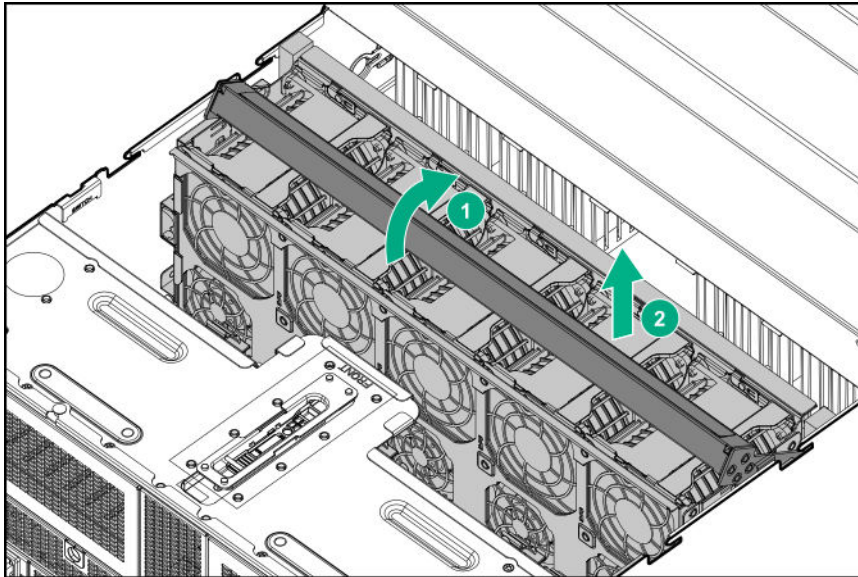
WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

Prerequisites

The fan modules have hot-plug functionality when a cable management arm is installed. If removing a fan module from the fan cage, powering down the server is not necessary with the cable management arm.

Procedure

1. Power down the server (**Powering down the server**).
2. Remove the access panel (**Removing the access panel**).
3. Remove the fan cage.



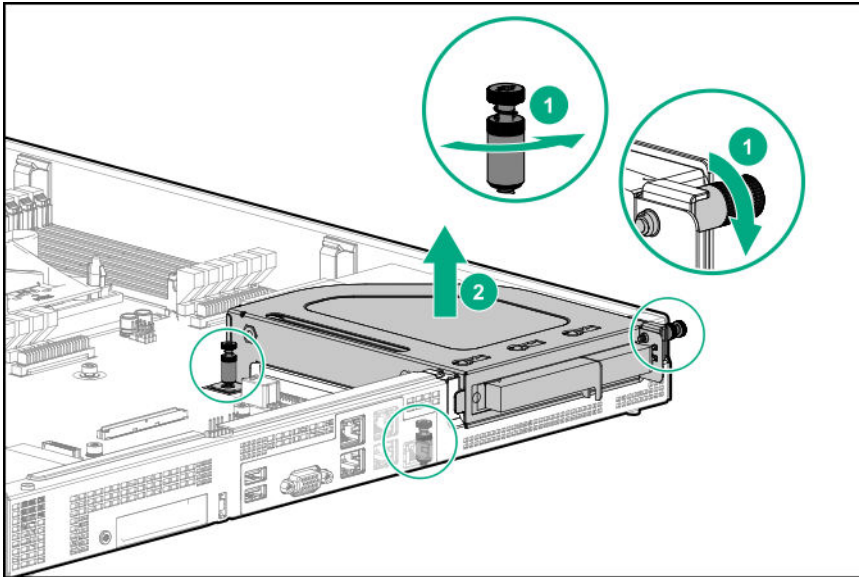
Removing the riser cage



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

Procedure

1. Back up all server data.
2. Power down the server (**Powering down the server**).
3. Disconnect all peripheral cables from the server.
4. Remove the system board module from the chassis (**Removing the system board module from the chassis**).
5. Place the module on a flat, level work surface.
6. Remove the riser cage.



To replace the component, reverse the removal procedure.

Setup

Safety and regulatory compliance

For important safety, environmental, and regulatory information, see *Safety and Compliance Information for Server, Storage, Power, Networking, and Rack Products*, available at the Hewlett Packard Enterprise website (<http://www.hpe.com/support/Safety-Compliance-EnterpriseProducts>).

Optional service

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

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

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

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

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

Warnings and cautions



WARNING: To reduce the risk of personal injury or damage to equipment, heed all warnings and cautions throughout the installation instructions.



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.
-
-



WARNING: The chassis is very 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.
 - Remove all servers from the chassis before installing or moving the chassis.
 - Use caution and get help to lift and stabilize the chassis during installation or removal, especially when the chassis is not fastened to the rack.
-
-



WARNING: To reduce the risk of personal injury or damage to the equipment, you must adequately support the chassis during installation and removal.



WARNING: Install the chassis starting from the bottom of the rack and work your way up 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.



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

- Never reach inside the chassis while the system is powered up.
 - Perform service on system components only as instructed in the user documentation.
-
-



CAUTION: Always be sure that equipment is properly grounded and that you follow proper grounding procedures before beginning any installation procedure. Improper grounding can result in ESD damage to electronic components. For more information, refer to "[Electrostatic discharge](#)."



CAUTION: When performing non-hot-plug operations, you must power down the server and/or the system. However, it may be necessary to leave the server powered up when performing other operations, such as hot-plug installations or troubleshooting.



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

Determining power and cooling configurations

Validate power and cooling requirements based on location and installed components.

Power requirements

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



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



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

Hot-plug power supply calculations

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

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.
- This equipment should be located in the same immediate area (such as adjacent cabinets) as any other equipment that has a connection between the earthed conductor of the same DC supply circuit and the earthing conductor, and also the point of earthing of the DC system. The DC system should 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.

To connect a DC power cable to a DC power source:

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.

Optimum environment

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

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

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

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

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

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

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

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

Temperature requirements

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

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

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

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

Electrical grounding requirements

The server must be grounded properly for proper operation and safety. In the United States, you must install the equipment in accordance with NFPA 70, 1999 Edition (National Electric Code), Article 250, as well as any local and regional building codes. In Canada, you must install the equipment in accordance with Canadian Standards Association, CSA C22.1, Canadian Electrical Code. In all other countries, you must install the equipment in accordance with any regional or national electrical wiring codes, such as the International Electrotechnical Commission (IEC) Code 364, parts 1 through 7. Furthermore, you must be sure that all power distribution devices used in the installation, such as branch wiring and receptacles, are listed or certified grounding-type devices.

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

Identifying the contents of the shipping carton

Unpack the shipping carton and locate the materials and documentation necessary for installing the chassis. All the rack mounting hardware necessary for installing the chassis into the rack is included with the rack or the chassis.

The contents of the shipping carton include:

- Chassis
- Power cord
- Hardware documentation and software products
- Rack-mounting hardware and documentation

You might also need the following items:

- Operating system or application software
- Hardware options
- Screwdrivers
 - T-10 Torx
 - T-15 Torx
 - T-30 Torx

Installation overview

Installation of a server requires the following steps:

Procedure

1. Install the chassis into the rack (**Installing the chassis into the rack**).
2. Install any server options. (**Installing hardware options**).
3. Install the operating system (**Operating system**).
4. Install system software.
5. Register the server (**Registering the server**).

Installing the chassis into the rack



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

Prerequisites

Before installing the chassis, observe all necessary **warnings and cautions**.

Procedure

1. Unpack the system and remove all components from the chassis.
2. Install the chassis and cable management arm into the rack. For more information, see the installation instructions that ship with the selected rail system.
3. Install options in the chassis.
4. Install all components in their original locations in the chassis.

5. Connect the power cords to the rear of the chassis.

6. Connect the system to the power source.



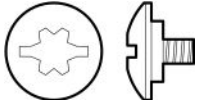


WARNING: To reduce the risk of electric shock or damage to the equipment:

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

Installing the rails and the cable management arm

Installation hardware

In kits supporting 1075 mm racks, the cable management arm and the power cord management brackets are not included.

Item	Hardware (Scale 1:1)	Quantity/Tool
A		4 10-32 panhead shoulder screw T-25 Torx Only 2 are used when the cable management arm is installed.
B		2 10-32 slotted screws T-25 Torx For cable management arm only
C		1 square-hole cage nut For cable management arm only

Prerequisites for installation

Procedure

1. Observe the following:



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.



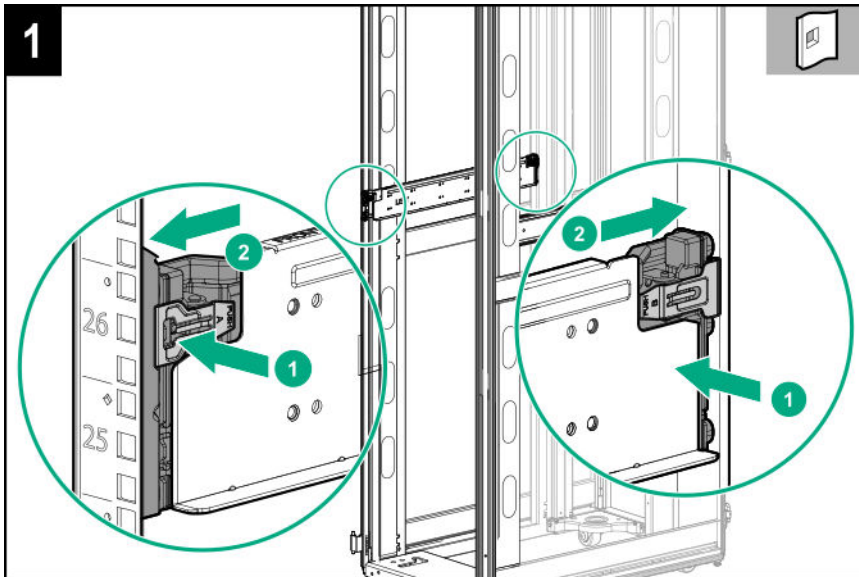
CAUTION: If installing the chassis in a 1075 mm rack, observe the following:

- To enable the chassis to fit in the 1075 mm rack, do not install the cable management arm or the power cord management brackets.
- When the cable management arm is not installed, hot-plug fan functionality is not supported. The cable management arm is required to remove the fans without removing power or connectivity.
- High-density PDUs are not supported when the chassis is installed in a 1075 mm rack.

2. Ensure the distance between the front and rear RETMA rails is between 73.66 cm (29 inches) and 78.74 cm (31 inches). If needed, adjust the rear RETMA rail.
3. If installing more than one chassis in a standard rack, plan the rail installation so that the cable management arms can be installed in alternating positions for each chassis.

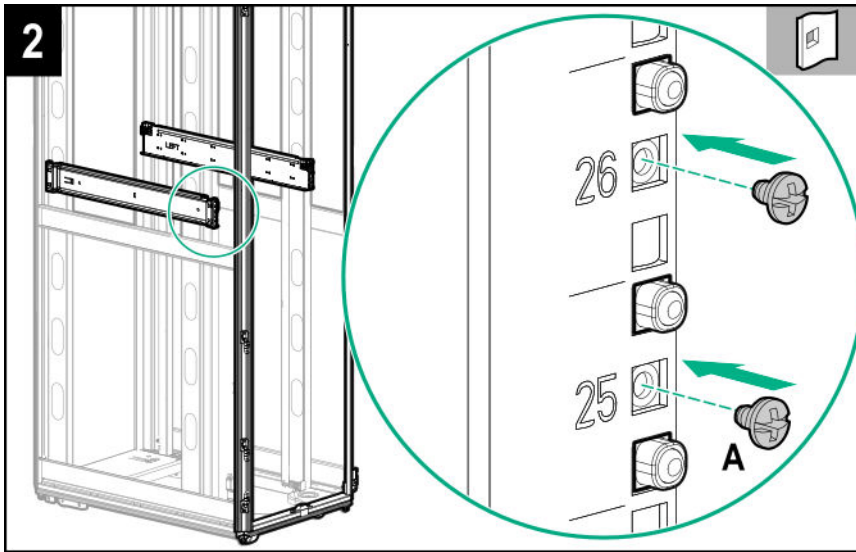
Installing the rails

Procedure



NOTE:

- If installing the cable management arm on the right, perform the following action on the other rail.
- In a 1075 mm rack, perform the following action on both rails (4 screws total).



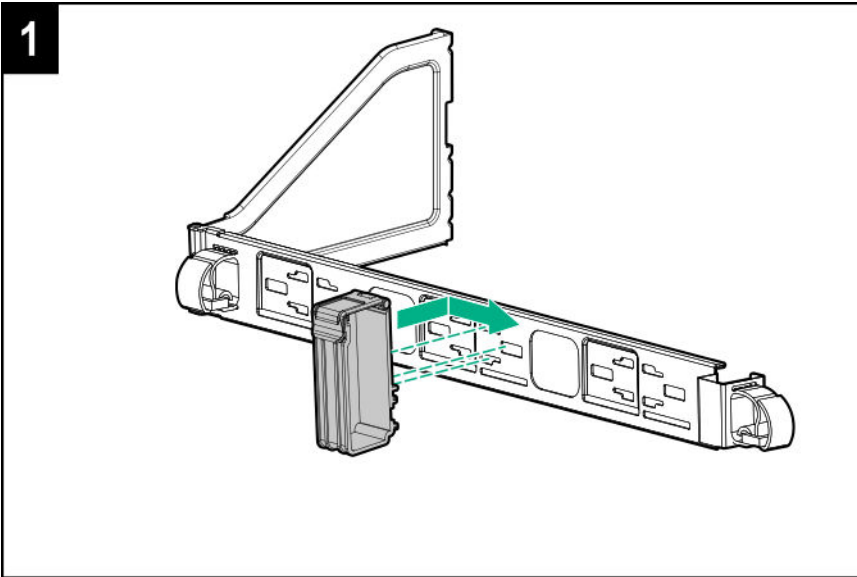
- **NOTE:**
 - If installing the chassis in a 1075 mm rack, skip the following step and go to "Installing the product in the rack."
 - If installing the cable management arm on the right, perform the following action on the other rail.



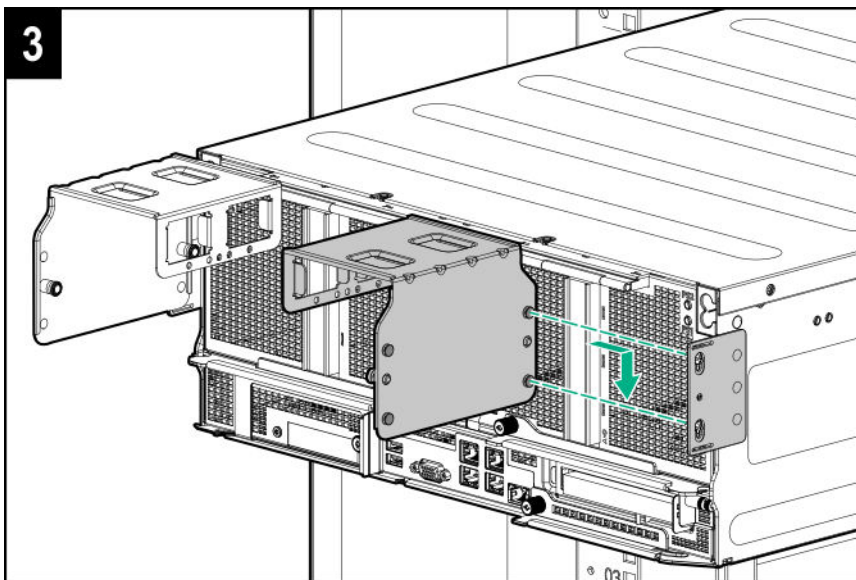
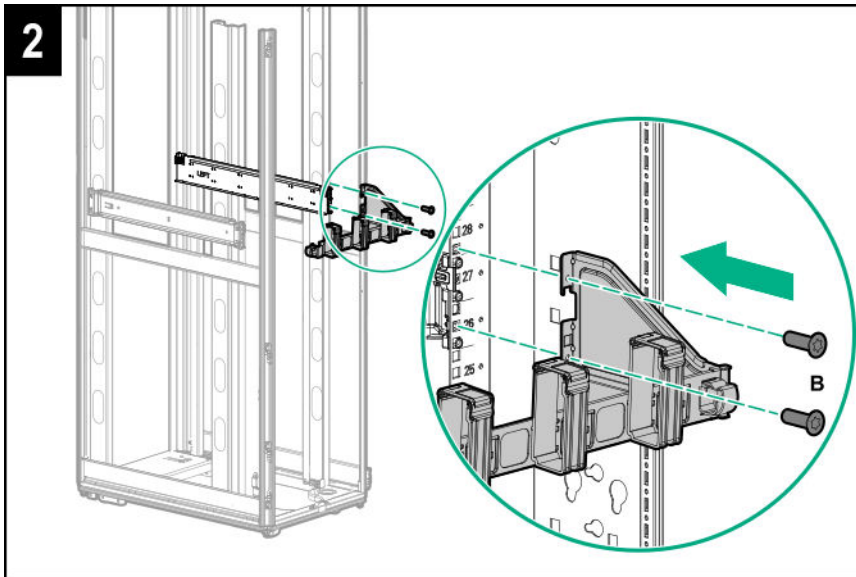
Installing the cable management arm

Procedure

- **NOTE:**
 - If installing the cable management arm on the left, it can be installed as is from the kit. Go to the next step.
 - If installing the cable management arm on the right, perform the following step to prepare the cable management arm.



- **NOTE:** For the following step, the orientation and installation of the bracket and screws on the cable management arm is the same for both sides.



Installing the product in the rack

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

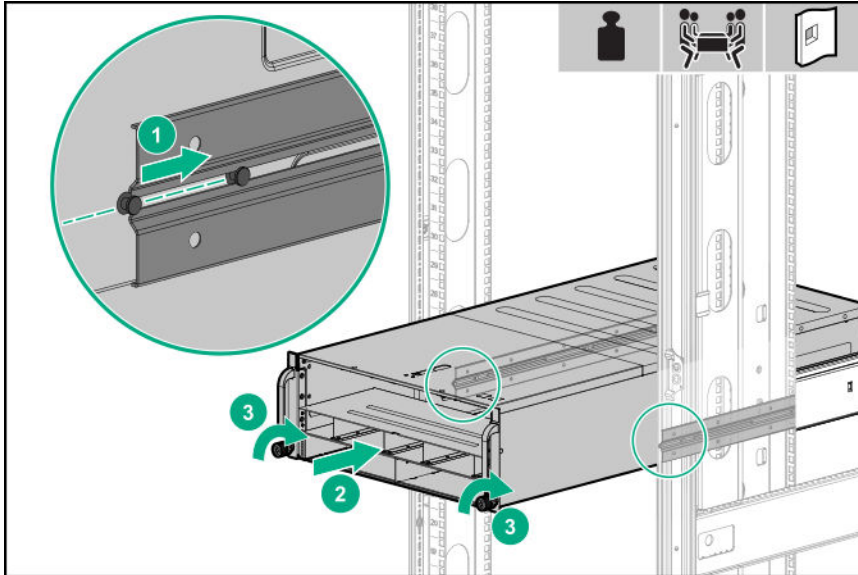
⚠ WARNING: To reduce the risk of personal injury or equipment damage, do one the following:

- If the chassis is empty, use at least 2 people to lift and stabilize the product pieces during assembly.
 - If the chassis is fully loaded, use at least 4 people to lift and stabilize the product pieces during assembly.
 - Use a lift that can handle the load of the product.
-

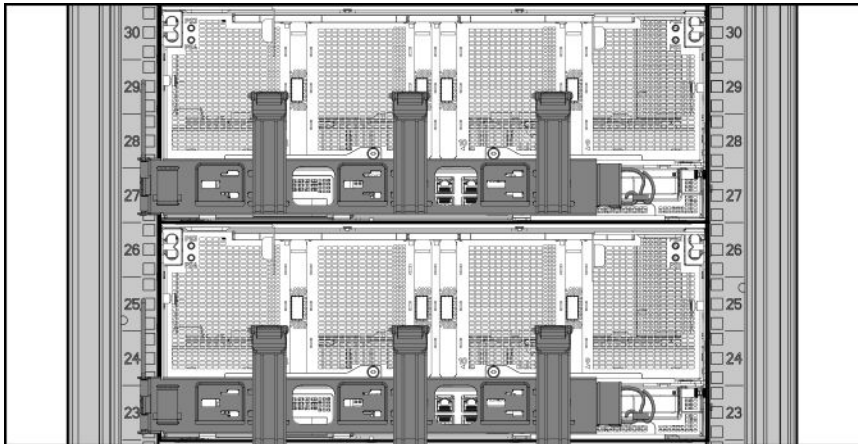
⚠ CAUTION: Be sure to keep the product parallel to the floor when installing the chassis. Tilting the product up or down could result in damage to the slides.

Procedure

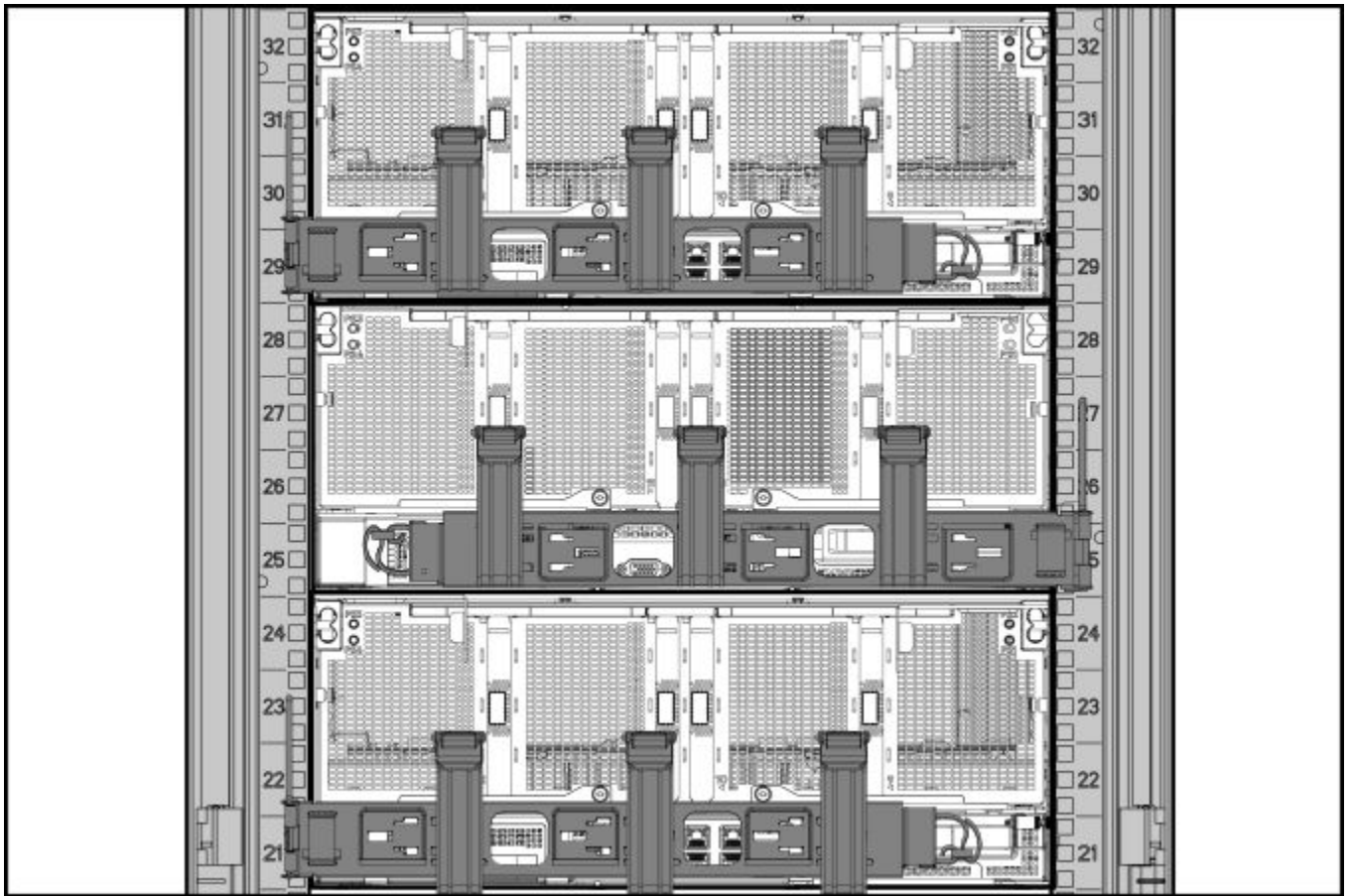
WARNING: On both sides, align the three alignment pins on the chassis with the channel in the rails. Otherwise, the chassis can fall if the rack is moved or shipped.



Multiple chassis installed in a rack



When installing multiple chassis in a standard rack, Hewlett Packard Enterprise recommends installing the cable management arms in alternating positions, as shown below.



Installing hardware options

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

Operating system

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

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

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

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

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

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

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

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

Installing the operating system with Intelligent Provisioning

Procedure

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

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](#).

Selecting boot options

This server supports both Legacy BIOS Boot Mode and 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. Do one of the following:
 - a. To enter the UEFI System Utilities screen and modify the server configuration ROM default settings, press the **F9** key on the ProLiant POST screen. Choose one of the following boot modes:

- Legacy BIOS
 - UEFI (default)
- b.** 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

Hewlett Packard Enterprise product QuickSpecs

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

Introduction

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

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



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



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

Installing a power supply

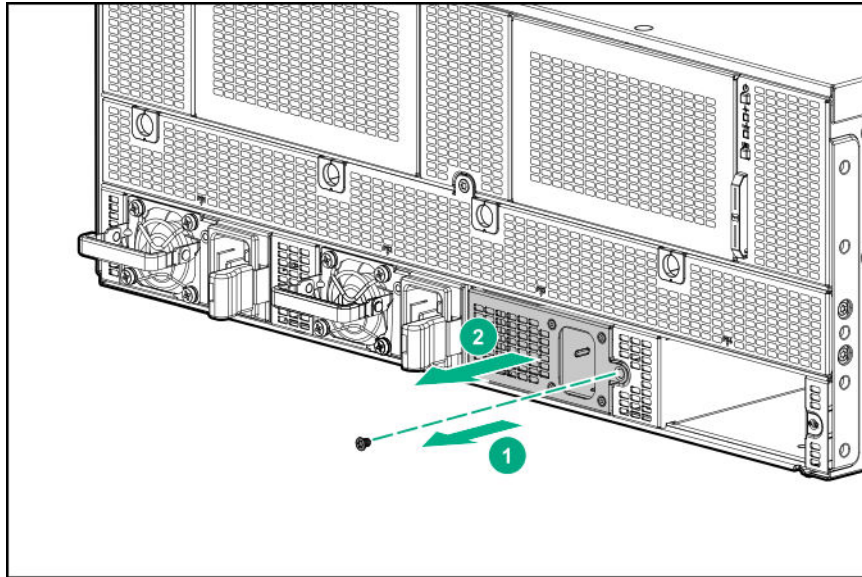
Prerequisites

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

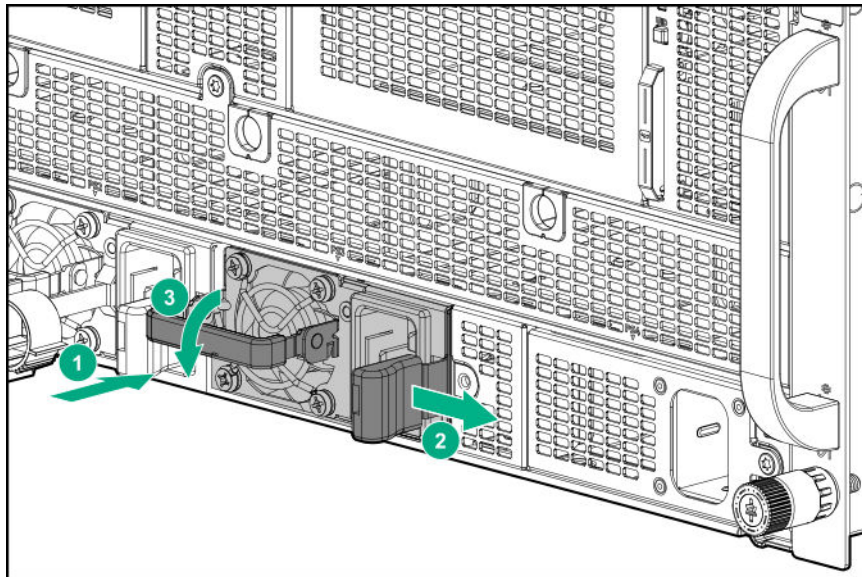
- The components included with the hardware option kit
- T-10 Torx screwdriver

Procedure

1. Remove the power supply blank.



2. Install the power supply.



3. Connect the power cord to the power supply.
4. Power up the server (**Power up the server**).

Installing an 8SFF drive cage

For information on supported drives, see [Supported drives](#).

Prerequisites

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

The components included with the hardware option kit

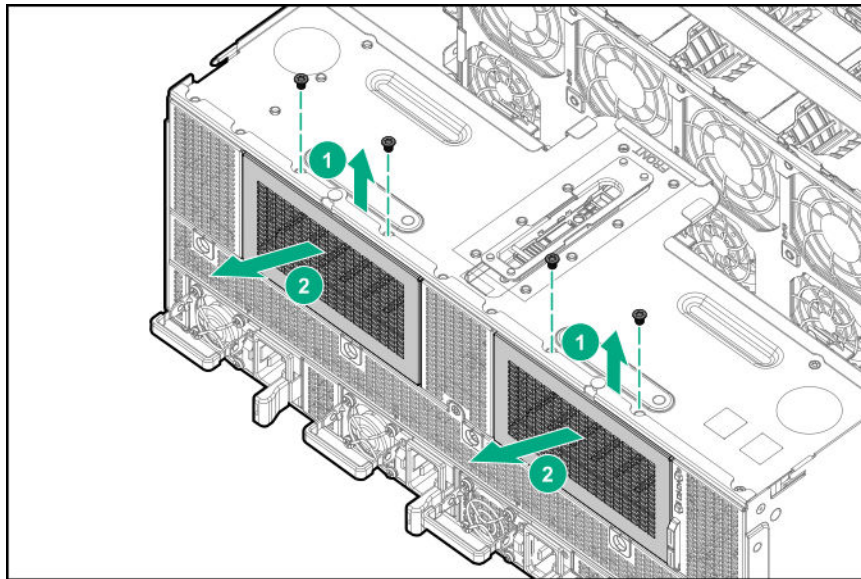
Procedure

1. Observe the following alerts:

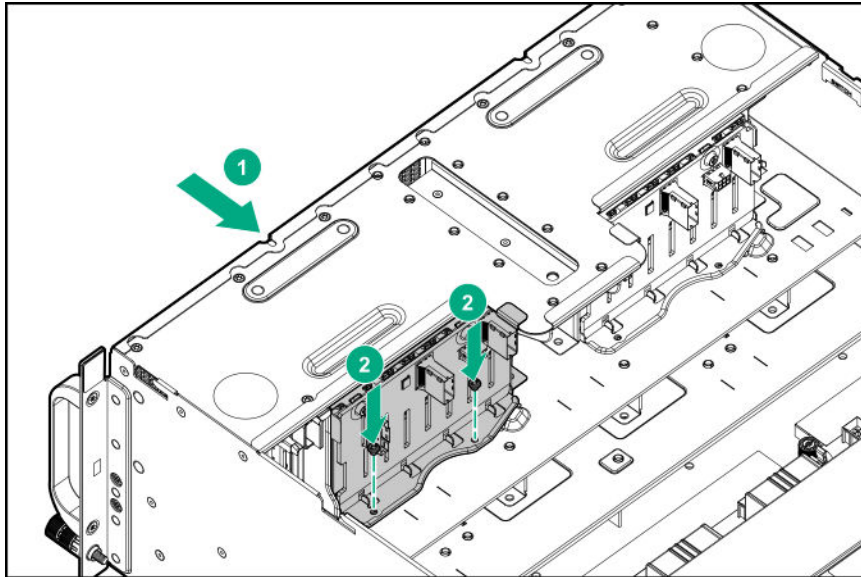
⚠ WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

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

2. Power down the server (**Powering down the server**).
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Extend the chassis from the rack (**Extending the chassis from the rack**).
5. Remove the access panel (**Removing the access panel**).
6. Remove the drive cage blank.



7. Remove the fan cage (**Removing the fan cage**).
8. Connect cables:
 - a. **SAS/SATA cabling**
 - b. **Drive power cabling**
9. Install the drive cage.



10. Install the fan cage.
11. Install the access panel.
12. Install the chassis in the rack.
13. Connect each power cord to the chassis.
14. Connect each power cord to the power source.
15. Power up the server (**Power up the server**).
16. Install drives.

Installing a hot-plug SAS or SATA drive

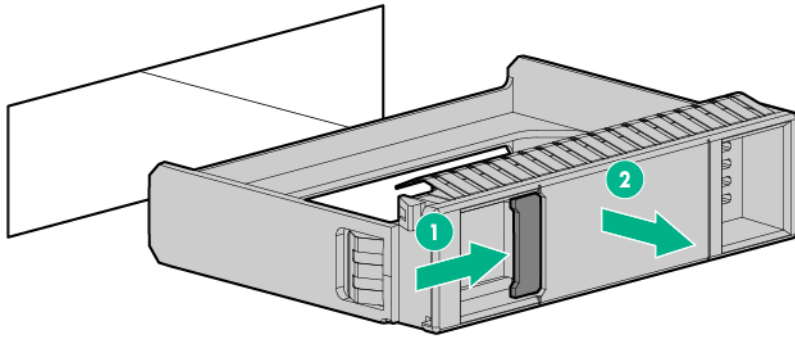
Prerequisites

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

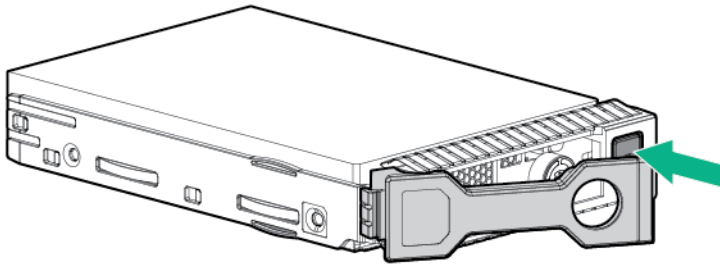
The components included with the hardware option kit

Procedure

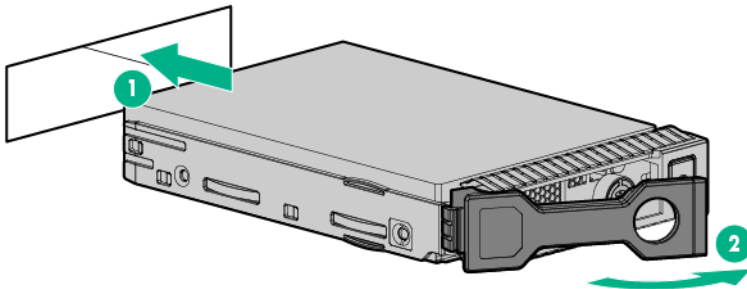
1. Remove the drive blank.



2. Prepare the drive.



3. Install the drive.



4. Determine the status of the drive from the drive LED definitions (**Hot-plug drive LED definitions**).

Installing the NVMe enablement kit

Prerequisites

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

The components included with the hardware option kit

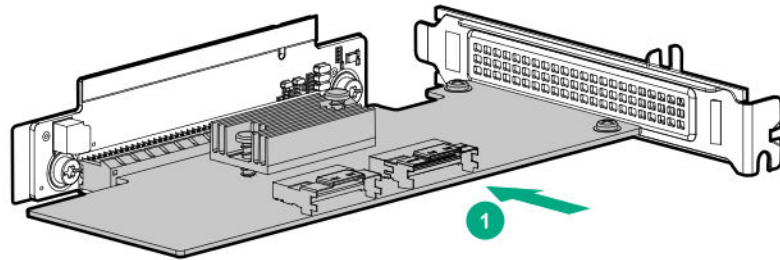
Procedure

1. Observe the following alerts:

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

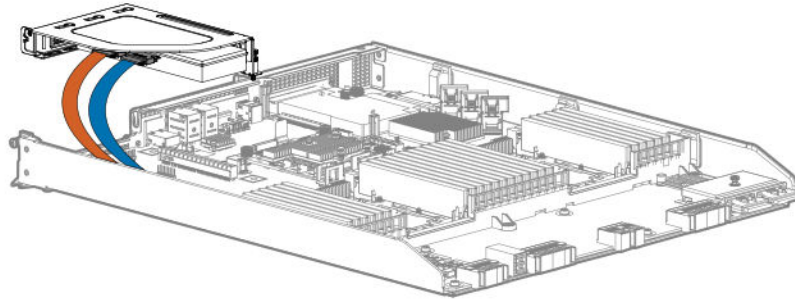
⚠ CAUTION: To prevent damage to electrical components, properly ground the server before beginning any installation procedure. Improper grounding can cause electrostatic discharge.

2. Back up all server data.
3. Power down the server (**Powering down the server**).
4. Disconnect all peripheral cables from the server.
5. Remove the system board module from the chassis (**Removing the system board module from the chassis**).
6. Place the module on a flat, level work surface.
7. Remove the riser cage (**Removing the riser cage**).
8. Install the NVMe riser board.



9. Connect the cables to the storage controller.

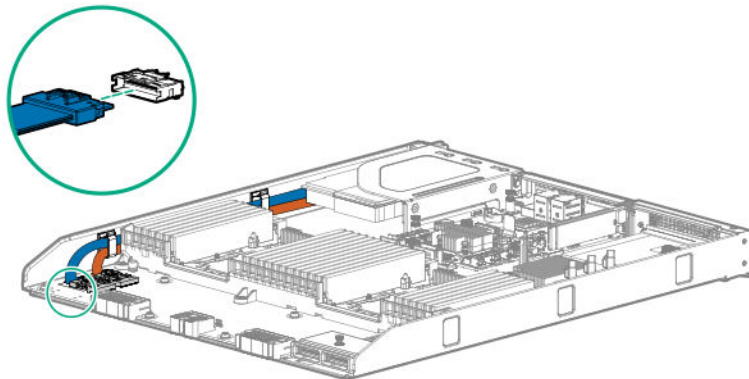
In the following illustration, the orange cable connects to port J3. The blue cable connects to port J4.



10. Connect the cables to the system board.

For more information, see [NVMe cabling](#).

- a. Connect the cable from port J3 on the riser board to NVMe drive port J19 on the system board.
- b. Connect the cable from port J4 on the riser board to NVMe drive port J13 on the system board.



11. Install the riser cage.
12. Install the system board module.
13. Connect all peripheral cables to the server.
14. Power up the server ([Power up the server](#)).

Installing NVMe drives

Prerequisites

NVMe drives are supported when the NVMe enablement kit is installed. For more information, see [Installing the NVMe enablement kit](#).

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

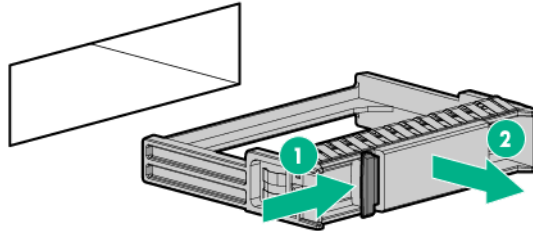
The components included with the hardware option kit

Procedure

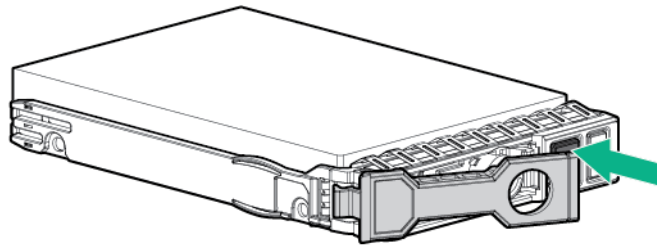
1. Observe the following alert:

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

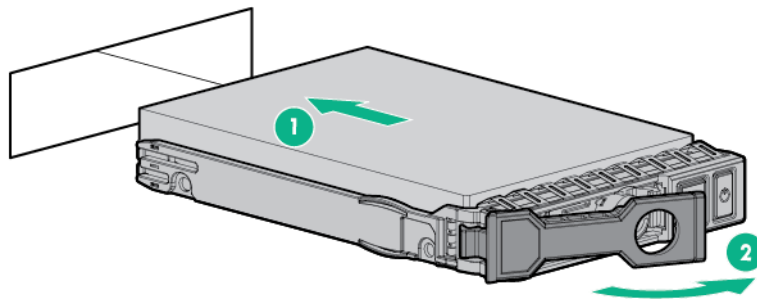
2. Remove the drive blank, if installed.



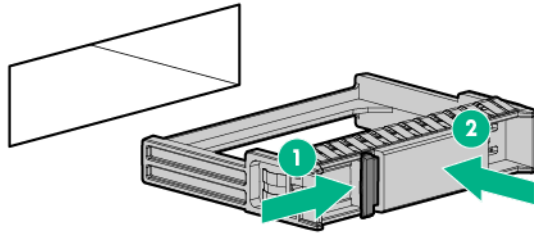
3. Press the Do Not Remove button to open the release handle.



4. Install the drives.



5. Install an SFF drive blank in any unused drive bays.



Installing the M.2 SSD enablement option

Prerequisites

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

The components included with the hardware option kit

Procedure

1. Observe the following alerts:

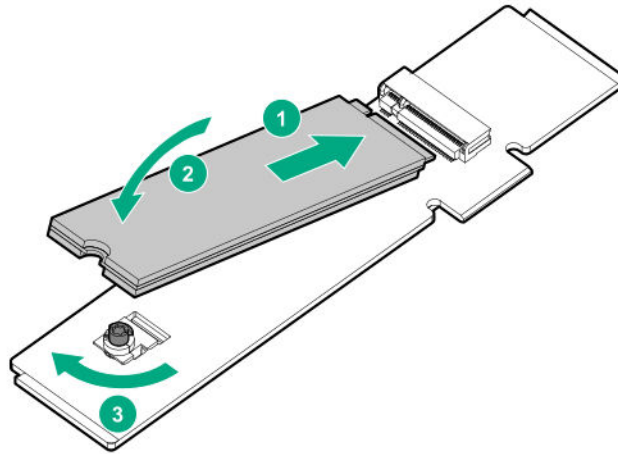


WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

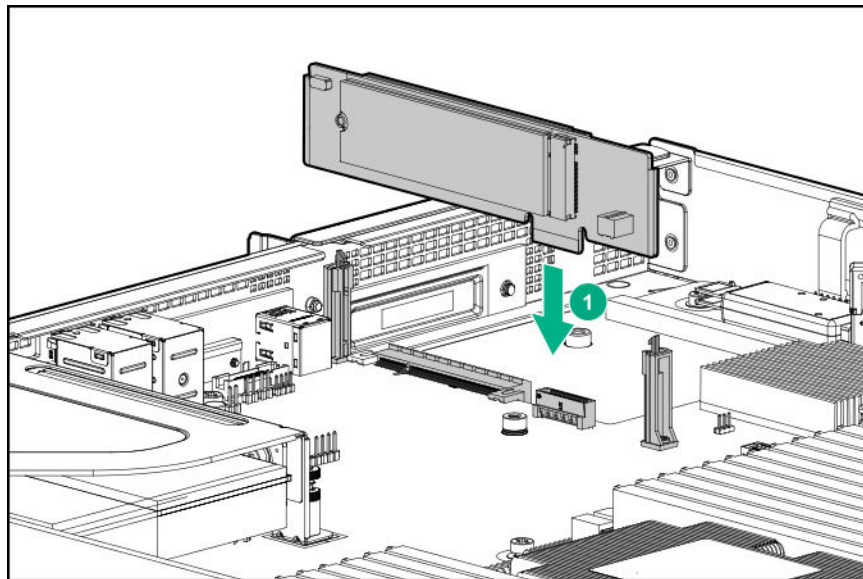


CAUTION: To prevent damage to electrical components, properly ground the server before beginning any installation procedure. Improper grounding can cause electrostatic discharge.

2. Back up all server data.
3. Power down the server (**Powering down the server**).
4. Disconnect all peripheral cables from the server.
5. Remove the system board module from the chassis (**Removing the system board module from the chassis**).
6. Place the module on a flat, level work surface.
7. Install the M.2 SSD on the M.2 riser board.



8. Install the riser board.



9. Install the system board module.
10. Connect all peripheral cables to the server.
11. Power up the server (**Power up the server**).

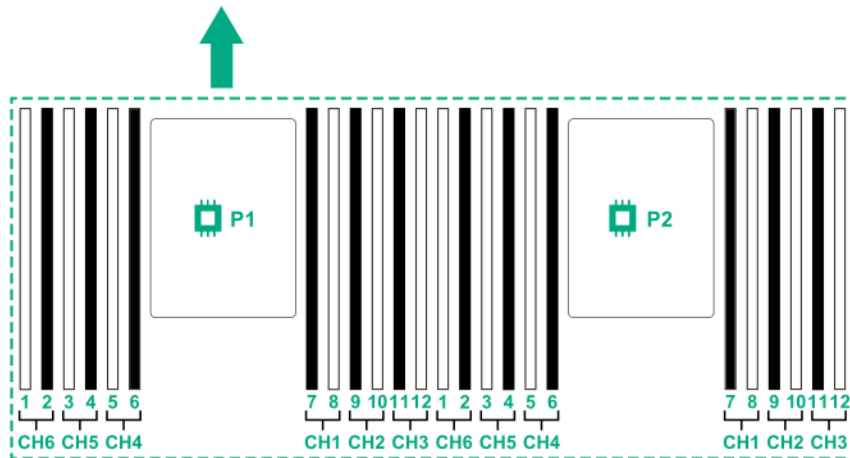
Memory options

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

DIMM slot locations

DIMM slots are numbered sequentially (1 through 12) for each processor. The supported AMP modes use the letter assignments for population guidelines.

The arrow indicates the front of the server.



DIMM population information

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

DIMM-processor compatibility

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

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

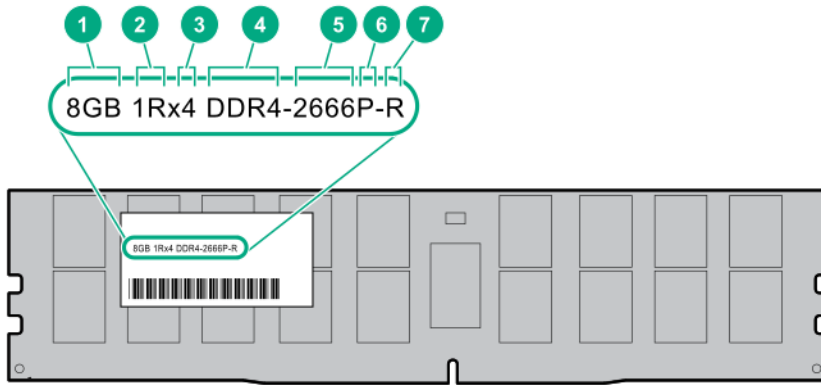
Mixing DIMM types is not supported. Install only the supported DDR4-2666 or DDR4-2933 DIMMs in the server.

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
5	Maximum memory speed	2133 MT/s 2400 MT/s 2666 MT/s 2933 MT/s

Table Continued

Item	Description	Example
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 (<http://www.hpe.com/support/DDR4SmartMemoryQS>).

Installing a DIMM

Prerequisites

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

The components included with the hardware option kit

Procedure

1. Observe the following alerts:

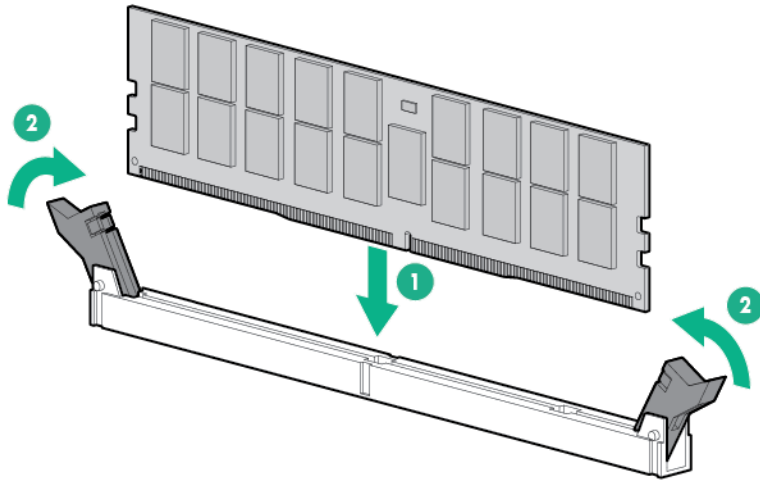


WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.



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

2. Power down the server (**Powering down the server**).
3. Disconnect all peripheral cables from the server.
4. Remove the system board module from the chassis (**Removing the system board module from the chassis**).
5. Place the module on a flat, level work surface.
6. Open the DIMM slot latches.
7. Install the DIMM.



8. Install the system board module.
9. Connect all peripheral cables to the server.
10. Power up the server (**Power up the server**).

Installing a type -a controller

Prerequisites

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

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

Procedure

1. Observe the following alerts:

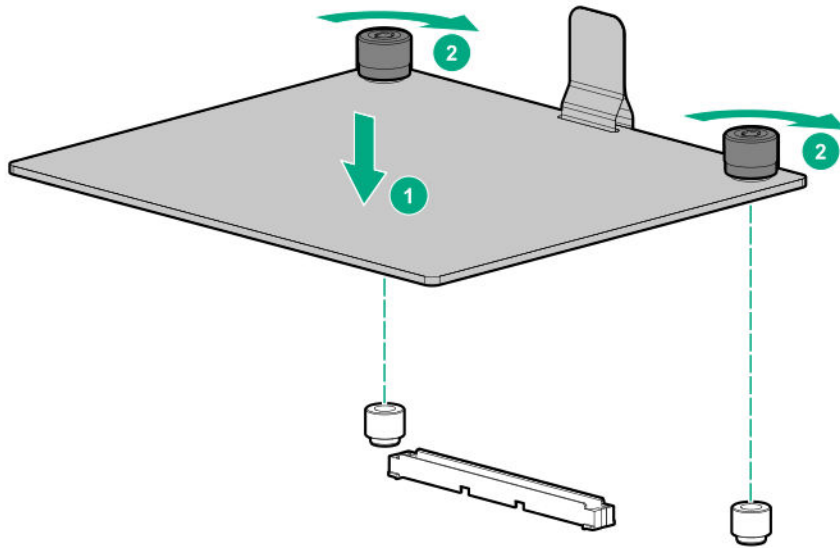


WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.



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

2. Back up all server data.
3. Power down the server (**Powering down the server**).
4. Disconnect all peripheral cables from the server.
5. Remove the system board module from the chassis (**Removing the system board module from the chassis**).
6. Place the module on a flat, level work surface.
7. Install the controller.



8. Connect the controller cables.
9. Install the system board module.
10. Connect all peripheral cables to the server.
11. Power up the server (**Power up the server**).

Installing a type -p controller

Prerequisites

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

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

Procedure

1. Observe the following alerts:

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

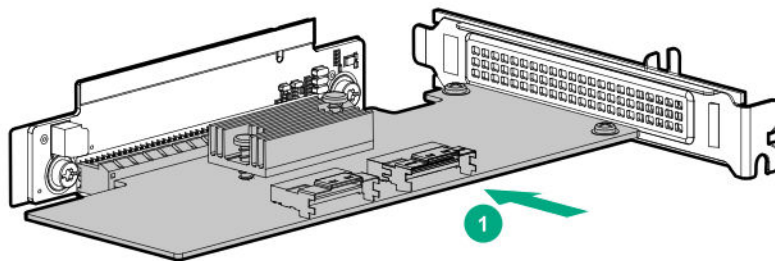
⚠ CAUTION: To prevent damage to electrical components, properly ground the server before beginning any installation procedure. Improper grounding can cause electrostatic discharge.

2. Observe the following alerts:

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

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

3. Back up all server data.
4. Power down the server (**Powering down the server**).
5. Disconnect all peripheral cables from the server.
6. Remove the system board module from the chassis (**Removing the system board module from the chassis**).
7. Place the module on a flat, level work surface.
8. Remove the riser cage (**Removing the riser cage**).
9. Install the controller.



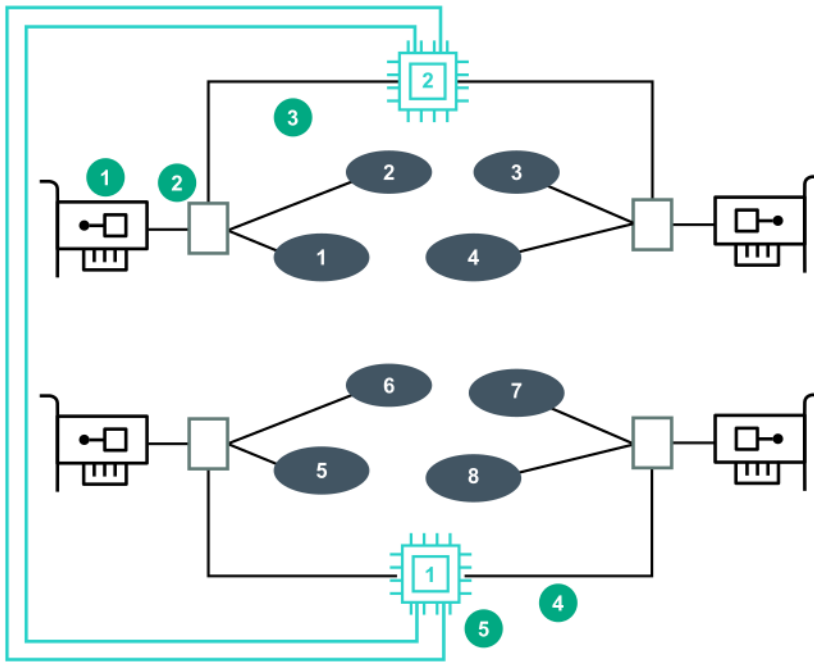
10. Install the riser cage.
11. Connect the controller cables.
12. Install the system board module.
13. Connect all peripheral cables to the server.
14. Power up the server (**Power up the server**).

PCIe GPU options

The server supports installing a maximum of 8 PCIe GPU cards. The PCIe slots can be mapped to the processors in the following configurations:

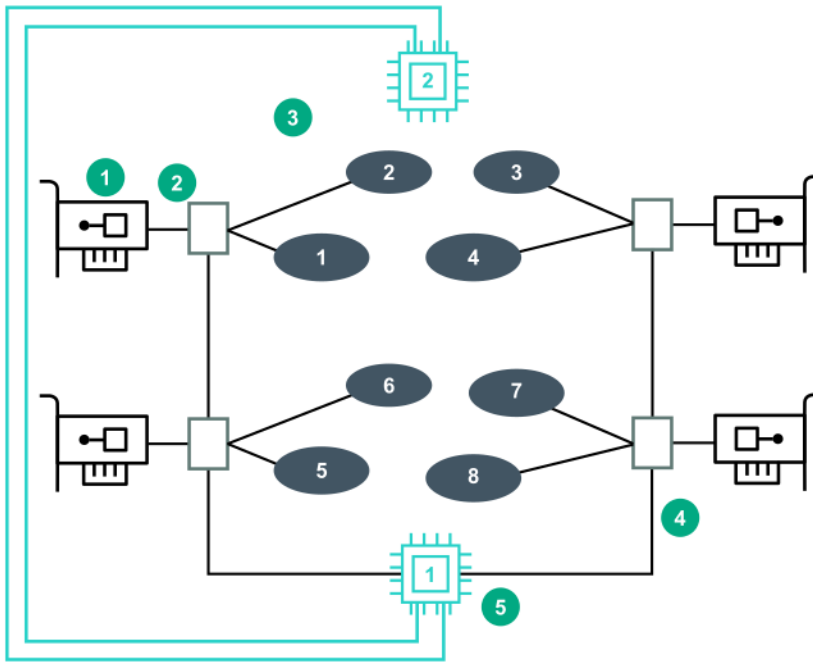
- 4:1—Maps 4 PCIe slots to each installed processor
- 8:1—Maps all slots to a single processor

4:1 configuration



Item	Description
1	PCIe expansion card
2	Switches
3	PCIe GPUs
4	PCIe Gen3 x16
5	Processors with Intel UPI (up to two, processor dependent)

8:1 configuration



Item	Description
1	PCIe expansion card
2	Switches
3	PCIe GPUs
4	PCIe Gen3 x16
5	Processors with Intel UPI (up to two, processor dependent)

More information

[Installing a PCIe GPU](#)

Installing a PCIe GPU

The server supports installing a maximum of 8 PCIe GPU cards.

Prerequisites

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

The components included with the hardware option kit

Procedure

1. Observe the following alerts:

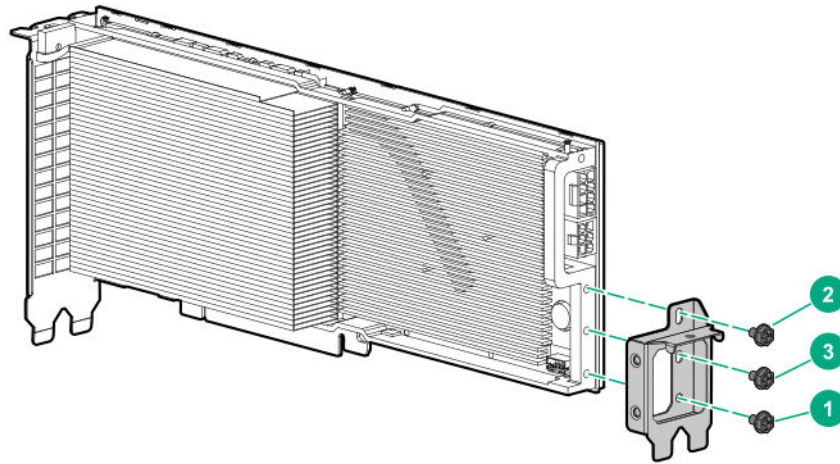


WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

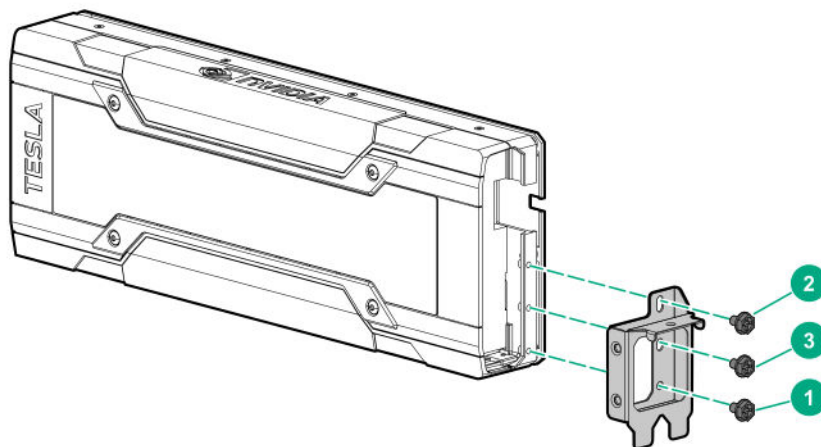
CAUTION: To prevent damage to electrical components, properly ground the server before beginning any installation procedure. Improper grounding can cause electrostatic discharge.

2. Power down the server (**Powering down the server**).
3. Disconnect all peripheral cables from the server.
4. Remove the GPU tray from the chassis (**Removing the GPU tray from the chassis**).
5. Place the module on a flat, level work surface.
6. Remove the bracket installed on the GPU. Set the screws aside.
7. Using the screws removed in the previous step, install the bracket included in the GPU option kit.

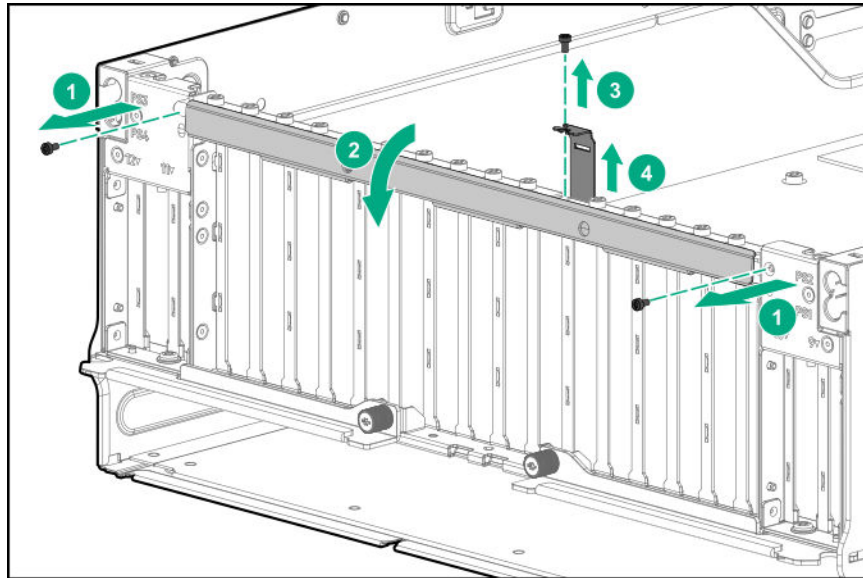
- AMD GPU



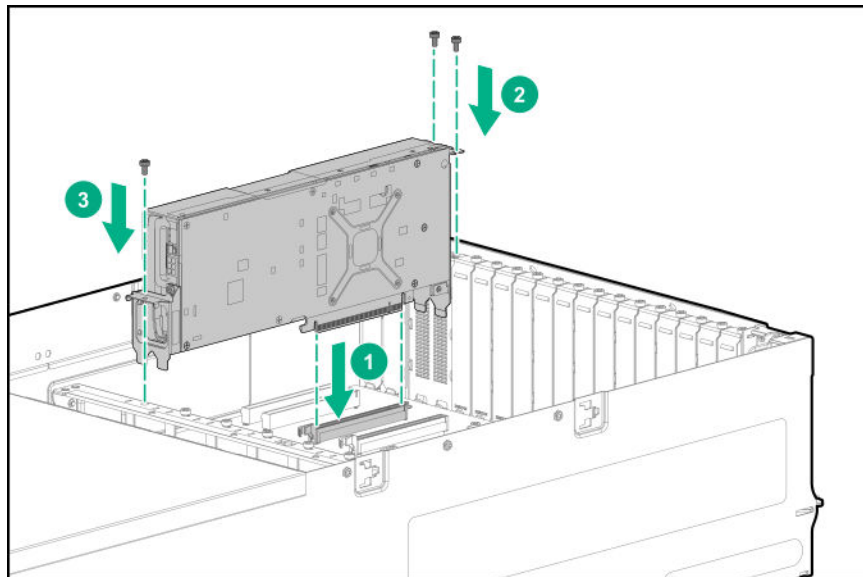
- NVIDIA GPU



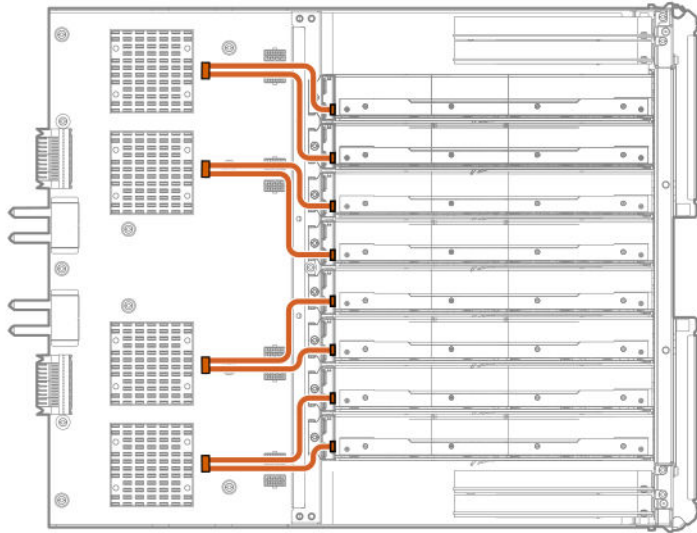
8. Remove 2 blanks from the same GPU slot.



9. Align and install the GPU.



10. Connect the power cable from the GPU to the GPU module.



11. Connect all peripheral cables to the server.
12. Power up the server (**Power up the server**).
13. Configure the PCIe GPU slots (**Configuring PCIe GPU slots**).

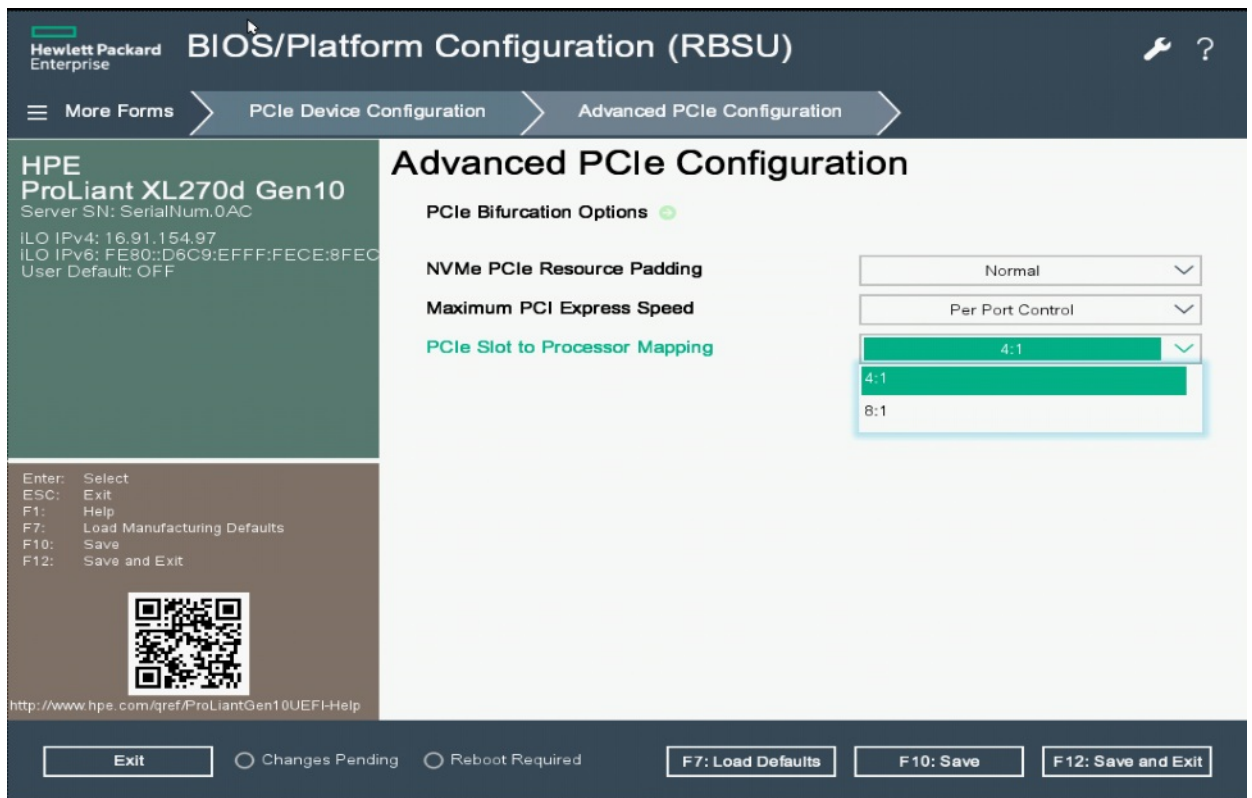
More information

[Configuring PCIe GPU slots](#)

Configuring PCIe GPU slots

Procedure

1. Access System Utilities. During POST, press **F9**.
2. Select **System Configuration > BIOS/Platform Configuration (RBSU) > PCIe Device Configuration > Advanced PCIe Configuration**.
3. Select the preferred option from the **PCIe Slot to Processor Mapping** drop-down list.



SXM2 GPU options

The server supports installation of either 4 or 8 SXM2 GPUs. 4-GPU configurations can be installed in the following topologies, depending on the specific workload requirements of your server:

- Topology A
- Topology B
- Topology C

More information

[Installing an SXM2 GPU](#)

[Topology A](#)

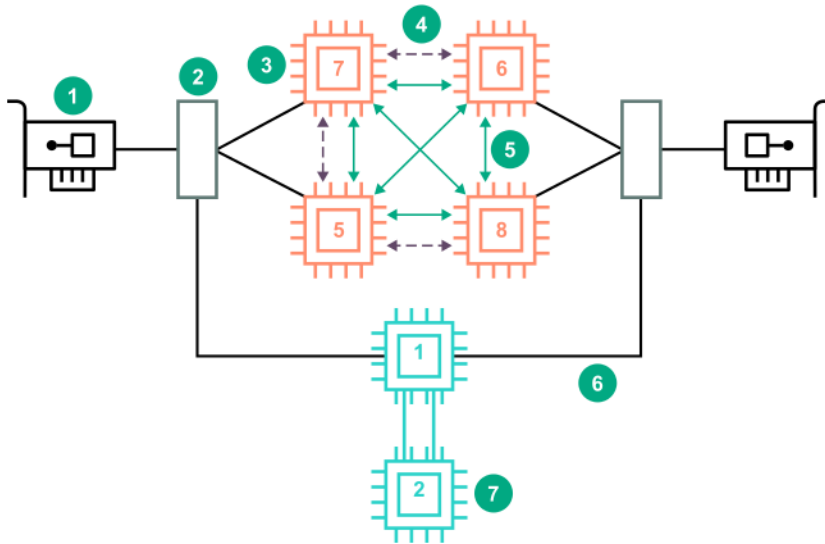
[Topology B](#)

[Topology C](#)

Topology A

Topology A consists of:

- 4 GPUs installed in slots 5, 6, 7, and 8
- 2 FH/HL PCIe cards in slots 11 and 12

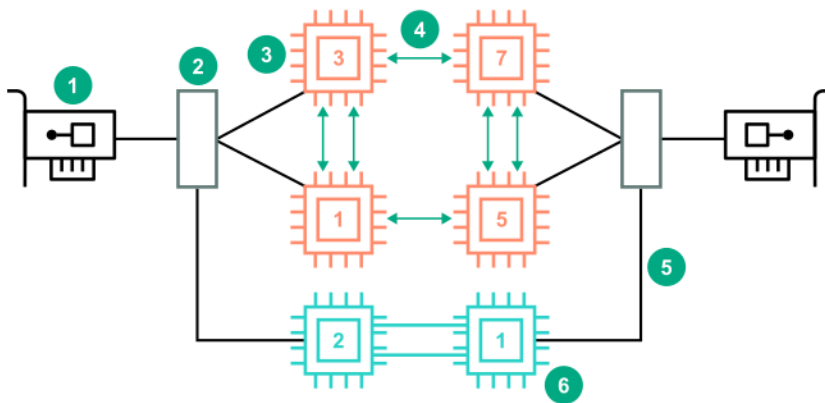


Item	Description
1	PCIe expansion card
2	Switches
3	SXM2 GPUs
4	NVLINK for Volta @ 25GB/s
5	NVLINK (Pascal and Volta) up to 25GBps
6	PCIe Gen3 x16
7	Processors with Intel UPI (up to two, processor dependent)

Topology B

Topology B consists of:

- 4 GPUs installed in slots 1, 3, 5, and 7.
- 2 FH/HL PCIe cards in slots X and Y

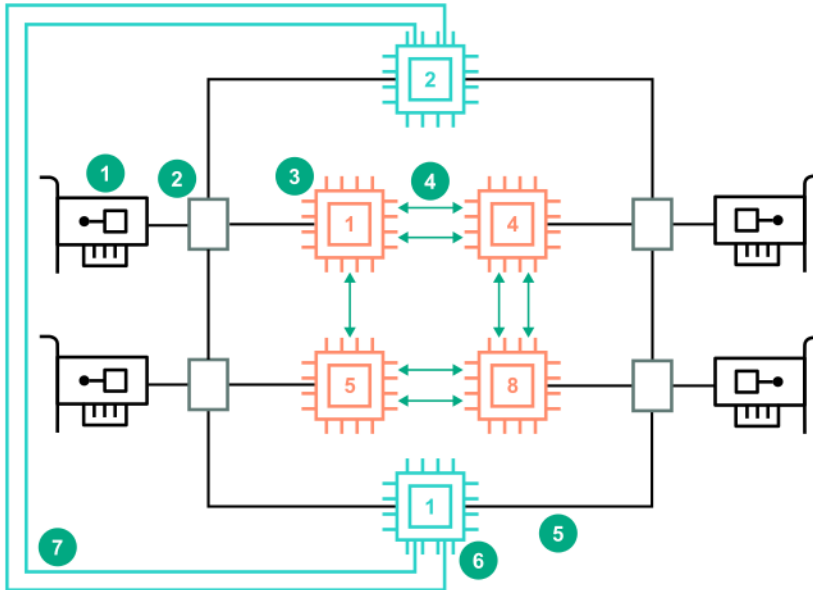


Item	Description
1	PCIe expansion card
2	Switches
3	SXM2 GPUs
4	NVLINK (Pascal and Volta) up to 25GBps
5	PCIe Gen3 x16
6	Processors with Intel UPI (up to two, processor dependent)

Topology C

Topology C consists of:

- 4 GPUs installed in slots 1, 4, 5, and 8.
- 4 FH/HL PCIe cards in slots 9–12.



Item	Description
1	PCIe expansion board
2	Software
3	SXM2 GPUs
4	NVLINK (Pascal and Volta) up to 25GBps
5	PCIe Gen3 x16
6	Processors
7	Intel UPI (up to two, processor dependent)

Installing an SXM2 GPU

For the highest reliability and best end user experience, HPE must install the SXM2 GPU in the factory. Field installations and upgrades of the SXM2 GPU are no longer supported.

Installing a PCIe riser board in the SXM2 GPU module

Prerequisites

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

The components included with the hardware option kit

Procedure

1. Observe the following alerts:

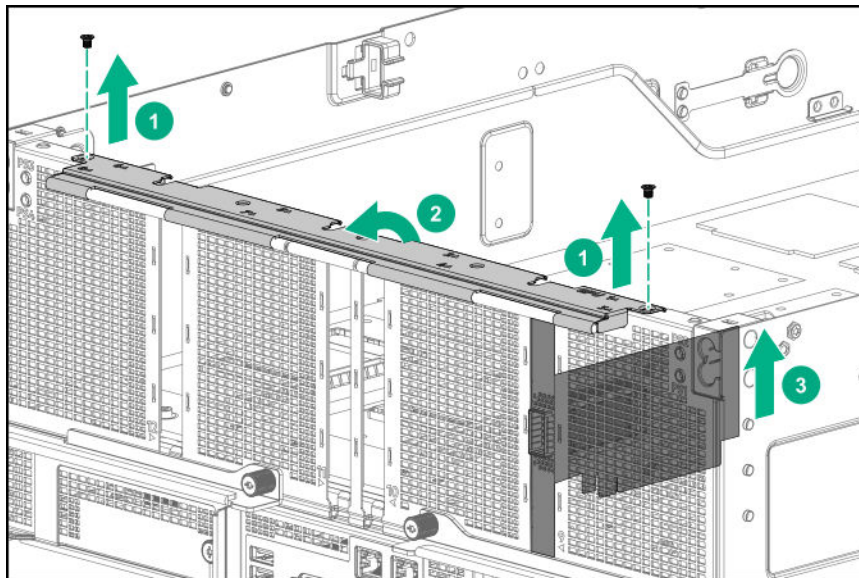


WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

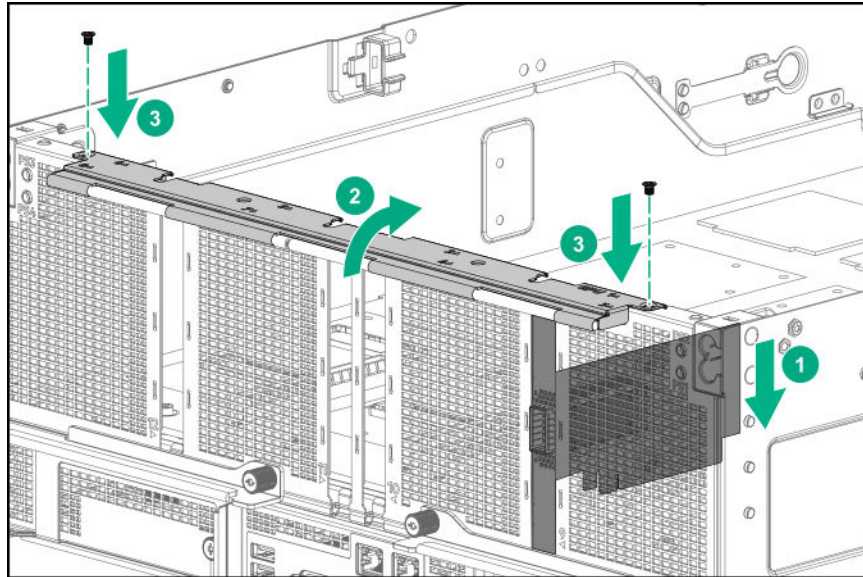


CAUTION: To prevent damage to electrical components, properly ground the server before beginning any installation procedure. Improper grounding can cause electrostatic discharge.

2. Power down the server (**Powering down the server**).
3. Disconnect all peripheral cables from the server.
4. Remove the GPU tray from the chassis (**Removing the GPU tray from the chassis**).
5. Place the module on a flat, level work surface.
6. Open the retainer, and then remove the PCIe riser board blank.



7. Install the PCIe riser board, and then close the retainer.



8. Install the GPU module.
9. Connect all peripheral cables to the server.
10. Power up the server (**Power up the server**).

Installing a PCIe riser board in the PCIe GPU module

Prerequisites

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

The components included with the hardware option kit

Procedure

1. Observe the following alerts:

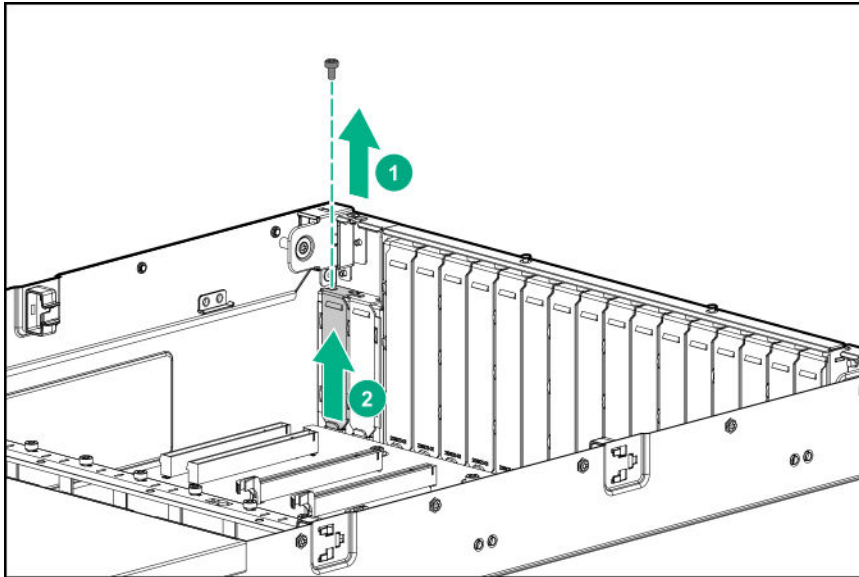


WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

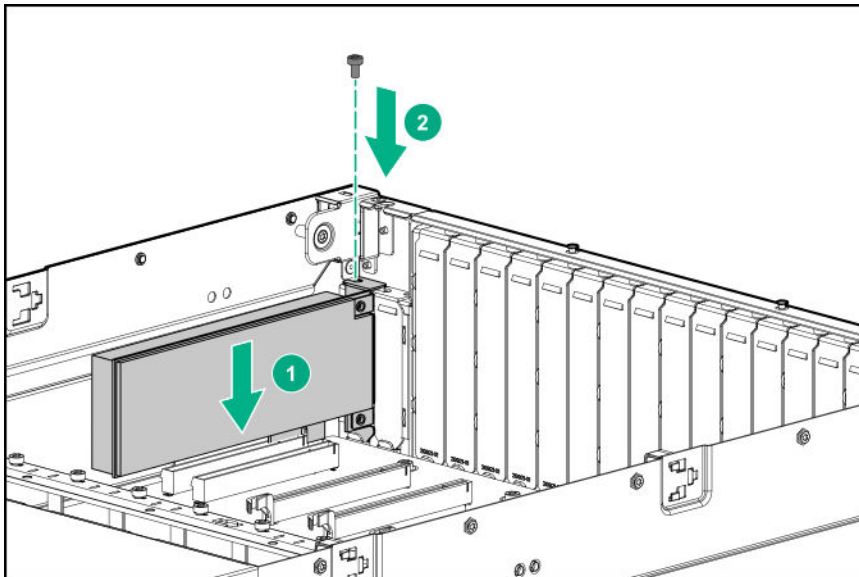


CAUTION: To prevent damage to electrical components, properly ground the server before beginning any installation procedure. Improper grounding can cause electrostatic discharge.

2. Power down the server (**Powering down the server**).
3. Disconnect all peripheral cables from the server.
4. Remove the GPU tray from the chassis (**Removing the GPU tray from the chassis**).
5. Place the module on a flat, level work surface.
6. Remove the PCIe riser board blank.



7. Install the PCIe riser board.



8. Install the GPU module.
9. Connect all peripheral cables to the server.
10. Power up the server (**Power up the server**).

Installing a processor heatsink assembly

Procedure

1. Observe the following alerts:



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

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

2. Observe the following alerts:

⚠ CAUTION: When handling the heatsink, always hold it along the top and bottom of the fins. Holding it from the sides can damage the fins.

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

⚠ CAUTION: If installing a processor with a faster speed, update the system ROM before installing the processor. To download firmware and view installation instructions, see the **[Hewlett Packard Enterprise Support Center website](#)**.

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

ⓘ 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.

3. Back up all server data.

4. Power down the server (**[Powering down the server](#)**).

5. Disconnect all peripheral cables from the server.

6. Remove the system board module from the chassis (**[Removing the system board module from the chassis](#)**).

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

8. Remove any components or cables that may prevent access to the processor socket.

9. Remove the dust cover from the processor socket you intend to upgrade.

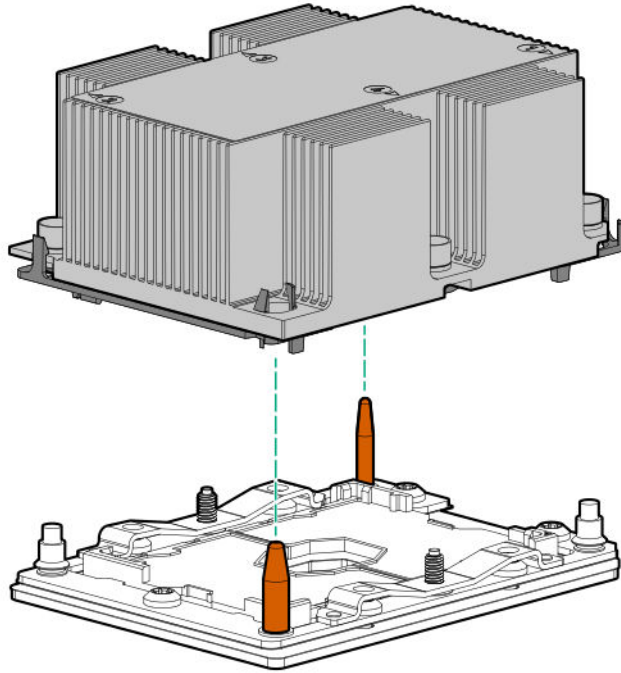
10. Install the processor heatsink assembly:

a. Locate the Pin 1 indicator on the processor carrier and the socket.

b. Align the processor heatsink assembly with the heatsink alignment pins. Then, gently lower it down until it sits evenly on the socket.

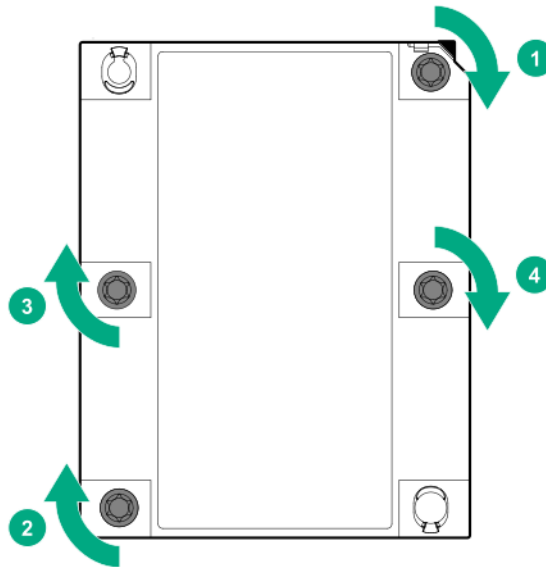
The heatsink alignment pins are keyed. The processor heatsink assembly will only install one way.

Your heatsink may look different than the one shown.



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

- c. Using a T-30 Torx screwdriver, fully tighten each heatsink nut in the order indicated on the heatsink label (1 -2 -3 -4) until it no longer turns.



- 11.** Install any components or cables previously removed to access the processor socket.
- 12.** Install the access panel.
- 13.** Do one of the following:

- Install the server in the rack, if necessary.
- Install the server blade in the enclosure.

14. Power up the server.

- a. Connect the power cords.
- b. Press the Power On/Standby button.

The installation is complete.

HPE Smart Storage Battery

The HPE Smart Storage Battery supports the following devices:

HPE Smart Array SR 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.

Installing the HPE Smart Storage Battery



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

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. Observe the following alerts:

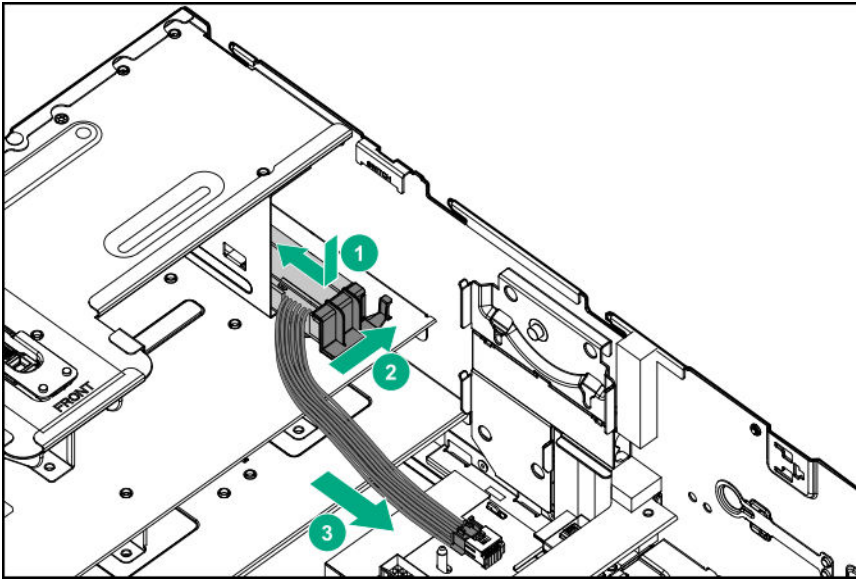


WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.



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

- 2.** Back up all server data.
- 3.** Power down the server (**Powering down the server**).
- 4.** Extend the chassis from the rack (**Extending the chassis from the rack**).
- 5.** Remove the access panel (**Removing the access panel**).
- 6.** Remove the fan cage (**Removing the fan cage**).
- 7.** Install the Smart Storage Battery, and then connect the cable.



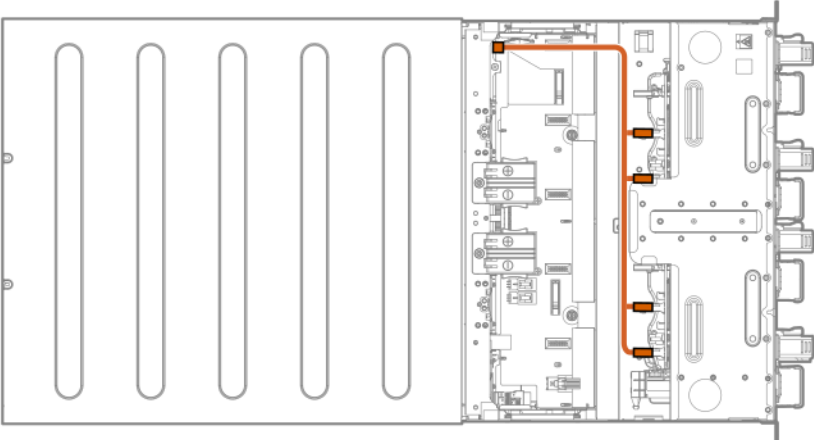
8. Install the fan cage.
9. Install the access panel.
10. **Install the chassis.**
11. **Power up the server.**

Cabling

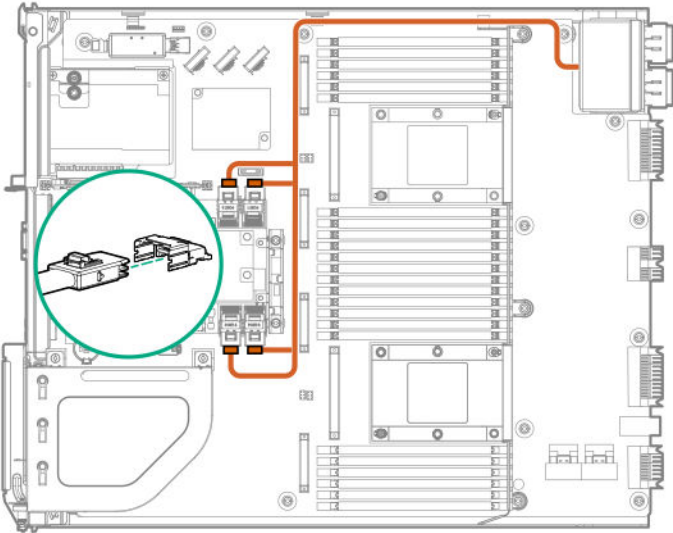
SAS/SATA cabling

⚠ CAUTION: Route the SAS/SATA cables on the drive bay shelf. If they are routed on the slot underneath the drive bay shelf where the AC power cables are routed, a power surge may occur.

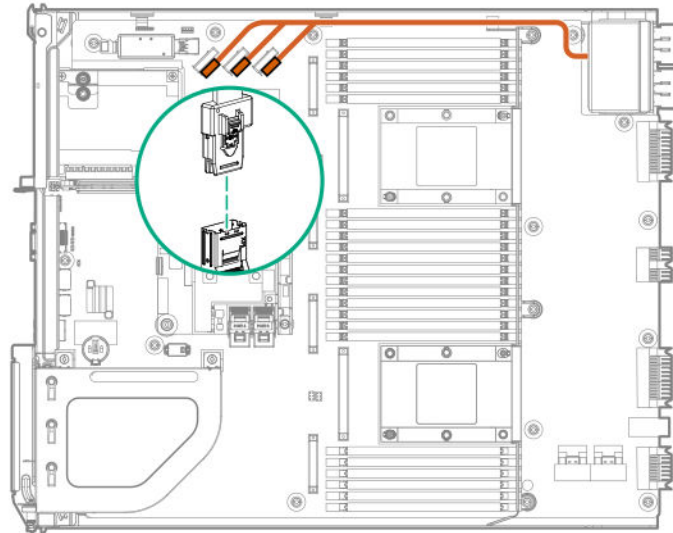
SAS/SATA cabling to the drives



SAS cabling to the system board



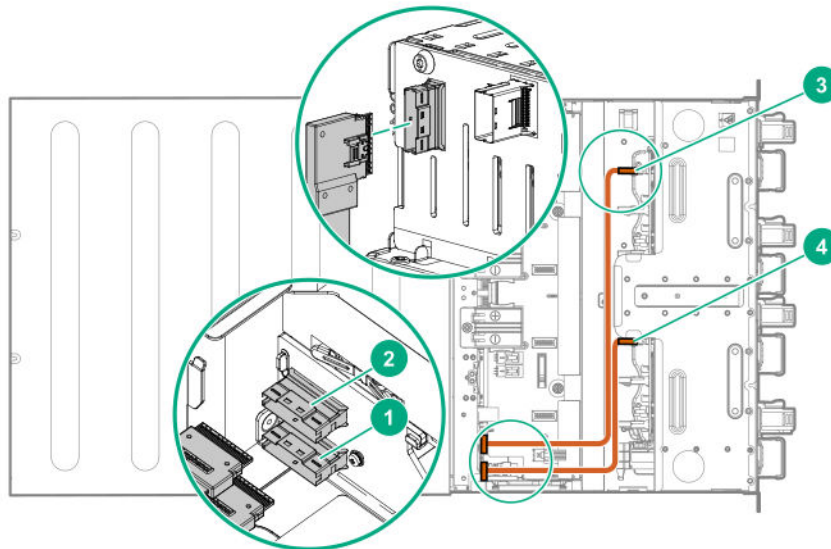
SATA cabling to the system board



NVMe cabling

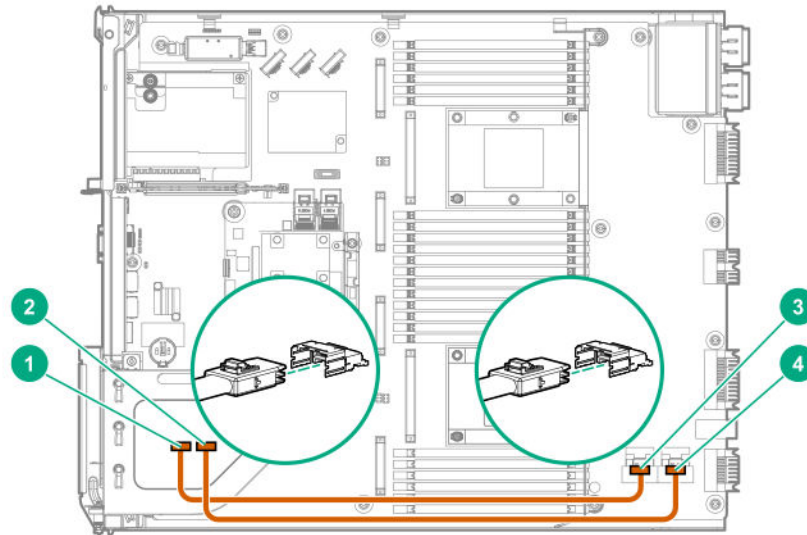
CAUTION: Route the NVMe cables on the drive bay shelf. If they are routed on the slot underneath the drive bay shelf where the AC power cables are routed, a power surge may occur.

NVMe cabling to the midplane



Item	Description
1	NVMe midplane connector J3 - Connects to drive cage 1
2	NVMe midplane connector J4 - Connects to drive cage 2
3	Drive cage 1
4	Drive cage 2

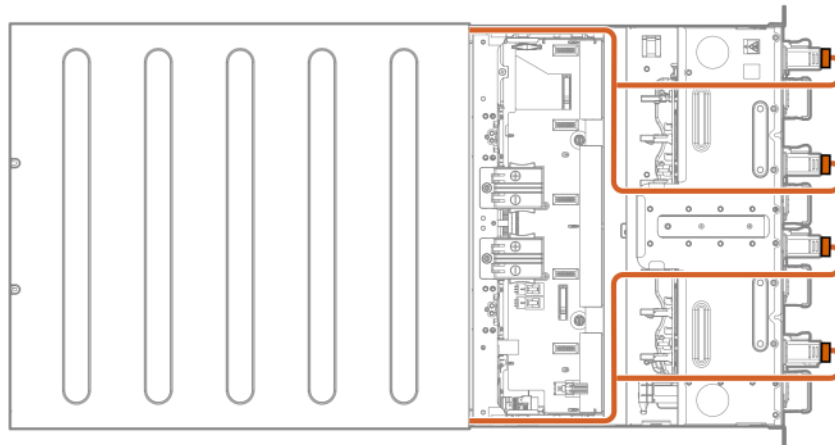
NVMe cabling to the system board



Item	Description
1	NVMe enablement board port J3
2	NVMe enablement board port J4
3	NVMe drive port J19
4	NVMe drive port J13

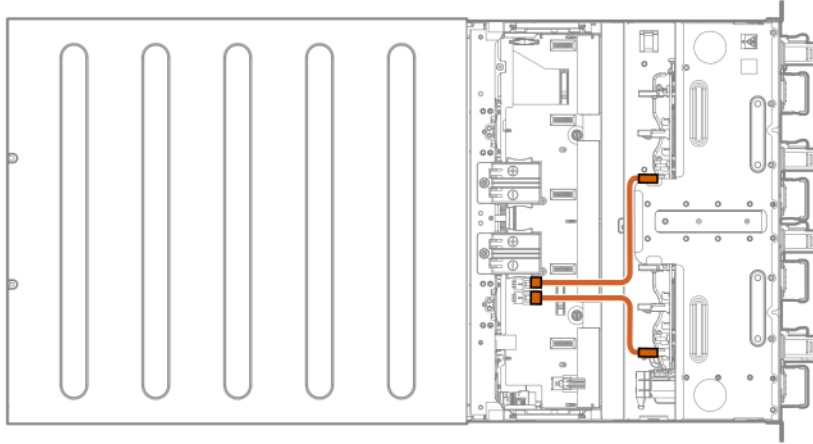
AC power cabling

CAUTION: Route the AC power cables on the slot underneath the drive bay shelf. If they are routed on the drive bay shelf, a power surge may occur.

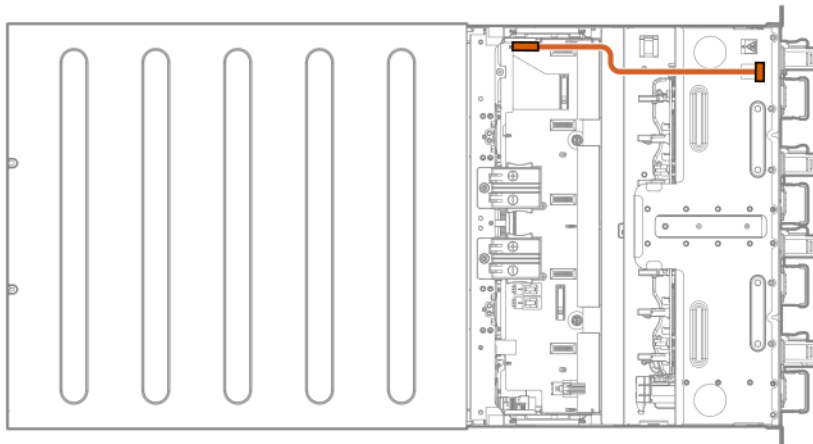


Drive power cabling

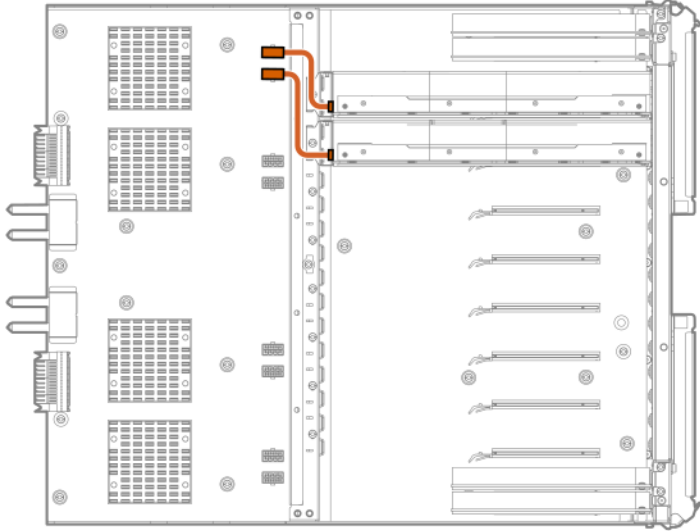
- ⚠ CAUTION:** Route the drive power cables on the drive bay shelf. If they are routed on the slot underneath the drive bay shelf where the AC power cables are routed, a power surge may occur.



Front LED/power/UID cabling

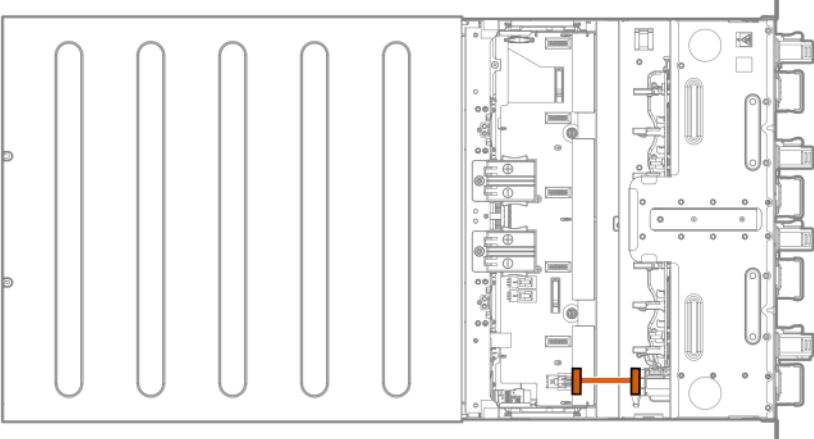


GPU module power cabling



HPE Smart Storage Battery cabling

⚠ CAUTION: Route the HPE Smart Storage Battery cable directly from the power distribution board to the battery on the drive bay shelf. Do not route the cable on the slot underneath the drive bay shelf.



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>HPE Smart Storage Administrator</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

Product QuickSpecs

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

Active Health System Viewer

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

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

Active Health System

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

The Active Health System provides:

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

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

Active Health System data collection

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

Examples of information that is collected:

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

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

Active Health System Log

The data collected by the Active Health System is stored in the Active Health System Log. The data is logged securely, isolated from the operating system, and separate from customer data. 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 <http://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: <http://www.hpe.com/support/ahsv-docs>.

HPE iLO 5

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

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

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

iLO Federation

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

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

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

iLO supports the following features:

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

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

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

iLO Service Port

The Service Port is a USB port with the label **iLO** on supported ProLiant Gen10 servers and Synergy Gen10 compute modules.

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

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

- Download the Active Health System Log to a supported USB flash drive.
When you use this feature, the connected USB flash drive is not accessible by the host operating system.
- Connect a client (such as a laptop) with a supported USB to Ethernet adapter to access the iLO web interface, remote console, CLI, iLO RESTful API, or scripts.
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: <http://www.hpe.com/support/ilo-docs>.

iLO RESTful API

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

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

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

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

iLO Amplifier Pack

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

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

Integrated Management Log

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

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

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

Intelligent Provisioning

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

Intelligent Provisioning 3.30 and later includes HPE SMB Setup. When you launch F10 mode from the POST screen, you are prompted to select whether you want to enter the Intelligent Provisioning or HPE SMB Setup mode.

NOTE: After you have selected a mode, you must reprovision 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 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 SMB Setup.
- From the iLO web interface using **Always On**. **Always On** allows you to access Intelligent Provisioning without rebooting your server.

Intelligent Provisioning operation

Intelligent Provisioning includes the following components:

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

! **IMPORTANT:**

- Although your server is preloaded with firmware and drivers, Hewlett Packard Enterprise recommends updating the firmware upon initial setup. Also, downloading and updating the latest version of Intelligent Provisioning ensures the latest supported features are available.
 - For ProLiant servers, firmware is updated using the Intelligent Provisioning Firmware Update utility.
 - Do not update firmware if the version you are currently running is required for compatibility.
-

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

Intelligent Provisioning provides installation help for the following operating systems:

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

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

Management Security

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

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

Scripting Toolkit for Windows and Linux

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

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

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

UEFI System Utilities

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

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

HPE servers with UEFI can provide:

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

Selecting the boot mode

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

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

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

Prerequisite

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

Procedure

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

Secure Boot

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

- UEFI drivers loaded from PCIe cards
- UEFI drivers loaded from mass storage devices

- Preboot UEFI Shell applications
- OS UEFI boot loaders

When Secure Boot is enabled:

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

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

You can configure Secure Boot:

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

Launching the Embedded UEFI Shell

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

Prerequisites

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

Procedure

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

The **Embedded UEFI Shell** screen appears.

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

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

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

The `Shell>` prompt appears.

4. Enter the commands required to complete your task.
5. Enter the `exit` command to exit the Shell.

HPE Smart Storage Administrator

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

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

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

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

- Accessing HPE SSA in the offline environment

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

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

- Accessing HPE SSA in the online environment

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

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

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

USB support

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

External USB functionality

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

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

Redundant ROM support

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

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

Safety and security benefits

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

Keeping the system current

Updating firmware or system ROM

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

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

More information

[Updating firmware from the System Utilities](#)

Service Pack for ProLiant

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

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

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

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

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

Smart Update Manager

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

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

Key features of SUM include:

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

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

Integrated Smart Update Tools

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

- **iSUT:** Polls iLO to check for requests from SUM or iLO Amplifier Pack for updates through the management network and orchestrates staging, deploying, and activating updates. You can adjust the polling interval by issuing the appropriate command-line option provided by iSUT. Performs inventory on target servers, stages deployment, deploys updates, and then reboots the servers.
- **iLO 5 with integrated Smart Update** (Gen10 servers only): Performs iLO Repository-based updates by downloading the components from iLO Repository when iLO Installation Queue has the components which can be updated by iSUT.
- **iLO Amplifier Pack:** Displays available updates for servers. Communicates with iSUT (or SUT 1.x) to initiate updates using the iLO Redfish interface. iSUT reports the status of updates to iLO Amplifier Pack via iLO Restful Interface.
- **SPP:** A comprehensive systems software and firmware update solution, which is delivered as a single ISO image.
- **SUM:** A tool for firmware and driver maintenance for HPE ProLiant servers and associated options.

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

Updating firmware from the System Utilities

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

Procedure

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

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

6. Select **Select Firmware File.**

7. Select the flash file in the **File Explorer list.**

The firmware file is loaded and the **Firmware Updates** screen lists details of the file in the **Selected firmware file** field.

8. Select **Image Description, and then select a firmware image.**

A device can have multiple firmware images.

9. Select **Start firmware update.**

Updating the firmware from the UEFI Embedded Shell

Procedure

1. Access the System ROM Flash Binary component for your server from the Hewlett Packard Enterprise Support Center (<http://www.hpe.com/support/hpesc>).
2. Copy the binary file to a USB media or iLO virtual media.
3. Attach the media to the server.
4. Boot to the UEFI Embedded Shell.
5. To obtain the assigned file system volume for the USB key, enter `map -r`.
6. Change to the file system that contains the System ROM Flash Binary component for your server. Enter one of the `fsx` file systems available, such as `fs0:` or `fs1:`, and press **Enter**.
7. Use the `cd` command to change from the current directory to the directory that contains the binary file.
8. Flash the system ROM by entering `fwupdate -d BIOS -f filename`.
9. Reboot the server. A reboot is required after the firmware update in order for the updates to take effect and for hardware stability to be maintained.

Online Flash components

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

Drivers

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

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

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

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

Software and firmware

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

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

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

Operating system version support

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

HPE Pointnext Portfolio

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

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

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

Utilize the Advisory and Transformation Services in the following areas:

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

For more information, see the Hewlett Packard Enterprise website:

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

Proactive notifications

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

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

You can subscribe to proactive notifications on the **Hewlett Packard Enterprise website**.

Troubleshooting

Troubleshooting resources

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

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

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

Removing and replacing the system battery

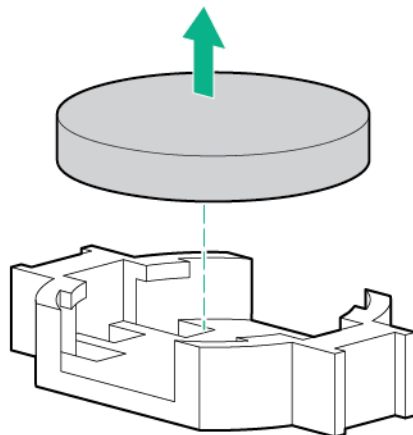
The system battery provides power to the internal clock. If the server no longer automatically displays the correct date and time, you might need to replace the system battery.

⚠ 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. Back up all server data.
2. Power down the server (**Powering down the server**).
3. Disconnect all peripheral cables from the server.
4. Remove the system board module from the chassis (**Removing the system board module from the chassis**).
5. Place the module on a flat, level work surface.
6. Locate the battery (**System board components**).
7. Remove the battery.



To replace the component, reverse the removal procedure.

Specifications

Chassis mechanical specifications

Specification	Value
Height	175.8 mm (6.92 in)
Depth	850.3 mm (33.47 in)
Width	440 mm (17.32 in)
Maximum system weight	58.97 kg (130 lbs)

Power supply specifications

For more information and detailed specifications, see the power supply datasheet on the [Artesyn website](#).

Specification	Value
Input (nominal voltage range)	100 VAC to 120 VAC
	200 VAC to 240 VAC
	240 VDC
Power factor correction	Active
Output power	2220 W maximum continuous
Outputs	
Nominal output voltage	12 V and 12 V standby: 12.00
Voltage regulation	12 V and 12 V standby: +- 5%
Minimum operating current	12 V: 1 A
	12 V standby: 0.1 A
Maximum operating current	12 V:
	<ul style="list-style-type: none">• 183 A/high line• 100 A/low line
	12 V standby: 3.5 A

Electrostatic discharge

Preventing electrostatic discharge

To prevent damaging the system, be aware of the precautions you must follow when setting up the system or handling parts. 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 device.

Procedure

- 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.

Grounding methods to prevent electrostatic discharge

Several methods are used for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm ± 10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
- Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, have an authorized reseller install the part.

For more information on static electricity or assistance with product installation, contact the **Hewlett Packard Enterprise Support Center**.

Websites

General websites

Hewlett Packard Enterprise Information Library

www.hpe.com/info/EIL

Single Point of Connectivity Knowledge (SPOCK) Storage compatibility matrix

www.hpe.com/storage/spock

Storage white papers and analyst reports

www.hpe.com/storage/whitepapers

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

Information to collect

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

Accessing updates

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

Hewlett Packard Enterprise Support Center

www.hpe.com/support/hpesc

Hewlett Packard Enterprise Support Center: Software downloads

www.hpe.com/support/downloads

Software Depot

www.hpe.com/support/softwaredepot

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



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

Customer self repair

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

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

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

Remote support

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

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

Remote support and Proactive Care information

HPE Get Connected

www.hpe.com/services/getconnected

HPE Proactive Care services

www.hpe.com/services/proactivecare

HPE Proactive Care service: Supported products list

www.hpe.com/services/proactivecaresupportedproducts

HPE Proactive Care advanced service: Supported products list

www.hpe.com/services/proactivecareadvancedsupportedproducts

Proactive Care customer information

Proactive Care central

www.hpe.com/services/proactivecarecentral

Proactive Care service activation

www.hpe.com/services/proactivecarecentralgetstarted

Warranty information

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

HPE ProLiant and IA-32 Servers and Options

www.hpe.com/support/ProLiantServers-Warranties

HPE Enterprise and Cloudline Servers

www.hpe.com/support/EnterpriseServers-Warranties

HPE Storage Products

www.hpe.com/support/Storage-Warranties

HPE Networking Products

www.hpe.com/support/Networking-Warranties

Regulatory information

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

www.hpe.com/support/Safety-Compliance-EnterpriseProducts

Additional regulatory information

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

www.hpe.com/info/reach

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

www.hpe.com/info/ecodata

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

www.hpe.com/info/environment

Documentation feedback

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