



**Hewlett Packard
Enterprise**

HPE ProLiant ML110 Gen10 Server User Guide

Abstract

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

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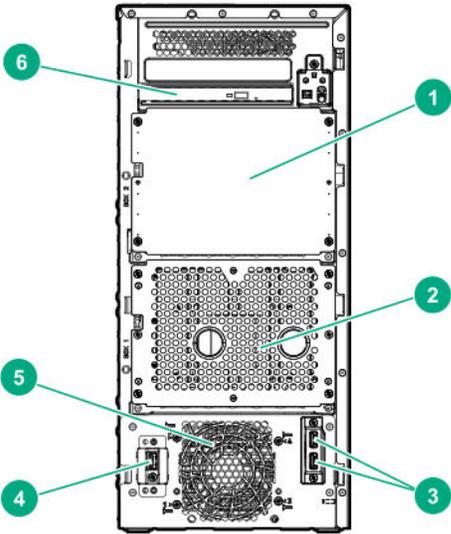
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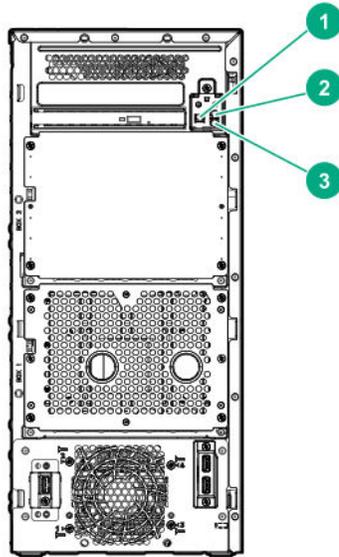
Component identification

Front panel components



Item	Description
1	Box 2
2	Box 1
3	USB 3.0 connectors
4	iLO service port
5	PCIe Fan
6	Slim Optical Disc Drive (Optional)

Front panel LEDs and buttons

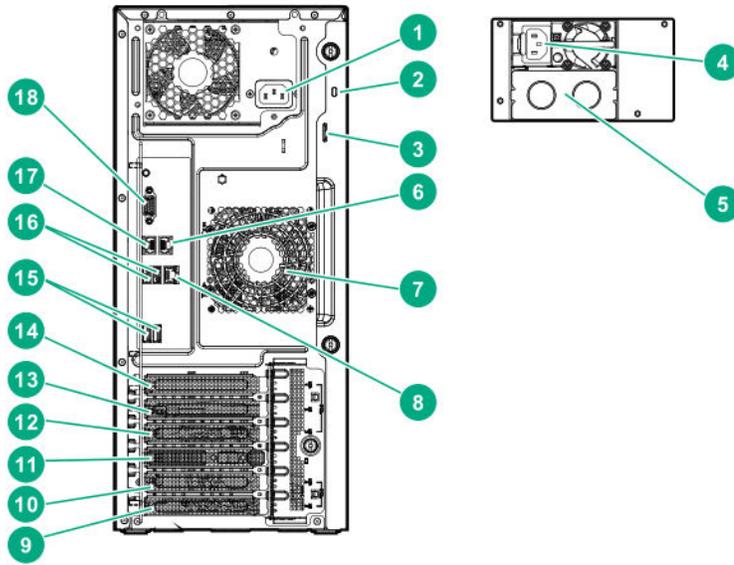


Item	Description	Status
1	Power On/Standby button and system power LED	<p>Solid green = System on</p> <p>Flashing green (1 flash per second) = Performing power on sequence</p> <p>Solid amber = System in standby</p> <p>Off = No power present</p> <p>If the system power LED is off, verify the following conditions:</p> <ul style="list-style-type: none"> • Facility power is present. • The power supply is installed and is working correctly. • The power cord is attached and is connected to a power source. • The front I/O cable is connected.
2	Health LED	<p>Solid green = Normal</p> <p>Flashing green (1 flash per second) = iLO is rebooting.</p> <p>Flashing amber = System degraded</p> <p>Flashing red (1 flash per second) = System critical¹</p>
3	NIC status LED	<p>Solid green = Link to network</p> <p>Flashing green (1 flash per second) = Network active</p> <p>Off = No network activity</p>

¹ If the health LED indicates a degraded or critical state, review the system IML or use iLO to review the system health status.

When all three LEDs described in this table and the UID button/LED on the rear panel flash simultaneously, a power fault has occurred. For more information, see **Power fault LEDs** on page 10. For the location of the UID button/LED on the rear panel, see **Rear panel LEDs** on page 10 .

Rear panel components



Item	Description
1	Non-hot-plug power supply
2	Kensington security slot
3	Padlock eye
4	Power supply bay 1 of the hot-plug power supply (optional)
5	Power supply bay 2 of the hot-plug power supply (optional)
6	NIC port 1
7	System fan
8	iLO Management port
9	Slot 5 PCIe3x8 (4, 1)
10	Slot 4 PCIe3 x16 (16 8, 4, 1)
11	Serial port (optional)
12	Slot 3 PCIe3 x8 (8, 4, 1)
13	Slot 2 PCIe3 x8 (4, 1)
14	Slot 1 PCIe3 x16 (16, 8, 4, 1)
15	USB 3.0 port

Table Continued

Item	Description
16	USB 2.0 port
17	NIC port 2
18	Video port

UID button functionality

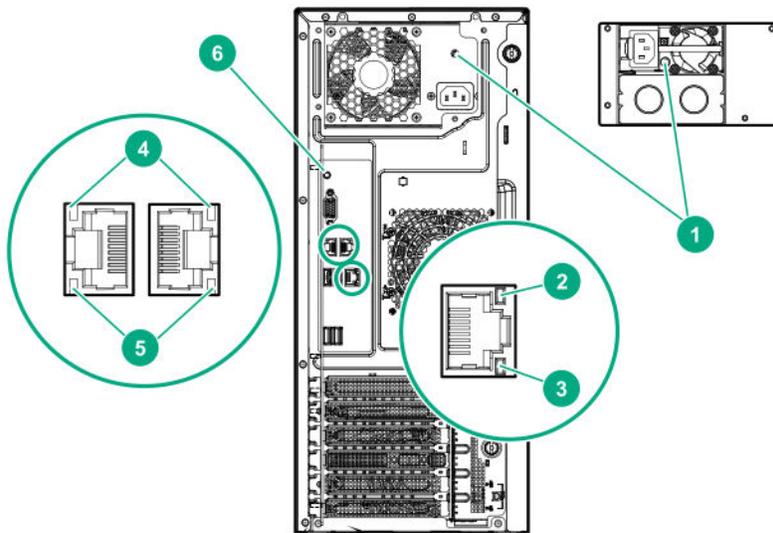
The UID button can be used to display the HPE ProLiant Pre-boot Health Summary when the server will not power on. For more information, see the latest *HPE iLO User Guide* on the [Hewlett Packard Enterprise website](#).

Power fault LEDs

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

Subsystem	LED behavior
System board	1 flash
Processor	2 flashes
Memory	3 flashes
Removable HPE Flexible Smart Array controller/Smart SAS HBA controller	6 flashes
System board PCIe slots	7 flashes
Power backplane or storage backplane	8 flashes
Power supply	9 flashes

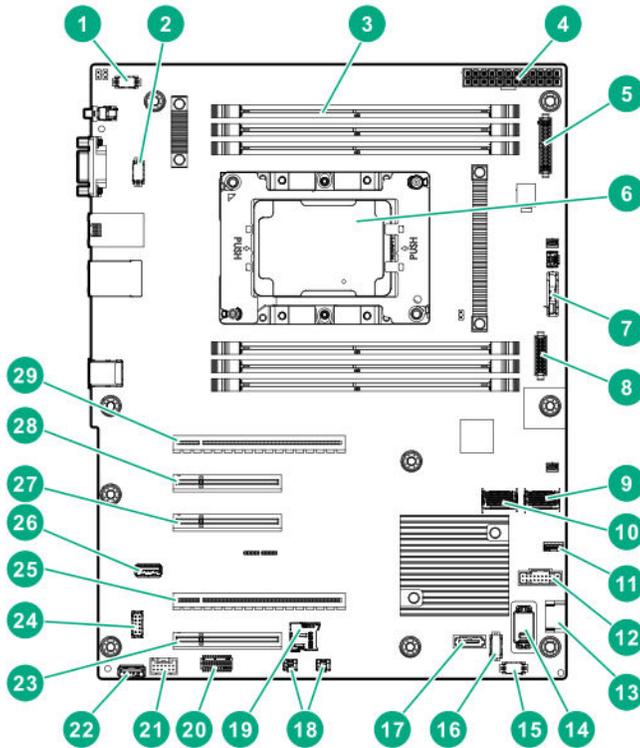
Rear panel LEDs



Item	Description	Status
1	Power supply LED	<p>Solid green = Normal</p> <p>Off = One or more of the following conditions exists:</p> <ul style="list-style-type: none"> • Power is unavailable • Power supply failed • Power supply is in standby mode • Power supply error
2	iLO link LED	<p>Green = Linked to network connection</p> <p>Off = No network connection</p>
3	iLO activity LED	<p>Green or flashing green = Network activity</p> <p>Off = No network activity</p>
4	NIC link LED	<p>Green = Linked to network</p> <p>Off = No network connection</p>
5	NIC activity LED	<p>Green or flashing green = Network activity</p> <p>Off = No network activity</p>
6	UID button/LED	<p>Solid blue = Activated</p> <p>Flashing blue:</p> <ul style="list-style-type: none"> • 1 flash per second = Remote management or firmware upgrade in progress • 4 flashes per second = iLO manual reboot sequence initiated • 8 flashes per second = iLO manual reboot sequence in progress <p>Off = Deactivated</p>

! **IMPORTANT:** Consider NIC as HPE Ethernet 1GB 2-port 332i Adapter whose performance is a PCIe Gen2 x1 device.

System board components



Item	Description
1	Fan connector 4 (system fan)
2	Fan connector 3 (system fan)
3	DIMM slots
4	24-pin power supply connector
5	RPSU connector
6	Processor
7	System Battery
8	Front I/O connector
9	x4 SATA port 1
10	x4 SATA port 2
11	iLO service port connector
12	Front USB 3.0 connector

Table Continued

Item	Description
13	SATA port 9
14	TPM connector
15	Fan connector 1 (PCIe fan)
16	Fan connector 2 (PCIe fan)
17	SATA port 10
18	Storage backup power connectors
19	microSD slot ¹
20	System maintenance switch
21	Smart storage battery connector
22	Internal USB 2.0 connector
23	Slot 5 PCIe3 x8 (4, 1) ²
24	Serial port connector
25	Slot 4 PCIe3 x16 (16, 8, 4, 1)
26	Internal USB 3.0 connector
27	Slot 3 PCIe3 x8 (8, 4, 1)
28	Slot 2 PCIe3 x8 (4, 1)
29	Slot 1 PCIe3 x16 (16, 8, 4, 1)

¹ If the microSD slot does not appear in Device Manager under Windows, click **View** in the tool bar and then select **show hidden device**.

² Although the Speed of slot 5 is designed for 32Gb/s, the actual running speed will be lower than it was designed. Hence, slot 5 will be least recommended for usage.

System maintenance switch descriptions

Position	Default	Function
S1 ¹	Off	Off = iLO 5 security is enabled. On = iLO 5 security is disabled.
S2	Off	Off = System configuration can be changed. On = System configuration is locked.
S3	Off	Reserved

Table Continued

Position	Default	Function
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	Off = Set default boot mode to UEFI. On = Set default boot mode to legacy.
S8	—	Reserved
S9	—	Reserved
S10	—	Reserved
S11	—	Reserved
S12	—	Reserved

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

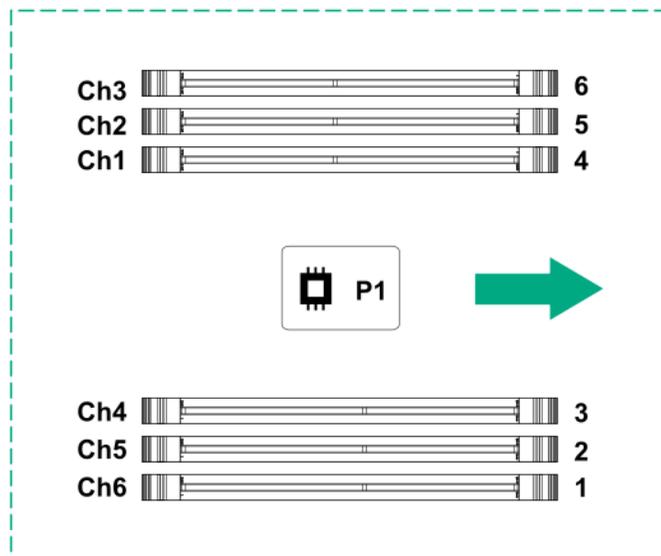
² When the system maintenance switch position 6 is set to the On position, the system is prepared to restore all configuration settings to their manufacturing defaults.

³ When the system maintenance switch position 6 is set to the On position and Secure Boot is enabled, some configurations cannot be restored. For more information, see **Secure Boot** on page 100.

DIMM slot locations

DIMM slots are numbered sequentially (1 through 6) for the processor.

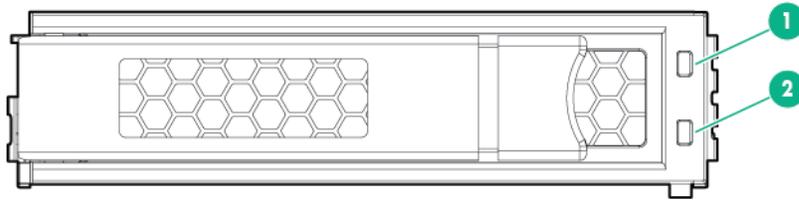
The arrow points to the front of the server.



IMPORTANT:
A3DC only supports DIMM module with 32G dual rank.

Drives

LFF drive LED definitions



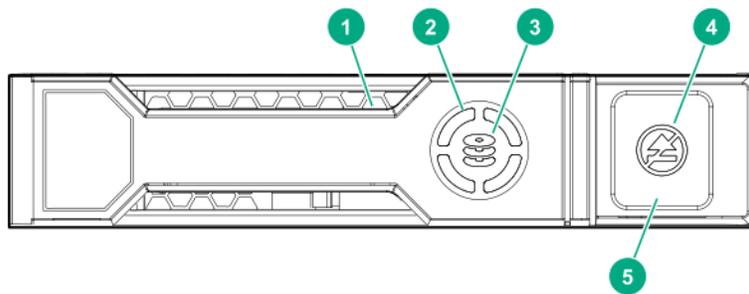
Item	Definition
1	Fault/UID (amber/blue)
2	Online/Activity (green)

Online/Activity LED (green)	Fault/UID LED (amber/blue)	Definition
On, off, or flashing	Alternating amber and blue	One or more of the following conditions exist: <ul style="list-style-type: none"> The drive has failed. A predictive failure alert has been received for this drive. The drive has been selected by a management application.
On, off, or flashing	Solid blue	One or both of the following conditions exist: <ul style="list-style-type: none"> The drive is operating normally. The drive has been selected by a management application.
On	Flashing amber	A predictive failure alert has been received for this drive. Replace the drive as soon as possible.
On	Off	The drive is online but is not currently active.
1 flash per second	Flashing amber	Do not remove the drive. Removing the drive might terminate the current operation and cause data loss. The drive is part of an array that is undergoing capacity expansion or stripe migration, but a predictive failure alert has been received for this drive. To minimize the risk of data loss, do not remove the drive until the expansion or migration is complete.

Table Continued

1 flash per second	Off	Do not remove the drive. Removing the drive might terminate the current operation and cause data loss. The drive is rebuilding, erasing, or is part of an array that is undergoing capacity expansion or stripe migration.
4 flashes per second	Flashing amber	The drive is active but a predictive failure alert has been received for the drive. Replace the drive as soon as possible.
4 flashed per second	Off	The drive is active and is operating normally.
Off	Solid amber	A critical fault condition has been identified for this drive and the controller has placed it offline. Replace the drive as soon as possible.
Off	Flashing amber	A predictive failure alert has been received for this drive. Replace the drive as soon as possible.
Off	Off	The drive is offline, a spare, or not configured as part of an array.

SFF SmartDrive components



Item	Description	Status
1	Locate LED ¹	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 LED	Rotating green = Drive activity Off = No drive activity

Table Continued

Item	Description	Status
3	Drive status LED	<p>Solid green = The drive is a member of one or more logical drives.</p> <p>Flashing green = The drive is rebuilding or performing a RAID migration, stripe size migration, capacity expansion, or logical drive extension, or is erasing.</p> <p>Flashing amber/green = The drive is a member of one or more logical drives and predicts the drive will fail.</p> <p>Flashing amber = The drive is not configured and predicts the drive will fail.</p> <p>Solid amber = The drive has failed.</p> <p>Off = The drive is not configured by a RAID controller.</p>
4	Do not remove LED	<p>Solid white = Do not remove the drive. Removing the drive causes one or more of the logical drives to fail.</p> <p>Off = The drive can be removed. Removing the drive does not cause a logical drive to fail.</p>
5	Do not remove button	Press to open the release lever.

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

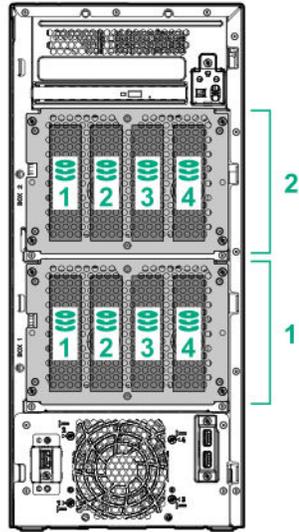
Drive Numbering

The following images show the drive numbering for each of the supported drive configurations. For drive box numbering information, see **Front panel components** on page 7.

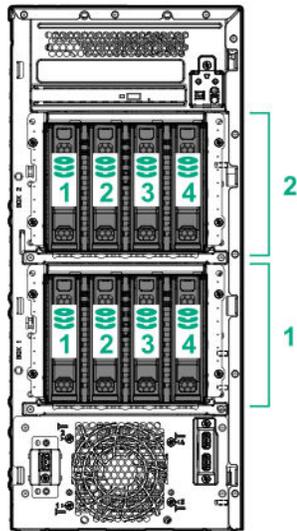
With optional drive cages installed, the server supports up to 8 LFF non-hot-plug drives, 8 LFF hot-plug drives, or 16 SFF hot-plug drives. If only one drive cage is installed, it must be installed in box 1. The server does not support mixing SFF and LFF drives.

Hewlett Packard Enterprise recommends that you populate drive bays starting with the lowest drive number. Drives are numbered from left to right in each component box.

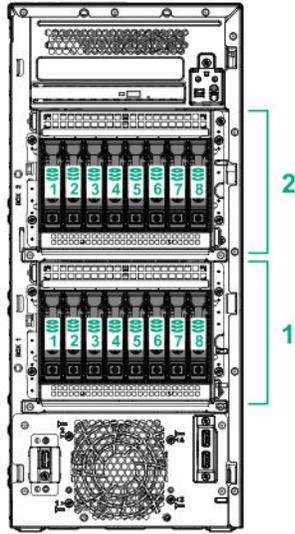
- Four-bay LFF non-hot-plug drive model



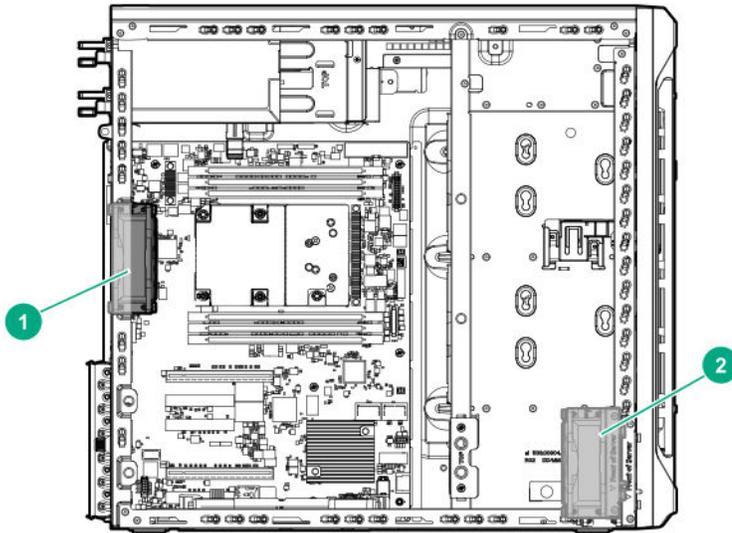
- Four-bay LFF hot-plug drive model



- Eight-bay SFF hot-plug drive model



Fan locations



Item	Description
1	Default system fan module (92 x 32 mm)
2	Default PCIe fan module (92 X 32 mm)

The server also supports redundant fan options, see Redundant fan option.

Operations

Power up the server

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

Power down the server

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



IMPORTANT:

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

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

- Press and release the Power On/Standby button.
This method initiates a controlled shutdown of applications and the OS before the server enters standby mode.
- Press and hold the Power On/Standby button for more than 4 seconds to force the server to enter standby mode.
This method forces the server to enter standby mode without properly exiting applications and the OS. If an application stops responding, you can use this method to force a shutdown.
- Use a virtual power button selection through iLO 5.
This method initiates a controlled remote shutdown of applications and the OS before the server enters standby mode.

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

Remove the server from the rack



WARNING:

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

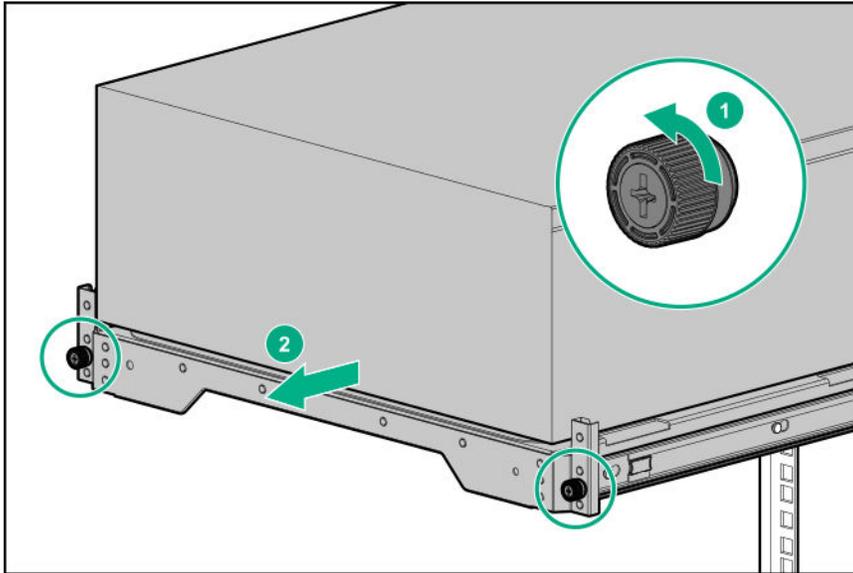
- Observe local occupational health and safety requirements and guidelines for manual material handling.
 - Get help to lift and stabilize the product during installation or removal, especially when the product is not fastened to the rails. Hewlett Packard Enterprise recommends that a minimum of two people are required for all rack server installations. A third person may be required to help align the server if the server is installed higher than chest level.
 - Use caution when installing the server in or removing the server from the rack; it is unstable when not fastened to the rails.
-

Prerequisites

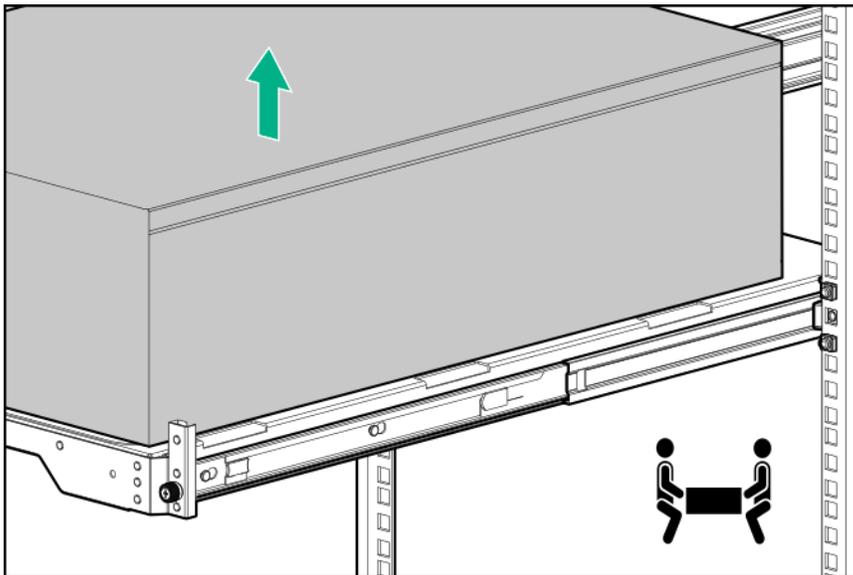
Before you perform this procedure, make sure that you have T-15 Torx screwdriver available.

Procedure

1. **Power down the server** on page 20.
2. Fully extend the server out of the rack.



3. Disconnect all peripheral cables from the server.
4. Disconnect each power cord from the server.
5. Lift the server from the tray.



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

Remove 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.

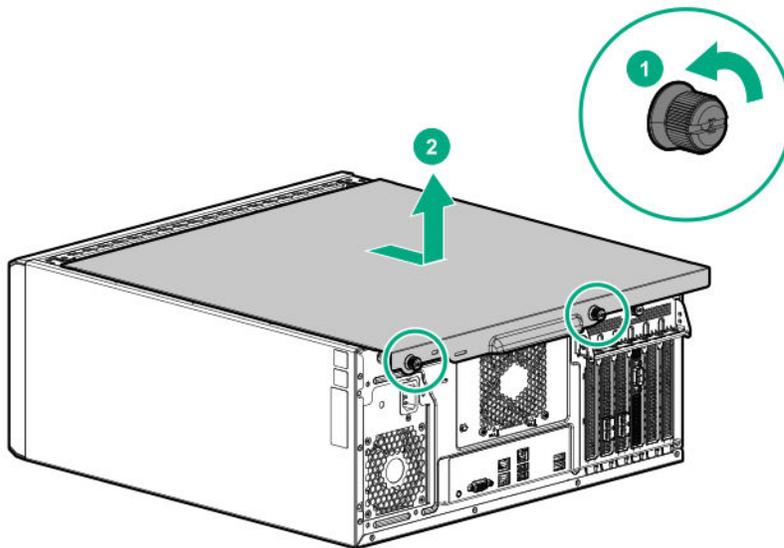
⚠ CAUTION:
For proper cooling, do not operate the server without the access panel, baffles, expansion slot covers, or blanks installed. If the server supports hot-plug components, minimize the amount of time the access panel is open.

**CAUTION:**

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

Procedure

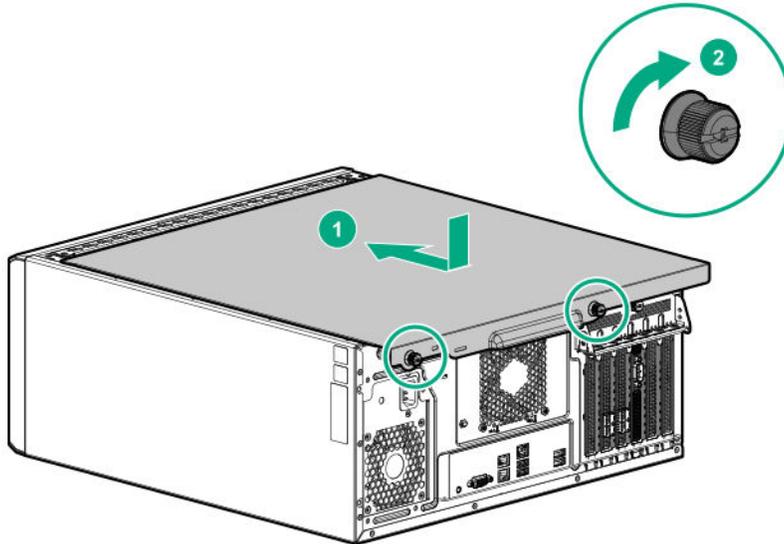
1. **Power down the server** on page 20.
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Do one of the following:
 - Server in rack mode: **Remove the server from the rack** on page 20.
 - Server in tower mode: Place the server on its side and access panel facing up.
4. If a Kensington security cable is installed, disconnect it from the rear panel. See the security cable documentation for instructions.
5. Place the server on its side and access panel facing up.
6. Remove the access panel:
 - a. Loosen the access panel thumbscrews.
 - b. Slide and remove the access panel from the server.



Install the access panel

Procedure

1. Install the access panel:
 - a. Place the access panel on the chassis, and slide it towards the front of the server.
 - b. Tighten the thumbscrews.

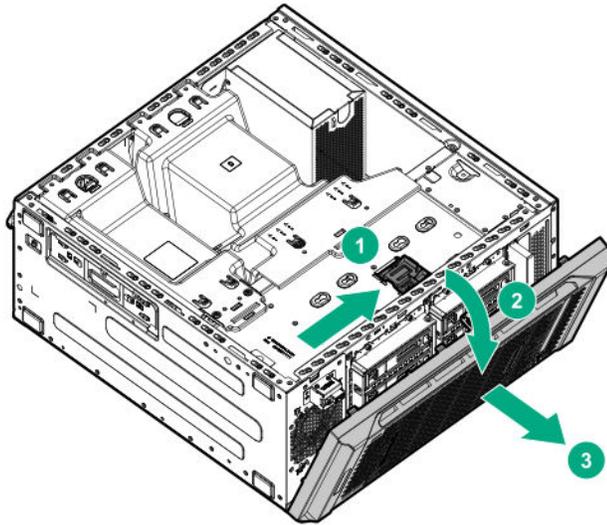


2. If a Kensington security cable was removed, connect it to the rear panel. See the security cable documentation for instructions.
3. Do one of the following:
 - Server in rack mode: **Install the server on the rack** on page 39.
 - Server in tower mode: Return the server to an upright position.
4. Connect each power cord to the server.
5. Connect each power cord to the power source.
6. **Power up the server** on page 20.

Remove the front bezel

Procedure

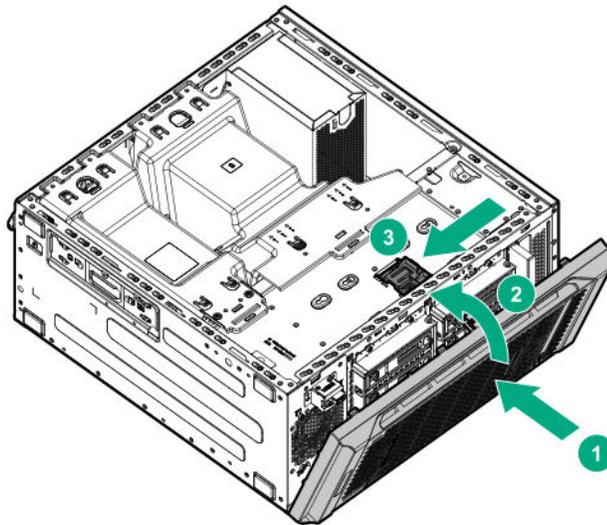
1. If the bezel is locked, **power down the server**.
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Place the server on its side and access panel facing up.
4. If the front bezel is locked by the internal locker, **remove the access panel**.
5. Open and remove the front bezel:
 - a. Slide up the internal locker.
 - b. Open the front bezel.
 - c. Remove the front bezel.



Install the front bezel

Procedure

1. Install and close the front bezel.



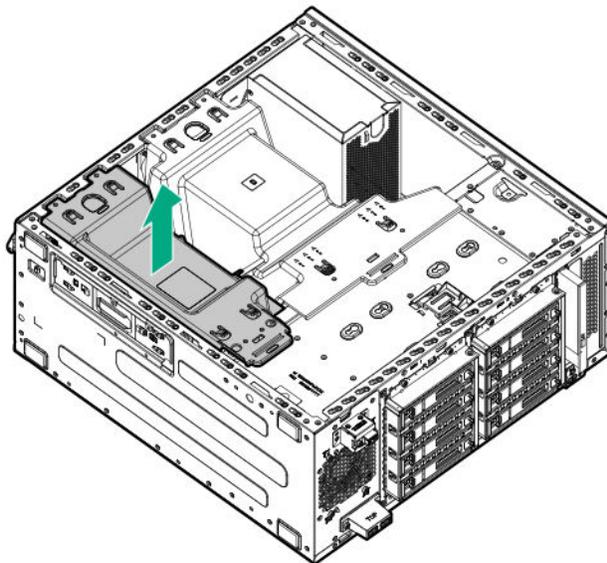
2. Do one of the following:
 - Lock the internal locker.
 - Leave the internal locker in unlock position if you want to access the front panel any time without removing the access panel.
3. **Install the access panel** on page 22.
4. Do one of the following:
 - Server in rack mode: **Install the server on the rack** on page 39.
 - Server in tower mode: Return the server to an upright position.
5. Connect each power cord to the server.

6. Connect each power cord to the power source.
7. **Power up the server** on page 20.

Remove the PCIe air baffle

Procedure

1. **Power down the server** on page 20.
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Do one of the following:
 - Server in rack mode: **Remove the server from the rack** on page 20.
 - Server in tower mode: Place the server on its side and access panel facing up.
4. **Remove the access panel** on page 21.
5. Remove the PCIe air baffle.

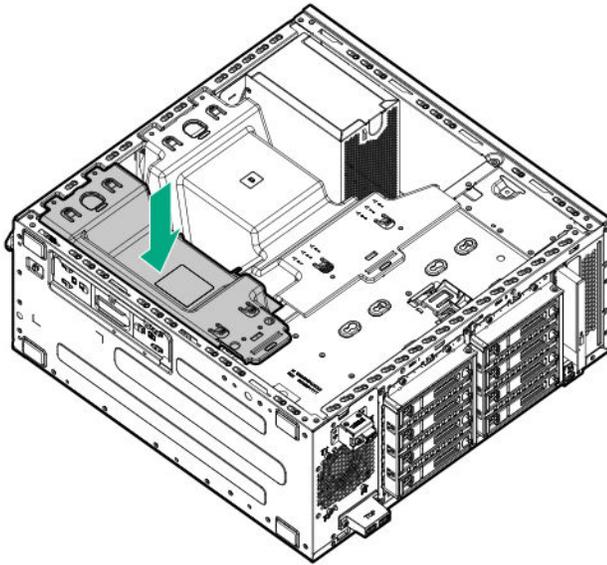


Install the PCIe air baffle

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

Procedure

1. Install the PCIe air baffle.

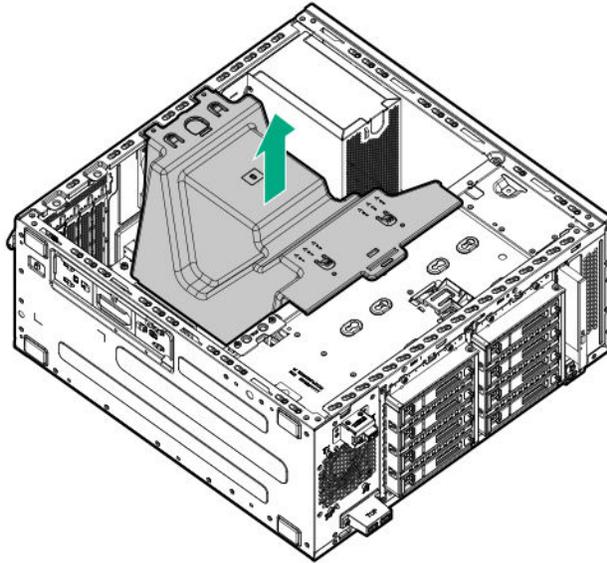


2. **Install the front bezel** on page 24.
3. **Install the access panel** on page 22.
4. Do one of the following:
 - Server in rack mode: **Install the server on the rack** on page 39.
 - Server in tower mode: Return the server to an upright position.
5. Connect each power cord to the server.
6. Connect each power cord to the power source.
7. **Power up the server** on page 20.

Remove the system air baffle

Procedure

1. **Power down the server** on page 20.
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Do one of the following:
 - Server in rack mode: **Remove the server from the rack** on page 20.
 - Server in tower mode: Place the server on its side and access panel facing up.
4. **Remove the access panel** on page 21.
5. **Remove the PCIe air baffle** on page 25.
6. Remove the system air baffle.



Install the system air baffle

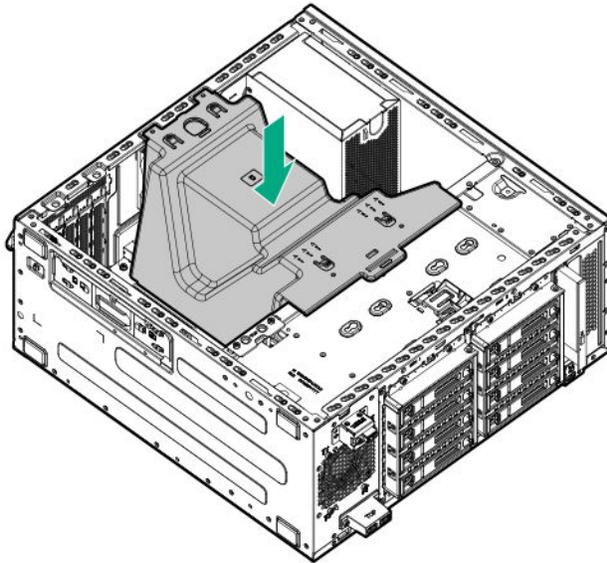


CAUTION:

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

Procedure

1. Install the system air baffle.



2. **Install the PCIe air baffle** on page 25
3. **Install the front bezel** on page 24.
4. **Install the access panel** on page 22.
5. Do one of the following:

- Server in rack mode: **Install the server on the rack** on page 39.
 - Server in tower mode: Return the server to an upright position.
6. Connect each power cord to the server.
 7. Connect each power cord to the power source.
 8. **Power up the server** on page 20.

Setup

Optional service

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

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

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

¹The time commitment for this repair service might vary depending on the site's geographical region. 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**.

Operational requirements

Space and airflow requirements

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

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

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

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

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

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

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

-
- △ CAUTION:**
If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment:
- Front and rear doors—If the 42U rack includes closing front and rear doors, you must allow 5,350 sq cm (830 sq in) of holes evenly distributed from top to bottom to permit adequate airflow (equivalent to the required 64 percent open area for ventilation).
 - Side—The clearance between the installed rack component and the side panels of the rack must be a minimum of 7 cm (2.75 in).
-

Temperature requirements

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

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

-
- △ CAUTION:**
To reduce the risk of damage to the equipment when installing third-party options:
- Do not permit optional equipment to impede airflow around the server or to increase the internal rack temperature beyond the maximum allowable limits.
 - Do not exceed the manufacturer's TMRA.
-

Power requirements

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

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

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

Electrical grounding requirements

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

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

Server warnings and cautions

**WARNING:**

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

- Observe local occupational health and safety requirements and guidelines for manual material handling.
 - Get help to lift and stabilize the product during installation or removal, especially when the product is not fastened to the rails. Hewlett Packard Enterprise recommends that a minimum of two people are required for all rack server installations. A third person may be required to help align the server if the server is installed higher than chest level.
 - Use caution when installing the server in or removing the server from the rack; it is unstable when not fastened to the rails.
-
-

**WARNING:**

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

**WARNING:**

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

**CAUTION:**

Protect the 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 in operation during a power failure.

**CAUTION:**

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

Rack warnings



WARNING:

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

- The 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:

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

- At least two people are needed to safely unload the rack from the pallet. An empty 42U rack can weigh as much as 115.0 kg (253.0 lb), can stand more than 2.1 m (7.0 ft) tall, and might become unstable when being moved on its casters.
 - Never stand in front of the rack when it is rolling down the ramp from the pallet. Always handle the rack from both sides.
-
-



WARNING:

To reduce the risk of personal injury or damage to the equipment, adequately stabilize the rack before extending a component outside the rack. Extend only one component at a time. A rack may become unstable if more than one component is extended.



WARNING:

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



WARNING:

Both default fan and redundant fan Kit are rack mode supported. However increased cooling mode enablement is required at default fan in RBSU options.

Enabling increased cooling in RBSU

Procedure

1. From the **System Utilities** screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Advanced Options > Fan and Thermal Options > Thermal Configuration**.
2. Select **Increased Cooling**—Operates fans at a higher speed.
3. Save your setting.

Electrostatic discharge

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

To prevent electrostatic damage:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:
 - Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm ± 10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
 - Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
 - Use conductive field service tools.
 - Use a portable field service kit with a folding static-dissipating work mat.

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

For more information on static electricity or assistance with product installation, contact an authorized reseller.

Prerequisites for the initial server setup

Procedure

- Verify that the optimum environmental requirements are satisfied.**
- Confirm that the installation engineer understands how to integrate the server into the user network, in particular from an IP addressing perspective and from a domain perspective.
- Prepare Ethernet cables of an appropriate length for each of the LAN, WAN, and remote management (iLO) connections.
- Verify that there are sufficient ports available on the devices to which the server will be connected (for example, router, LAN switch).

Server box contents

Unpack the server shipping carton and locate the materials and documentation necessary for installing the server.

The server shipping box contains

- Server (Tower or Rack model)
 - The server model will depend on the configuration ordered by the customer
- Power cord
- Hardware documentation

Setting up the server in tower mode

Procedure

1. **Remove the server from the rack.**
2. Turn the server to the upright position.
3. Place the server on a flat stable surface.
4. **Connect peripheral devices to the server.**

**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.

5. Connect the power cord to the rear of the server.
6. Connect the power cord to the AC power source.

Setting up the server in rack mode

For setting up a server in rack mode, see [Tower to rack conversion kit](#) on page 35

Configuring the server

When the server is powered on, the POST screen is displayed. Use the following options to configure the server:

- System utilities (**F9**)
Use this option to configure UEFI, RBSU, or other boot settings.
- Intelligent Provisioning (**F10**)
Use this option to configure drives, access Smart Storage Administrator, or begin installing or deploying an operating system.
- Boot order (**F11**)
Use this option to select a boot device.
- Network boot (**F12**)
Use this option to PXE boot the server from the network.

Installing or deploying an operating system

Before installing an operating system, observe the following:

- Be sure to read the HPE UEFI requirements for ProLiant servers on the [Hewlett Packard Enterprise website](#). If UEFI requirements are not met, you might experience boot failures or other errors when installing the operating system.
- Update firmware before using the server for the first time, unless software or components require an older version. For more information, see "[Keeping the system current](#)" on page 102."
- For the latest information on supported operating systems, see the [Hewlett Packard Enterprise website](#).
- The server does not ship with OS media. All system software and firmware is preloaded on the server.

Registering the server

To experience quicker service and more efficient support, register the server at the My License Portal website:

<https://myenterpriselicense.hpe.com/>

Hardware options installation

Product QuickSpecs

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

Introduction

If more than one option is being installed, read the installation instructions for all the hardware options and identify similar steps to 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.

Tower to rack conversion kit

Use the tower-to-rack conversion kit to switch the tower server to rack mode operation. Once installed, complete in-rack serviceability for all server components is supported.

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

- Observe local occupational health and safety requirements and guidelines for manual material handling.
- Get help to lift and stabilize the product during installation or removal, especially when the product is not fastened to the rails. Hewlett Packard Enterprise recommends that a minimum of two people are required for all rack server installations. A third person may be required to help align the server if the server is installed higher than chest level.
- Use caution when installing the server in or removing the server from the rack; it is unstable when not fastened to the rails.

⚠ 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.

⚠ WARNING:
To avoid risk of personal injury or damage to the equipment, do not stack anything on top of rail-mounted equipment or use it as a work surface when extended from the rack.

Installing the tower-to-rack conversion kit

Procedure

1. **Review the rack warnings and cautions.**
2. If the server is currently used in tower mode, **prepare the server for rack installation.**
3. **Install the rack rails and server tray.**
4. **Install the server on the rack.**
5. **Power up the server.**

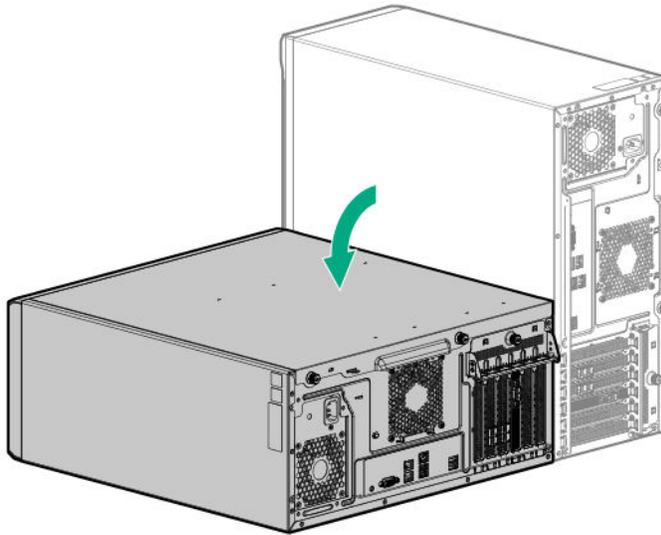
Preparing the server for rack installation

Prerequisites

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

Procedure

1. **Power down the server** on page 20.
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Place the server on the side and access panel facing up.



Install the rack rails and server tray

These rack rails can be installed in both round- or square-hole racks.

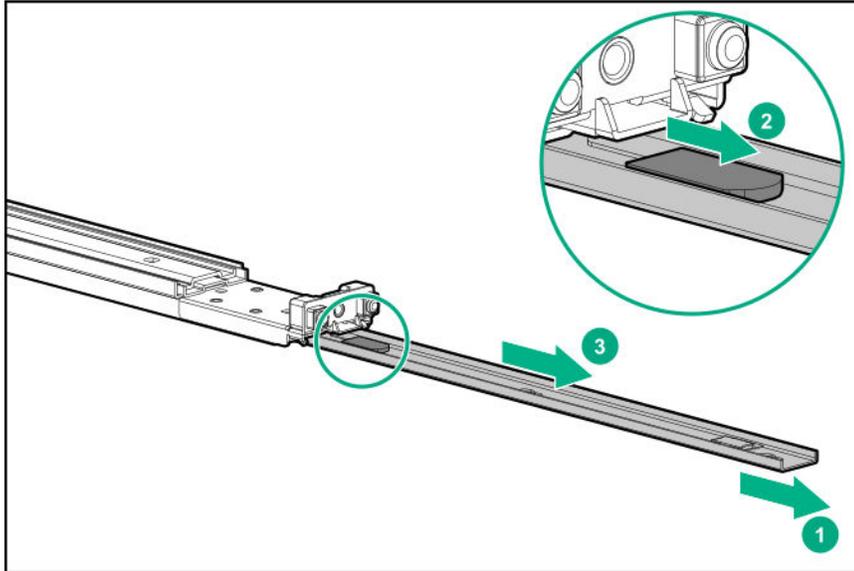
Prerequisites

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

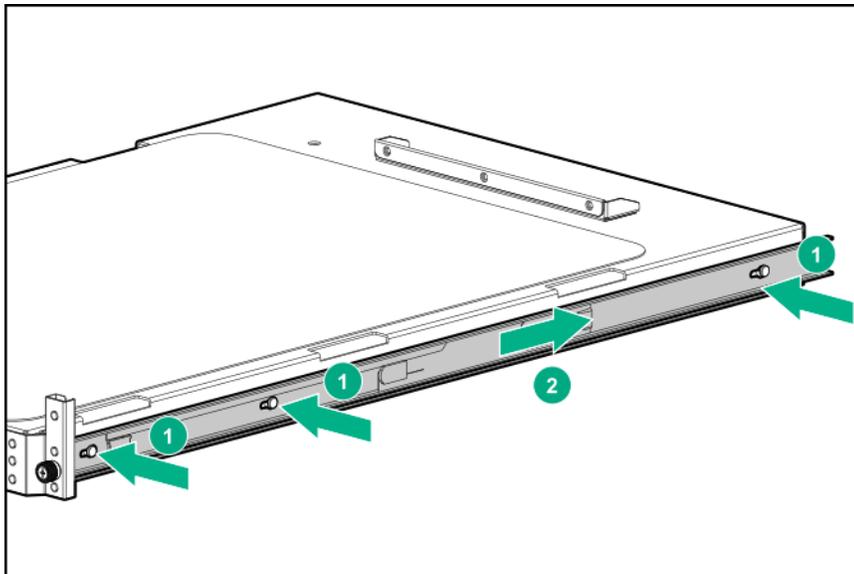
- Left and right rack rail assemblies – These rails occupy 1U position on the rack.
- Server tray
- T-15 Torx screwdriver

Procedure

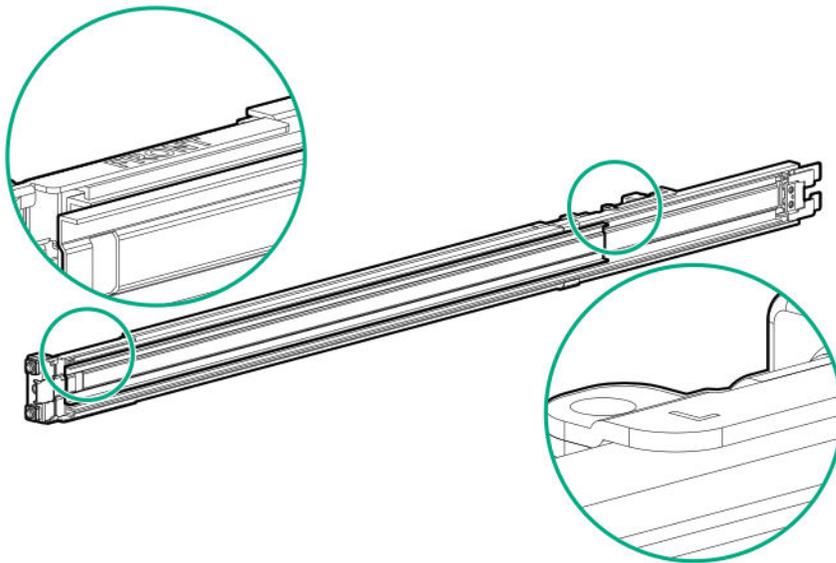
1. Disassemble the rail assemblies:
 - a. Pull out the inner rail until it is fully extended .
 - b. Slide and hold the white release tab in the direction shown, and then remove the inner sliding rail from the outer mounting rail.



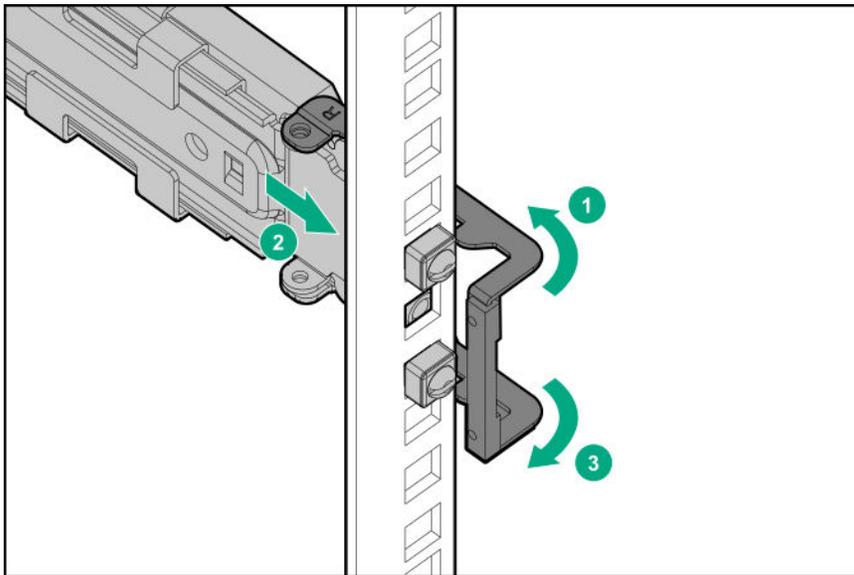
- c. Repeat steps a–b on the other rail assembly.
2. Install the sliding rails on the server tray:
 - a. Align the notches on the rail with the pins on the side.
 - b. Slide the rail towards the rear of the tray to lock it into place.



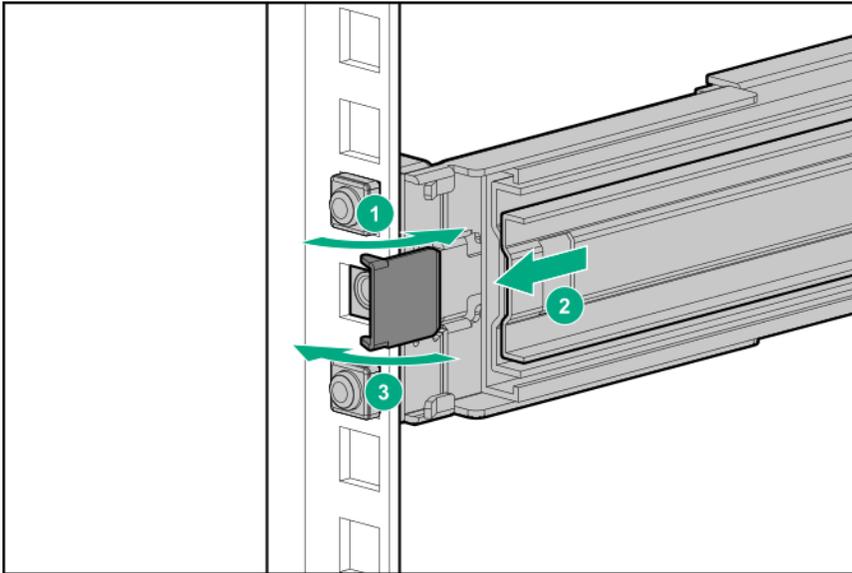
- c. Repeat steps a–b on the other inner rail.
3. Locate the orientation markers on the mounting rails:
 - The front end of the rails is marked **FRONT**.
 - The rear end of the rails is marked with **L** for left and **R** for right.



4. Fasten the mounting rails to the rack columns:
 - a. Retract and hold the rear retention bracket.
 - b. Insert the pegs on the mounting flange into the rack holes.
 - c. Release the rear retention bracket.

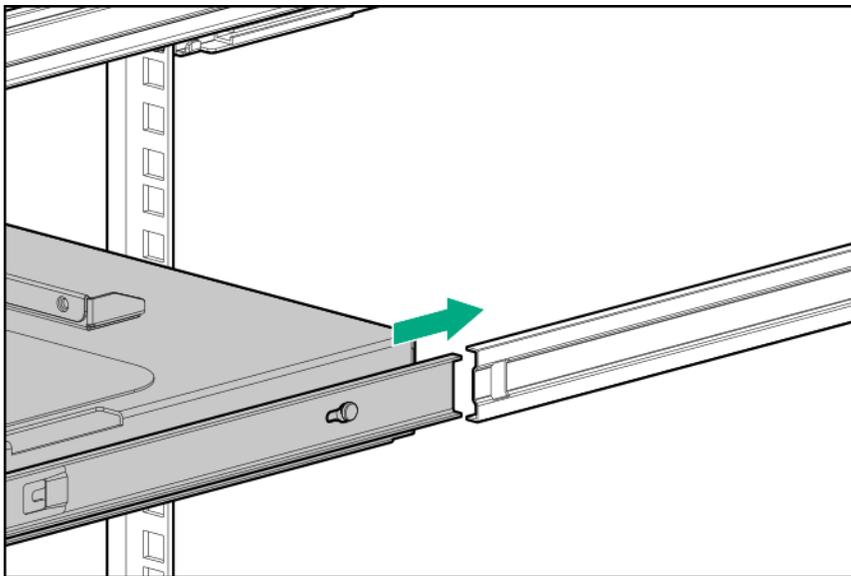


- d. Retract and hold the front retention bracket.
 - e. Insert the pegs on the mounting flange into the rack holes.
 - f. Release the front retention bracket.



- g. Repeat steps a-f to fasten the other mounting rail.
 - h. Make sure that both rails are mounted at the same vertical position on both sides of the rack.
5. Slide the server tray into the rack.

The rails will click and lock into place when the tray is properly engaged.



Install the server on the rack

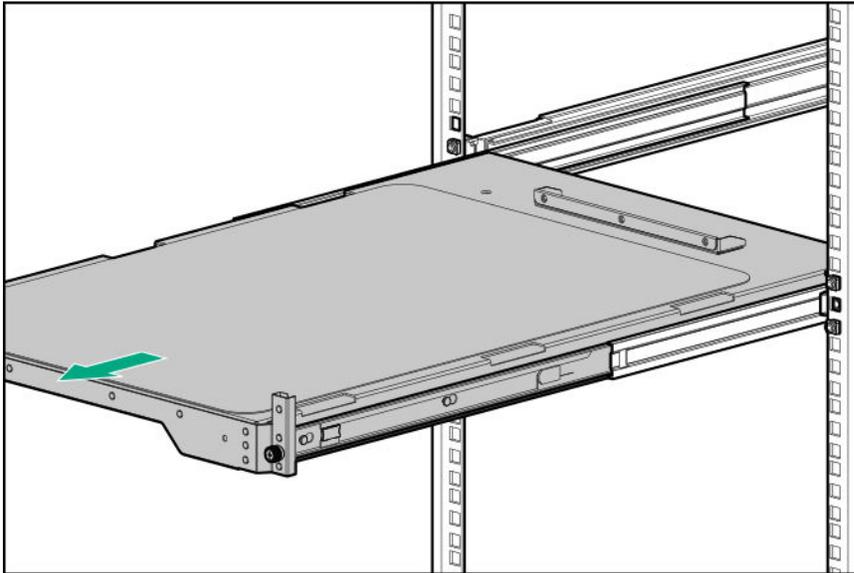
-
- ⚠ **IMPORTANT:**
The rack conversion kit is leveraged from ML350 Gen10 server, so the actual server might differ from the graphical representation.
-

Prerequisites

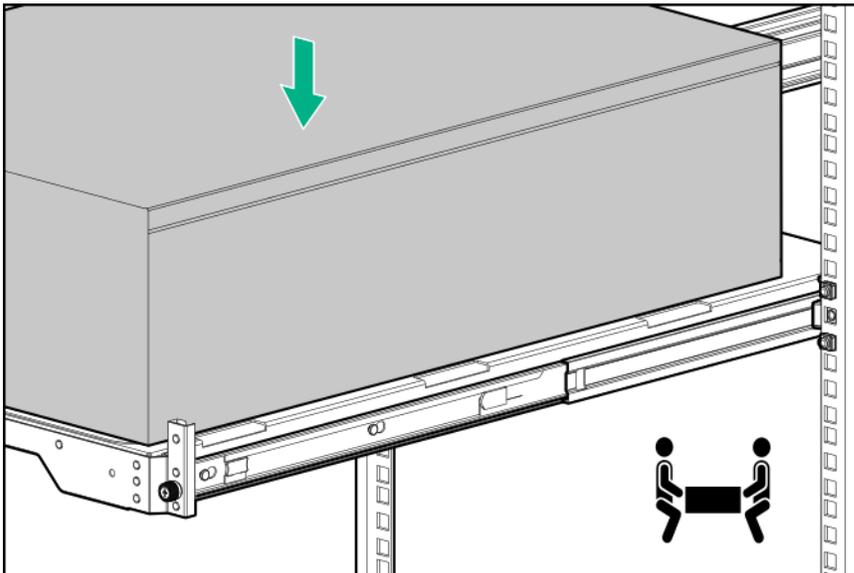
Before you perform this procedure, make sure that you have T-15 Torx screwdriver available.

Procedure

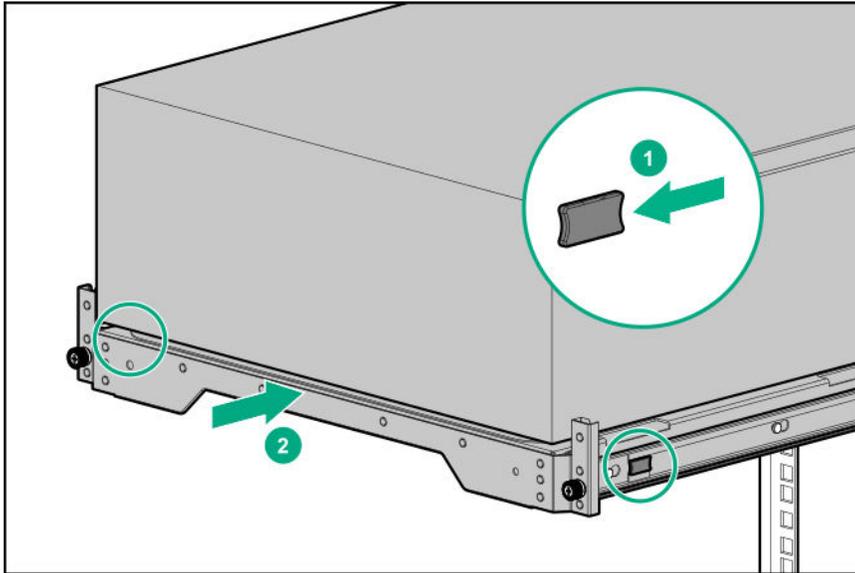
1. Grasp the tray notch and extend the server tray out of the rack.



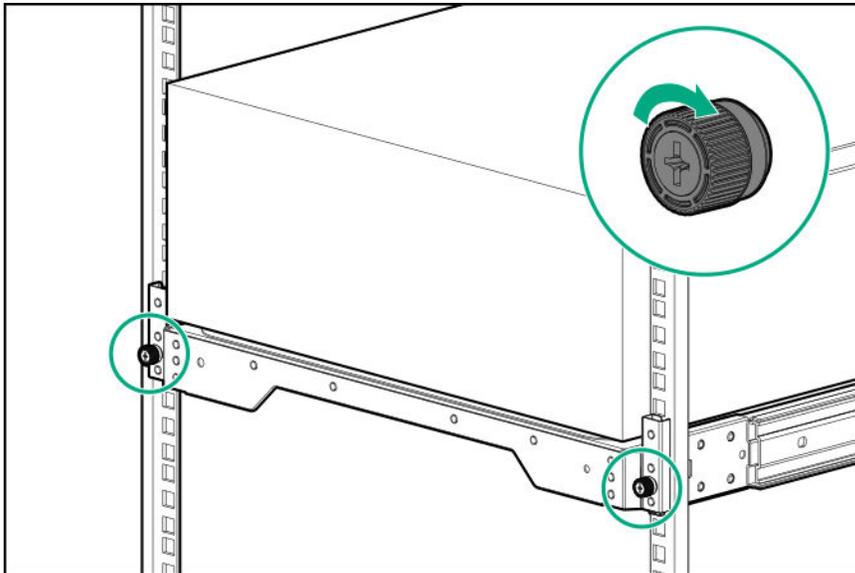
2. Place the server at the center of the server tray.
Align the front panel of the server with the edge of the tray.



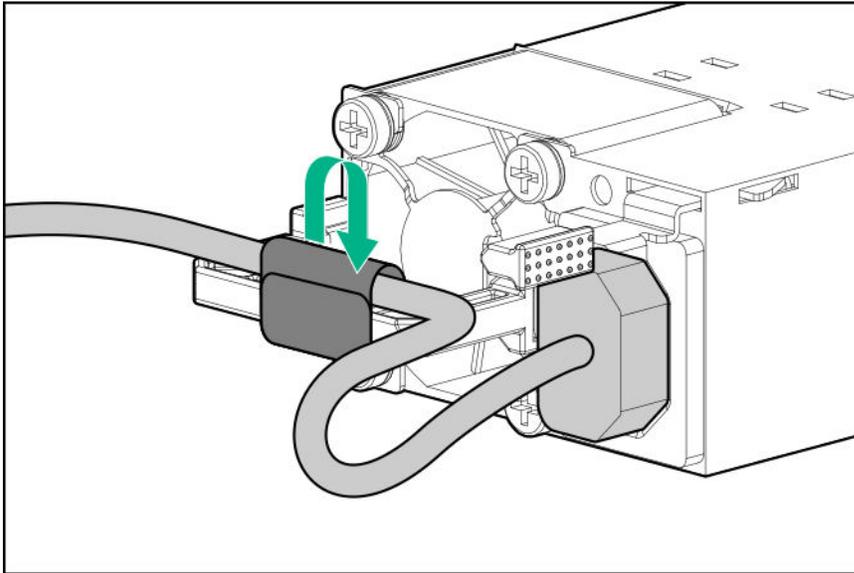
3. Press and hold the blue rail-release tabs, and then slide the server tray back into the rack.



4. Tighten the server tray thumbscrews.



5. Connect all peripheral cables and power cords to the rear panel.
6. Secure the power cord with the strain relief strap. Roll the extra length of the strap around the power input module handle.



7. Connect each power cord to the power source.

8. **Power up the server.**

The installation is complete.

Drive options

Drive installation guidelines

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

Observe the following general guidelines:

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

For drive numbering, see **Drive Numbering** on page 17.

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

Drive support information

Depending on the drive cage installed the server supports the following drives.

- Non-hot-plug LFF drives
- Hot-plug LFF drives
- Hot-plug SFF drives

The server supports up to 16 drives in SFF configuration and 8 drives in LFF configuration.

The embedded storage controller supports SATA drive installation. For SAS drive installation, install a Host Bus Adapter or a Smart Array Controller board option.

Redundant fan is required when installing SAS SSD or 15K/rpm SAS HDD in second cage.

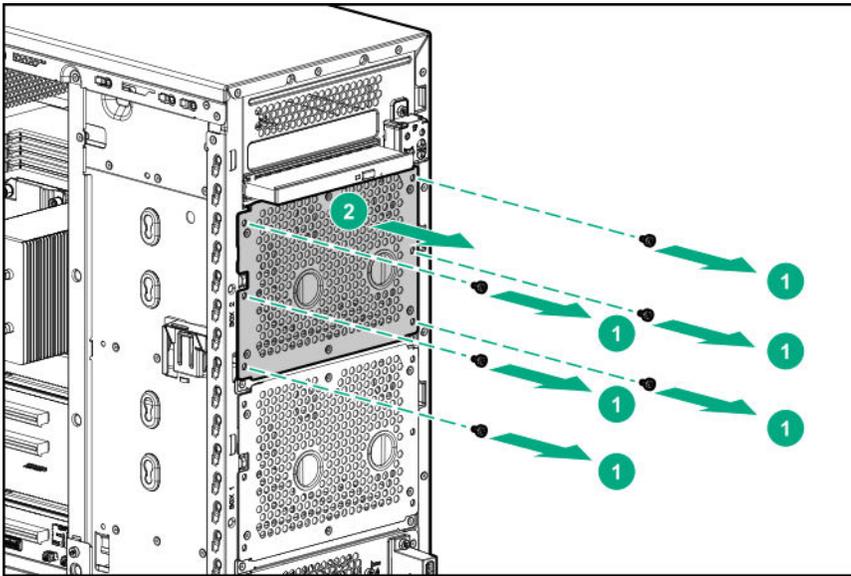
Installing the non-hot-plug drive

Prerequisites

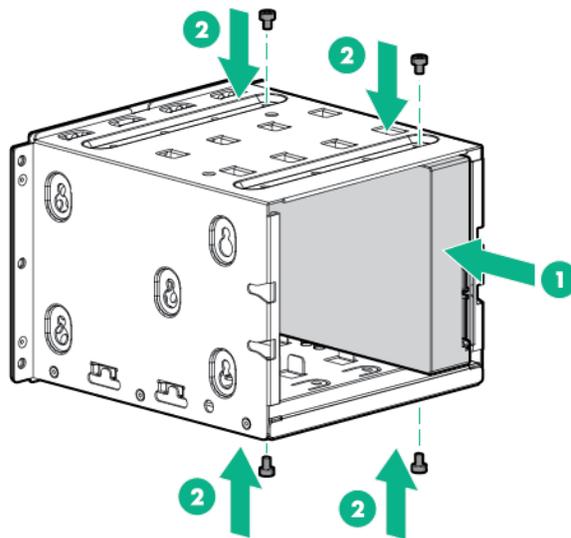
Before you perform this procedure, make sure that you have T-15 Torx screwdriver available.

Procedure

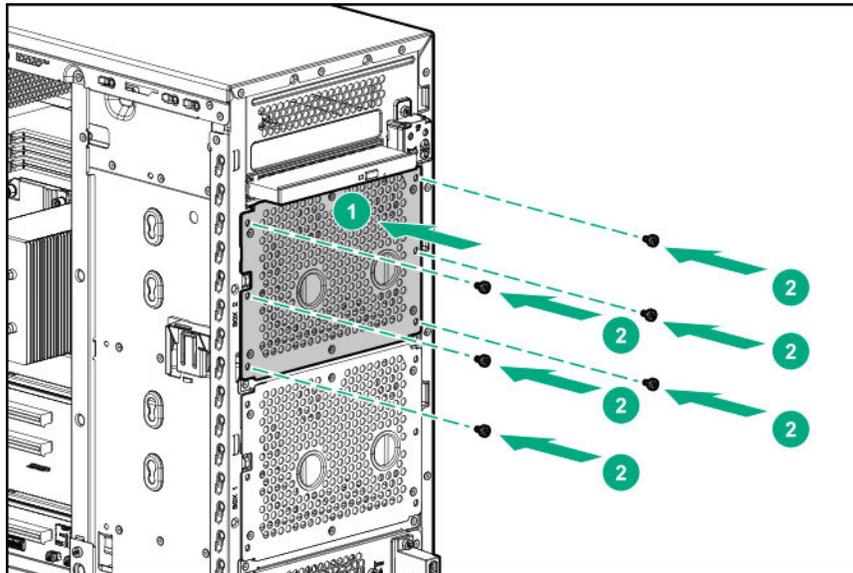
1. **Power down the server** on page 20.
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Do one of the following:
 - Server in rack mode: **Remove the server from the rack** on page 20.
 - Server in tower mode: Place the server on its side and access panel facing up.
4. **Remove the access panel** on page 21.
5. **Remove the front bezel** on page 23.
6. **Remove the PCIe air baffle** on page 25.
7. **Remove the system air baffle** on page 26.
8. Disconnect all existing drive cage cables.
9. Remove the installed drive cage.



10. Use the screws on the non-hot-plug drive cage to install the drives.



11. Install the 4 LFF non-hot-plug drive cage assembly.



12. **Connect the drive cage cables.**
13. **Install the system air baffle** on page 27.
14. **Install the PCIe air baffle** on page 25.
15. **Install the front bezel** on page 24.
16. **Install the access panel** on page 22.
17. Do one of the following:
 - Server in rack mode: **Install the server on the rack** on page 39.
 - Server in tower mode: Return the server to an upright position.
18. Connect each power cord to the server.
19. Connect each power cord to the power source.
20. **Power up the server** on page 20.

The installation is complete.

Installing an LFF hot-plug drive

△ CAUTION:

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

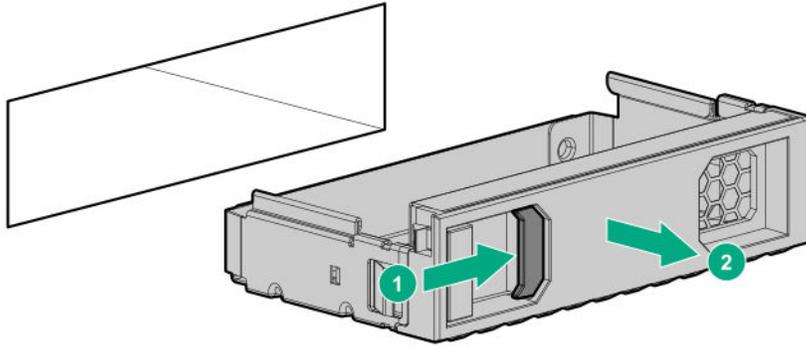
Prerequisites

Before you perform this procedure:

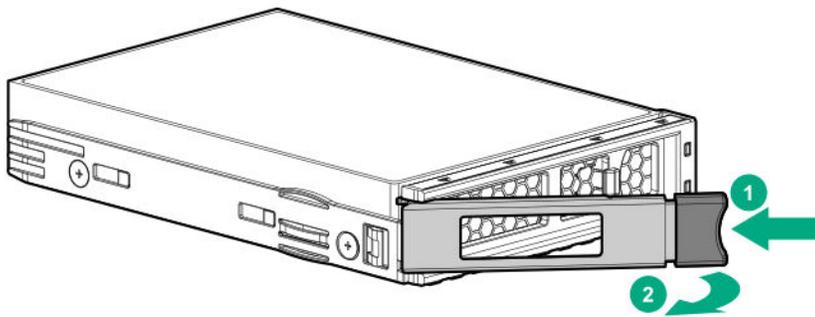
- **Verify that the LFF hot-plug drive cage is installed.**
- Make sure that you have the LFF hot-plug drive option is available.

Procedure

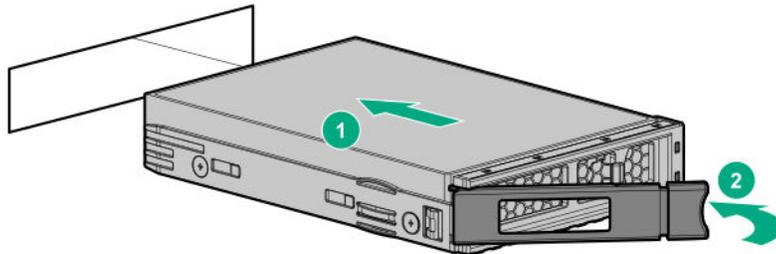
1. Open the front bezel.
2. Remove the drive blank.



3. Prepare the drive.



4. Install the drive.



5. If a hot-plug drive is installed into an empty backplane after the initial boot, reboot the system to get optimal ventilation.

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

7. Close the front bezel.

The installation is complete.

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

Installing an SFF hot-plug drive

⚠ CAUTION:

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

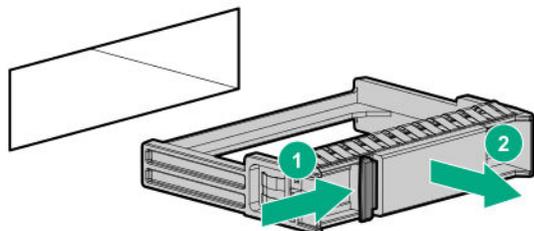
Prerequisites

Before you perform this procedure:

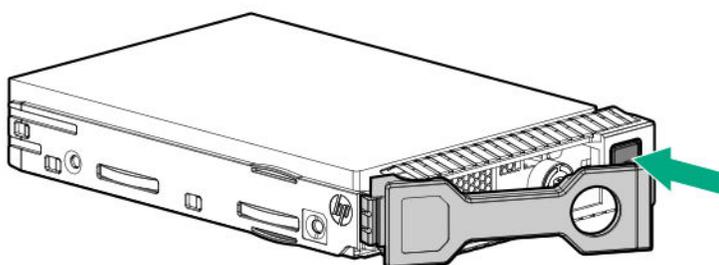
- **Verify that the SFF hot-plug drive cage is installed.**
- Make sure that you have the SFF hot-plug drive option is available.

Procedure

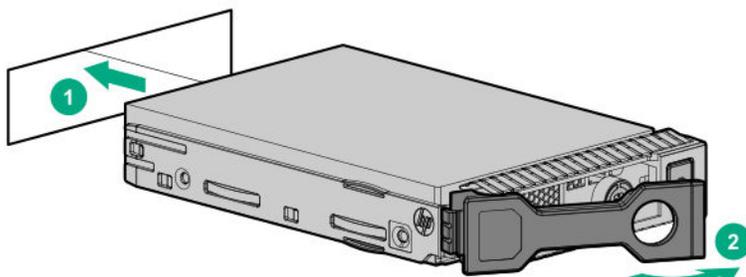
1. Open the front bezel.
2. Remove the drive blank.



3. Prepare the drive.



4. Install the SFF drive.



5. If a hot-plug drive is installed into an empty backplane after the initial boot, reboot the system to get optimal ventilation.
6. **Observe the LED status of the drive.**
7. Close the front bezel.

The installation is complete.

To configure arrays, see the *HPE Smart Array SR Gen10 Configuration Guide* at the [Hewlett Packard Enterprise website](https://www.hpe.com/enterprise).

Drive cage options

4 LFF non-hot-plug drive cage option

The server supports 4 LFF non-hot-plug drive cage option. This option cannot be installed together with 4 LFF and 8 SFF hot-plug drive cage option.

Installing the 4 LFF non-hot-plug drive cage

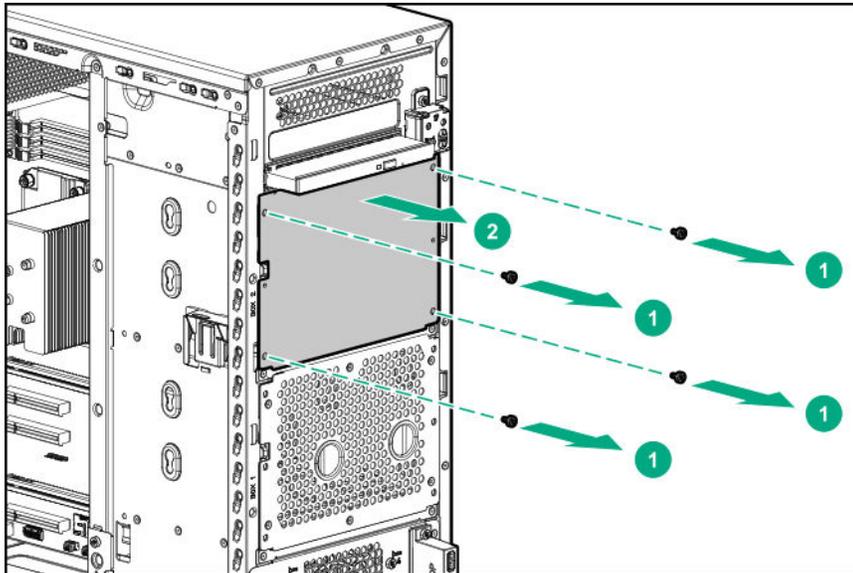
Prerequisites

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

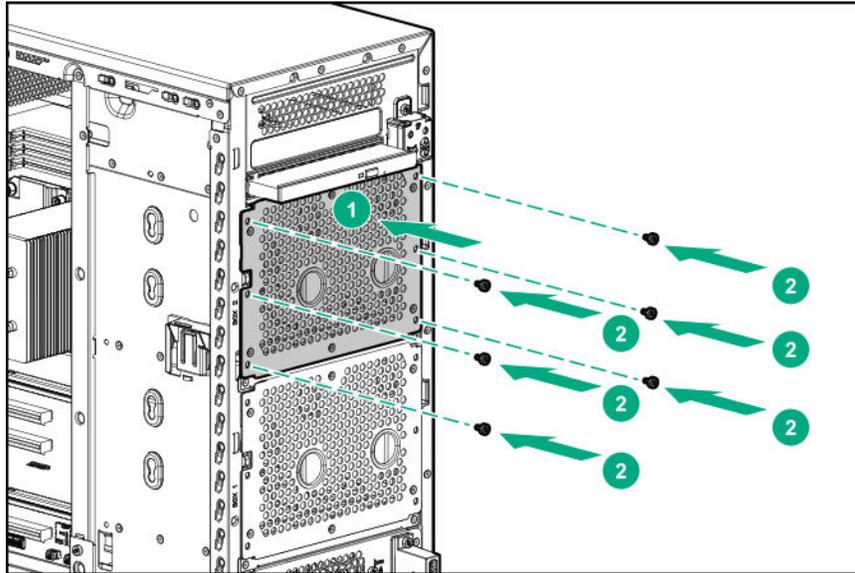
- Drive cage option kit
- Non-hot-plug drive option
- T-15 Torx Screwdriver

Procedure

1. **Power down the server** on page 20.
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Do one of the following:
 - Server in rack mode: **Remove the server from the rack** on page 20.
 - Server in tower mode: Place the server on its side and access panel facing up.
4. **Remove the access panel** on page 21.
5. **Remove the front bezel** on page 23.
6. **Remove the PCIe air baffle** on page 25.
7. **Remove the system air baffle** on page 26.
8. Remove the drive bay cover from box 2.



9. **Install non-hot-plug drives in the drive cage.**
10. Install the drive cage in box 2.



11. **Connect the drive cage cables.**
12. **Install the system air baffle** on page 27.
13. **Install the PCIe air baffle** on page 25.
14. **Install the front bezel** on page 24.
15. **Install the access panel** on page 22.
16. Do one of the following:
 - Server in rack mode: **Install the server on the rack** on page 39.
 - Server in tower mode: Return the server to an upright position.
17. Connect each power cord to the server.
18. Connect each power cord to the power source.
19. **Power up the server** on page 20.

The installation is complete.

4 LFF hot-plug drive cage option

The server supports 4 LFF hot-plug drive cage option. This option cannot be installed together with the 4 LFF non-hot-plug and 8 SFF hot-plug drive cage option.

Installing the 4 LFF hot-plug drive cage

The 4 LFF hot-plug drive cage can be installed in both box 1 and box 2. Follow the same installation procedure.

Prerequisites

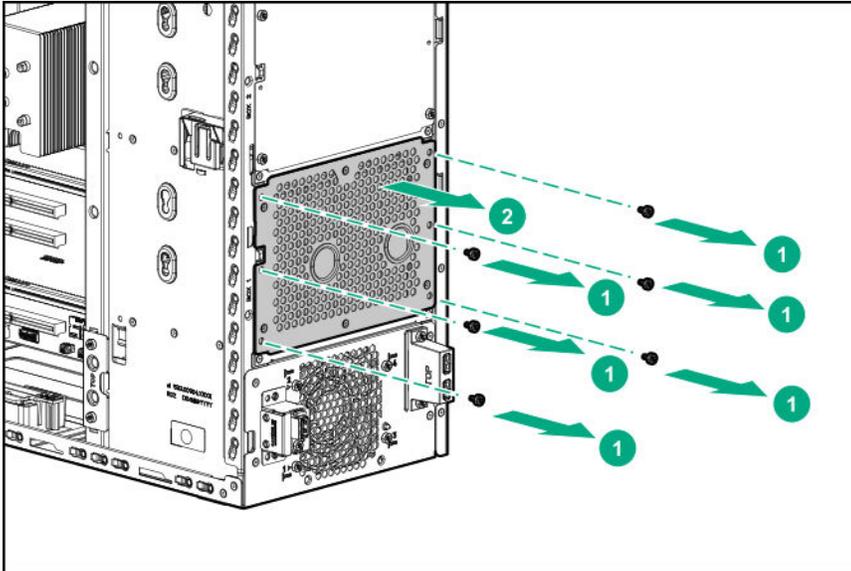
Before you perform this procedure, make sure that you have the following items available:

- LFF drive cage option
- LFF drive option
- T-15 Torx Screwdriver

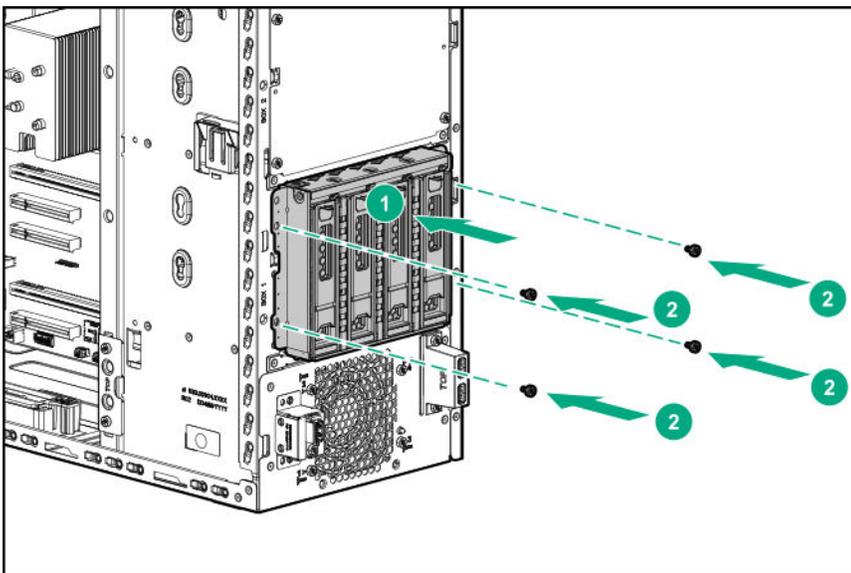
Procedure

1. **Power down the server** on page 20.
2. Remove all power:

- a. Disconnect each power cord from the power source.
- b. Disconnect each power cord from the server.
3. Do one of the following:
 - Server in rack mode: **Remove the server from the rack** on page 20.
 - Server in tower mode: Place the server on its side and access panel facing up.
4. **Remove the access panel** on page 21.
5. **Remove the front bezel** on page 23.
6. **Remove the PCIe air baffle** on page 25.
7. **Remove the system air baffle** on page 26.
8. Disconnect all existing drive cage cables.
9. Remove the installed drive cage assembly.



10. Install the drive cage in box 1.



11. **Connect the drive cage cables.**
12. **Install LFF hot-plug drives in the drive cage.**

When installing drives start from the lowest drive number, see **Drive Numbering** on page 17.

13. **Install the system air baffle** on page 27.
14. **Install the PCIe air baffle** on page 25.
15. **Install the front bezel** on page 24.
16. **Install the access panel** on page 22.
17. Do one of the following:
 - Server in rack mode: **Install the server on the rack** on page 39.
 - Server in tower mode: Return the server to an upright position.
18. Connect each power cord to the server.
19. Connect each power cord to the power source.
20. **Power up the server** on page 20.

The installation is complete.

8 SFF hot-plug drive cage option

The server supports the 8 SFF hot-plug drive cage option. This option cannot be installed together with the 4 LFF non-hot-plug or 4 LFF hot-plug drive cage option.

Installing the 8 SFF hot-plug drive cage

The 8 SFF hot-plug drive cage can be installed in both box 1 and box 2. Follow the same installation procedure.

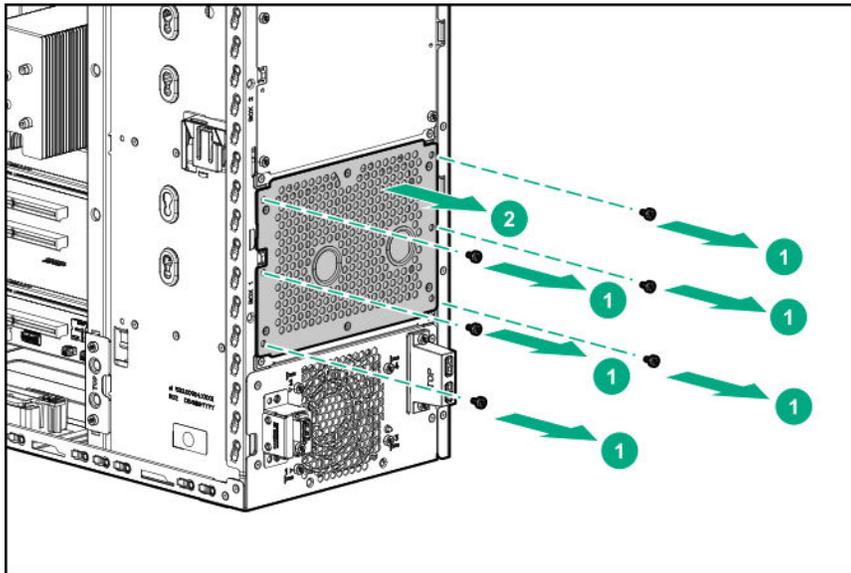
Prerequisites

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

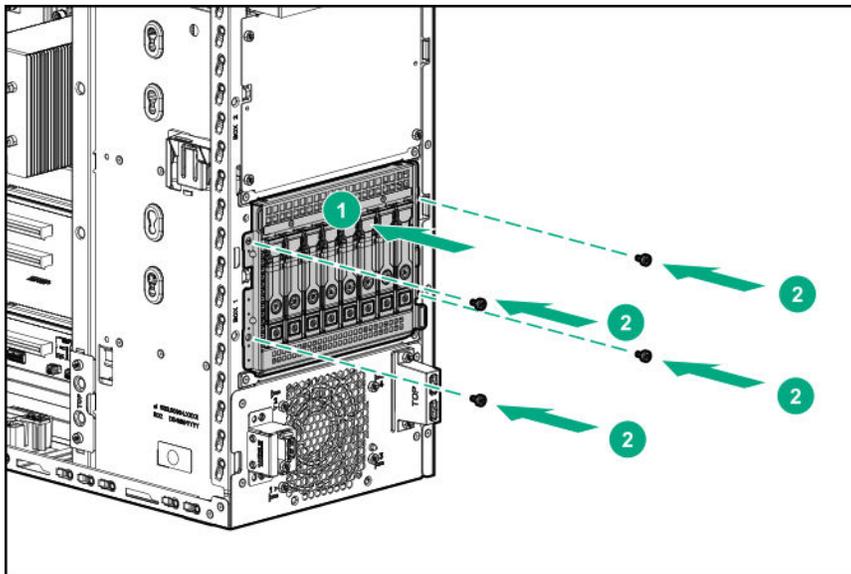
- 8 SFF drive cage option
- SFF drive option
- T-15 Torx Screwdriver

Procedure

1. **Power down the server** on page 20.
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Do one of the following:
 - Server in rack mode: **Remove the server from the rack** on page 20.
 - Server in tower mode: Place the server on its side and access panel facing up.
4. **Remove the access panel** on page 21.
5. **Remove the front bezel** on page 23.
6. **Remove the PCIe air baffle** on page 25.
7. **Remove the system air baffle** on page 26.
8. Disconnect all existing drive cage cables.
9. Remove the installed drive cage assembly.



10. Install the drive cage in box 1.



11. **Connect the drive cage cables.**
12. **Install SFF drives in the drive cage.**

When installing drives start from the lowest drive number, see **Drive Numbering** on page 17.

13. **Install the system air baffle** on page 27.
14. **Install the PCIe air baffle** on page 25.
15. **Install the front bezel** on page 24.
16. **Install the access panel** on page 22.
17. Do one of the following:
 - Server in rack mode: **Install the server on the rack** on page 39.
 - Server in tower mode: Return the server to an upright position.
18. Connect each power cord to the server.
19. Connect each power cord to the power source.
20. **Power up the server** on page 20.

The installation is complete.

Storage controller options

The server supports the following storage controllers:

- Embedded storage controllers
- Host Bus Adapters
- Smart Array storage controllers

The Smart Array storage controller and HBA can be installed in all PCIe slots.

For slot 5, the speed of slot is designed for 32Gb/s, the actual running speed will be lower than it was designed. Hence slot 5 is the least recommended for usage.

Storage controller installation guidelines

To maintain optimal thermal conditions when installing an HPE P-series Smart Array Controller or an HBA option, Hewlett Packard Enterprise recommends the following guidelines.

Install this storage controller/HBA option	In slot	Using this cable option
E208i-p E208e-p	Slot 1, 3 or 4 is recommended.	Mini-SAS cable option
P408i-p P408e-p	Slot 1, 3 or 4 is recommended.	Mini-SAS cable option

Installing the Smart Array storage controller

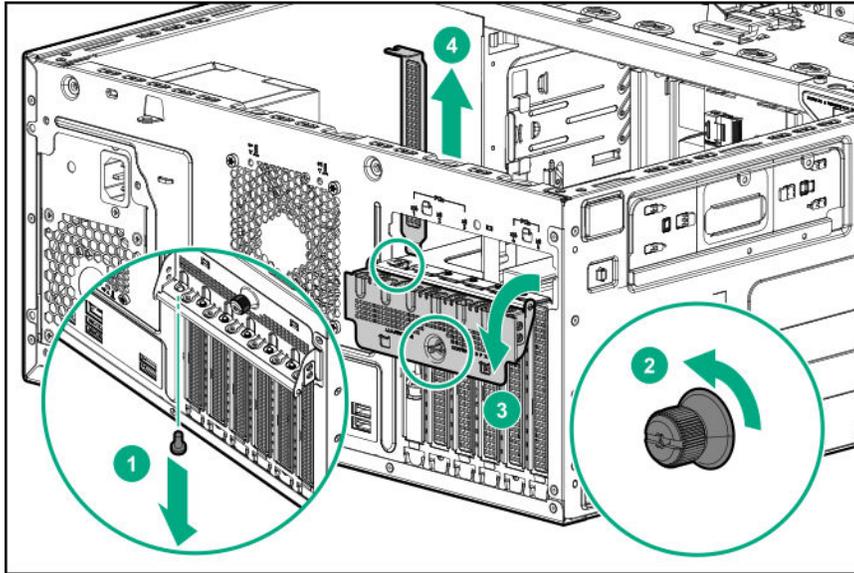
Prerequisites

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

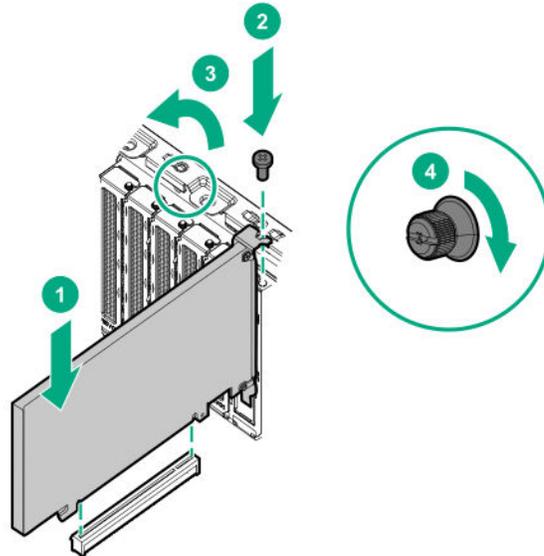
- Controller option
- T-15 Torx screwdriver

Procedure

1. Back up all server data.
2. **Power down the server** on page 20.
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Do one of the following:
 - Server in rack mode: **Remove the server from the rack** on page 20.
 - Server in tower mode: Place the server on its side and access panel facing up.
5. **Remove the access panel** on page 21.
6. **Remove the PCIe air baffle** on page 25.
7. **Remove the system air baffle** on page 26.
8. Remove the PCIe slot cover retainer and slot blank.



9. Install the Smart Storage controller.



10. Make sure that the controller board is firmly seated in the slot.
11. **Connect the cables.**
12. **Install the system air baffle** on page 27.
13. **Install the PCIe air baffle** on page 25.
14. **Install the access panel** on page 22.
15. Do one of the following:
 - Server in rack mode: **Install the server on the rack** on page 39.
 - Server in tower mode: Return the server to an upright position.
16. Connect each power cord to the server.
17. Connect each power cord to the power source.
18. **Power up the server** on page 20.

The installation is complete.

Smart Storage Battery option

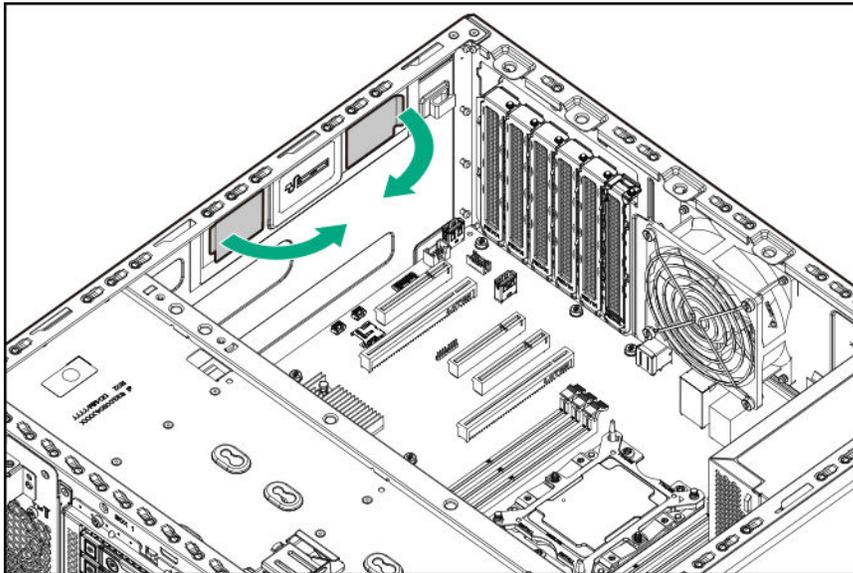
The Smart Storage Battery is a centralized backup source and is required to back up the write cache content onto flash memory on the Smart Array P-class Gen10 controllers if there was an unplanned server power loss. In this server, the 96 W, 260 mm battery supports up to 24 devices.

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

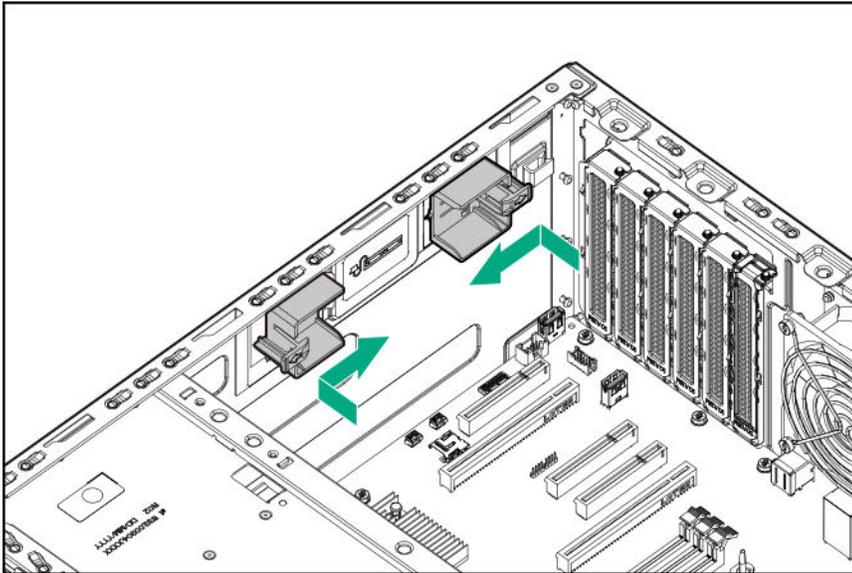
Installing a Smart Storage Battery

Procedure

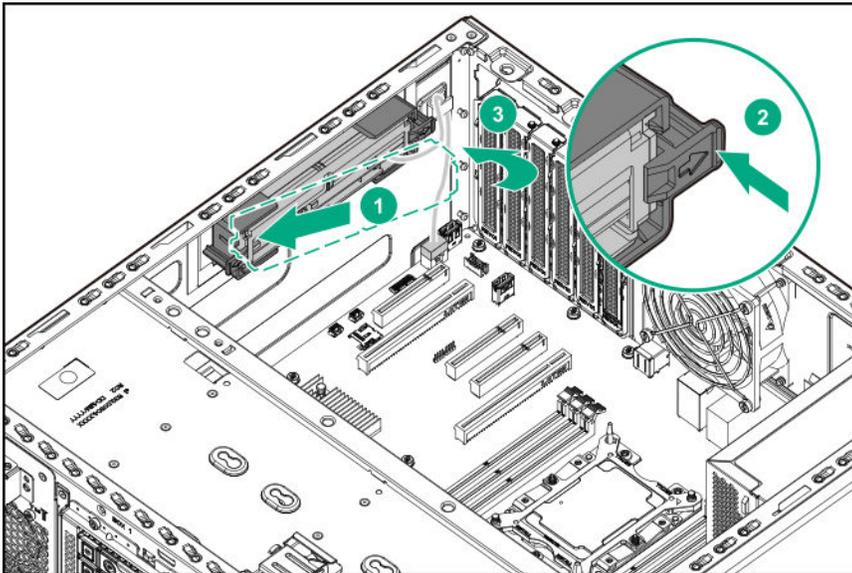
1. Back up all server data.
2. **Power down the server** on page 20.
3. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
4. Do one of the following:
 - Server in rack mode: **Remove the server from the rack** on page 20.
 - Server in tower mode: Place the server on its side and access panel facing up.
5. **Remove the access panel** on page 21.
6. **Remove the PCIe air baffle** on page 25.
7. **Remove the system air baffle** on page 26.
8. Remove the slot covers.



9. Install the Smart Storage Battery holder.



10. Install the Smart Storage Battery:
 - a. Install the Smart Storage Battery into the holder.
 - b. Route the battery cable through the cable clip and connect to the system board connector.



11. **Connect the Smart Array cache backup power cable.**
12. **Install the system air baffle** on page 27.
13. **Install the PCIe air baffle** on page 25.
14. **Install the access panel** on page 22.
15. Do one of the following:
 - Server in rack mode: **Install the server on the rack** on page 39.
 - Server in tower mode: Return the server to an upright position.
16. Connect each power cord to the server.
17. Connect each power cord to the power source.
18. **Power up the server** on page 20.

The installation is complete.

M.2 SSD Enablement option

The server supports M.2 SSD Enablement option.

The M.2 SSD enablement board can be installed in all slots. However slots 1, 3, and 4 are most recommended.

Installing an M.2 SATA SSD

❗ **IMPORTANT:**
The speed of slot 5 is designed for 32Gb/s, but the actual running speed will be lower than it was designed. Hence slot 5 is least recommended for usage.

❗ **IMPORTANT:**
The M.2 SATA SSD enablement will not be shown in the RBSU PCIe device.

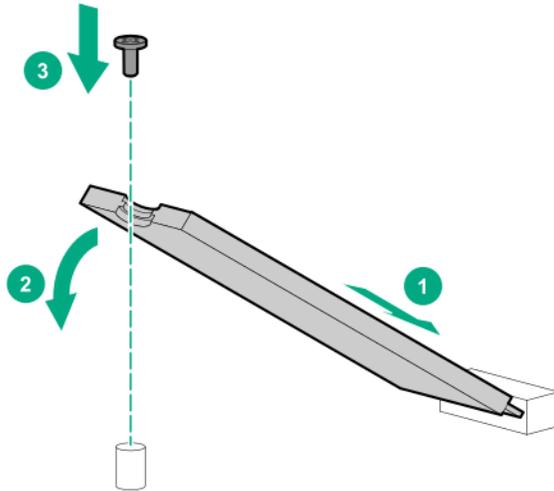
Prerequisites

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

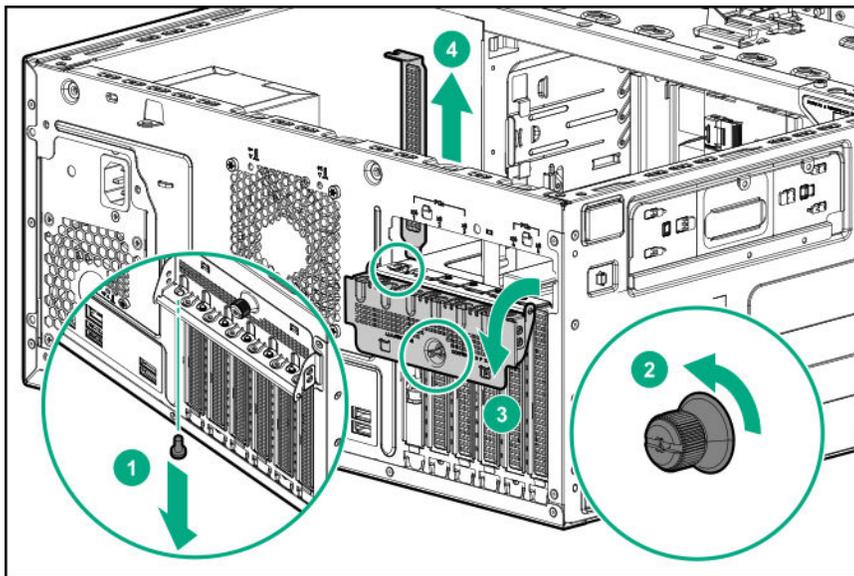
- M.2 SSD option
- T-15 Torx screwdriver
- Phillip No.1 head screwdriver

Procedure

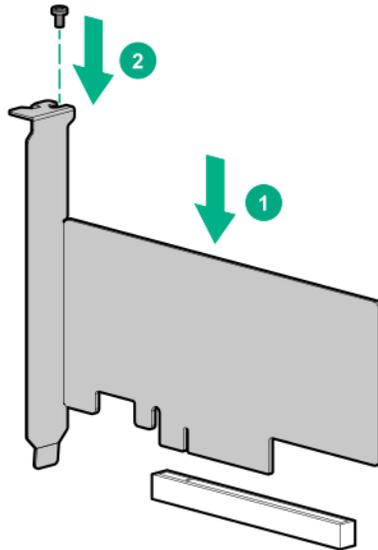
1. **Power down the server** on page 20.
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Do one of the following:
 - Server in rack mode: **Remove the server from the rack** on page 20.
 - Server in tower mode: Place the server on its side and access panel facing up.
4. **Remove the access panel** on page 21.
5. **Remove the PCIe air baffle** on page 25.
6. **Remove the system air baffle** on page 26.
7. Install the SSD module on the M.2 SSD enablement board:
 - a. Insert the SSD module into the SSD slot at a 45 degree angle, and then gently press it down against the M.2 SSD Enablement board.
 - b. Secure the SSD module to the M.2 SSD enablement board with a screw.
 - c. Repeat the process if you are installing a second SSD module.



8. Locate the appropriate PCIe slot to install the M.2 SSD enablement board. The recommended slots are 1, 3, and 4.
9. Open the PCIe slot cover retainer and remove the slot blank.



10. Install the M.2 SSD enablement board with SSD modules installed and close the PCIe slot cover retainer.



11. Make sure that the board is firmly seated on the slot.
12. Install the PCIe retainer cover.
13. **Connect the cables.**
14. **Install the system air baffle** on page 27.
15. **Install the PCIe air baffle** on page 25.
16. **Install the access panel** on page 22.
17. Do one of the following:
 - Server in rack mode: **Install the server on the rack** on page 39.
 - Server in tower mode: Return the server to an upright position.
18. Connect each power cord to the server.
19. Connect each power cord to the power source.
20. **Power up the server** on page 20.

The installation is complete.

Redundant fan option

When one of the following scenarios occurs, the server requires a redundant fan with a 800W redundant power supply to be installed:

- When a second SAS HDD cage is installed and the HDDs are running at 15K.
- When a SAS SSD is installed.
- If one fan fails, the system will be required to continue operating with a Redundant Fan. This condition is indicated by a flashing amber Health LED.
- When the system requirements are to meet the ASHRAE A3 extended operating environment.

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

! **IMPORTANT:**
The redundant fan option is not supported when ATX power supply is installed in the server.

Installing the redundant PCIe fan

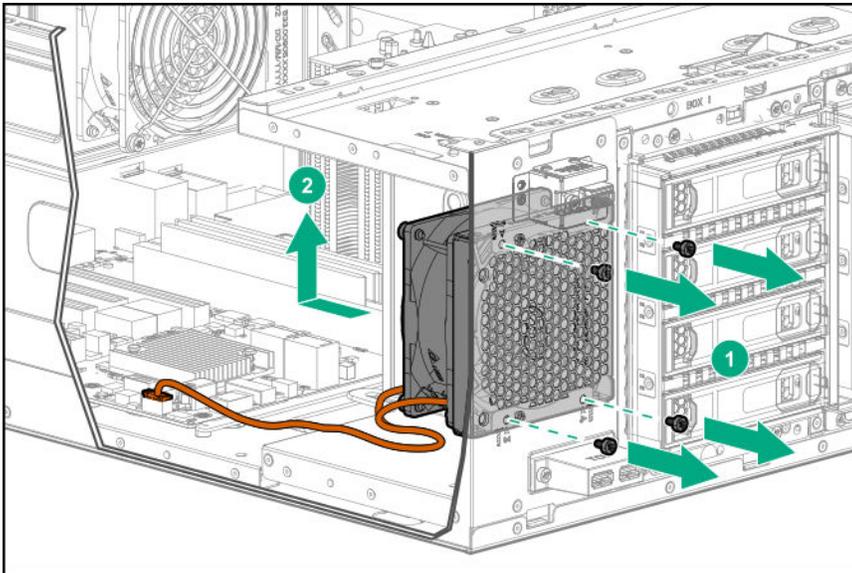
Prerequisites

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

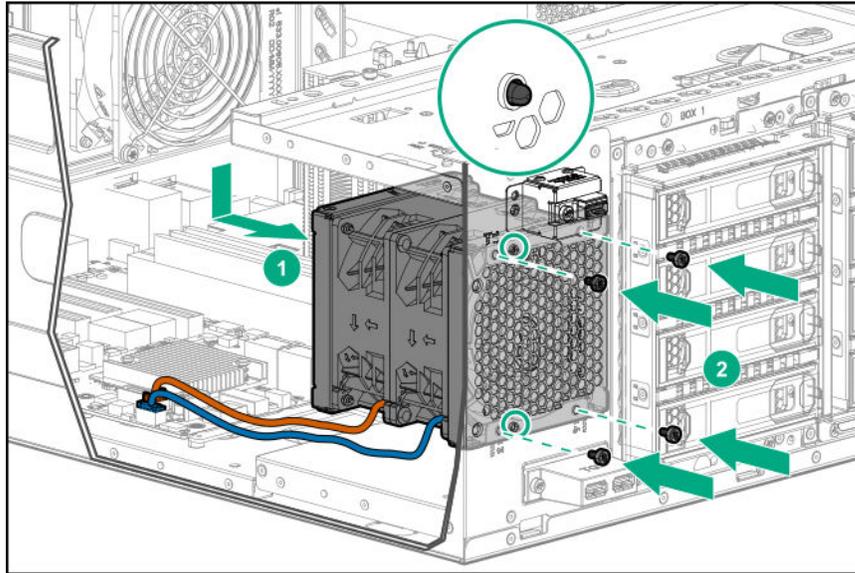
- Components from the hardware option kit
- T-15 Screwdriver

Procedure

1. **Power down the server** on page 20.
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Do one of the following:
 - Server in rack mode: **Remove the server from the rack** on page 20.
 - Server in tower mode: Place the server on its side and access panel facing up.
4. **Remove the access panel** on page 21.
5. **Remove the front bezel** on page 23.
6. **Remove the PCIe air baffle** on page 25.
7. **Remove the system air baffle** on page 26.
8. Remove the default PCIe fan.



9. Install the redundant PCIe fan module in the front panel.
 - a. Mount the fan module on the front panel; ensuring that both guiding pins on the fan guard are inserted into the chassis opening.
 - b. Tighten the four T-15 screws.
 - c. Connect the fan cable and secure the fan cable in the cable clip.



10. **Connect the fan cable to the system board.**
11. **Install the system air baffle** on page 27.
12. **Install the PCIe air baffle** on page 25.
13. **Install the front bezel** on page 24.
14. **Install the access panel** on page 22.
15. Do one of the following:
 - Server in rack mode: **Install the server on the rack** on page 39.
 - Server in tower mode: Return the server to an upright position.
16. Connect each power cord to the server.
17. Connect each power cord to the power source.
18. **Power up the server** on page 20.

The installation is complete.

Installing the redundant system fan

Prerequisites

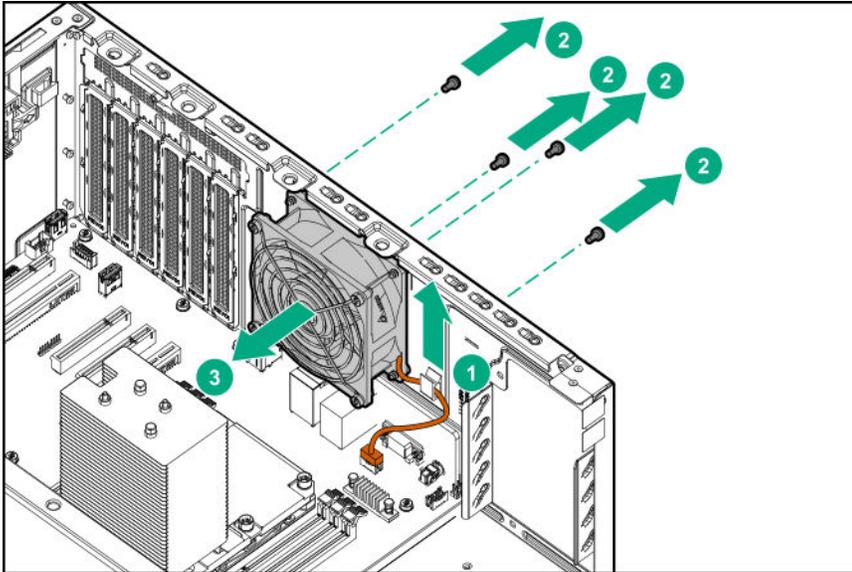
Before you perform this procedure, make sure that you have the following items available:

- Redundant system fan module
- T-15 Torx screwdriver

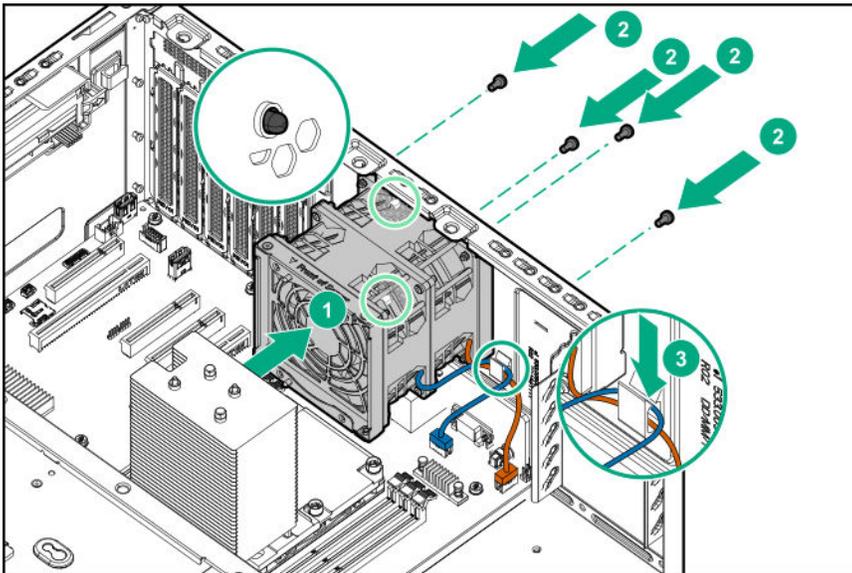
Procedure

1. **Power down the server** on page 20.
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Do one of the following:
 - Server in rack mode: **Remove the server from the rack** on page 20.
 - Server in tower mode: Place the server on its side and access panel facing up.
4. **Remove the access panel** on page 21.
5. **Remove the PCIe air baffle** on page 25.

6. **Remove the system air baffle** on page 26.
7. Remove the rear system fan.



8. Install the redundant system fan module in the rear panel.
 - a. Mount the fan module on the rear panel, and then ensure that both guiding pins on fan guard are inserted into the opening chassis.
 - b. Tighten the four T-15 screws.
 - c. Connect the fan cable and secure the fan cable in the cable clip.



9. **Connect the fan cable to the system board connectors.**
10. **Install the system air baffle** on page 27.
11. **Install the PCIe air baffle** on page 25.
12. **Install the access panel** on page 22.
13. Do one of the following:
 - Server in rack mode: **Install the server on the rack** on page 39.
 - Server in tower mode: Return the server to an upright position.
14. Connect each power cord to the server.

15. Connect each power cord to the power source.

16. **Power up the server** on page 20.

The installation is complete.

Internal USB device option

The server has one internal USB 2.0 port and one USB 3.0 port. You can use these two ports to install internal USB devices, that are intended to be rarely removed, such as a USB dongle for Bluetooth or Wi-Fi support.

This server also supports the installation of the Dual 8Gb microSD Enterprise Midline USB device on the server internal USB connector.

This USB storage device contains a dual-SD card module that supports up to two SD, SDHC, or SDXC storage cards providing data redundancy through a mirrored RAID-1 configuration. This USB storage device connects to an internal USB connector and is configured upon boot.

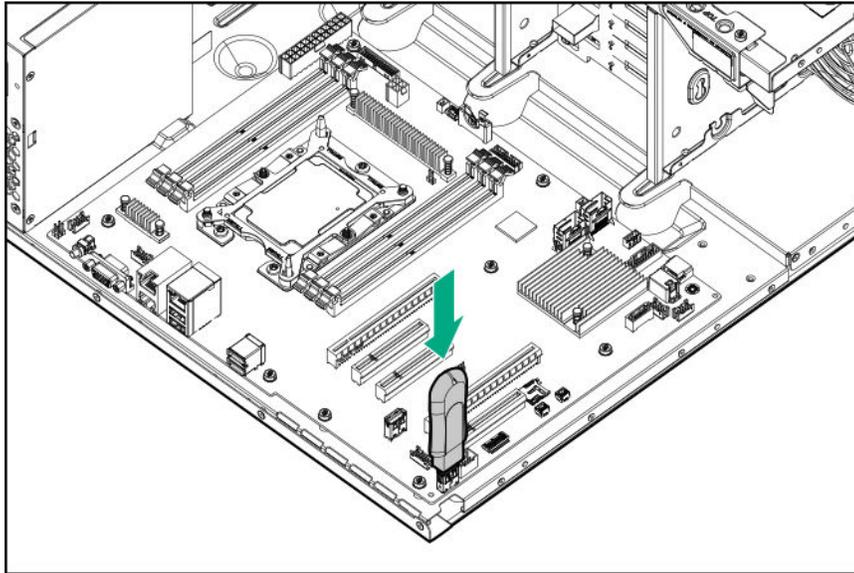
If the microSD SD card does not show in the Device Manager under the Windows (O.S.). Select the **Show hidden devices** in the **View** drop-down menu of the Device manager, the microSD card appears in the device list.

To locate the internal USB connector, see **System board components** on page 12.

Installing an internal USB device

Procedure

1. **Power down the server** on page 20.
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Do one of the following:
 - Server in rack mode: **Remove the server from the rack** on page 20.
 - Server in tower mode: Place the server on its side and access panel facing up.
4. **Remove the access panel** on page 21.
5. **Remove the PCIe air baffle** on page 25.
6. **Remove the system air baffle** on page 26.
7. **Locate the internal USB connector**.
8. Plug in the USB device into the internal USB port.



9. **Install the system air baffle** on page 27.
10. **Install the PCIe air baffle** on page 25.
11. **Install the access panel** on page 22.
12. Do one of the following:
 - Server in rack mode: **Install the server on the rack** on page 39.
 - Server in tower mode: Return the server to an upright position.
13. Connect each power cord to the server.
14. Connect each power cord to the power source.
15. **Power up the server** on page 20.

The installation is complete.

Serial port option

The server supports Serial port option.

Installing the serial port

Prerequisites

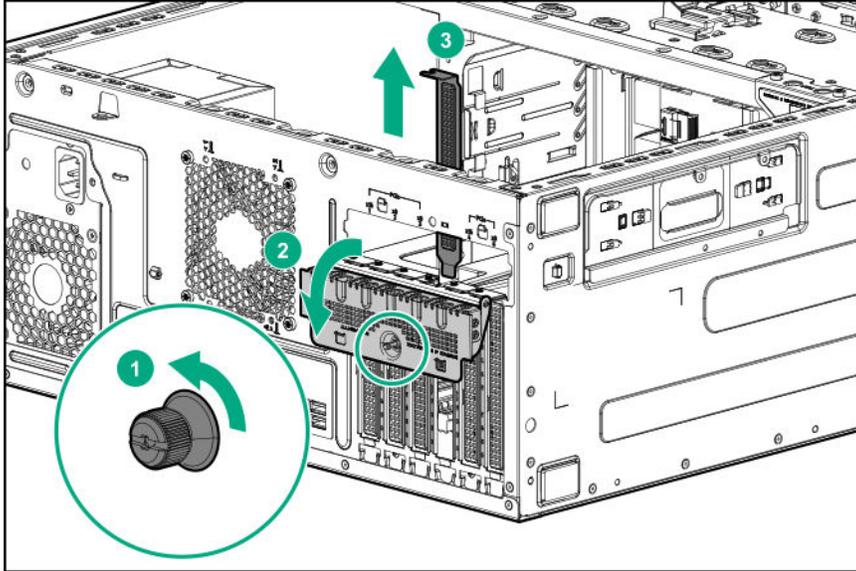
Before you perform this procedure, make sure that you have the following items available:

- Serial port option
- T-15 Screwdriver

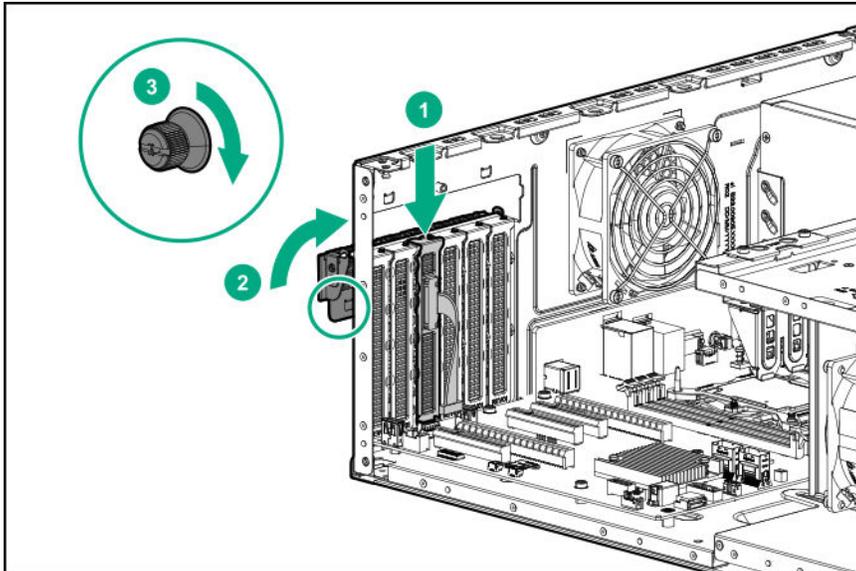
Procedure

1. **Power down the server** on page 20.
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Do one of the following:

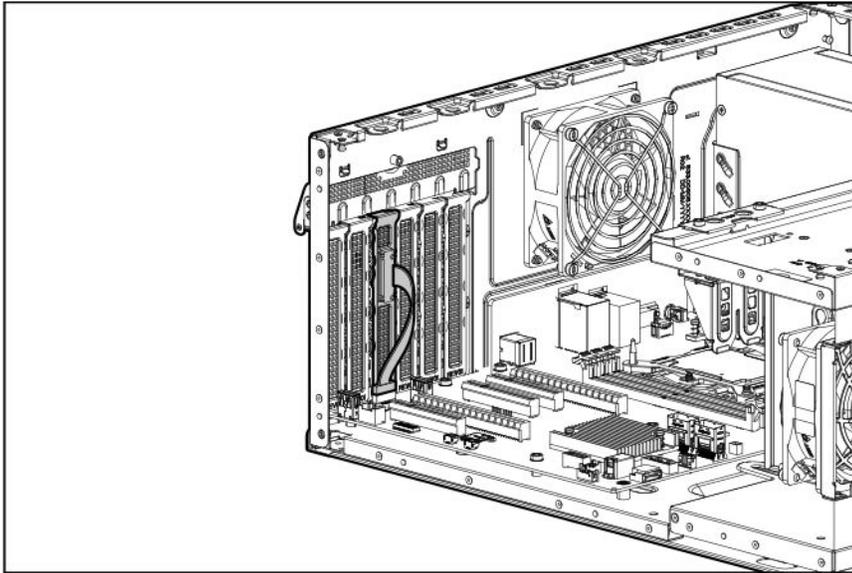
- Server in rack mode: **Remove the server from the rack** on page 20.
 - Server in tower mode: Place the server on its side and access panel facing up.
4. **Remove the access panel** on page 21.
 5. **Remove the PCIe air baffle** on page 25.
 6. **Remove the system air baffle** on page 26.
 7. Remove the PCIe slot cover:
 - a. Loosen the thumbscrew on the slot cover retainer.
 - b. Open the slot cover retainer.
 - c. Remove the slot cover.



8. Install the serial port:
 - a. Slide serial port assembly into the removed slot cover.
 - b. Secure the serial port assembly with the T-15 screw on chassis.
 - c. Close the retainer cover.
 - d. Tighten the thumbscrew.



9. Connect the serial port cable.



10. **Install the system air baffle** on page 27.
11. **Install the PCIe air baffle** on page 25.
12. **Install the access panel** on page 22.
13. Do one of the following:
 - Server in rack mode: **Install the server on the rack** on page 39.
 - Server in tower mode: Return the server to an upright position.
14. Connect each power cord to the server.
15. Connect each power cord to the power source.
16. **Power up the server** on page 20.

The installation is complete.

Memory options

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

DIMM population information

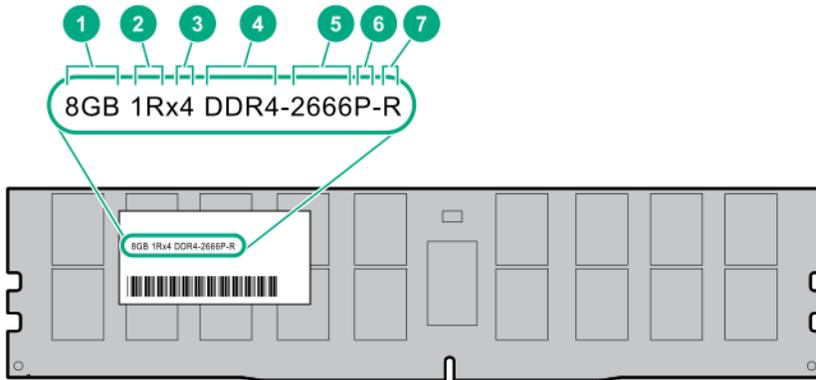
For specific DIMM population information, see the DIMM population guidelines on the Hewlett Packard Enterprise website (<http://www.hpe.com/docs/memory-population-rules>).

HPE Smart Memory 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.



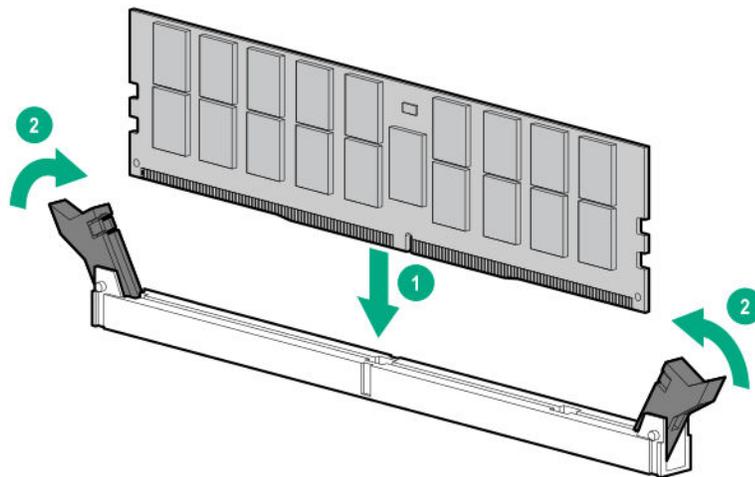
Item	Description	Definition
1	Capacity	8 GB 16 GB 32 GB 64 GB 128 GB
2	Rank	1R = Single rank 2R = Dual rank 4R = Quad rank 8R = Octal rank
3	Data width on DRAM	x4 = 4-bit x8 = 8-bit x16 = 16-bit
4	Memory generation	PC4 = DDR4
5	Maximum memory speed	2133 MT/s 2400 MT/s 2666 MT/s
6	CAS latency	P = CAS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

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

Installing a DIMM

Procedure

1. **Power down the server** on page 20.
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Do one of the following:
 - Server in rack mode: **Remove the server from the rack** on page 20.
 - Server in tower mode: Place the server on its side and access panel facing up.
4. **Remove the access panel** on page 21.
5. **Remove the PCIe air baffle** on page 25.
6. **Remove the system air baffle** on page 26.
7. Install the DIMM.
 - a. Open the DIMM slot latches.
 - b. Align the notch on the bottom edge of the DIMM with the keyed surface of the DIMM slot, and then install the DIMM into the slot.



8. **Install the system air baffle** on page 27.
9. **Install the PCIe air baffle** on page 25.
10. **Install the access panel** on page 22.
11. Do one of the following:
 - Server in rack mode: **Install the server on the rack** on page 39.
 - Server in tower mode: Return the server to an upright position.
12. Connect each power cord to the server.
13. Connect each power cord to the power source.
14. **Power up the server** on page 20.

The installation is complete.

550W ATX Power Supply option

Installing the 550W ATX power supply option

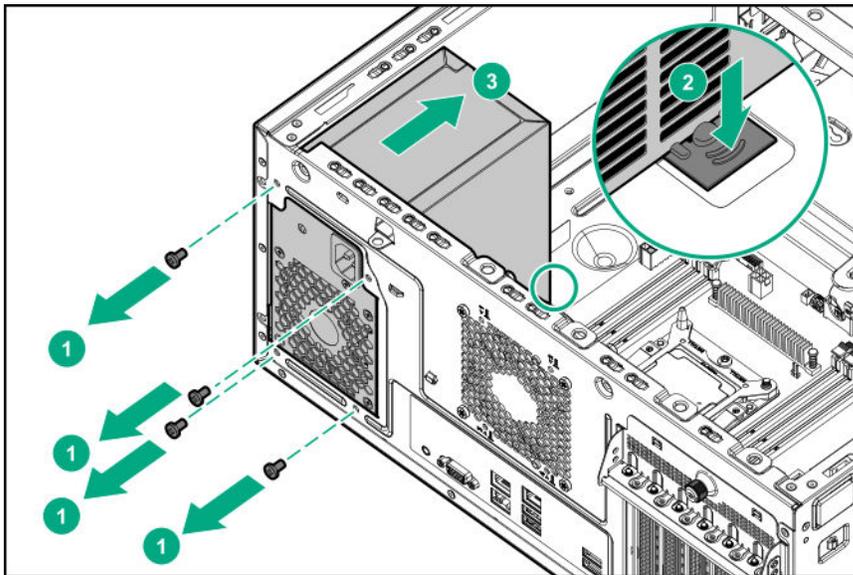
Prerequisites

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

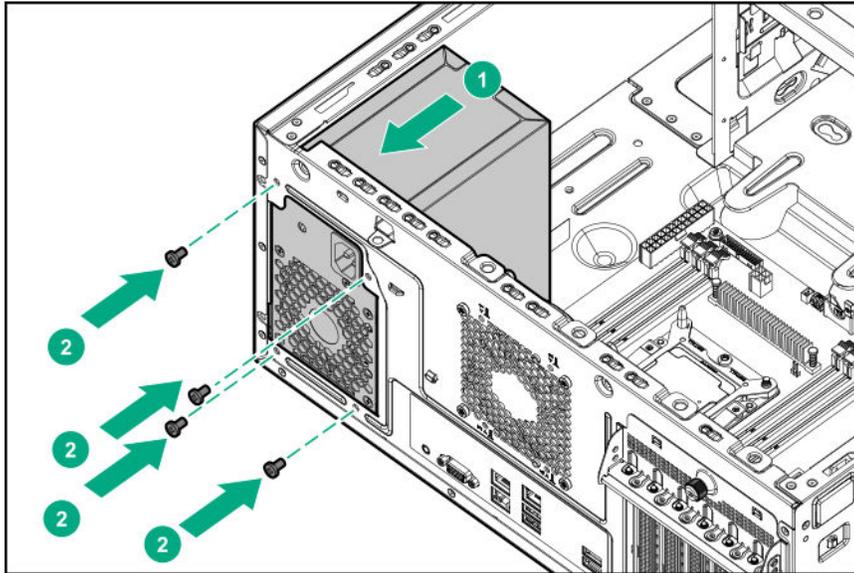
- 550W ATX power supply module
- T-15 Screwdriver

Procedure

1. **Power down the server** on page 20.
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Do one of the following:
 - Server in rack mode: **Remove the server from the rack** on page 20.
 - Server in tower mode: Place the server on its side and access panel facing up.
4. **Remove the access panel** on page 21.
5. **Remove the PCIe air baffle** on page 25.
6. **Remove the system air baffle** on page 26.
7. Disconnect all the power supply cables connected to the system board.
8. Remove the existing power supply.



9. Install the non-hot-plug 550W ATX power supply.



10. **Connect the power supply cables.**
11. **Install the system air baffle** on page 27.
12. **Install the PCIe air baffle** on page 25.
13. **Install the access panel** on page 22.
14. Do one of the following:
 - Server in rack mode: **Install the server on the rack** on page 39.
 - Server in tower mode: Return the server to an upright position.
15. Connect each power cord to the server.
16. Connect each power cord to the power source.
17. **Power up the server** on page 20.

The installation is complete.

Redundant power supply enablement option

The server supports Redundant power supply enablement option.

The RPS enablement option is installed to improve power efficiency and enable power redundancy. Power efficiency requires the installation of one power input module and power redundancy requires the installation of two power input modules. This module is a separately purchased option and is not part of the RPS enablement option kit.

When this RPS backplane enablement option and a single power input module are installed in the server, you can install or remove a second power input module without powering down the server.

Power supply warnings and cautions



WARNING:

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

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



WARNING:

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



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.



CAUTION:

Mixing different types of power supplies in the same server might:

- Limit or disable some power supply features including support for power redundancy
- Cause the system to become unstable and might shut down.

To ensure access to all available features, all power supplies in the same server should have the same output and efficiency ratings. Verify that all power supplies have the same part number and label color.

Installing the Redundant power supply enablement option

Prerequisites

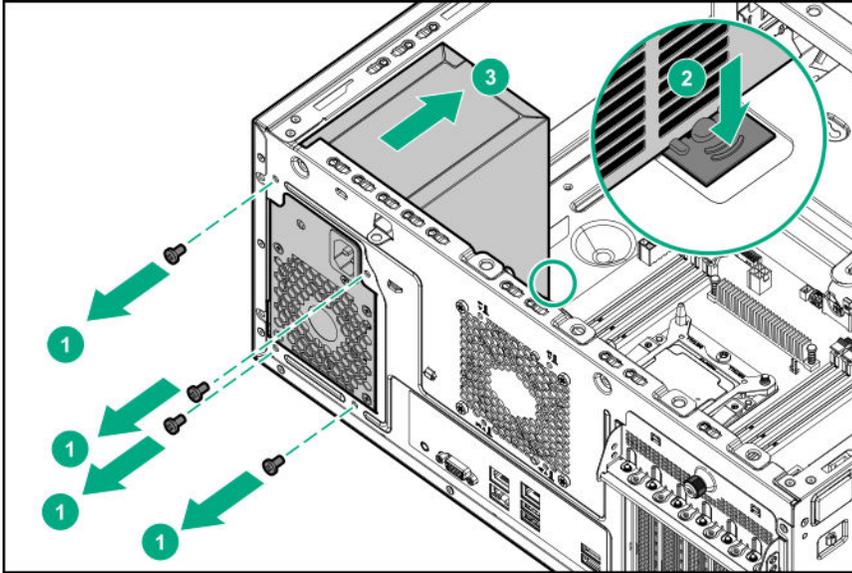
Before performing the procedure make sure:

- **To review the power supply warnings and cautions**
- Make sure you have the following items available:
 - Redundant power supply enablement option
 - Hot-plug power supply
 - T-15 Screwdriver

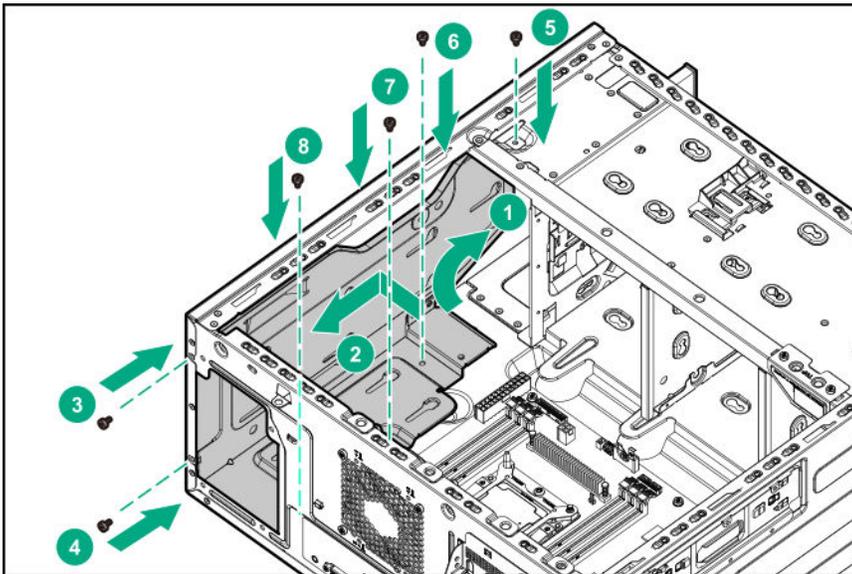
Procedure

1. **Power down the server** on page 20.
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Do one of the following:

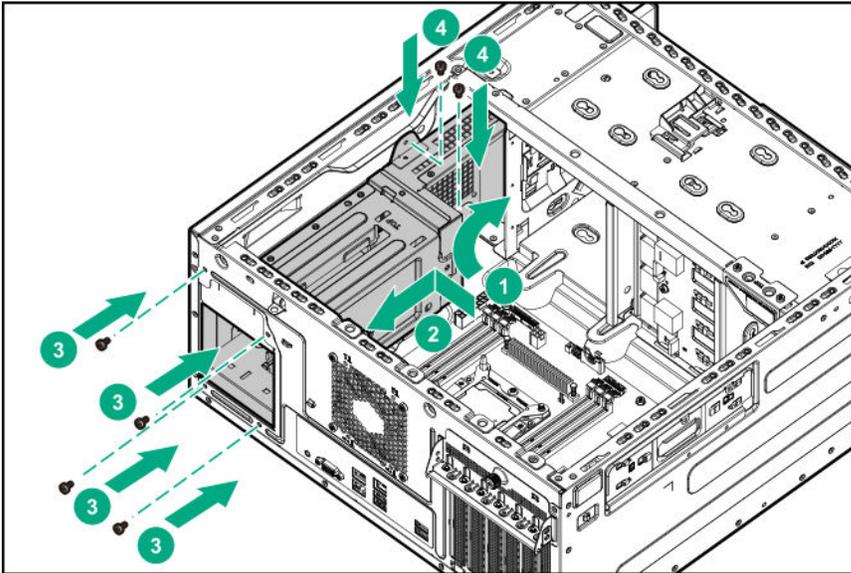
- Server in rack mode: **Remove the server from the rack** on page 20.
 - Server in tower mode: Place the server on its side and access panel facing up.
4. **Remove the access panel** on page 21.
 5. **Remove the system air baffle** on page 26.
 6. Disconnect all power supply cables from the system board, drive cages, and devices.
 7. Remove the existing power supply.



8. Insert and install the RPS bracket into the bay.



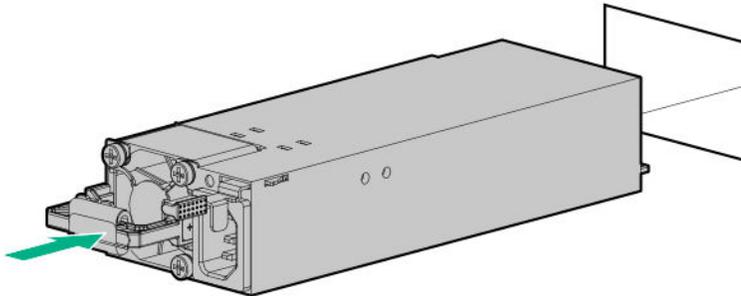
9. Grab the power supply cables from the RPS backplane assembly and then insert the backplane into the bay carefully.



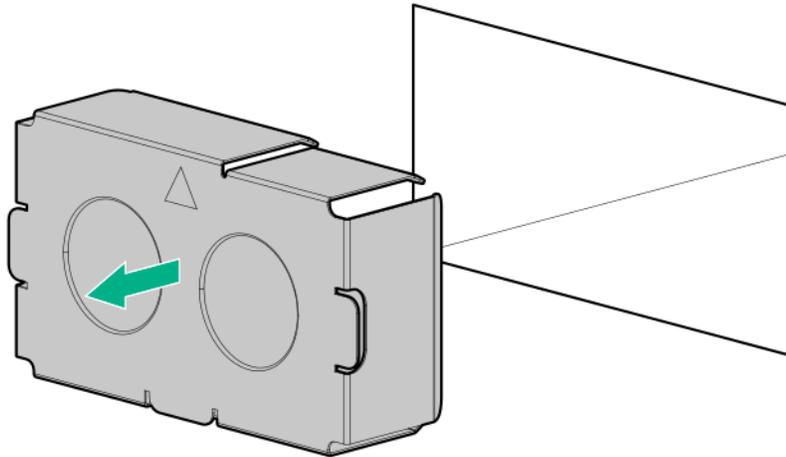
10. Connect the RPS backplane cables.

11. Install a hot-plug power supply in the power supply bay 1.

When facing the rear of the server in an upright position, the upper level of power supply bay is bay 1 and the lower level is bay 2.



12. To enable power redundancy in the server, install a second power supply in the power supply bay 2:
a. Remove the power supply blank from bay 2.



- b. Install a second hot-plug power supply in the power supply bay 2 as step 13.
13. **Install the system air baffle** on page 27.
 14. **Install the access panel** on page 22.
 15. Do one of the following:
 - Server in rack mode: **Install the server on the rack** on page 39.
 - Server in tower mode: Return the server to an upright position.
 16. Connect each power cord to the server.
 17. Connect each power cord to the power source.
 18. **Power up the server** on page 20.

The installation is complete.

HPE Trusted Platform Module 2.0 Gen10 option

Overview

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

This procedure includes three sections:

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

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

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

**IMPORTANT:**

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

HPE Trusted Platform Module 2.0 Guidelines

**CAUTION:**

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

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

- Do not remove an installed TPM. Once installed, the TPM is bound to the system board. If an OS is configured to use the TPM and it is removed, the OS may go into recovery mode, data loss can occur, or both.
- When installing or replacing hardware, Hewlett Packard Enterprise service providers cannot enable the TPM or the encryption technology. For security reasons, only the customer can enable these features.
- When returning a system board for service replacement, do not remove the TPM from the system board. When requested, Hewlett Packard Enterprise Service provides a TPM with the spare system board.
- Any attempt to remove the cover of an installed TPM from the system board can damage the TPM cover, the TPM, and the system board.
- If the TPM is removed from the original server and powered up on a different server, data stored in the TPM including keys will be erased.
- When using BitLocker, always retain the recovery key/password. The recovery key/password is required to complete Recovery Mode after BitLocker detects a possible compromise of system integrity or system configuration.
- Hewlett Packard Enterprise is not liable for blocked data access caused by improper TPM use. For operating instructions, see the TPM documentation or the encryption technology feature documentation provided by the operating system.

Installing and enabling the HPE TPM 2.0 Gen10 Kit

Installing the Trusted Platform Module board

Preparing the server for installation

Procedure

1. Observe the following warnings:

**WARNING:**

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

**WARNING:**

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

2. Update the system ROM.

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

3. Power down the server (**Power down the server** on page 20).
4. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
5. Do one of the following:
 - Server in rack mode: **Remove the server from the rack** on page 20.
 - Server in tower mode: Place the server on its side and access panel facing up.
6. **Remove the access panel** on page 21.
7. **Remove the PCIe air baffle** on page 25.
8. **Remove the system air baffle** on page 26.
9. Remove any components or cables that may prevent access to the TPM connector.
10. Proceed to **Installing the TPM board and cover** on page 75.

Installing the TPM board and cover

Procedure

1. Observe the following alerts:



CAUTION:

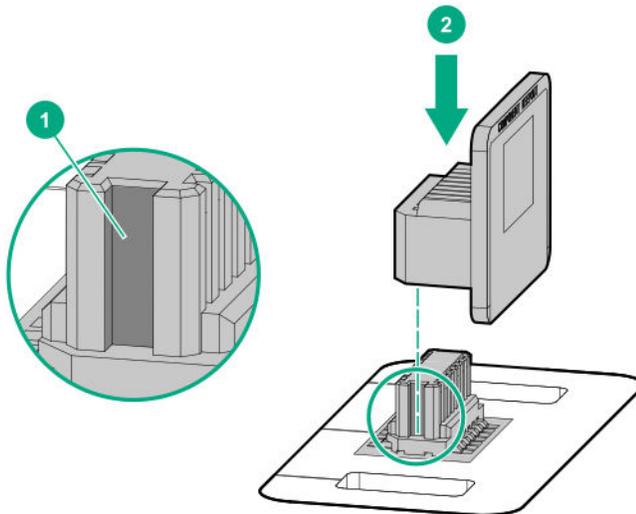
If the TPM is removed from the original server and powered up on a different server, data stored in the TPM including keys will be erased.



CAUTION:

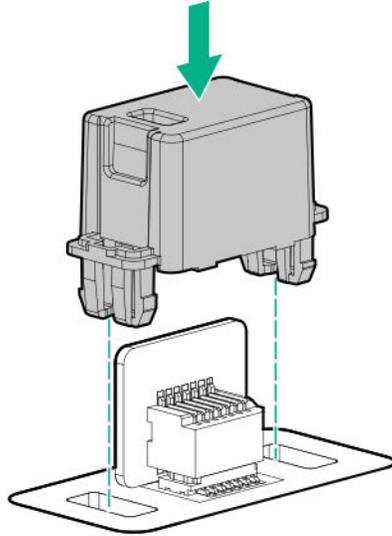
The TPM is keyed to install only in the orientation shown. Any attempt to install the TPM in a different orientation might result in damage to the TPM or system board.

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



3. Install the TPM cover:

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



4. Proceed to **Preparing the server for operation** on page 76.

Preparing the server for operation

Procedure

1. **Install the system air baffle** on page 27.
2. **Install the PCIe air baffle** on page 25.
3. **Install the access panel** on page 22.
4. Do one of the following:
 - Server in rack mode: **Install the server on the rack** on page 39.
 - Server in tower mode: Return the server to an upright position.
5. Connect each power cord to the server.
6. Connect each power cord to the power source.
7. **Power up the server** on page 20.

Enabling the Trusted Platform Module

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

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

Enabling the Trusted Platform Module as TPM 2.0

Procedure

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

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

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

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

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

Enabling the Trusted Platform Module as TPM 1.2

Procedure

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

The server reboots a second time without user input. During this reboot, the TPM setting becomes effective.
8. Enable TPM functionality in the OS, such as Microsoft Windows BitLocker or measured boot.

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

Retaining the recovery key/password

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

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

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

Cabling

Cabling guidelines

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

Observe the following guidelines when working with server cables.

Before connecting cables

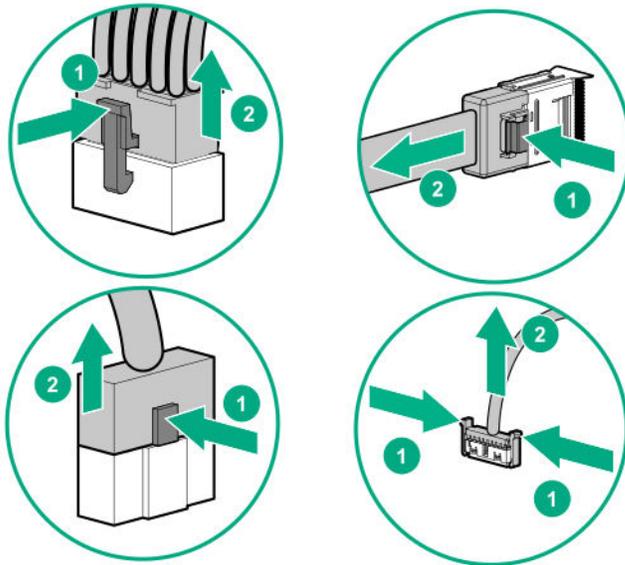
- Note the port labels on the PCA components. Not all of these components are used by all servers:
 - System board ports
 - Drive and power supply backplane ports
 - Expansion board ports (controllers, adapters, expanders, risers, and similar boards)
- Note the label near each cable connector. This label indicates the destination port for the cable connector.
- Some data cables are pre-bent. Do not unbend or manipulate the cables.
- To prevent mechanical damage or depositing oil that is present on your hands, and other contamination, do not touch the ends of the connectors.

When connecting cables

- Before connecting a cable to a port, lay the cable in place to verify the length of the cable.
- Use the internal cable management features to properly route and secure the cables.
- When routing cables, be sure that the cables are not in a position where they can be pinched or crimped.
- Avoid tight bend radii to prevent damaging the internal wires of a power cord or a server cable. Never bend power cords and server cables tight enough to cause a crease in the sheathing.
- Make sure that the excess length of cables are properly secured to avoid excess bends, interference issues, and airflow restriction.
- To prevent component damage and potential signal interference, make sure that all cables are in their appropriate routing position before installing a new component and before closing up the server after hardware installation/maintenance.

When disconnecting cables

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

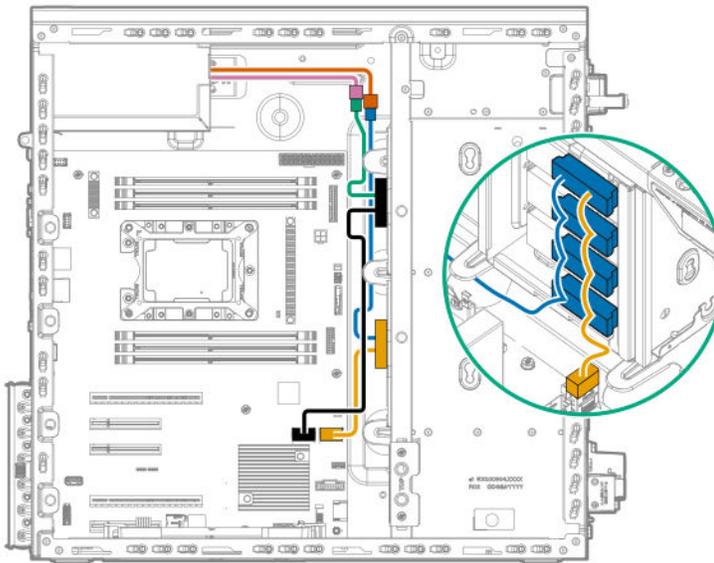


Remove cables that are no longer being used. Retaining them inside the server can restrict airflow. If you intend to use the removed cables at later time, label and store them for future use.

Drive and Storage cabling

LFF non-hot-plug drive cabling

Eight bay LFF non-hot-plug drive cabling



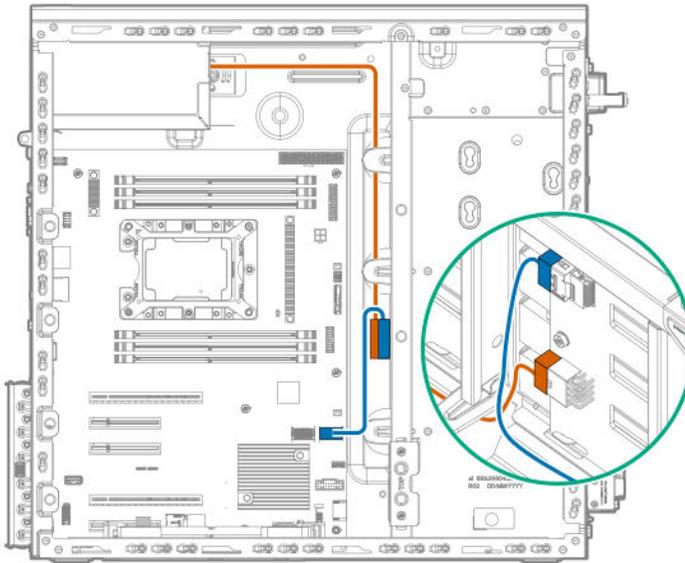
Cable Color	Description
Orange	Power supply cable
Pink	Power supply cable
Green	Box 2 drive power supply cable

Table Continued

Cable Color	Description
Blue	Box 1 drive power supply cable
Black	Box 2 non-hot-plug drive to system board x4 SATA port 2
Amber	Box 1 non-hot-plug drive to system board x4 SATA port 1

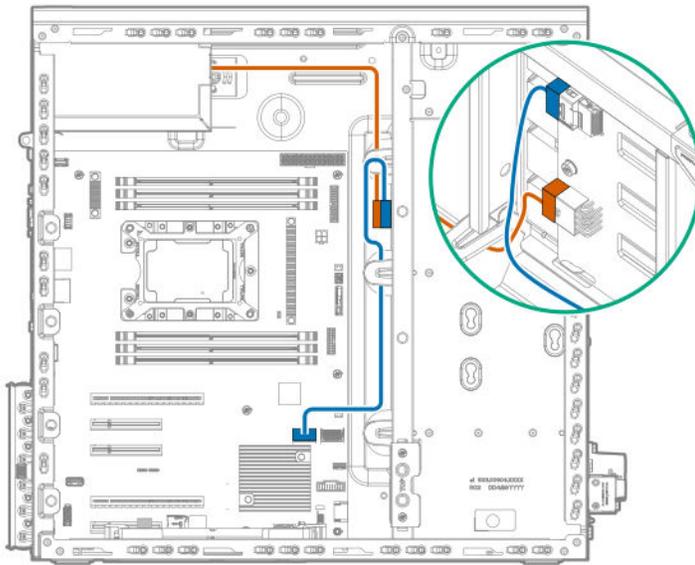
LFF hot-plug drive cabling

Box 1 drive backplane connected to the system board



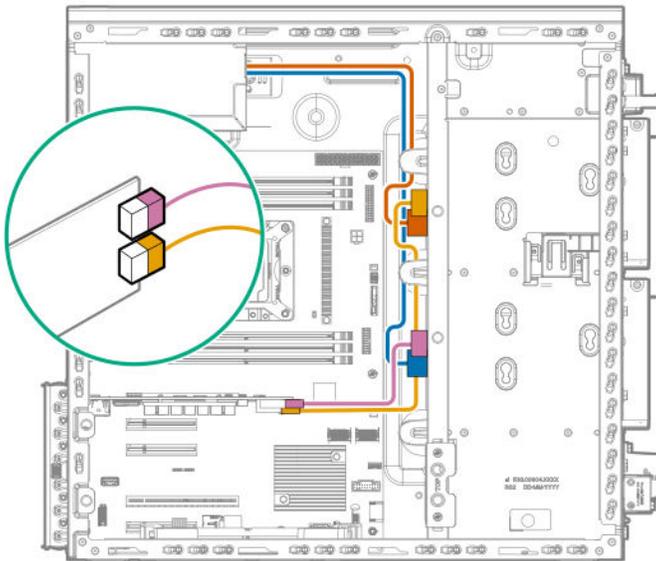
Cable Color	Description
Orange	Drive power supply cable
Blue	Box 1 drive backplane Mini-SAS cable to system board x4 SATA port 1

Box 2 drive backplane connected the system board



Cable Color	Description
Orange	Drive power supply cable
Blue	Box 2 drive backplane Mini-SAS cable to system board x4 SATA port 2

Box 1 and Box 2 drive backplanes connected to a HBA/Smart Array controller



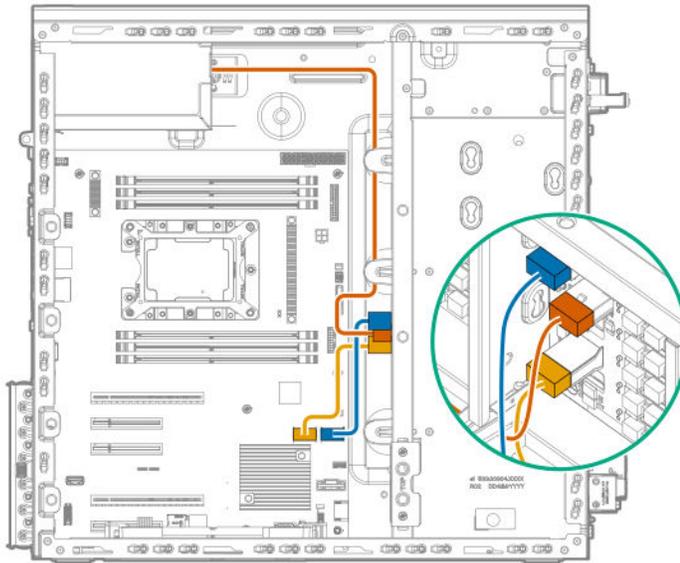
Cable Color	Description
Orange	Box 2 drive power supply cable
Blue	Box 1 drive power supply cable

Table Continued

Cable Color	Description
Amber	Box 2 drive backplane Mini-SAS cable to controller port 2
Pink	Box 1 drive backplane Mini-SAS cable to controller port 1

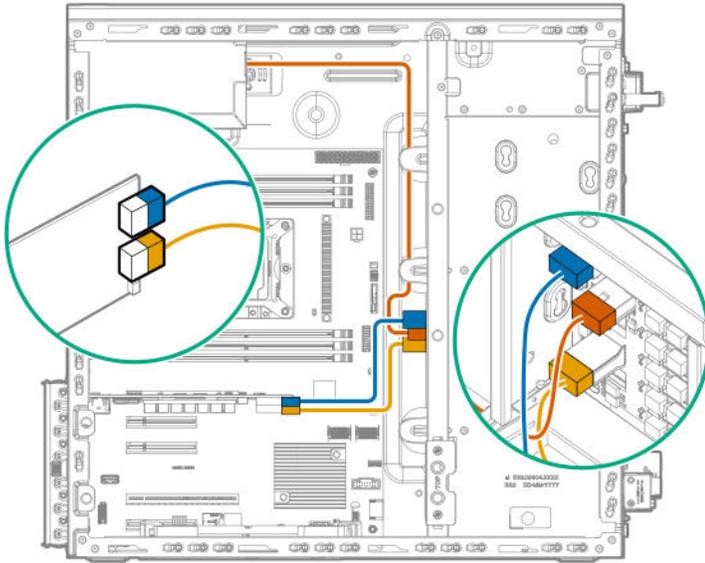
SFF hot-plug drive cabling

Box 1 drive backplane connected to the system board



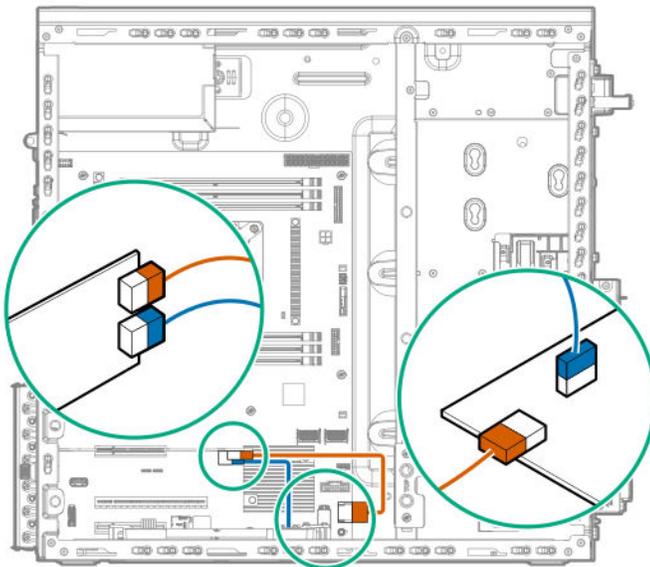
Cable color	Description
Orange	Drive power supply cable
Blue	Box 1 drive backplane port 1 Mini-SAS cable to system board x4 SATA port 1
Amber	Box 1 drive backplane port 2 Mini-SAS cable to system board x4 SATA port 2

Box 1 drive backplane connected to a HBA/Smart Array controller



Item	Description
Orange	Drive power supply cable
Blue	Box 1 drive backplane port 1 Mini-SAS cable to type-p controller port 1
Amber	Box 1 drive backplane port 2 Mini-SAS cable to type-p controller port 2

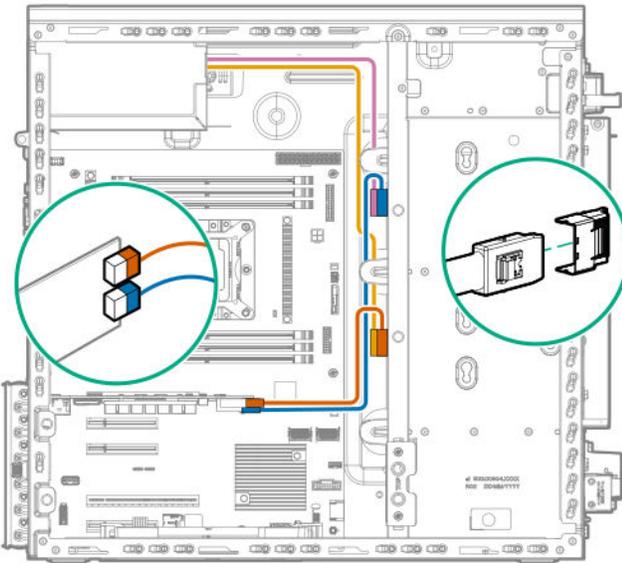
M.2 SSD cabling



Cable Color	Description
Orange	SATA cable from M.2 SSD enablement board port 1 to system board SATA port 9
Blue	SATA cable from M.2 SSD enablement board port 2 to system board SATA port 10

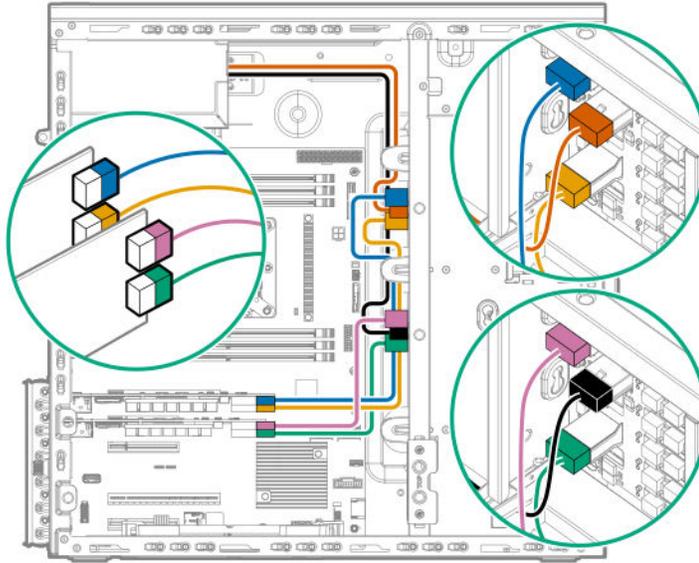
Storage controller cabling

Host Bus Adapter/Smart Array controller connected to the 2x 4-bay LFF hot-plug drive cage



Cable color	Description
Orange	Box 1 drive backplane Mini-SAS cable to type-p controller port 1
Blue	Box 2 drive backplane Mini-SAS cable to type-p controller port 2
Yellow	Box 1 drive power supply cable
Pink	Box 2 drive power supply cable

2 Host Bus Adapters/Smart Array controllers connected to the 16-bay SFF hot-plug drive cage



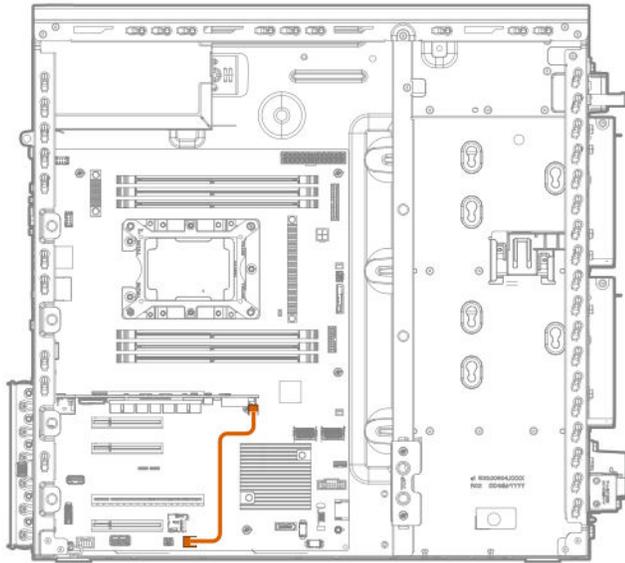
Cable color	Description
Blue	Box 2 drive backplane port 1 Mini-SAS cable to slot 1 type-p controller port 1
Yellow	Box 2 drive backplane port 2 Mini-SAS cable to slot 1 type-p controller port 2
Pink	Box 1 drive backplane port 1 Mini-SAS cable to slot 2 type-p controller port 1
Green	Box 1 drive backplane port 2 Mini-SAS cable to slot 2 type-p controller port 2
Black	Box 1 drive power supply cable
Orange	Box 2 drive power supply cable

FBWC module cabling

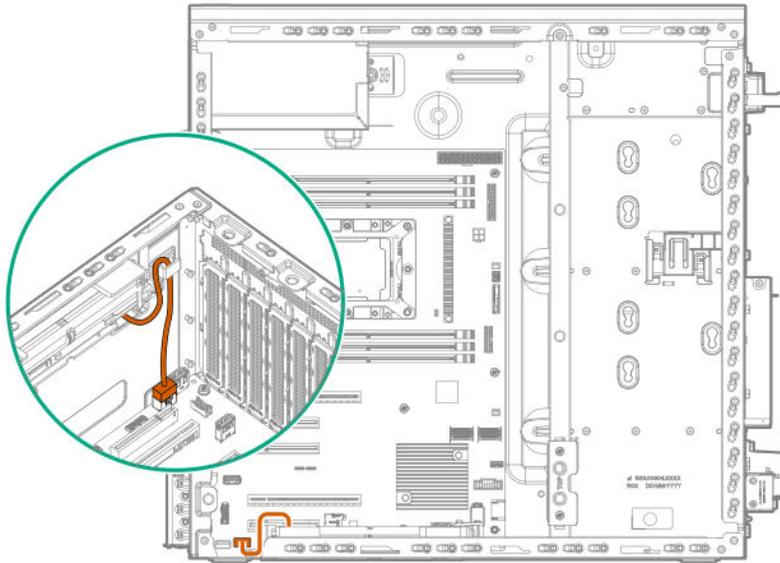
The FBWC solution is a separately purchased option. This server only supports FBWC module installation when a Smart Array P-Series controller is installed.

Depending on the controller option installed, the actual storage controller connectors might look different from what is shown in this section.

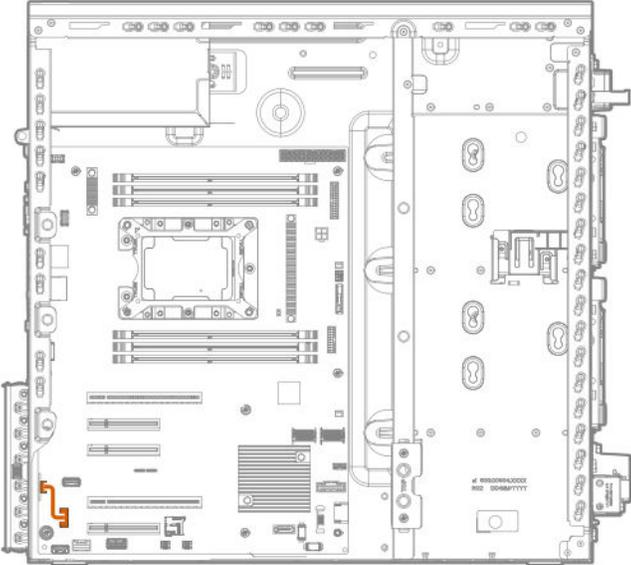
FBWC module on a P408i-p controller:



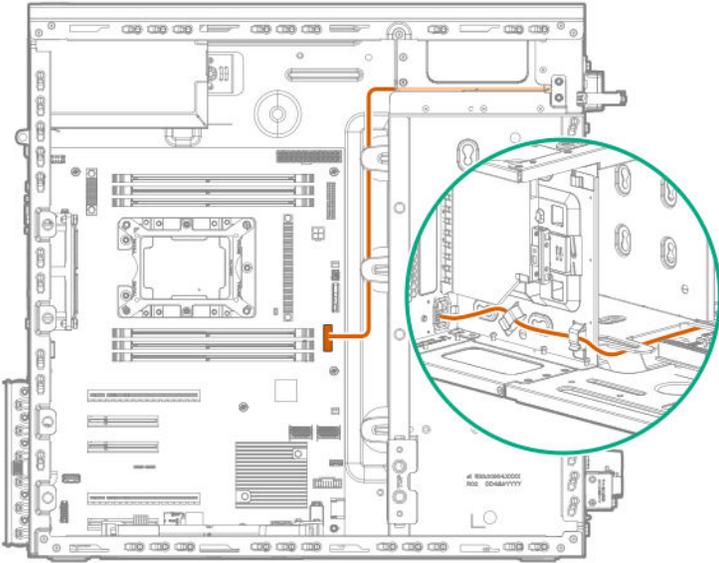
Smart Storage Battery cabling



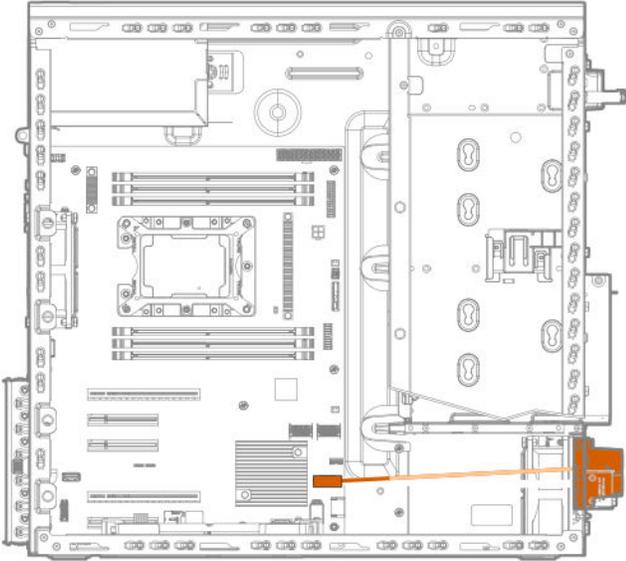
Serial port cabling



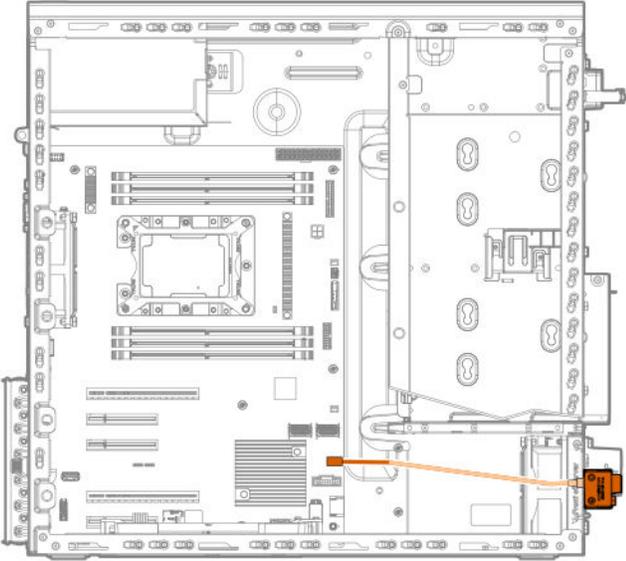
Front I/O cabling



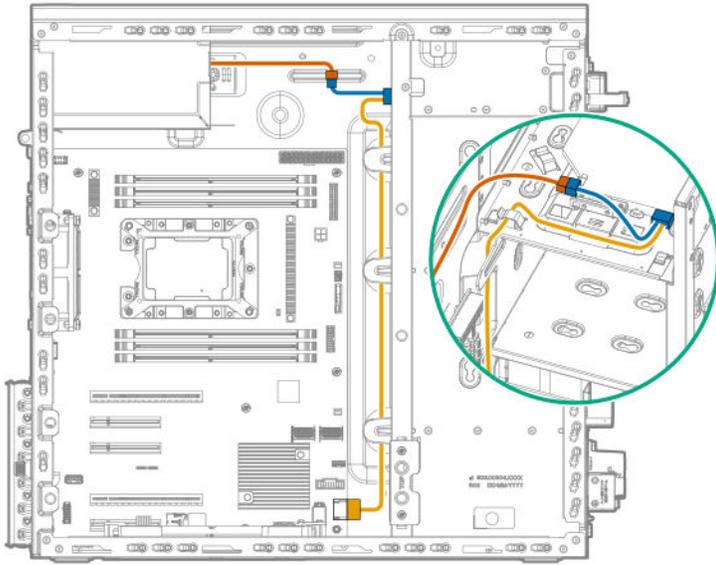
Front USB 3.0 cabling



iLO service port cabling



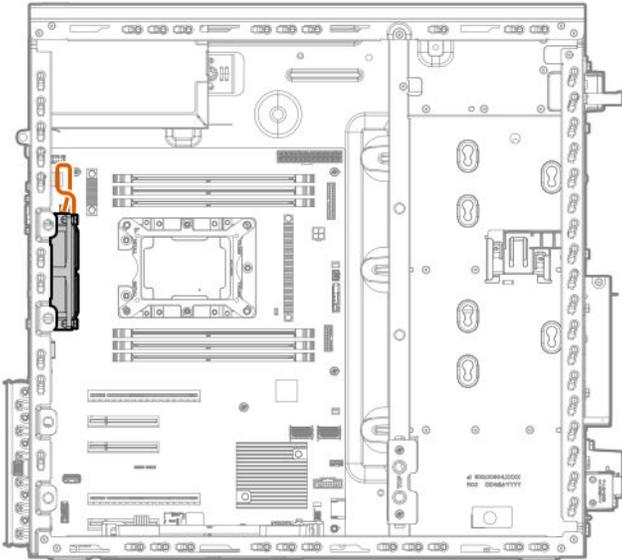
Optical drive cabling



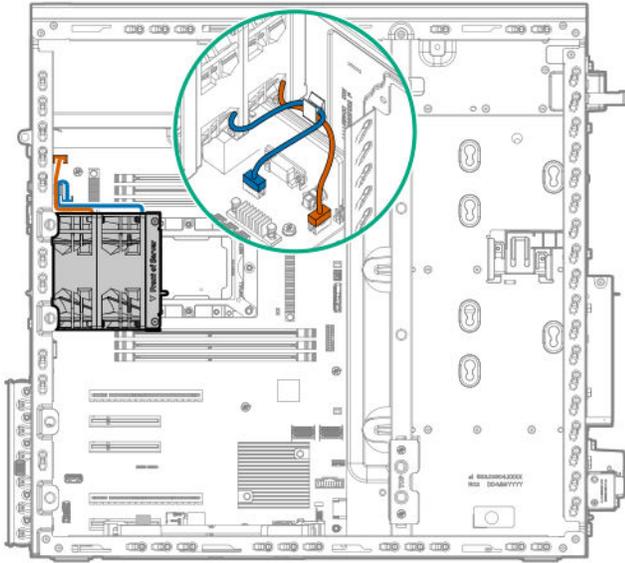
Cable color	Description
Orange	Power supply cable
Blue	Drive power supply cable
Amber	SATA cable

Fan cabling

Default system fan cabling

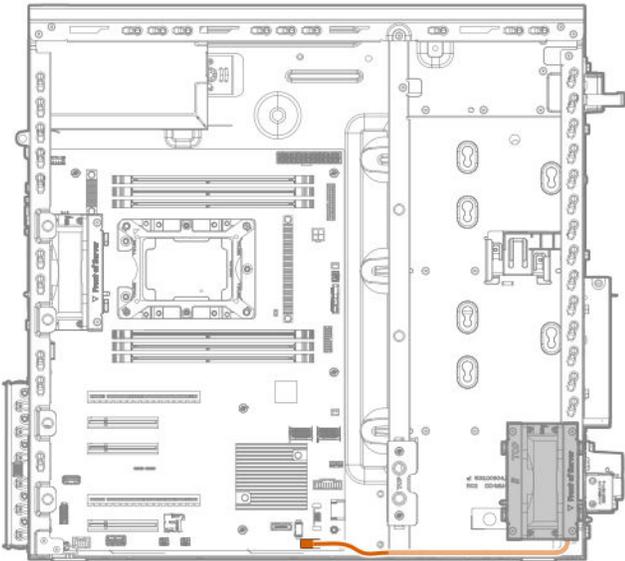


Redundant system fan cabling

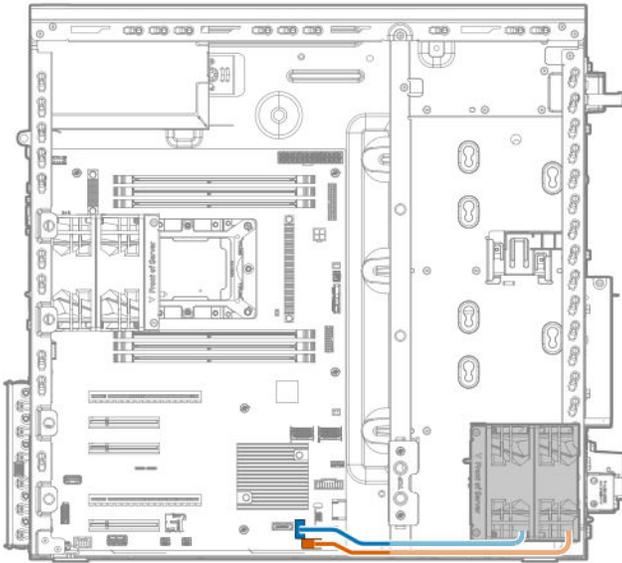


Cable color	Description
Orange	System fan cable to fan connector 4
Blue	System fan cable to fan connector 3

Default PCIe fan cabling



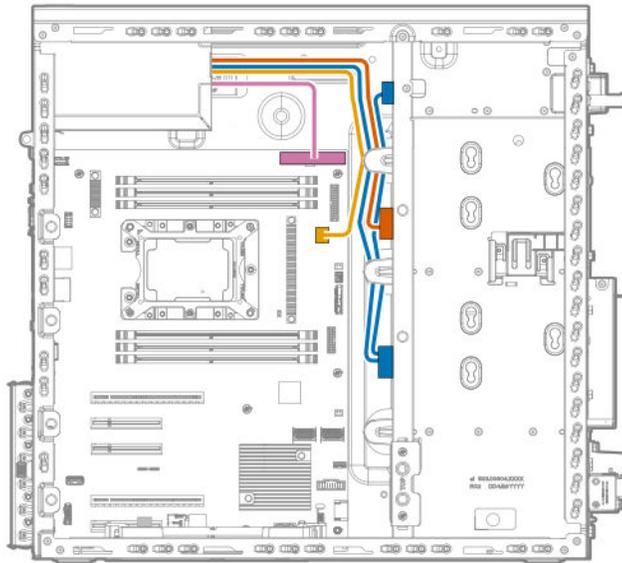
Redundant PCIe fan cabling



Cable color	Description
Orange	PCIe fan cable to fan connector 1
Blue	PCIe fan cable to fan connector 2

Power supply cabling

350W non-hot-plug power supply cabling

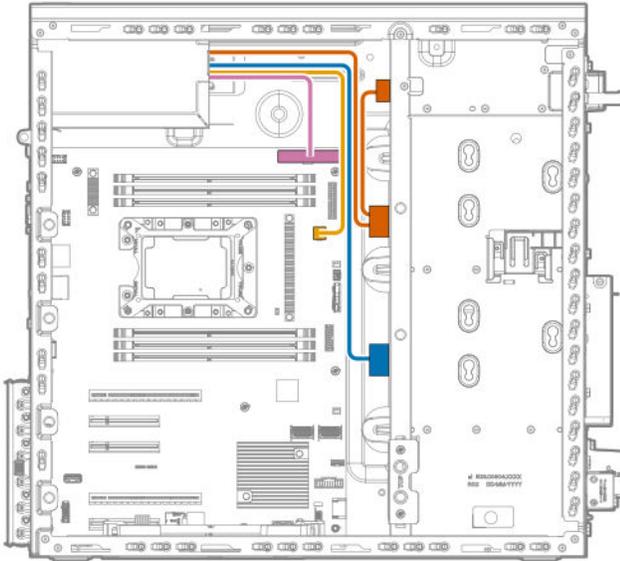


Cable Color	Description
Orange	8-pin power supply cable to box 2 drive backplane
Blue	8-pin power supply cable to box 1 drive backplane and optical drive

Table Continued

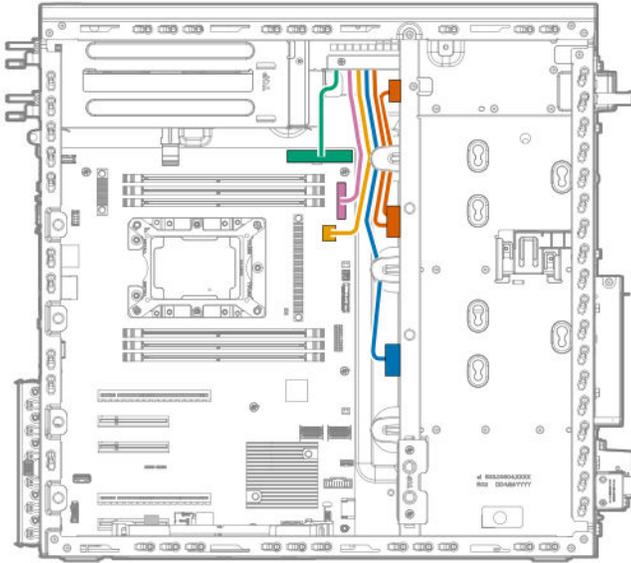
Cable Color	Description
Amber	4-pin power supply cable to system board
Pink	24-pin power supply cable

550W non-hot-plug power supply cabling



Cable Color	Description
Orange	8-pin power supply cable to box 2 drive backplane and optical drive
Blue	8-pin power supply cable to box 1 drive backplane
Amber	4-pin power supply cable to system board
Pink	24-pin power supply cable

Redundant power supply cabling



Cable Color	Description
Pink	RPSU cable
Blue	Box 1 drive backplane power supply cable
Amber	4-pin power supply cable to system board
Orange	Box 2 drive backplane and media bay power cable
Green	24-pin power supply cable

Software and configuration utilities

Server mode

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

Software or configuration utility	Server mode
Active Health System on page 95	Online and Offline
HPE iLO 5 on page 96	Online and Offline
HPE Smart Storage Administrator on page 101	Online and Offline
iLO RESTful API on page 97	Online and Offline
Intelligent Provisioning on page 98	Offline
Scripting Toolkit for Windows and Linux on page 99	Online
Service Pack for ProLiant on page 103	Online and Offline
Smart Update Manager on page 103	Online and Offline
UEFI System Utilities on page 99	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 on the Hewlett Packard Enterprise website.

Active Health System data collection

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

Examples of information that is collected:

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

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

Active Health System Log

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

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

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

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

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 on the Hewlett Packard Enterprise website.

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 an iLO Federation group.

When an iLO Federation page loads, 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 scripted media for access by the servers in an iLO Federation group.
- Group power control—Manage the power status of the servers in an iLO Federation group.
- Group power capping—Set dynamic power caps for the servers in an iLO Federation group.
- Group firmware update—Update the firmware of the servers in an iLO Federation group.
- Group license installation—Enter a license key to activate iLO licensed features on the servers in an iLO Federation group.
- 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 on the Hewlett Packard Enterprise website.

iLO Service Port

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

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).

When you use the iLO Service Port:

- Actions are logged in the iLO Event Log.
- The server UID blinks 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 on the Hewlett Packard Enterprise website.

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/info/restfulinterface/docs>).

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

RESTful Interface Tool

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

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

iLO Amplifier Pack

The iLO Amplifier Pack is an advanced server inventory and firmware and driver update solution that enables rapid discovery, detailed inventory reporting, and 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>.

Intelligent Provisioning

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

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

IMPORTANT:

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

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

To access Intelligent Provisioning:

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

Intelligent Provisioning operation

Intelligent Provisioning includes the following components:

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

! **IMPORTANT:**

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

NOTE:

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

Intelligent Provisioning provides installation help for the following operating systems:

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

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

Management Security

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

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](http://www.hpe.com).

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 pre-boot 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.

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

- Accessing HPE SSA in the offline environment



IMPORTANT:

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

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

- Accessing HPE SSA in the online environment

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

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

USB support

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

External USB functionality

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

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

Redundant ROM support

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

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

Safety and security benefits

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

Keeping the system current

Updating firmware or system ROM

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

- The **Firmware Update** option in the System Utilities. See [Updating firmware from the System Utilities](#).
- The `fwupdate` command in the **Embedded UEFI Shell**.

- Service Pack for ProLiant (SPP)
- HPE online flash components

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 on supported ProLiant servers.

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

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

To download the SPP, see the SPP download page at <https://www.hpe.com/servers/spp/download>.

Smart Update Manager

SUM is a tool for firmware, driver, and software maintenance on ProLiant servers, BladeSystem enclosures, Moonshot systems, and other nodes. It provides a browser-based GUI or a command-line scripting interface for flexibility and adaptability.

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 mode.
- 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

Smart Update Tools is a software utility used with iLO 4 (Gen9 servers), iLO 5 (Gen10 servers), HPE OneView, iLO Amplifier Pack, Service Pack for ProLiant (SPP), and Smart Update Manager (SUM) to stage, install, and activate firmware and driver updates.

NOTE:

HPE OneView and iLO Amplifier Pack manage the iLO while SUT runs on each server and deploys the updates. The same administrator might not manage both applications. Create a process that notifies the administrators when updates are available.

- **Smart Update Tools:** Polls an iLO, HPE OneView, 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 SUT. Performs inventory on target servers, stages deployment, deploys updates, and then reboots the servers.

- **iLO 5 with integrated Smart Update** (Gen10 servers only): Loads Install Sets to the iLO Repository on iLO 5 nodes. SUT deploys OS-based updates from the iLO Repository.
- **iLO Amplifier Pack**: Displays available updates for servers. Communicates with SUT, or SUT 1.x to initiate updates, reports the status to iLO Amplifier Pack.
- **HPE OneView**: Displays available updates for servers. Communicates with iSUT to initiate updates, reports the status on the **Firmware** section of the **Server Profile** page of HPE OneView. HPE OneView provides automated compliance reporting in the dashboard.
- **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:

Do not manage one node with iLO Amplifier Pack and HPE OneView at the same time.

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**, 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.

After the operating system is deployed, driver support might not be current. You can update drivers using any of the following **Smart Update Solutions**:

- Service Pack for ProLiant
- SPP custom download
- Smart Update Manager
- Downloading specific drivers

To locate the drivers for a particular server, go to the **Hewlett Packard Enterprise Support Center website**, and then search for your 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**.
- Download individual drivers, firmware, or other systems software components from the server product page in the **Hewlett Packard Enterprise Support Center website**.

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**](#).

Removing and replacing the system battery

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



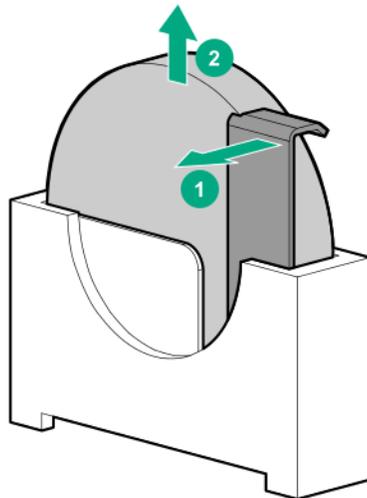
WARNING:

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. **Power down the server.**
2. Remove all power:
 - a. Disconnect each power cord from the power source.
 - b. Disconnect each power cord from the server.
3. Place the server on its side and access panel facing up.
4. **Remove the access panel** on page 21.
5. **Remove the PCIe air baffle** on page 25.
6. **Remove the system air baffle** on page 26.
7. **Locate the battery.**
8. Remove the battery.



9. To replace the component, reverse the removal procedure.
10. Properly dispose of the old battery.

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

Troubleshooting

NMI functionality

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

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

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

Troubleshooting resources

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

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

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

Specifications

Environmental specifications

Specification	Value
Temperature range¹	—
Operating	10°C to 35°C (41°F to 104°F)
Nonoperating	-30°C to 60°C (-22°F to 140°F)
Relative humidity (noncondensing)	—
Operating	8% to 90% 28°C (82.4°F), maximum wet bulb temperature
Nonoperating	5% to 95% 38.7°C (101.7°F), maximum wet bulb temperature

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

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

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

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

Server specifications

Dimension (with feet/bezel)	Value
Height	44.00 cm (17.32 in)
Depth	48.05 cm (18.92 in)
Width	19.50 cm (7.68 in)
Weight (approximate)	
Minimum (one drive, power supply, and processor installed)	13.5 kg (29.82 lb)
Maximum (all drives, power supplies, and processors installed)	25.0 kg (55.00 lb)

Power supply specifications

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

- ATX 350W non-hot-plug power supply
- ATX 550W non-hot-plug power supply
- HPE 800W Flex Slot Platinum Hot-plug Low Halogen Power Supply

⚠ CAUTION:

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

NOTE: ATX power supply will not support redundant fan option.

ATX 350W non-hot-plug power supply

Specification	Value
Input requirements	
Rated input voltage	100 VAC to 240 VAC
Rated input frequency	50 Hz to 60 Hz
Rated input current	4.5 A at 100 VAC 1.9 A at 240 VAC
Maximum rated input power	437 W at 100 VAC 416 W at 240 VAC
BTUs per hour	1491 at 100 VAC 1419 at 240 VAC
Power supply output	
Rated steady-state power	350 W at 100VAC to 240VAC
Maximum peak power	385 W at 100VAC to 240VAC

ATX 550W non-hot-plug power supply

Specification	Value
Input requirements	
Rated input voltage	100 VAC to 240 VAC
Rated input frequency	50 Hz to 60 Hz
Rated input current	6.4 A at 100 VAC 2.62 A at 240 VAC
Maximum rated input power	634 W at 100 VAC 613 W at 240 VAC

Table Continued

Specification	Value
BTUs per hour	1876 at 100 VAC 1876 at 240 VAC
Power supply output	
Rated steady-state power	550 W at 100VAC to 240VAC
Maximum peak power	575 W at 100VAC to 240VAC

HPE 800W Flex Slot Platinum Hot Plug Low Halogen Power Supply

Specification	Value
Input requirements	
Rated input voltage	100 VAC to 127 VAC 100 VAC to 240 VAC 240 VDC for China only
Rated input frequency	50 Hz to 60 Hz Not applicable to 240 VDC
Rated input current	9.4 A at 100 VAC 4.5 A at 200 VAC 3.8 A at 240 VDC for China only
Maximum rated input power	899 W at 100 VAC 867 W at 200 VAC 864 W at 240 VDC for China only
BTUs per hour	3,067 at 100 VAC 2,958 at 200 VAC 2,949 at 240 VAC for China only
Power supply output	
Rated steady-state power	800 W at 100 VAC to 127 VAC input 800 W at 100 VAC to 240 VAC input 800 W at 240 VDC input for China only
Maximum peak power	800 W at 100 VAC to 127 VAC input 800 W at 100 VAC to 240 VAC input 800 W at 240 VDC input for China only

Hot-plug power supply calculations

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

Safety, warranty, and regulatory information

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>).

Warranty information

[HPE ProLiant and x86 Servers and Options](#)

[HPE Enterprise Servers](#)

[HPE Storage Products](#)

[HPE Networking Products](#)

Belarus Kazakhstan Russia marking



Manufacturer and Local Representative Information

Manufacturer information:

Hewlett Packard Enterprise Company, 3000 Hanover Street, Palo Alto, CA 94304 U.S.

Local representative information Russian:

- Russia:

ООО «Хьюлетт Паккард Энтерпрайз», Российская Федерация, 125171, г. Москва, Ленинградское шоссе, 16А, стр.3, Телефон/факс: +7 495 797 35 00

- Belarus:

ИООО «Хьюлетт-Паккард Бел», Республика Беларусь, 220030, г. Минск, ул. Интернациональная, 36-1, Телефон/факс: +375 17 392 28 20

- Kazakhstan:

ТОО «Хьюлетт-Паккард (К)», Республика Казахстан, 050040, г. Алматы, Бостандыкский район, проспект Аль-Фараби, 77/7, Телефон/факс: + 7 727 355 35 52

Local representative information Kazakh:

- Russia:

ЖШС "Хьюлетт Паккард Энтерпрайз", Ресей Федерациясы, 125171, Мәскеу, Ленинград тас жолы, 16А блок 3, Телефон/факс: +7 495 797 35 00

- Belarus:

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Интернациональная көшесі, 36/1, Телефон/факс: +375 17 392 28 20

- Kazakhstan:

ЖШС «Хьюлетт-Паккард (К)», Қазақстан Республикасы, 050040, Алматы қ.,
Бостандық ауданы, Әл-Фараби даңғылы, 77/7, Телефон/факс: +7 727 355 35 52

Manufacturing date:

The manufacturing date is defined by the serial number.

CCSYWWZZZZ (serial number format for this product)

Valid date formats include:

- YWW, where Y indicates the year counting from within each new decade, with 2000 as the starting point; for example, 238: 2 for 2002 and 38 for the week of September 9. In addition, 2010 is indicated by 0, 2011 by 1, 2012 by 2, 2013 by 3, and so forth.
- YYWW, where YY indicates the year, using a base year of 2000; for example, 0238: 02 for 2002 and 38 for the week of September 9.

Turkey RoHS material content declaration

Türkiye Cumhuriyeti: EEE Yönetmeliğine Uygundur

Ukraine RoHS material content declaration

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

Websites

General websites

Hewlett Packard Enterprise Information Library

www.hpe.com/info/EIL

Subscription Service/Support Alerts

www.hpe.com/support/e-updates

Single Point of Connectivity Knowledge (SPOCK) Storage compatibility matrix

www.hpe.com/storage/spock

Storage white papers and analyst reports

www.hpe.com/storage/whitepapers

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

Product websites

Product QuickSpecs

<http://www.hpe.com/servers/ml110-gen10>

HPE ProLiant ML110 Gen10 support page

<http://www.hpe.com/support/ml110gen10>

HPE ProLiant ML110 Gen10 documents

<http://www.hpe.com/info/ml110gen10-docs>

Support and other resources

Accessing Hewlett Packard Enterprise Support

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

Information to collect

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

Accessing updates

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

Hewlett Packard Enterprise Support Center

www.hpe.com/support/hpesc

Hewlett Packard Enterprise Support Center: Software downloads

www.hpe.com/support/downloads

Software Depot

www.hpe.com/support/softwaredepot

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

ⓘ IMPORTANT:

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

Customer self repair

Hewlett Packard Enterprise customer self repair (CSR) programs allow you to repair your product. If a CSR part needs to be replaced, it will be shipped directly to you so that you can install it at your convenience.

Some parts do not qualify for CSR. Your Hewlett Packard Enterprise authorized service provider will determine whether a repair can be accomplished by CSR.

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

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

Remote support

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

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

Remote support and Proactive Care information

HPE Get Connected

www.hpe.com/services/getconnected

HPE Proactive Care services

www.hpe.com/services/proactivecare

HPE Proactive Care service: Supported products list

www.hpe.com/services/proactivecaresupportedproducts

HPE Proactive Care advanced service: Supported products list

www.hpe.com/services/proactivecareadvancedsupportedproducts

Proactive Care customer information

Proactive Care central

www.hpe.com/services/proactivecarecentral

Proactive Care service activation

www.hpe.com/services/proactivecarecentralgetstarted

Documentation feedback

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