



**Hewlett Packard**  
Enterprise

# **HPE ProLiant MicroServer Gen10 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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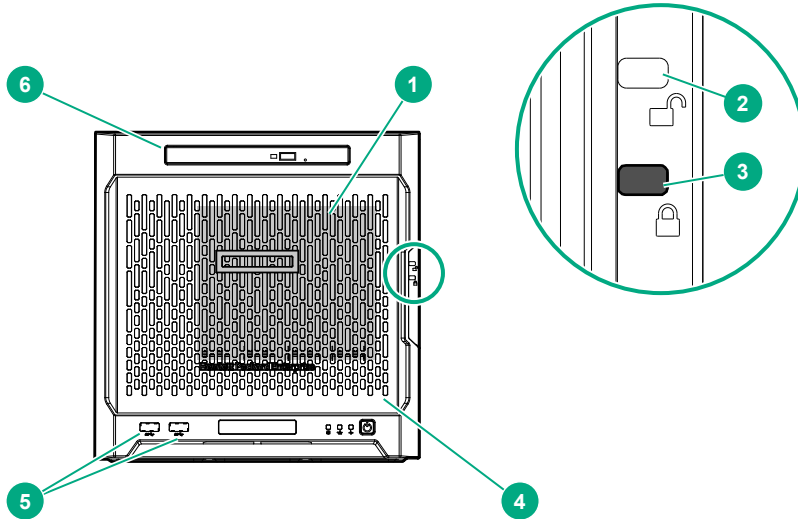
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# Component identification

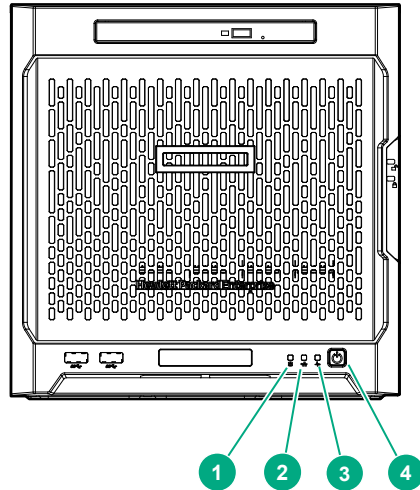
This chapter describes the external and internal server features and components.

## Front panel components



Item	Component	Description
1	Drive bays (4, behind the front bezel)	By default, the drive bays support 3.5-inch LFF SATA drives. To support 2.5-inch SFF drives, install the SFF drive converter option.
2	Front bezel unlock indicator	To remove the front bezel from the chassis, this groove must show the blue indicator.
3	Front bezel lock indicator	To lock the front bezel in the chassis, this groove must show the blue indicator.
4	Front bezel	To access the front drive bays, remove this bezel.
5	USB 3.0 ports (2)	Connect USB 3.0 devices to these ports. USB 3.0 support after POST varies by operating system.
6	Media bay	When the relevant enablement options kits are installed, this bay supports either a slim-type optical disc drive or solid state drive option.

# Front panel LEDs and buttons



Item	Description	Status
1	Drive activity LED	Flashing green = Ongoing drive activity Off = No drive activity  This LED only reflects the status of LFF/SFF drives and SSD that are connected to the onboard SATA ports.
2	NIC status LED	Solid green = Linked to network Flashing green = Network active Off = No network activity  This LED only reflects the status of Ethernet connections managed by the embedded Broadcom BCM5720 Gigabit Ethernet controller.
3	Health LED	Solid green = Normal Flashing amber = One or more component is in degraded condition. <sup>1</sup> Flashing red = One or more component is in critical condition. <sup>1</sup>
4	Power on/Standby button and system power LED	Flashing green = Ongoing power-on sequence Solid green = System on and normal operation Amber = System in standby Off = No power present <sup>2</sup>

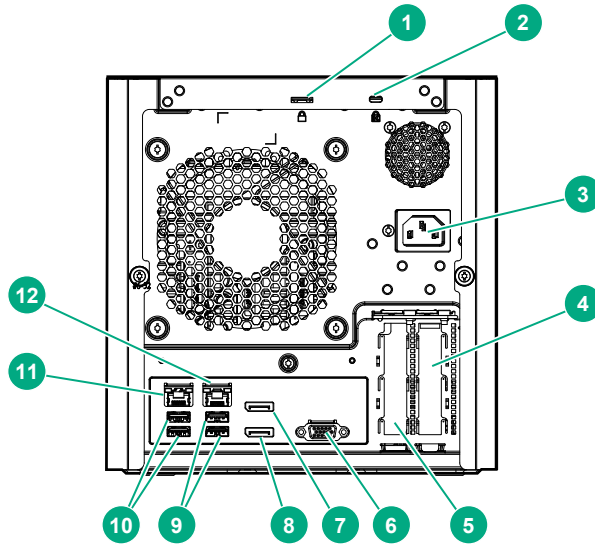
<sup>1</sup> To identify which component is in the degraded or critical state, reboot the server. A POST error message screen showing the affected component will appear for about 30 seconds. Depending on how critical the component health status is, the system boot may or may not be completed. For troubleshooting information, see the [HPE ProLiant MicroServer Gen10 Troubleshooting Guide](#).

<sup>2</sup> If the server does not power on, verify the following items:

Item	Description	Status
------	-------------	--------

- The site power is available.
- The power cord is properly connected to the server power jack and to a working power source.
- The internal power supply cable is properly connected to the system board.

## Rear panel components



Item	Component	Description
1	Padlock eye	To lock the chassis cover and prevent access to the internal components, attach a padlock here.
2	Kensington security slot	To secure the server to a heavy or immovable object, connect an anti-theft security cable here.
3	Power jack	Connects the power cord.
4	Expansion slot 2, PCIe3 x4 (1)	For additional hardware capabilities, install a compatible low-profile PCIe expansion board here. This expansion slot supports expansion boards with a physical connector link widths of up to x16. <sup>1</sup>
5	Expansion slot 1, PCIe3 x8 (8, 4, 1)	For additional hardware capabilities, install a compatible low-profile PCIe expansion board here. This expansion slot supports expansion boards with a physical connector link widths of up to x16. <sup>1</sup>
6	Video port	Connects to an analog VGA monitor or projector.
7	Display port 1	Connects to a digital display device, such as a high-resolution set top boxes or TV displays. <sup>2</sup>

*Table Continued*



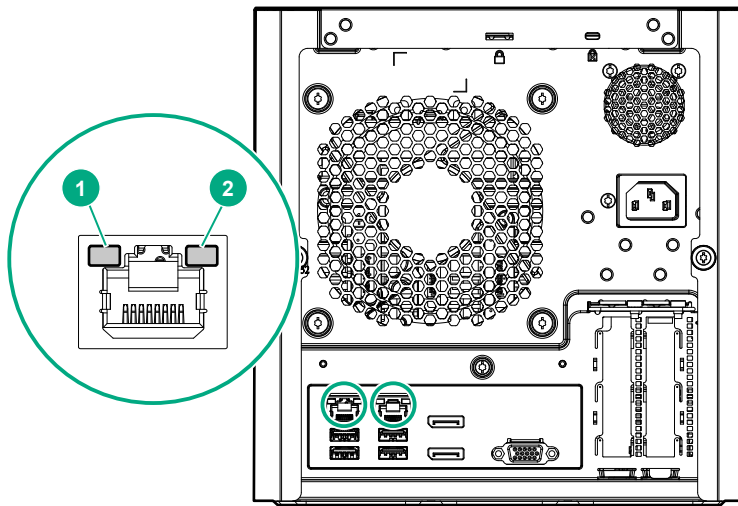
Item	Component	Description
8	Display port 2	Connects to a digital display device, such as a high-resolution set top boxes or TV displays. <sup>2</sup>
9	USB 2.0 ports (2)	Connect USB 2.0 devices to these ports.
10	USB 3.0 ports (2)	Connect USB 3.0 devices to these ports. USB 3.0 support after POST varies by operating system.
11	NIC port 1 (1 Gb)	Connect an Ethernet cable here to connect the server to a wired network. <sup>3</sup>
12	NIC port 2 (1 Gb)	Connect an Ethernet cable here to connect the server to a wired network. <sup>3</sup>

<sup>1</sup> This expansion slot is open-ended, which enables down-plugging. Down-plugging means a larger-width expansion board can be installed in a smaller-width connector. For this server, the expansion slot supports low-profile expansion boards with a physical connector link width of up to  $\times 16$ . The board operates at the highest common negotiable link width specified for the slot.

<sup>2</sup> To support 4K resolution at a full 60 Hz frame rate, this Display port requires dual-channel memory configuration. Single-channel memory configuration will only support up to 30 Hz frame rate.

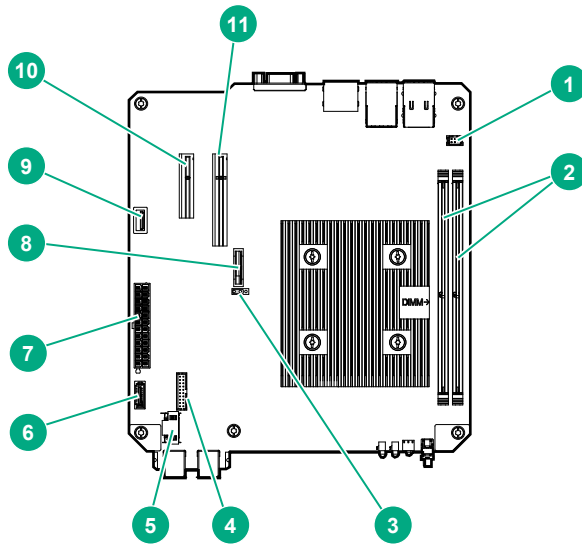
<sup>3</sup> This NIC port supports 10/100/1000 Mbps data transfer rate per port.

## Rear panel LEDs



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

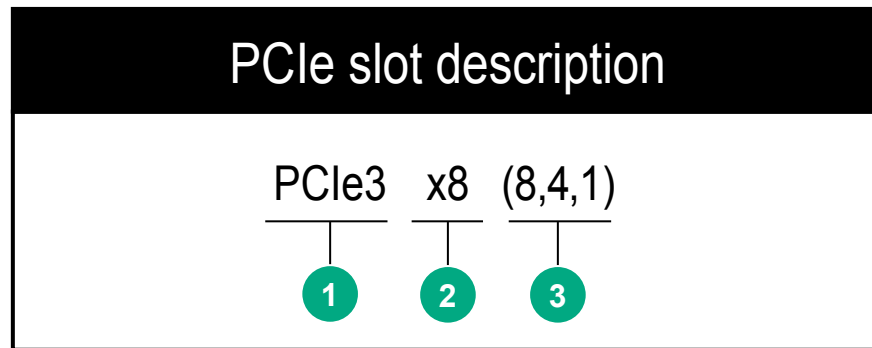
# System board components



Item	Component	Description
1	Fan connector	Connects the fan cable.
2	DIMM slots	These slots support standard UDIMMs with ECC only.
3	CMOS header	Use the jumper on this header to clear the CMOS.
4	TPM connector	This connector supports the TPM 2.0 option for data security solution.
5	LFF/SFF drive SATA port	Connects the LFF/SFF drive SATA cable.
6	Optical drive or SSD SATA port	Connects the optical drive or SSD SATA cable.
7	System board power connector	Connects the power supply cable.
8	System battery	This battery provides power to the server real-time clock and BIOS settings.
9	Internal USB 2.0 port	Connect internal USB devices to this port.
10	Expansion slot 2, PCIe3 x4 (1)	For additional hardware capabilities, install a compatible low-profile PCIe expansion board here. This expansion slot supports expansion boards with a physical connector link widths of up to x16. <sup>1</sup>
11	Expansion slot 1, PCIe3 x8 (8, 4, 1)	For additional hardware capabilities, install a compatible low-profile PCIe expansion board here. This expansion slot supports expansion boards with a physical connector link widths of up to x16. <sup>1</sup>

<sup>1</sup> This expansion slot is open-ended, which enables down-plugging. Down-plugging means a larger-width expansion board can be installed in a smaller-width connector. For this server, the expansion slot supports low-profile expansion boards with a physical connector link widths of up to x16. The board operates at the highest common negotiable link width specified for the slot.

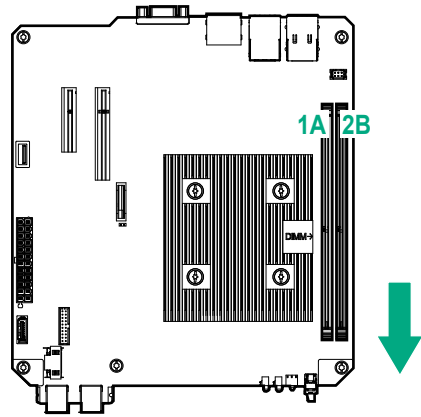
## PCIe slot description



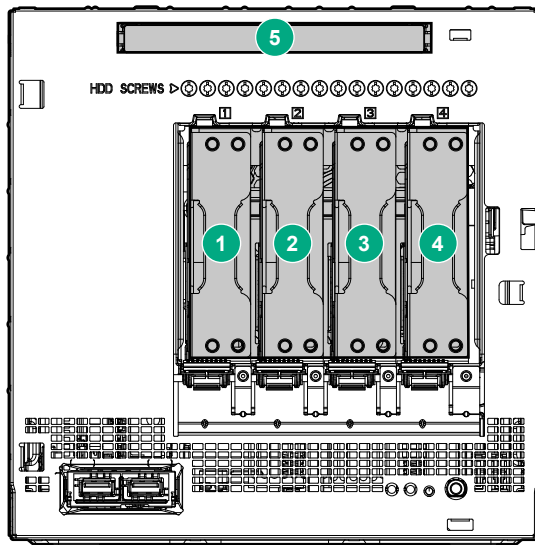
Item	Description	Definition
1	PCI Express version	<p>Each PCIe version corresponds to a specific data transfer rate between the processor and peripheral devices. Generally, a version update corresponds to an increase in transfer rate.</p> <ul style="list-style-type: none"> <li>• PCIe 1.x</li> <li>• PCIe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

## DIMM slot locations

The DIMM slots are numbered 1 and 2. The arrow in the following illustration points to the front of the server.



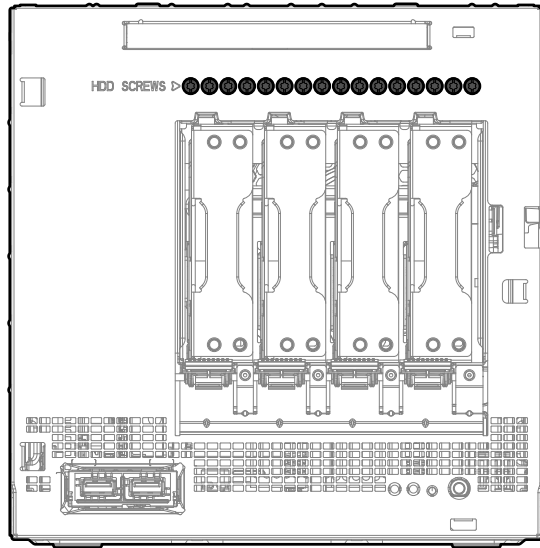
## Drive numbering



Item	Description
1-4	LFF/SFF drives
5	Solid state drive or optical disc drive

## Drive screws

There are 16 T-15 Torx screws located above the drive bays. Use these screws to install LFF or SFF drives in the server.



# Setup

This chapter describes the initial setup procedures to prepare the server for operation.

## Optional services

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

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

- Foundation Care – Keep systems running.

The time commitment for this service might vary depending on the site's geographical region. For more service information available at your site, contact your local **HPE support center**.

- Deployment service for both hardware and software.
- HPE Education Services – Help train your IT staff.

For more information on HPE support services, see the HPE Pointnext website:

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

## Initial server setup overview

### Procedure

1. **Unpack the server shipping carton.**
2. If applicable, install any hardware options that are shipped separately from the server.  
For detailed option installation instructions, see the relevant section in **Hardware options installation** on page 31.
3. **Review the initial server setup prerequisites.**
4. **Connect the I/O devices.**
5. **Connect the network cable.**
6. **Connect the power cord.**
7. **Power on the server for the first time.**
8. **Install an operating system (OS).**
9. As a best practice, Hewlett Packard Enterprise recommends that you **install the latest firmware, drivers, and system software before using the server for the first time.**
10. **Register the server.**

## Unpacking the server shipping carton

Unpack the server shipping carton. The contents of the server shipping carton include:

- Server
- Power cord
- Printed setup documentation

# Prerequisites for the initial server setup

## Procedure

- Verify that the optimum environmental requirements are satisfied.**
- Review and observe the server warnings and cautions.**
- Prepare the following items:
  - Keyboard, mouse, and monitor
  - Ethernet cables of an appropriate length for each of the LAN and/or WAN connections.
  - Verify the network settings needed to integrate the server into the site network, in particular from an IP addressing perspective and from a domain perspective.
  - Verify that there are sufficient ports available on the devices to which the server will be connected (for example, router, LAN switch).

## Optimum environment

When installing the server, select a location that meets the environmental requirements described in this section.

## Site requirements

The server may be located in an office space or a purpose-made equipment room. The location must:

- Comply with local health and safety regulations.
- Be clean, tidy, and free of excessive dust and vibration.
- Be in an area in which the server cannot easily be disconnected from its power source.
- Not be adjacent to or underneath any area or piece of equipment where liquid is stored.
- Not be in a place where the server might be bumped, scratched, or disturbed.
- Be within an area that is ideally locked or at minimum not accessible to unauthorized personnel.
- Be within patching distance, directly or via cable management cross-patches, of the location of the WAN connection and the switch that supplies the office/room floor network ports.

## Space and airflow requirements

Leave at least a 10 cm (4 in) clearance space at the front and back of the server for proper ventilation.

---

### CAUTION:

The server draws in cool air through the ventilation openings on the front side, and expels warm air through the ventilation openings on the rear side. Do not block these openings. Failure to observe this caution will result in improper airflow and insufficient cooling that can lead to thermal damage.

---

## 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 TMRA for most server products is 35°C (95°F). The temperature in the room where the server 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 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, see the product rating label or the user documentation supplied with that option.

---

**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.

---

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

- Balance the server power load between available AC supply branch circuits.
- Do not allow the overall system AC current load to exceed 80% of the branch circuit AC current rating.
- Do not use common power outlet strips for this equipment.
- Provide a separate electrical circuit for the server.

## 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.

## Connecting the I/O devices

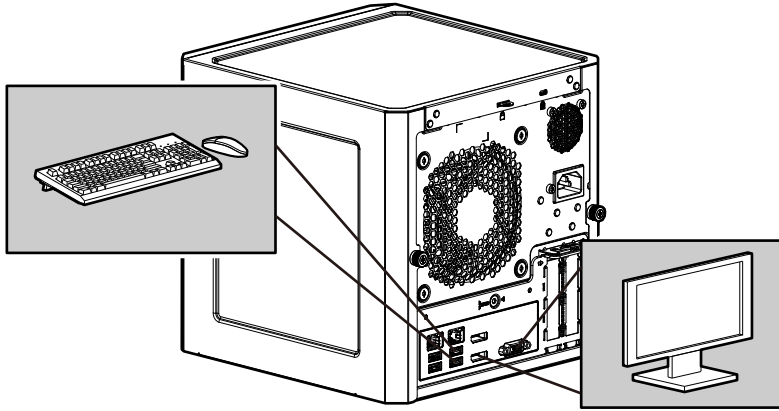
### About this task

To view and navigate the initial server setup screens, connect I/O devices to the server.

### Procedure

1. Connect a keyboard and mouse to the USB ports.
2. Connect a monitor to the VGA or Display port.

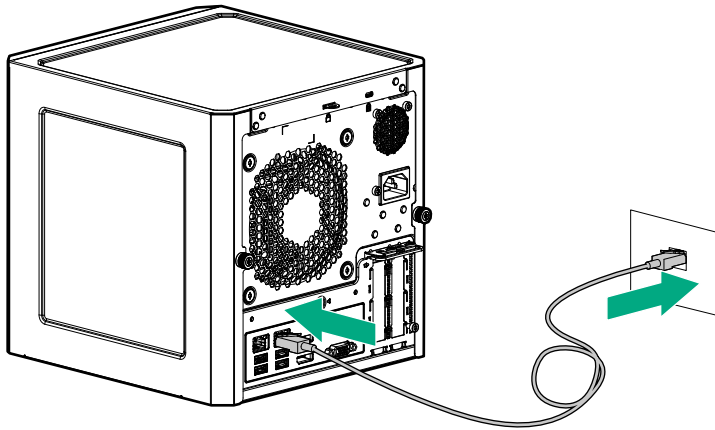




## Connecting the network cable

### Procedure

1. Connect one end of the network cable to the NIC port.
2. Connect the other end of the network cable to a network jack or a network device such as router or LAN switch.



# Connecting the power cord

## About this task



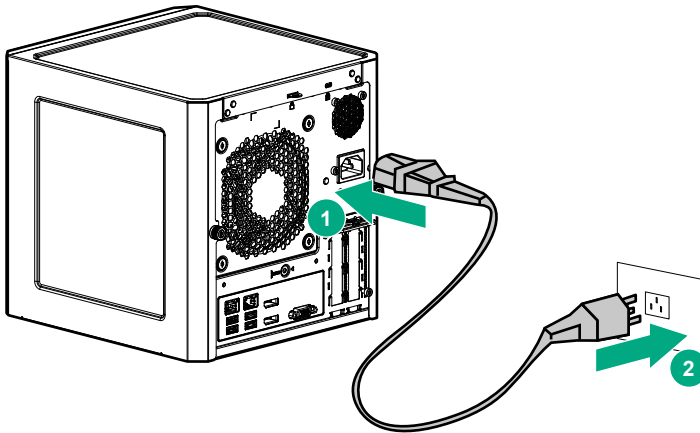
### WARNING:

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.

## Procedure

1. Connect the power cord to the server power jack.
2. Connect the power cord to the AC power source.



# Powering on the server for the first time

## Procedure

1. If you are installing an operating system from a bootable media, insert the media into the server.
2. Press the Power On/Standby button.
3. Verify that the system power LED changes to green.
4. During the initial boot, on the enter setup prompt, press the **F2** or **Del** key to access the Aptio Setup Utility and do one of the following:
  - Modify the default BIOS configuration settings.
  - Access the preloaded ClearOS image.
  - Adjust the boot order to select the OS bootable media.

# Installing an operating system

To operate properly, the server must have a supported operating system. For information on supported operating systems, see the Hewlett Packard Enterprise website:

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

This server supports Class 2 UEFI implementation. UEFI Class 2 implementation supports both UEFI boot mode and legacy BIOS boot mode. The boot mode is configured in the Aptio Setup Utility. When the server is configured for UEFI boot mode, observe the appropriate operating system, boot mode, network device, and controller requirements. For more information on these requirements, see the *Important UEFI Requirements (for the HPE ProLiant MicroServer Gen10)* on the Hewlett Packard Enterprise Information Library:

<http://www.hpe.com/info/UEFI/docs>

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

- If you are planning to install ClearOS, there are two install scenarios:
  - For a server that shipped with ClearOS, **boot the server to the preloaded ClearOS image**.
  - For a server that does not have ClearOS preloaded, download the software from the Hewlett Packard Enterprise website:

<http://www.hpe.com/servers/clearos>

ClearOS is a Linux-based OS with a web-based interface with its own application marketplace for small to medium businesses. For detailed ClearOS installation instructions, see the *ClearOS 7 on HPE ProLiant Servers Installation Guide* at:

<http://www.hpe.com/support/ClearOS-IG>

- If you are planning to install another OS, **boot directly from the OS installation media**.

This installation media can either be an optical disc or a USB drive. If you are using an OS installation disc and the server does not have an internal optical drive installed, an external USB optical drive is required.

## Install the preloaded ClearOS image

### Procedure

1. On the Aptio Setup Utility screen, select the Boot menu.
2. Under Boot Option Priorities, verify that Boot Option #1 is set as [ClearOS Utilities].  
If it is not set, select Boot Option #1, press the Enter key, and then change the setting to [ClearOS Utilities].
3. To confirm the change and exit the utility, press the F4 key.  
The server automatically reboots to the selected device.
4. Follow the OS installation wizard instructions.

## Install an OS from a bootable installation media

### Procedure

1. On the Aptio Setup Utility screen, select the **Boot** menu.
2. Under **Boot Option Priorities**, verify that **Boot Option #1** is set to the OS installation media device.  
If it is not set, select **Boot Option #1**, press the **Enter** key, and then change the setting.
3. To confirm the change and exit the utility, press the **F4** key.  
The server automatically reboots to the selected device.
4. Follow the OS installation wizard instructions.

## Installing the latest system software and firmware

As a best practice, Hewlett Packard Enterprise recommends that you install the latest firmware, drivers, and system software before using the server for the first time. To get the latest firmware and software updates, see the server download page:

<http://www.hpe.com/downloads/microservergen10>

## Registering the server

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

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

# Operations

This chapter describes the hardware operations carried out prior to and after installing or removing a hardware option, or performing a server maintenance or troubleshooting procedure.

Before performing these hardware operations, review and observe the server warnings and cautions.

## Server warnings and cautions

---

**WARNING:**

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

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**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:**

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

---

**CAUTION:**

To prevent improper cooling and thermal damage, do not operate the server with the media bay blank, chassis cover, or the front bezel removed.

---

**CAUTION:**

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

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**CAUTION:**

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

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## Electrostatic discharge

### Preventing electrostatic discharge

**About this task**

To prevent damaging the system, be aware of the precautions you must follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

## Procedure

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

## Grounding methods to prevent electrostatic discharge

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

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

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

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

## Power up the server

Press the Power On/Standby button.

The server exits standby mode and applies full power to the system. The system power LED changes to green.

## Power down the server

### Prerequisites

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

### Procedure

- 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.

The system power LED changes to red indicating that the server is in standby mode. Auxiliary power is still present in the system in this mode.

# Prepare the server for hardware installation or removal

## Procedure

1. **Power down the server** on page 22.
2. Disconnect the power cord from the AC source, and then from the server.
3. Disconnect all peripheral cables from the server.
4. If installed, unlock and remove the security padlock and/or the Kensington security lock.

For more information, see the lock documentation.

# Prepare the server for operation

## Procedure

1. If removed, attach the security padlock and/or the Kensington security lock.  
For more information, see the lock documentation.
2. Connect all peripheral cables to the server.
3. Connect the power cord to the server power jack, and then to the AC source.
4. Secure the power cord and rear panel cables based on the standard cable management practices.
5. **Power up the server** on page 22.

# Remove the front bezel

To access the drive bays, remove the front bezel.

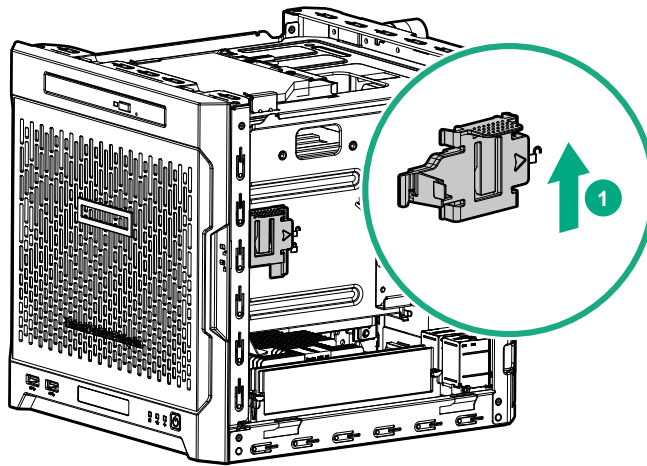
## Removing a locked front bezel

### Prerequisites

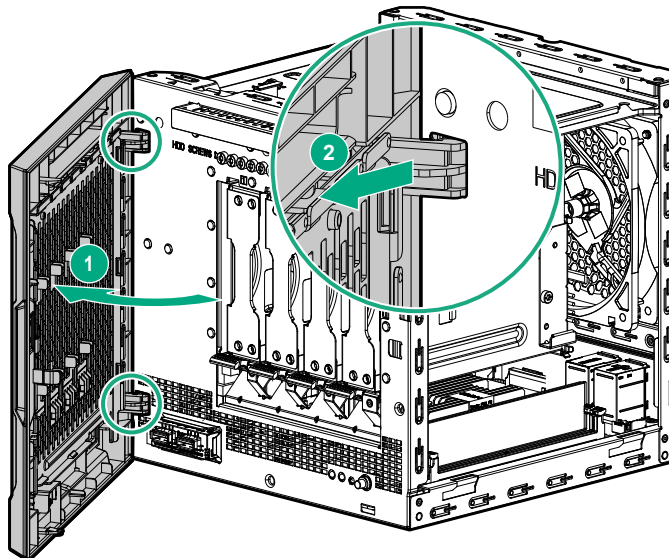
1. **Power down the server** on page 22.
2. Disconnect the power cord from the AC source, and then from the server.
3. Disconnect all peripheral cables from the server.
4. **Remove the chassis cover** on page 26.

### Procedure

1. To unlock the front bezel from the chassis, slide the release tab upward.



2. Open the front bezel.
3. To completely detach the bezel from the front panel, release the bezel hinges from the chassis.  
Retain the bezel for later use.



## Removing an unlocked front bezel

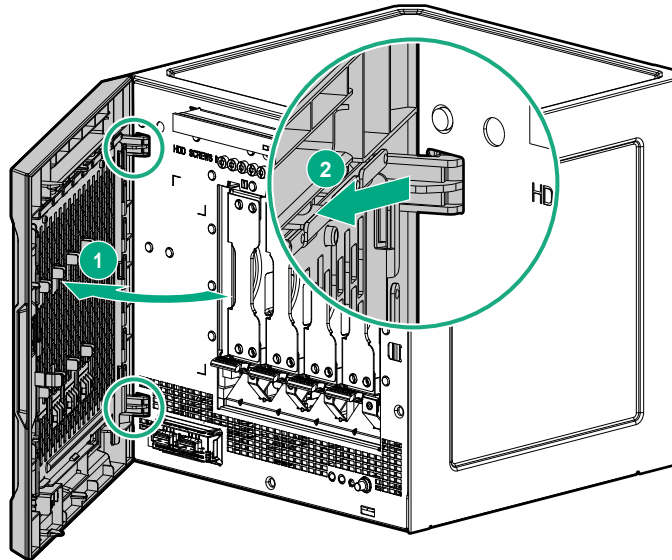
### Prerequisites

1. **Power down the server** on page 22.
2. Disconnect the power cord from the AC source, and then from the server.
3. Disconnect all peripheral cables from the server.

### Procedure

1. Open the front bezel.
2. To completely detach the bezel from the front panel, release the bezel hinges from the chassis.  
Retain the bezel for later use.





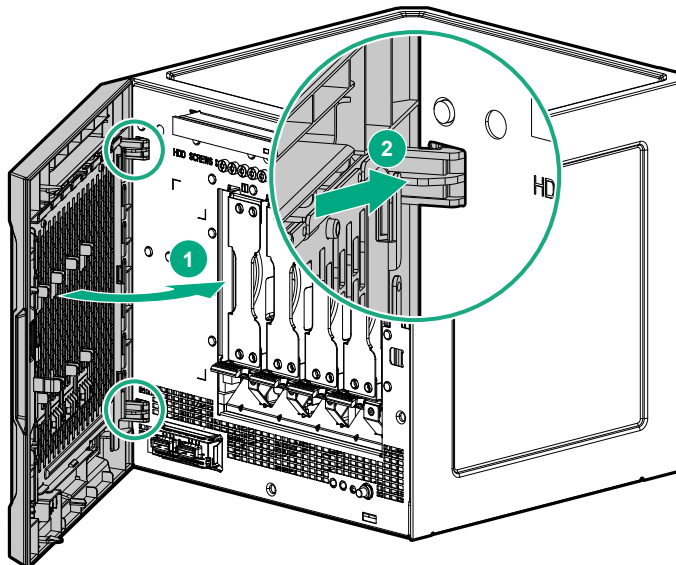
## Install the front bezel

### About this task

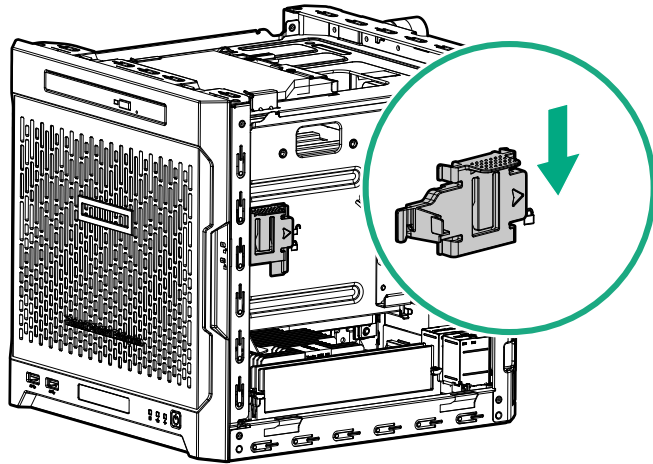
To cover the drive bays, install the front bezel.

### Procedure

1. Attach the bezel to the front panel, and then close it.



2. If you prefer to secure the bezel to the chassis, do the following:
  - a. If installed, **remove the chassis cover**.
  - b. Slide the release tab downwards to lock the bezel to the chassis.



c. **Install the chassis cover** on page 27.

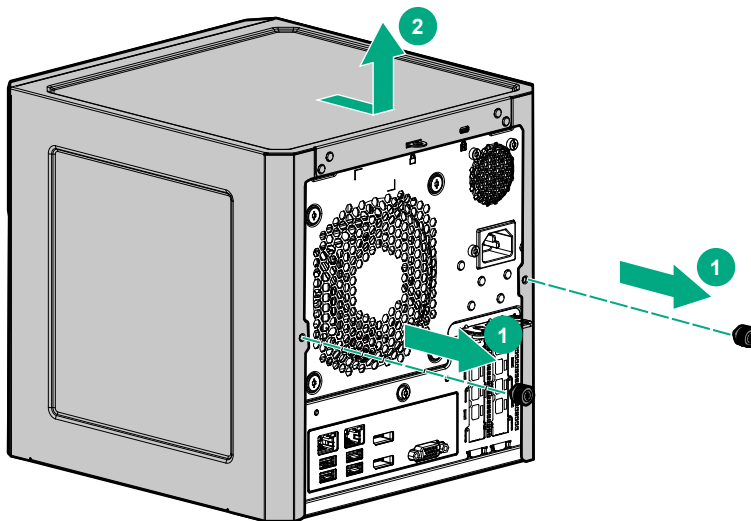
## Remove the chassis cover

### About this task

To access the front bezel lock and the internal components, remove the chassis cover.

### Procedure

1. If installed, unlock and remove the security padlock and/or the Kensington security lock.  
For more information, see the lock documentation.
2. Remove the chassis cover thumbscrews.  
If the thumbscrews are too tight, use a T-15 screwdriver to remove it.
3. Slide the chassis cover toward the rear panel, and then lift it from the server.



# Install the chassis cover

To prevent access to the front bezel lock and the internal components, install the chassis cover.

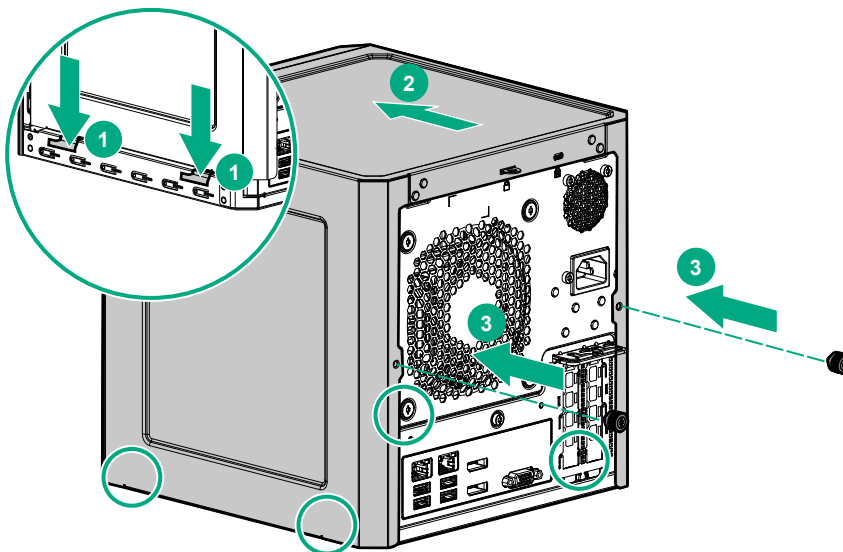
## Install the chassis cover

### Prerequisites

1. Verify that all internal cables are properly connected and are secured in their respective cable ties.
2. Verify that the drive cables are not blocking the fan blades.

### Procedure

1. Insert the tabs on the bottom left and right sides of the chassis cover into the corresponding slots on the chassis.
2. Slide the chassis cover towards the front panel.
3. Install the chassis thumbscrews.



4. If removed, install the security padlock and/or the Kensington security lock.  
For more information, see the lock documentation.

# Install the system board assembly

To secure the system board inside the chassis, install the system board assembly.

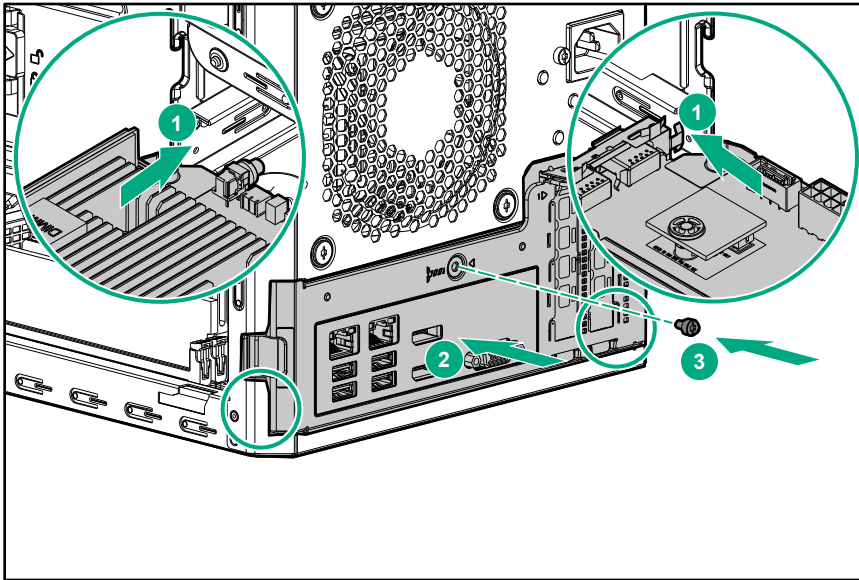
## Install the system board assembly

### Prerequisites

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

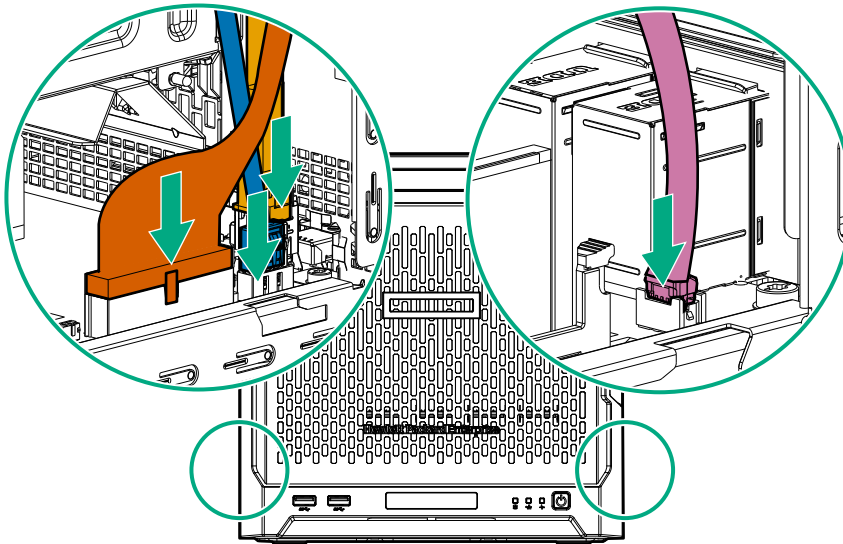
### Procedure

1. Slide the system board assembly into the chassis.
2. Press against the system board assembly until it clicks into place.
3. Install the system board assembly screw.



4. Connect the following system cables:

- Power supply cable
- Optical drive or SSD SATA cable (optional)
- LFF/SFF drive SATA cable – This cable can either be connected to the system board or to an installed HBA.
- Fan cable



5. If removed, install the internal USB device.

## Remove the system board assembly

To install or remove hardware components on the system board or to access the CMOS header, remove the system board assembly.

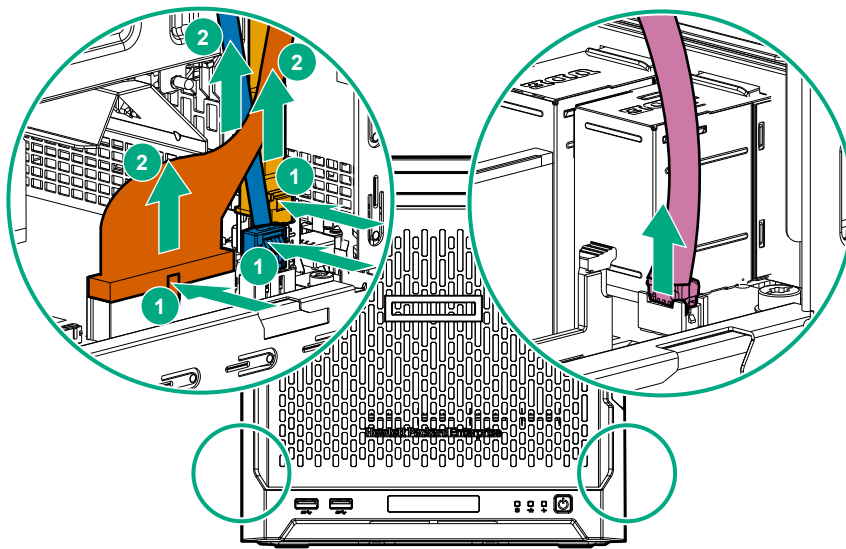
# Remove the system board assembly

## Prerequisites

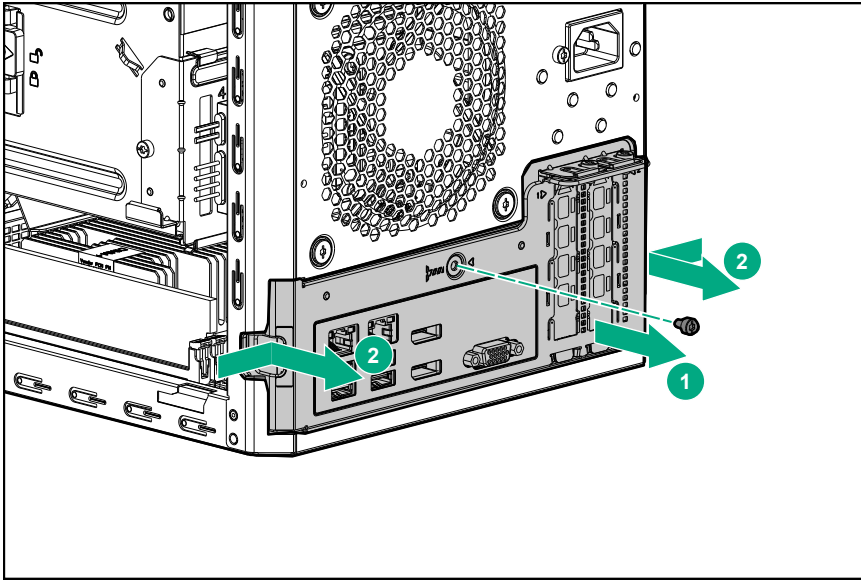
Before you perform this procedure, make sure that you have a T-15 Torx screwdriver available.

## Procedure

1. If installed, remove the internal USB device.
2. To serve as a reference for system cable connections when the system board assembly is installed back into the server, take a picture of the current system board cable connections.
3. Disconnect the following system cables:
  - Power supply cable
  - Optical drive or SSD SATA cable (optional)
  - LFF/SFF drive SATA cable – This cable can either be connected to the system board or to an installed HBA.
  - Fan cable



4. Remove the system board assembly screw.
5. Place a finger in the notch on both sides of the system board assembly, and then pull out the assembly.



# Hardware options installation

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

For more information on supported options, see the product QuickSpecs on the HPE ProLiant MicroServer Gen10 website at:

<http://www.hpe.com/server/microserver>

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

## 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.

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## Drive support information

This server only supports non-hot-plug drives. These drives are not designed to be installed or removed from the server while the system is still powered on. Power off the server before installing or removing a drive option.

From a drive interface standpoint, the embedded Marvell 88SE9230 PCIe to SATA 6Gb/s Controller supports SATA drives.

From a form factor standpoint, the server drive bays support 3.5-inch LFF drives. To support 2.5-inch SFF drives, **install the SFF-to-LFF drive converter option**.

To support a 7-mm SATA solid state drive in the media bay, **install the SSD enablement kit**.

## Drive installation guidelines

- Populate drive bays based on the drive numbering sequence. Start from the **drive bay with the lowest device number**.
- All drives grouped into the same drive array must meet the following criteria:
  - They must be either all hard drives or all solid state drives.
  - Drives should be the same capacity to provide the greatest storage space efficiency when drives are grouped together into the same drive array.
- The system automatically sets all device numbers.

## Installing an LFF drive

### About this task

To add internal data storage to the server, install one or more LFF drives in the drive bays.

## Procedure

1. **Power down the server** on page 22.
2. Disconnect the power cord from the AC source, and then from the server.
3. Disconnect all peripheral cables from the server.
4. **Remove the front bezel** on page 23.
5. **Install the LFF drive** on page 32.
6. **Install the front bezel** on page 25.
7. Connect all peripheral cables to the server.
8. Connect the power cord to the server power jack, and then to the AC source.
9. **Power up the server** on page 22.
10. Determine the status of the server drives from the **drive LED definitions**.
11. To configure drive arrays, do one of the following:
  - If the drives are connected to the LFF/SFF drive SATA port, use the **Marvell Storage Utility** on page 63 or the **Marvell BIOS Utility** on page 64.
  - If the drives are connected to an HPE Smart HBA or Smart Array controller option, use the **HPE Smart Storage Administrator** on page 63.

## Install the LFF drive

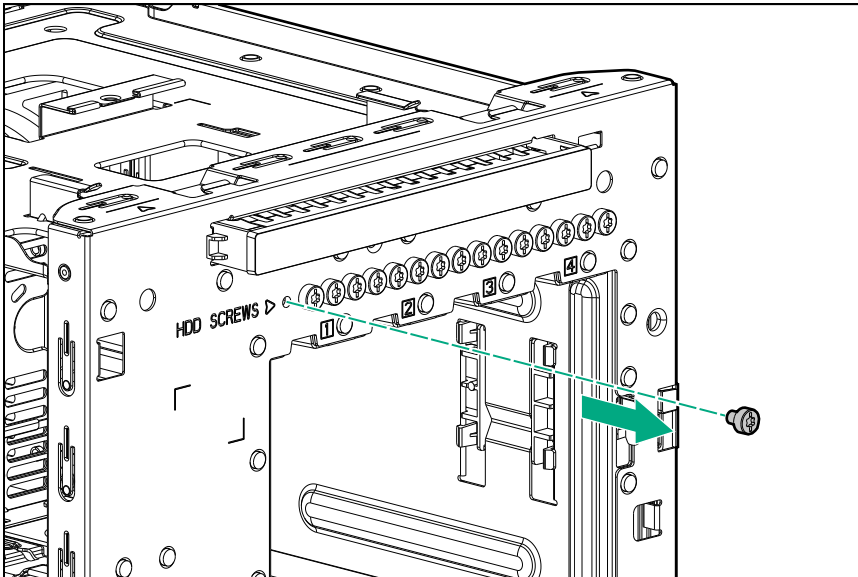
### Prerequisites

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

- T-15 Torx screwdriver
- LFF drive option

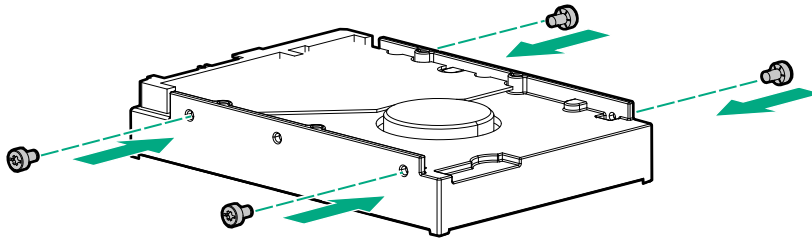
### Procedure

1. Remove four drive screws from the front panel.

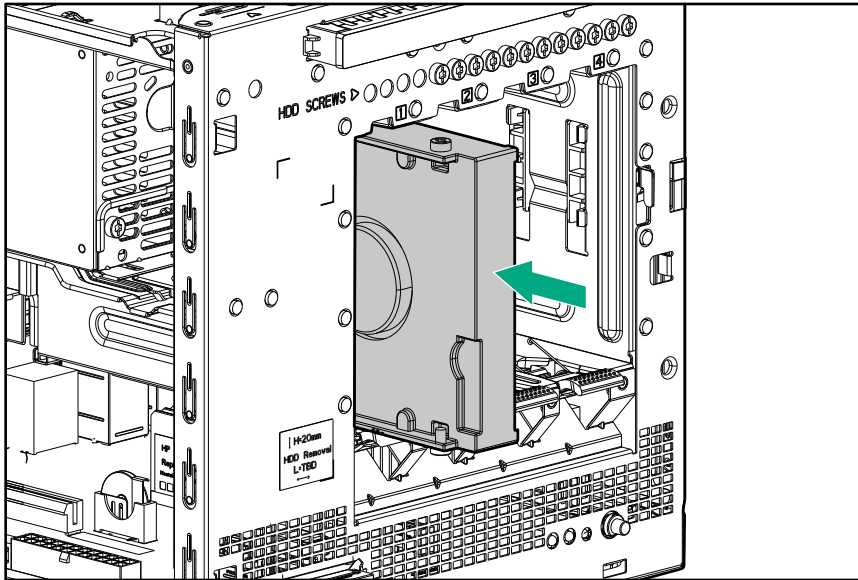


2. Install the screws in the drive.





3. Slide the drive into the drive bay until it clicks into place.



## Installing an SFF drive

### About this task

To install SFF drives in the drive bays, install the SFF drive converter option. In general, SFF drives give greater power and space savings. SFF drives can require as little as half the power and generate significantly less heat than LFF drives.

### Procedure

1. **Power down the server** on page 22.
2. Disconnect the power cord from the AC source, and then from the server.
3. Disconnect all peripheral cables from the server.
4. **Remove the front bezel** on page 23.
5. **Install the SFF drive** on page 34.
6. **Install the front bezel** on page 25.
7. Connect all peripheral cables to the server.
8. Connect the power cord to the server power jack, and then to the AC source.
9. **Power up the server** on page 22.
10. Determine the status of the server drives from the **drive LED definitions**.
11. To configure drive arrays, do one of the following:

- If the drives are connected to the LFF/SFF drive SATA port, use the **Marvell Storage Utility** on page 63 or the **Marvell BIOS Utility** on page 64.
- If the drives are connected to an HPE Smart HBA or Smart Array controller option, use the **HPE Smart Storage Administrator** on page 63.

## Install the SFF drive

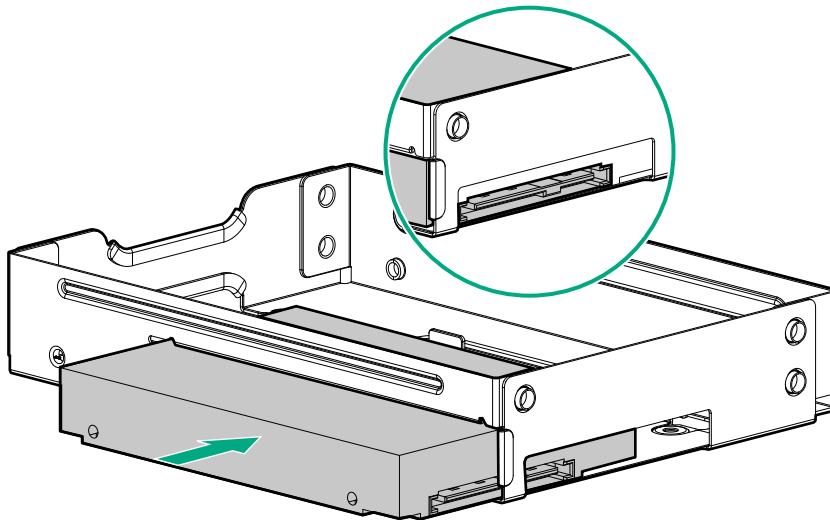
### Prerequisites

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

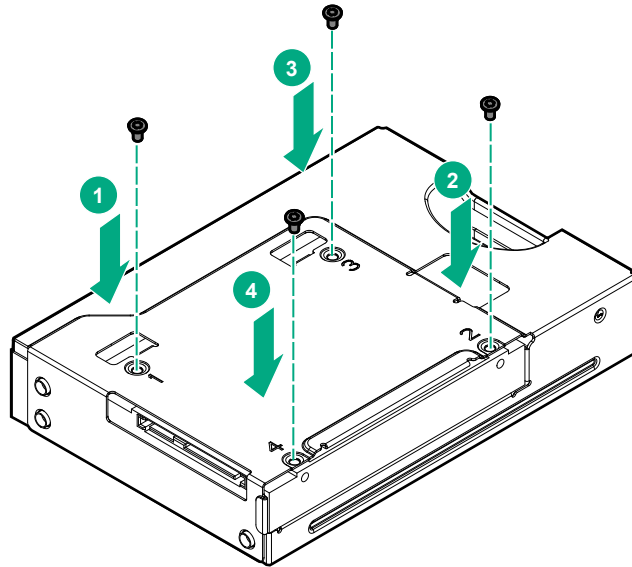
- T-10 Torx screwdriver
- T-15 Torx screwdriver
- SFF drive converter option kit. This kit includes:
  - Drive converter tray
  - T-10 screws (4)
- SFF drive option

### Procedure

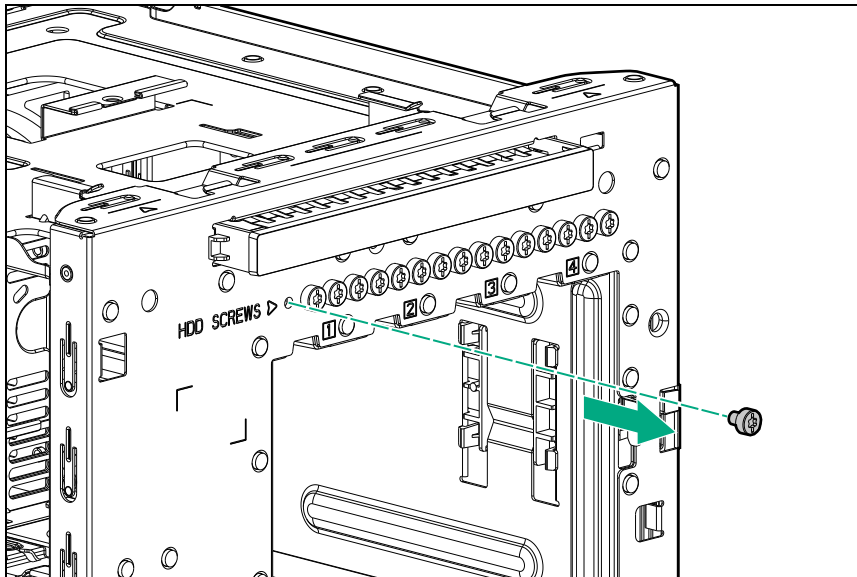
1. Install the SFF drive in the drive converter tray.



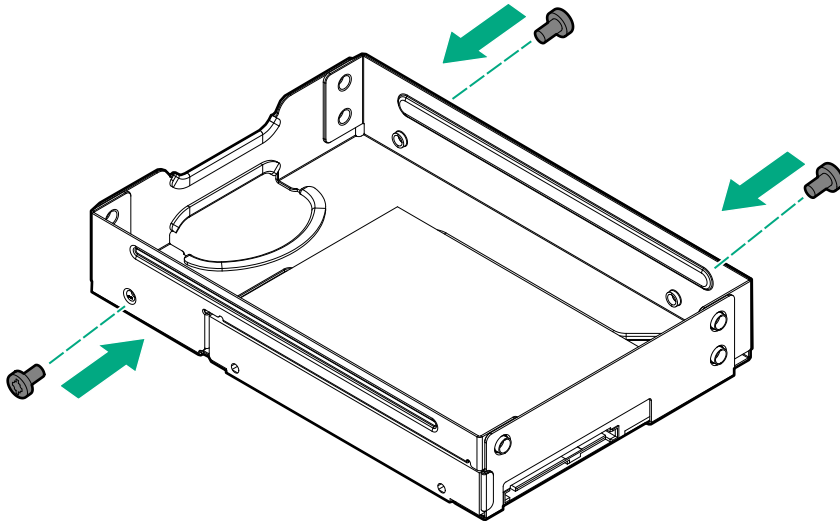
2. Follow the callout sequence in the following illustration to install the screws included in the converter kit on the bottom side of the converter tray.



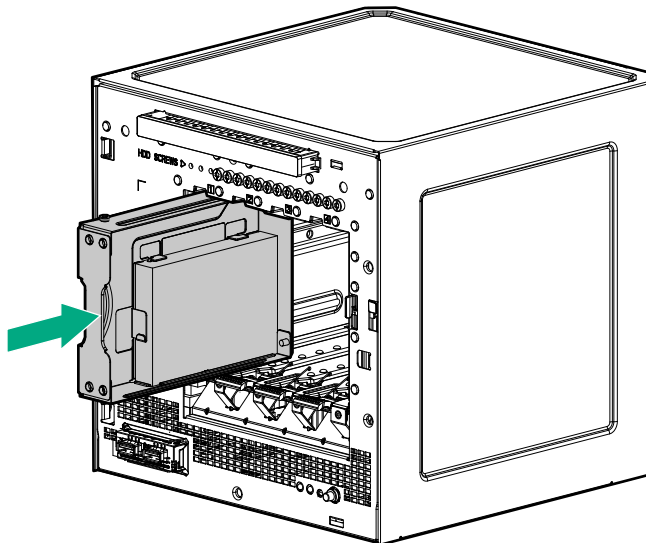
3. Remove three drive screws from the front panel.



4. Install the three screws removed from the front panel on the left and right sides of the converter tray.



5. Slide the drive into the drive bay until it clicks into place.



## Installing an SSD

### About this task

The media bay supports a 7-mm slim-type SATA solid state drive option. SSDs have no moving parts. Information is stored in microchips. Traditional hard disk drives use a mechanical arm with a read/write head to move around and read information from the right location on a rotating storage platters. This lack of rotating media in SSDs:

- Greatly reduces the SSD's power consumption
- Enable SSDs to tolerate significantly higher operating shock and vibration levels

SSDs are suitable for server workloads with highly random data under a variety of write-workload applications.

## Procedure

1. **Power down the server** on page 22.
2. Disconnect the power cord from the AC source, and then from the server.
3. Disconnect all peripheral cables from the server.
4. **Remove the chassis cover** on page 26.
5. **Install the SSD** on page 37.
6. **Install the chassis cover** on page 27.
7. Connect all peripheral cables to the server.
8. Connect the power cord to the server power jack, and then to the AC source.
9. **Power up the server** on page 22.

## Install the SSD

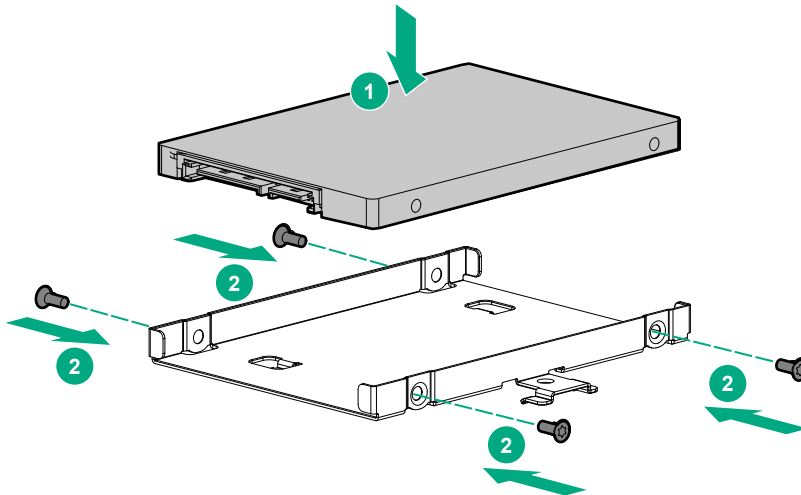
### Prerequisites

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

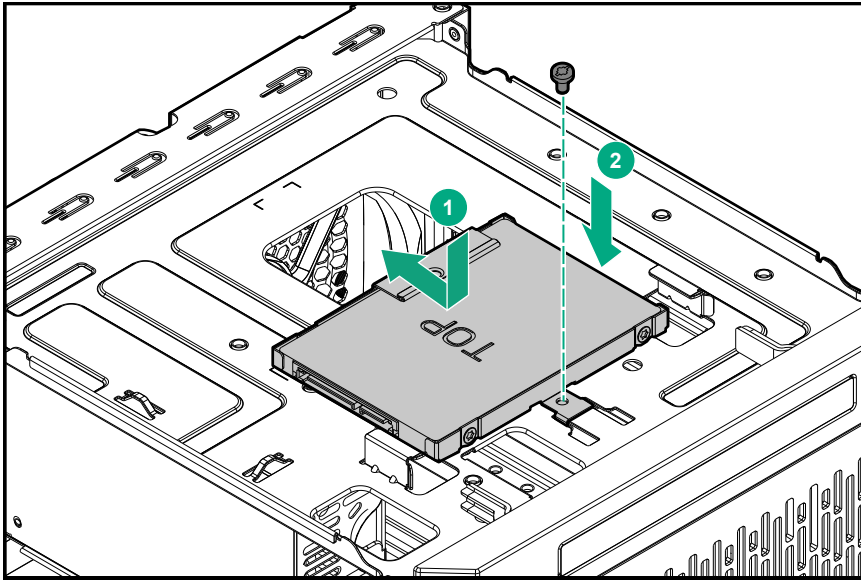
- T-10 Torx screwdriver
- T-15 Torx screwdriver
- SSD enablement option kit. This kit includes:
  - SSD tray
  - SSD power cable
  - SSD SATA cable
  - T-10 screws (4, for securing the SSD)
  - T-15 Torx screw (1, for securing the SSD tray)
- SSD option

### Procedure

1. Place the SSD in the SSD tray, and then install the SSD screws.

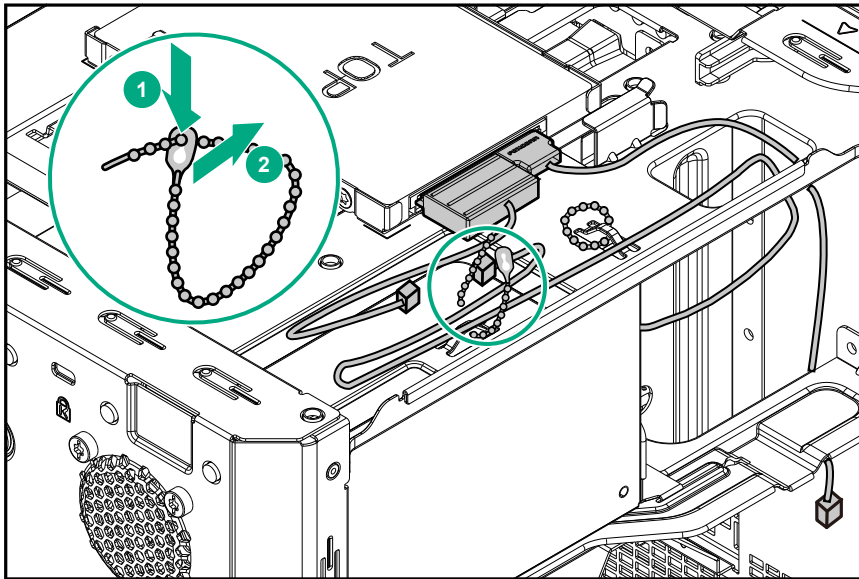


2. Install the SSD assembly in the media bay, and then secure it with the screw.

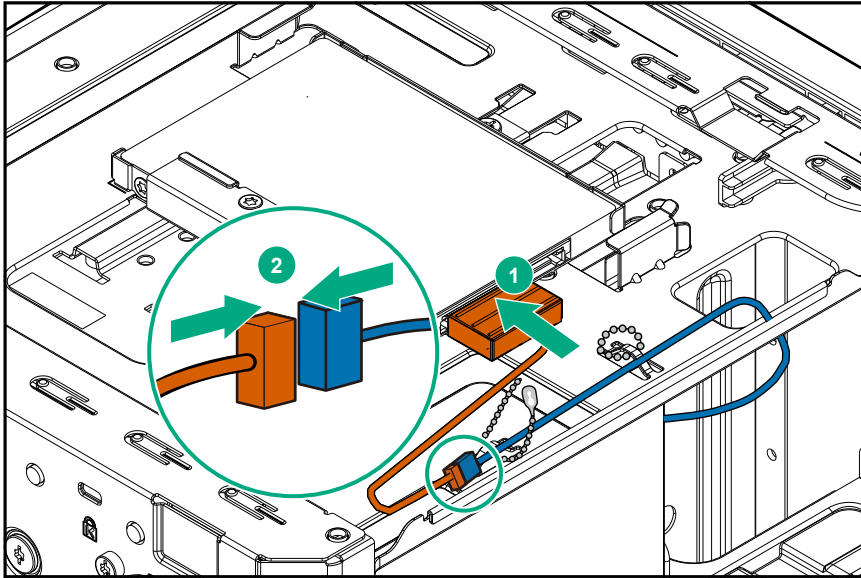


3. Connect the SSD power cable:

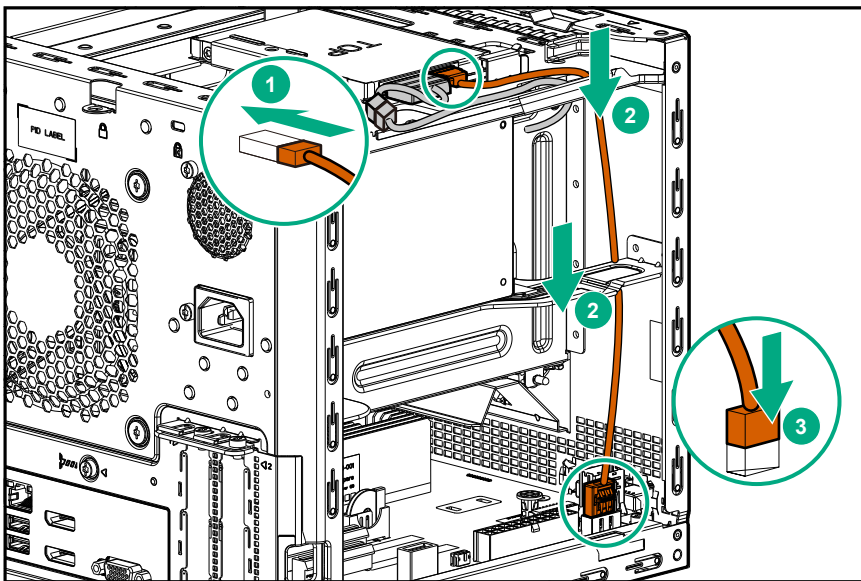
a. Open the cable ties.



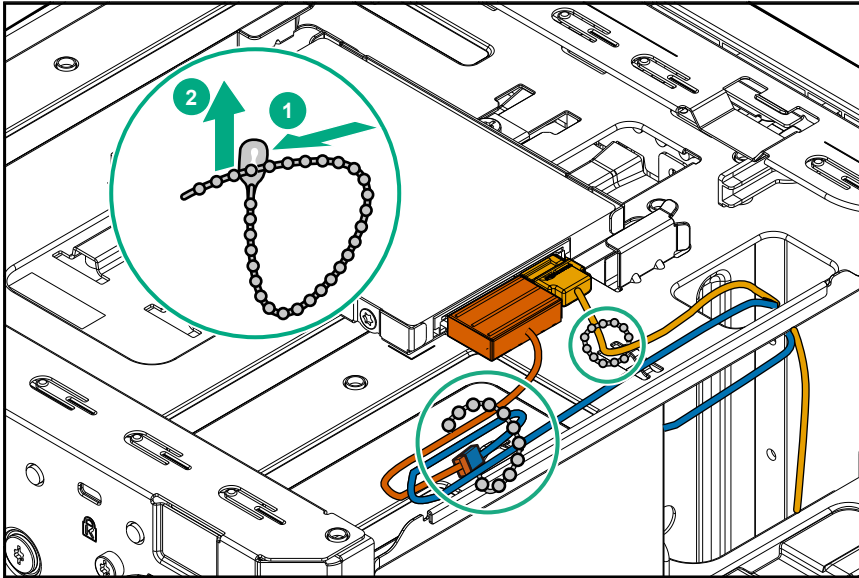
b. Connect the power cable to the SSD, and then to the power supply cable labeled P3.



4. Connect the SSD SATA cable:
  - a. Connect the SATA cable to the SSD.
  - b. Route the SATA cable through the left side chassis opening down to the system board.
  - c. Connect the SATA cable to the SATA port.



5. Bundle the extra length of the SSD power and SATA cables, and then secure them in the cable ties.



## Installing an optical drive

### About this task

The media bay supports a slim-type SATA optical drive option. This option allows you to retrieve or store data on optical discs like CDs and DVDs.

### Procedure

1. **Power down the server** on page 22.
2. Disconnect the power cord from the AC source, and then from the server.
3. Disconnect all peripheral cables from the server.
4. **Remove the chassis cover** on page 26.
5. **Remove the front bezel** on page 23.
6. **Install an optical drive** on page 40.
7. **Install the front bezel** on page 25.
8. **Install the chassis cover** on page 27.
9. Connect all peripheral cables to the server.
10. Connect the power cord to the server power jack, and then to the AC source.
11. **Power up the server** on page 22.

## Install an optical drive

### Prerequisites

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

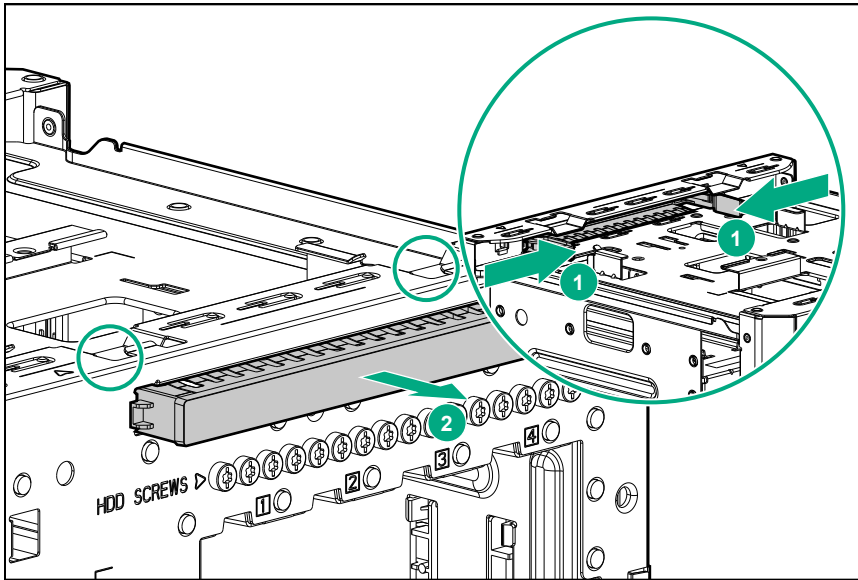
- T-15 Torx screwdriver
- Phillips No. 2 screwdriver
- Optical drive option kit. This kit includes:
  - Optical drive
  - Optical drive bracket
  - Phillips No. 2 screws (2, for securing the optical drive bracket)
  - T-15 screw (1, for securing the optical drive)



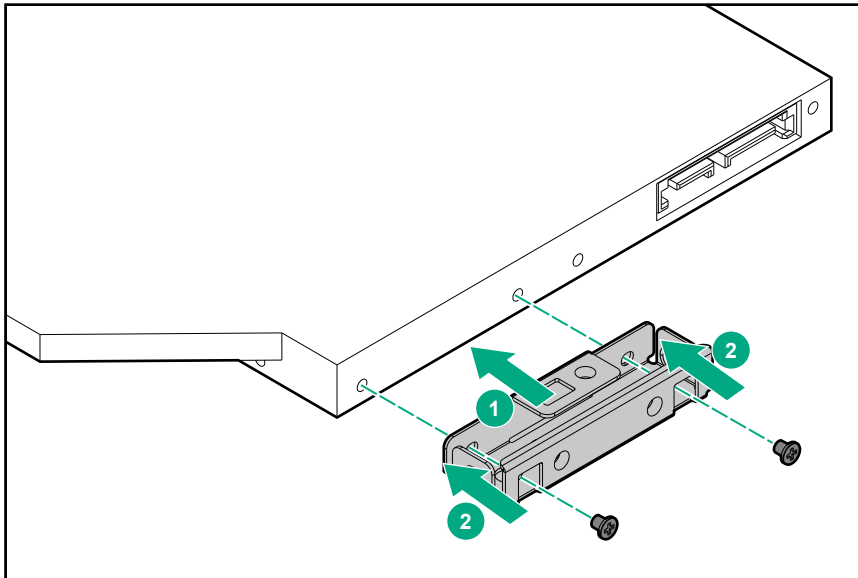
## Procedure

1. Facing the server, press and hold the release latches on both sides of the optical drive blank, and then push the blank out of the media bay.

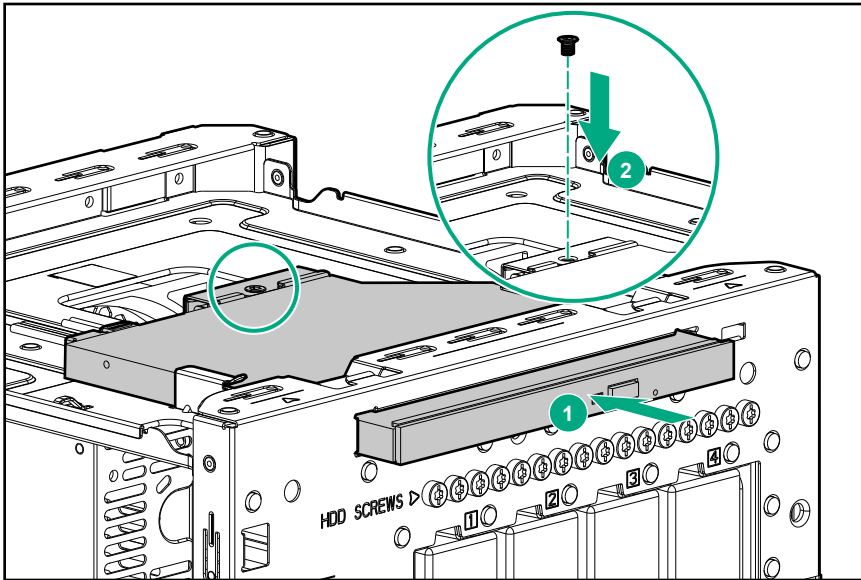
Retain the blank for future use.



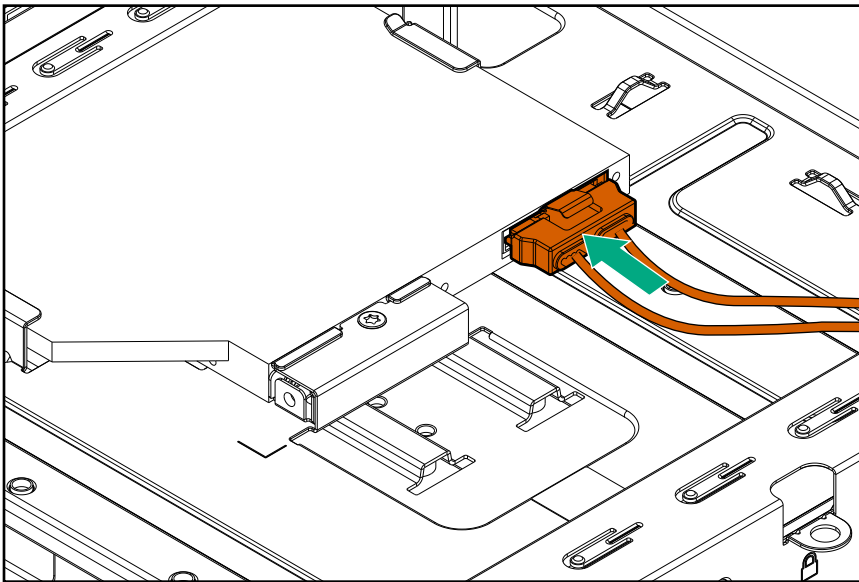
2. Attach the bracket to the optical drive.



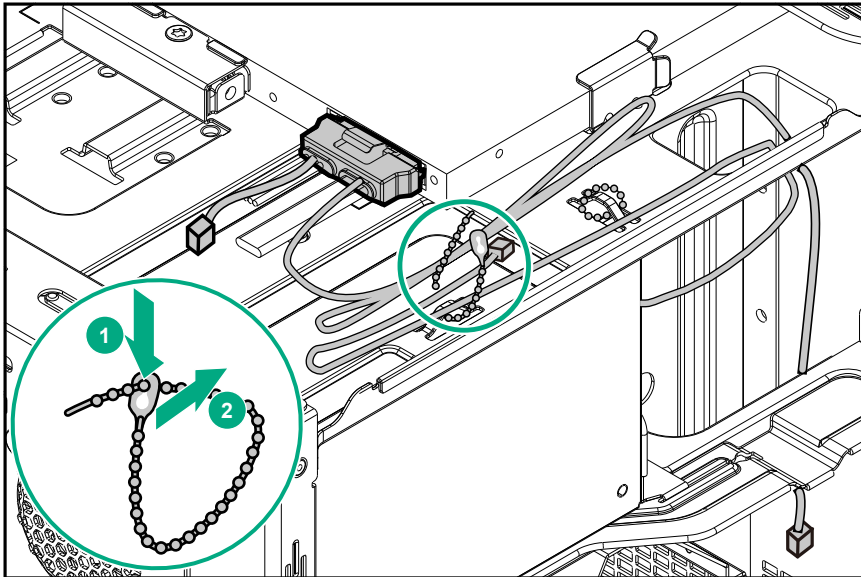
3. Slide the optical drive into the media bay.
4. Install the optical drive screw.



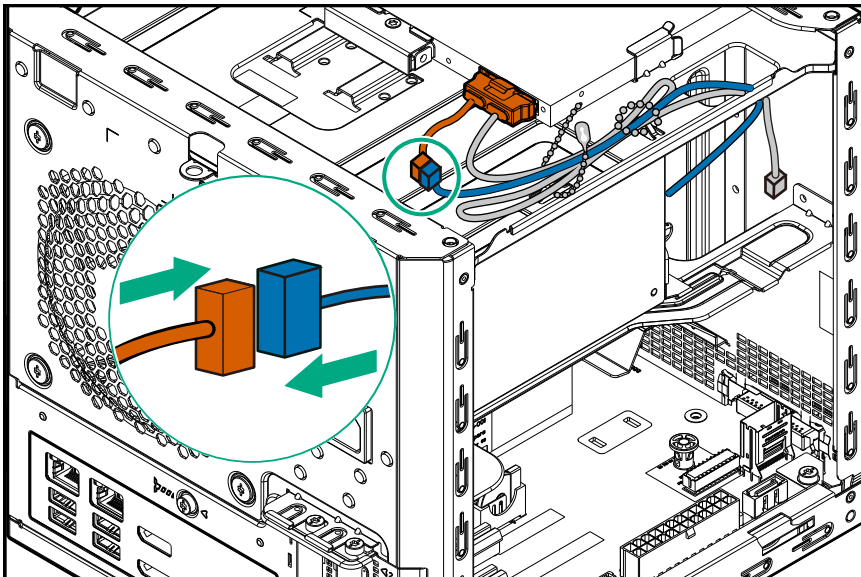
5. Connect the optical drive SATA Y-cable:
  - a. Connect the common end of the cable to the optical drive.



- b. Open the cable tie.

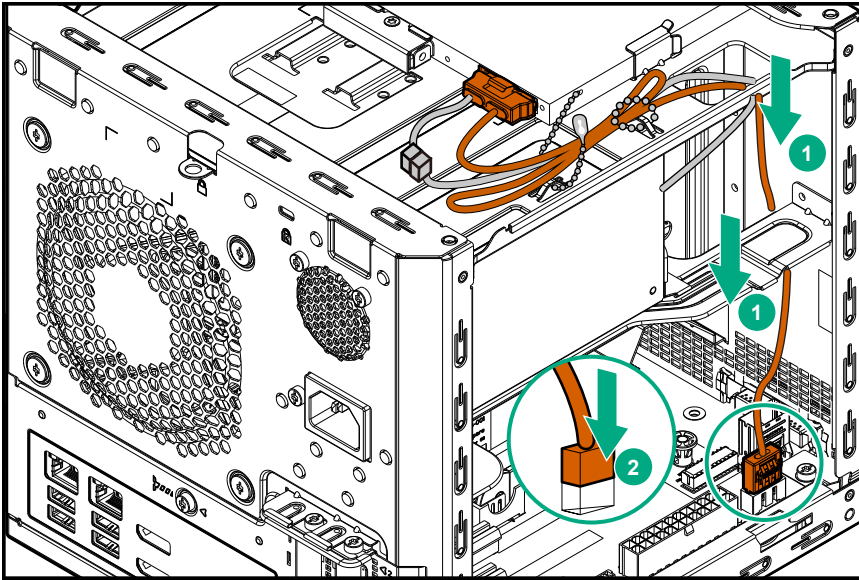


c. Connect the power end of the SATA cable to the power supply cable labeled P3.

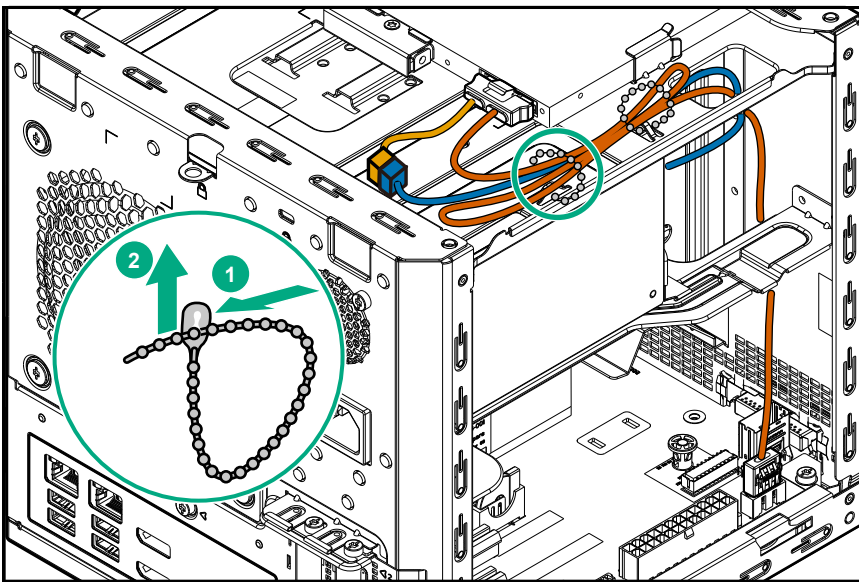


d. Route the data end of the SATA Y-cable through the left side chassis opening down to the system board.

e. Connect the data end of the cable to the SATA port.



- f. Bundle the extra length of the SATA Y-cable and the power supply P3 cable, and then secure them in the cable tie.



## Memory support

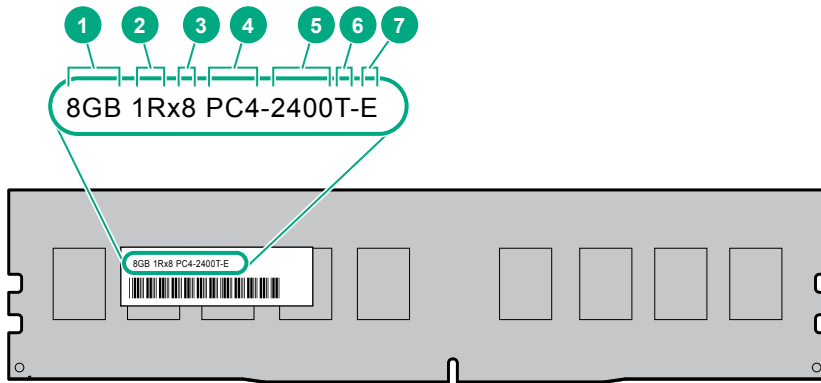
The server has two DIMM slots supporting standard UDIMMs with ECC for a maximum memory capacity of 32 GB.

For more information on the server memory support, see the Gen10 memory user guide on the Hewlett Packard Enterprise Information Library:

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

## DIMM 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 TSVLRDIMM)
7	DIMM type	R = RDIMM (registered) L = LRDIMM (load reduced) E = UDIMM (unbuffered ECC)

## DIMM ranks

To understand and configure memory protection modes properly, an understanding of DIMM rank is helpful. Some DIMM configuration requirements are based on these classifications.

A single-rank DIMM has one set of memory chips that is accessed while writing to or reading from the memory. A dual-rank DIMM is similar to having two single-rank DIMMs on the same module, with only one rank accessible at a time. A quad-rank DIMM is, effectively, two dual-rank DIMMs on the same module. Only one rank is accessible at a time. The server memory control subsystem selects the proper rank within the DIMM when writing to or reading from the DIMM.

Dual- and quad-rank DIMMs provide the greatest capacity with the existing memory technology. For example, if current DRAM technology supports 8 GB single-rank DIMMs, a dual-rank DIMM would be 16 GB, and a quad-rank DIMM would be 32 GB, and an octal-rank LRDIMM would be 64 GB.

LRDIMMs are labeled as quad- and octal-rank DIMMs. There are four and eight ranks of DRAM on the DIMM, but the LRDIMM buffer creates an abstraction that allows the DIMM to appear as a logical dual-rank DIMM to the system. This is called Rank Multiplication. The LRDIMM buffer also isolates the electrical loading of the DRAM from the system to allow for faster operation. These two changes allow the system to support up to three LRDIMMs per memory channel, providing for greater memory capacity and higher memory operating speed compared to quad-rank RDIMMs.

## DIMM handling guidelines

When handling a DIMM, observe the following guidelines.

- Avoid electrostatic discharge.
- Always hold DIMMs by the side edges only.
- Avoid touching the connectors on the bottom of the DIMM.
- Never wrap your fingers around a DIMM.
- Avoid touching the components on the sides of the DIMM.
- Never bend or flex the DIMM.

---

### CAUTION:

Failure to properly handle DIMMs can cause damage to the components on the DIMM, as well as the system board connector.

---

## DIMM installation guidelines

When installing a DIMM, observe the following guidelines.

- Before seating the DIMM, open the DIMM slot and align the DIMM with the slot.
- To align and seat the DIMM, use two fingers to hold the DIMM along the side edges.
- To seat the DIMM, use two fingers to apply gentle pressure along the top of the DIMM.

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

## Installing a DIMM

### About this task

The server uses memory to perform almost all of its operations. Upgrading the server memory capacity leads to faster boot-up, processing period, and timely responses to promote optimum system performance.

### Procedure

1. **Power down the server** on page 22.
2. Disconnect the power cord from the AC source, and then from the server.

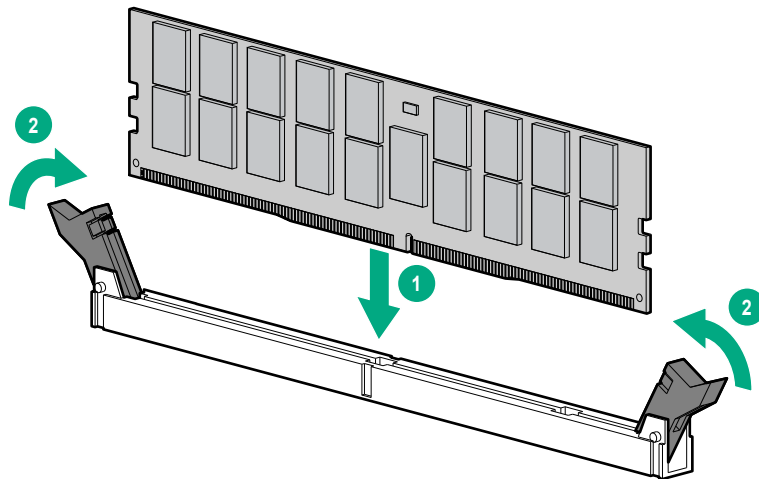
3. Disconnect all peripheral cables from the server.
4. **Remove the chassis cover** on page 26.
5. **Install the DIMM** on page 47.
6. **Install the chassis cover** on page 27.
7. Connect all peripheral cables to the server.
8. Connect the power cord to the server power jack, and then to the AC source.
9. **Power up the server** on page 22.
10. To configure the memory, use the **Aptio Setup Utility** on page 59. Select **Chipset > South Bridge > Memory Configuration**.

## Install the DIMM

### Procedure

1. Open the DIMM slot latches.
2. Align the notch on the bottom edge of the DIMM with the keyed surface of the DIMM slot, and then fully press the DIMM into the slot until the latches snap back into place.

The DIMM slots are structured to ensure proper installation. If you try to insert a DIMM but it does not fit easily into the slot, you might have positioned it incorrectly. Reverse the orientation of the DIMM and insert it again.



## Expansion board options

The server has two low-profile, open-ended PCIe3 expansion slots. Use these slots to install additional hardware capabilities such as:

- An HBA to enable advanced drive features.
- A GPU to accelerate the processing speed of your applications.
- A network adapter with advanced Ethernet connectivity features.

## Installing an expansion board

### Procedure

1. **Power down the server** on page 22.
2. Disconnect the power cord from the AC source, and then from the server.
3. Disconnect all peripheral cables from the server.
4. **Remove the chassis cover** on page 26.

5. **Remove the system board assembly** on page 28.
6. If the expansion board is shipped with an air baffle attached, **remove this baffle from the board**.
7. If the expansion board is shipped with a full-height bracket attached, **replace it with a low-profile one**.
8. **Install the expansion board**.
9. **Install the system board assembly** on page 27
10. Connect all necessary internal cabling to the expansion board.

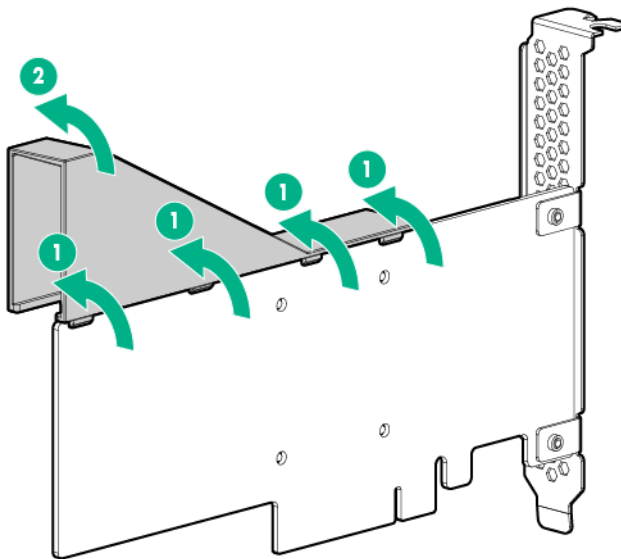
For more information on these cabling requirements, see the documentation that ships with the option.

11. **Install the chassis cover** on page 27.
12. Connect all peripheral cables to the server.
13. Connect the power cord to the server power jack, and then to the AC source.
14. **Power up the server** on page 22.

## Remove the air baffle from the expansion board

Remove the air baffle from the expansion board.

The number and location of the latches that secure the baffle to the board will vary depending on the expansion board. The illustration below is an example image only. See the expansion board documentation for model-specific information.



## Install a low-profile bracket on the expansion board

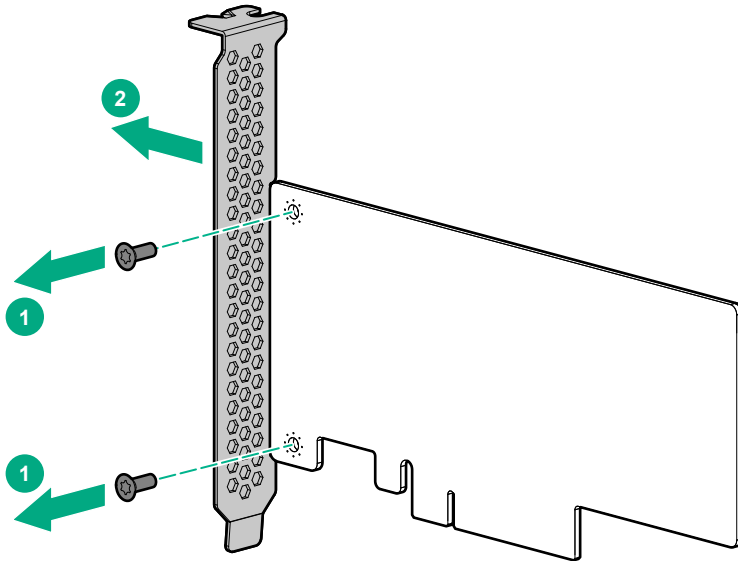
### About this task

The number and location of the bracket screws will vary depending on the expansion board. The illustrations below are example images only. See the expansion board documentation for model-specific information.

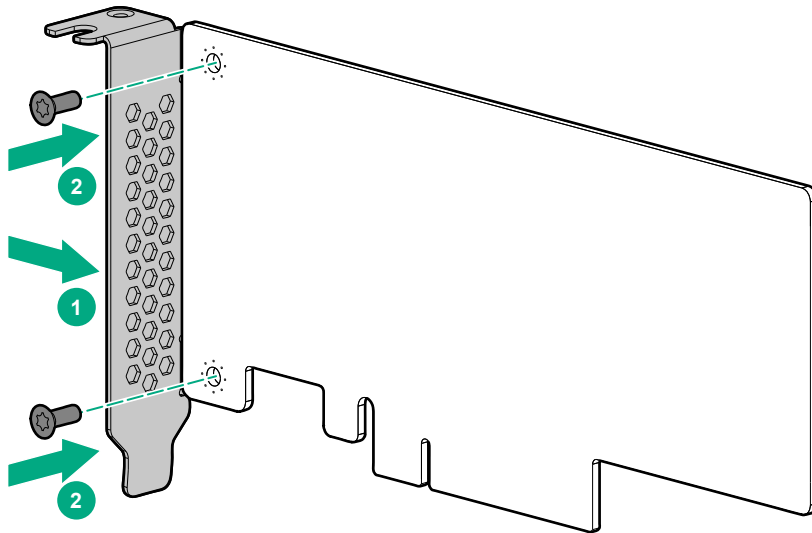
### Procedure

1. Remove the full-height bracket from the expansion board.





2. Install the low-profile bracket on the expansion board.



## Install the expansion board

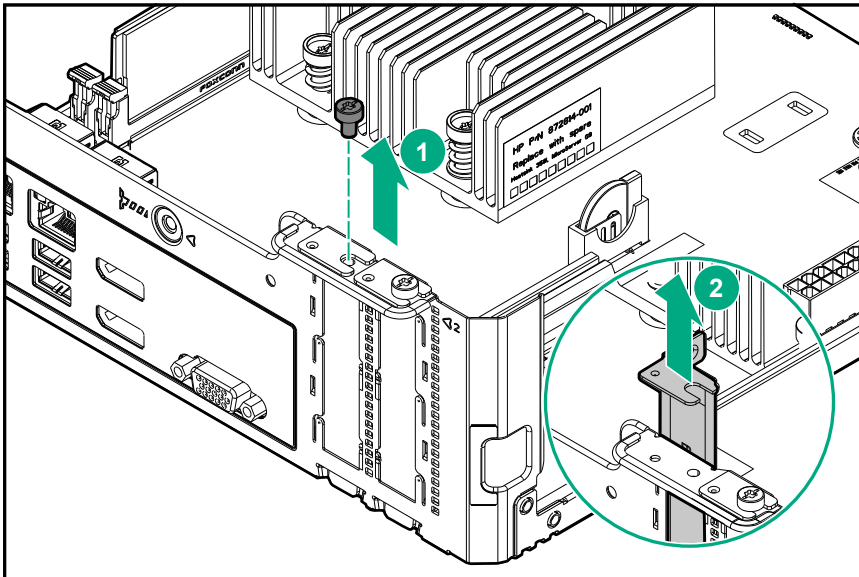
### Prerequisites

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

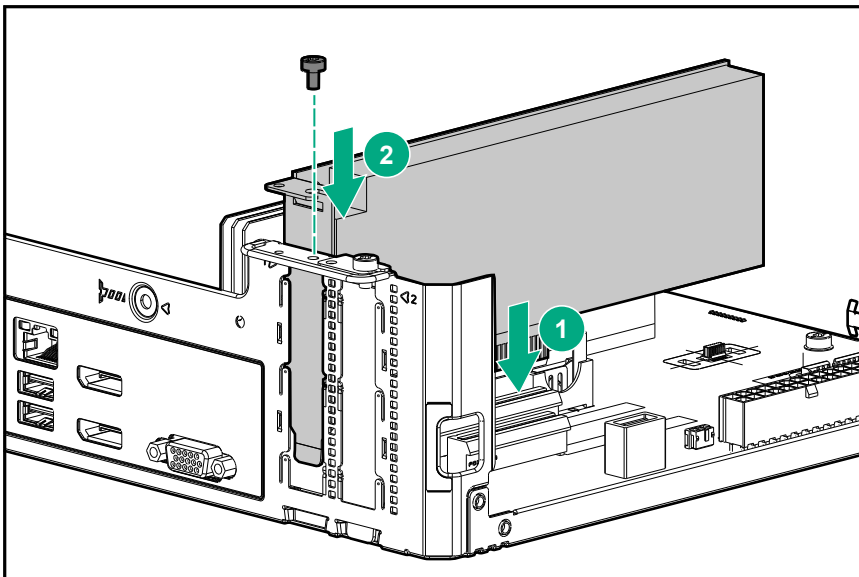
### Procedure

1. Identify the expansion slot compatible with the expansion board, and then remove the blank opposite that slot.

Retain the blank for future use.



2. Verify that any switches or jumpers on the expansion board are set properly. For more information, see the expansion board documentation.
3. Install the expansion board. Verify that the board is firmly seated in the slot.



## Internal USB device options

The server has an internal USB 2.0 port that you can use to install internal USB devices such as:

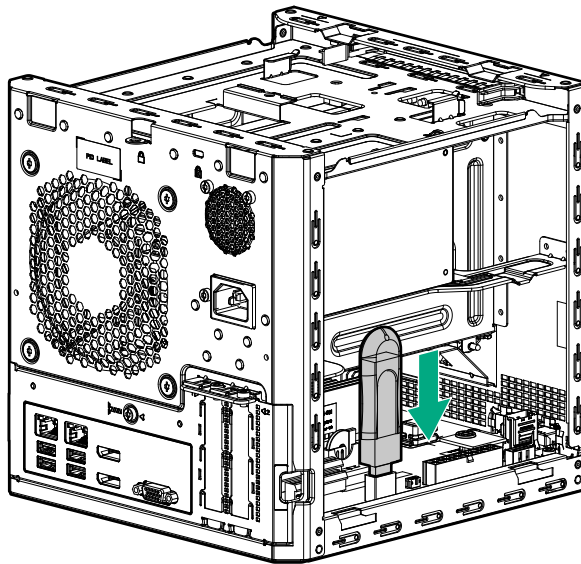
- USB flash media devices for booting up from flash solutions or for data backup/redundancy.
- USB devices that are intended to be rarely removed such as a USB dongle for Bluetooth or Wi-Fi support.

## Install an internal USB device

### Procedure

1. **Power down the server** on page 22.
2. Disconnect the power cord from the AC source, and then from the server.
3. Disconnect all peripheral cables from the server.
4. **Remove the chassis cover** on page 26.

5. Plug in the USB device into the internal USB port.



6. **Install the chassis cover** on page 27.
7. Connect all peripheral cables to the server.
8. Connect the power cord to the server power jack, and then to the AC source.
9. **Power up the server** on page 22.

For more information on any required setup or configuration procedure, see the USB device documentation.

## External HPE RDX Backup System option

To install a simple, inexpensive, and reliable way to securely store your data backups, install an external HPE RDX Backup System. The backup system is a removable, ruggedized, hard disk drive system.

The backup system consists of two components:

- RDX cartridge
- RDX docking station

Hewlett Packard Enterprise recommends that no more than one HPE RDX Removable Disk Backup System be connected to a system at a time.

For more information on installing and configuring the external HPE RDX Removable Disk Backup System, see the Storage section of the Hewlett Packard Enterprise Information Library:

<http://www.hpe.com/info/storage/docs>

## HP Trusted Platform Module

The TPM is a hardware-based system security feature that can securely store information, such as passwords and encryption keys, which can be used to authenticate the platform.

The TPM works with Microsoft Windows BitLocker which is a data protection feature available in Microsoft Windows Server 2008 R2 SP1 and later operating systems. BitLocker helps protect user data and helps ensure that a server running Windows Server has not been tampered with while the system was offline.

This server supports TPM 2.0. To prevent possible damage to the TPM or to the system board, the TPM cannot be removed from the board once it has been installed.

## Trusted Platform Module (TPM) — China Import Restrictions

**HPE Special Reminder:** Before enabling TPM functionality on this system, you must ensure that your intended use of TPM complies with relevant local laws, regulations and policies, and approvals or licenses must be obtained if applicable.

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

### 可信任平台模块 (Trusted Platform Module · TPM) 声明

**HPE 特别提醒：**在您在系统中启用 TPM 功能前，请您务必确认，您将要对 TPM 的使用遵守相关的当地法律、法规及政策，并已获得所需的一切事先批准及许可(如适用)。

若因您未获得相应的操作/使用许可而发生的合规问题，皆由您自行承担全部责任，与 HPE 无涉。

## HP Trusted Platform Module installation 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 becomes a permanent part of the system board.
- When installing or replacing hardware, Hewlett Packard Enterprise service providers cannot enable the TPM or the encryption technology. For security reasons, only the customer can enable these features.
- When returning a system board for service replacement, do not remove the TPM from the system board. When requested, HPE Service provides a TPM with the spare system board.
- Any attempt to remove an installed TPM from the system board breaks or disfigures the TPM security rivet. Upon locating a broken or disfigured rivet on an installed TPM, administrators should consider the system compromised and take appropriate measures to ensure the integrity of the system data.
- 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.
- HPE is not liable for blocked data access caused by improper TPM use. For operating instructions, see the encryption technology feature documentation provided by the operating system.

## Installing the Trusted Platform Module overview

### Procedure

1. [Installing the Trusted Platform Module board](#) on page 52.
2. [Retain the recovery key/password](#).
3. [Enabling the Trusted Platform Module](#) on page 54.

## Installing the Trusted Platform Module board

### Procedure

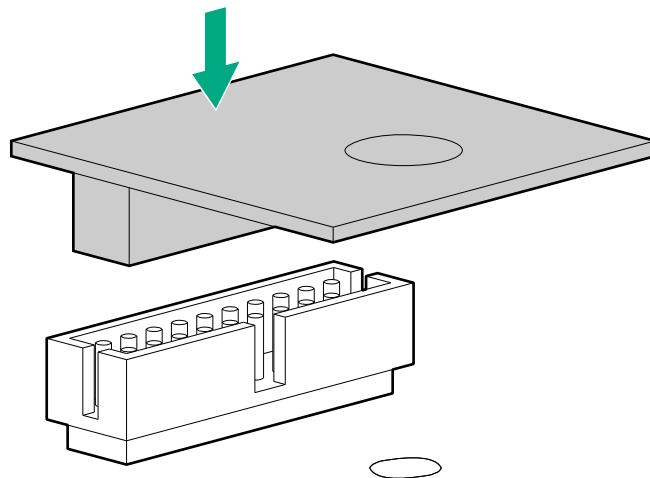
1. [Power down the server](#) on page 22.
2. Disconnect the power cord from the AC source, and then from the server
3. Disconnect all peripheral cables from the server.
4. [Remove the chassis cover](#) on page 26.

5. **Remove the system board assembly** on page 28.
6. **Install the Trusted Platform Module board** on page 53.
7. **Install the system board assembly** on page 27.
8. **Install the chassis cover** on page 27.
9. Connect all peripheral cables to the server.
10. Connect the power cord to the server power jack, and then to the AC source.
11. **Power up the server** on page 22.

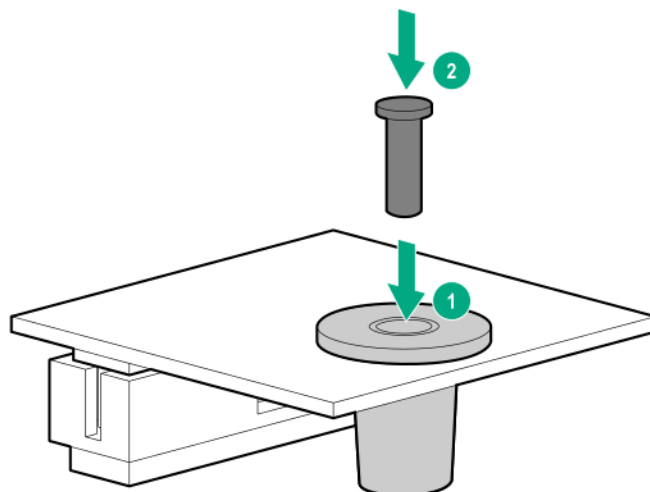
## Install the Trusted Platform Module board

### Procedure

1. **Locate the TPM connector on the system board.**
2. Install the TPM board.



3. Install the TPM security rivet by pressing the rivet firmly into the system board.



# Retaining the recovery key/password

## About this task

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 guidelines listed in the following procedure list when retaining the recovery key/password.

## Procedure

- 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.

# Enabling the Trusted Platform Module

## Procedure

1. To access the Aptio Setup Utility, on the enter setup prompt, press the **F2** or **Del** key.
2. Select **Advanced > Trusted Computing**, and then press the **Enter** key.
3. Verify that the TPM device name is displayed.
4. To exit the utility, press the **Esc** key.

The server reboots without user input. During this system reboot, the TPM is enabled.

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

---

### CAUTION:

When a TPM is installed and enabled on the server, data access is locked if you fail to follow the proper procedures for updating the system or option firmware, replacing the system board, replacing a hard drive, or modifying OS application TPM settings.

---

For more information on adjusting TPM usage in BitLocker, see the Microsoft website:

<http://technet.microsoft.com/en-us/library/cc732774.aspx>

# Cabling

## Cabling overview

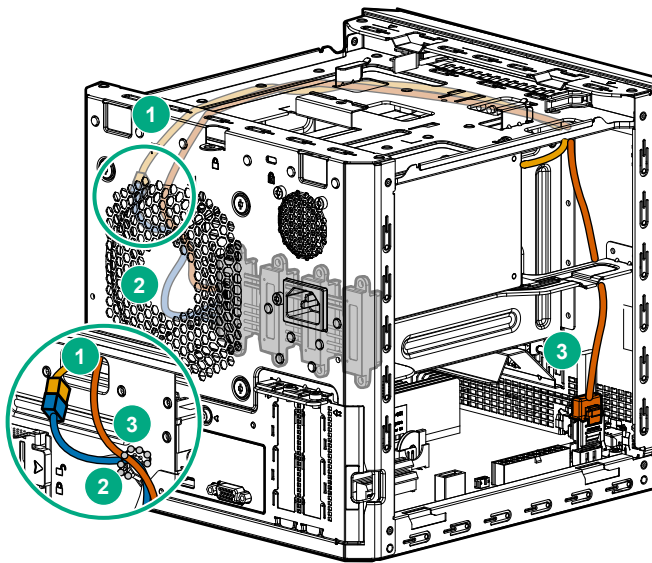
This section provides guidelines that help you make informed decisions about cabling the server and hardware options to optimize performance.

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

## Four-bay non-hot-plug drive cabling

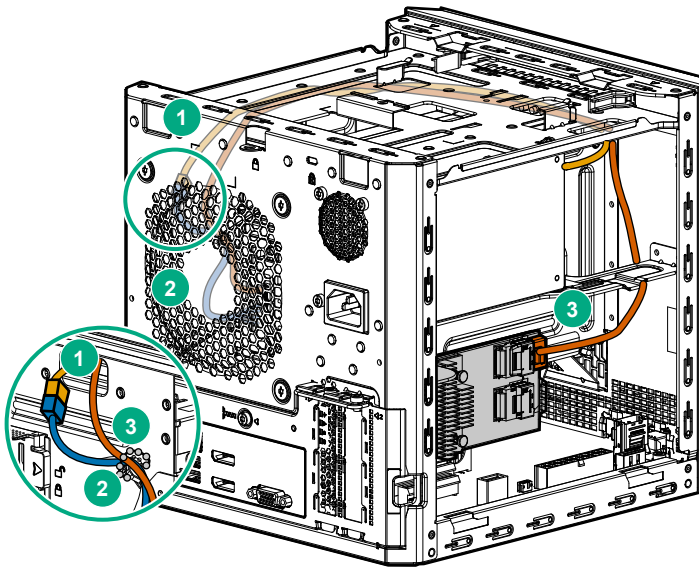
The four-bay non-hot-plug drive cable assembly consists of the drive power and SATA cables attached to a bracket. If either the drive power or SATA cable becomes defective, the entire cable assembly will need to be replaced.

- LFF/SFF drive SATA cable connected to the system board



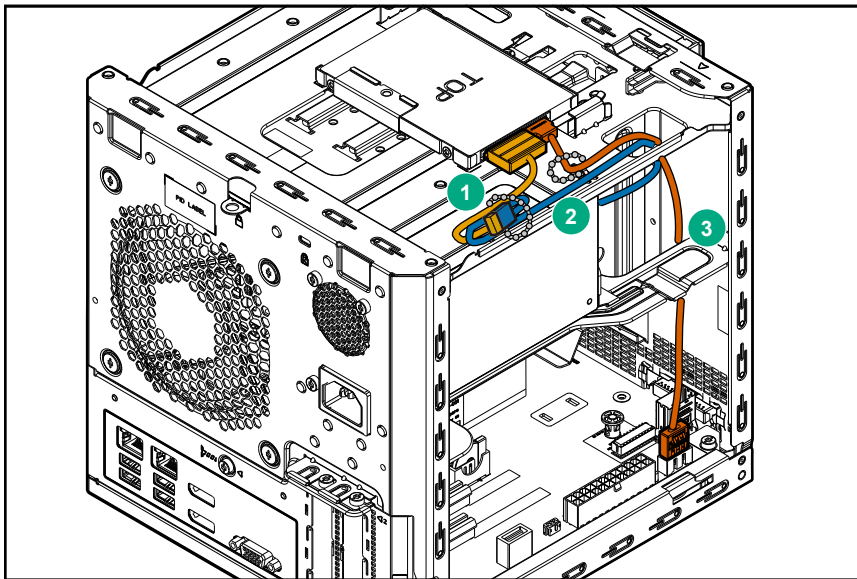
Item	Description
1	P2 power supply cable
2	LFF/SFF drive power cable
3	LFF/SFF drive SATA cable

- LFF/SFF drive SATA cable connected to an HBA



Item	Description
1	P2 power supply cable
2	LFF/SFF drive power cable
3	LFF/SFF drive SATA cable

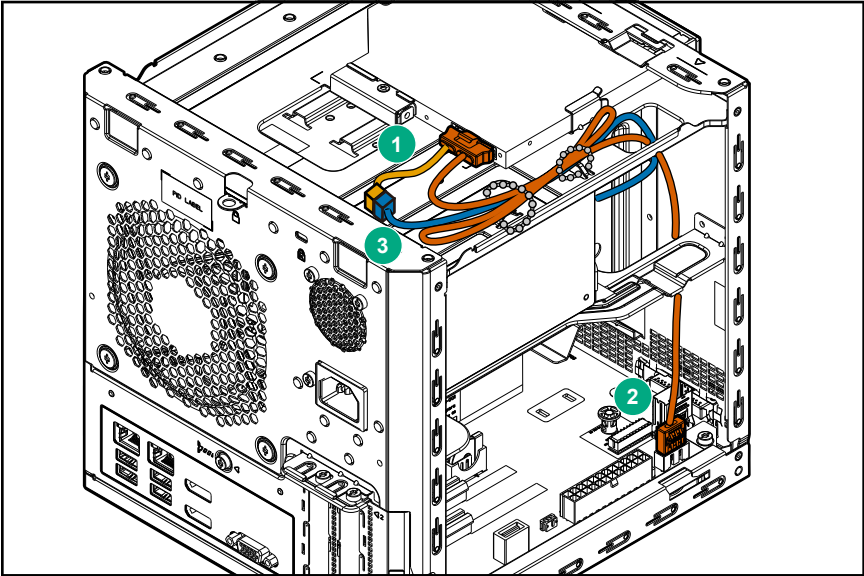
## Solid state drive cabling



Item	Description
1	SSD power cable
2	P3 power supply cable
3	SSD SATA cable

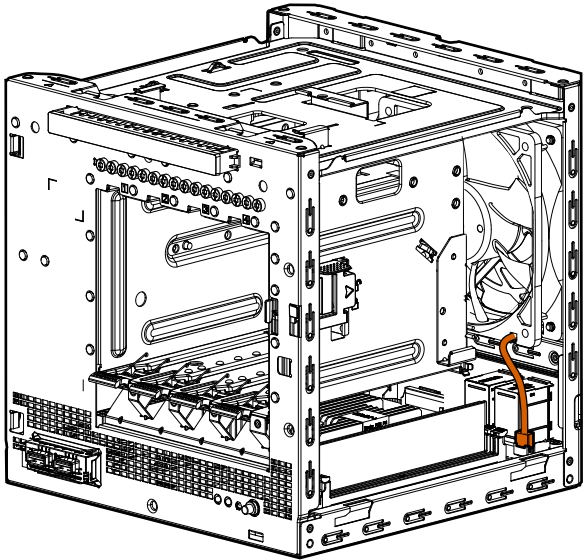


# Optical drive cabling

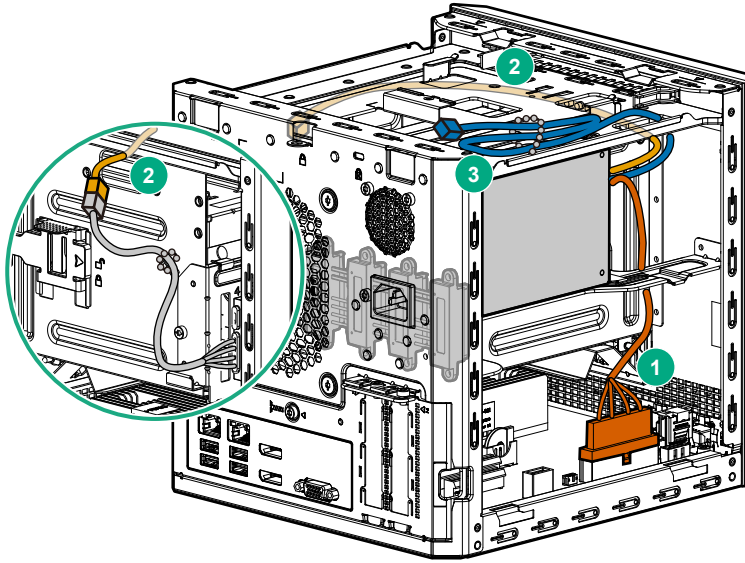


Item	Description
1	Optical drive power cable
2	Optical drive SATA cable
3	P3 power supply cable

# Fan cabling



# Power supply cabling



Item	PSU cable marker	Description
1	P1	System board power cable
2	P2	LFF/SFF drive power cable
3	P3	Optical drive/SSD power cable

# Software and configuration utilities

## Server mode

Software or configuration utility	Server mode
<b><u>Aptio Setup Utility</u></b>	Offline
<b><u>HPE Smart Storage Administrator</u></b>	Online and offline
<b><u>Marvell Storage Utility</u></b>	Online
<b><u>Marvell BIOS Utility</u></b>	Offline

## Product QuickSpecs

For more information about product features, specifications, options, configurations, and compatibility, see the product QuickSpecs on the HPE ProLiant MicroServer Gen10 website:

<http://www.hpe.com/server/microserver>

## Aptio Setup Utility

The Aptio Setup Utility is embedded in the system ROM. This utility enables you to perform a wide range of configuration activities, including the following:

- Configuring system devices and installed options
- Enabling and disabling system features
- Displaying system information
- Selecting the primary boot controller
- Configuring memory options

## Using the Aptio Setup Utility

To use the Aptio Setup Utility, use the following keys:

Key	Action
F2 or Del (during POST)	Access the Aptio Setup Utility.
Left and right arrows	Navigate the menus.
Up and down arrows	Navigate menu items.
Enter	Select menu items.
F4	Save selections and exit the utility.
F1	Access help for the highlighted configuration option.
Esc	Exit the utility.

Default configuration settings are applied to the server in either of the following scenarios:

- When the system powers up for the first time
- When the system is restored to the default settings

Default configuration settings are sufficient for typical server operations. However, you can modify the configuration settings as needed. The system prompts you to access the Aptio Setup Utility every time the system is powered up.

## Boot option control

This feature enables you:

- To choose the boot mode, select **Advanced > Boot Option**.
- To set the boot option priority, select **Boot > Boot Option Priorities**.
- To select the one time boot option, select **Save & Exit > Boot Override**.

This menu allows you to select the boot device for a specific boot and does not modify the boot order configuration settings.

To select the one time boot option directly during POST, press the **F11** key when prompted during system boot, and then select the preferred boot device.

## Boot option

Use this option to set the boot mode for the system. The following boot modes are supported:

- UEFI boot mode — The UEFI boot mode is the default boot mode. It configures the server to boot UEFI-compatible operating systems, and is required to use certain Aptio Setup Utility options.
- Legacy boot mode — This boot mode configures the server to boot traditional operating systems in legacy BIOS-compatibility mode. Certain situations might require that you operate in legacy boot mode, such as booting custom OS images that were installed using legacy boot mode or created using a legacy BIOS system.

## Selecting the boot mode

### Procedure

1. Reboot the server.
2. To access the Aptio Setup Utility, press the **Del** or **F2** key.
3. Select **Advanced > Boot Option > Boot Mode**.
4. Select a boot mode setting, and then press the **Enter** key.
5. To confirm the change and exit the utility, press the **F4** key.

## Restoring and customizing configuration settings

The following options are available for restoring or customizing the configuration settings:

- Reset all configuration settings to the factory default settings.
- Restore and use the system default configuration settings.
- Configure default settings as necessary, and then save the configuration as the user default configuration.
- Restore the user default configuration.

To restore the user default configuration, select **Save & Exit > Default Option > Restore User Default**.

## Clearing the BIOS configuration settings

The server BIOS configuration settings such as the system date and time, boot sequence, and hardware settings are stored in the CMOS. These settings are configured in the Aptio Setup Utility.

You might need to clear the CMOS if any of the following conditions occur:

- POST errors or boot issues
- Corrupted BIOS settings
- Incorrect settings made in the Aptio Setup Utility have caused error messages to be unreadable.

- If there is a hardware compatibility issue of a known compatible component.
- If the power-on password is forgotten.

---

**⚠ CAUTION:**

Be careful when clearing or altering the BIOS settings. Changing some settings might prevent the server from booting up correctly or might result in data loss.

---

Clearing the CMOS resets the BIOS settings to their factory default state. To clear the CMOS:

- If the Aptio Setup Utility is accessible, **use the Restore Defaults option under the Save & Exit menu.**
- If the Aptio Setup Utility is not accessible, **use the CMOS header.**

After clearing the CMOS, use the Aptio Setup Utility to reconfigure the BIOS settings.

## Clearing the BIOS settings by using the Aptio Setup Utility

### Procedure

1. Reboot the server.
2. To access the Aptio Setup Utility, on the enter setup prompt, press the **F2** or **Del** key.
3. Select the **Save & Exit** menu.
4. Under **Default Options**, select **Restore Defaults**, and then press the **Enter** key.
5. Select **Yes**.
6. To confirm the change and exit the utility, press the **F4** key.

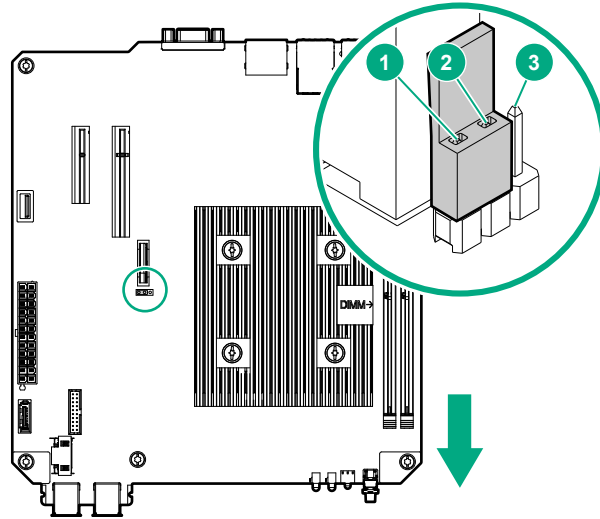
## Clearing the BIOS settings by using the CMOS header

### About this task

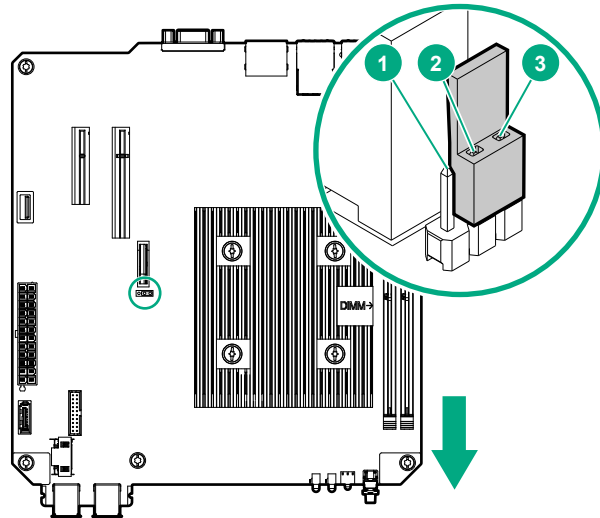
The arrow shown in the steps 6 and 7 illustrations points to the front of the server.

### Procedure

1. **Power down the server** on page 22.
2. Disconnect the power cord from the AC source, and then from the server.
3. Disconnect all peripheral cables from the server.
4. **Remove the chassis cover** on page 26.
5. **Remove the system board assembly** on page 29.
6. Remove the jumper from its default position on pins 2 and 3, and place them on pins 1 and 2.



7. After five seconds, remove the jumper from pins 1 and 2, and move it back to the default position on pins 2 and 3.



8. **Install the system board assembly** on page 27.
9. **Install the chassis cover** on page 27.
10. Connect all peripheral cables to the server.
11. Connect the power cord to the server power jack, and then to the AC source.
12. **Power up the server** on page 22.

## Embedded UEFI Shell

The system BIOS in this server includes an Embedded UEFI Shell in the ROM. The UEFI Shell environment provides an API, a command-line prompt, and a set of CLIs that allow scripting, file manipulation, and system information. These features enhance the capabilities of the Aptio Setup Utility.

For more information, see the UEFI Shell Specification on the UEFI website:

<http://www.uefi.org/specifications>

## Secure Boot configuration

Secure Boot 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. Secure Boot also ensures 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, only firmware components and operating systems with boot loaders that have an appropriate digital signature can be executed during the boot process. Only operating systems that support Secure Boot and have a UEFI boot loader signed with one of the authorized keys can boot.

User can customize the certificates embedded in the UEFI BIOS by adding or removing their own certificates.

## Utilities and features

### HPE Smart Storage Administrator

The HPE SSA is a configuration and management tool for HPE Smart HBA and Smart Array controller options. The HPE SSA exists in the following interface formats:

- HPE SSA GUI
- HPE SSA CLI
- HPE SSA Scripting

Although all formats support configuration tasks, some of the advanced tasks are available in only one format.

In this server, HPE SSA can be accessed in both online and offline modes. In online mode, SSA is only accessible from the local server.

To access, install, and launch HPE SSA in an online environment, download the HPE SSA executables from the Hewlett Packard Enterprise Support Center website (<http://www.hpe.com/support/hpesc>). Under **Select your HPE product**, enter the product name or number, and then click **Go**.

To access, install, and launch HPE SSA in an offline environment, download the HPE SSA ISO image from the HPE Smart Storage Administrator website:

<http://www.hpe.com/servers/ssa>

For more information, see the *HPE Smart Storage Administrator User Guide*:

[http://www.hpe.com/support/SSA\\_UG\\_en](http://www.hpe.com/support/SSA_UG_en)

### Marvell Storage Utility

The Marvell Storage Utility is a browser-based configuration and management utility for the embedded Marvell storage controller. Use this utility to create and manage RAID virtual disks and arrays using the drives connected to the embedded storage controller.

For more information, see the *Marvell Storage Utility User Manual for 88SE9230 and 88SE9220* included in the SATA management tool package for the server. To download this package, go to the Hewlett Packard Enterprise Support Center website (<http://www.hpe.com/support/hpesc>). Under **Select your HPE product**, enter the product name or number, and then click **Go**.

## Marvell BIOS Utility

The Marvell BIOS Utility is built into the embedded Marvell storage controller ROM. Use this utility to create and manage RAID virtual disks and arrays using the drives connected to the embedded storage controller.

### Accessing the Marvell BIOS Utility under legacy boot mode

#### Procedure

1. Reboot the server.
2. On the POST drive information screen, press **Ctrl+M**.

### Accessing the Marvell BIOS Utility under UEFI boot mode

#### Procedure

1. Download the Marvell BIOS Utility package from the Hewlett Packard Enterprise Support Center website (<http://www.hpe.com/support/hpesc>) and save the package in a USB key.
2. Attach the USB media to the server.
3. Reboot the server.
4. To access the **One-Time Boot Menu**, when prompted, press the **F11** key.
5. Select **UEFI: Built-in EFI Shell**.
6. To obtain the assigned file system volume for the USB key, enter the `map -r` command at the UEFI Shell prompt.
7. Change to the file system that contains the Marvell BIOS Utility package, and then press the **Enter** key.

If no other storage devices are mounted on the system, the USB drive is `fs0:` on the UEFI shell.

8. Enter the following command:

```
fs0:\> ui64.efi
```

where 0 is the server directory for the USB device containing the Marvell BIOS Utility package.

## USB support

Hewlett Packard Enterprise servers support both USB 2.0 ports and USB 3.0 ports. Both port types support installing all types of USB devices (USB 1.0, USB 2.0, and USB 3.0), but might run at lower speeds in specific situations:

- USB 3.0 capable devices operate at USB 2.0 speeds when installed in a USB 2.0 port.
- In UEFI boot mode, Hewlett Packard Enterprise provides legacy USB support in the preboot environment before the operating system loads for USB 1.0, USB 2.0, and USB 3.0 speeds.
- In legacy boot mode, Hewlett Packard Enterprise provides legacy USB support in the preboot environment before the operating system loads for USB 1.0 and USB 2.0 speeds. USB 3.0 ports can be used with all devices in legacy boot mode but are not available at USB 3.0 speeds in the preboot environment. Standard USB support (USB support from within the operating system) is provided by the OS through the appropriate USB device drivers. Support for USB 3.0 varies by operating system.

The pre-OS behavior of the USB ports is configurable in the [Aptio Setup Utility](#).

## Keeping the system current

### Firmware

Firmware is a software program that is stored in the system ROM chip on the system board or to an optional controller. Firmware controls the system when it is first powered on and then passes control to the operating system.



The firmware on the system board of the server is called the system ROM or the BIOS. The firmware on another piece of hardware configured in the server is called the option ROM.

## Firmware update

Update the firmware (also called "flashing the ROM") as part of regular server maintenance. In addition, check for specific firmware updates in between regular updates to help keep the server performing optimally.

Firmware updates are created for, but are not limited to, the following reasons:

- To provide critical problem fixes that ensure system stability, such as upgrades that might prevent server unresponsiveness and other issues that could put the system at risk.
- To correct product issues, such as ROM or processor functionality.
- To improve system performance or make the system more serviceable.

Server downtime and time spent removing, returning, and ultimately replacing hardware might be avoided by first updating the firmware during the troubleshooting process. Many product issues that result in hardware replacement are preventable or correctable with a firmware update. Hewlett Packard Enterprise recommends checking for a firmware update before sending a part back to Hewlett Packard Enterprise for replacement.

On servers that have add-on options, Hewlett Packard Enterprise recommends checking for firmware upgrades for each installed option whenever an update to the system ROM or to another option is performed. This ensures that the entire system is running the latest updates for each component.

Multiple methods exist to update the system ROM:

- EFI tool under Embedded UEFI Shell
- Online Flash components

Product entitlement is required to perform updates.

---

### CAUTION:

Any kind of system interruption during the firmware update results in errors that might corrupt the BIOS settings. These errors prevent the server from booting up. To prevent these update errors, observe the following cautions:

- Attach a UPS to the server to provide backup power to the system when updating the firmware.
  - Do not perform a forced shutdown of the server.
  - Do not perform a forced closure of the firmware update tool.
- 

## Updating the system ROM using the EFI tool from within the Embedded UEFI Shell

### About this task

For systems configured in UEFI boot mode, use the following procedure to update the firmware.

### Procedure

1. Access the System ROM Flash component for your server from the Hewlett Packard Enterprise Support Center website (<http://www.hpe.com/support/hpesc>) and save the package in a USB key.
2. Copy the file to a USB device.
3. Attach the USB device to the server.
4. To access the **One-Time Boot Menu** option, when prompted, press the **F11** key.
5. Select **UEFI: Built-in EFI Shell**.
6. To obtain the assigned file system volume for the USB key, enter the `map -r` command at the UEFI Shell prompt.
7. Change to the file system that contains the System ROM Flash Binary file that you downloaded for your server. Enter one of the `fsx` file systems available, such as `fs0` or `fs1`, and then press the **Enter** key.

If no other storage devices are mounted on the system, the USB drive is `fs0:` on the UEFI shell.

8. To change from the current directory to the directory that contains the binary file, enter the `cd` command.
9. To flash the system ROM from the downloaded binary file, enter the `flashbios.nsh` command.
10. 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

Online Flash components provide updated system firmware that can be installed directly on supported operating systems. To download this component, go to the Hewlett Packard Enterprise Support Center website (<http://www.hpe.com/support/hpesc>). Under **Select your HPE product**, enter the product name or number, and then click **Go**. To update the firmware, follow the instructions inside the firmware update package. The firmware update takes effect after rebooting the server.

## Drivers, firmware, and software updates

### ! IMPORTANT:

Always perform a backup before installing or updating device drivers.

- For the latest option ROM and driver updates for Hewlett Packard Enterprise hardware options, download the individual drivers, firmware, and components from the Hewlett Packard Enterprise Support Center website (<http://www.hpe.com/support/hpesc>). Under **Select your HPE product**, enter the product name or number, and then click **Go**.
- For the latest system ROM and other systems software components, download the individual drivers, firmware, and components from the server download page on the Hewlett Packard Enterprise website:

<http://www.hpe.com/downloads/microservergen10>

## 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 deliver confidence, reduces risk and helps customers realize agility and stability. We help 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 our 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>

## Change control and proactive notification

Hewlett Packard Enterprise offers Change Control and Proactive Notification to notify customers 30 to 60 days in advance of the following:

- Upcoming hardware and software changes
- Bulletins
- Patches

Let us know what commercial products you own and we will send you the latest updates to keep your business running smoothly.

For more information, see the Hewlett Packard Enterprise website:

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

# Troubleshooting

## Troubleshooting resources

For troubleshooting information about resolving common problems, comprehensive courses of action for fault isolation and identification, issue resolution, and software maintenance, see the *HPE ProLiant MicroServer Gen10 Troubleshooting Guide* at:

<http://www.hpe.com/support/microservergen10-TSG>

# Specifications

## Environmental specifications

Specification	Value
<b>Temperature range<sup>1</sup></b>	—
Operating <sup>2</sup>	10°C to 35°C (50°F to 95°F)
Nonoperating	-30°C to 60°C (-22°F to 140°F)
<b>Relative humidity (noncondensing)</b>	—
Operating	10% to 90% 28°C (82.4°F) maximum wet bulb temperature (noncondensing) across the operating temperature range of 0°C to 40°C.
Nonoperating	5% to 95% 38.7°C (101.7°F), maximum wet bulb temperature

<sup>1</sup> All temperature ratings shown are for sea level. An altitude derating of 1.0°C per 304.8 m (1.8°F per 1000 ft) to 3048 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.

<sup>2</sup> System performance during standard operation might degrade if there is a fan fault or if the internal server temperature is above 30°C (86°F).

## Server specifications

Dimension	Value
Height	23.50 cm (9.25 in)
Depth	25.40 cm (10.00 in)
Width	23.00 cm (9.06 in)
<b>Weight (approximate values)</b>	
Minimum (one drive and one DIMM installed, no media drive or expansion board installed)	6.495 kg (14.32 lb)
Maximum (four drives, two DIMMs, optical drive or SSD, and two expansion boards installed)	9.69 kg (21.36 lb)

## Power supply specifications

The server is configured with a non-hot-plug, nonredundant 200 W power supply.

## 200 W power supply specifications

Specification	Value
<b>Input requirements</b>	
Rated input voltage	100 V AC to 240 V AC
Rated input frequency	50 Hz to 60 Hz
Rated input current	3.5 A at 100 V AC
Rated input power	244 W at 115 V AC
Efficiency	>82% at full load
<b>Power supply output</b>	
Rated steady-state power	200 W
Maximum peak power	200 W
Rated output power	200 W

# Warranty and regulatory information

## Warranty information

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

[www.hpe.com/support/Safety-Compliance-EnterpriseProducts](http://www.hpe.com/support/Safety-Compliance-EnterpriseProducts)

### Additional warranty information

HPE ProLiant and x86 Servers and Options

[www.hpe.com/support/ProLiantServers-Warranties](http://www.hpe.com/support/ProLiantServers-Warranties)

HPE Enterprise Servers

[www.hpe.com/support/EnterpriseServers-Warranties](http://www.hpe.com/support/EnterpriseServers-Warranties)

HPE Storage Products

[www.hpe.com/support/Storage-Warranties](http://www.hpe.com/support/Storage-Warranties)

HPE Networking Products

[www.hpe.com/support/Networking-Warranties](http://www.hpe.com/support/Networking-Warranties)

## Regulatory information

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

[www.hpe.com/support/Safety-Compliance-EnterpriseProducts](http://www.hpe.com/support/Safety-Compliance-EnterpriseProducts)

### Additional regulatory information

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

[www.hpe.com/info/reach](http://www.hpe.com/info/reach)

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

[www.hpe.com/info/ecodata](http://www.hpe.com/info/ecodata)

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

[www.hpe.com/info/environment](http://www.hpe.com/info/environment)

## 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:

«HEWLETT-PACKARD Bel» ЖШС, Беларусь Республикасы, 220030, Минск қ., 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



# 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](http://www.hpe.com/support/hpesc)

### Hewlett Packard Enterprise Support Center: Software downloads

[www.hpe.com/support/downloads](http://www.hpe.com/support/downloads)

### Software Depot

[www.hpe.com/support/softwaredepot](http://www.hpe.com/support/softwaredepot)

- To subscribe to eNewsletters and alerts:  
[www.hpe.com/support/e-updates](http://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](http://www.hpe.com/support/AccessToSupportMaterials)

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### 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.

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## 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>

## 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](mailto: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.

# Acronyms and abbreviations

**3DS TSV**

three-dimensional stacked through-silicon via (integrated circuit packaging technology)

**API**

application program interface

**CAS**

column access strobe

**CSR**

Customer Self Repair

**DDR4**

double data rate-4

**HBA**

host bus adapter

**HPE SSA**

HPE Smart Storage Administrator

**ISO**

International Organization for Standardization

**LFF**

large form factor

**LRDIMM**

load reduced dual in-line memory module

**PCIe**

Peripheral Component Interconnect Express

**PDU**

power distribution unit

**POST**

Power-On Self-Test

**PSU**

power supply unit

**RDIMM**

registered dual in-line memory module

**REACH**

Registration, Evaluation, Authorization, Restriction of Chemicals (European Union chemical regulatory framework)

**RoHS**

Restriction of Hazardous Substances

**SATA**

serial ATA

**SSD**

solid state drive

**TPM**

Trusted Platform Module

**TMRA**

recommended ambient operating temperature

**UDIMM**

unregistered dual in-line memory module

**UEFI**

Unified Extensible Firmware Interface