Hewlett Packard Enterprise

HPE ProLiant XL170r Gen10 Server User Guide

Abstract

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

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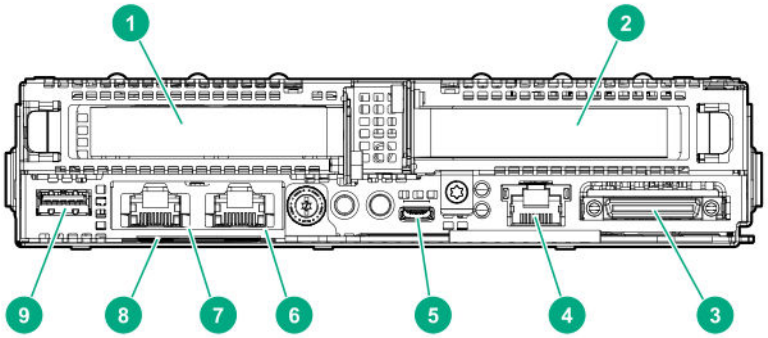
Contents

Introduction

The HPE ProLiant XL170r Gen10 server is a 1U half-width server that contains two processors. The server supports Intel Xeon Scalable Family series processor options and 16 memory DIMM slots. It has two I/O slots for a choice of networking and clustering options.

Component identification

Rear panel components



Item	Description
1	Slot 1 PCIe3 x16 (16, 8, 4, 1)
2	Slot 2 PCIe3 x16 (16, 8, 4, 1) or FlexibleLOM
3	SUV port
4	iLO Management Port[1]
5	iLO Service Port
6	Media Module NIC port 2[2]
7	Media Module NIC port 1[2]
8	**Serial number/iLO information pull tab** on page 8
9	USB 3.0 port

[1] If the RCM module is installed on the chassis, the iLO Management Port is automatically disabled.

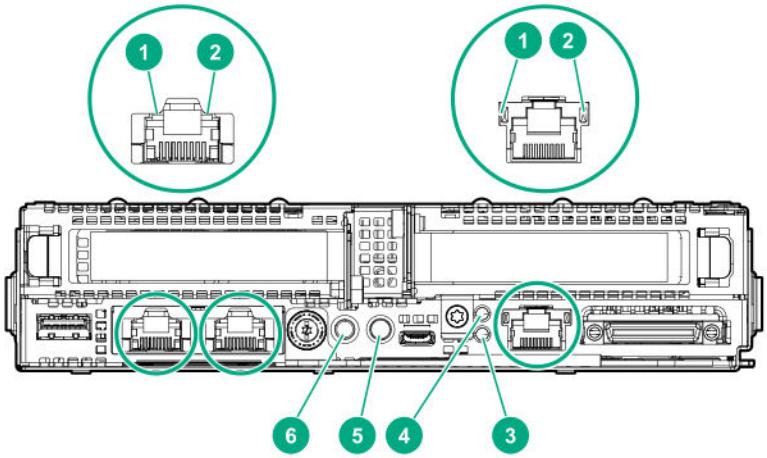
[2] The Media Module adapter is a hardware option.

Serial number/iLO information pull tab

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

Use a mobile device to scan the QR code label to display the server mobile product page (**http://www.hpe.com/qref/xl170rgen10**). This page contains links to server setup information, spare part numbers, QuickSpecs, troubleshooting resources, and other useful product links.

Rear panel LEDs and buttons



Item	Description	Status	Definition
1	NIC link LED[2]	Green	Linked to network
		Off	No network link
2	NIC status LED[1]	Flashing green	Network active
		Off	No network activity
3	Health LED[1]	Solid green	Normal
		Flashing green	iLO is rebooting.
		Flashing amber	System degraded
		Flashing red	System critical
4	Do not remove LED	Flashing white	Do not remove the server. Removing the server may terminate the current operation and cause data loss.
		Off	The server can be removed.
5	UID button/LED[1]	Solid blue	Activated

Table Continued

Item	Description	Status	Definition
		Flashing blue	• 1 flash per second = Remote management or firmware upgrade in progress • 4 flashes per second = iLO manual soft reboot sequence initiated • 8 flashes per second = iLO manual hard reboot sequence in progress
		Off	Deactivated
6	Power On/Standby button and system power LED[1]	Solid green	System on and normal operation
		Flashing green	Performing power-on sequence
		Solid amber	System in standby
		Off	No power present[3]

[1] When the LEDs described in this table flash simultaneously, a power fault has occurred. For more information, see **Front panel LED power fault codes** on page 10.

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

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

Server UID LED

The UID LED is used to locate a particular server when it is deployed in a dense chassis with other equipment. Activating the UID LED helps an onsite technician to quickly identify a server for maintenance tasks.

UID button functionality

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

Front panel LED power fault codes

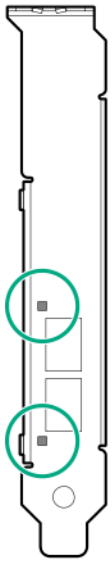
The following table provides a list of power fault codes, and the subsystems that are affected. Not all power faults are used by all servers.

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

Table Continued

Subsystem	LED behavior
FlexibleLOM	5 flashes
Removable HPE Smart Array SR Gen10 controller	6 flashes
System board PCIe slots	7 flashes
Power backplane or storage backplane	8 flashes
Power supply	9 flashes

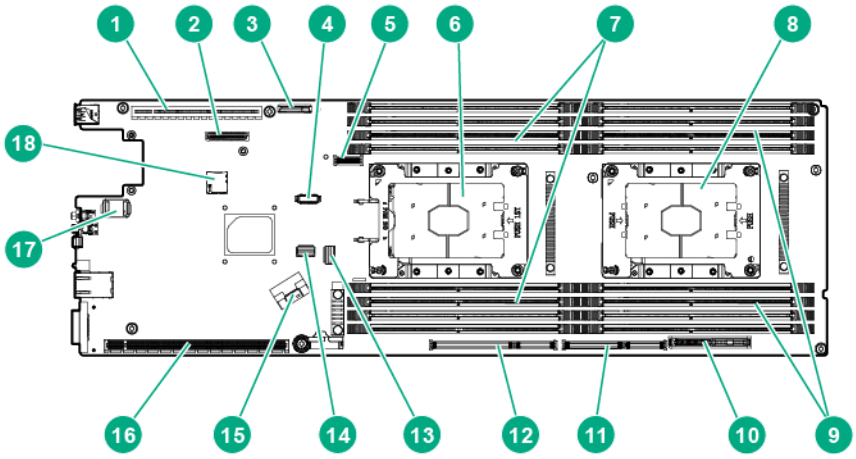
HPE InfiniBand HDR/Ethernet 940QSFP 56x16 adapter LEDs



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

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

System board components



Item	Description
1	Primary PCIe x16 riser connector 1
2	Media Module connector
3	System battery
4	OPA adapter sideband cable connector
5	M.2 SSD riser connector
6	Processor 1
7	DIMM slots for processor 1
8	Processor 2
9	DIMM slots for processor 2
10	Bayonet board connector
11	Secondary PCIe x24 riser connector 4
12	Secondary PCIe x24 riser connector 3
13	x4 SATA port
14	**System maintenance switch**
15	x8 SATA port
16	Secondary PCIe x24 riser connector 2
17	TPM connector
18	microSD slot

System maintenance switch descriptions

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

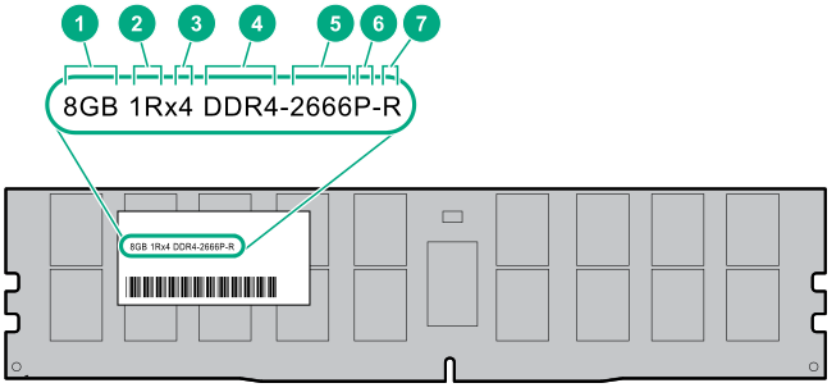
1 To access the redundant ROM, set S1, S5, and S6 to On.

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

3 When the system maintenance switch position 6 is set to the On position and Secure Boot is enabled, some configurations cannot be restored. For more information, see **Secure Boot** on page 106.

DIMM label identification

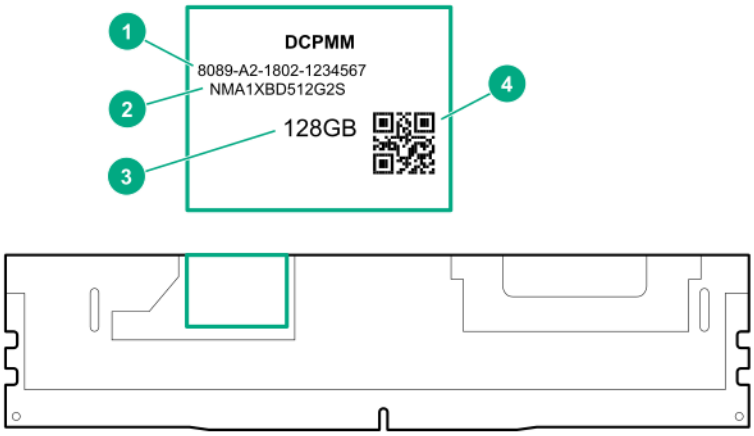
To determine DIMM characteristics, see the label attached to the DIMM. The information in this section helps you to use the label to locate specific information about the DIMM.



Item	Description	Example
1	Capacity	8 GB 16 GB 32 GB 64 GB 128 GB
2	Rank	1R = Single rank 2R = Dual rank 4R = Quad rank 8R = Octal rank
3	Data width on DRAM	x4 = 4-bit x8 = 8-bit x16 = 16-bit
4	Memory generation	PC4 = DDR4
5	Maximum memory speed	2133 MT/s 2400 MT/s 2666 MT/s 2933 MT/s
6	CAS latency	P = CAS 15-15-15 T = CAS 17-17-17 U = CAS 20-18-18 V = CAS 19-19-19 (for RDIMM, LRDIMM) V = CAS 22-19-19 (for 3DS TSV LRDIMM) Y = CAS 21-21-21 (for RDIMM, LRDIMM) Y = CAS 24-21-21 (for 3DS TSV LRDIMM)
7	DIMM type	R = RDIMM (registered) L = LRDIMM (load reduced) E = Unbuffered ECC (UDIMM)

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

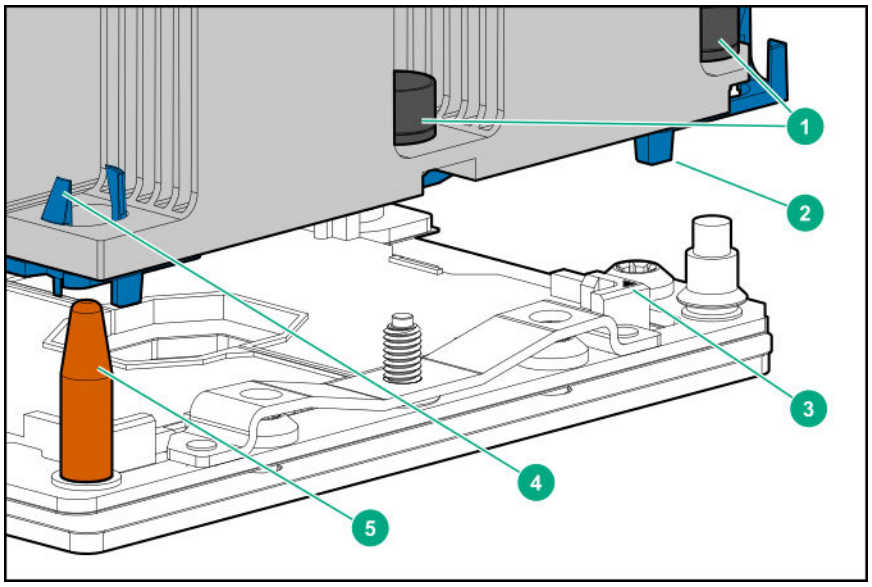
HPE Persistent Memory module label identification



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

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

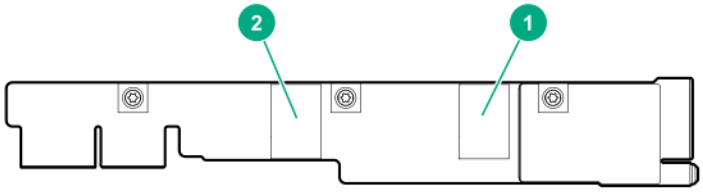
Processor, heatsink, and socket components



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

[1] Symbol also on the processor and frame.

Bayonet port numbering



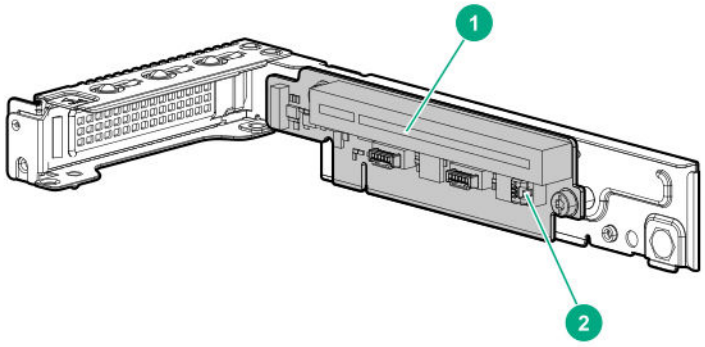
PCIe riser board components

This section identifies the riser slots compatible with specific types of expansion options supported by the server. The following riser options are supported:

- **Primary riser**
- **Secondary risers**
- **M.2 SSD riser**

Primary riser board components

The primary riser function is linked to processor 1. This riser only supports low-profile expansion boards.



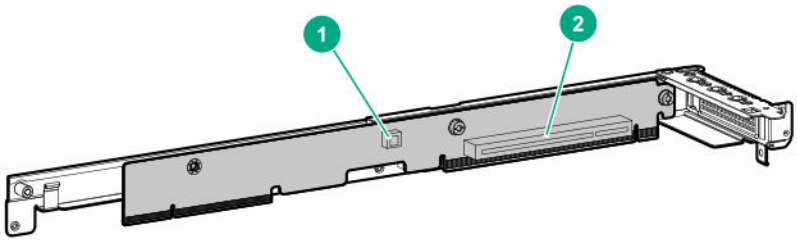
Item	Slot number	Description	Supported option
1	1	PCIe3 x16 (16, 8, 4, 1)	• Smart Array type-p controller • Network adapter • OPA adapter[1] • InfiniBand adapter
2	—	Storage controller backup power connector	—

[1] Intel Omni-Path Architecture

Secondary riser board components

The server supports multiple riser options in the secondary position.

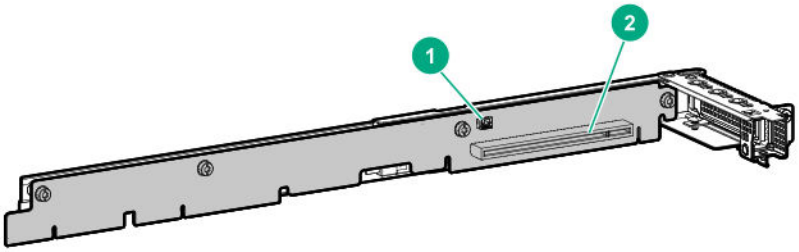
P1 secondary riser board components



Item	Slot number	Description	Supported options
1	—	Storage controller backup power connector	—
2	2	PCIe3 x16 (16, 8, 4, 1)	• Smart Array type-p controller • Low-profile expansion boards • Auxiliary card

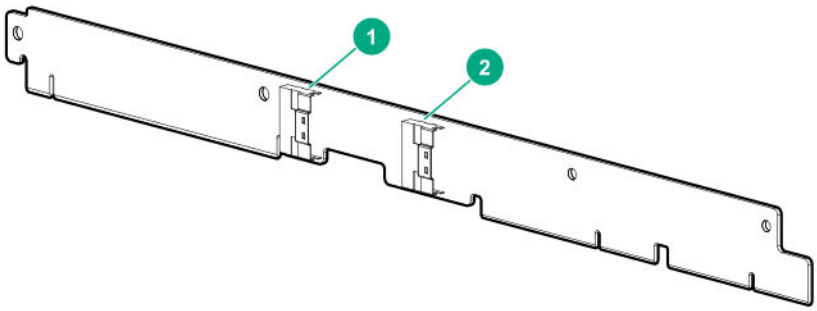
P2 secondary riser board components

Processor 2 is required to support the P2 secondary riser option.



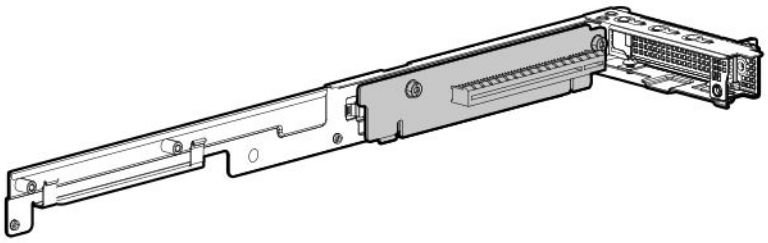
Item	Slot number	Description	Supported options
1	—	Storage controller backup power connector	—
2	2	PCIe3 x16 (16, 8, 4, 1)	• Smart Array type-p controller • Low-profile expansion boards • Auxiliary card

P1/P2 secondary riser port numbering

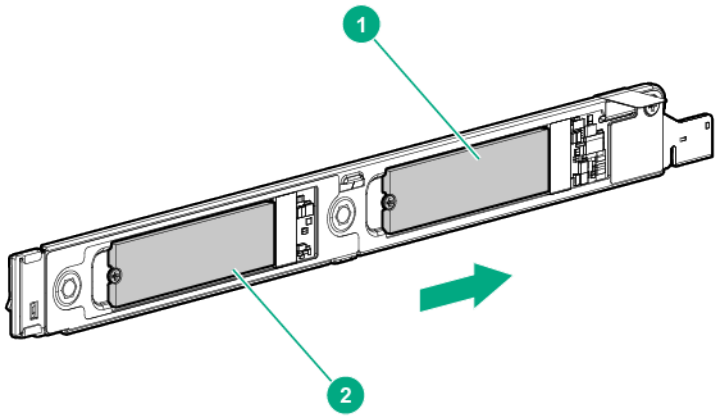


FlexibleLOM riser board slot

The FlexibleLOM riser function is linked to processor 1.



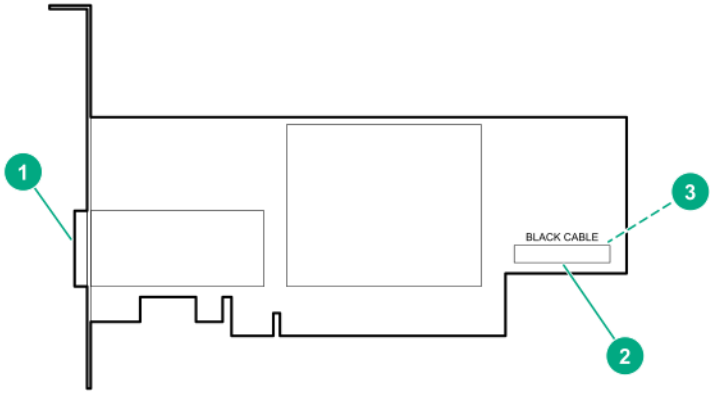
M.2 SSD riser bay numbering



The arrow points toward the server release lever.

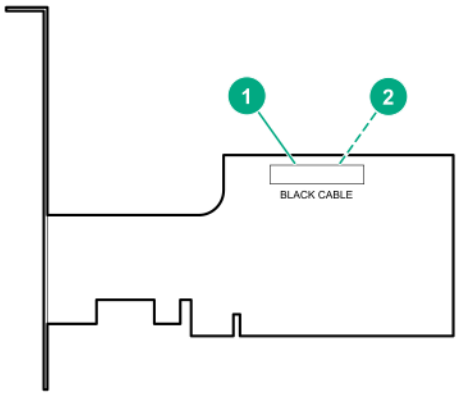
Item	Description
1	Bay 7
2	Bay 8

HPE InfiniBand HDR100/Ethernet 200 GB 1-port 940QSFP56 x16 adapter component



Item	Description
1	QSFP56 port
2	Black cable connector
3	Black cable connector

HPE InfiniBand HDR PCIe G3 Auxiliary card



Item	Description
1	Black cable connector
2	Black cable connector

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.

Power up the server

The SL/XL chassis firmware initiates an automatic power-up sequence when the servers are installed. If the default setting is changed, use one of the following methods to power up each server:

- Use a virtual power button selection through iLO 5.
- Press and release the Power On/Standby button.

When the server goes from standby mode to full power mode, the server power LED changes from amber to green.

Power down the server

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

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

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

- Press and release the Power On/Standby button.

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

  This method forces the server to enter standby mode without properly exiting applications and the OS. If an application stops responding, you can use this method to force a shutdown.
- Use a virtual power button selection through iLO 5.

  This method initiates a controlled remote shutdown of applications and the OS before the server enters standby mode.

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

Installing drive blanks and thermal bezel blanks for components with thermal limitations

Depending on the chassis model and the system fan mode, some components might be subject to thermal limitations. For some cases, it is necessary to remove some installed drives and replace them with thermal bezel blanks or drive blanks.

Prerequisites

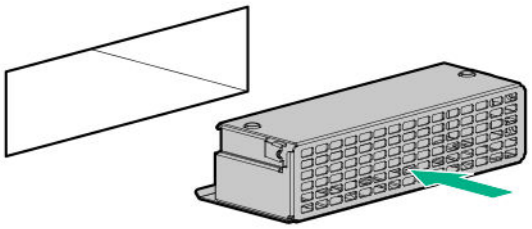
See the **Locations of drive blanks and thermal bezel blanks for components with thermal limitations** on page 24 to:

1. Identify the chassis model and system fan mode of the system you plan to install the component in.
2. Determine if the accelerator is subject to thermal limitations in the identified system setup.
3. Note the required drive bay action for the component installation.

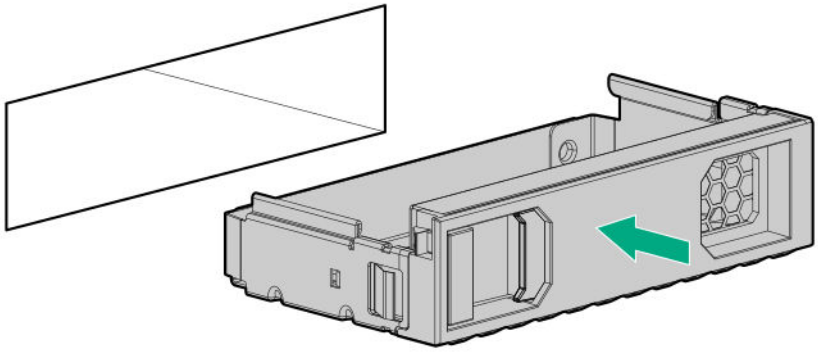
Procedure

1. Perform a backup of all critical server data and programs.
2. If installed, remove the front bezel.
3. Remove the drives and/or drives blanks from the bays noted in step 3 of the Prerequisites.
4. Do one of the following:

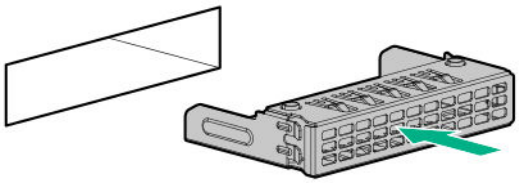
   - Install the LFF thermal bezel blanks.



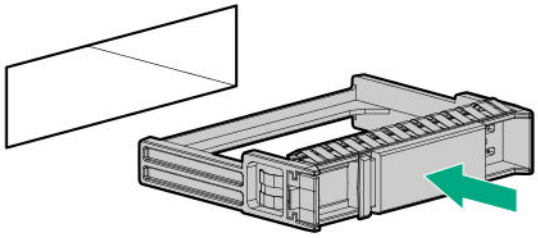
   - Install the LFF drive blank



   - Install the SFF thermal bezel blanks.



- Install the SFF drive blanks.

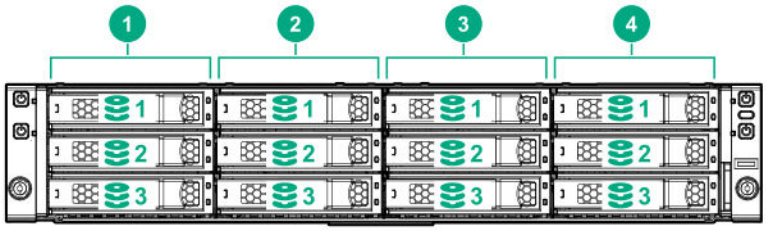


Locations of drive blanks and thermal bezel blanks for components with thermal limitations

Apollo r2200 Gen10 Chassis in nonredundant/redundant fan mode

The illustration callouts:

- outside the front panel image refer to the server numbering.
- on the drive bays refer to the drive numbering.



InfiniBand adapter model	Required drive bay action
IB HDR100/EN 100 GB 1P 940QSFP56 IB HDR100/EN 100 GB 2P 940QSFP56 IB HDR/EN 200 GB 1P 940QSFP56	LFF thermal bezel blanks in bays: 1-2 and 2-2 3-2 and 4-2
Ethernet adapters with SFP+, SFP28 or QSFP transceivers/ InfiniBand adapters with QDR or FDR speed[1] Ethernet adapters with QSFP28 transceiver/ InfiniBand adapters with EDR speed[1]	LFF drive blanks in bays: 1-2 and 2-2 3-2 and 4-2

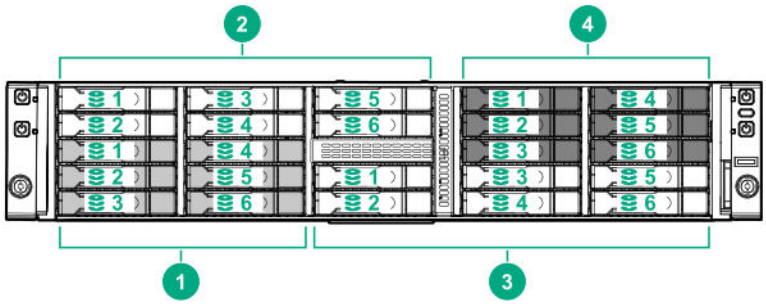
[1] HPE recommends populating drive blanks 1-2, 2-2, 3-2, 4-2 for higher ambient temperature when using copper cables.

HPE Persistent Memory module	Required drive bay action
	LFF thermal bezel blanks in bays: 1-2, 2-2, 3-2, 4-2

Apollo r2600 Gen10 Chassis with 24 drives in nonredundant/redundant fan mode

The illustration callouts:

- outside the front panel image refer to the server numbering.
- on the drive bays refer to the drive numbering.



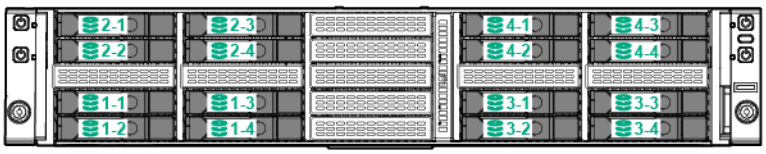
InfiniBand adapter model	Required drive bay action
IB HDR100/EN 100 GB 1P 940QSFP56 IB HDR100/EN 100 GB 2P 940QSFP56 IB HDR/EN 200 GB 1P 940QSFP56	Thermal bezel blanks in bays: 1-3, 1-4, 1-5, 1-6 2-3, 2-4, 2-5, 2-6 3-3, 3-4, 3-5, 3-6 4-3, 4-4, 4-5, 4-6

HPE Persistent Memory module	Required drive bay action
	Thermal bezel blanks in bays: 1-3, 1-4, 1-5, 1-6 2-3, 2-4, 2-5, 2-6 3-3, 3-4, 3-5, 3-6 4-3, 4-4, 4-5, 4-6

Apollo r2800 Gen10 Chassis with 16 NVMe drives

In the illustration callouts:

- The first digit refers to the server numbering.
- The second digit refers to the drive numbering.



InfiniBand adapter model	Required drive bay action
IB HDR100/EN 100 GB 1P 940QSFP56, redundant and nonredundant fan mode	Thermal bezel blanks in bays: 1-3 and 1-4
IB HDR100/EN 100 GB 2P 940QSFP56, redundant and nonredundant fan mode	2-3 and 2-4 3-3 and 3-4
IB HDR/EN 200 GB 1P 940QSFP56, redundant fan mode	4-3 and 4-4

Remove the server from the chassis

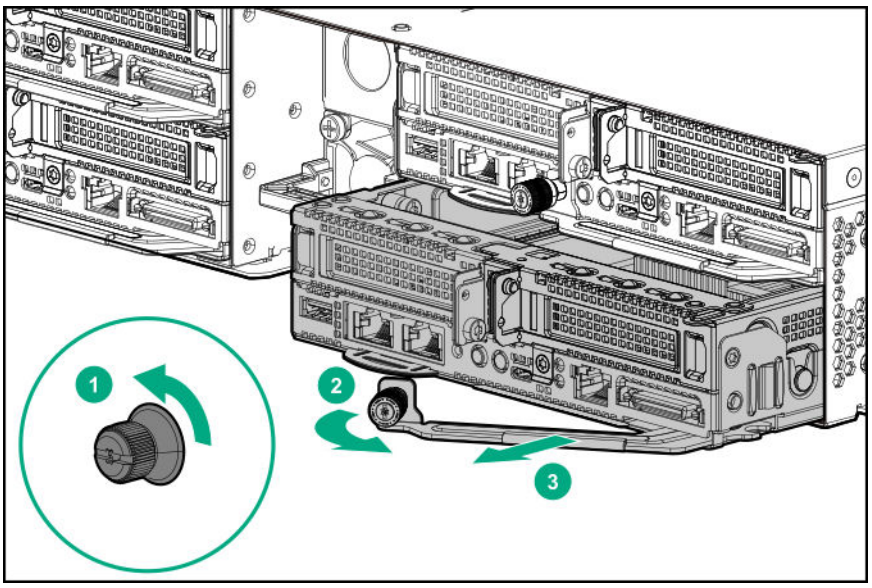
CAUTION: To prevent improper cooling and thermal damage, do not operate the chassis unless all bays are populated with a component or a blank.

CAUTION: To avoid damage to the server or server blank:

- Always support the bottom of the server or server blank when removing it from the chassis.
- Do not use the release lever to carry the server or server blank.

Procedure

1. **Power down the server** on page 22.
2. Disconnect all peripheral cables from the server.
3. Remove the server from the chassis:
   a. Loosen the release lever thumbscrew.
   b. Open the release lever.
   c. Use the release lever to pull the server out of the chassis.



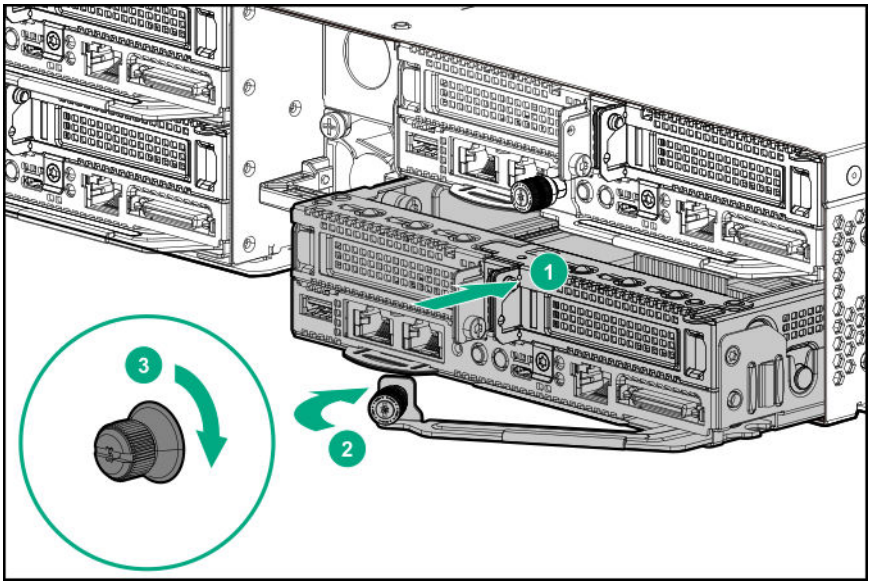
Install the server into the chassis

CAUTION: To avoid damage to the server or server blank:

- Always support the bottom of the server or server blank when removing it from the chassis.
- Do not use the release lever to carry the server or server blank.

Procedure

1. Slide the server into the chassis.
2. Close the release lever.
3. Tighten the release lever thumbscrew.



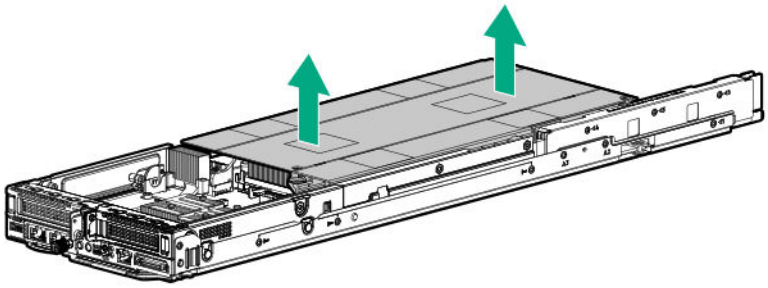
4. Connect all peripheral cables to the server.
5. **Power up the server** on page 22.

Remove the air baffle

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

Procedure

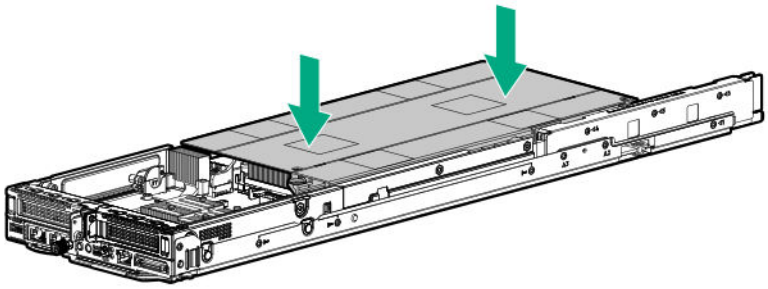
1. **Power down the server** on page 22.
2. Disconnect all peripheral cables from the server.
3. **Remove the server from the chassis** on page 27.
4. Remove the air baffle.



Install the air baffle

Procedure

1. Install the air baffle.



2. **Install the server into the chassis** on page 28.

3. Connect all peripheral cables to the server.
4. **Power up the server** on page 22.

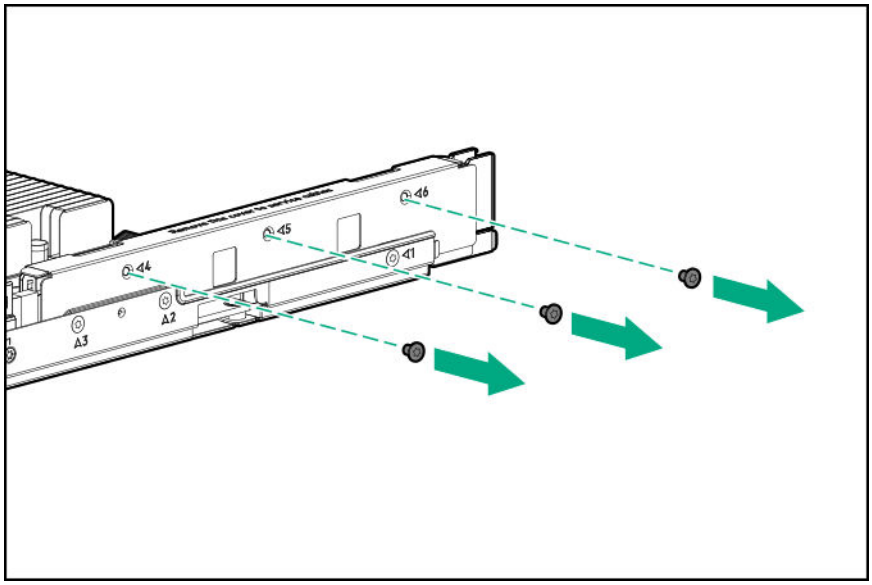
Remove the bayonet board

Prerequisites

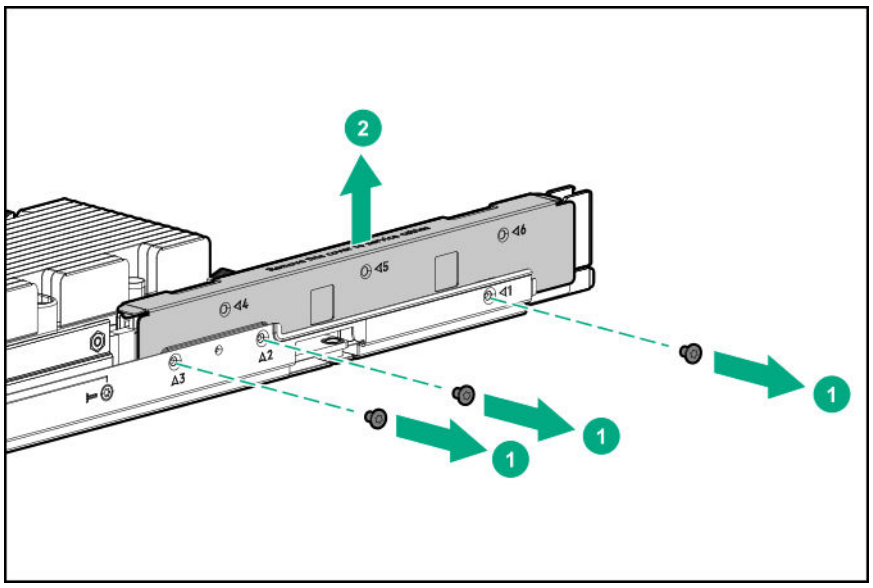
Before you perform this procedure, make sure that you have a T-10 Torx screwdriver available.

Procedure

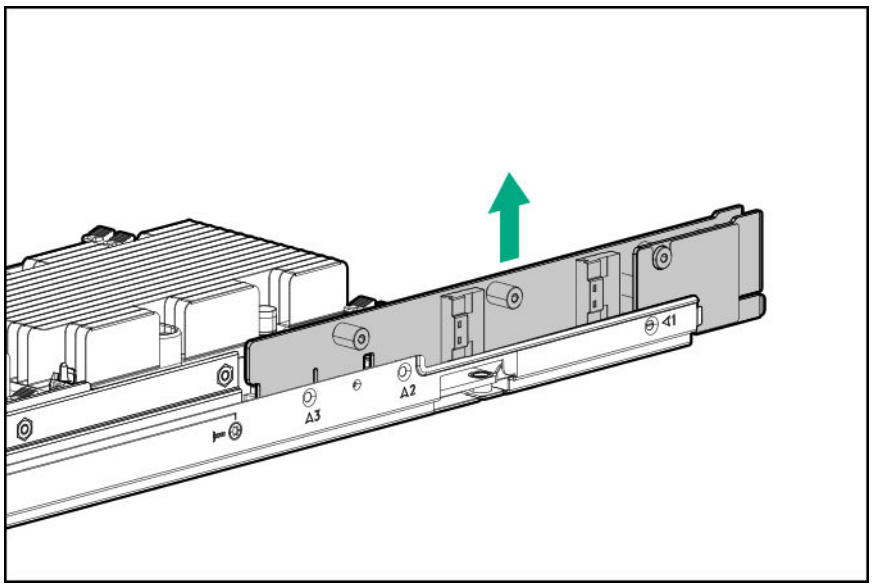
1. **Power down the server** on page 22.
2. Disconnect all peripheral cables from the server.
3. **Remove the server from the chassis** on page 27.
4. **Remove the air baffle** on page 29.
5. Remove the bayonet board:
   a. Remove the screws securing the cover to the bayonet board.



   b. Remove the screws securing the cover to the server tray, and then remove the cover.



c. Disconnect the bayonet board cables, and then remove the bayonet board.



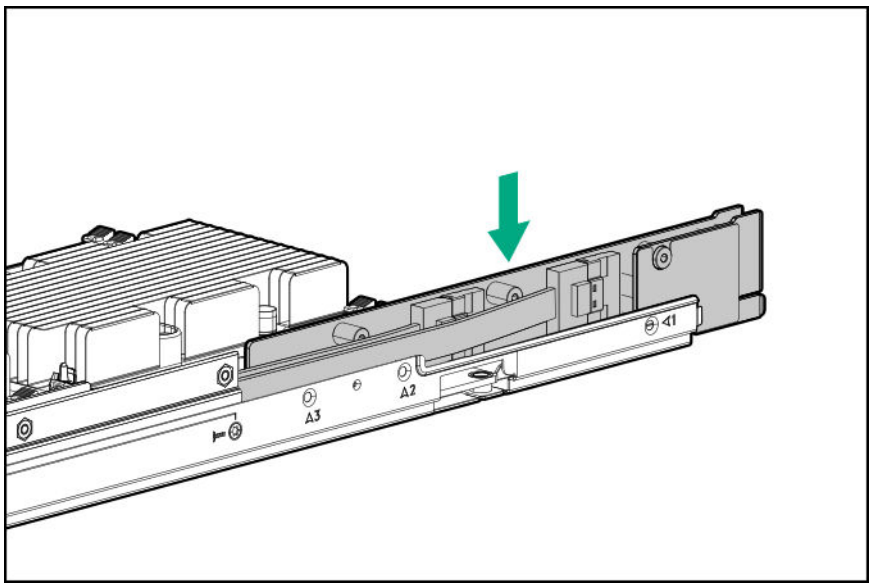
Install the bayonet board

Prerequisites

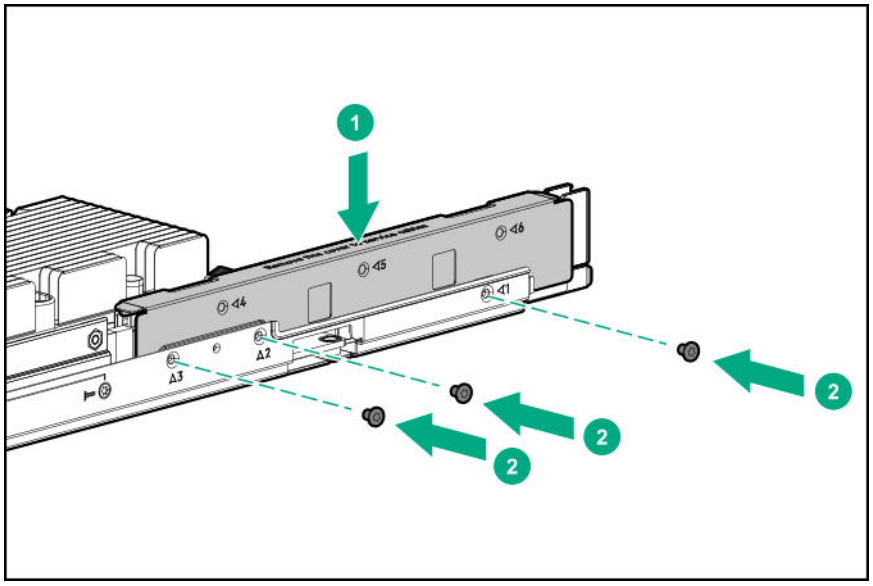
Before you perform this procedure, make sure that you have a T-10 Torx screwdriver available.

Procedure

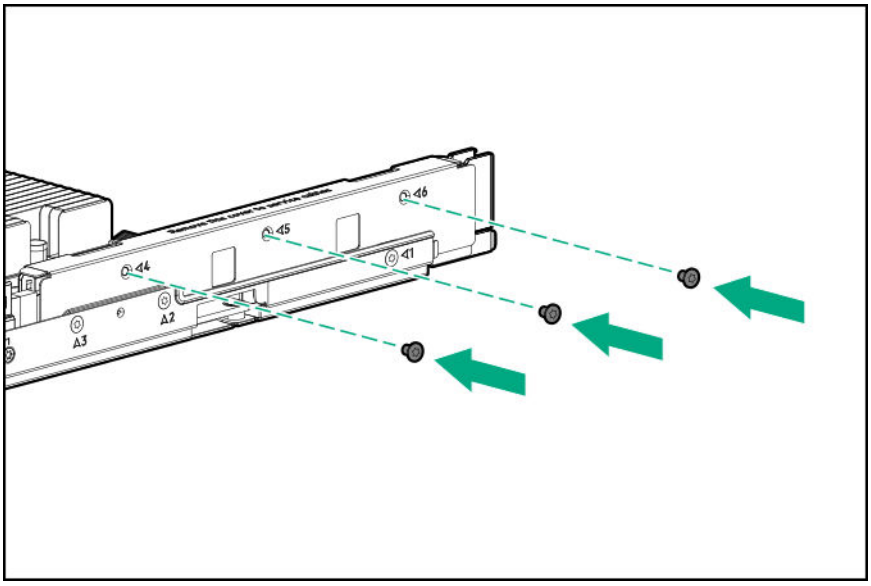
1. Install the bayonet board:
   a. Connect all the bayonet board cables.
   b. Install the bayonet board. Make sure that the board is firmly seated in the connector.



c. Install the bayonet board cover, and then install the screws to secure it to the server tray.



d. Install the screws to secure the cover to the bayonet board.



2. **Install the air baffle** on page 29.
3. **Install the server into the chassis** on page 28.
4. Connect all peripheral cables to the server.
5. **Power up the server** on page 22.

Remove the secondary riser blank

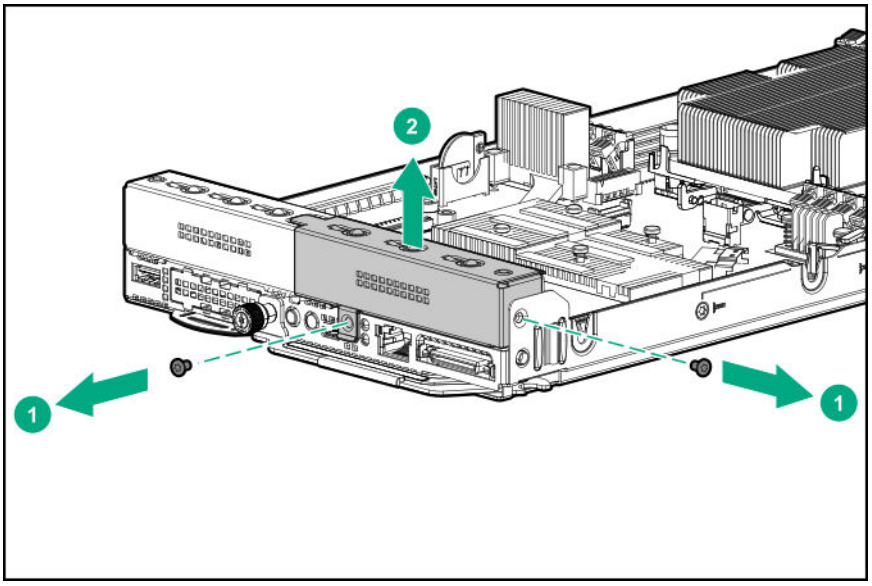
CAUTION: To prevent improper cooling and thermal damage, do not operate the server unless either riser blank or riser cage is installed.

Prerequisites

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

Procedure

1. **Power down the server** on page 22.
2. Disconnect all peripheral cables from the server.
3. **Remove the server from the chassis** on page 27.
4. Remove the secondary riser blank.



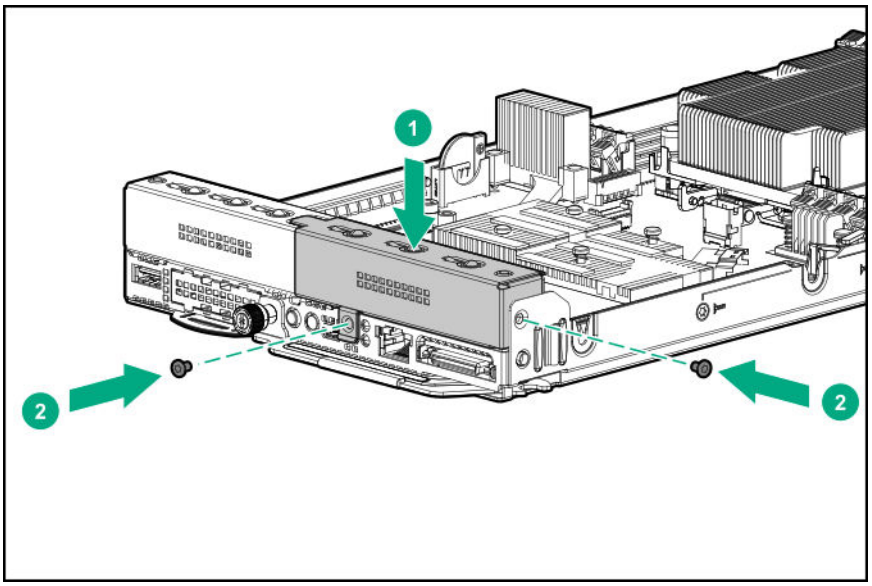
Install the secondary riser blank

Prerequisites

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

Procedure

1. Install the secondary riser blank.



2. **Install the server into the chassis** on page 28.
3. Connect all peripheral cables to the server.
4. **Power up the server** on page 22.

Remove the secondary riser cage

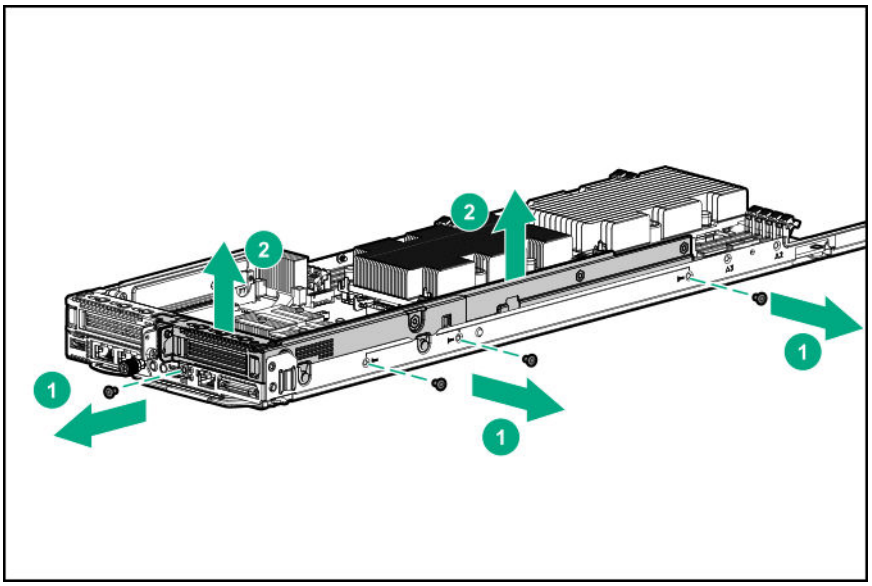
CAUTION: To prevent improper cooling and thermal damage, do not operate the server unless either riser blank or riser cage is installed.

Prerequisites

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

Procedure

1. **Power down the server** on page 22.
2. Disconnect all peripheral cables from the server.
3. **Remove the server from the chassis** on page 27.
4. **Remove the air baffle** on page 29.
5. **Remove the bayonet board** on page 30.
6. If an expansion board with internal cabling is installed on the riser cage, disconnect these internal cables from the expansion board.
7. Disconnect all cables from the riser board.
8. Remove the secondary riser cage.



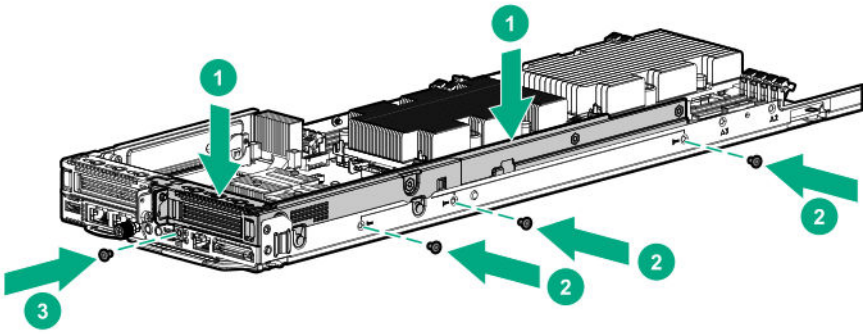
Install the secondary riser cage

Prerequisites

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

Procedure

1. Install the secondary riser cage. Make sure that the riser board is firmly seated in its system board connectors.



2. **Install the bayonet board** on page 31.
3. **Install the air baffle** on page 29.
4. **Install the server into the chassis** on page 28.
5. Connect all peripheral cables to the server.
6. **Power up the server** on page 22.

Remove the primary riser blank

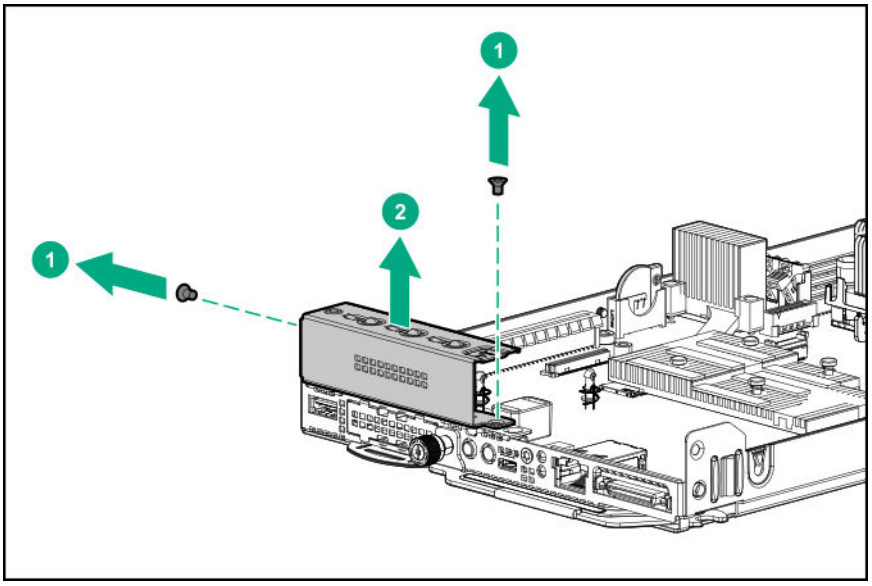
CAUTION: To prevent improper cooling and thermal damage, do not operate the server unless either riser blank or riser cage is installed.

Prerequisites

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

Procedure

1. **Power down the server** on page 22.
2. Disconnect all peripheral cables from the server.
3. **Remove the server from the chassis** on page 27.
4. If a secondary riser cage is installed, **remove the bayonet board**.
5. Do one of the following:
   - **Remove the secondary riser blank** on page 33.
   - **Remove the secondary riser cage** on page 35.
6. Remove the primary riser blank.



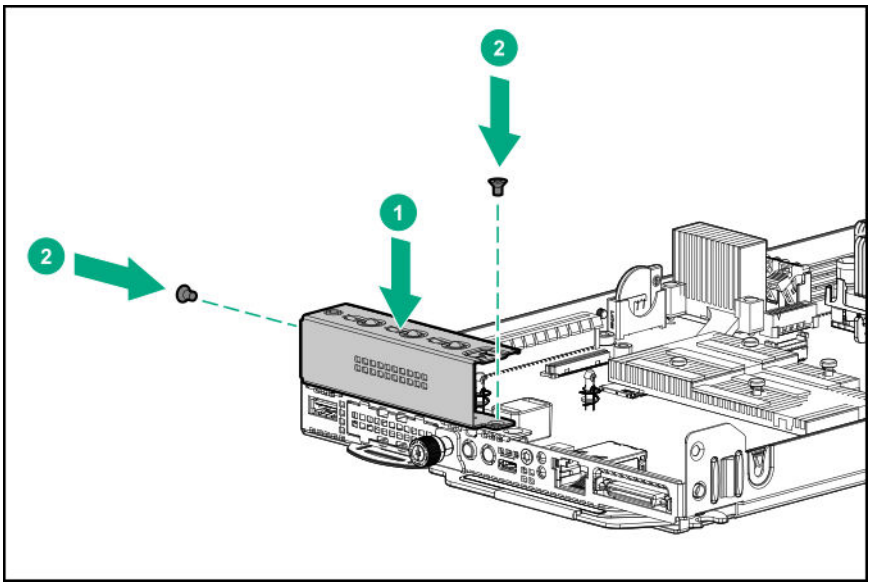
Install the primary riser blank

Prerequisites

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

Procedure

1. Install the primary riser blank.



2. Do one of the following:
   - **Install the secondary riser blank** on page 34.
   - **Install the secondary riser cage** on page 35.
3. If removed, **install the bayonet board**.
4. **Install the server into the chassis** on page 28.

5. Connect all peripheral cables to the server.
6. **Power up the server** on page 22.

Remove the primary riser cage

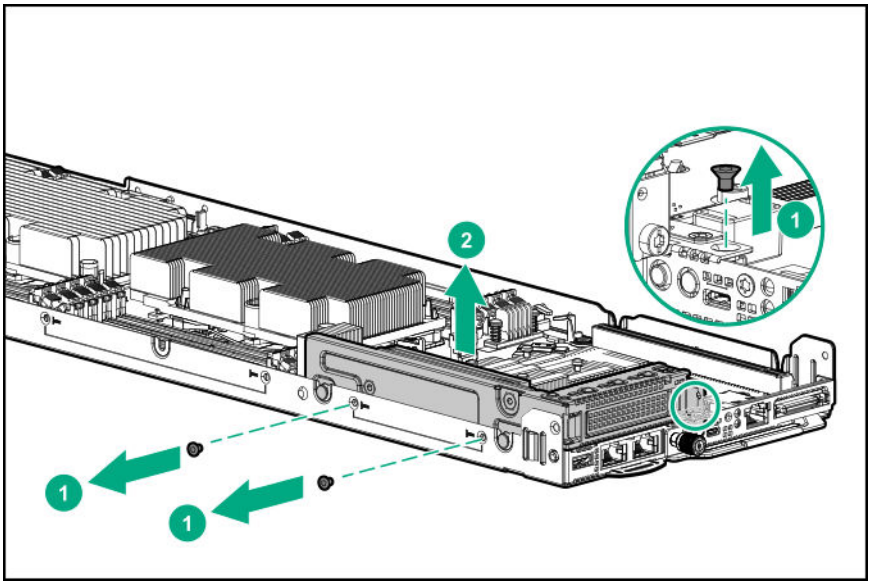
CAUTION: To prevent improper cooling and thermal damage, do not operate the server unless either riser blank or riser cage is installed.

Prerequisites

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

Procedure

1. **Power down the server** on page 22.
2. Disconnect all peripheral cables from the server.
3. **Remove the server from the chassis** on page 27.
4. **Remove the air baffle** on page 29.
5. If a secondary riser option is installed, **remove the bayonet board**.
6. Do one of the following:
   - **Remove the secondary riser blank** on page 33.
   - **Remove the secondary riser cage** on page 35.
7. If an expansion board with internal cabling is installed on the riser cage, disconnect these internal cables from the expansion board.
8. Disconnect all cables from the riser board.
9. Remove the primary riser cage.



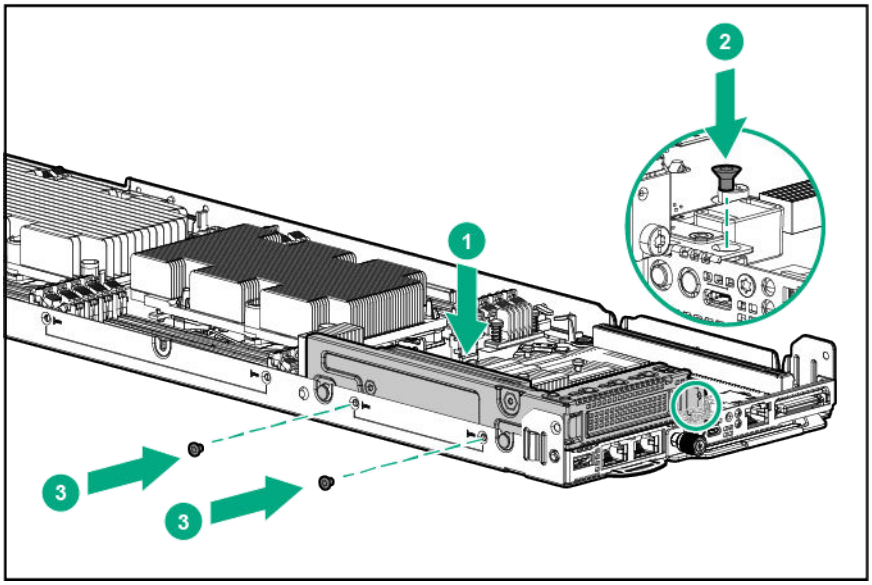
Install the primary riser cage

Prerequisites

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

Procedure

1. Install the primary riser cage. Make sure that the riser board is firmly seated in its system board the connector.



2. Do one of the following:

   - **Install the secondary riser blank** on page 34.
   - **Install the secondary riser cage** on page 35.

3. If removed, **install the bayonet board**.
4. If removed, **install the bayonet board**.
5. **Install the air baffle** on page 29.
6. **Install the server into the chassis** on page 28.
7. Connect all peripheral cables to the server.
8. **Power up the server** on page 22.

Setup

General site planning

Before you begin installing the HPE Apollo 2000 Gen10 System, Hewlett Packard Enterprise recommends that you plan and coordinate the installation process with an authorized HPE representative or partner. Proper planning provides a more efficient installation process and leads to greater availability, reliability, and serviceability of the system.

Optional service

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

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

- Foundation Care – Keep systems running.
  - 6-Hour Call-to-Repair[1]
  - 4-Hour 24x7
  - Next Business Day
- Proactive Care – Help prevent service incidents and get you to technical experts when there is one.
  - 6-Hour Call-to-Repair[1]
  - 4-Hour 24x7
  - Next Business Day
- Deployment service for both hardware and software
- Hewlett Packard Enterprise Education Services – Help train your IT staff.

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

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

Product QuickSpecs

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

Compiling the documentation

The documentation, while delivered individually and in various formats, works as a system. Consult these documents before attempting installation. These documents provide the required important safety information and decision-making steps for the configuration. To access these documents, see the Hewlett Packard Enterprise website (**https://www.hpe.com/info/Apollo2000-Gen10-docs**).

Initial server installation

Depending on the user technical expertise and the complexity of the product, for the initial server installation, the user can choose to order the **HPE Installation Service** on page 41.

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

HPE Installation Service

HPE Installation Service provides basic installation of Hewlett Packard Enterprise branded equipment, software products, as well as HPE-supported products from other vendors that are sold by HPE or by HPE authorized resellers. The Installation Service is part of a suite of HPE deployment services that are designed to give users the peace of mind that comes from knowing that their HPE and HPE-supported products have been installed by an HPE specialist.

The HPE Installation Service provides the following benefits:

- Installation by an HPE authorized technical specialist.
- Verification prior to installation that all service prerequisites are met.
- Delivery of the service at a mutually scheduled time convenient to your organization.
- Allows your IT resources to stay focused on their core tasks and priorities.
- Full coverage during the warranty period for products that require installation by an HPE authorized technical specialist.

For more information on the features, limitations, provisions, and ordering information of the HPE Installation Service, see this Hewlett Packard Enterprise website:

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

Setting up the server

Prerequisites
Before installing the server:

- Download the latest SPP:

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

  Support validation required
- Verify that your OS or virtualization software is supported:

  http://www.hpe.com/info/ossupport
- Read the HPE UEFI requirements for ProLiant servers on the **Hewlett Packard Enterprise website**. If the UEFI requirements are not met, you might experience boot failures or other errors when installing the operating system.
- Obtain the storage driver if needed:
  - Download it from the HPE Support Center website:

    http://www.hpe.com/support/hpesc
  - Extract it from the SPP.
- Read the safety and compliance information on the HPE website:

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

- Read the system operational requirements and the server warnings and cautions:
  - **Operational requirements** on page 44
  - **Server warnings and cautions** on page 45

Procedure

1. Unbox the server node and verify the contents:
   - Server node
   - Documentation
2. (Optional) Install the server hardware options. For installation instructions, see **Hardware options installation** on page 49.
3. **Install the server into the chassis**.
4. Connect all peripheral cables to the servers and chassis.
5. Connect each power cord to the chassis.
6. Connect each power cord to the power source.
7. Decide how to manage the server:
   - Locally: Use a KVM switch or a connect a keyboard, monitor, and mouse.
   - Remotely: Connect to the iLO web interface and run a remote console:
     a. Verify the following:
        - iLO is licensed to use the remote console feature.

          If iLO is not licensed, visit the HPE website:

          http://www.hpe.com/info/ilo
        - The iLO Management Port is connected to a secure network.

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

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

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

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

Power on the server

8. Press the Power On/Standby button.

   For remote management, use the iLO virtual power button.

9. Using the SPP, **update the following**:
   - System ROM
   - Storage controller
   - Network controller

Set up the storage

10. Set up the storage. Do one of the following:
    - To configure the server to boot from a SAN, see the following guide:

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

Deploy an OS or virtualization software

11. Manually deploy an OS or virtualization software:
    a. Insert the installation media.

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

Register the server

12. To experience quicker service and more efficient support, register the server at the HPE website:

https://myenterpriselicense.hpe.com

Operational requirements

Site requirements

The server must be located in a computer room or server room. The room must:

- Be only accessible to authorized technicians trained the room restriction reasons and precautions.
- Be within an area that is ideally locked or at minimum not accessible to unauthorized personnel.

Space and airflow requirements

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

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

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

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

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

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

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

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

Temperature requirements

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

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

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

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

Power requirements

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

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

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

Grounding requirements

- The building installation must provide a means of connection to protective earth.
- The equipment must be connected to that means of connection.
- A service person must check whether the socket-outlet from which the equipment is to be powered provides a connection to the building protective earth. If the outlet does not provide a connection, the service person must arrange for the installation of a protective earthing conductor from the separate protective earthing terminal to the protective earth wire in the building.

Device bay thermal requirements

Operate the chassis only when a device or blank is installed in all device bays. Before powering up the chassis, be sure to do the following:

- Install a drive or drive blank into all drive bays.
- Install a server or a blank into all server bays.
- Install a power supply or power supply blank into all power supply bays.

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.

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

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

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

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

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

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

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

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

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

CAUTION: Protect the 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 damage to electrical components, properly ground the server before beginning any installation procedure. Improper grounding can cause electrostatic discharge. For more information, refer to "**Electrostatic discharge** on page 47."

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.

CAUTION: To prevent improper airflow and insufficient cooling that can lead to thermal damage, observe the following:

- Do not operate the chassis without the access panel, baffles, or blanks installed.
- Do not operate the server without the baffles, expansion slot covers, or blanks installed.

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

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

Server shipping carton contents

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

The contents of the server shipping carton include:

- Server
- Printed setup documentation
- Accessory kit

Electrostatic discharge

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

To prevent electrostatic damage:

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

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

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

Installing the operating system

To operate properly, the server must have a supported operating system installed. For the latest information on operating system support, see the Hewlett Packard Enterprise website (**http://www.hpe.com/info/supportos**).

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

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

- Insert the operating system CD into the USB-attached DVD-ROM drive (user provided) and reboot the server. Download the Service Pack for ProLiant from the SPP download site (**http://www.hpe.com/servers/spp/download**) and create SPP media to install the drivers.
- Remote deployment installation — Use PXE boot into a server and deploy an operating system with a host server.

For additional system software and firmware updates, download the Service Pack for ProLiant from the Hewlett Packard Enterprise website (**http://www.hpe.com/servers/spp/download**). Software and firmware must be updated before using the node for the first time, unless any installed software or components require an older version.

For more information on using these installation methods, see the Hewlett Packard Enterprise website (**http://www.hpe.com/info/ilo**).

Selecting boot options

This server supports both Legacy BIOS Boot Mode and UEFI Boot Mode. On servers operating in UEFI Boot Mode, the boot controller and boot order are set automatically.

Procedure

1. Press the Power On/Standby button.
2. Do one of the following:
   - To enter the UEFI System Utilities screen and modify the server configuration ROM default settings, press the **F9** key on the ProLiant POST screen. Choose one of the following boot modes:
     - Legacy BIOS
     - UEFI (default)
   - If you do not need to modify the server configuration and are ready to install the system software, press the **F10** key to access Intelligent Provisioning.

For more information on automatic configuration, see the UEFI documentation on the **Hewlett Packard Enterprise website**.

Hardware options installation

Introduction

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

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

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

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

SUV cable option

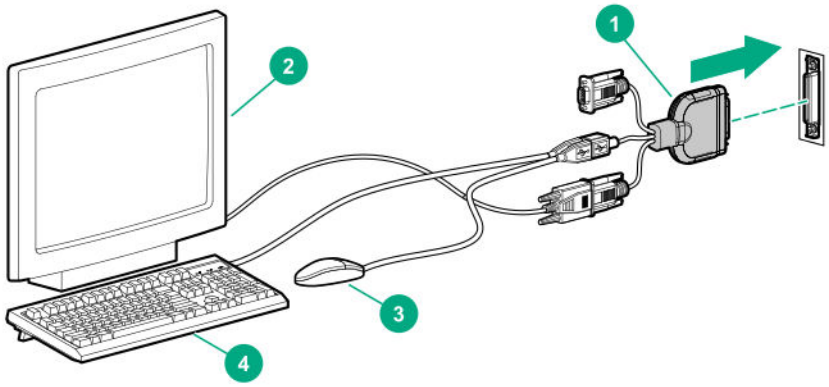
CAUTION: To avoid equipment damage when removing the SUV cable, press and hold the release buttons on the SUV cable connector before disconnecting the cable from the SUV port.

Use an SUV cable to perform server administration, configuration, and diagnostic procedures by connecting video and USB devices directly to the server.

Using an SUV cable for a KVM setup

Procedure

1. Connect the SUV cable to the SUV port.
2. Connect a monitor to the video connector.
3. Connect a USB mouse to the second USB connector.
4. Connect a USB keyboard to the other USB connector.

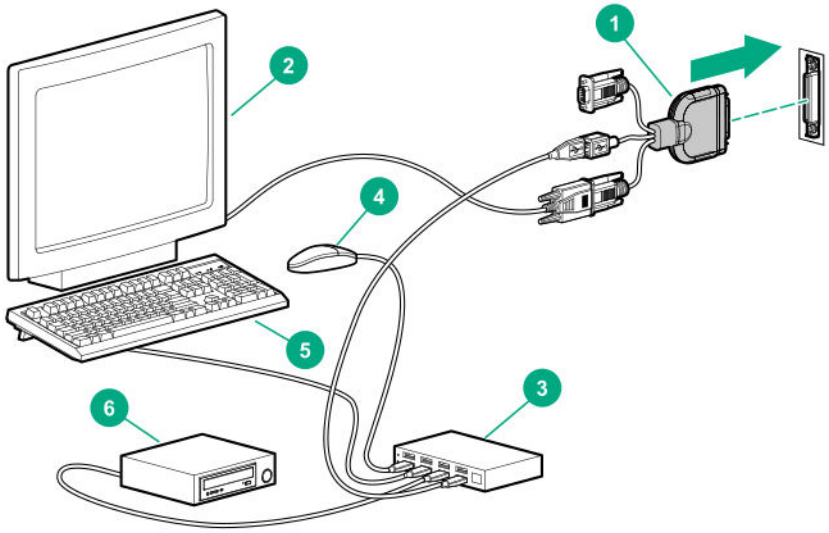


Using an SUV cable to access USB drives in a KVM setup

The USB connectors on the SUV cable do not support USB devices that require a power source greater than 500 mA at 5 V. When accessing this type of USB drives, such as a USB key or a USB optical drive, use a USB hub in a KVM setup.

Procedure

1. Connect the SUV cable to the SUV port.
2. Connect a monitor to the video connector.
3. Connect a USB hub to the USB connector.
4. Connect a USB mouse to the USB hub.
5. Connect a USB keyboard to the USB hub.
6. Connect a USB key or a USB optical drive to the USB hub.



Processor and heatsink options

Install the processor heatsink assembly

CAUTION: The maximum inlet ambient temperature for most components installed in the system is 35°C (95°F). Some components, however, are subject to thermal limitations depending on the chassis model and the fan configuration. There are some hardware configurations where it is necessary to limit the number of drives installed in the chassis. For more information, see **Temperature requirements**.

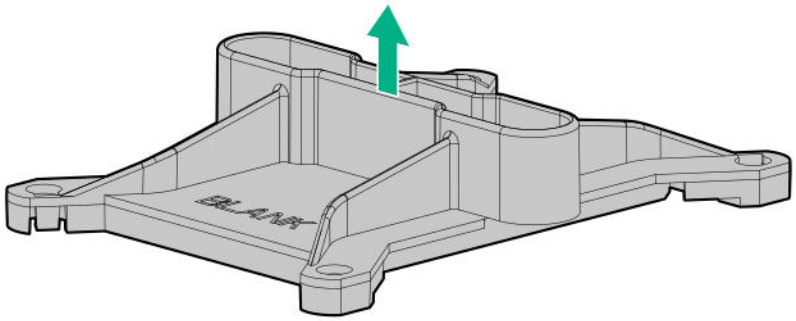
Prerequisites

Before installing this option, make sure that you have the following tools available:

- T-15 Torx screwdriver
- T-30 Torx screwdriver

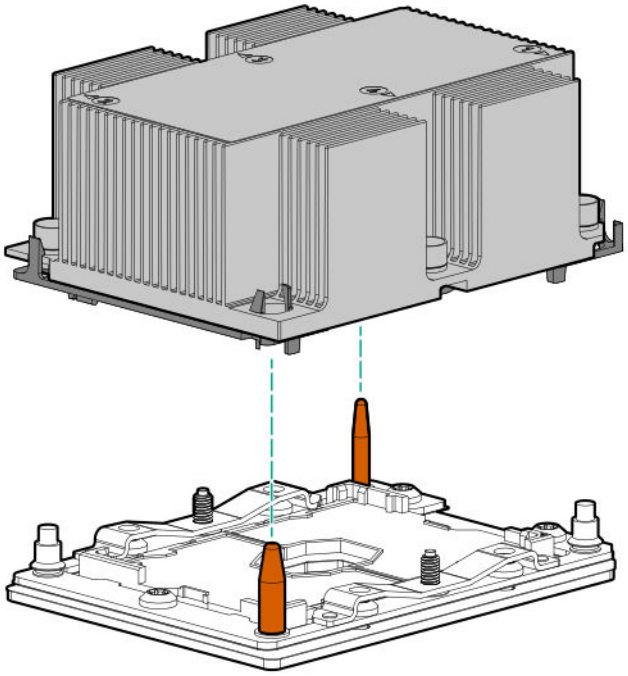
Procedure

1. **Power down the server** on page 22.
2. Disconnect all peripheral cables from the server.
3. **Remove the server from the chassis** on page 27.
4. **Remove the air baffle** on page 29.
5. Processor heatsink assemblies for processor sockets 1 and 2 are not interchangeable. Note the appropriate assembly orientation on the heatsink label.
6. Remove the processor socket blank.



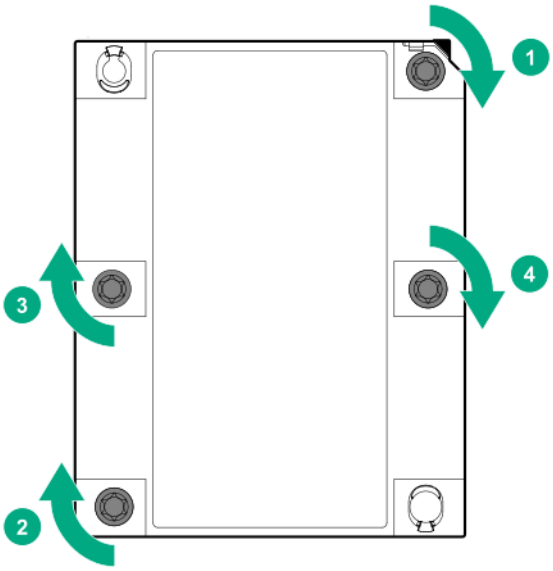
   Retain the blank for future use.
7. Install the processor heatsink assembly:
   a. Locate and align the Pin 1 indicator on the processor frame and the socket.
   b. Align the processor heatsink assembly with the heatsink alignment posts and gently lower it down until it sits evenly on the socket.
      The heatsink alignment posts are keyed. The processor will only install one way.

      Your heatsink might look different than the one shown.



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

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



8. **Install the air baffle** on page 29.
9. **Install the server into the chassis** on page 28.
10. Connect all peripheral cables to the server.

11. **Power up the server** on page 22.
12. If the server is using Intel Xeon Gold 6244 processors, **select one of the advanced fan cooling method**.

The installation is complete.

Selecting an advanced fan cooling method

Procedure

1. During the server startup sequence, press the **F9** key to access **System Utilities**.
2. From the **System Utilities** screen, select **System Configuration** > **BIOS/Platform Configuration (RBSU)** > **Advanced Options** > **Fan and Thermal Options** > **Thermal Configuration**.
3. Select one of the advanced fan cooling method:
   - **Enhanced CPU Cooling**
   - **Maximum Cooling**
4. Press **F10** to save the configuration.

Memory options

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

DIMM population information

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

DIMM-processor compatibility

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

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

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

HPE SmartMemory speed information

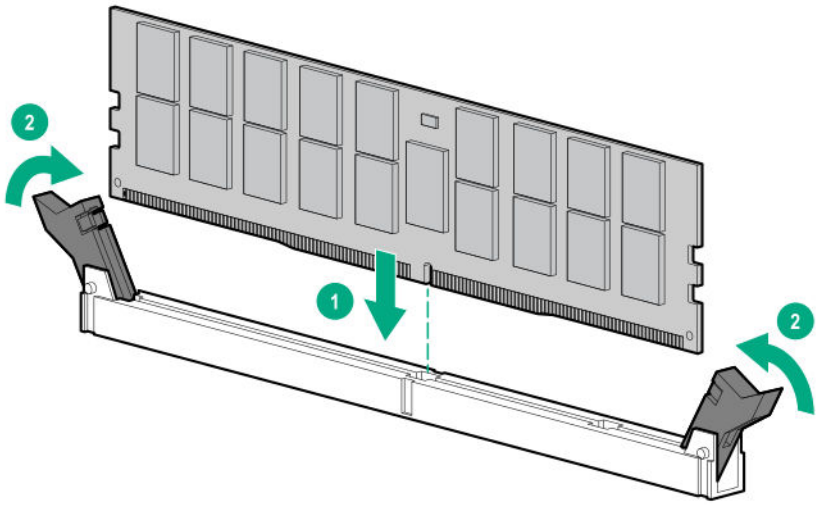
For more information about memory speed information, see the Hewlett Packard Enterprise website (**https://www.hpe.com/docs/memory-speed-table**).

Installing a DIMM

The server supports up to 16 DIMMs.

Procedure

1. **Power down the server** on page 22.
2. Disconnect all peripheral cables from the server.
3. **Remove the server from the chassis** on page 27.
4. **Remove the air baffle** on page 29.
5. Install the DIMM:
   a. Open the DIMM slot latches.
   b. Align the notch on the bottom edge of the DIMM with the keyed surface of the DIMM slot, and then fully press the DIMM into the slot until the latches snap back into place.



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

6. **Install the air baffle** on page 29.
7. **Install the server into the chassis** on page 28.
8. Connect all peripheral cables to the server.
9. **Power up the server** on page 22.

The installation is complete.

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

HPE Persistent Memory option

HPE Persistent Memory, which offers the flexibility to deploy as dense memory or fast storage and features Intel Optane DC Persistent Memory, enables per-socket memory capacity of up to 3.0 TB. HPE Persistent Memory, together with traditional volatile DRAM DIMMs, provide fast, high-capacity, cost-effective memory and storage to transform big data workloads and analytics by enabling data to be stored, moved, and processed quickly.

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

- 128 GB
- 256 GB
- 512 GB

HPE Persistent Memory module-processor compatibility

HPE Persistent Memory modules are supported only in servers with second-generation Intel Xeon Scalable processors installed.

HPE Persistent Memory population information

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

System requirements for HPE Persistent Memory module support

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

Before installing HPE Persistent Memory modules, make sure that the following components and software are available:

- A supported HPE ProLiant Gen10 server or Synergy compute module using second-generation Intel Xeon Scalable processors. For more information, see the product QuickSpecs on the Hewlett Packard Enterprise website (**http://www.hpe.com/support/persistentmemoryQS**).
- HPE DDR4 Standard Memory RDIMMs or LRDIMMs (the number will vary based on your chosen configuration).
- Supported firmware and drives:
  - System ROM version 2.10 or later
  - Server Platform Services (SPS) Firmware version 04.01.04.296
  - HPE iLO 5 Firmware version 1.43
  - HPE Innovation Engine Firmware version 2.1.x or later

  Download the required firmware and drivers from the Hewlett Packard Enterprise website (**http://www.hpe.com/info/persistentmemory**).
- A supported operating system:
  - Windows Server 2012 R2 with persistent memory drivers from Hewlett Packard Enterprise
  - Windows Server 2016 with persistent memory drivers from Hewlett Packard Enterprise
  - Windows Server 2019
  - Red Hat Enterprise Linux 7.6
  - Red Hat Enterprise Linux 8.0
  - SUSE Linux Enterprise Server 12 SP4

- SUSE Linux Enterprise Server 15 with SUSE-SU-2019:0224-1 kernel update
- SUSE Linux Enterprise Server 15 SP1 with SUSE-SU-2019:1550-1 kernel update
- VMware vSphere 6.7 U2 + Express Patch 10 (ESXi670-201906002) or later (supports App Direct and Memory modes)
- VMware vSphere 6.5 U3 or later (supports Memory mode)

- Hardware and licensing requirements for optional encryption of the HPE Persistent Memory modules:
  - HPE TPM 2.0 (local key encryption)
  - HPE iLO Advanced License (remote key encryption)
  - Key management server (remote key encryption)

For more information, see the *HPE Persistent Memory User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/persistentmemory-docs**).

Installing HPE Persistent Memory modules

Use this procedure only for new HPE Persistent Memory module installations. If you are migrating this HPE Persistent Memory module from another server, see the *HPE Persistent Memory User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/persistentmemory-docs**).

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

Procedure

1. Observe the following alerts:

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

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

   CAUTION: Failure to properly handle HPE Persistent Memory modules can damage the component and the system board connector.

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

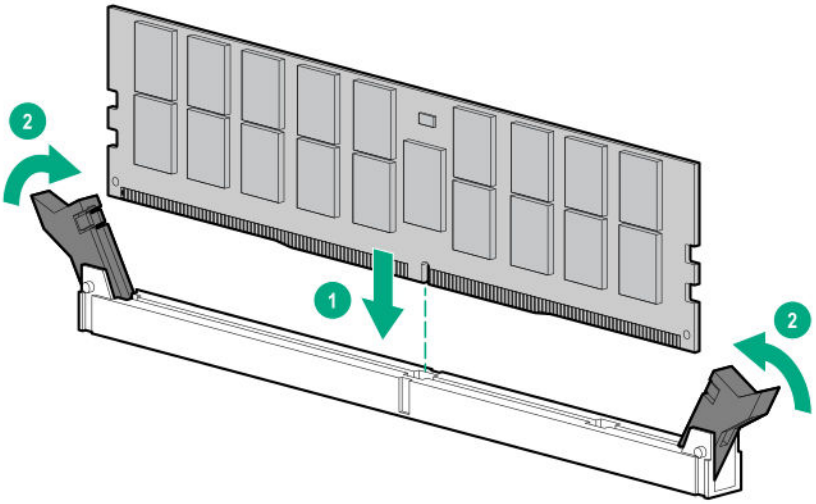
2. **Power up the server** on page 22.

   a. Shut down the OS as directed by the OS documentation.

   b. To place the server in standby mode, press the Power On/Standby button. When the server enters standby power mode, the system power LED changes to amber.

   c. Disconnect the power cords (rack and tower servers).

3. Disconnect all peripheral cables from the server.
4. **Remove the server from the chassis** on page 27.
5. **Remove the air baffle** on page 29.
6. Open the DIMM slot latches.
7. Install the HPE Persistent Memory module.



8. **Install the air baffle** on page 29.
9. **Install the server into the chassis** on page 28.
10. If removed, reconnect all power cables.
11. Connect all peripheral cables to the server.
12. **Power up the server** on page 22.
13. **Configure the server for HPE Persistent Memory**.

Configuring the server for HPE Persistent Memory

After installing HPE Persistent Memory modules, configure the server for HPE Persistent Memory.

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

A number of configuration tools are available, including:

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

For more information, see the *HPE Persistent Memory User Guide* on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/persistentmemory-docs**).

Installing the Omni-Path Architecture adapter option

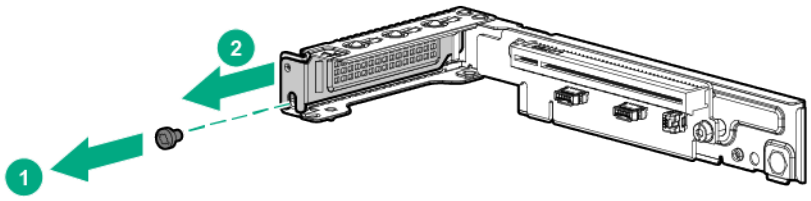
Prerequisites

Before installing this option:

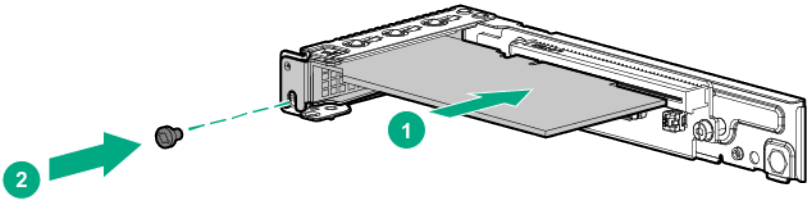
- Verify that an Intel Xeon 61XXF processor is installed in the processor socket 1.
- Verify that the server has at least 32 GB memory capacity.
- Make sure that you have a T-15 Torx screwdriver available.

Procedure

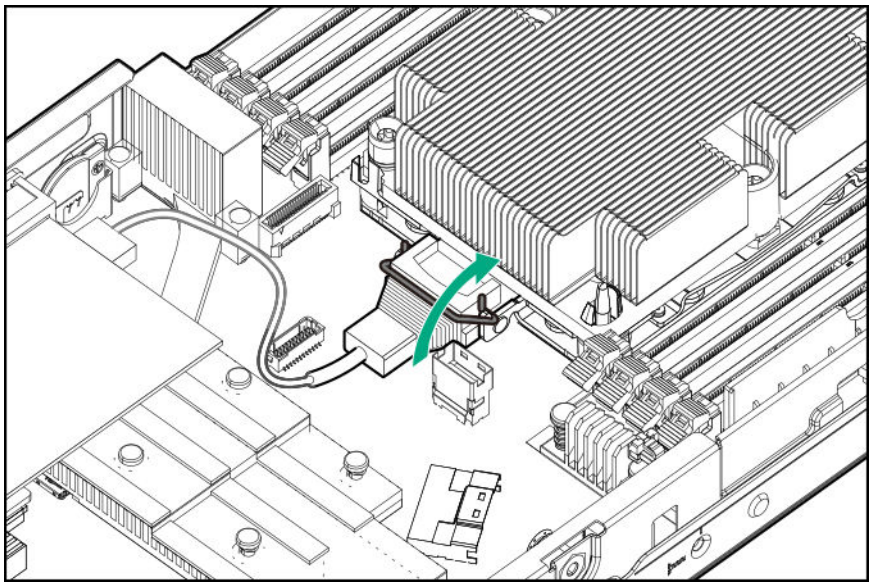
1. **Power down the server** on page 22.
2. Disconnect all peripheral cables from the server.
3. **Remove the server from the chassis** on page 27.
4. **Remove the air baffle** on page 29.
5. If a secondary riser option is installed, **remove the bayonet board**.
6. Do one of the following:
   - **Remove the secondary riser blank** on page 33.
   - **Remove the secondary riser cage** on page 35.
7. Do one of the following:
   - **Remove the primary riser blank** on page 36.
   - **Remove the primary riser cage** on page 38.
8. Remove the primary riser slot blank.



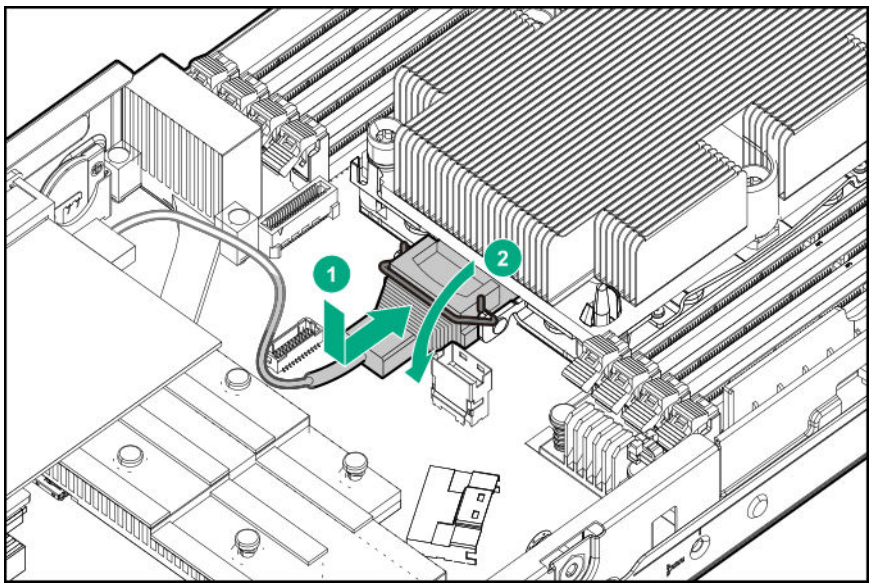
9. Connect the IFP and sideband cables to the OPA adapter.
10. Install the OPA adapter in the primary riser slot. Make sure that the board is firmly seated in the slot.



11. **Install the primary riser cage** on page 39.
12. Connect the OPA adapter IFP cable:
    a. Lift the IFP cable retaining latch.



    b. Connect the IFP cable to the Intel Xeon 61XXF processor.
    c. Close the IFP cable retaining latch.



13. **Connect the OPA adapter sideband cable to the system board**.
14. Do one of the following:
    - **Install the secondary riser blank** on page 34.
    - **Install the secondary riser cage** on page 35.
15. If removed, **install the bayonet board**.
16. **Install the air baffle** on page 29.
17. **Install the server into the chassis** on page 28.
18. Connect the LAN segment cables to the adapter.
19. Connect all peripheral cables to the server.
20. **Power up the server** on page 22.

The installation is complete.

Riser cage options

Installing the primary riser cage option

The primary riser function is linked to processor 1. This riser only supports low-profile expansion boards.

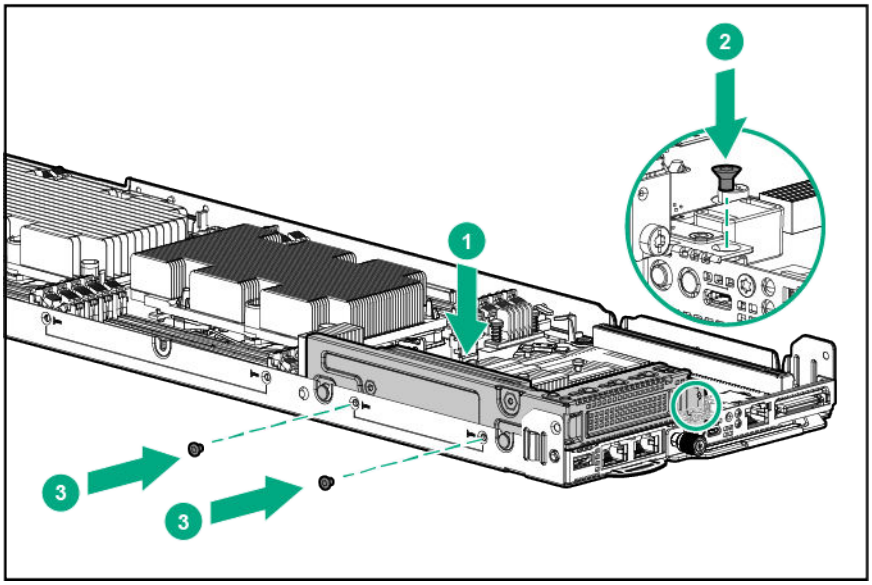
Prerequisites

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

Procedure

1. **Power down the server** on page 22.
2. Disconnect all peripheral cables from the server.
3. **Remove the server from the chassis** on page 27.

4. **Remove the air baffle** on page 29.
5. If a secondary riser option is installed, **remove the bayonet board**.
6. Do one of the following:
   - **Remove the secondary riser blank** on page 33.
   - **Remove the secondary riser cage** on page 35.
7. Install the primary riser cage. Make sure that the riser board is firmly seated in its system board connector.



8. If you are planning to install an expansion board in this riser cage, **install it now**.
9. Do one of the following:
   - **Install the secondary riser blank** on page 34.
   - **Install the secondary riser cage** on page 35.
10. If removed, **install the bayonet board**.
11. **Install the air baffle** on page 29.
12. **Install the server into the chassis** on page 28.
13. Connect all peripheral cables to the server.
14. **Power up the server** on page 22.

The installation is complete.

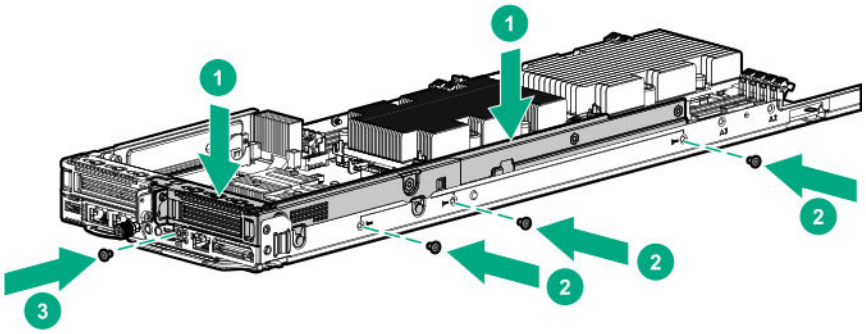
Installing the secondary riser cage option

Prerequisites

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

Procedure

1. **Power down the server** on page 22.
2. Disconnect all peripheral cables from the server.
3. **Remove the server from the chassis** on page 27.
4. **Remove the air baffle** on page 29.
5. If a secondary riser option is installed, **remove the bayonet board**.
6. **Remove the secondary PCIe riser blank**.
7. Install the secondary riser cage. Make sure that the riser board is firmly seated in its system board connectors.



8. If you are planning to install an expansion board in this riser cage, **install it now**.
9. If removed, **install the bayonet board**.
10. **Install the air baffle** on page 29.
11. **Install the server into the chassis** on page 28.
12. Connect all peripheral cables to the server.
13. **Power up the server** on page 22.

The installation is complete.

Expansion board options

Installing an expansion board in the primary riser cage

The primary riser slot only supports low-profile expansion boards. For more information on this riser option, see **Primary riser board components** on page 17.

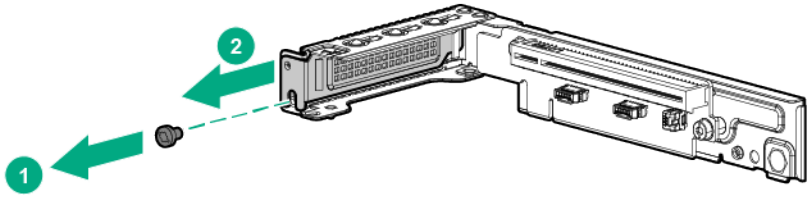
CAUTION: The maximum inlet ambient temperature for most components installed in the system is 35°C (95°F). Some components, however, are subject to thermal limitations depending on the chassis model and the fan configuration. There are some hardware configurations where it is necessary to limit the number of drives installed in the chassis. For more information, see **Temperature requirements**.

Prerequisites

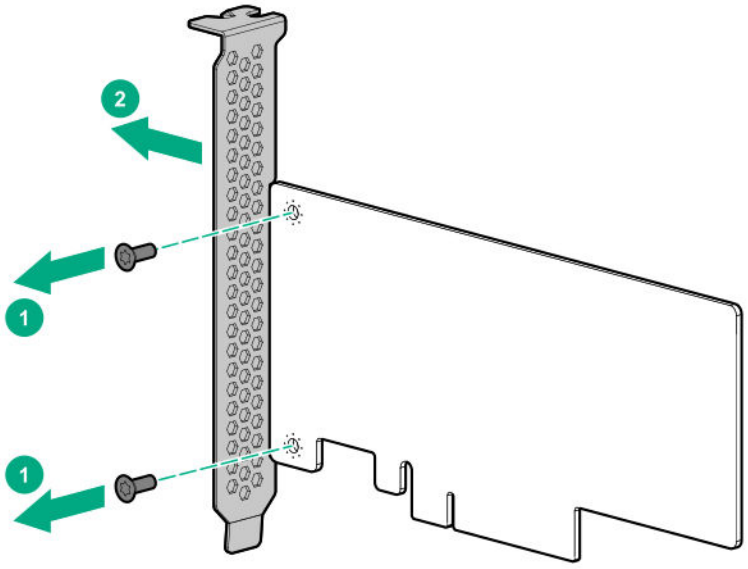
Before you perform this procedure, make sure that you have a T-15 Torx screwdriver available.

Procedure

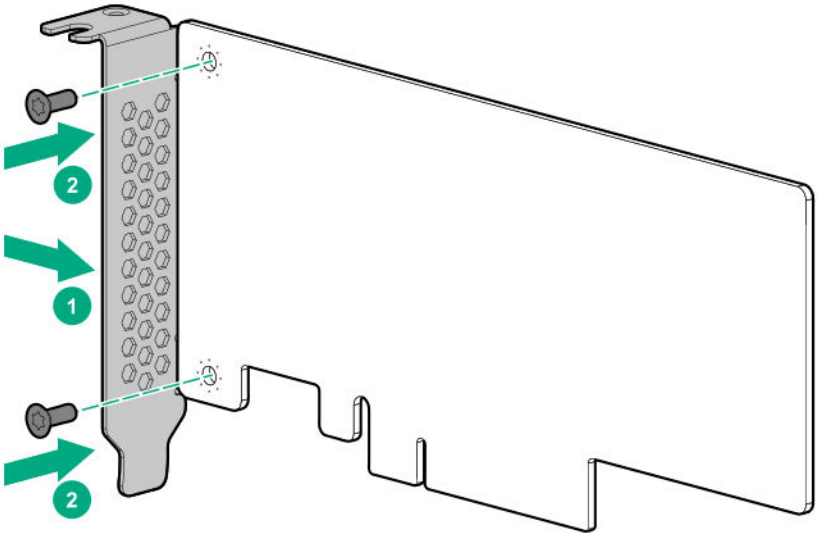
1. **Power down the server** on page 22.
2. Disconnect all peripheral cables from the server.
3. **Remove the server from the chassis** on page 27.
4. **Remove the air baffle** on page 29.
5. If a secondary riser option is installed, **remove the bayonet board**.
6. Do one of the following:
   - **Remove the secondary riser blank** on page 33.
   - **Remove the secondary riser cage** on page 35.
7. **Remove the secondary riser cage** on page 35.
8. Remove the primary riser slot blank.



9. If installed, remove the full-height bracket from the expansion board.



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



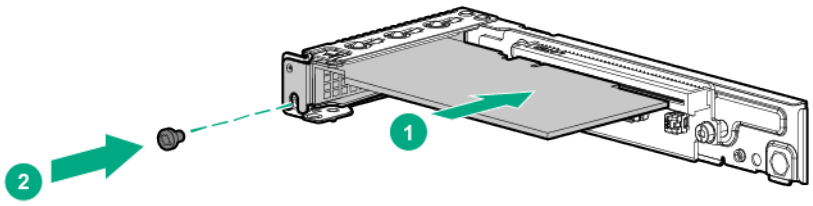
11. Make sure that any switches or jumpers on the expansion board are set properly.

    For more information, see the documentation that ships with the option.

12. Connect all necessary internal cabling to the expansion board.

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

13. Install the expansion board. Make sure that the board is firmly seated in the slot.



14. **Install the primary riser cage** on page 39.
15. Do one of the following:
    - **Install the secondary riser blank** on page 34.
    - **Install the secondary riser cage** on page 35.
16. If removed, **install the bayonet board**.
17. **Install the air baffle** on page 29.
18. **Install the server into the chassis** on page 28.
19. Connect all peripheral cables to the server.
20. **Power up the server** on page 22.

The installation is complete.

Installing an expansion board in the secondary riser cage

The server supports multiple riser options in the secondary position. For more information on the secondary riser options, see **Secondary riser board components** on page 17.

CAUTION: The maximum inlet ambient temperature for most components installed in the system is 35°C (95°F). Some components, however, are subject to thermal limitations depending on the chassis model and the fan configuration. There are some hardware configurations where it is necessary to limit the number of drives installed in the chassis. For more information, see **Temperature requirements**.

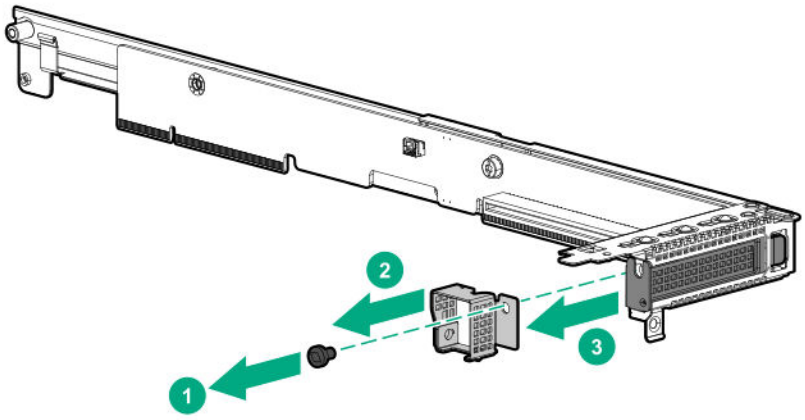
Prerequisites

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

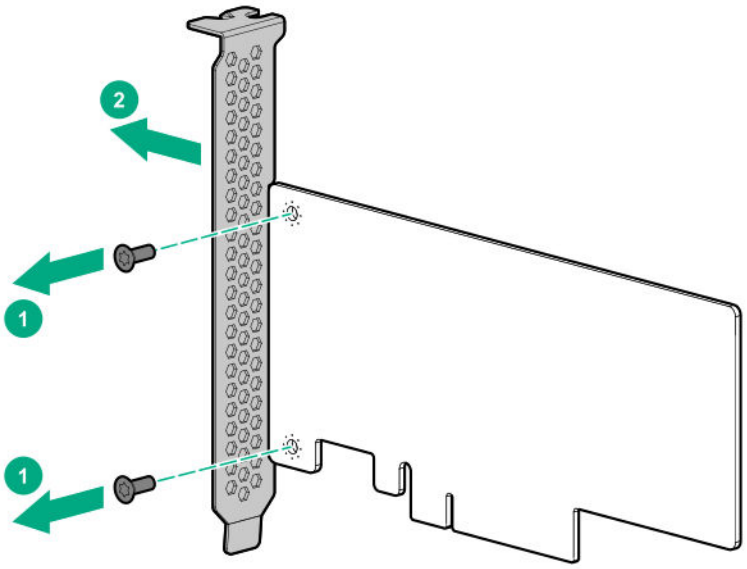
Procedure

1. **Power down the server** on page 22.
2. Disconnect all peripheral cables from the server.
3. **Remove the server from the chassis** on page 27.
4. **Remove the air baffle** on page 29.
5. **Remove the bayonet board**.

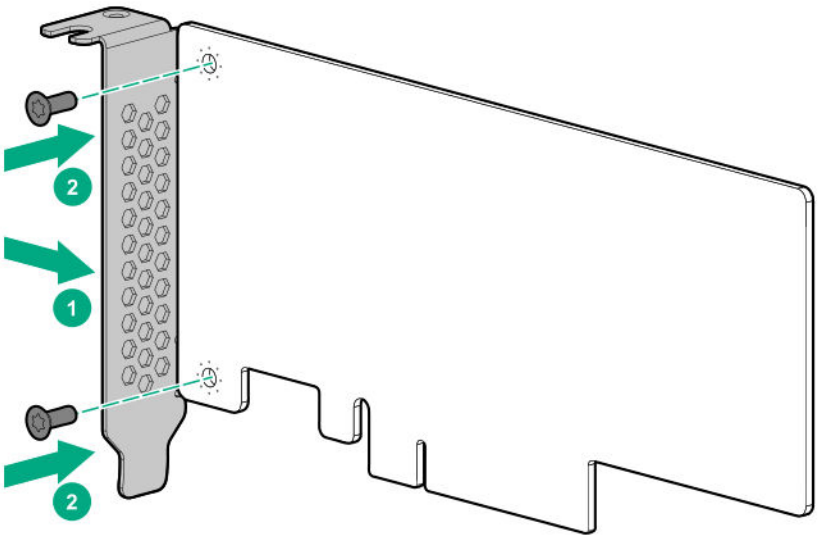
6. **Remove the secondary riser cage** on page 35.
7. Remove the secondary riser slot blank.



8. If installed, remove the full-height bracket from the expansion board.



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



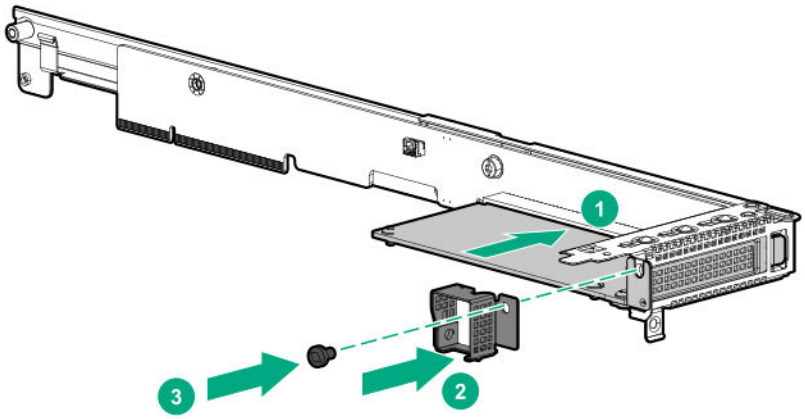
10. Make sure that any switches or jumpers on the expansion board are set properly.

    For more information, see the documentation that ships with the option.

11. Connect all necessary internal cabling to the expansion board.

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

12. Install the expansion board. Make sure that the board is firmly seated in the slot.



13. **Install the secondary riser cage** on page 35.
14. If removed, **install the bayonet board**.
15. **Install the air baffle** on page 29.
16. **Install the server into the chassis** on page 28.
17. Connect all peripheral cables to the server.
18. **Power up the server** on page 22.

The installation is complete.

Installing an HPE InfiniBand HDR/Ethernet 200 GB 1-port 940QSFP56 x16 adapter and auxiliary card

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

An HPE InfiniBand HDR/Ethernet 200 GB 1-port 940QSFP56 x16 adapter is installed in slot 1 and auxiliary card is installed in slot 2.

For more information of HPE InfiniBand HDR/Ethernet 100 GB 1-port 940QSFP56 x16 adapter installation, see **Expansion board options** on page 62.

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

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

CAUTION: The connector pins are fragile and easily damaged. To avoid damaging the connector pins, do not use excessive force when connecting the cables.

Prerequisites

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

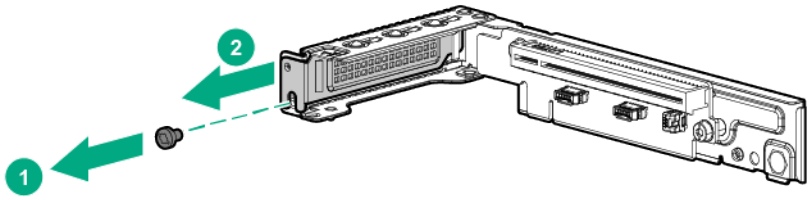
- T-15 Torx screwdriver
- Phillips No. 2 screwdriver
- HPE InfiniBand HDR PCIe G3 Auxiliary card with 150 mm cable kit (P06154-B22)

Procedure

1. **Power down the server** on page 22.
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Disconnect all peripheral cables from the server.
4. **Remove the server from the chassis** on page 27.
5. **Remove the air baffle** on page 29.
6. Do one of the following:
   - **Remove the secondary riser blank** on page 33.
   - **Remove the secondary riser cage** on page 35.
7. Do one of the following:

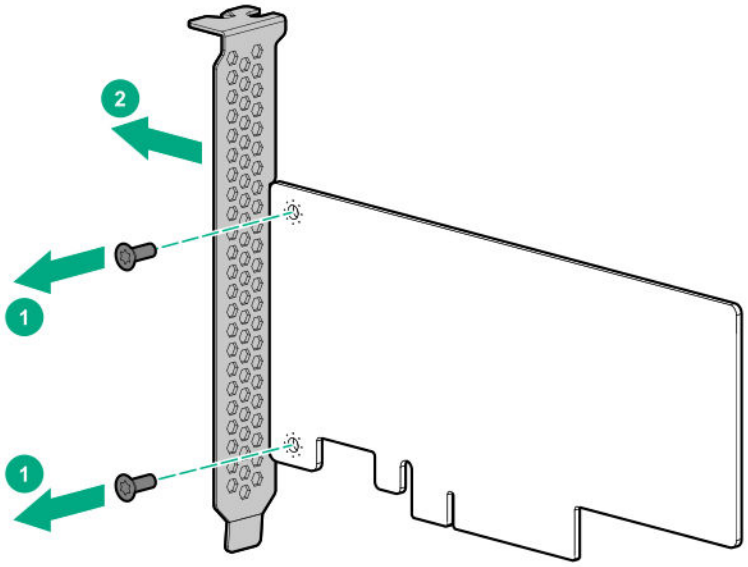
- **Remove the primary riser blank** on page 36.
- **Remove the primary riser cage** on page 38.

8. Remove the primary riser slot blank.



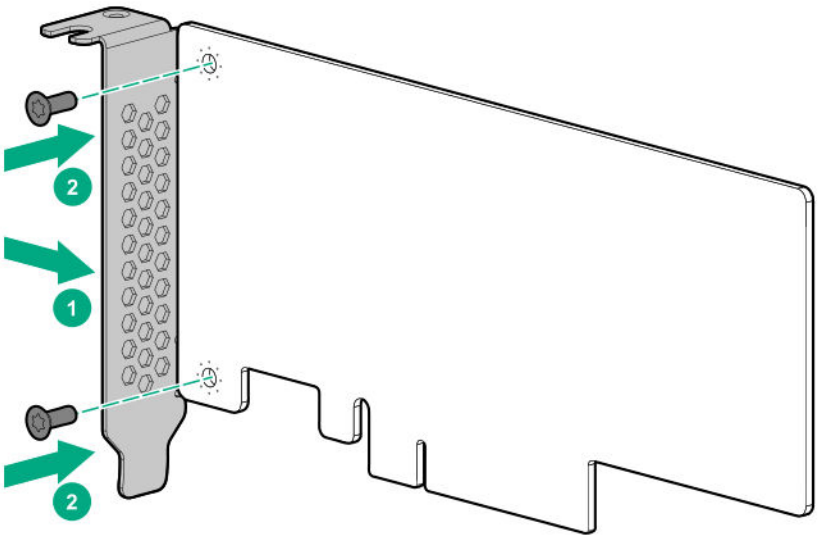
Retain the primary riser slot blank and screw for future use.

9. If installed, remove the full-height bracket from the adapter.

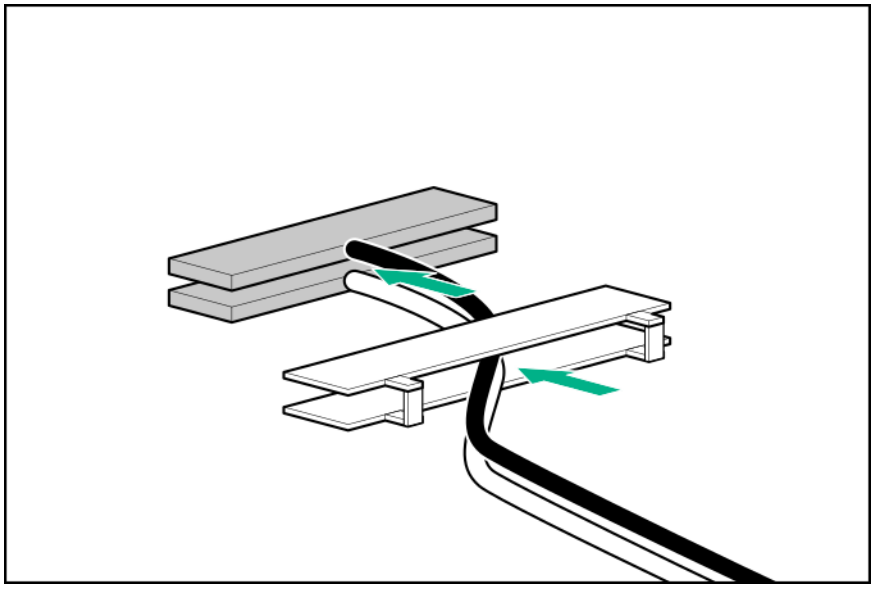


Retain the full-height bracket and screws for future use.

10. Install the low-profile bracket provided in the kit on the adapter and the auxiliary card.

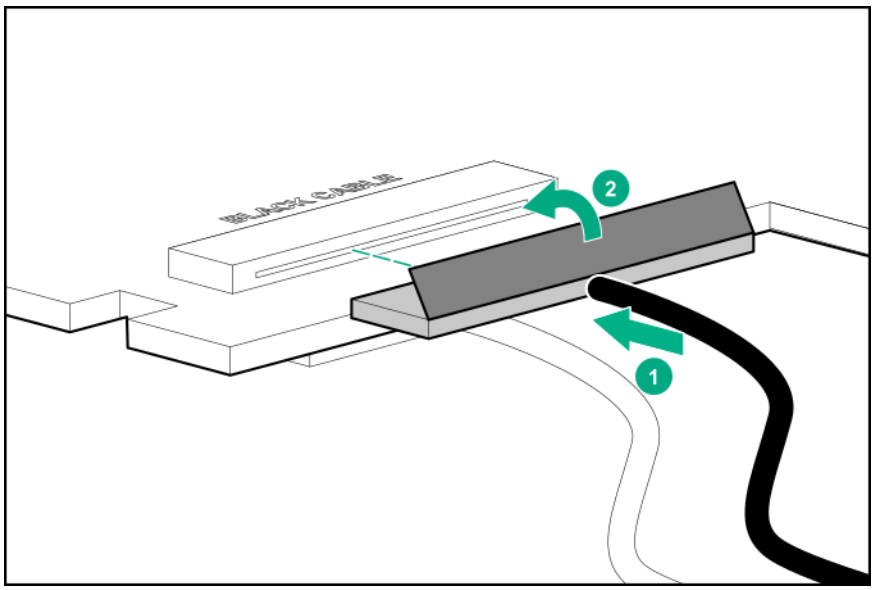


11. Thread the two cables provided in the kit together using the cable retention clip on either ends of the cables. Ensure that the clip posts are pointing towards the cable ends.



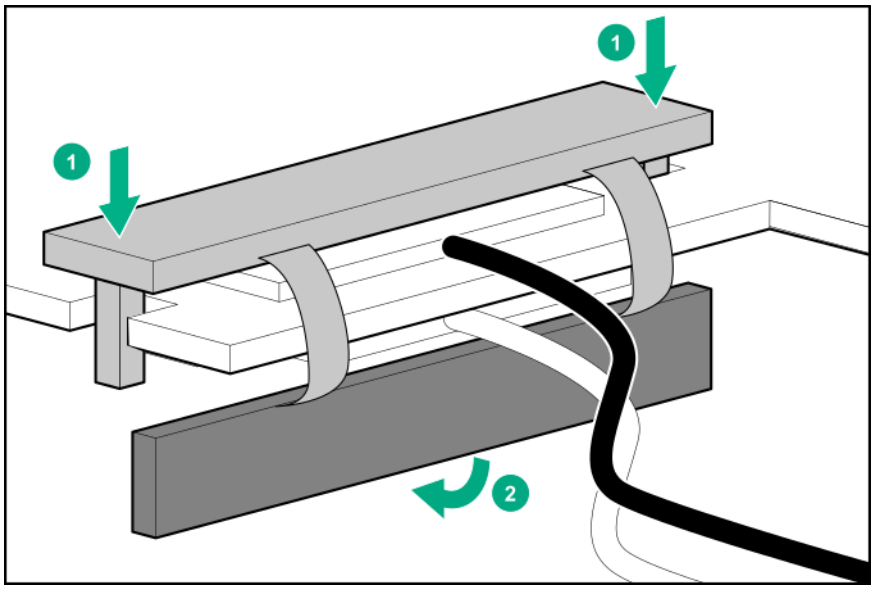
CAUTION: The white and black cables from the auxiliary card connect to the adapter board ports labeled WHITE CABLE and BLACK CABLE, respectively. The cable latch door must be open when connecting the cables. Close the cable latch door after connecting the cable.

12. Install the cables on the adapter:
    a. Connect the cable.
    b. Close the cable latch door until it clicks into place.

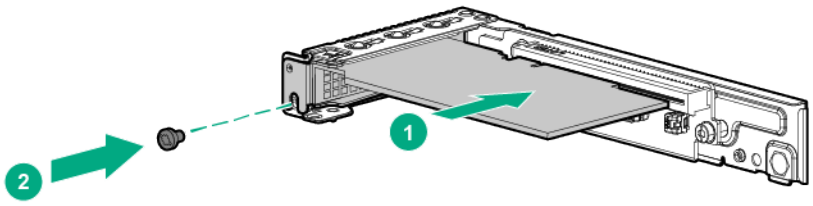


IMPORTANT: The connector is very delicate. To avoid the risk of breaking or bending the connector, push in the connector very gently. Do not touch the connector to avoid oil and dirt transfer to the connection area.

13. Push the clip down and slide the cable retention clip on the adapter.



14. Install the adapter in the primary riser cage.

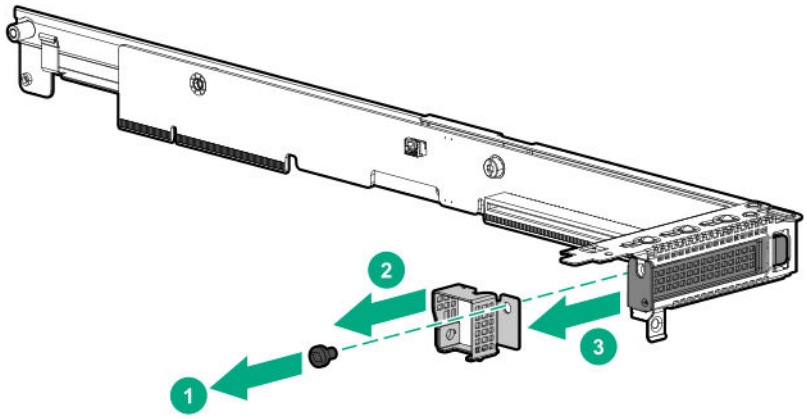


15. **Install the primary riser cage** on page 39.
16. **Repeat step 12 to connect the other end of the black and white cables to the auxiliary card**.

CAUTION: Cables on both cards should be angled in the same direction after installation.

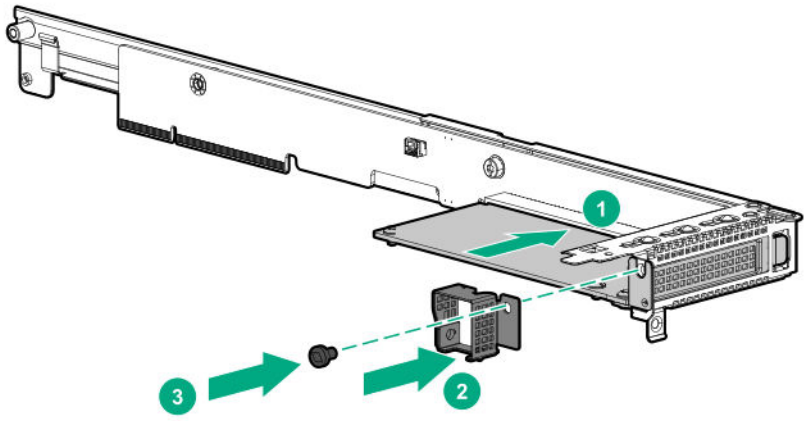
CAUTION: Avoid routing the cables through the iLO component on the system board.

17. To install the cable retention clip on the auxiliary card, **repeat step 13**.
18. To install the auxiliary card in secondary riser cage, do the following:
    a. Remove the secondary riser slot blank.



Retain the secondary riser slot blank, retention cover, and screw for future use.

    b. Install the auxiliary card in secondary riser cage. Make sure that the board is firmly seated in the slot.



19. **Install the secondary riser cage** on page 35.
20. **Route and manage the black and white cables**.
21. If removed, **install the bayonet board**.
22. **Install the air baffle** on page 29.
23. **Install the server into the chassis** on page 28.
24. Connect all peripheral cables to the server.
25. Connect all power:
    a. Connect each power cord to the server.
    b. Connect each power cord to the power source.
26. **Power up the server** on page 22.

The installation is complete.

For more information on UEFI configurations, see the Hewlett Packard Enterprise website:

https://hpe.com/hpsc/swd/public

Storage controller options

The server supports the following storage controllers:

- For SATA drives only – Embedded HPE Smart Array S100i SR Gen10 Controller
- For SAS and SATA drives – HPE Smart Array type-p controller

  The Smart Array type-p controller options are supported in both the primary and secondary riser slots.

IMPORTANT: The Apollo r2800 Gen10 Chassis with 16 NVMe drives does not support connection to the embedded Smart Array S100i SR Gen10 Software RAID nor to a Smart Array type-p controller.

Installing a Smart Array type-p controller in the primary riser cage

CAUTION: The maximum inlet ambient temperature for most components installed in the system is 35°C (95°F). Some components, however, are subject to thermal limitations depending on the chassis model and the fan configuration. There are some hardware configurations where it is necessary to limit the number of drives installed in the chassis. For more information, see **Temperature requirements**.

Prerequisites

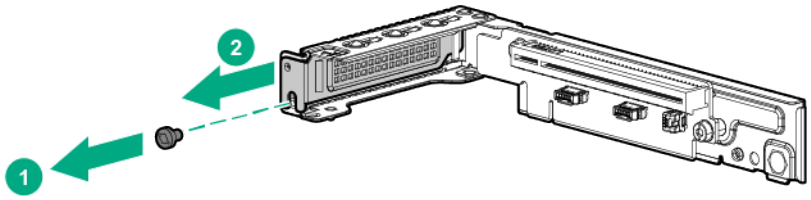
- Before you perform this procedure, make sure that you have a T-15 Torx screwdriver available.
- If you are installing a Smart Array P-class Gen10 controller, an energy pack option is required. For more information, see the chassis user guide on the Hewlett Packard Enterprise website (**https://www.hpe.com/info/Apollo2000-Gen10-docs**).
- Before you perform this procedure, perform the following steps:

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

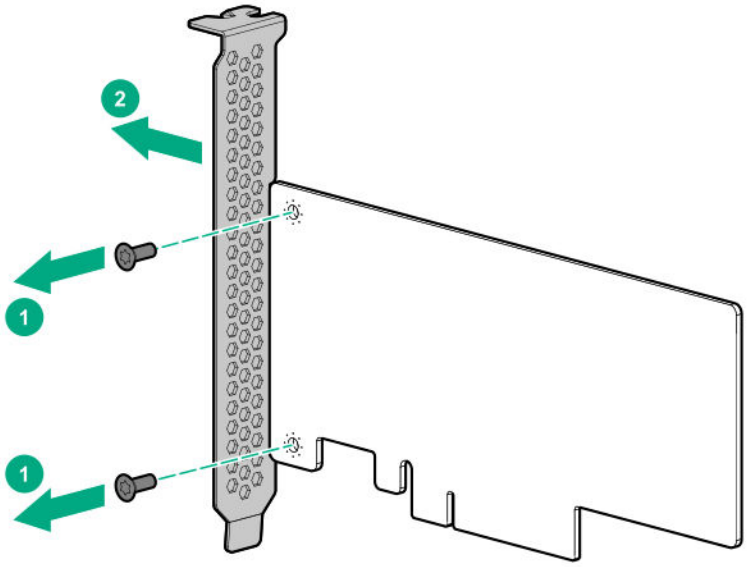
CAUTION: In systems that use external data storage, be sure that the server is the first unit to be powered down and the last to be powered back up. Taking this precaution ensures that the system does not erroneously mark the drives as failed when the server is powered up.

Procedure

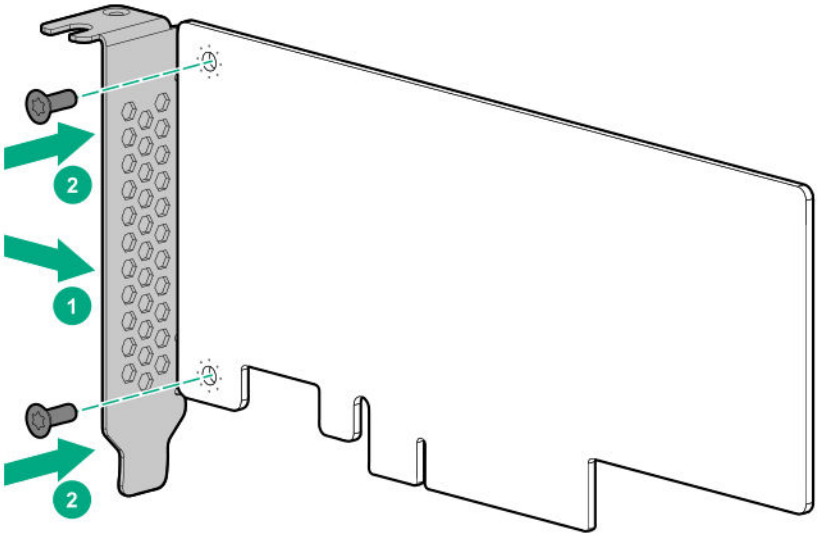
1. **Power down the server** on page 22.
2. Disconnect all peripheral cables from the server.
3. **Remove the server from the chassis** on page 27.
4. **Remove the air baffle** on page 29.
5. If a secondary riser option is installed, **remove the bayonet board**.
6. Do one of the following:
   - **Remove the secondary riser blank** on page 33.
   - **Remove the secondary riser cage** on page 35.
7. **Remove the primary riser cage** on page 38.
8. Remove the primary riser slot blank.



9. If installed, remove the full-height bracket from the controller.



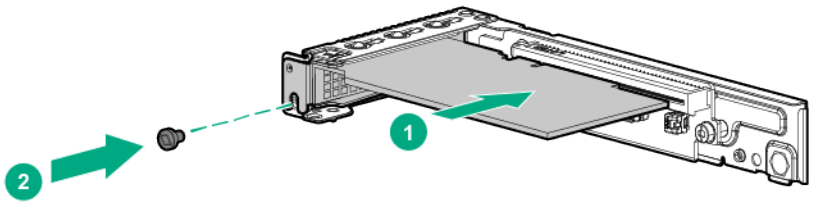
10. Install the low-profile bracket on the controller.



11. Connect the following cables to the controller:

- **Controller Mini-SAS cables**
- If you are installing a Smart Array P-class Gen10 controller, **connect the storage controller backup power cable**.

12. Install the controller. Make sure that the board is firmly seated in the slot.



13. If you have installed a Smart Array P-class Gen10 controller, **connect the storage controller backup power cable to the riser board**.
14. **Install the primary riser cage** on page 39.
15. Do one of the following:
    - **Install the secondary riser blank** on page 34.
    - **Install the secondary riser cage** on page 35.
16. **Connect the Smart Array controller cables to the bayonet board**.
17. If removed, **install the bayonet board**.
18. **Install the air baffle** on page 29.
19. **Install the server into the chassis** on page 28.
20. Connect all peripheral cables to the server.
21. To enable HPE Smart Array SR SmartCache or HPE Smart Array MR CacheCade in a Smart Array P-class Gen10 controller, install an energy pack.

    SmartCache and CacheCade enable solid-state drives to be used as caching devices for hard drive media. These features accelerate access to frequently used data by caching hot data from the hard drives onto the solid-state drives.

    For more information, see the chassis user guide on the Hewlett Packard Enterprise website (**https://www.hpe.com/info/Apollo2000-Gen10-docs**).
22. **Configure the HPE Smart Array Gen10 controller**.

The installation is complete.

Installing a Smart Array type-p controller in the secondary riser cage

CAUTION: The maximum inlet ambient temperature for most components installed in the system is 35°C (95°F). Some components, however, are subject to thermal limitations depending on the chassis model and the fan configuration. There are some hardware configurations where it is necessary to limit the number of drives installed in the chassis. For more information, see **Temperature requirements**.

Prerequisites

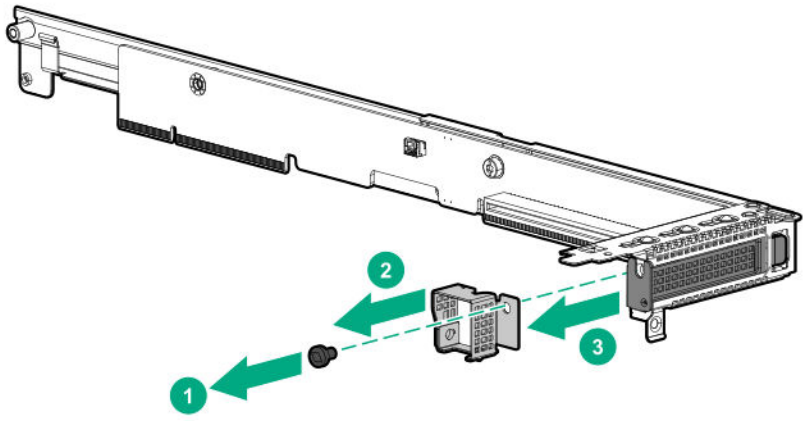
- Before you perform this procedure, make sure that you have a T-15 Torx screwdriver available.
- If you are installing a Smart Array P-class Gen10 controller, an energy pack option is required. For more information, see the chassis user guide on the Hewlett Packard Enterprise website (**https://www.hpe.com/info/Apollo2000-Gen10-docs**).
- Before you perform this procedure, perform the following steps:

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

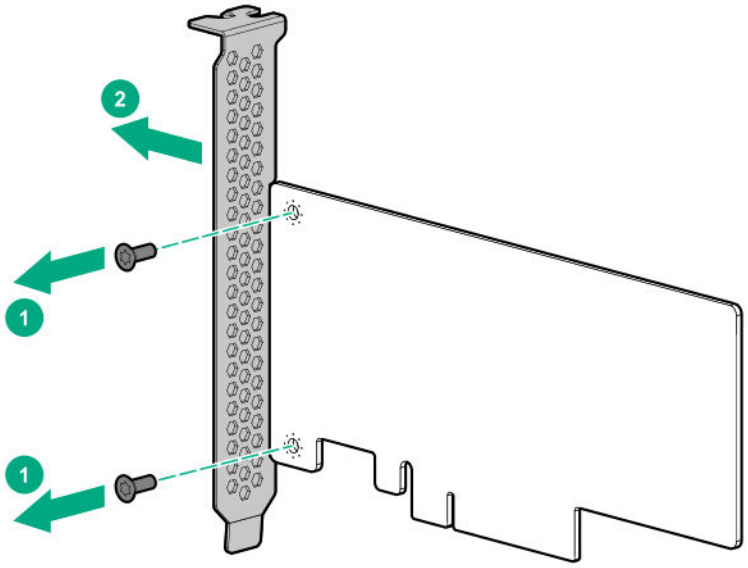
CAUTION: In systems that use external data storage, be sure that the server is the first unit to be powered down and the last to be powered back up. Taking this precaution ensures that the system does not erroneously mark the drives as failed when the server is powered up.

Procedure

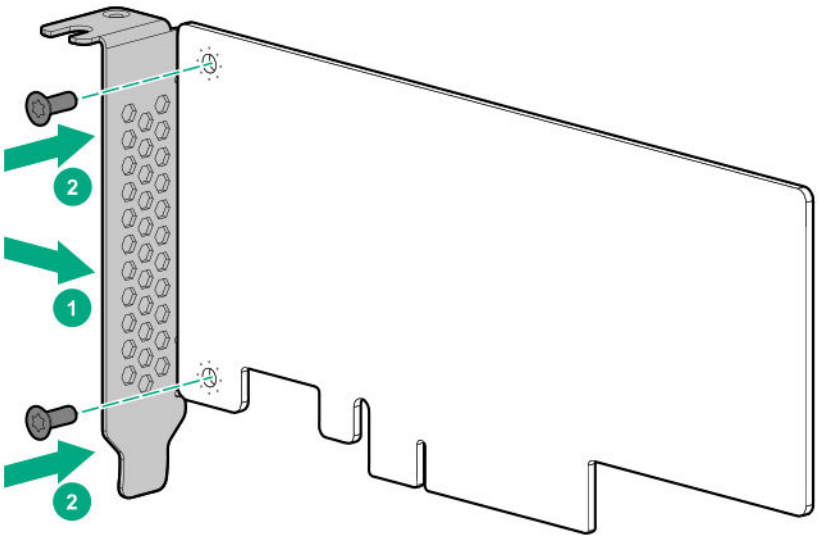
1. **Power down the server** on page 22.
2. Disconnect all peripheral cables from the server.
3. **Remove the server from the chassis** on page 27.
4. **Remove the air baffle** on page 29.
5. **Remove the bayonet board** on page 30.
6. **Remove the secondary riser cage** on page 35.
7. Remove the secondary riser slot blank.



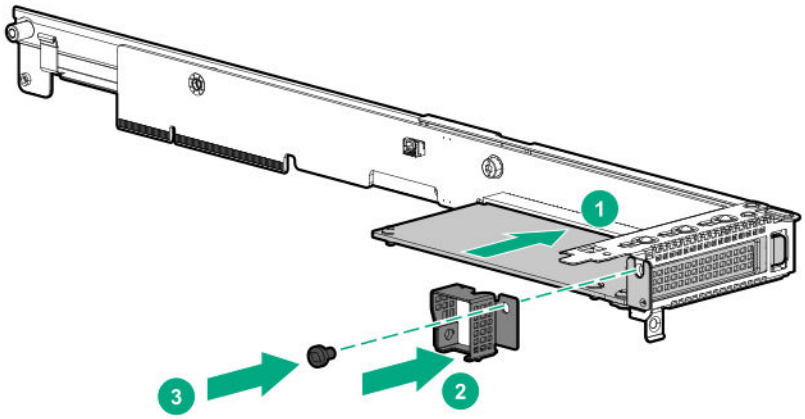
8. If installed, remove the full-height bracket from the controller.



9. Install the low-profile bracket on the controller.



10. Connect the following cables to the controller:
    - **Controller Mini-SAS cables**
    - If you are installing a Smart Array P-class Gen10 controller, **connect the storage controller backup power cable**.
11. Install the controller. Make sure that the board is firmly seated in the slot.



12. If you have installed a Smart Array P-class Gen10 controller, **connect the storage controller backup power cable to the riser board**.
13. **Install the secondary riser cage** on page 35.
14. **Connect the Smart Array controller cables to the bayonet board**.
15. If removed, **install the bayonet board**.
16. **Install the air baffle** on page 29.
17. **Install the server into the chassis** on page 28.

18. Connect all peripheral cables to the server.
19. To enable HPE Smart Array SR SmartCache or HPE Smart Array MR CacheCade in a Smart Array P-class Gen10 controller, install an energy pack.

    SmartCache and CacheCade enable solid-state drives to be used as caching devices for hard drive media. These features accelerate access to frequently used data by caching hot data from the hard drives onto the solid-state drives.

    For more information, see the chassis user guide on the Hewlett Packard Enterprise website (**https://www.hpe.com/info/Apollo2000-Gen10-docs**).
20. **Configure the HPE Smart Array Gen10 controller**.

The installation is complete.

Configuring an HPE Smart Array Gen10 controller

Procedure

1. **Power up the server**.
2. If you are running the server in UEFI Boot Mode, select the boot options.
3. **Update the drive firmware if it is not the latest revision**.
4. (Optional) If running the server in Legacy Boot Mode, set the controller as the boot controller.
5. (Optional) If running the server in Legacy Boot Mode, change the controller boot order.
6. If the new controller is not the new boot device, install the device drivers.
7. If the controller firmware is not the latest version, use SPP to update it.
8. Use UEFI System Utilities or HPE Smart Storage Administrator (HPE SSA) to create arrays and logical drives.

See the following resources for more information:

- SPP – See the product documentation in the information library:

  http://www.hpe.com/info/spp/docs
- UEFI System Utilities or HPE Smart Storage Administrator – See the *HPE Smart Array SR Gen10 Configuration Guide* in the information library:

  http://www.hpe.com/info/smartstorage-docs

M.2 SATA SSD option

The server has dedicated connector for a dual-bay M.2 SSD riser that supports M.2 2280 SATA SSDs. If only one SSD is being installed, install it in bay 7. For information on the riser bay numbering, see **M.2 SSD riser bay numbering** on page 20.

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

Installing an M.2 SSD

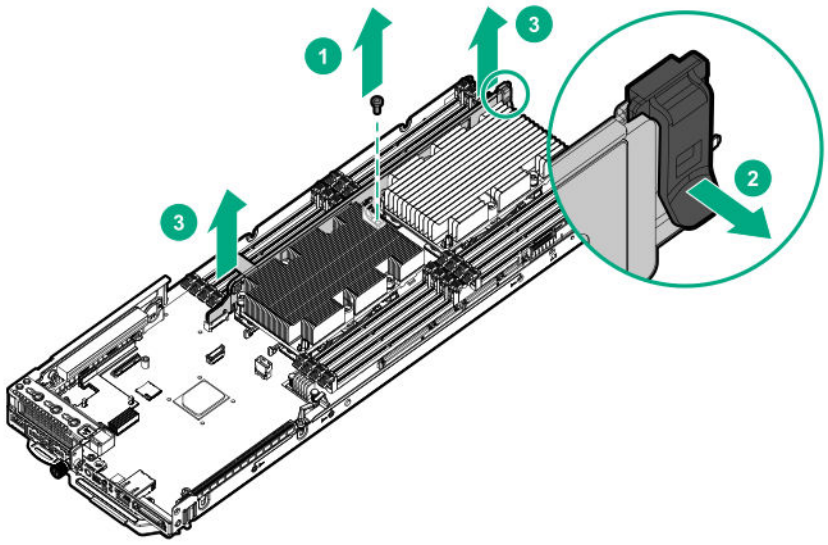
Prerequisites

Before installing this option, make sure that you have the following tools available:

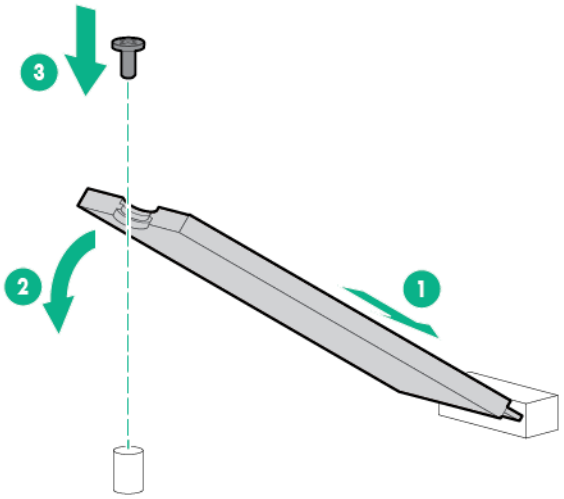
- Phillips No. 1 screwdriver
- T-15 Torx screwdriver

Procedure

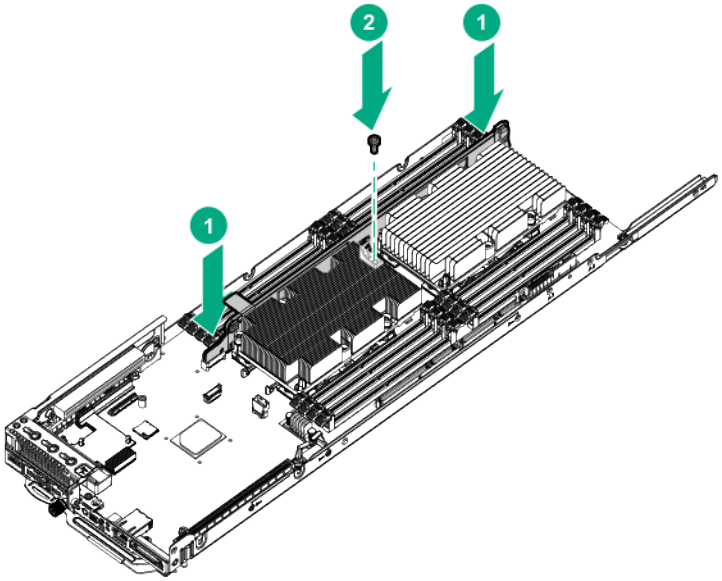
1. **Power down the server** on page 22.
2. Disconnect all peripheral cables from the server.
3. **Remove the server from the chassis** on page 27.
4. **Remove the air baffle** on page 29.
5. Remove the DIMM guard:
   a. Remove the DIMM guard screw.
   b. Carefully disengage the latch from the DIMM guard post.
   c. Remove the DIMM guard.
      Retain the component for future use.



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



7. Install the M.2 SSD riser. Make sure that the riser board is firmly seated in its system board connector.



8. **Install the air baffle** on page 29.
9. **Install the server into the chassis** on page 28.
10. Connect all peripheral cables to the server.
11. **Power up the server** on page 22.

The installation is complete.

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

FlexibleLOM option

The server supports a FlexibleLOM riser cage option in the secondary position.

CAUTION: The maximum inlet ambient temperature for most components installed in the system is 35°C (95°F). Some components, however, are subject to thermal limitations depending on the chassis model and the fan configuration. There are some hardware configurations where it is necessary to limit the number of drives installed in the chassis. For more information, see **Temperature requirements**.

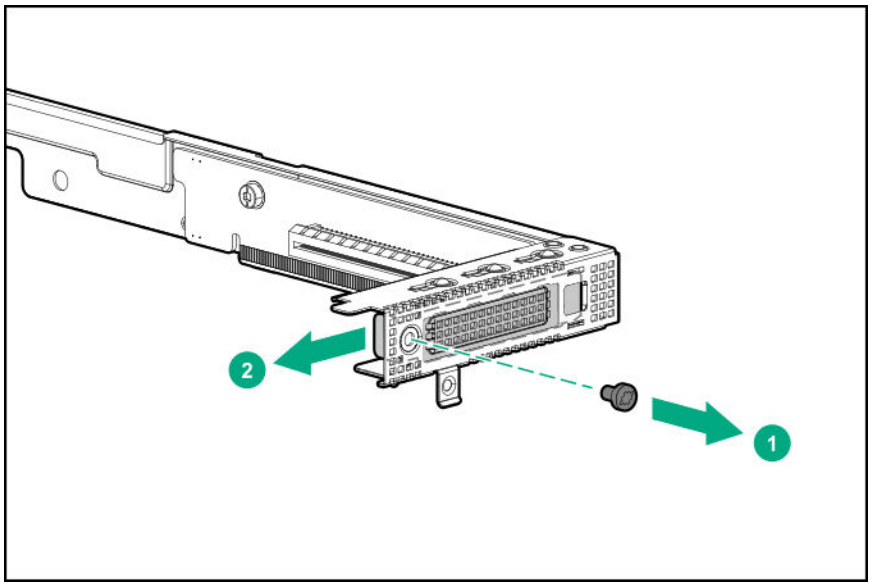
Installing the FlexibleLOM adapter

Prerequisites

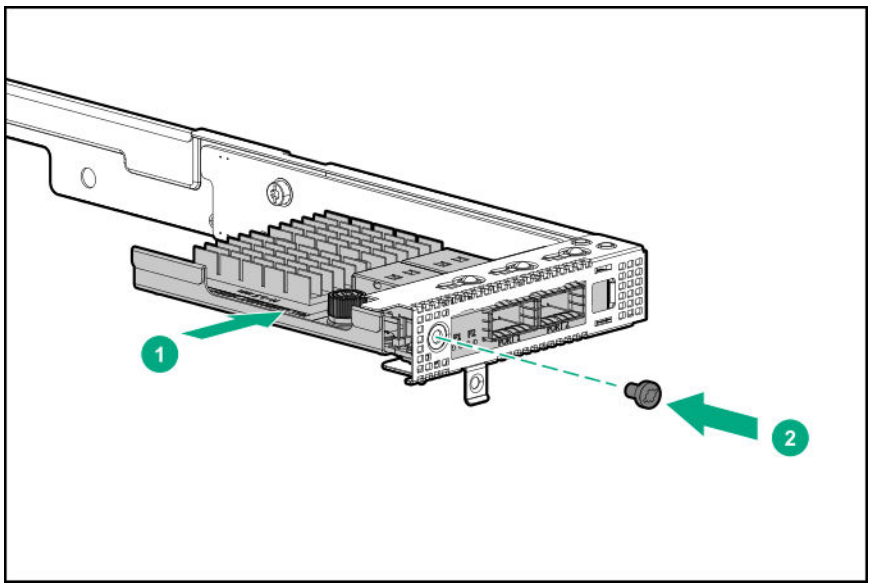
Before installing this option, make sure that you have a T-10 and a T-15 Torx screwdrivers available.

Procedure

1. **Power down the server** on page 22.
2. Disconnect all peripheral cables from the server.
3. **Remove the server from the chassis** on page 27.
4. **Remove the air baffle** on page 29.
5. **Remove the bayonet board** on page 30.
6. **Remove the secondary riser blank** on page 33.
7. Remove the FlexibleLOM slot blank.



8. Install the FlexibleLOM adapter. Make sure that the board is firmly seated in the slot.



9. **Install the FlexibleLOM riser cage**.
10. If removed, **install the bayonet board**.
11. **Install the air baffle** on page 29.
12. **Install the server into the chassis** on page 28.
13. Connect the LAN segment cables to the adapter.
14. Connect all peripheral cables to the server.
15. **Power up the server** on page 22.

The installation is complete.

Installing the Media Module adapter

CAUTION: The maximum inlet ambient temperature for most components installed in the system is 35°C (95°F). Some components, however, are subject to thermal limitations depending on the chassis model and the fan configuration. There are some hardware configurations where it is necessary to limit the number of drives installed in the chassis. For more information, see **Temperature requirements**.

Prerequisites

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

Procedure

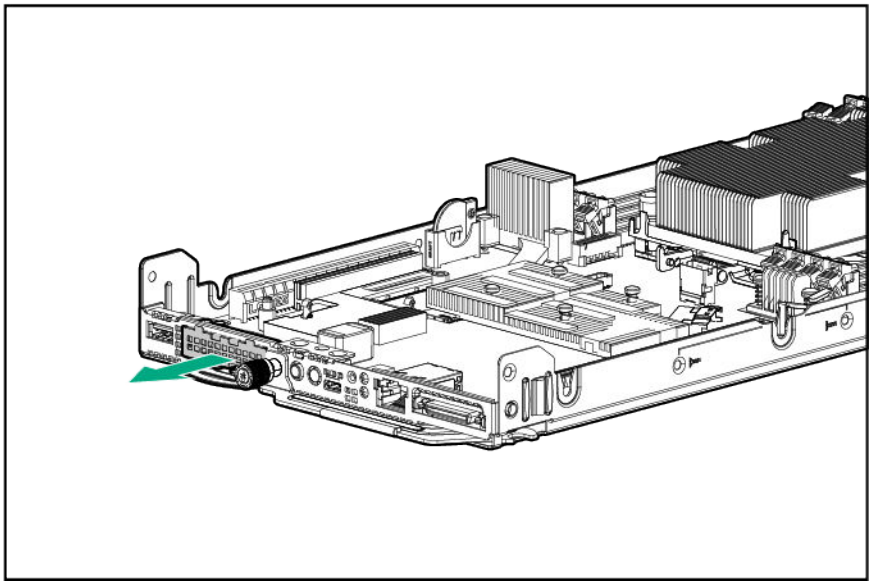
1. **Power down the server** on page 22.
2. Disconnect all peripheral cables from the server.
3. **Remove the server from the chassis** on page 27.
4. **Remove the air baffle** on page 29.
5. If a secondary riser option is installed, **remove the bayonet board**.
6. Do one of the following:

- **Remove the secondary riser blank** on page 33.
- **Remove the secondary riser cage** on page 35.

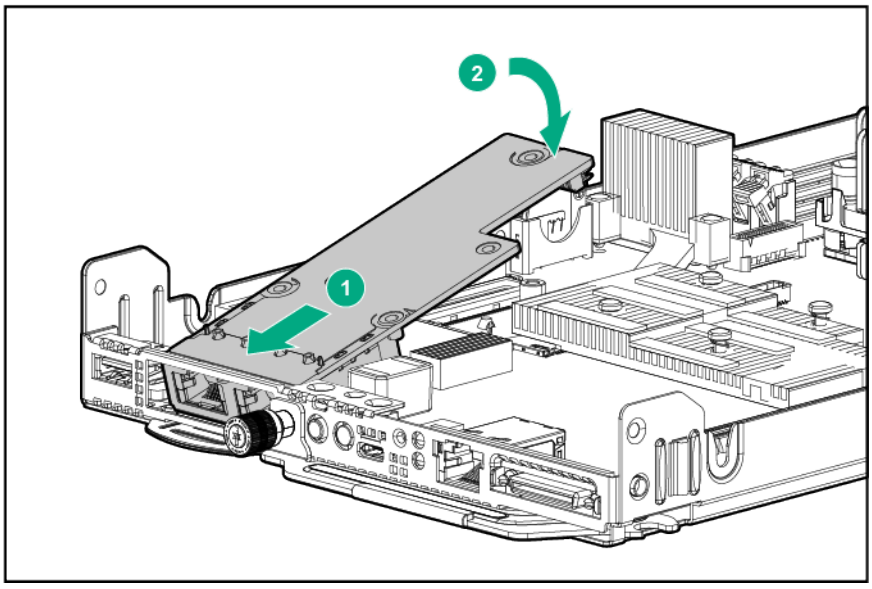
7. Do one of the following:

   - **Remove the primary riser blank** on page 36.
   - **Remove the primary riser cage** on page 38.

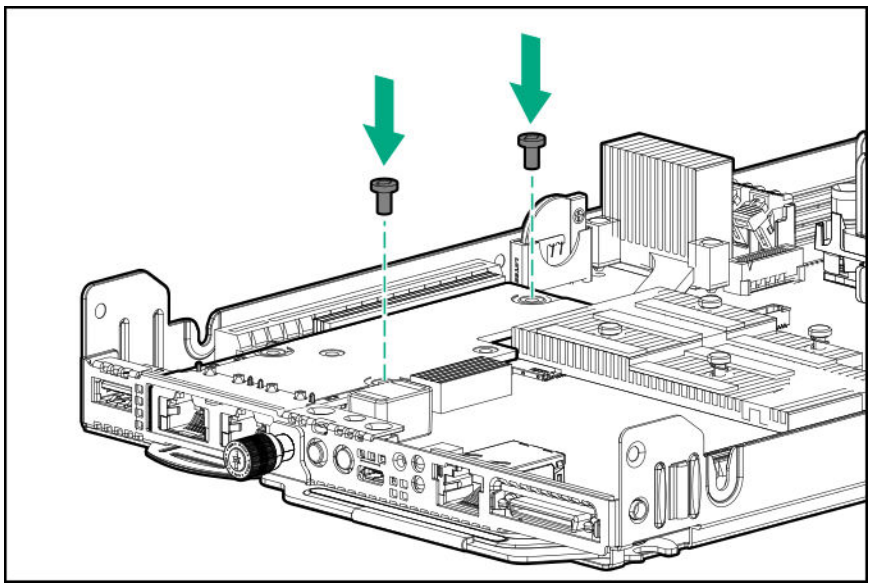
8. Remove the Media Module blank.



9. Install the Media Module adapter. Make sure that the board is firmly seated in the slot.



10. Install the Media Module screws.



11. Do one the following:
    - **Install the primary riser blank** on page 37.
    - **Install the primary riser cage** on page 39.
12. Do one of the following:
    - **Install the secondary riser blank** on page 34.
    - **Install the secondary riser cage** on page 35.
13. If removed, **install the bayonet board**.
14. **Install the air baffle** on page 29.
15. **Install the server into the chassis** on page 28.
16. Connect the LAN segment cables to the adapter.
17. Connect all peripheral cables to the server.
18. **Power up the server** on page 22.

The installation is complete.

HPE Trusted Platform Module 2.0 Gen10 option

Overview

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

This procedure includes three sections:

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

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

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

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

HPE Trusted Platform Module 2.0 Guidelines

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

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

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

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

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

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

Installing and enabling the HPE TPM 2.0 Gen10 Kit

Installing the Trusted Platform Module board

Preparing the server for installation

Procedure

1. Observe the following warnings:

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

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

   For rack and tower servers, remove the power cord.

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

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

2. Update the system ROM.

   Locate and download the latest ROM version from the **Hewlett Packard Enterprise Support Center website**. Follow the instructions on the website to update the system ROM.

3. **Power down the server** on page 22.
4. If an expansion board is blocking access to the TPM connector, **remove the primary riser cage**.
5. Proceed to **Installing the TPM board and cover** on page 88.

Installing the TPM board and cover

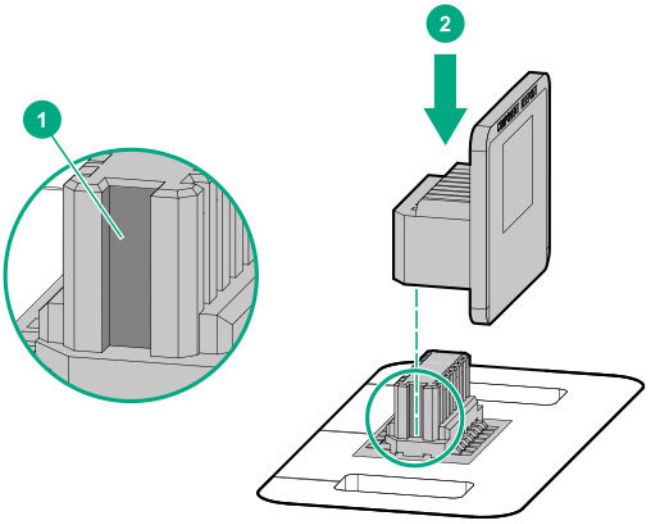
Procedure

1. Observe the following alerts:

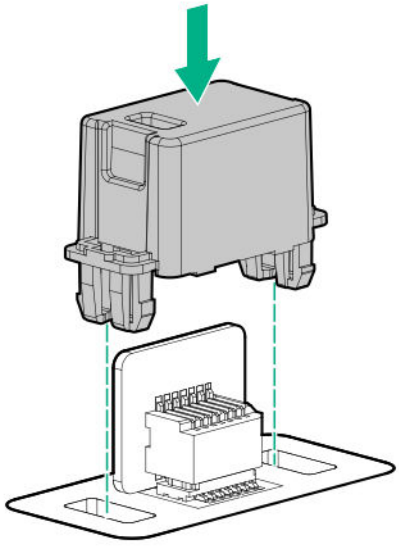
   CAUTION: If the TPM is removed from the original server and powered up on a different server, data stored in the TPM including keys will be erased.

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

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



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



4. Proceed to **Preparing the server for operation** on page 89.

Preparing the server for operation

Procedure

1. If an expansion board in the primary riser slot was removed, **install the board**.
2. Connect all peripheral cables to the server.
3. **Power up the server** on page 22.

Enabling the Trusted Platform Module

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

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

Enabling the Trusted Platform Module as TPM 2.0

Procedure

1. During the server startup sequence, press the **F9** key to access **System Utilities**.
2. From the System Utilities screen, select **System Configuration** > **BIOS/Platform Configuration (RBSU)** > **Server Security** > **Trusted Platform Module options**.
3. Verify the following:
   - "Current TPM Type" is set to **TPM 2.0**.
   - "Current TPM State" is set to **Present and Enabled**.
   - "TPM Visibility" is set to **Visible**.
4. If changes were made in the previous step, press the **F10** key to save your selection.
5. If F10 was pressed in the previous step, do one of the following:
   - If in graphical mode, click **Yes**.
   - If in text mode, press the **Y** key.
6. Press the **ESC** key to exit System Utilities.
7. If changes were made and saved, the server prompts for reboot request. Press the **Enter** key to confirm reboot.

   If the following actions were performed, the server reboots a second time without user input. During this reboot, the TPM setting becomes effective.
   - Changing from TPM 1.2 and TPM 2.0
   - Changing TPM bus from FIFO to CRB
   - Enabling or disabling TPM
   - Clearing the TPM
8. Enable TPM functionality in the OS, such as Microsoft Windows BitLocker or measured boot.

   For more information, see the **Microsoft website**.

Enabling the Trusted Platform Module as TPM 1.2

Procedure

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

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

   For more information, see the **Microsoft website**.

Retaining the recovery key/password

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

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

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

Cabling

Cabling guidelines

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

Observe the following guidelines when working with server cables.

Before connecting cables

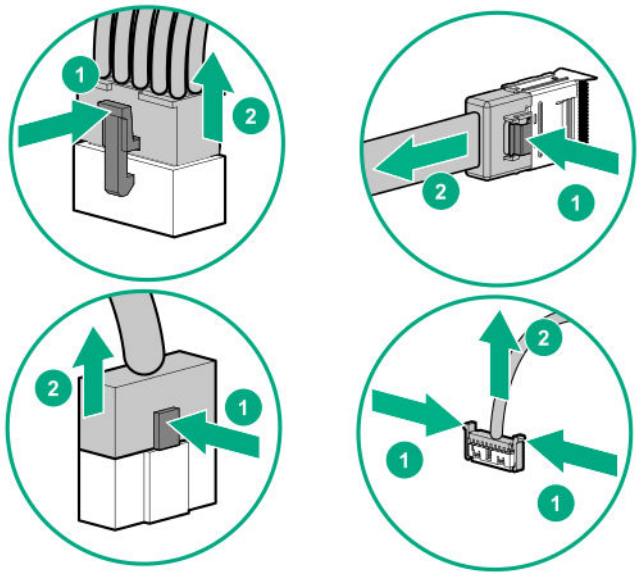
- Note the port labels on the PCA components. Not all of these components are used by all servers:
  - System board ports
  - Drive and power supply backplane ports
  - Expansion board ports (controllers, adapters, expanders, risers, and similar boards)
- Note the label near each cable connector. This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

When connecting cables

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

When disconnecting cables

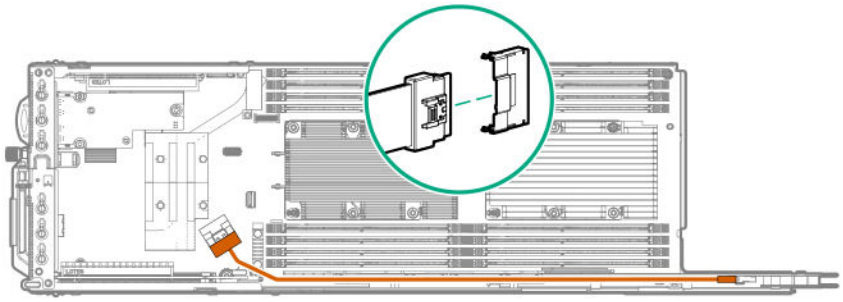
- Grip the body of the cable connector. Do not pull on the cable itself because this action can damage the internal wires of the cable or the pins on the port.
- If a cable does not disconnect easily, check for any release latch that must be pressed to disconnect the cable.



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

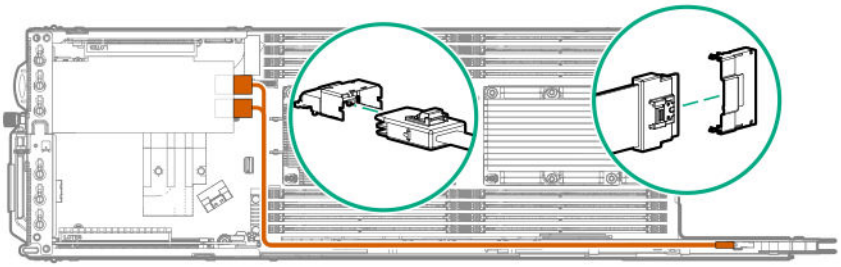
Smart Array cabling

Onboard S100i SR Gen10 controller cabling (SATA only)

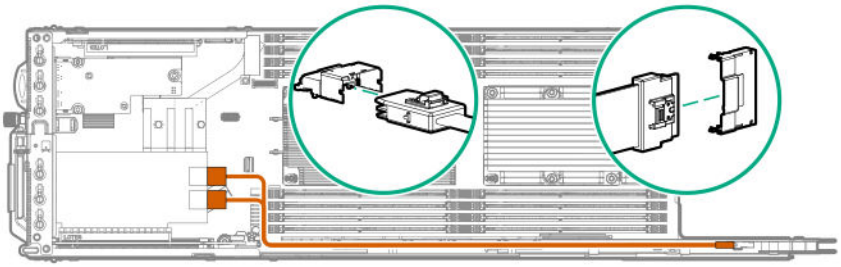


Smart Array type-p controller cabling (SAS/SATA)

Smart Array type-p controller cabling in the primary riser slot

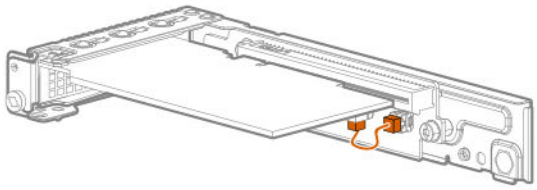


Smart Array type-p controller cabling in the secondary riser slot

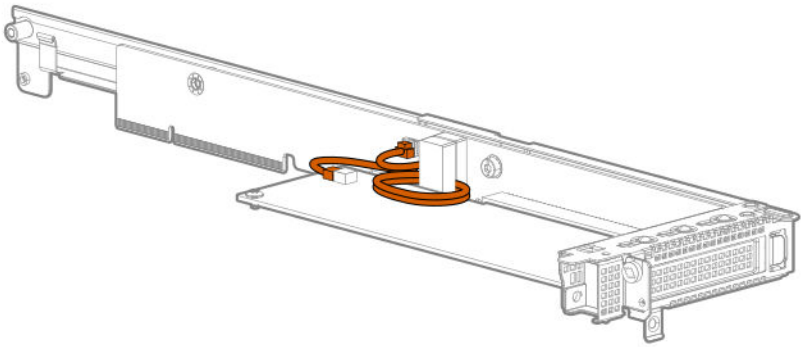


Storage controller backup power cabling

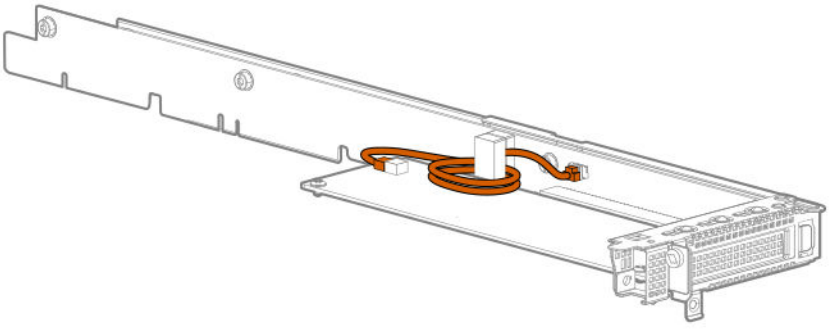
Storage controller backup power cabling in the primary riser slot



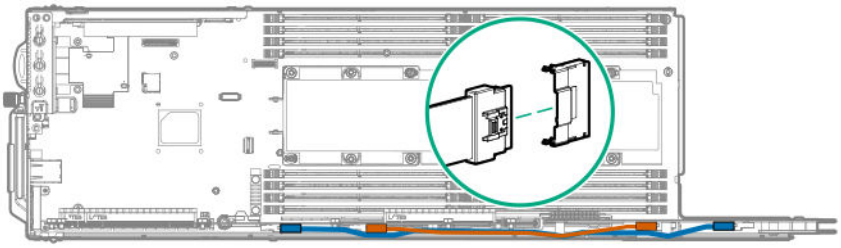
Storage controller backup power cabling in the P1 secondary riser



Storage controller backup power cabling in the P2 secondary riser

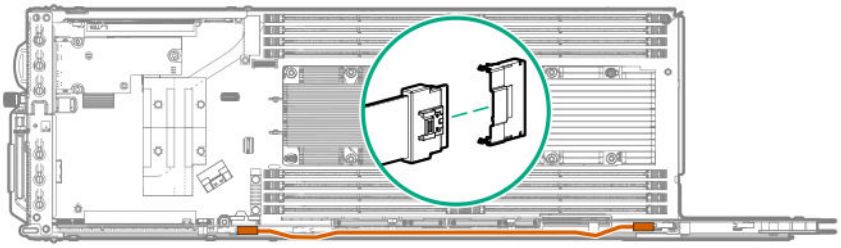


Secondary riser cabling



Cable color	Description
Blue	Secondary riser port 1 to bayonet port 1
Orange	Secondary riser port 2 to bayonet port 2

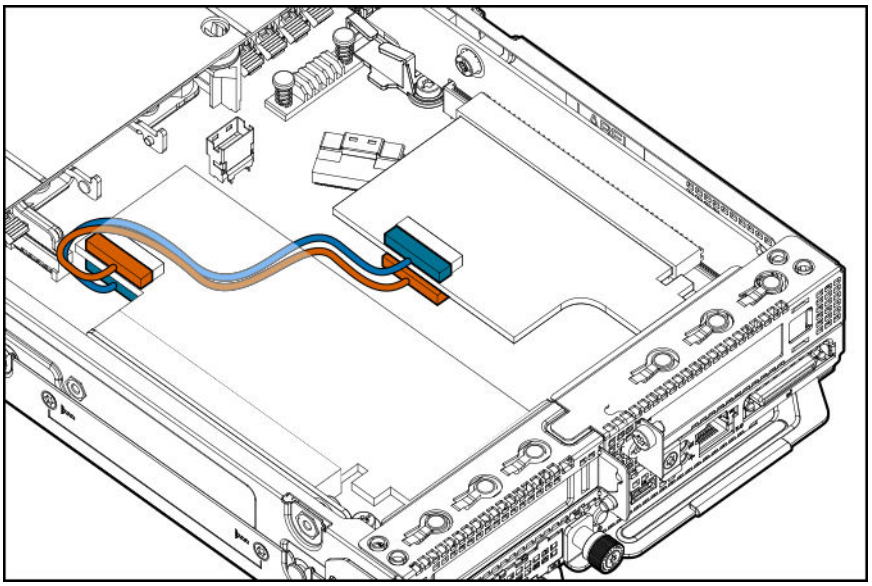
FlexibleLOM riser cabling



OPA adapter cabling

Cable color	Description
Blue	OPA adapter sideband cable
Orange	OPA adapter IFP cable

InfiniBand and auxiliary adapter cabling



Cable color	Description
Orange	White cable
Blue	Black cable

Software and configuration utilities

Server mode

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

Software or configuration utility	Server mode
Active Health System on page 99	Online and Offline
HPE iLO 5 on page 99	Online and Offline
HPE Smart Storage Administrator on page 107	Online and Offline
iLO RESTful API on page 101	Online and Offline
Intelligent Provisioning on page 103	Online and Offline
Scripting Toolkit for Windows and Linux on page 104	Online
Service Pack for ProLiant on page 108	Online and Offline
Smart Update Manager on page 109	Online and Offline
UEFI System Utilities on page 104	Offline

Product QuickSpecs

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

Active Health System Viewer

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

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

Active Health System

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

The Active Health System provides:

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

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

Active Health System data collection

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

Examples of information that is collected:

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

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

Active Health System Log

The data collected by the Active Health System is stored in the Active Health System Log. The data is logged securely, isolated from the operating system, and separate from customer data. Host resources are not consumed in the collection and logging of Active Health System data.

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

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

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

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

HPE iLO 5

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

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

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

iLO Federation

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

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

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

iLO supports the following features:

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

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

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

iLO Service Port

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

To find out if your server or compute module supports this feature, see the server specifications document at the following website: **http://www.hpe.com/info/qs**.

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

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

  When you use this feature, the connected USB flash drive is not accessible by the host operating system.
- Connect a client (such as a laptop) with a supported USB to Ethernet adapter to access the iLO web interface, remote console, CLI, iLO RESTful API, or scripts.

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

  Some servers, such as the XL170r, require an adapter to connect a USB to Ethernet adapter to the iLO Service Port.

Hewlett Packard Enterprise recommends the HPE Micro USB to USB Adapter (part number 789904-B21).

When you use the iLO Service Port:

- Actions are logged in the iLO event log.
- The server UID flashes to indicate the Service Port status.

  You can also retrieve the Service Port status by using a REST client and the iLO RESTful API.
- You cannot use the Service Port to boot any device within the server, or the server itself.
- You cannot access the server by connecting to the Service Port.
- You cannot access the connected device from the server.

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

iLO RESTful API

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

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

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

For more information, watch the **Redfish & How it works with HPE Server Management** video.

RESTful Interface Tool

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

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

iLO Amplifier Pack

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

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

HPE Apollo Platform Manager overview

The HPE ProLiant XL170r Gen10 is a rack-level point of contact for HPE ProLiant Scalable System and HPE Apollo administration.

Rack management features

- Automatic chassis and device discovery with topographic views
- Time-stamped, rack-level event logging
- Rack and chassis shared power and thermal component management
- Integrated serial connector for server console and ancillary device access
- Integrated Gb Ethernet switch for server iLO consolidation

Server management features

- Server health monitoring
- iLO Single Sign-On access
- Server FRU data reporting
- iLO IP address and PXE MAC address listings

Power management features

- Power control and measurement at the server, chassis, and rack level
- PDU-level power outlet control and current measurement
- Rack-level static or dynamic power capping
- DC Power Shelf management and integration with UPS subsystem

NOTE: The use of the term "server" represents nodes, server trays, server nodes, and cartridges.

For a full description of APM features and support, see the QuickSpecs on the Hewlett Packard Enterprise website (**http://www.hpe.com/info/qs**).

HPE Insight Cluster Management Utility

The Insight CMU is an efficient and robust hyperscale cluster lifecycle management framework and suite of tools for large Linux clusters. A simple graphical interface enables an at-a-glance view of the entire cluster across multiple metrics, provides frictionless scalable remote management and analysis, and allows rapid software provisioning to all system nodes. Insight CMU makes cluster management more user friendly, efficient, and error-free than if it were being managed by scripts, or on a node-by-node basis. Insight CMU is highly flexible and customizable, offers both GUI and CLI interfaces, and is used to deploy a range of software environments, from simple compute farms to highly customized, application-specific configurations.

For more information on Insight CMU features and links to technical documentation, QuickSpecs, and a product demo, see the Hewlett Packard Enterprise website (**http://www.hpe.com/info/cmu**).

To download the product, go to the Hewlett Packard Enterprise Software Depot (**http://www.hpe.com/support/softwaredepot**). Click **Insight Management**, then click **Insight Cluster Management**.

Integrated Management Log

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

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

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

Intelligent Provisioning

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

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

NOTE: After you have selected a mode, you must reprovision the server to change the mode that launches when you boot to F10.

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

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

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

To access Intelligent Provisioning:

- Press **F10** from the POST screen and enter either Intelligent Provisioning or HPE Rapid Setup Software.
- From the iLO web interface using **Always On**. **Always On** allows you to access Intelligent Provisioning without rebooting your server.

Intelligent Provisioning operation

Intelligent Provisioning includes the following components:

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

IMPORTANT:

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

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

Intelligent Provisioning provides installation help for the following operating systems:

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

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

Management Security

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

Scripting Toolkit for Windows and Linux

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

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

For more information or to download the STK, see the **Hewlett Packard Enterprise website**.

UEFI System Utilities

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

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

HPE servers with UEFI can provide:

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

Selecting the boot mode

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

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

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

Prerequisite

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

Procedure

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

Secure Boot

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

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

When Secure Boot is enabled:

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

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

You can configure Secure Boot:

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

Launching the Embedded UEFI Shell

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

Prerequisites

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

Procedure

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

   The **Embedded UEFI Shell** screen appears.

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

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

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

   The `Shell>` prompt appears.

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

HPE Smart Storage Administrator

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

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

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

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

- Accessing HPE SSA in the offline environment

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

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

- Accessing HPE SSA in the online environment

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

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

HPE InfoSight for servers

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

HPE InfoSight for servers:

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

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

USB support

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

External USB functionality

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

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

Redundant ROM support

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

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

Safety and security benefits

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

Keeping the system current

Updating firmware or system ROM

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

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

Service Pack for ProLiant

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

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

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

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

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

Smart Update Manager

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

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

Key features of SUM include:

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

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

Smart Update Tools

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

NOTE: HPE OneView manages the iLO while iSUT runs on each server and deploys the updates. The same tool might not manage both applications. Create a process that notifies the administrators when updates are available.

- **Smart Update Tools**: Polls iLO to check for requests from HPE OneView for updates through the management network and orchestrates staging, deploying, and activating updates. You can adjust the polling interval by issuing the appropriate command-line option provided by iSUT. Performs inventory on target servers, stages deployment, deploys updates, and then reboots the servers.
- **HPE OneView**: Displays available updates for servers. Communicates with iSUT (or SUT 1.x) to initiate updates, reports the status on the **Firmware** section of the **Server Profile** page of HPE OneView. HPE OneView provides automated compliance reporting in the dashboard.
- **SPP**: A comprehensive systems software and firmware update solution, which is delivered as a single ISO image.
- **SUM**: A tool for firmware and driver maintenance for HPE ProLiant servers and associated options.

NOTE: Do not manage the same nodes with SUM and HPE OneView at the same time.

Updating firmware from the System Utilities

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

Procedure

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

   The **Firmware Updates** screen lists details about your selected device, including the current firmware version in use.
6. Select **Select Firmware File**.
7. Select the flash file in the **File Explorer** list.

   The firmware file is loaded and the **Firmware Updates** screen lists details of the file in the **Selected firmware file** field.
8. Select **Image Description**, and then select a firmware image.

   A device can have multiple firmware images.
9. Select **Start firmware update**.

Updating the firmware from the UEFI Embedded Shell

Procedure

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

Online Flash components

This component provides updated system firmware that can be installed directly on supported operating systems. Additionally, when used in conjunction with SUM, this Smart Component allows the user to

update firmware on remote servers from a central location. This remote deployment capability eliminates the need for the user to be physically present at the server to perform a firmware update.

Drivers

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

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

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

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

Software and firmware

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

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

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

Operating system version support

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

HPE Pointnext Portfolio

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

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

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

Utilize the Advisory and Transformation Services in the following areas:

- Private or hybrid cloud computing
- Big data and mobility requirements

- Improving data center infrastructure
- Better use of server, storage, and networking technology

For more information, see the Hewlett Packard Enterprise website:

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

Proactive notifications

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

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

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

Troubleshooting

NMI functionality

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

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

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

Troubleshooting resources

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

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

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

System battery replacement

System battery information

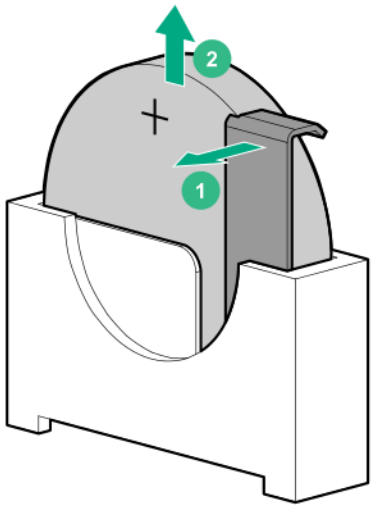
The server contains an internal lithium manganese dioxide, a vanadium pentoxide, or an alkaline battery that provides power to the real-time clock. If this battery is not properly handled, a risk of the fire and burns exists. To reduce the risk of personal injury:

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

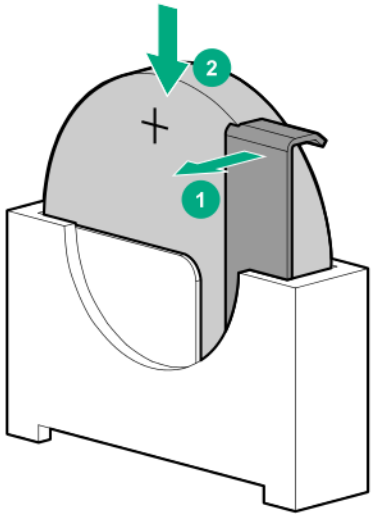
Removing and replacing the system battery

Procedure

1. **Power down the server** on page 22.
2. Disconnect all peripheral cables from the server.
3. **Remove the server from the chassis** on page 27.
4. **Remove the air baffle** on page 29.
5. If a secondary riser option is installed, **remove the bayonet board**.
6. Do one of the following:
   - **Remove the secondary riser blank** on page 33.
   - **Remove the secondary riser cage** on page 35.
7. **Remove the primary riser cage**.
8. **Locate the battery on the system board**.
9. Slightly push the metal tab, and then remove the system battery from the socket.



10. Slightly push the metal tab, and then install the new system battery in the socket.



11. **Install the server into the chassis** on page 28.
12. Connect all peripheral cables to the server.
13. **Power up the server** on page 22.
14. Properly dispose of the old battery. For more information about proper battery disposal, contact an authorized reseller or an authorized service provider.

Safety, warranty, and regulatory information

Regulatory information

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

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

Additional regulatory information

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

www.hpe.com/info/reach

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

www.hpe.com/info/ecodata

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

www.hpe.com/info/environment

Notices for Eurasian Economic Union

EAC

Manufacturer and Local Representative Information

Manufacturer information:

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

Local representative information Russian:

- **Russia**

  ООО "Хьюлетт Паккард Энтерпрайз", Российская Федерация, 125171, г. Москва, Ленинградское шоссе, 16А, стр.3, Телефон: +7 499 403 4248 Факс: +7 499 403 4677

- **Kazakhstan**

  ТОО «Хьюлетт-Паккард (К)», Республика Казахстан, 050040, г. Алматы, Бостандыкский район, проспект Аль-Фараби, 77/7, Телефон/факс: + 7 727 355 35 50

Local representative information Kazakh:

- **Russia**

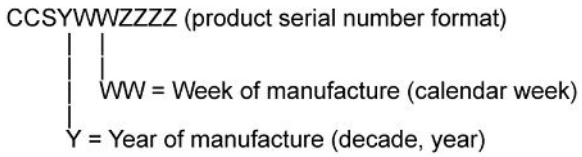
  ЖШС "Хьюлетт Паккард Энтерпрайз", Ресей Федерациясы, 125171, Мәскеу, Ленинград тас жолы, 16А блок 3, Телефон: +7 499 403 4248 Факс: +7 499 403 4677

- **Kazakhstan**

ЖШС «Хьюлетт-Паккард (К)», Қазақстан Республикасы, 050040, Алматы к., Бостандық ауданы, Әл-Фараби даңғ ылы, 77/7, Телефон/факс: +7 727 355 35 50

Manufacturing date:

The manufacturing date is defined by the serial number.



If you need help identifying the manufacturing date, contact **tre@hpe.com**.

Turkey RoHS material content declaration

Türkiye Cumhuriyeti: AEEE Yönetmeliğine Uygundur

Ukraine RoHS material content declaration

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

Warranty information

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

HPE ProLiant and IA-32 Servers and Options

www.hpe.com/support/ProLiantServers-Warranties

HPE Enterprise and Cloudline Servers

www.hpe.com/support/EnterpriseServers-Warranties

HPE Storage Products

www.hpe.com/support/Storage-Warranties

HPE Networking Products

www.hpe.com/support/Networking-Warranties

Specifications

Environmental specifications

Specification	Value
Temperature range[1]	—
Operating	10°C to 35°C (50°F to 95°F)
Non-operating	-30°C to 60°C (-22°F to 140°F)
Relative humidity (noncondensing)	—
Operating	8% to 90% 28°C (82.4°F), maximum wet bulb temperature
Non-operating	5% to 95% 38.7°C (101.7°F), maximum wet bulb temperature

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

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

- 5°C to 10°C (41°F to 50°F) and 35°C to 40°C (95°F to 104°F) at sea level with an altitude derating of 1.0°C per every 175 m (1.8°F per every 574 ft) above 900 m (2953 ft) to a maximum of 3050 m (10,000 ft).
- 40°C to 45°C (104°F to 113°F) at sea level with an altitude derating of 1.0°C per every 125 m (1.8°F per every 410 ft) above 900 m (2953 ft) to a maximum of 3050 m (10,000 ft).

Mechanical specifications

Specification	Value
Height	4.13 cm (1.63 in)
Depth	65.80 cm (25.91 in)
Width	18.45 cm (7.27 in)
Weight (approximate values)	
Weight (maximum)	4.61 kg (10.17 lb)
Weight (minimum)	3.30 kg (7.27 lb)

Temperature requirements

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

The operating temperature inside the rack is always higher than the room temperature and is dependent on the configuration of equipment in the rack. Check the TMRA for each piece of equipment before installation.

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

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

- The maximum inlet ambient temperature for most components installed in the server is 35°C (95°F). Some components, however, have thermal limitations depending on the chassis model and the fan configuration. If two or more components with temperature limitations are installed in the server, observe the lowest maximum inlet ambient temperature.
- In most cases, the removable drive blanks are installed in empty drive bays. However, when components that have thermal limitations are installed, it might be necessary to limit the number of drives installed in the chassis. In which case, a combination of drive blanks and/or thermal bezel blanks is installed in the empty drive bays.
- For list of components with thermal limitations, see to the following topics:
  - **Thermal limitations for components in systems with the Enhanced Processor Performance feature enabled** on page 119
  - **Thermal limitations for components in systems with the Enhanced Processor Performance feature disabled** on page 135
- The following drive options have drive capacities greater than or equal to 10 TB, but their thermal requirements are the same as drives with capacities of less than 10 TB.
  - 857646-B21
  - 857650-B21
  - 878562-B21
  - 878566-B21
  - 881781-B21
  - 881787-B21

List of components with temperature requirements

The maximum inlet ambient temperature for most components installed in the server is 35°C (95°F). Some components, however, are subject to thermal limitations depending on the chassis model and the fan configuration. If two or more components with temperature requirements are installed in the server, observe the lowest maximum inlet ambient temperature.

Thermal limitations for components in systems with the Enhanced Processor Performance feature enabled

The Enhanced Processor Performance feature adjusts the processor settings to a more aggressive setup that can result in increased performance, but might result in higher power consumption.

To configure this feature, from the **System Utilities** screen, select **System Configuration** > **BIOS/ Platform Configuration (RBSU)** > **Power and Performance Options** > **Advanced Performance Tuning Options**.

Processors

The following limitations are for the Intel Xeon Gold 6244 (G6244) processor:

- The processor does not support enhanced processor performance.
- LFF drives with drive capacities greater than or equal to 10 TB are not supported for the Apollo r2200 Gen10 Chassis series with three drives per node.

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
Processor with a TDP of 135 W or more, except G6244	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	28°C (82.4°F)
			3 drives[2]	Not supported
			0 to 2 drives[3]	35°C (95°F)
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	30°C (86°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	30°C (86°F)
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	30°C (86°F)
Intel Xeon Gold 6244	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	Not supported
			3 drives[2]	Not supported
			0 to 2 drives[3]	Not supported
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	Not supported
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	Not supported

Table Continued

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	Not supported
Processor with a TDP between 115 W and 130 W	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	30°C (86°F)
			3 drives[2]	Not supported
			0 to 2 drives[3]	35°C (95°F)
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	35°C (95°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	35°C (95°F)
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	35°C (95°F)

1 The drive capacity must be less than 10 TB.

2 The drive capacity must be greater than or equal to 10 TB.

3 If the component is installed in server 1 or server 2, and the server is installed in the Apollo r2200 Gen10 Chassis, drive blanks must be installed in drive bays 1-2 and 2-2. Similarly, if the component is installed in server 3 or server 4, and the server is installed in the Apollo r2200 Gen10 Chassis, drive blanks must be installed in drive bays 3-2 and 4-2.

DIMMs

NOTE: In nonredundant fan configuration, 32 GB RDIMM and 64 GB LRDIMM can support up to 35°C (95°F) temperature.

NOTE: HPE Persistent Memory module does not support enhanced processor performance.

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
32 GB RDIMM	Apollo r2200 Gen10 Chassis	Redundant	3 drives[1]	30°C (86°F)
			3 drives[2]	Not supported

Table Continued

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
	(12 LFF backplane)		0 to 2 drives[3]	35°C (95°F)
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant	0 to 6 drives	35°C (95°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant	0 to 24 drives	35°C (95°F)
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant	0 to 4 drives	35°C (95°F)
64 GB LRDIMM	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant	3 drives[1]	Not supported
			3 drives[2]	Not supported
			0 to 2 drives[3]	35°C (95°F)
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant	0 to 6 drives	35°C (95°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant	0 to 24 drives	35°C (95°F)

Table Continued

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant	0 to 4 drives	35°C (95°F)
128 GB LRDIMM	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	Not supported
			3 drives[2]	Not supported
			0 to 2 drives[3]	Not supported
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	Not supported
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	Not supported
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	Not supported
HPE Persistent Memory module	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	Not supported
			3 drives[2]	Not supported
			0 to 2 drives[3]	Not supported
			0 to 2 drives[4]	Not supported
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8	Redundant and nonredundant	0 to 6 drives	Not supported

Table Continued

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
	NVMe backplane)		0 to 2 drives[5]	Not supported
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	Not supported
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)		0 to 4 drives	Not supported

1 The drive capacity must be less than 10 TB.

2 The drive capacity must be greater than or equal to 10 TB.

3 If the component is installed in server 1 or server 2, and the server is installed in the Apollo r2200 Gen10 Chassis, drive blanks must be installed in drive bays 1-2 and 2-2. Similarly, if the component is installed in server 3 or server 4, and the server is installed in the Apollo r2200 Gen10 Chassis, drive blanks must be installed in drive bays 3-2 and 4-2.

4 If the component is installed in server 1 or server 2, and the server is installed in the Apollo r2200 Gen10 Chassis, bezel blanks must be installed in drive bays 1-2 and 2-2. Similarly, if the component is installed in server 3 or server 4, and the server is installed in the Apollo r2200 Gen10 Chassis, bezel blanks must be installed in drive bays 3-2 and 4-2.

5 If the component is installed in server 1 or server 2, and the server is installed in the Apollo r2600 Gen10 Chassis, bezel blanks must be installed in drive bays 1-3, 1-4, 1-5, 1-6, 2-3, 2-4, 2-5 and 2-6. Similarly, if the component is installed in server 3 or server 4, and the server is installed in the Apollo r2600 Gen10 Chassis, bezel blanks must be installed in drive bays 3-3, 3-4, 3-5, 3-6, 4-3, 4-4, 4-5 and 4-6.

HPE Smart Array controllers

CAUTION: To prevent improper cooling and thermal damage, do not keep an energy pack inside the chassis when the Smart Array P-class controller is not installed.

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
P408i-p Controller[1]	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[2]	Not supported
			3 drives[3]	Not supported
			0 to 2 drives[4]	28°C (82.4°F)

Table Continued

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	22°C (71.6°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	22°C (71.6°F)
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	Not supported
P408e-p Controller[1]	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[2]	Not supported
			3 drives[3]	Not supported
			0 to 2 drives[4]	28°C (82.4°F)
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	25°C (77°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	25°C (77°F)
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	25°C (77°F)
E208i-p Controller	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[2]	30°C (86°F)
			3 drives[3]	Not supported
			0 to 2 drives[4]	35°C (95°F)

Table Continued

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	30°C (86°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	30°C (86°F)
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	Not supported
E208e-p Controller	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[2]	28°C (82.4°F)
			3 drives[3]	Not supported
			0 to 2 drives[4]	35°C (95°F)
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	30°C (86°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	30°C (86°F)
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	30°C (86°F)

1 An energy pack is supported only with P408i-p and P408e-p controllers. Due to thermal concerns, HPE recommends removing the energy pack if these controller type cards are not installed in the chassis.

2 The drive capacity must be less than 10 TB.

3 The drive capacity must be greater than or equal to 10 TB.

4 If the component is installed in server 1 or server 2, and the server is installed in the Apollo r2200 Gen10 Chassis, drive blanks must be installed in drive bays 1-2 and 2-2. Similarly, if the component is installed in server 3 or server 4, and the server is installed in the Apollo r2200 Gen10 Chassis, drive blanks must be installed in drive bays 3-2 and 4-2.

Fibre Channel and Converged Network adapters

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
FC HBA	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	Not supported
			3 drives[2]	Not supported
			0 to 2 drives[3]	22°C (71°F)
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	Not supported
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	Not supported
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	Not supported
CNA	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	Optical cable: Not supported Copper cable: 28°C (82.4°F)
			3 drives[2]	Not supported
			0 to 2 drives[3]	Optical cable: 22°C (71°F) Copper cable: 35°C (95°F)

Table Continued

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	Optical cable: Not supported Copper cable: 30°C (86°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	Optical cable: Not supported Copper cable: 30°C (86°F)
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	Optical cable: Not supported Copper cable: 30°C (86°F)

1 The drive capacity must be less than 10 TB.

2 The drive capacity must be greater than or equal to 10 TB.

3 If the component is installed in server 1 or server 2, and the server is installed in the Apollo r2200 Gen10 Chassis, drive blanks must be installed in drive bays 1-2 and 2-2. Similarly, if the component is installed in server 3 or server 4, and the server is installed in the Apollo r2200 Gen10 Chassis, drive blanks must be installed in drive bays 3-2 and 4-2.

Ethernet and InfiniBand adapters

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
Ethernet adapters with SFP+, SFP28 or QSFP transceivers/ InfiniBand adapters with QDR or FDR speed	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	Optical cable: Not supported Copper cable: 28°C (82.4°F)
			3 drives[2]	Not supported
			0 to 2 drives[3]	Optical cable: 22°C (71.6°F) Copper cable: 35°C (95°F)

Table Continued

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	Optical cable: Not supported Copper cable: 30°C (86°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	Optical cable: Not supported Copper cable: 30°C (86°F)
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	Optical cable: Not supported Using a copper cable: 30°C (86°F)
Ethernet adapters with QSFP28 transceiver/ InfiniBand adapters with EDR speed	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	Optical cable: Not supported Copper cable: 25°C (77°F)
			3 drives[2]	Not supported
			0 to 2 drives[3]	Optical cable: Not supported Copper cable: 28°C (82.4°F)
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	Optical cable: Not supported Copper cable: 28°C (82.4°F)

Table Continued

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	Optical cable: Not supported Copper cable: 28°C (82.4°F)
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	Optical cable: Not supported Copper cable: 28°C (82.4°F)
IB HDR100/EN 100 GB 1P 940QSFP56	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	Not supported
			3 drives[2]	Not supported
			0 to 2 drives[3]	Not supported
			0 to 2 drives[4]	Optical cable: 25°C (77°F) Copper cable: 30°C (86°F)
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	Not supported
			0 to 2 drives[5]	Optical cable: 22°C (71.6°F) Copper cable: 28°C (82.4°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	Not supported
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	Not supported
			0 to 2 drives [6]	Optical cable: Not supported Copper cable: 22°C (71.6°F)

Table Continued

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
IB HDR100/EN 100 GB 2P 940QSFP56	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	Not supported
			3 drives[2]	Not supported
			0 to 2 drives[3]	Not supported
			0 to 2 drives[4]	Optical cable: 22°C (71.6°F) Copper cable: 35°C (95°F)
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	Not supported
			0 to 2 drives[5]	Optical cable: Not supported Copper cable: 30°C (86°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	Not supported
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	Not supported
			0 to 2 drives[6]	Optical cable: Not supported Copper cable: 25°C (77°F)
IB HDR/EN 200 GB 1P 940QSFP56	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	Not supported
			3 drives[2]	Not supported
			0 to 2 drives[3]	Not supported
			0 to 2 drives[4]	Optical cable: 22°C (71.6°F) Copper cable: 28°C (82.4°F)
	Apollo r2600 Gen10 Chassis	Redundant and nonredundant	0 to 6 drives	Not supported

Table Continued

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
	(24 SFF or 16 SFF + 8 NVMe backplane)		0 to 2 drives[5]	Optical cable: Not supported Copper cable: 22°C (71.6°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	Not supported
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	Not supported
		Nonredundant	0 to 2 drives[6]	Not supported
		Redundant		Optical cable: Not supported Copper cable: 22°C (71.6°F)

1 The drive capacity must be less than 10 TB.

2 The drive capacity must be greater than or equal to 10 TB.

3 If the component is installed in server 1 or server 2, and the server is installed in the Apollo r2200 Gen10 Chassis, drive blanks must be installed in drive bays 1-2 and 2-2. Similarly, if the component is installed in server 3 or server 4, and the server is installed in the Apollo r2200 Gen10 Chassis, drive blanks must be installed in drive bays 3-2 and 4-2.

4 If the component is installed in server 1 or server 2, and the server is installed in the Apollo r2200 Gen10 Chassis, bezel blanks must be installed in drive bays 1-2 and 2-2. Similarly, if the component is installed in server 3 or server 4, and the server is installed in the Apollo r2200 Gen10 Chassis, bezel blanks must be installed in drive bays 3-2 and 4-2.

5 If the component is installed in server 1 or server 2, and the server is installed in the Apollo r2600 Gen10 Chassis, bezel blanks must be installed in drive bays 1-3, 1-4, 1-5, 1-6, 2-3, 2-4, 2-5 and 2-6. Similarly, if the component is installed in server 3 or server 4, and the server is installed in the Apollo r2600 Gen10 Chassis, bezel blanks must be installed in drive bays 3-3, 3-4, 3-5, 3-6, 4-3, 4-4, 4-5 and 4-6.

6 If the component is installed in server 1 or server 2, and the server is installed in the Apollo r2800 Gen10 Chassis, bezel blanks must be installed in drive bays 1-3, 1-4, 2-3 and 2-4. Similarly, if the component is installed in server 3 or server 4, and the server is installed in the Apollo r2800 Gen10 Chassis, bezel blanks must be installed in drive bays 3-3, 3-4, 4-3 and 4-4.

FlexibleLOM adapters with SFP+, SFP28 or QSFP transceivers

Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	Optical cable: Not supported Copper cable: 28°C (82.4°F)
		3 drives[2]	Not supported
		0 to 2 drives[3]	Optical cable: Not supported Copper cable: 30°C (86°F)
Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	Optical cable: Not supported Copper cable: 30°C (86°F)
Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	Optical cable: Not supported Copper cable: 30°C (86°F)
Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	Optical cable: Not supported Copper cable: 30°C (86°F)

1 The drive capacity must be less than 10 TB.

2 The drive capacity must be greater than or equal to 10 TB.

3 If the component is installed in server 1 or server 2, and the server is installed in the Apollo r2200 Gen10 Chassis, drive blanks must be installed in drive bays 1-2 and 2-2. Similarly, if the component is installed in server 3 or server 4, and the server is installed in the Apollo r2200 Gen10 Chassis, drive blanks must be installed in drive bays 3-2 and 4-2.

Media Module adapters

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
Media Module 10 GB 2P 568FLR-MMSFP+	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	30°C (86°F)
			3 drives[2]	Not supported
			0 to 2 drives[3]	30°C (86°F)

Table Continued

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	30°C (86°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	30°C (86°F)
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	30°C (86°F)
Media Module 10 GB 2P 568FLR-MMT	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	30°C (86°F)
			3 drives[2]	Not supported
			0 to 2 drives[3]	30°C (86°F)
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	30°C (86°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	30°C (86°F)
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	30°C (86°F)

1 The drive capacity must be less than 10 TB.

2 The drive capacity must be greater than or equal to 10 TB.

3 If the component is installed in server 1 or server 2, and the server is installed in the Apollo r2200 Gen10 Chassis, drive blanks must be installed in drive bays 1-2 and 2-2. Similarly, if the component is installed in server 3 or server 4, and the server is installed in the Apollo r2200 Gen10 Chassis, drive blanks must be installed in drive bays 3-2 and 4-2.

Thermal limitations for components in systems with the Enhanced Processor Performance feature disabled

Processors

The following limitations are for the Intel Xeon Gold 6244 (G6244) processor:

- The processor does not support enhanced processor performance.
- LFF drives with drive capacities greater than or equal to 10 TB are not supported for the Apollo r2200 Gen10 Chassis series with three drives per node.

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
Processor with a TDP of 125 W or more, except G6244	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	30°C (86°F)
			3 drives[2]	25°C (77°F)
			0 to 2 drives[3]	35°C (95°F)
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	35°C (95°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	35°C (95°F)
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	35°C (95°F)
Intel Xeon Gold 6244	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	25°C (77°F)
			3 drives[2]	Not supported
			0 to 2 drives[3]	30°C (86°F)

Table Continued

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	28°C (82.4°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	28°C (82.4°F)
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	30°C (86°F)

[1] The drive capacity must be less than 10 TB.

[2] The drive capacity must be greater than or equal to 10 TB.

[3] If the component is installed in server 1 or server 2, and the server is installed in the Apollo r2200 Gen10 Chassis, drive blanks must be installed in drive bays 1-2 and 2-2. Similarly, if the component is installed in server 3 or server 4, and the server is installed in the Apollo r2200 Gen10 Chassis, drive blanks must be installed in drive bays 3-2 and 4-2.

DIMMs

In nonredundant fan mode, the 32 GB RDIMM, 64 GB LRDIMM, and 128 GB LRDIMM can support the maximum inlet ambient temperature of 35°C (95°F).

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
32 GB RDIMM	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant	3 drives[1]	30°C (86°F)
			3 drives[2]	30°C (86°F)
			0 to 2 drives[3]	35°C (95°F)

Table Continued

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant	0 to 6 drives	35°C (95°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant	0 to 24 drives	35°C (95°F)
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant	0 to 4 drives	35°C (95°F)
64 GB LRDIMM	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant	3 drives[1]	Not supported
			3 drives[2]	Not supported
			0 to 2 drives[3]	35°C (95°F)
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant	0 to 6 drives	35°C (95°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant	0 to 24 drives	35°C (95°F)

Table Continued

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant	0 to 4 drives	35°C (95°F)
128 GB LRDIMM	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant	3 drives[1]	Not supported
			3 drives[2]	Not supported
			0 to 2 drives[3]	30°C (86°F)
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant	0 to 6 drives	30°C (86°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant	0 to 24 drives	35°C (95°F)
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant	0 to 4 drives	35°C (95°F)
HPE Persistent Memory module	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	Not supported
			3 drives[2]	Not supported
			0 to 2 drives[3]	Not supported
			0 to 2 drives[4]	25°C (77°F)
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8	Redundant and nonredundant	0 to 6 drives	Not supported

Table Continued

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
	NVMe backplane)		0 to 2 drives[5]	22°C (71.6°F)
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 24 drives	Not supported
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	22°C (71.6°F)

1 The drive capacity must be less than 10 TB.

2 The drive capacity must be greater than or equal to 10 TB.

3 If the component is installed in server 1 or server 2, and the server is installed in the Apollo r2200 Gen10 Chassis, drive blanks must be installed in drive bays 1-2 and 2-2. Similarly, if the component is installed in server 3 or server 4, and the server is installed in the Apollo r2200 Gen10 Chassis, drive blanks must be installed in drive bays 3-2 and 4-2.

4 If the component is installed in server 1 or server 2, and the server is installed in the Apollo r2200 Gen10 Chassis, bezel blanks must be installed in drive bays 1-2 and 2-2. Similarly, if the component is installed in server 3 or server 4, and the server is installed in the Apollo r2200 Gen10 Chassis, bezel blanks must be installed in drive bays 3-2 and 4-2.

5 If the component is installed in server 1 or server 2, and the server is installed in the Apollo r2600 Gen10 Chassis, bezel blanks must be installed in drive bays 1-3, 1-4, 1-5, 1-6, 2-3, 2-4, 2-5 and 2-6. Similarly, if the component is installed in server 3 or server 4, and the server is installed in the Apollo r2600 Gen10 Chassis, bezel blanks must be installed in drive bays 3-3, 3-4, 3-5, 3-6, 4-3, 4-4, 4-5 and 4-6.

HPE Smart Array controllers

CAUTION: To prevent improper cooling and thermal damage, do not keep an energy pack inside the chassis when the Smart Array P-class controller is not installed.

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
P408i-p controller	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	22°C (71.6°F)
			3 drives[2]	Not supported
			0 to 2 drives[3]	30°C (86°F)

Table Continued

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	28°C (82.4°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	28°C (82.4°F)
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	Not supported
P408e-p controller	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	22°C (71.6°F)
			3 drives[2]	22°C (71.6°F)
			0 to 2 drives[3]	30°C (86°F)
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	30°C (86°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	30°C (86°F)

Table Continued

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	30°C (86°F)
E208i-p controller	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	35°C (95°F)
			3 drives[2]	28°C (82.4°F)
			0 to 2 drives[3]	35°C (95°F)
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	35°C (95°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	35°C (95°F)
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	35°C (95°F)
E208e-p controller	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	30°C (86°F)
			3 drives[2]	28°C (82.4°F)
			0 to 2 drives[3]	35°C (95°F)

Table Continued

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	35°C (95°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	35°C (95°F)
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	35°C (95°F)

1 The drive capacity must be less than 10 TB.

2 The drive capacity must be greater than or equal to 10 TB.

3 If the component is installed in server 1 or server 2, and the server is installed in the Apollo r2200 Gen10 Chassis, drive blanks must be installed in drive bays 1-2 and 2-2. Similarly, if the component is installed in server 3 or server 4, and the server is installed in the Apollo r2200 Gen10 Chassis, drive blanks must be installed in drive bays 3-2 and 4-2.

Fibre Channel and Converged Network adapters

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
FC HBA	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	Not supported
			3 drives[2]	Not supported
			0 to 2 drives[3]	28°C (82.4°F)
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	25°C (77°F)

Table Continued

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	25°C (77°F)
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	25°C (77°F)
CNA	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	Optical cable: Not supported Copper cable: 30°C (86°F)
			3 drives[2]	Optical cable: Not supported Copper cable: 25°C (77°F)
			0 to 2 drives[3]	Optical cable: 28°C (82.4°F) Copper cable: 35°C (95°F)
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	Optical cable: 25°C (77°F) Copper cable: 35°C (95°F)

Table Continued

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	Optical cable: 25°C (77°F) Copper cable: 35°C (95°F)
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	Optical cable: 25°C (77°F) Copper cable: 35°C (95°F)

1 The drive capacity must be less than 10 TB.

2 The drive capacity must be greater than or equal to 10 TB.

3 If the component is installed in server 1 or server 2, and the server is installed in the Apollo r2200 Gen10 Chassis, drive blanks must be installed in drive bays 1-2 and 2-2. Similarly, if the component is installed in server 3 or server 4, and the server is installed in the Apollo r2200 Gen10 Chassis, drive blanks must be installed in drive bays 3-2 and 4-2.

Ethernet and InfiniBand adapters

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
Ethernet adapters with SFP+, SFP28 or QSFP transceiver/ InfiniBand adapters with QDR or FDR speed	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	Optical cable: Not supported Copper cable: 30°C (86°F)
			3 drives[2]	Optical cable: Not supported Copper cable: 25°C (77°F)
			0 to 2 drives[3]	Optical cable: 28°C (82.4°F) Copper cable: 35°C (95°F)

Table Continued

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	Optical cable: 25°C (77°F) Copper cable: 35°C (95°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	Optical cable: 25°C (77°F) Copper cable: 35°C (95°F)
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	Optical cable: 25°C (77°F) Copper cable: 35°C (95°F)
Ethernet adapters with QSFP28 transceiver/ InfiniBand adapters with EDR speed	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	Optical cable: Not supported Copper cable: 25°C (77°F)
			3 drives[2]	Optical cable: Not supported Copper cable: 22°C (71.6°F)
			0 to 2 drives[3]	Optical cable: 22°C (71.6°F) Copper cable: 35°C (95°F)
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	Optical cable: 22°C (71.6°F) Copper cable: 35°C (95°F)

Table Continued

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	Optical cable: 22°C (71.6°F) Copper cable: 35°C (95°F)
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	Optical cable: 22°C (71.6°F) Copper cable: 35°C (95°F)
IB HDR100/EN 100 GB 1P 940QSFP56	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	Not supported
			3 drives[2]	Not supported
			0 to 2 drives[3]	Not supported
			0 to 2 drives[4]	Optical cable: 30°C (86°F) Copper cable: 35°C (95°F)
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	Not supported
			0 to 2 drives[5]	Optical cable: 25°C (77°F) Copper cable: 30°C (86°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	Not supported
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	Not supported
			0 to 2 drives[6]	Optical cable: 22°C (71.6°F) Copper cable: 25°C (77°F)

Table Continued

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
IB HDR100/EN 100 GB 2P 940QSFP56	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	Not supported
			3 drives[2]	Not supported
			0 to 2 drives[3]	Not supported
			0 to 2 drives[4]	Optical cable: 25°C (77°F) Copper cable: 35°C (95°F)
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	Not supported
			0 to 2 drives[5]	Optical cable: 22°C (71.6°F) Copper cable: 30°C (86°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	Not supported
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	Not supported
			0 to 2 drives[6]	Optical cable: 22°C (71.6°F) Copper cable: 28°C (82.4°F)
IB HDR/EN 200 GB 1P 940QSFP56	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	Not supported
			3 drives[2]	Not supported
			0 to 2 drives[3]	Not supported
			0 to 2 drives[4]	Optical cable: 25°C (77°F) Copper cable: 30°C (86°F)
	Apollo r2600 Gen10 Chassis	Redundant and nonredundant	0 to 6 drives	Not supported

Table Continued

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
	(24 SFF or 16 SFF + 8 NVMe backplane)		0 to 2 drives[5]	Optical cable: 22°C (71.6°F) (CPU TDP <= 130W) Copper cable: 25°C (77°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	Not supported
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	Not supported
		Nonredundant	0 to 2 drives[6]	Not supported
		Redundant		Optical cable: 22°C (71.6°F) (CPU TDP <= 125W) Copper cable: 25°C (77°F)

1 The drive capacity must be less than 10 TB.

2 The drive capacity must be greater than or equal to 10 TB.

3 If the component is installed in server 1 or server 2, and the server is installed in the Apollo r2200 Gen10 Chassis, drive blanks must be installed in drive bays 1-2 and 2-2. Similarly, if the component is installed in server 3 or server 4, and the server is installed in the Apollo r2200 Gen10 Chassis, drive blanks must be installed in drive bays 3-2 and 4-2.

4 If the component is installed in server 1 or server 2, and the server is installed in the Apollo r2200 Gen10 Chassis, bezel blanks must be installed in drive bays 1-2 and 2-2. Similarly, if the component is installed in server 3 or server 4, and the server is installed in the Apollo r2200 Gen10 Chassis, bezel blanks must be installed in drive bays 3-2 and 4-2.

5 If the component is installed in server 1 or server 2, and the server is installed in the Apollo r2600 Gen10 Chassis, bezel blanks must be installed in drive bays 1-3, 1-4, 1-5, 1-6, 2-3, 2-4, 2-5 and 2-6. Similarly, if the component is installed in server 3 or server 4, and the server is installed in the Apollo r2600 Gen10 Chassis, bezel blanks must be installed in drive bays 3-3, 3-4, 3-5, 3-6, 4-3, 4-4, 4-5 and 4-6.

6 If the component is installed in server 1 or server 2, and the server is installed in the Apollo r2800 Gen10 Chassis, bezel blanks must be installed in drive bays 1-3, 1-4, 2-3 and 2-4. Similarly, if the component is installed in server 3 or server 4, and the server is installed in the Apollo r2800 Gen10 Chassis, bezel blanks must be installed in drive bays 3-3, 3-4, 4-3 and 4-4.

FlexibleLOM adapters with SFP+, SFP28 or QSFP transceivers

Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	Optical cable: Not supported Copper cable: 30°C (86°F)
		3 drives[2]	Optical cable: Not supported Copper cable: 25°C (77°F)
		0 to 2 drives[3]	Optical cable: 25°C (77°F) Copper cable: 35°C (95°F)
Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	Optical cable: 25°C (77°F) Copper cable: 35°C (95°F)
Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	Optical cable: 25°C (77°F) Copper cable: 35°C (95°F)
Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	Optical cable: 25°C (77°F) Copper cable: 35°C (95°F)

1 The drive capacity must be less than 10 TB.

2 The drive capacity must be greater than or equal to 10 TB.

3 If the component is installed in server 1 or server 2, and the server is installed in the Apollo r2200 Gen10 Chassis, drive blanks must be installed in drive bays 1-2 and 2-2. Similarly, if the component is installed in server 3 or server 4, and the server is installed in the Apollo r2200 Gen10 Chassis, drive blanks must be installed in drive bays 3-2 and 4-2.

Media Module adapters

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
Media Module 10 GB 2P 568FLR-MMSFP+	Apollo r2200 Gen10 Chassis	Redundant and nonredundant	3 drives[1]	30°C (86°F)
			3 drives[2]	30°C (86°F)

Table Continued

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
	(12 LFF backplane)		0 to 2 drives[3]	35°C (95°F)
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	35°C (95°F)
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	35°C (95°F)
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	35°C (95°F)
Media Module 10 GB 2P 568FLR-MMT	Apollo r2200 Gen10 Chassis (12 LFF backplane)	Redundant and nonredundant	3 drives[1]	30°C (86°F)
			3 drives[2]	30°C (86°F)
			0 to 2 drives[3]	35°C (95°F)
	Apollo r2600 Gen10 Chassis (24 SFF or 16 SFF + 8 NVMe backplane)	Redundant and nonredundant	0 to 6 drives	30°C (86°F)

Table Continued

Description	Chassis	Fan configuration	Number of drives supported by the server	Maximum inlet ambient temperature
	Apollo r2800 Gen10 Chassis (24 SFF backplane with SAS expander)	Redundant and nonredundant	0 to 24 drives	30°C (86°F)
	Apollo r2800 Gen10 Chassis (16 NVMe backplane)	Redundant and nonredundant	0 to 4 drives	30°C (86°F)

[1] The drive capacity must be less than 10 TB.

[2] The drive capacity must be greater than or equal to 10 TB.

[3] If the component is installed in server 1 or server 2, and the server is installed in the Apollo r2200 Gen10 Chassis, drive blanks must be installed in drive bays 1-2 and 2-2. Similarly, if the component is installed in server 3 or server 4, and the server is installed in the Apollo r2200 Gen10 Chassis, drive blanks must be installed in drive bays 3-2 and 4-2.

Websites

General websites

Hewlett Packard Enterprise Information Library

www.hpe.com/info/EIL

Subscription Service/Support Alerts

www.hpe.com/support/e-updates

Single Point of Connectivity Knowledge (SPOCK) Storage compatibility matrix

www.hpe.com/storage/spock

Storage white papers and analyst reports

www.hpe.com/storage/whitepapers

For additional general support websites, see **Support and other resources**.

Product websites

HPE ProLiant XL170r Gen10 support page

http://www.hpe.com/info/Apollo2000-Gen10-docs

HPE ProLiant XL170r Gen10 user documents

http://www.hpe.com/info/XL170r-Gen10-UG-en

Support and other resources

Accessing Hewlett Packard Enterprise Support

- For live assistance, go to the Contact Hewlett Packard Enterprise Worldwide website:

  http://www.hpe.com/info/assistance

- To access documentation and support services, go to the Hewlett Packard Enterprise Support Center website:

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

Information to collect

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

Accessing updates

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

  Hewlett Packard Enterprise Support Center

  www.hpe.com/support/hpesc

  Hewlett Packard Enterprise Support Center: Software downloads

  www.hpe.com/support/downloads

  Software Depot

  www.hpe.com/support/softwaredepot

- To subscribe to eNewsletters and alerts:

  www.hpe.com/support/e-updates

- To view and update your entitlements, and to link your contracts and warranties with your profile, go to the Hewlett Packard Enterprise Support Center **More Information on Access to Support Materials** page:

  www.hpe.com/support/AccessToSupportMaterials

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

Customer self repair

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

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

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

Remote support

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

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

Remote support and Proactive Care information

HPE Get Connected

www.hpe.com/services/getconnected

HPE Proactive Care services

www.hpe.com/services/proactivecare

HPE Proactive Care service: Supported products list

www.hpe.com/services/proactivecaresupportedproducts

HPE Proactive Care advanced service: Supported products list

www.hpe.com/services/proactivecareadvancedsupportedproducts

Proactive Care customer information

Proactive Care central

www.hpe.com/services/proactivecarecentral

Proactive Care service activation

www.hpe.com/services/proactivecarecentralgetstarted

Warranty information

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

HPE ProLiant and IA-32 Servers and Options

www.hpe.com/support/ProLiantServers-Warranties

HPE Enterprise and Cloudline Servers

www.hpe.com/support/EnterpriseServers-Warranties

HPE Storage Products

www.hpe.com/support/Storage-Warranties

HPE Networking Products

www.hpe.com/support/Networking-Warranties

Regulatory information

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

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

Additional regulatory information

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

www.hpe.com/info/reach

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

www.hpe.com/info/ecodata

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

www.hpe.com/info/environment

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Acronyms and abbreviations

AHCI

Advanced Host Controller Interface

CSR

Customer Self Repair

CNA

Converged Network Adapter

FHHL

Full Height Half Length

FC HBA

Fibre Channel Host Bus Adapter

HPE APM

HPE Apollo Platform Management

HPE SSA

HPE Smart Storage Administrator

iLO

Integrated Lights-Out

IML

Integrated Management Log

ISO

International Organization for Standardization

IFP

Internal faceplate-to-processor

LFF

large form factor

LOM

LAN on Motherboard

NIC

network interface controller

NMI

nonmaskable interrupt

PCIe

Peripheral Component Interconnect Express

PDB

Power Distribution Board

PDU

power distribution unit

POST

Power-On Self-Test

RBSU

ROM-Based Setup Utility

RCM

Rack Consolidation Management

RoHS

Restriction of Hazardous Substances

SAS

serial attached SCSI

SATA

serial ATA

SFF

small form factor

SPP

Service Pack for ProLiant

UEFI

Unified Extensible Firmware Interface

UID

unit identification

USB

universal serial bus