



**Hewlett Packard
Enterprise**

HPE Apollo 2000 Gen10 Chassis User Guide

Abstract

This document contains setup, installation, and configuration information for the HPE Apollo 2000 Chassis. This document is for the person who installs, administers, and troubleshoots the system. Hewlett Packard Enterprise assumes that you are qualified in the servicing of computer equipment and trained in using safe practices when dealing with hazardous energy levels.

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HPE Apollo 2000 Gen10 System

Introduction

The HPE Apollo 2000 Gen10 System consists of a chassis and servers. There are four chassis options with different storage configurations. To ensure proper thermal cooling, all server tray slots on the chassis must be populated with servers or server tray blanks.

Chassis

- HPE Apollo r2200 Gen10 Chassis (12 low-profile LFF model)
- HPE Apollo r2600 Gen10 Chassis (24 SFF model, supports a maximum of 24 SFF SmartDrives or a mix of 16 SFF SmartDrives and 8 NVMe drives)
- HPE Apollo r2800 Gen10 Chassis with 16 NVMe
- HPE Apollo r2800 Gen 10 Chassis (24 SFF model with storage expander backplane)

Servers

- HPE ProLiant XL170r Gen10 Server (1U)
- HPE ProLiant XL190r Gen10 Server (2U)

The chassis supports the combination of 1U and 2U servers. One chassis can support a maximum of the following:

- Four 1U servers
- Two 1U servers and one 2U server
- Two 2U servers

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

Planning the installation

Safety and regulatory compliance

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

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>).

Configuration guidelines

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

Determining power and cooling configurations

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

Power requirements

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

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

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

HPE Apollo Platform Manager

HPE Apollo Platform Manager, formerly named HPE Advanced Power Manager, is a point of contact for system administration.

To install, configure, and access HPE APM, see the *HPE Apollo Platform Manager User Guide* on the Hewlett Packard Enterprise website (http://www.hpe.com/support/APM_UG_en).


Hot-plug power supply calculations


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

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](#).

Warnings and cautions


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


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


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

 **WARNING:** The chassis is very heavy. To reduce the risk of personal injury or damage to the equipment:

- Observe local occupational health and safety requirements and guidelines for manual material handling.
 - Remove all servers from the chassis before installing or moving the chassis.
 - Use caution and get help to lift and stabilize the chassis during installation or removal, especially when the chassis is not fastened to the rack.
-

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

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

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



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

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



CAUTION: Always be sure that equipment is properly grounded and that you follow proper grounding procedures before beginning any installation procedure. Improper grounding can result in ESD damage to electronic components. For more information, refer to "**Electrostatic discharge** on page 73."



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.

Space and airflow requirements

Installation of the chassis is supported in 1200 mm Gen10 racks.

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.

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 chassis or rack component, the gaps between the components cause changes in airflow through the rack and across the components. 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 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 chassis or to increase the internal rack temperature beyond the maximum allowable limits.
 - Do not exceed the manufacturer's TMRA.
-

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.

Connecting a DC power cable to a DC power source

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

- This equipment must be installed by trained service personnel, as defined by the NEC and IEC 60950-1, Second Edition, the standard for Safety of Information Technology Equipment.
 - Connect the equipment to a reliably grounded Secondary circuit source. A Secondary circuit has no direct connection to a Primary circuit and derives its power from a transformer, converter, or equivalent isolation device.
 - The branch circuit overcurrent protection must be rated 20 A.
-

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

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

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

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

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

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

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

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

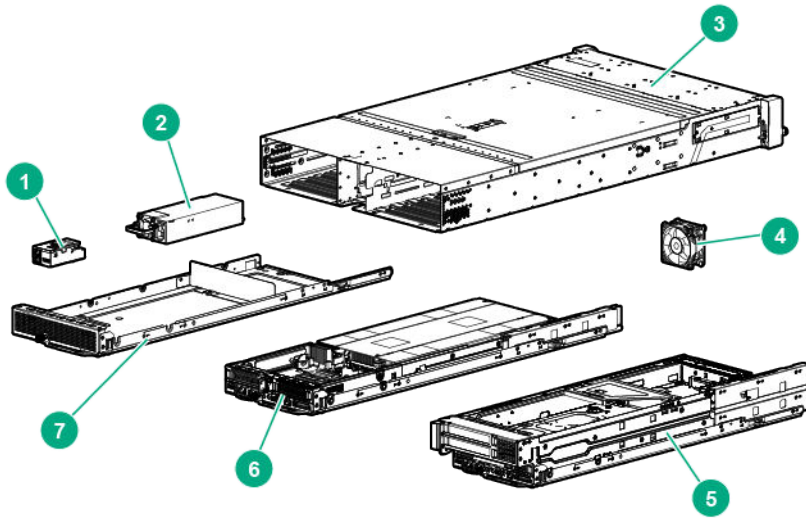
ⓘ IMPORTANT: The minimum nominal thread diameter of a pillar or stud type terminal must be 3.5 mm (0.138 in); the diameter of a screw type terminal must be 4.0 mm (0.157 in).

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

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

Identifying components and LEDs

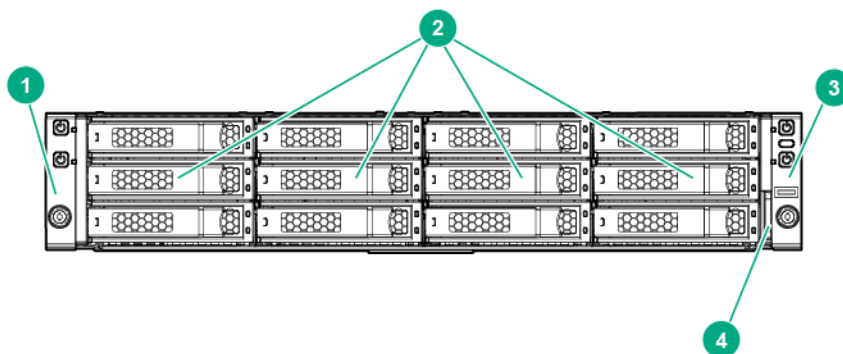
System components



Item	Description
1	RCM module (optional)
2	Power supply
3	HPE Apollo 2000 Gen10 Chassis
4	Fan
5	HPE ProLiant XL190r Gen10 Server
6	HPE ProLiant XL170r Gen10 Server
7	Server tray blank

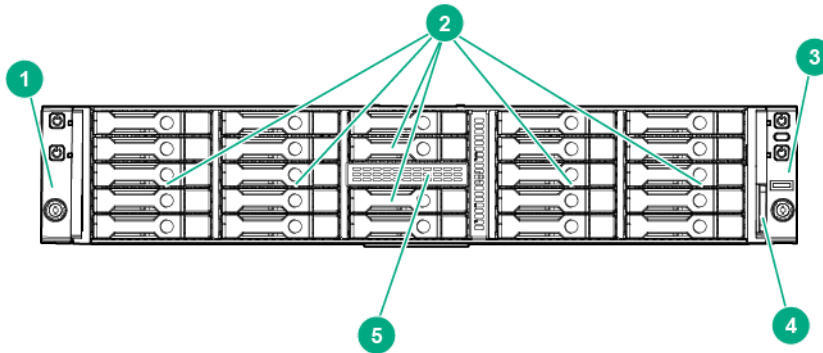
Front panel components

HPE Apollo r2200 Gen10 Chassis



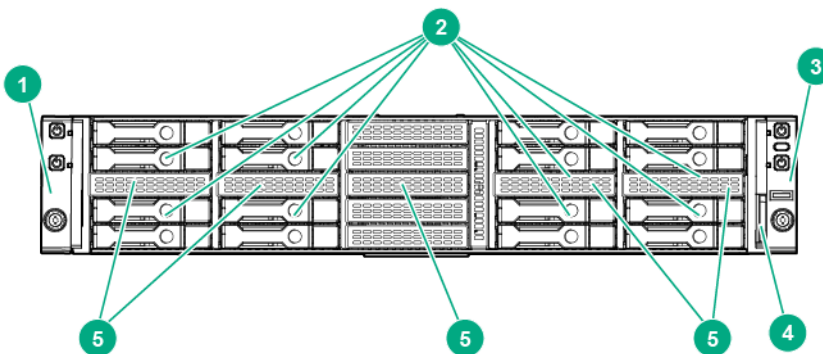
Item	Description
1	Left bezel ear
2	Low-profile LFF hot-plug drives
3	Right bezel ear
4	Chassis serial label pull tab

HPE Apollo r2600 Gen10 Chassis



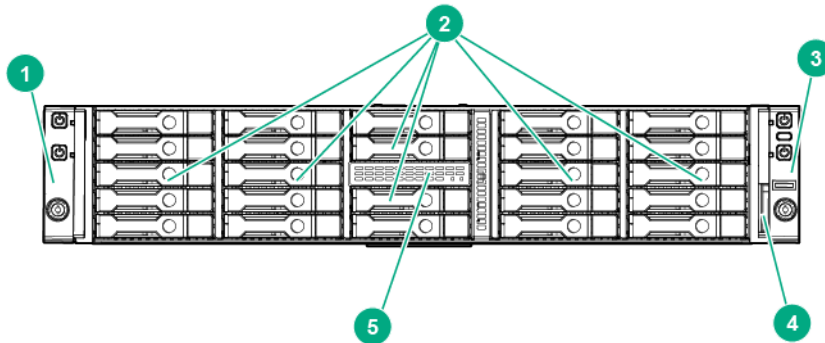
Item	Description
1	Left bezel ear
2	SFF hot-plug drives
3	Right bezel ear
4	Chassis serial label pull tab
5	Non-removable bezel blank

HPE Apollo r2800 Gen10 Chassis with 16 NVMe



Item	Description
1	Left bezel ear
2	NVMe drives
3	Right bezel ear
4	Chassis serial label pull tab
5	Non-removable bezel blanks

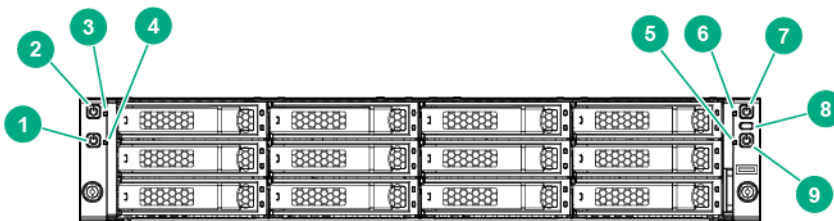
HPE Apollo r2800 Gen10 Chassis (24 SFF model with storage expander backplane)



Item	Description
1	Left bezel ear
2	SFF hot-plug drives
3	Right bezel ear
4	Chassis serial label pull tab
5	Expander daughter module with power LED ¹

¹ When the LEDs described in this table flash simultaneously, a power fault has occurred. For more information, see [Front panel LEDs](#).

Front panel LEDs



Item	Description	Status
1	Power On/Standby button and system power LED (Server 1) ¹	Solid green = System on Flashing green = Performing power on sequence Solid amber = System in standby Off = No power present ²
2	Power On/Standby button and system power LED (Server 2)	Solid green = System on Flashing green = Performing power on sequence Solid amber = System in standby Off = No power present ²
3	Health LED (Server 2) ¹	Solid green = Normal Flashing amber = System degraded Flashing red = System critical ³
4	Health LED (Server 1) ¹	Solid green = Normal Flashing amber = System degraded Flashing red = System critical ³
5	Health LED (Server 3) ¹	Solid green = Normal Flashing amber = System degraded Flashing red = System critical ³
6	Health LED (Server 4) ¹	Solid green = Normal Flashing amber = System degraded Flashing red = System critical ³
7	Power On/Standby button and system power LED (Server 4) ¹	Solid green = System on Flashing green = Performing power on sequence Solid amber = System in standby Off = No power present ²

Table Continued

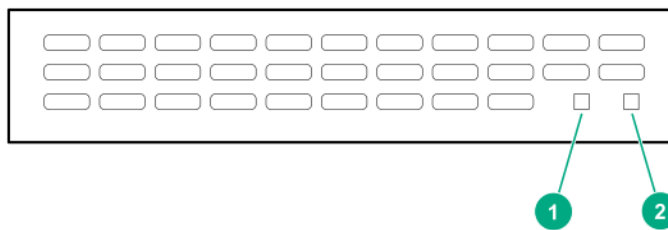
Item	Description	Status
8	UID button/LED ¹	Solid blue = Activated Flashing blue: <ul style="list-style-type: none"> • 1 flash per second = Remote management or firmware upgrade in progress • 4 flashes per second = iLO manual soft reboot sequence initiated • 8 flashes per second = iLO manual hard reboot sequence in progress Off = Deactivated
9	Power On/Standby button and system power LED (Server 3) ¹	Solid green = System on Flashing green = Performing power on sequence Solid amber = System in standby Off = No power present ²

¹ When the LEDs described in this table flash simultaneously, a power fault has occurred.

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

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

24 SFF with expander daughter board LEDs



Item	Description	Status
1	Expander daughter board power good LED	Solid green = Expander daughter board power is good Off = Expander daughter board power fault LED will be on
2	Expander daughter board power fault LED	Solid yellow = Expander daughter board power fault has occurred Off = Expander daughter board power good LED will be on

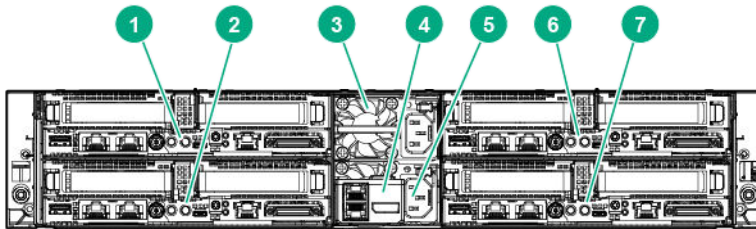
Power fault LEDs

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

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

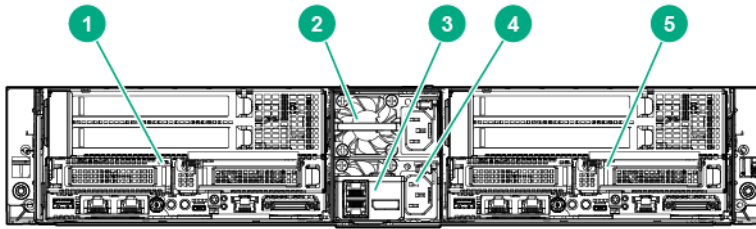
Rear panel components

Four 1U servers



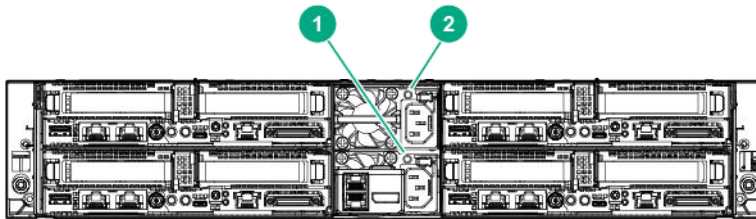
Item	Description
1	Server 4
2	Server 3
3	Power supply 2
4	RCM module (optional)
5	Power supply 1
6	Server 2
7	Server 1

Two 2U servers



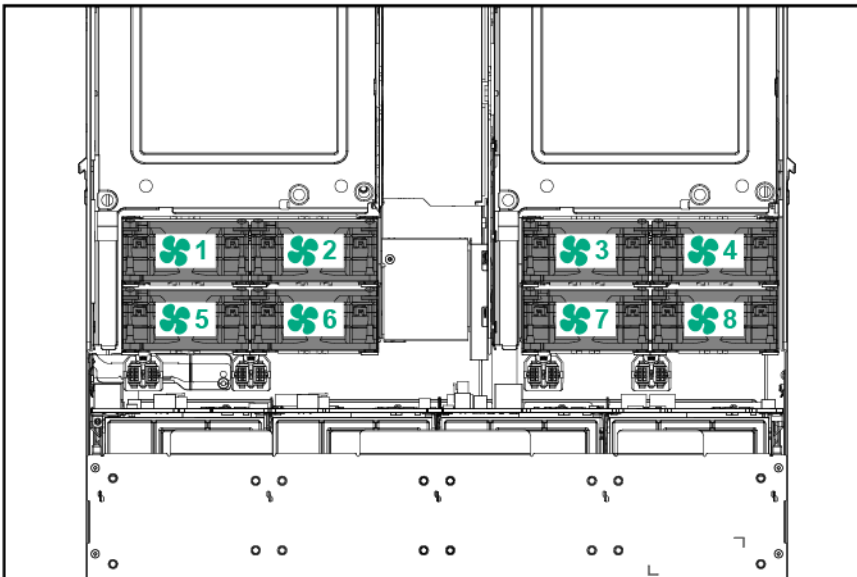
Item	Description
1	Server 3
2	Power supply 2
3	RCM module (optional)
4	Power supply 1
5	Server 1

Power supply LEDs



Item	Description	Status
1	Power supply 1 LED	<p>Solid green = Normal</p> <p>Off = One or more of the following conditions exists:</p> <ul style="list-style-type: none"> • Power is unavailable • Power supply failed • Power supply is in standby mode • Power supply error
2	Power supply 2 LED	<p>Solid green = Normal</p> <p>Off = One or more of the following conditions exists:</p> <ul style="list-style-type: none"> • Power is unavailable • Power supply failed • Power supply is in standby mode • Power supply error

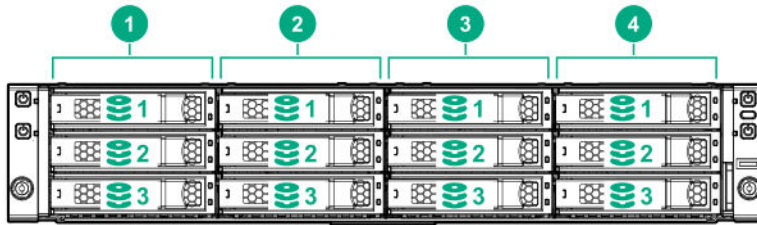
Fan locations



Drive bay numbering

- ⓘ **IMPORTANT:** Depending on the chassis configuration and the components installed in the servers, it might be necessary to limit the number of drives installed in the chassis. For more information, see "Temperature requirements" in the server user guide.

Apollo r2200 Gen10 Chassis (1U servers in AHCI mode)



Item	Description
1	Server 1 drive bays
2	Server 2 drive bays
3	Server 3 drive bays
4	Server 4 drive bays

Apollo r2200 Gen10 Chassis (2U servers in AHCI mode)



Item	Description
1	Server 1 drive bays
3	Server 3 drive bays

Apollo r2200 Gen10 Chassis (1U and 2U servers using embedded SATA S100i or a Smart Array controller)

One 1U server corresponds to a maximum of three low-profile LFF hot-plug drives.

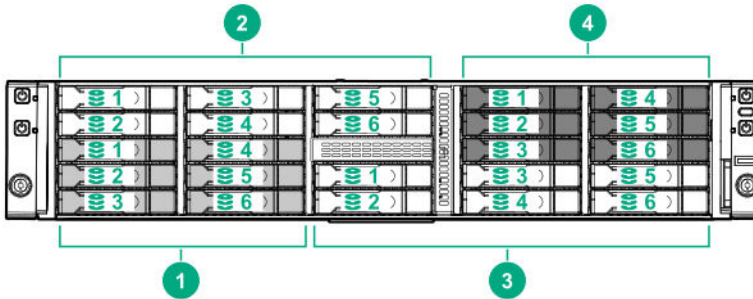
- Server 1 corresponds to drive bays 1-1 through 1-3.
- Server 2 corresponds to drive bays 2-1 through 2-3.
- Server 3 corresponds to drive bays 3-1 through 3-3.
- Server 4 corresponds to drive bays 4-1 through 4-3.

One 2U server corresponds to a maximum of six low-profile LFF hot-plug drives.

- Server 1 corresponds to drive bays 1-1 through 2-3.
- Server 3 corresponds to drive bays 3-1 through 4-3.

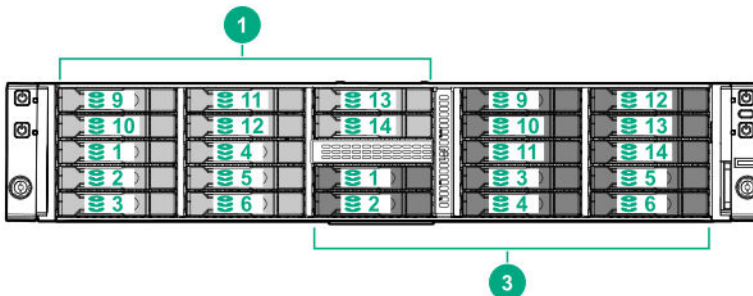


Apollo r2600 Gen10 Chassis (1U servers in AHCI mode)



Item	Description	Supported drives
1	Server 1 drive bays	Drive bays 1, 2, 3, and 4 support SFF SmartDrives only. Drive bays 5 and 6 support both SFF SmartDrives and NVMe drives.
2	Server 2 drive bays	Drive bays 1 and 2 support both SFF SmartDrives and NVMe drives. Drive bays 3, 4, 5, and 6 support SFF SmartDrives only.
3	Server 3 drive bays	Drive bays 1, 2, 3, and 4 support SFF SmartDrives only. Drive bays 5 and 6 support both SFF SmartDrives and NVMe drives.
4	Server 4 drive bays	Drive bays 1 and 2 support both SFF SmartDrives and NVMe drives. Drive bays 3, 4, 5, and 6 support SFF SmartDrives only.

Apollo r2600 Gen10 Chassis (2U servers in AHCI mode)



Item	Description	Supported drives
1	Server 1 drive bays	Drive bays 5, 6, 9, and 10 support both SFF SmartDrives and NVMe drives. All other drive bays support SFF SmartDrives only.
3	Server 3 drive bays	Drive bays 5, 6, 9, and 10 support both SFF SmartDrives and NVMe drives. All other drive bays support SFF SmartDrives only.

Apollo r2600 Gen10 Chassis (1U and 2U servers using the embedded SATA S100i or a Smart Array controller)

Drive bays 1-5, 1-6, 2-1, 2-2, 3-5, 3-6, 4-1, and 4-2 support both SFF SmartDrives and NVMe drives.

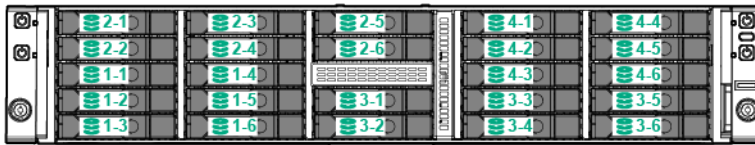
All other drives bays support SFF SmartDrives only.

One 1U server corresponds to a maximum of six drives.

- Server 1 corresponds to drive bays 1-1 through 1-6.
- Server 2 corresponds to drive bays 2-1 through 2-6.
- Server 3 corresponds to drive bays 3-1 through 3-6.
- Server 4 corresponds to drive bays 4-1 through 4-6.

One 2U server corresponds to a maximum of twelve drives.

- Server 1 corresponds to drive bays 1-1 through 2-6.
- Server 3 corresponds to drive bays 3-1 through 4-6.



Apollo r2800 Gen10 Chassis with 16 NVMe

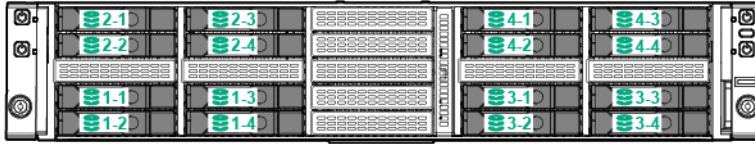
IMPORTANT: The HPE Apollo r2800 Gen10 Chassis with 16 NVMe does not support servers using the embedded SATA HPE Dynamic Smart Array S100i Controller or any type-p plug-in Smart Array Controller with internal ports and cables.

One 1U server corresponds to a maximum of four NVMe drives.

- Server 1 corresponds to drive bays 1-1 through 1-4.
- Server 2 corresponds to drive bays 2-1 through 2-4.
- Server 3 corresponds to drive bays 3-1 through 3-4.
- Server 4 corresponds to drive bays 4-1 through 4-4.

One 2U server corresponds to a maximum of eight NVMe drives.

- Server 1 corresponds to drive bays 1-1 through 2-4.
- Server 3 corresponds to drive bays 3-1 through 4-4.



Apollo r2800 Gen10 Chassis (24 SFF with storage expander backplane)

The factory default configuration evenly distributes the 24 SFF drive bays in the HPE Apollo 2800 Chassis.

For detailed information and examples on drive bay mapping configuration changes in the HPE Apollo r2800 Gen10 Chassis, see the [iLO REST APIs to GitHub](#) on the [Hewlett Packard Enterprise website](#).

NOTE: While the layout of the drives are internally mapped as mentioned below. The Redfish response or RESTful interface tool still continues to display a fixed 6 drives irrespective of 1U or 2U node inserted.

The HPE Apollo r2800 Chassis, featuring the storage expander backplane, supports the flexibility to assign drive bays to specific server nodes. This feature provides secure, remote configuration flexibility via iLO Redfish interface. To deploy HDD bay mapping configuration iLO user account privilege "Configure iLO Settings" is required.

Drive bay mapping configuration changes may be made from any server node and take effect after all server nodes in the HPE Apollo r2800 Chassis are turned off and the Chassis firmware is able to reset the storage expander backplane. All nodes must remain powered off for at least 5 seconds after executing the configuration changes. The server nodes may be remotely restarted through the iLO remote interface, or may be locally restarted by pressing the power button for each node.

This feature requires the following minimum firmware versions:

- Apollo 2000 System Chassis firmware version 1.2.10 or later
- Storage Expander firmware version 1.0 or later
- iLO firmware version 1.20 or later

Six drive bays are allocated to each 1U node.

- Server 1 corresponds to drive bays 1 through 6
- Server 2 corresponds to drive bays 7 through 12
- Server 3 corresponds to drive bays 13 through 18
- Server 4 corresponds to drive bays 19 through 24

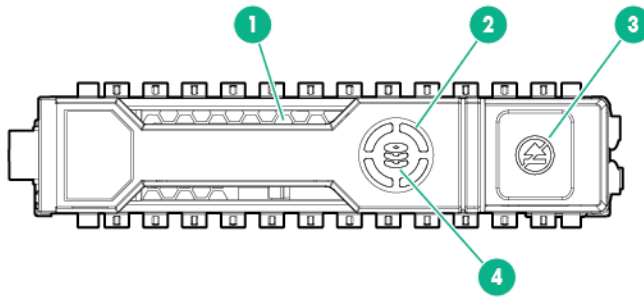
Twelve drive bays are allocated to each 2U node.

- Server 1 corresponds to drive bays 1 through 12
- Server 3 corresponds to drive bays 13 through 24



Hot-plug drive LED definitions

SmartDrive hot-plug drive LED definitions

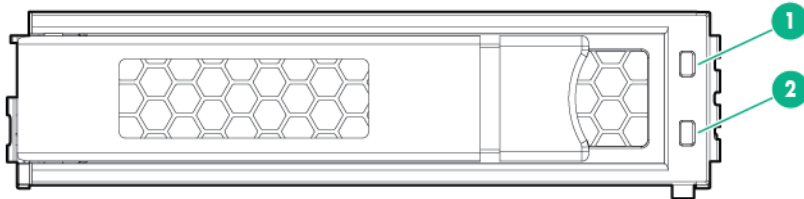


Item	Description	Status
1	Locate	<ul style="list-style-type: none"> • Solid blue = The drive is being identified by a host application. • Flashing blue = The drive carrier firmware is being updated or requires an update.
2	Activity ring LED	<ul style="list-style-type: none"> • Rotating green = Drive activity. • Off = No drive activity.

Table Continued

Item	Description	Status
3	Do not remove LED	<ul style="list-style-type: none"> • Solid white = Do not remove the drive. Removing the drive causes one or more of the logical drives to fail. • Off = Removing the drive does not cause a logical drive to fail.
4	Drive status LED	<ul style="list-style-type: none"> • Solid green = The drive is a member of one or more logical drives. • Flashing green = The drive is rebuilding or performing a RAID migration, strip size migration, capacity expansion, or logical drive extension, or is erasing. • Flashing amber/green = The drive is a member of one or more logical drives and predicts the drive will fail. • Flashing amber = The drive is not configured and predicts the drive will fail. • Solid amber = The drive has failed. • Off = The drive is not configured by a RAID controller.

Low-profile LFF hot-plug drive LED definitions



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

LED Activity

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

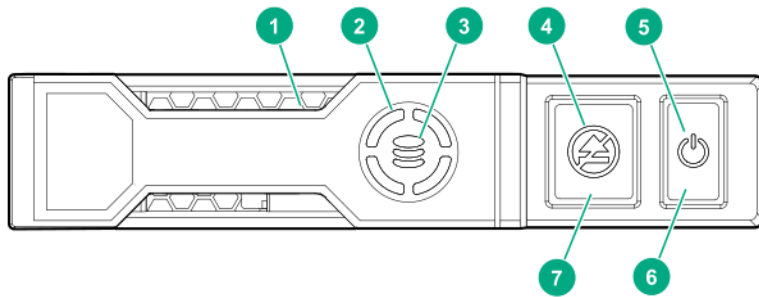
Table Continued

Online/Activity LED (green)	Fault/UID LED (amber/blue)	Definition
4 flashes per second	Flashing amber	The drive is active but a predictive failure alert has been received for this drive. Replace the drive as soon as possible.
4 flashes per second	Off	The drive is active and is operating normally.
Off	Solid amber	A critical fault condition has been identified for this drive and the controller has placed it offline. Replace the drive as soon as possible.
Off	Flashing amber	A predictive failure alert has been received for this drive. Replace the drive as soon as possible.
Off	Off	The drive is offline, a spare, or not configured as part of an array.

NVMe SSD components

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

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

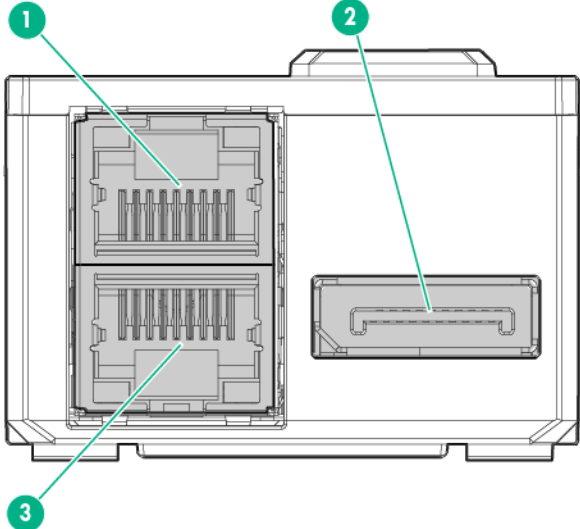


Item	Description	Status
1	Locate LED	Solid blue = The drive is being identified by a host application. Flashing blue = The drive carrier firmware is being updated or requires an update.
2	Activity ring LED	Rotating green = Drive activity Off = No drive activity

Table Continued

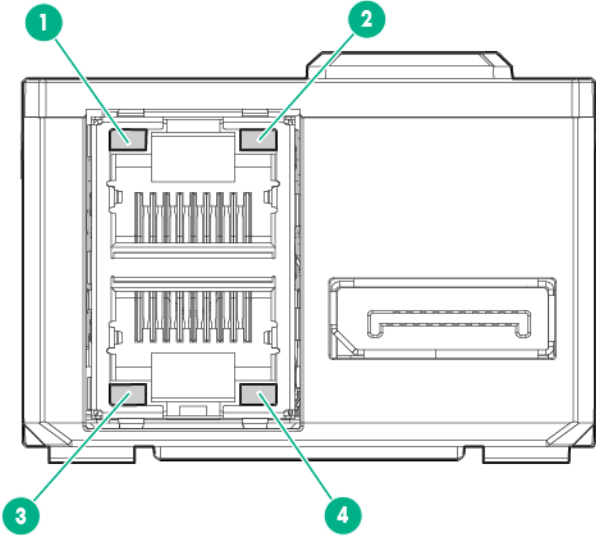
Item	Description	Status
3	Drive status LED	<p>Solid green = The drive is a member of one or more logical drives.</p> <p>Flashing green = The drive is rebuilding or performing a RAID migration, stripe size migration, capacity expansion, or logical drive extension, or is erasing.</p> <p>Flashing amber/green = The drive is a member of one or more logical drives and predicts the drive will fail.</p> <p>Flashing amber = The drive is not configured and predicts the drive will fail.</p> <p>Solid amber = The drive has failed.</p> <p>Off = The drive is not configured by a RAID controller.</p>
4	Do Not Remove LED	<p>Solid white = Do not remove the drive. Drive must be ejected from the PCIe bus prior to removal.</p> <p>Flashing white = Ejection request pending</p> <p>Off = Drive has been ejected</p>
5	Power LED	<p>Solid green = Do not remove the drive. Drive must be ejected from the PCIe bus prior to removal.</p> <p>Flashing green = Ejection request pending</p> <p>Off = Drive has been ejected</p>
6	Power button	<p>Press to request PCIe ejection. Removal request can be denied by the:</p> <ul style="list-style-type: none"> • RAID controller (one or more of the logical drives could fail) • Operating system
7	Do not remove button	Press to open the release lever.

RCM module components



Item	Description
1	iLO connector
2	HPE APM 2.0 connector
3	iLO connector

RCM module LEDs



Item	Description	Status
1	iLO activity LED	Green or flashing green = Network activity Off = No network activity
2	iLO link LED	Green = Linked to network Off = No network connection
3	iLO link LED	iLO link LED Green = Linked to network Off = No network connection
4	iLO activity LED	Green or flashing green = Network activity Off = No network activity

Installing the chassis

Installation overview

To set up and install the chassis:

1. Unpack the system.
2. Prepare the chassis for installation.
3. Install the rack rails and chassis into the rack.
4. Install hardware options into the servers.
5. Install the system components.
6. Cable the chassis.

Unpacking the system

Unpack the following hardware and prepare for installation:

- HPE Apollo 2000 Gen10 Chassis
- Rack rail kit
- System components and cabling

The following documents also ship with the HPE Apollo 2000 Gen10 Chassis:

- Start Here for Important Setup Information
- Safety, Compliance, and Warranty Information

Preparing the chassis for installation

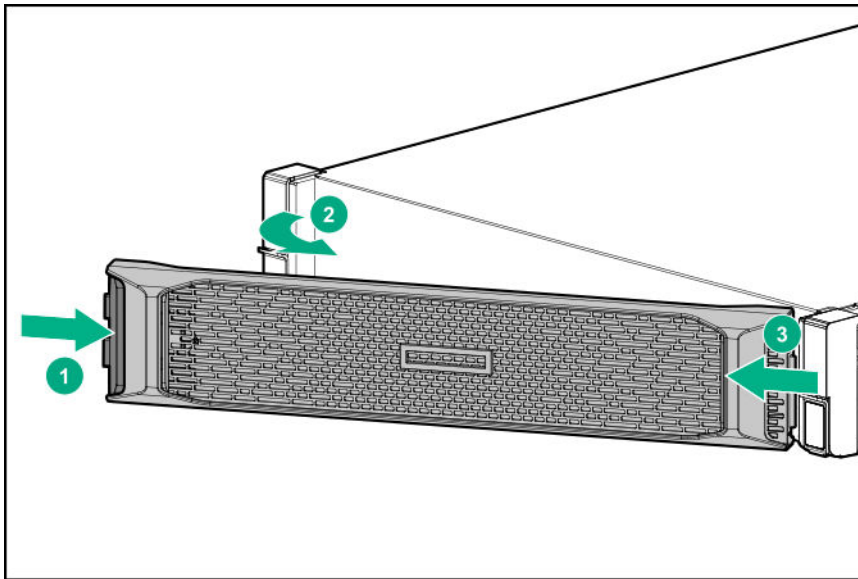
If installing the Smart Storage Battery and redundant fan options, install these options before installing the chassis into the rack.

Prerequisites

Before installing the chassis into the rack, Hewlett Packard Enterprise recommends removing the servers and drives. Because a fully populated chassis is heavy, removing the servers facilitates moving and installing the chassis.

Procedure

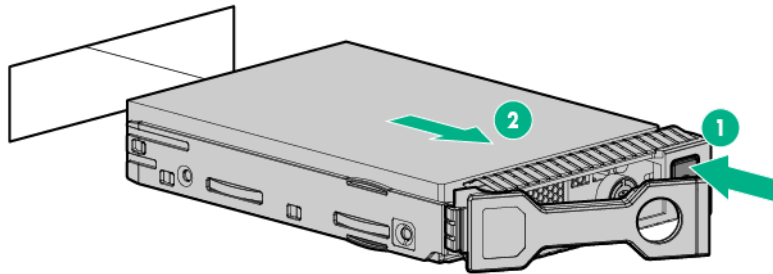
1. If installed, remove the bezel.



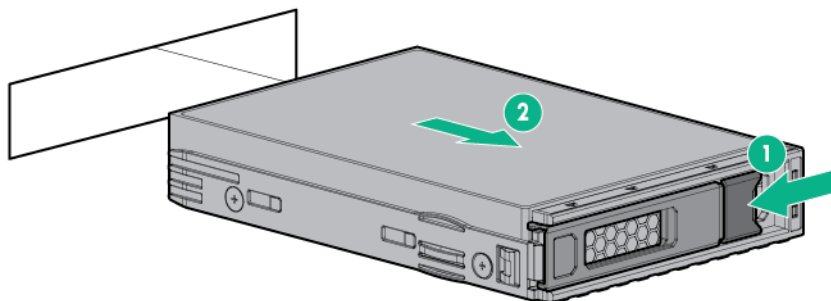
⚠ **IMPORTANT:** Label the drives before removing them. The drives must be returned to their original locations.

2. Remove the hot-plug drive.

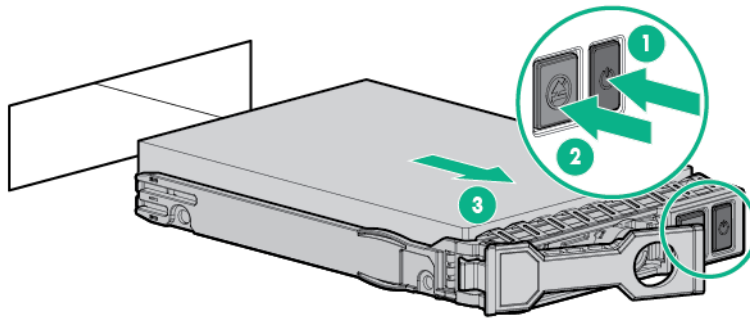
- SFF SmartDrive



- Low-profile LFF hot-plug drive



- NVMe hot-plug drive



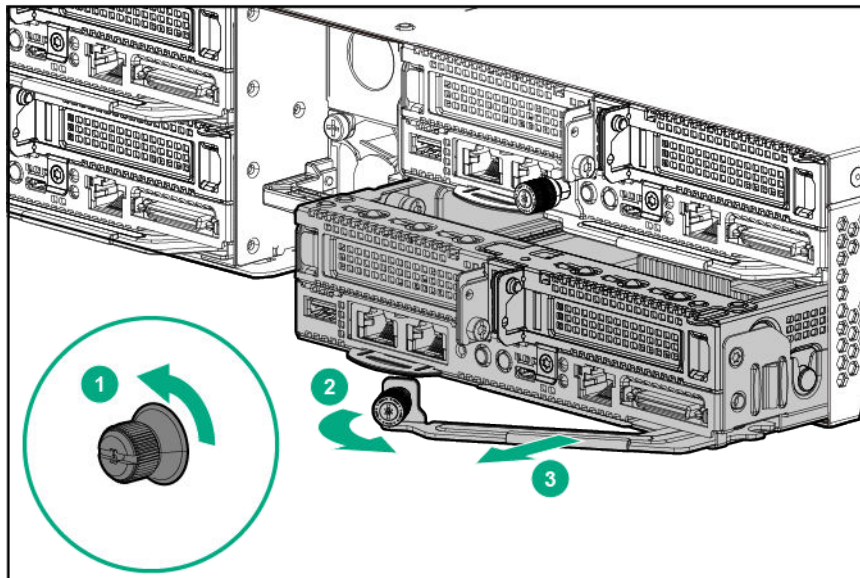
3. Remove the server from the chassis:

- a. Loosen the thumbscrew.
- b. Pull back the handle.

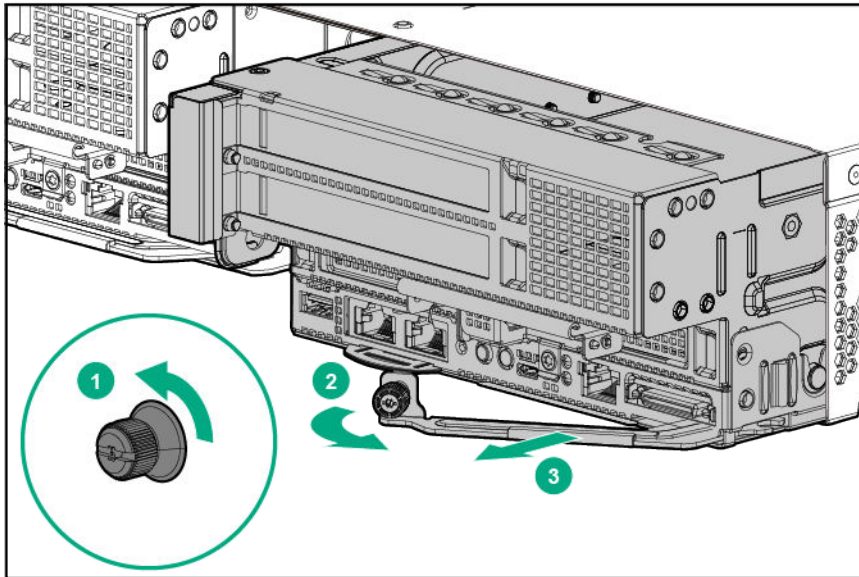
⚠ CAUTION: To avoid damage to the server, always support the bottom of the server when removing it from the chassis.

c. Remove the server:

- 1U server



- 2U server



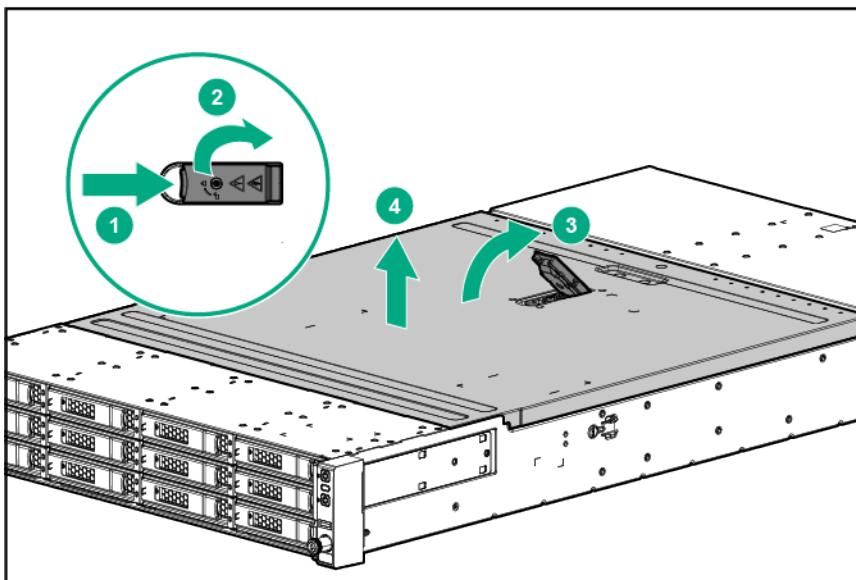
Installing the Smart Storage Battery for the regular Power Supply

Procedure

1. If installing a Smart Storage Battery or redundant fan option, remove the access panel.

NOTE: After the Smart Storage Battery is installed, it might take up to two hours to charge. Features requiring backup power are not enabled until the battery is fully charged.

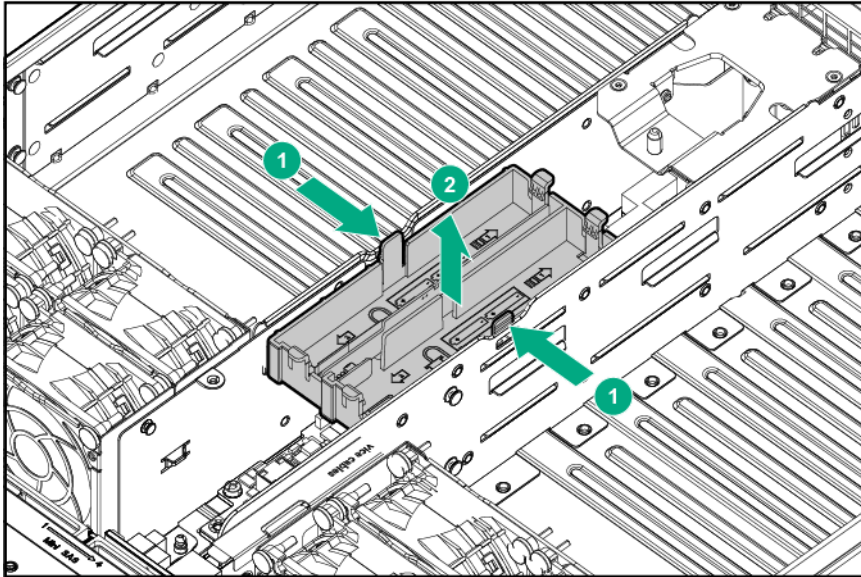
NOTE: The Smart Storage Battery is supported with P408i-p and P408e-p controllers only. Due to thermal concerns on some configurations, you are recommended to remove the Smart Storage Battery if these two cards are not installed in the chassis.



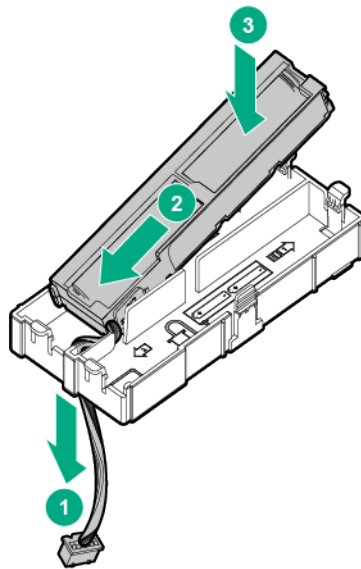
2. To install the Smart Storage Battery, do the following:

- a. Remove the battery holder.

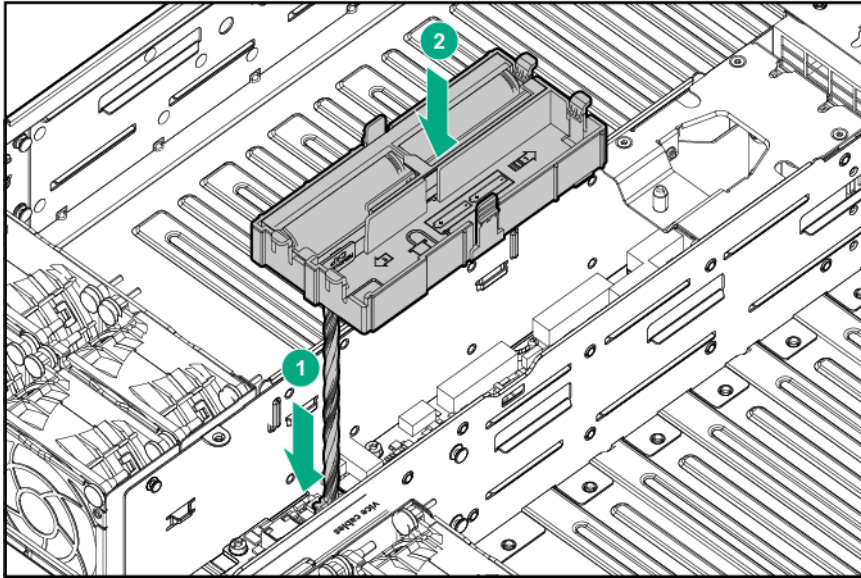
NOTE: Depending on the power supply installed, the design of the Smart Storage battery and the fan cage and module may be slightly different.



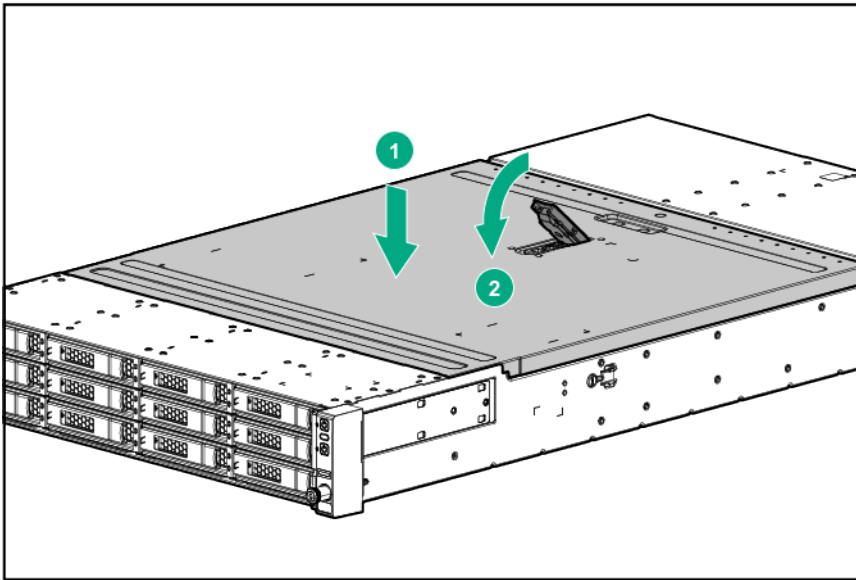
- b. Install the Smart Storage Battery into the holder and route the cable.



- c. Connect the battery cable to the power distribution board and install the holder into the chassis.



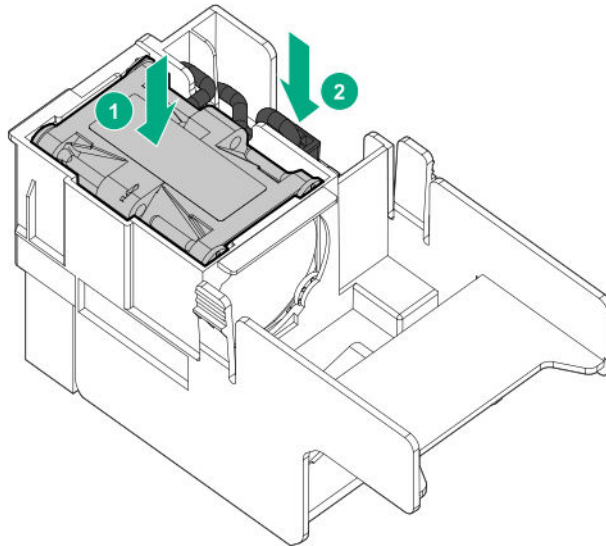
3. Install the access panel.



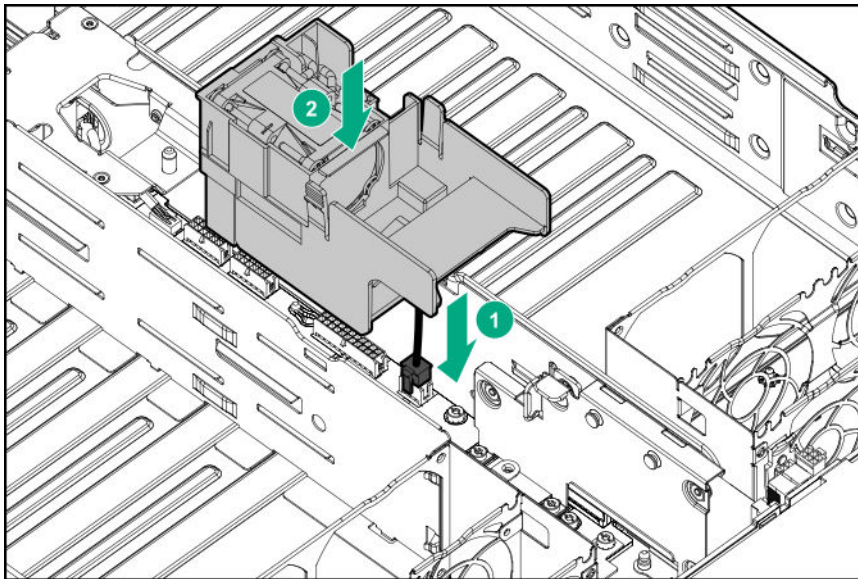
Installing the Smart Storage Battery for the H-Watt Power Supply

Procedure

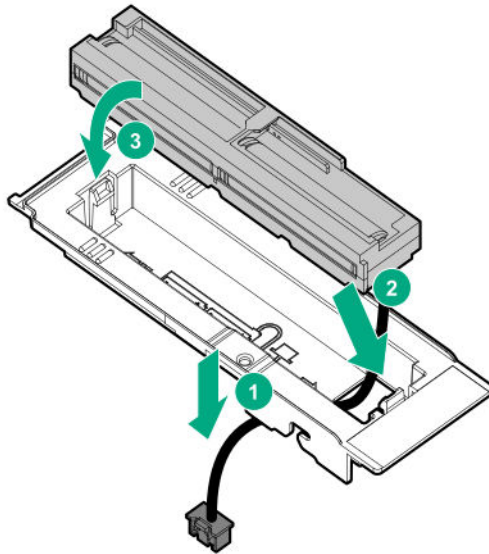
1. To install the Smart Storage Battery, remove the bezel, the hot-plug drives, and the server from the chassis.
2. Install the fan into the fan cage.



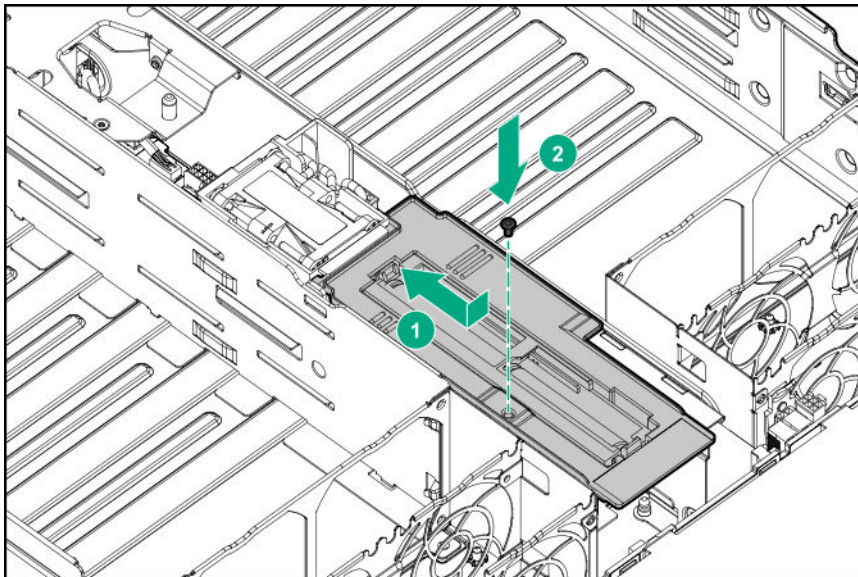
3. Connect the fan cage cable to the power distribution board connector and install the fan cage.



4. Install the Smart Storage Battery into the holder. Route the battery cable and connect it to the power distribution board.



5. Install the battery holder.



6. Install the redundant fan option.

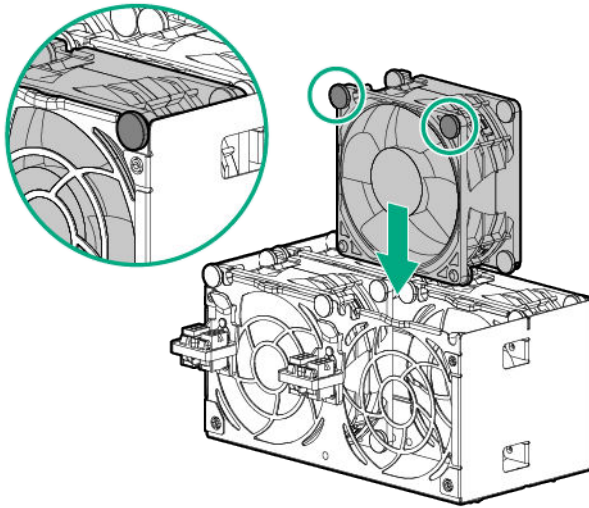
Installing the redundant fan option

Procedure

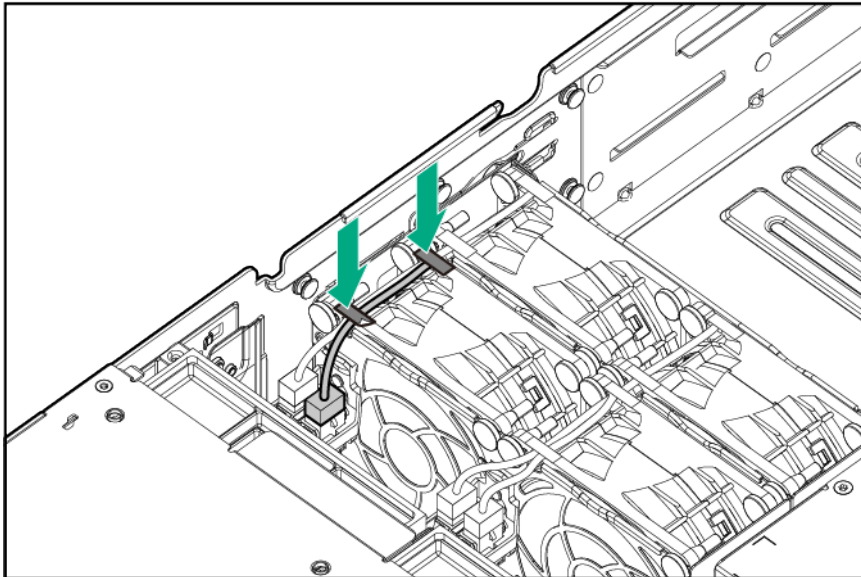
1. To install the redundant fan option, do the following:

NOTE: Depending on the power supply installed, the design of the SmartStorage battery and the fan cage and module may be slightly different.

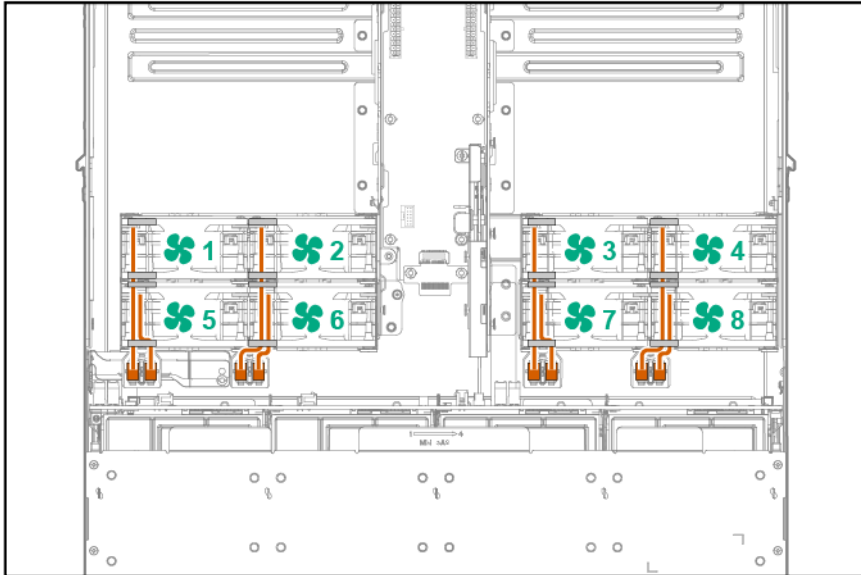
- a. Disconnect the fan module cables for fans 1, 2, 3, and 4. Be careful not to remove any existing adhesive tape.
- b. Install the redundant fans.



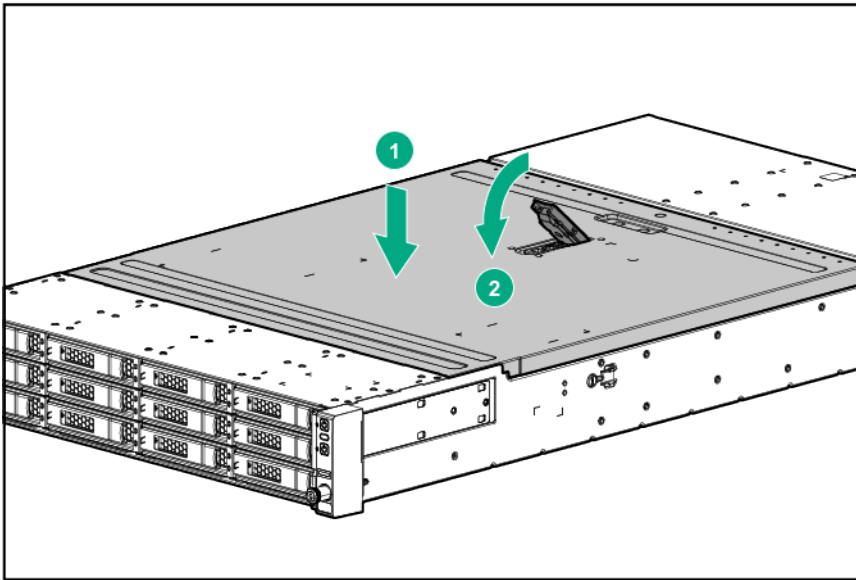
- c. Route the fan 1 and fan 5 cables through the grooves on the top of fan 5. Then secure the cables on top of fan 5 with two strips of adhesive tape.



- d. Repeat the previous step for fans 6, 7, and 8.
- e. Connect all fan module cables.



2. Install the access panel.



Installing the chassis into the rack

⚠ WARNING: The chassis is very heavy. To reduce the risk of personal injury or damage to the equipment:

- Observe local occupational health and safety requirements and guidelines for manual material handling.
- Remove all servers from the chassis before installing or moving the chassis.
- Use caution and get help to lift and stabilize the chassis during installation or removal, especially when the chassis is not fastened to the rack.

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

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

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

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

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

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

⚠ CAUTION: Hewlett Packard Enterprise has not tested or validated this chassis with any third-party racks. Before installing the chassis in a third-party rack, be sure to properly scope the limitations of the rack. Before proceeding with the installation, consider the following:

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

❗ IMPORTANT: When installing each chassis into the rack, be sure that the HPE Apollo Platform Manager is at the top of the chassis to ensure proper orientation in the rack.

Installing the 2U rack rail kit

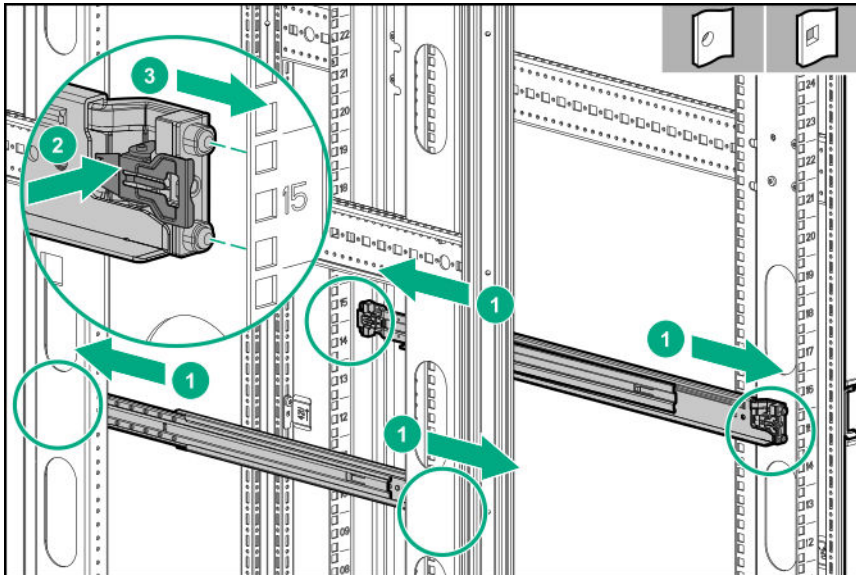
⚠ WARNING: To reduce the risk of personal injury or damage to the equipment, be sure that:

- The leveling jacks are extended to the floor.
- The full weight of the rack rests on the leveling jacks.
- The stabilizing feet are attached to the rack if it is a single-rack installation.
- The racks are coupled together in multiple-rack installations.
- Only one component is extended at a time. A rack may become unstable if more than one component is extended for any reason.

⚠ WARNING: If you are going to use a lift, be sure to use a lift that can handle the load of the component.

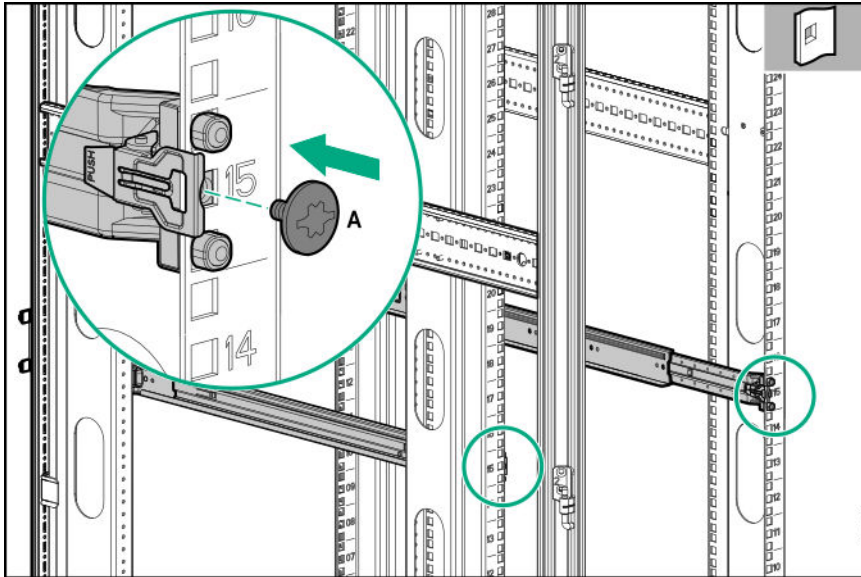
Procedure

1. Insert the 2U rack rails into the columns.

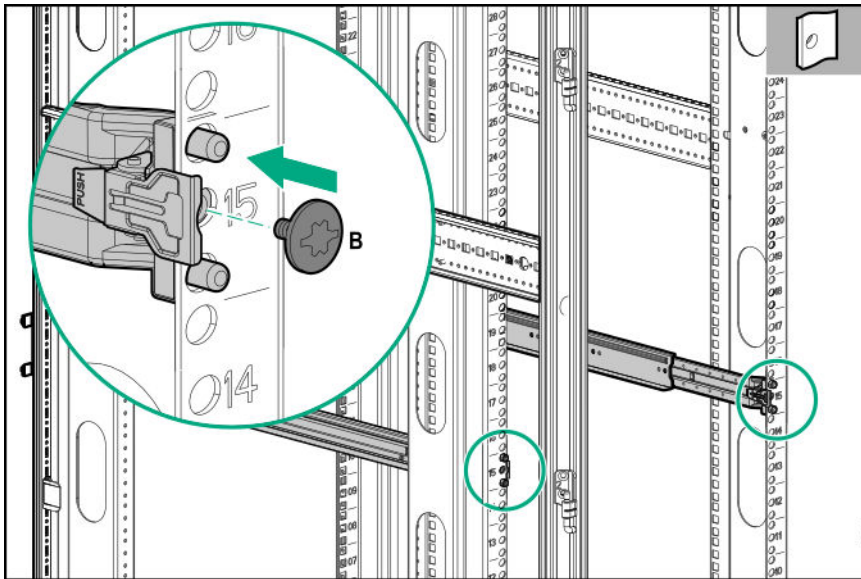


2. Secure the 2U rails with two panhead screws at the rear of the rack.

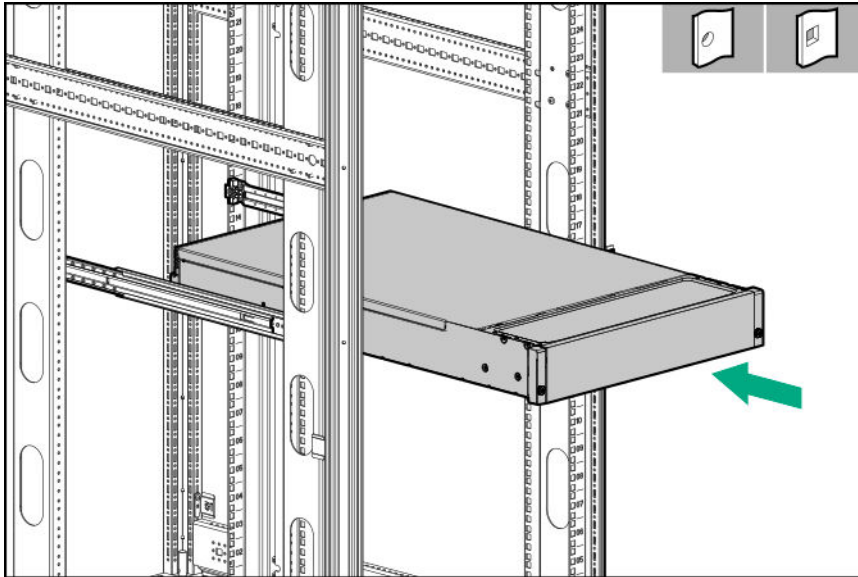
- Square-hole rack



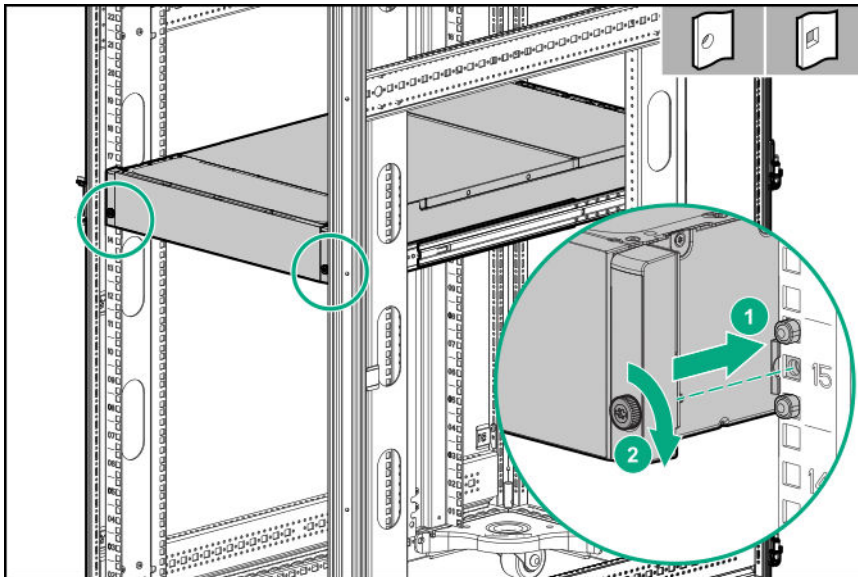
- Round-hole rack



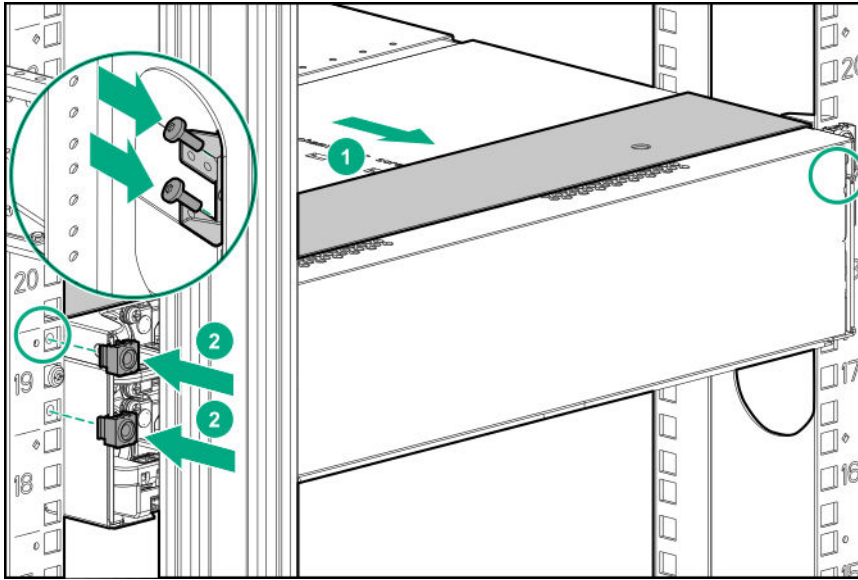
3. Install the chassis into the rack.



4. Tighten the thumbscrews.



5. If the rack is being shipped, install the shipping bracket for the top chassis only.



Installing hardware options into the server

To install hardware options into the server, see the server user guide on the [Hewlett Packard Enterprise website](#).

Installing the system components

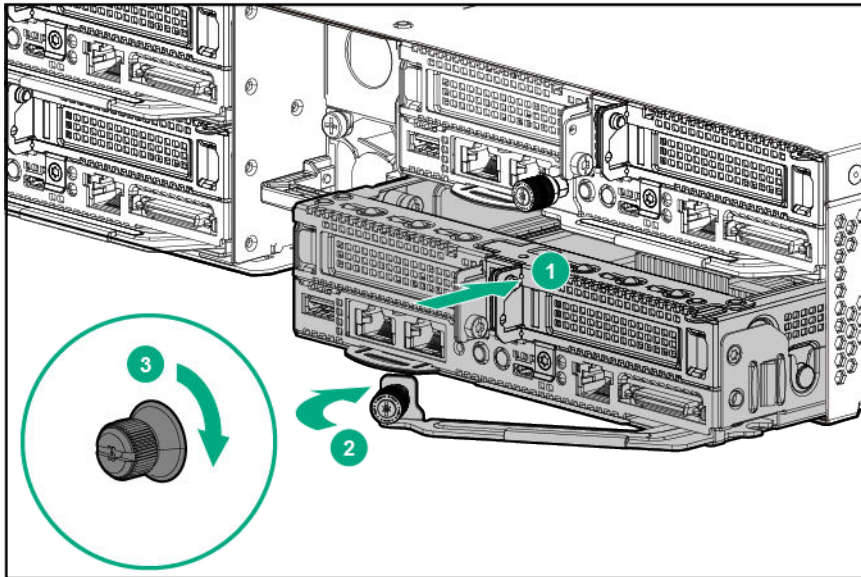
If components were removed during the chassis installation or additional components were ordered, install each device using the procedures in this section. If you perform any of the procedures in this section after powering on the chassis, ensure proper airflow by ensuring that each bay inside the chassis and at the rear of the chassis is populated with either a component or a blank. For component-specific replacement information, see the maintenance guides on the [Hewlett Packard Enterprise website](#).

Installing a server

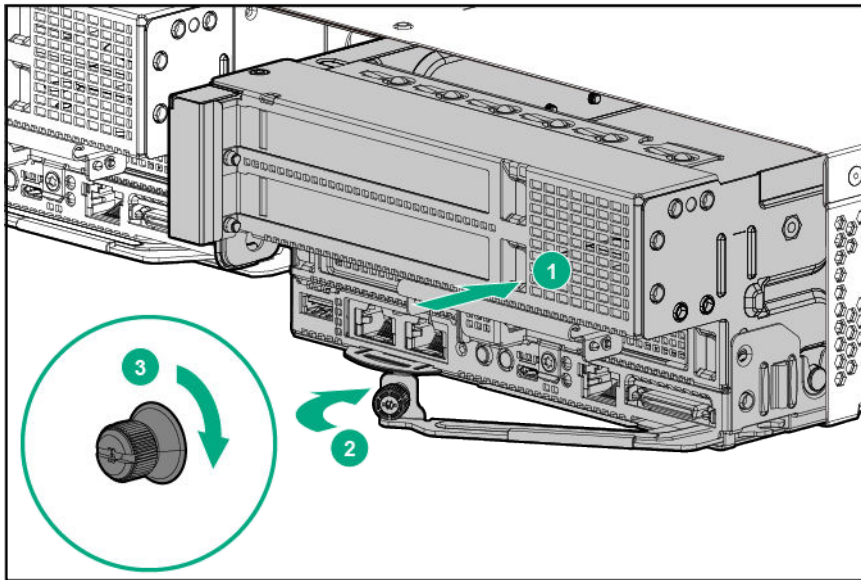
⚠ CAUTION: To ensure proper thermal cooling, all server tray slots must be populated with servers or server tray blanks.

Procedure

1. Install the server.
 - 1U server



- 2U server

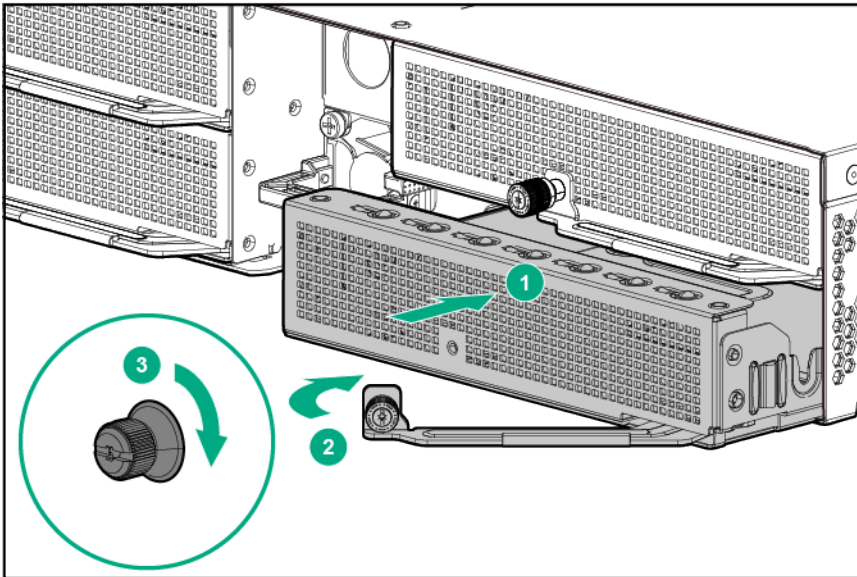


Installing the server tray blank

- ⚠ CAUTION:** To ensure proper thermal cooling, all server tray slots must be populated with servers or server tray blanks.

Procedure

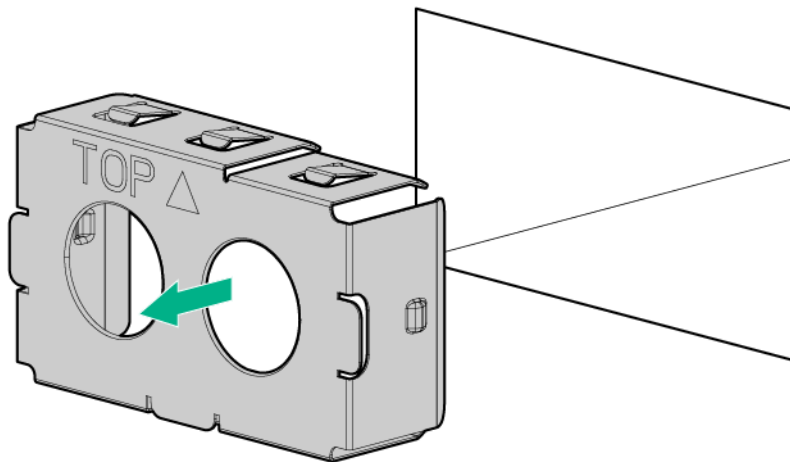
Install the server tray blank.



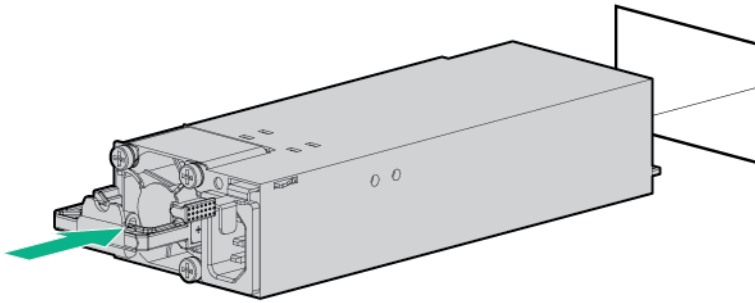
Installing a hot-plug AC power supply

Procedure

1. Access the product rear panel.
2. Remove the power supply blank.



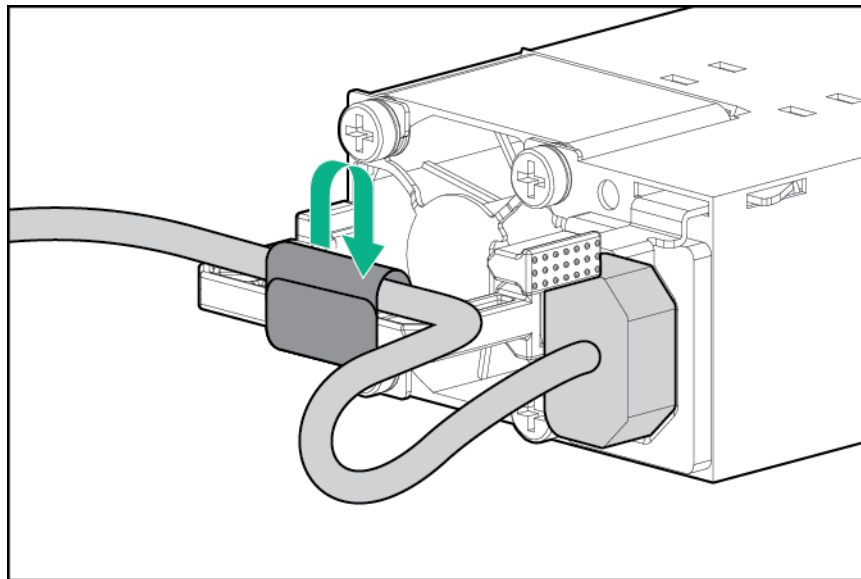
3. Slide the power supply into the bay until it clicks into place.



4. Connect the power cord to the power supply.
5. To prevent accidental power cord disconnection when sliding the server in and out of the chassis, secure the power cord in the strain relief strap attached to the power supply handle:
 - a. Unwrap the strain relief strap from the power supply handle.

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

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



Installing a hot-plug DC power supply

The following input power cord option might be purchased from an authorized reseller:

J6X43A—HPE 12 AWG 48 V DC 3.0 m Power Cord

If you are not using an input power cord option, the power supply cabling should be made in consultation with a licensed electrician and be compliant with local code.

If you are replacing the factory installed ground lug, use the KST RNB5-5 crimp terminal ring or equivalent. Use an M5-0.80 x 8 screw to attach the ground lug to the power supply.

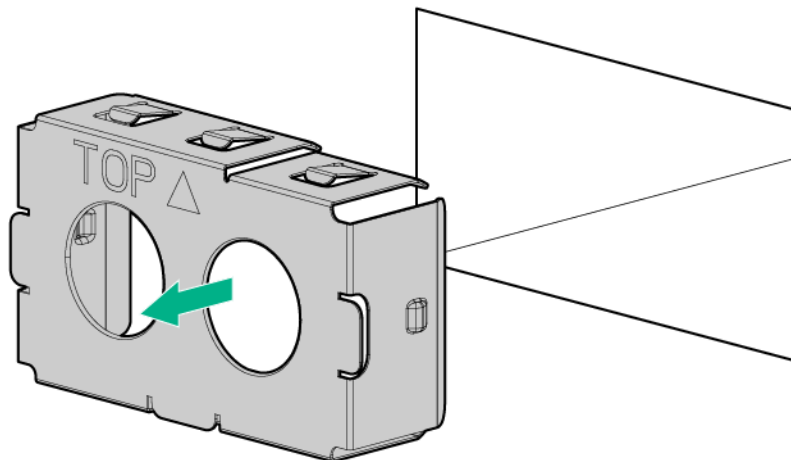


WARNING: To reduce the risk of electric shock, fire, and damage to the equipment, you must install this product in accordance with the following guidelines:

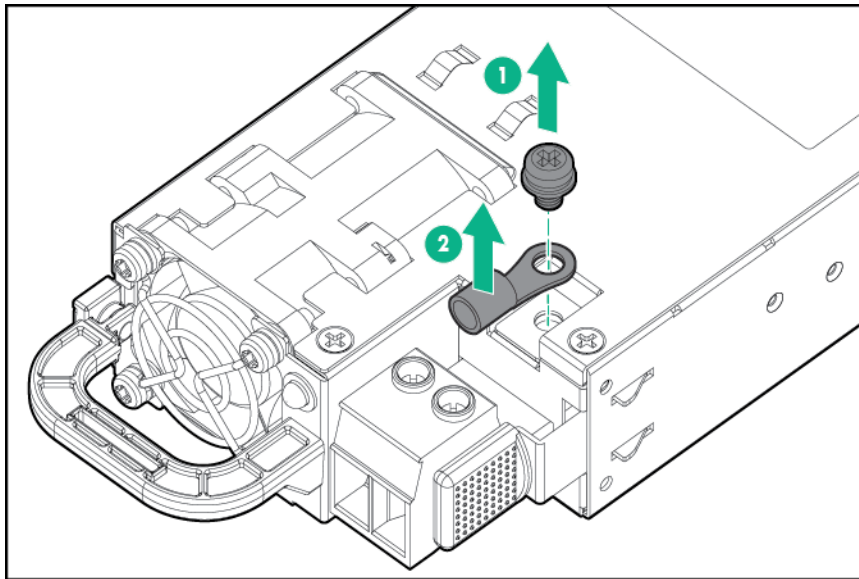
- This power supply is intended only for installation in Hewlett Packard Enterprise servers located in a restricted access location.
- This power supply is not intended for direct connection to the DC supply branch circuit. Only connect this power supply to a power distribution unit (PDU) that provides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

Procedure

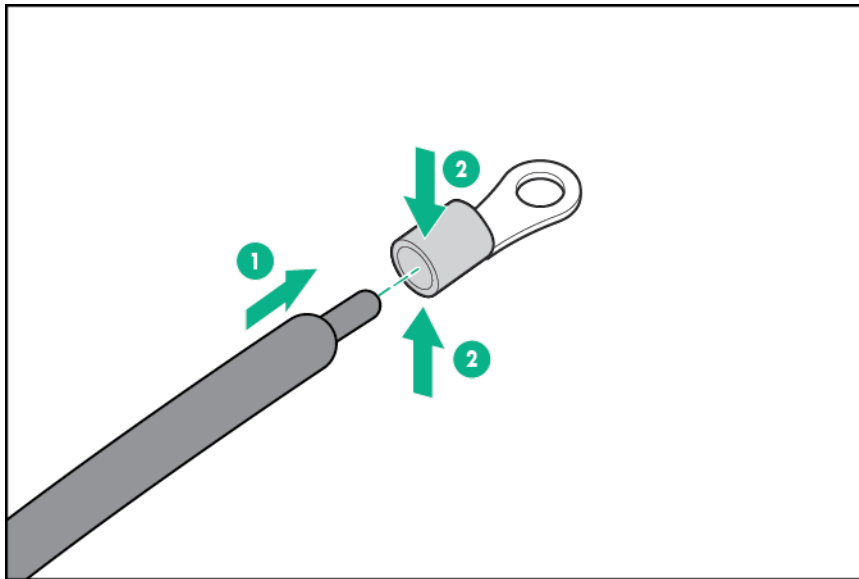
1. Access the product rear panel.
2. Remove the power supply blank.



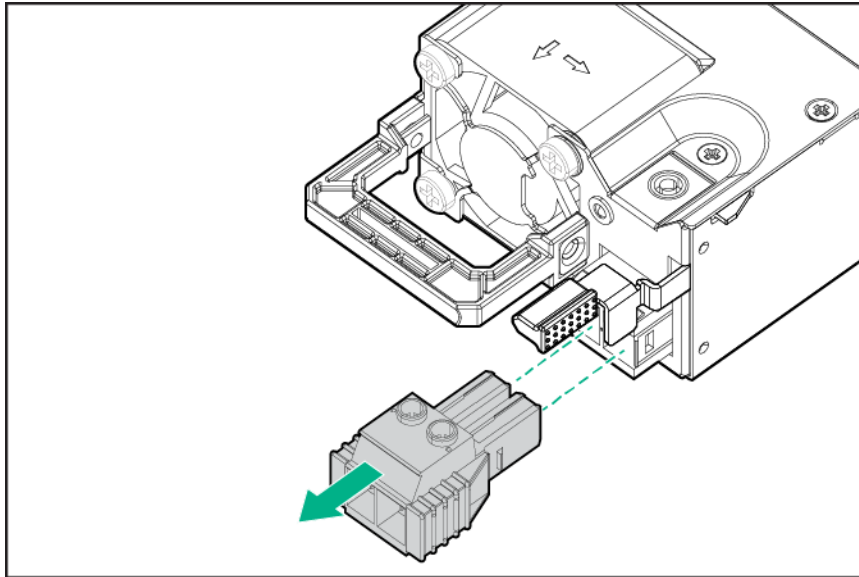
3. Remove the ring tongue.



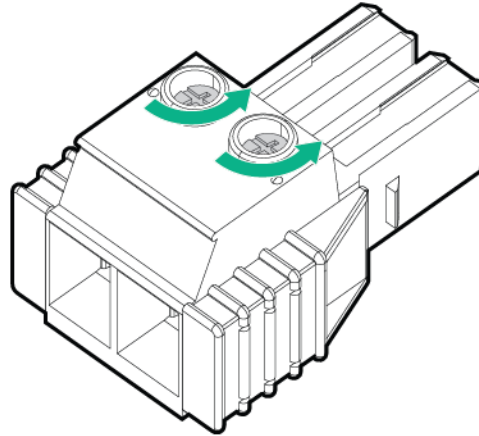
4. Crimp the ring tongue to the ground cable from the -48 V DC power source.



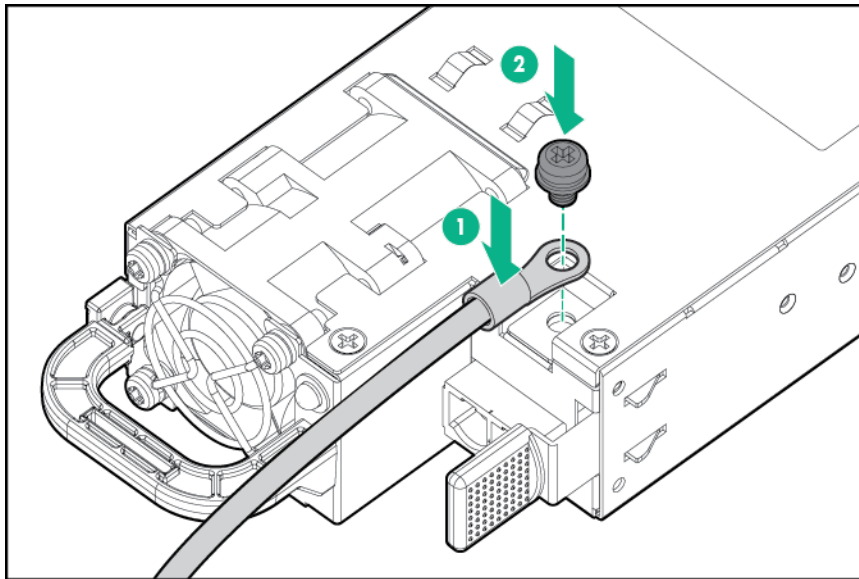
5. Remove the terminal block connector.



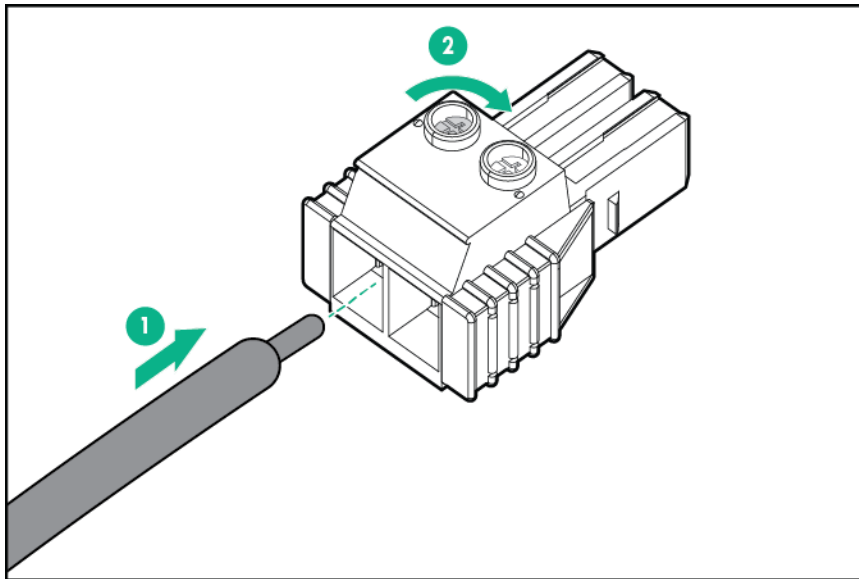
6. Loosen the screws on the terminal block connector.



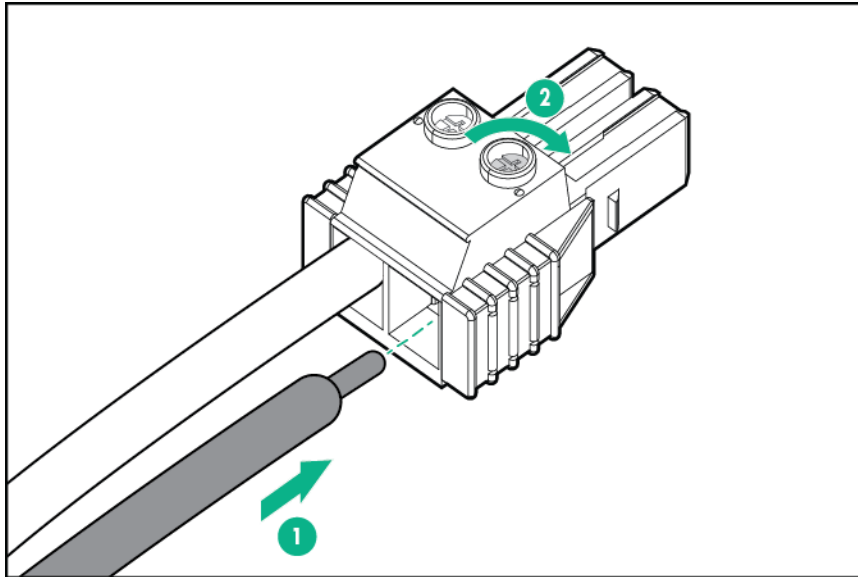
7. Attach the ground (earthed) wire to the ground screw and washer and tighten to 1.47 N m (13 lb-in) of torque. The ground wire must be connected before the -48 V wire and the return wire.
The ground wire must be connected before the -48 V wire and the return wire.



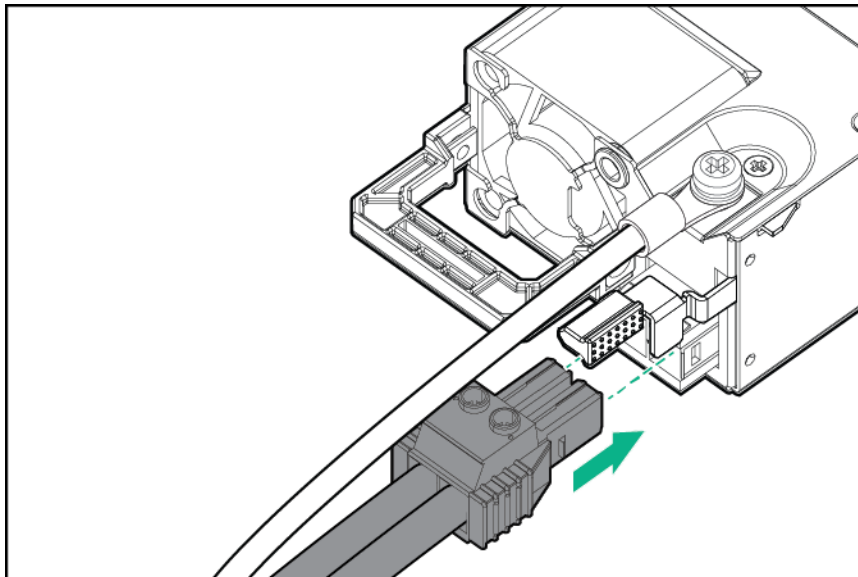
8. Insert the -48 V wire into the left side of the terminal block connector, and then tighten the screw to 1.3 N m (10 lb-in) of torque.



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



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

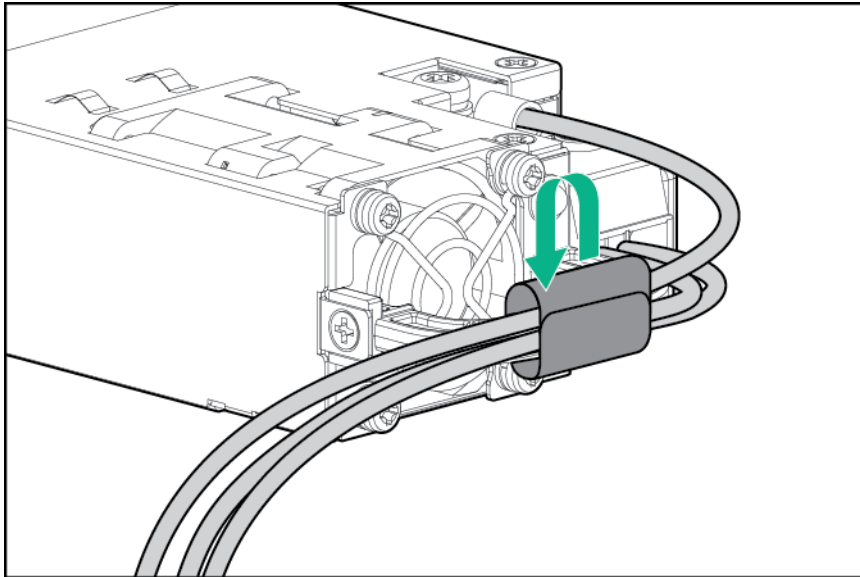


11. To prevent accidental power cord disconnection when sliding the server in and out of the chassis, secure the power cord, wires, and/or cables in the strain relief strap attached to the power supply handle:

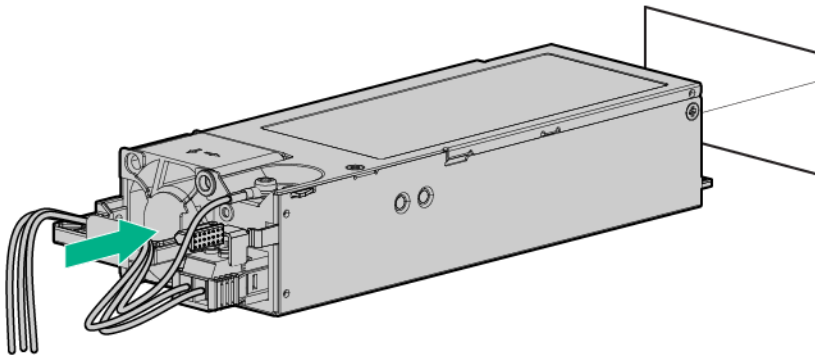
- a. Unwrap the strain relief strap from the power supply handle.

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

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



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



Drive options

The different chassis options support SAS, SATA, and NVMe drives. For more information on drive support, see **Drive bay numbering**.

ⓘ **IMPORTANT:** Depending on the chassis configuration and the components installed in the servers, it might be necessary to limit the number of drives installed in the chassis. For more information, see "Temperature requirements" in the server user guide.

Hot-plug drive guidelines

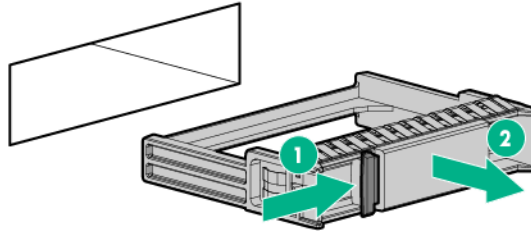
When adding drives to the server, observe the following general guidelines:

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

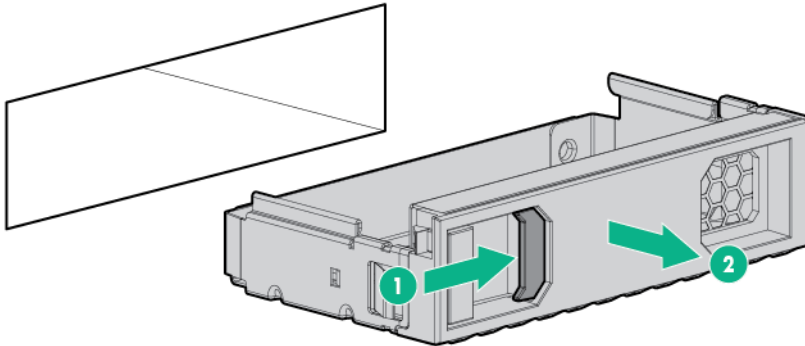
Removing the drive blank

Remove the components as indicated.

- SFF drive blank



- Low-profile LFF drive blank



Installing a hot-plug SAS or SATA drive

Prerequisites

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

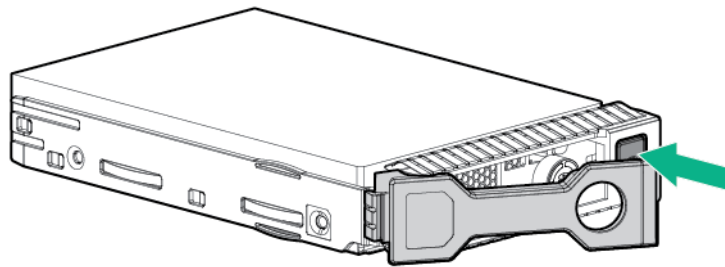
The components included with the hardware option kit.

Procedure

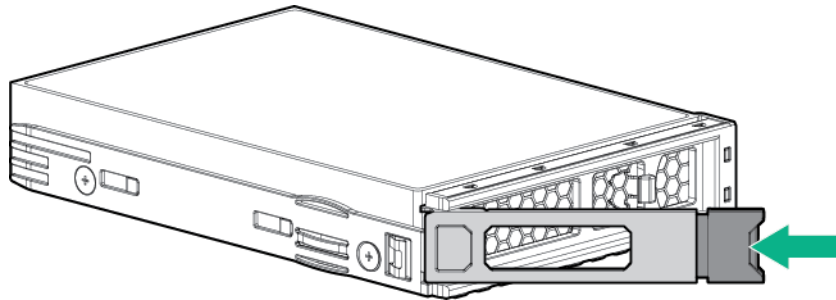
1. Remove the drive blank.

2. Prepare the drive.

- SFF SmartDrive

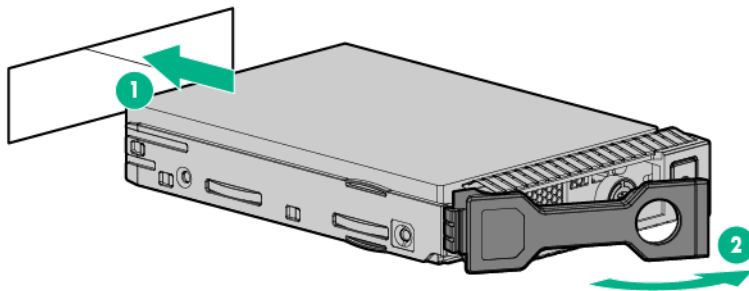


- Low-profile LFF hot-plug drive

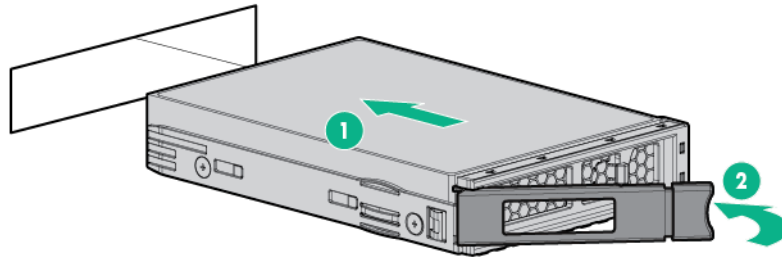


3. Install the drive.

- SFF SmartDrive



- Low-profile LFF hot-plug drive



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

Installing the NVMe drives

NVMe drives are supported in the HPE Apollo r2600 Gen10 Chassis and in the HPE Apollo r2800 Gen10 Chassis with 16 NVMe. For more information, see Drive bay numbering.

Prerequisites

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

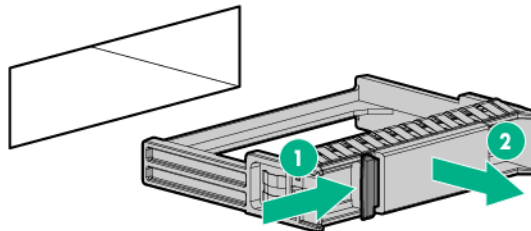
The components included with the hardware option kit.

Procedure

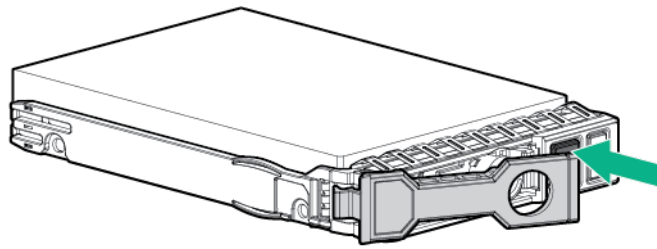
1. Observe the following alert:

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

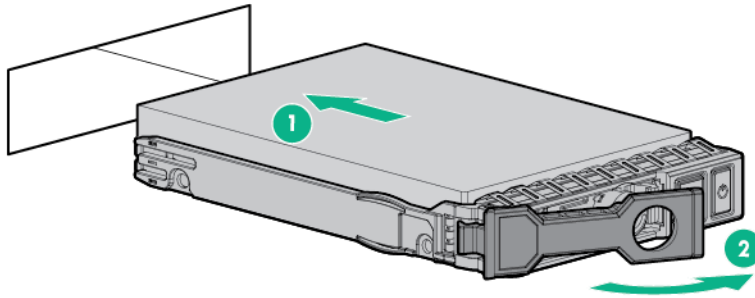
2. Remove the drive blank, if installed.



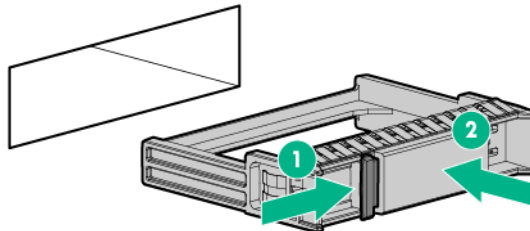
3. Press the Do Not Remove button to open the release handle.



4. Install the drives.



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

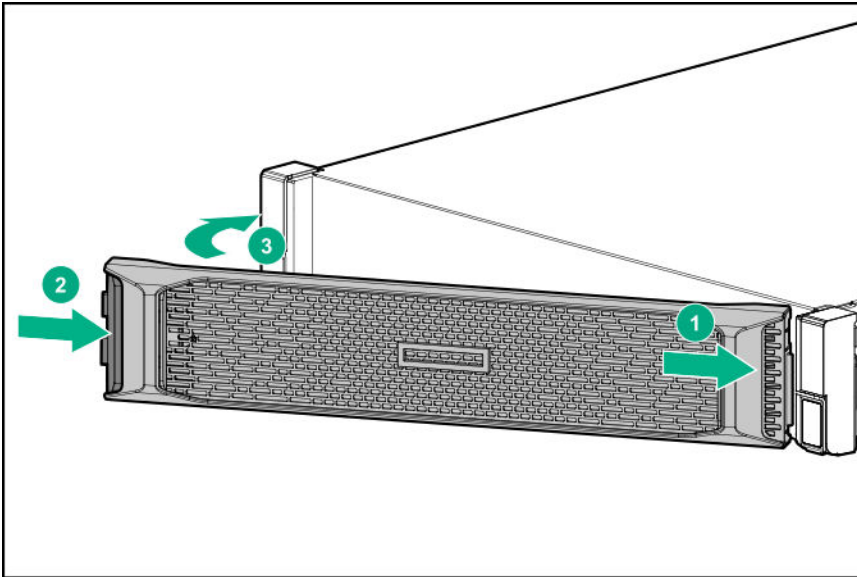


Installing the optional 2U bezel

NOTE: Your chassis may look slightly different than shown.

Procedure

Install the bezel.



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

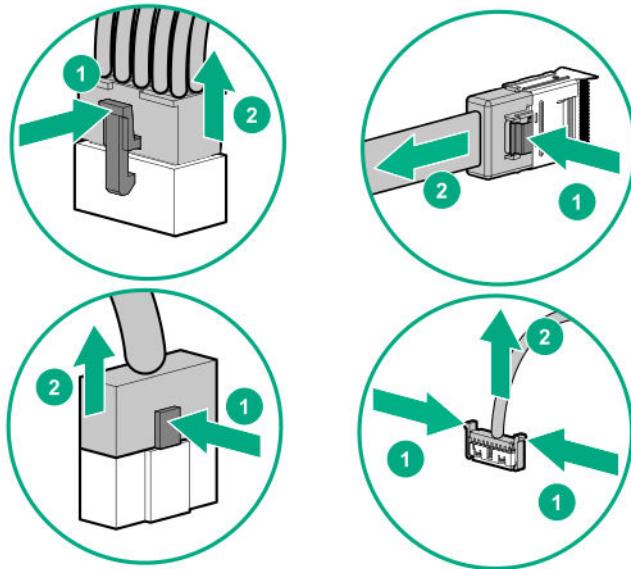
- Note the port labels on the PCA components. Not all of these components are used by all servers:
 - System board ports
 - Drive and power supply backplane ports
 - Expansion board ports (controllers, adapters, expanders, risers, and similar boards)
- Note the label near each cable connector. This label 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.



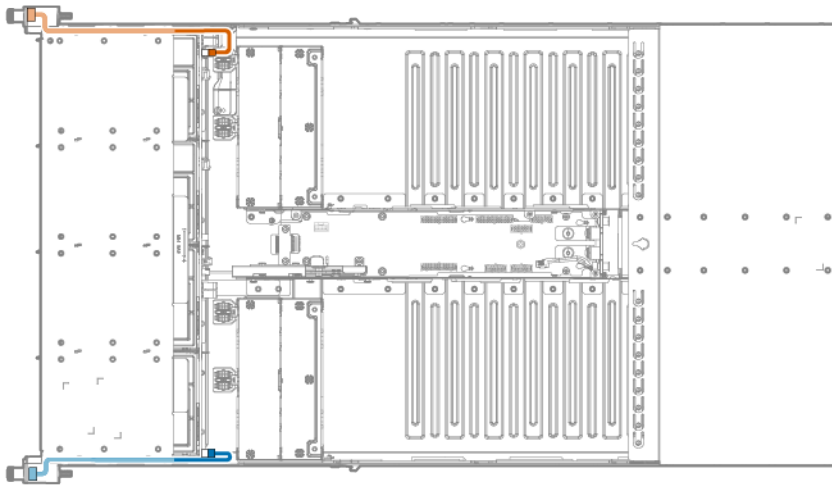
- Remove cables that are no longer being used. Retaining them inside the server can restrict airflow. If you intend to use the removed cables later, label and store them for future use.

Cabling the chassis

-
- ⚠ **WARNING:** Be sure that all circuit breakers are in the off position before connecting any power components.
-
- ⚠ **CAUTION:** To avoid damaging the fiber cables, do not drape cables from one side of the rack to the other and do not run cables over a hard corner or edge.
-
- ⚠ **CAUTION:** To avoid damaging the cable, squeeze the thermal boot on the cable before disconnecting from the connector.
-
- ⚠ **CAUTION:** To prevent loss of data and damage to the PDU, each power supply must be connected to a dedicated circuit breaker. Do not connect multiple power supplies to a single circuit breaker.
-

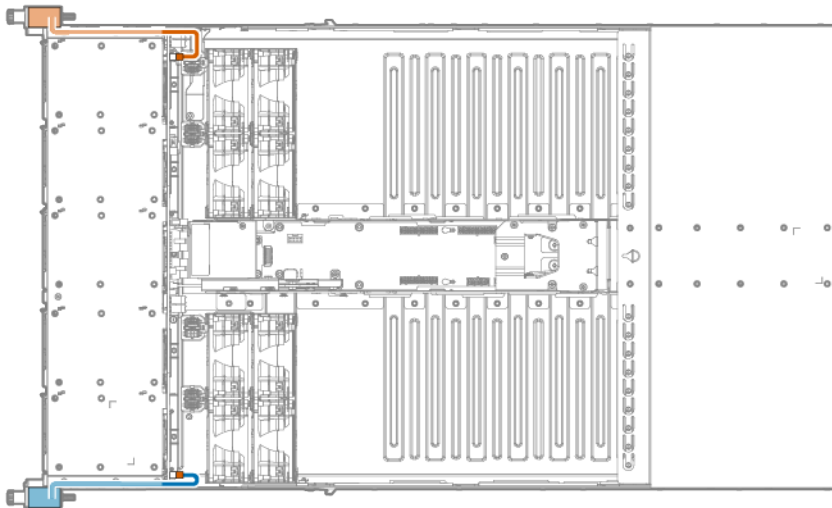
Front I/O cabling

HPE Apollo r2200 Gen10 Chassis



Cable color	Description
Orange	Left front I/O cable
Blue	Right front I/O cable

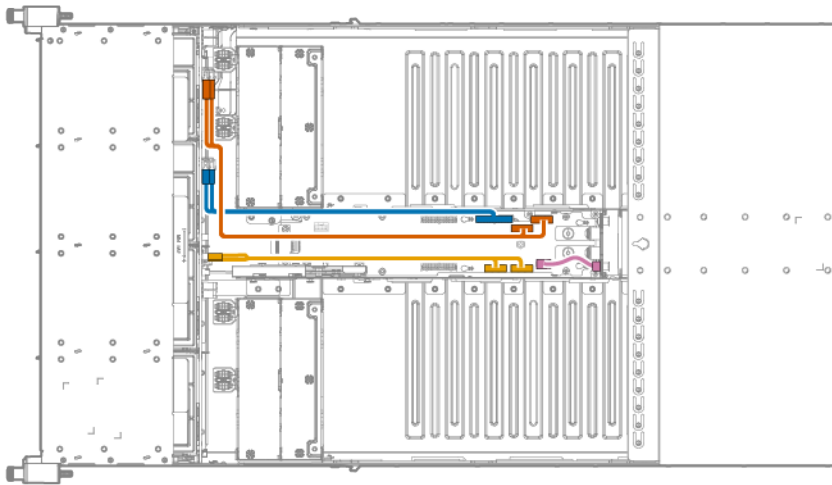
HPE Apollo r2600 Gen10 Chassis and HPE Apollo r2800 Gen10 Chassis with 16 NVMe



Cable color	Description
Orange	Left front I/O cable
Blue	Right front I/O cable

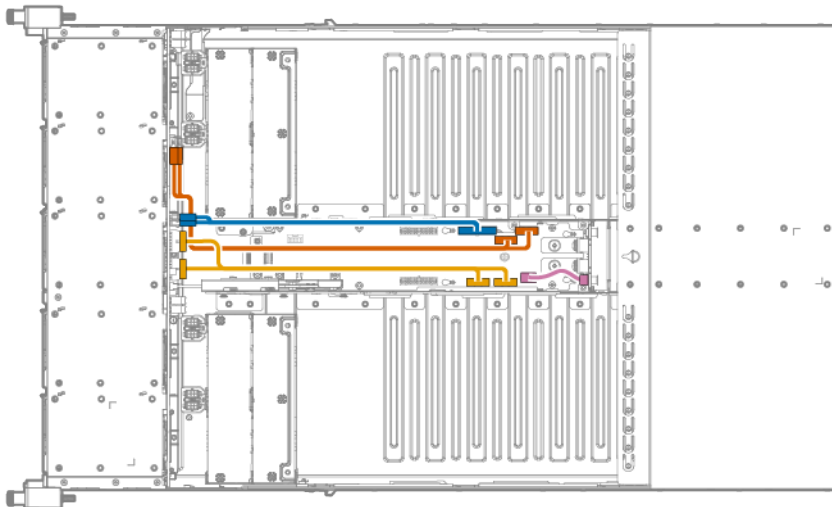
Drive backplane power cabling

HPE Apollo r2200 Gen10 Chassis



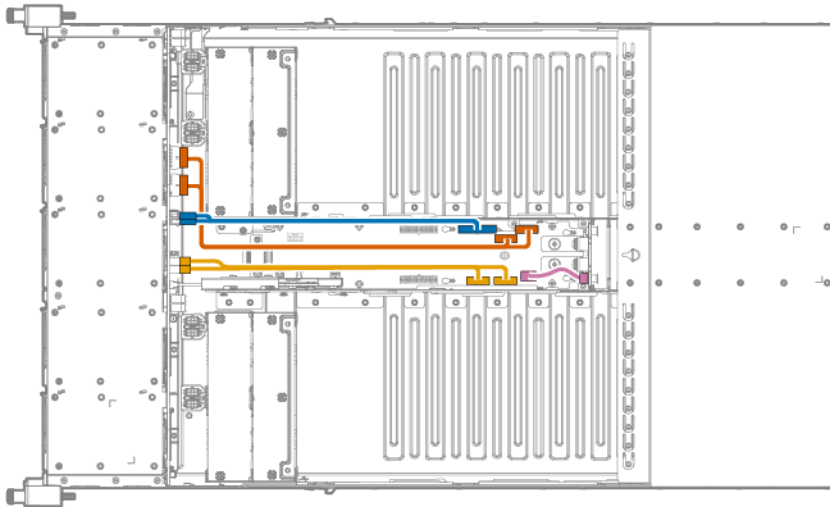
Cable color	Description
Orange	r2200 Gen10 Chassis power cable for server 1 and server 2
Blue	Chassis power cable for hot-plug drives
Amber	Chassis power cable for server 3 and server 4
Pink	Chassis pass-through power supply cable

HPE Apollo r2600 Gen10 Chassis



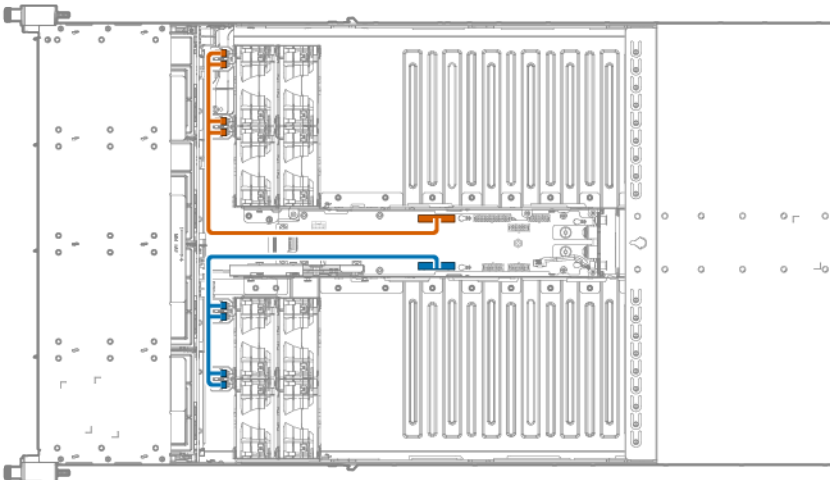
Cable color	Description
Orange	r2600/r2800 Gen10 Chassis power cable for server 1 and server 2
Blue	Chassis power cable for hot-plug drives
Amber	Chassis power cable for server 3 and server 4
Pink	Chassis pass-through power supply cable

HPE Apollo r2800 Gen10 Chassis



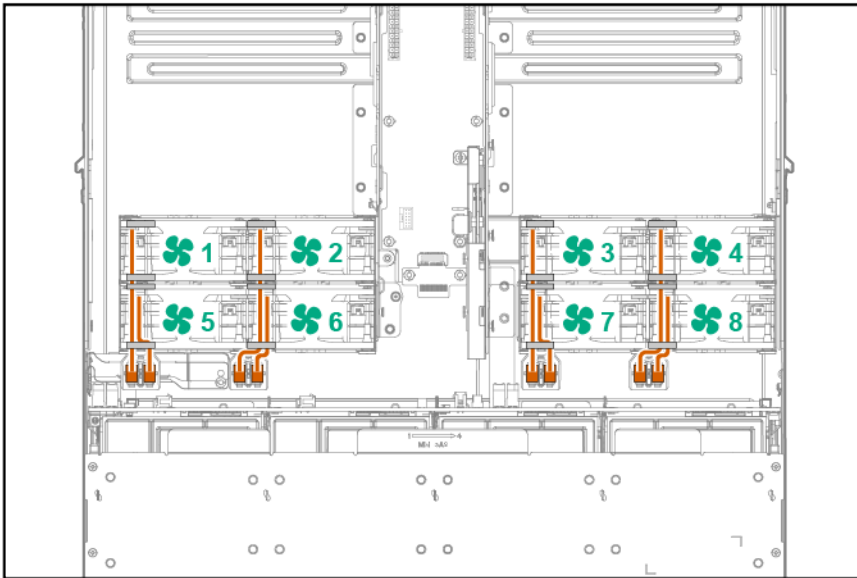
Cable color	Description
Orange	r2600/r2800 Gen10 Chassis power cable for server 1 and server 2
Blue	Chassis power cable for hot-plug drives
Amber	Chassis power cable for server 3 and server 4
Pink	Chassis pass-through power supply cable

Fan power cabling

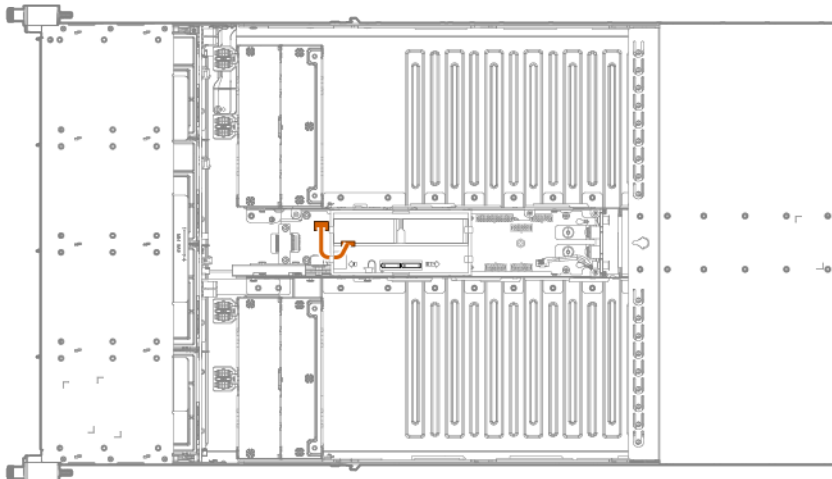


Cable color	Description
Orange	Fan power cable assembly for fans 1, 2, 5, and 6
Blue	Fan power cable assembly for fans 3, 4, 7, and 8

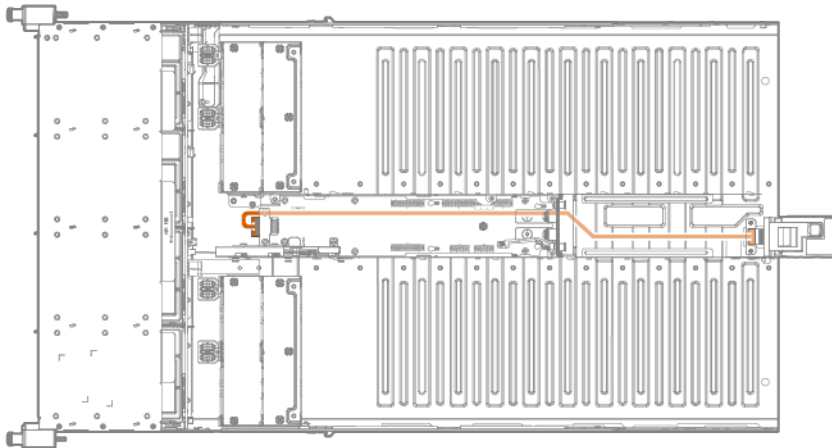
Fan module cabling



Smart Storage Battery cabling



RCM 2.0 cabling



Connecting the chassis to the network

The optional RCM module can connect multiple chassis to the same network.

Installing the RCM module

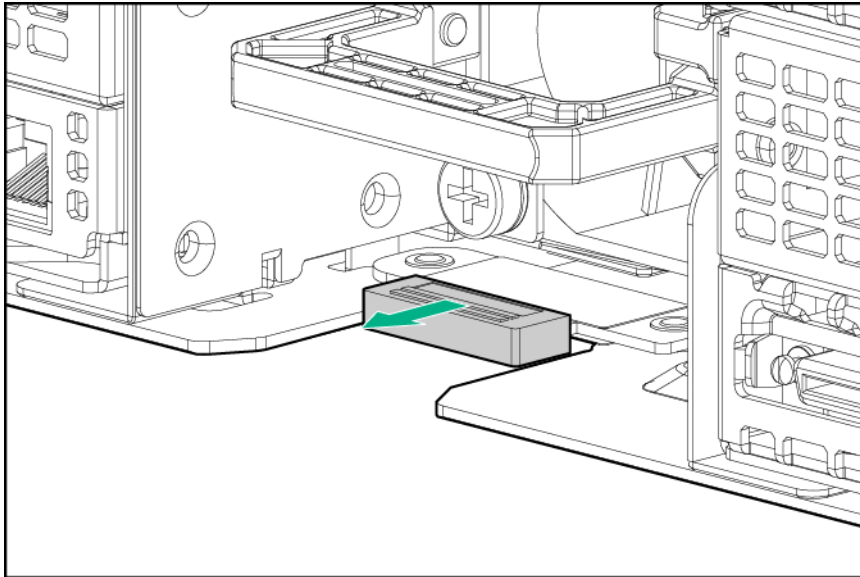
Prerequisites

Observe the following rules and limitations when installing or replacing an RCM module:

- Before installing the RCM module, ensure that all servers in the chassis are powered down. For more information on powering down the server, see the server user guide.
- If the RCM module is installed on the chassis, the iLO Management Ports in the servers will be automatically disabled.
- Use either the APM port or an iLO port to connect to a network. Having both ports connected at the same time results in a loopback condition.
- If using the RCM module iLO ports to connect multiple chassis to the network, the network must operate at a speed of 1 Gb/s. The servers installed in the chassis cannot connect to the network if the network is operating at a speed of 10/100 Mb/s or 10 Gb/s.
- If using the RCM module iLO ports to connect multiple chassis to the network, do not connect more than one iLO port to the network at the same time. Only one iLO port can be connected to the network, while the other iLO ports can be used to connect multiple chassis together. Having more than one iLO port connected to the network at the same time results in a loopback condition.

Procedure

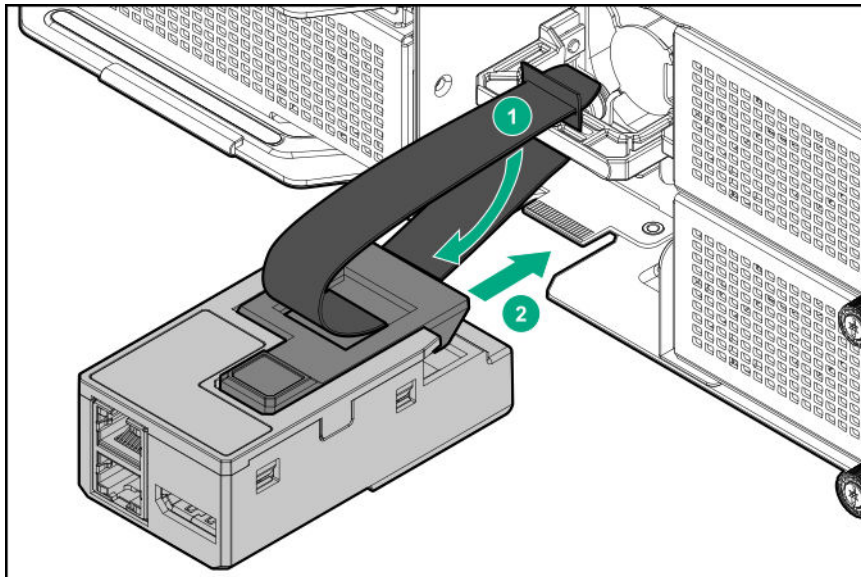
1. Remove the cover from the RCM cable connector.



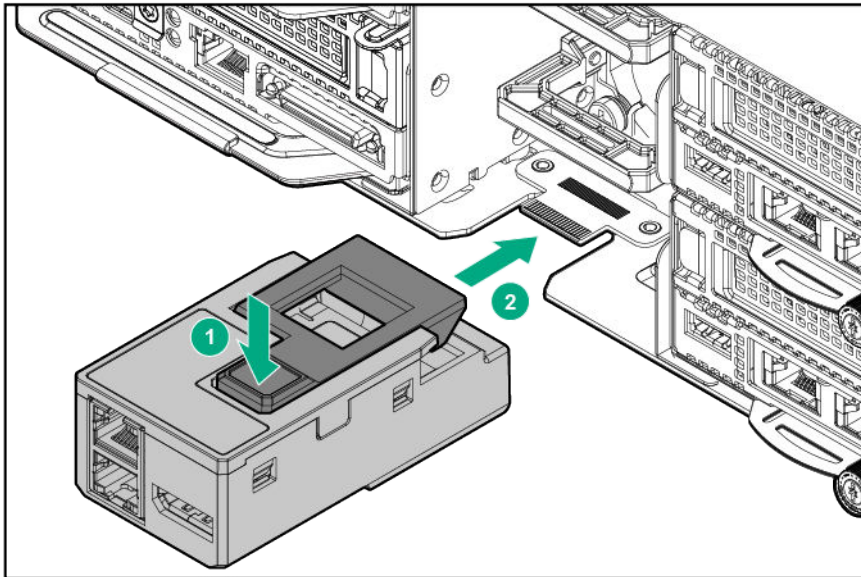
2. Remove the strain relief strap from the bottom power supply handle.

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

3. If only one power supply is installed, do the following:
 - a. Route the strain relief strap through the RCM module and around the handle of the bottom power supply.
 - b. Install the RCM module onto the bottom power supply.
 - c. Secure the power cord in the strain relief strap.



4. If two power supplies are installed, do the following:
 - a. Install the RCM module onto the bottom power supply.

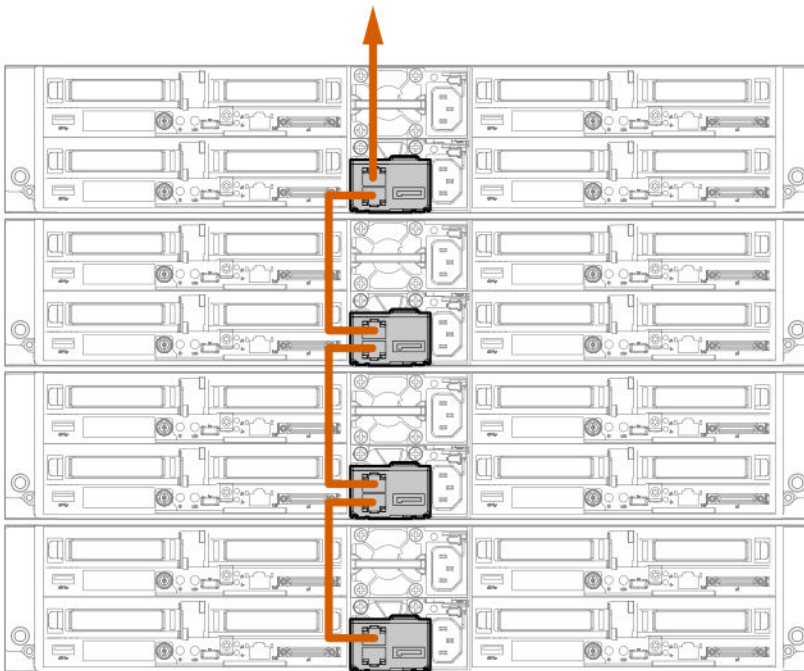


- b. Release the strain relief strap on the top power supply handle.
- c. Secure both power cords in the strain relief strap on the top power supply handle.

Connecting multiple chassis to the network with the RCM module iLO ports

Procedure

If using the RCM module iLO ports to connect the chassis to a network, connect all cables to the RCM module and the network.

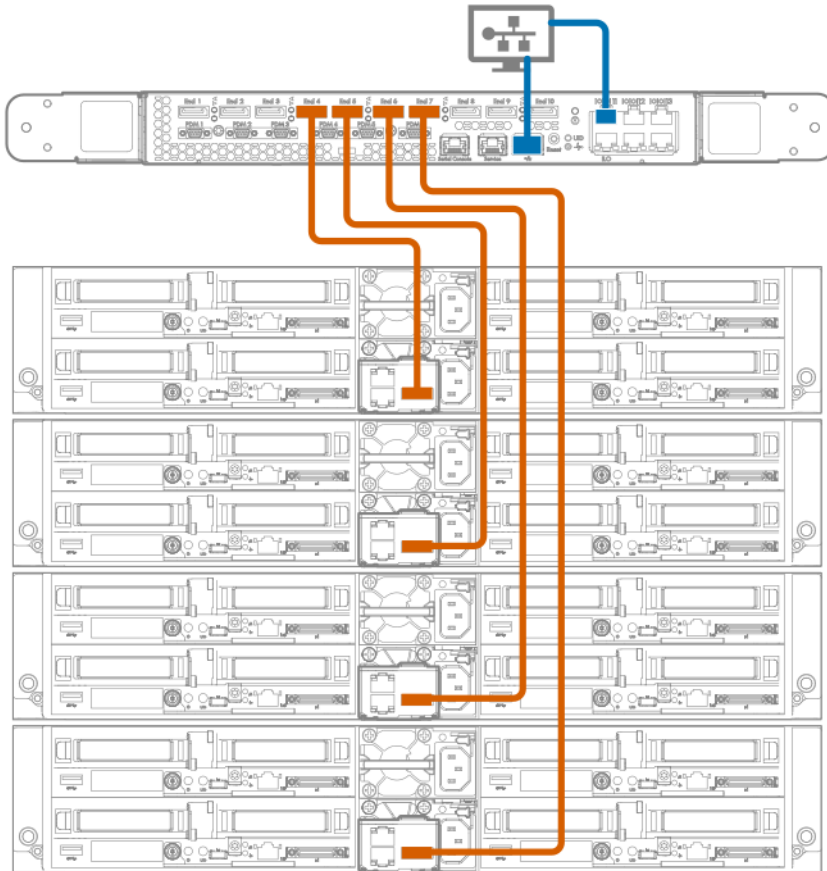


NOTE: The arrow indicates the connection to the network.

Connecting the optional HPE APM module

Procedure

1. Connect the APM to the network.
2. Connect the APM to the RCM modules.



Connecting power cables and applying power to the chassis

Procedure

1. Connect the chassis power supply cables to a PDU.
2. Apply power to the PDUs.
3. Be sure that each power supply LED is green.

Configuring the system

Power capping

The HPE ProLiant XL family of products provides a power capping feature that operates at the server enclosure level. The capping feature can be activated using the HPE Apollo Platform Manager. After a power cap is set for the enclosure, all the resident servers in the enclosure will have the same uniform power cap applied to them until the cap is either modified or canceled.

Using APM, the enclosure-level power capping feature can be expanded, or different caps can be applied to user-defined groups by using flexible zones within the same rack. A global power cap can also be applied to all enclosures with one APM command. For more information on using the APM, see the *HPE Apollo Platform Manager User Guide* on the Hewlett Packard Enterprise website (http://www.hpe.com/support/APM_UG_en).

Power capping modes

The following Power Management modes are standard and are configurable in the power management controller:

NOTE: Mode 4 is only supported through APM.

- Mode 0: No Redundancy

All power-capping is disabled. This mode can be used to minimize any possible performance impact of power-capping logic.

- Mode 1: Max Performance with Redundancy

This is the default power capping mode. This mode allows the maximum number of nodes to run by engaging power-capping if the power draw from the chassis attempts to exceed the load supported by the active power supplies. In this mode, the system is expected to survive (with the possibility of degraded performance) an unexpected power loss to one or more of the power supplies.

- Mode 2: Not supported

- Mode 3: User Configurable Mode

The user can specify a valid power cap value from a pre-defined range. A cap cannot be set below a minimum or above a maximum. The cap includes all server nodes, fans, and drives. User configurable mode requires an iLO Scale Out or iLO Advanced license.

- Mode 4: Rack Level Dynamic Power Capping Mode

In conjunction with APM, the user can specify a maximum power capacity for the entire rack. The APM dynamically allocates power to the applicable chassis within the rack to maximize performance given the available power. For more information, see the *HPE Apollo Platform Manager User Guide* on the Hewlett Packard Enterprise website (http://www.hpe.com/support/APM_UG_en).

- Mode 5: Power Feed Redundancy Mode

When used with an A+B power feed configuration, Power Feed Redundancy Mode throttles the system 100%, bringing the nodes to a complete stop if a power feed loss is deduced. Full throttling continues until the power feed is brought back online. In this mode, the system is expected to survive an unexpected loss of an entire power feed to half of the power supplies.

Configuring a power cap

To configure power capping, you can use the HPE Apollo Platform Manager, a rack level device that can control power caps for all enclosures in the rack. For more information, see the *HPE Apollo Platform Manager User Guide* (http://www.hpe.com/support/APM_UG_en) on the Hewlett Packard Enterprise website.

Setting the chassis power cap mode with HPE APM

Procedure

1. Log in to APM.
 - a. When the system boots, a Login prompt appears.
 - b. At the prompt, enter **Administrator**.
2. Before setting the power cap, enter the following command to review the power baseline:

```
>show power baseline
```

The information displayed provides the minimum cap value, the maximum cap value, and the chassis that meet the requirements for power capping.

3. To set the power cap for eligible chassis connected to the APM, enter the following command at the prompt:

```
>SET POWER CAP<wattage>|NONE [zone_name]
```

The wattage value, if provided, represents the total wattage to be allocated among all the chassis that are part of the baseline or partial baseline of a zone, if specified. This value is divided by the total maximum wattage established by the baseline to calculate a percentage cap value. This percentage is then multiplied against each chassis maximum wattage value to arrive at an appropriate cap value for that individual chassis.

If **NONE** is specified instead of a cap wattage value, then APM removes all (or the specified zone) of the power caps.

To remove baseline data from the EEPROM and to remove the power cap setting, enter the following command:

```
>SET POWER BASELINE NONE
```

After this command is issued, the only way to re-establish a power baseline is to issue the **SET POWER BASELINE** command. The system returns to the default power cap mode (mode 1).

Troubleshooting

Troubleshooting resources

The HPE ProLiant Gen10 Troubleshooting Guide, Volume I: Troubleshooting provides procedures for resolving common problems and comprehensive courses of action for fault isolation and identification, issue resolution, and software maintenance on ProLiant servers and server blades. To view the guide, select a language:

- [English](#)
- [French](#)
- [Spanish](#)
- [German](#)
- [Japanese](#)
- [Simplified Chinese](#)

The HPE ProLiant Gen10 Troubleshooting Guide, Volume II: Error Messages provides a list of error messages and information to assist with interpreting and resolving error messages on ProLiant servers and server blades. To view the guide, select a language:

- [English](#)
- [French](#)
- [Spanish](#)
- [German](#)
- [Japanese](#)
- [Simplified Chinese](#)

Electrostatic discharge

Preventing electrostatic discharge

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

Procedure

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

Grounding methods to prevent electrostatic discharge

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

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

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

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

Specifications

Environmental specifications

Specification	Value
Temperature range¹	—
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

HPE Apollo r2200 Gen10 Chassis

Specifications	Value
Dimensions	—
Height	8.76 cm (3.45 in)
Depth	87.93 cm (34.62 in)
Width	44.80 cm (17.64 in)
Weight (approximate values)	—
Weight (maximum)	41.16 kg (90.75 lb)
Weight (minimum)	13.10 kg (28.89 lb)

HPE Apollo r2600 Gen10 Chassis

Specifications	Value
Dimensions	—
Height	8.76 cm (3.45 in)
Depth	83.87 cm (33.02 in)
Width	44.80 cm (17.64 in)
Weight (approximate values)	—
Weight (maximum)	36.20 kg (79.81 lb)
Weight (minimum)	12.70 kg (28.00 lb)

HPE Apollo r2800 Gen10 Chassis with 16 NVMe

Specifications	Value
Dimensions	—
Height	8.76 cm (3.45 in)
Depth	83.87 cm (33.02 in)
Width	44.80 cm (17.64 in)
Weight (approximate values)	—
Weight (maximum)	36.20 kg (79.81 lb)
Weight (minimum)	12.70 kg (28.00 lb)

HPE Apollo r2800 Gen10 Chassis with 24 SFF

Specifications	Value
Dimensions	—
Height	8.76 cm (3.45 in)
Depth	83.87 cm (33.02 in)
Width	44.80 cm (17.64 in)
Weight (approximate values)	—
Weight (maximum)	36.20 kg (79.81 lb)
Weight (minimum)	12.70 kg (28.00 lb)

Power supply specifications

⚠ CAUTION: Do not mix power supplies with different efficiency and wattage in the chassis. Install only one type of power supply. Verify that all power supplies have the same part number and label color. The system becomes unstable and may shut down when it detects mismatched power supplies.

Depending on installed options, the system is configured with one of the following power supplies:

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

- [HPE 800W Flex Slot -48VDC Hot Plug Low Halogen Power Supply](#)
- [HPE 1600W Flex Slot Platinum Hot Plug Low Halogen Power Supply](#)
- [HPE 2200W Flex Slot Platinum Hot Plug Low Halogen Power Supply](#)

For more information about the power supply features, specifications, and compatibility, see the [Hewlett Packard Enterprise website](#).

HPE 800W Flex Slot Platinum Hot-plug Low Halogen Power Supply

Specification	Value
Input requirements	—
Rated input voltage	100 VAC to 127 VAC 200 VAC to 240 VAC 240 VDC for China only
Rated input frequency	50 Hz to 60 Hz Not applicable to 240 VDC
Rated input current	9.1 A at 100 VAC 4.4 A at 200 VAC 3.6 A at 240 VDC for China only
Maximum rated input power	899 W at 100 VAC 867 W at 200 VAC 864 W at 240 VDC for China only
BTUs per hour	3067 at 100 VAC 2958 at 200 VAC 2949 at 240 VAC for China only
Power supply output	—
Rated steady-state power	800 W at 100 VAC to 127 VAC input 800 W at 100 VAC to 240 VAC input 800 W at 240 VDC input for China only
Maximum peak power	800 W at 100 VAC to 127 VAC input 800 W at 100 VAC to 240 VAC input 800 W at 240 VDC input for China only

HPE 800W Flex Slot Universal Hot-plug Low Halogen Power Supply

Specification	Value
Input requirements	—
Rated input voltage	200 VAC to 277 VAC 380 VDC
Rated input frequency	50 Hz to 60 Hz
Rated input current	4.4 A at 200 VAC 3.1 A at 277 VAC 2.3 A at 380 VDC
Maximum rated input power	869 W at 200 VAC 865 W at 230 VAC 861 W at 277 VAC 863 W at 380 VDC
BTUs per hour	2964 at 200 VAC 2951 at 230 VAC 2936 at 277 VAC 2943 at 380 VDC
Power supply output	—
Rated steady-state power	800 W at 200 VAC to 277 VAC input
Maximum peak power	800 W at 200 VAC to 277 VAC input

HPE 800W Flex Slot -48VDC Hot-plug Low Halogen Power Supply

Specification	Value
Input requirements	—
Rated input voltage	-40 VDC to -72 VDC -48 VDC nominal input
Rated input current	22.1 A at -40 VDC input 18.2 A at -48 VDC input, nominal input 12.0 A at -72 VDC input
Rated input power (W)	874 W at -40 VDC input 865 W at -48 VDC input, nominal input 854 W at -72 VDC input

Table Continued

Specification	Value
Rated input power (BTUs per hour)	2983 at -40 VDC input 2951 at -48 VDC input, nominal input 2912 at -72 VDC input
Power supply output	—
Rated steady-state power (W)	800 W at -40 VDC to -72 VDC
Maximum peak power (W)	800 W at -40 VDC to -72 VDC
Maximum peak power	800 W at -40 VDC to -72 VDC input

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

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

⚠ CAUTION: This equipment is designed to permit the connection of the earthed conductor of the DC supply circuit to the earthing conductor at the equipment.

If this connection is made, all of the following must be met:

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

HPE 1600W Flex Slot Platinum Hot Plug Low Halogen Power Supply

Specification	Value
Input requirements	
Rated input voltage	200 VAC to 240 VAC 240 VDC for China only

Table Continued

Specification	Value
Rated input frequency	50 Hz to 60 Hz
Rated input current	8.7 A at 200 VAC 7.2 A at 240 VAC
Maximum rated input power	1,734 W at 200 VAC 1,725 W at 240 VAC
BTUs per hour	5,918 at 200 VAC 5,884 at 240 VAC
Power supply output	
Rated steady-state power	1,600 W at 200 VAC to 240 VAC input 1,600 W at 240 VDC input
Maximum peak power	2,200 W for 1 ms (turbo mode) at 200 VAC to 240 VAC input

HPE 2200W Flex Slot Platinum Hot Plug Low Halogen Power Supply

Specification	Value
Input requirements	
Rated input voltage	200 VAC to 240 VAC 240 VDC for China only
Rated input frequency	50 Hz to 60 Hz (Not applicable to 240VDC)
Rated input current	10.0 A at 240 VAC 8.2 A at 240 VDC for China Only
Maximum rated input power	1800 W at 200 VAC 2200 W at 240 VAC 1800 W at 240 VDC for China Only
BTUs per hour	6590 at 200 VAC 8096 at 240 VAC 6606 at 240 VDC for China only
Power supply output	

Table Continued

Specification	Value
Rated steady-state power	1800 W at 200 VAC
	2200 W at 240 VAC
	1800 W at 240 VDC for China only
Maximum peak power	1800 W at 200 VAC
	2200 W at 240 VAC
	1800 W at 240 VDC for China only

Hot-plug power supply calculations

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

Websites

- [Hewlett Packard Enterprise Information Library](#)
- [Hewlett Packard Enterprise Support Center](#)
- [Contact Hewlett Packard Enterprise Worldwide](#)
- [Subscription Service/Support Alerts](#)
- [Software Depot](#)
- [Customer Self Repair](#)
- [Insight Remote Support](#)
- [Serviceguard Solutions for HP-UX](#)
- [Single Point of Connectivity Knowledge \(SPOCK\) Storage compatibility matrix](#)
- [Storage white papers and analyst reports](#)

Support and other resources

Accessing Hewlett Packard Enterprise Support

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

Information to collect

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

Accessing updates

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

Hewlett Packard Enterprise Support Center

www.hpe.com/support/hpesc

Hewlett Packard Enterprise Support Center: Software downloads

www.hpe.com/support/downloads

Software Depot

www.hpe.com/support/softwaredepot

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

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

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

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

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

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 for your product or to view the *Safety and Compliance Information for Server, Storage, Power, Networking, and Rack Products* reference document, go to the Enterprise Safety and Compliance website:

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

Additional warranty information

HPE ProLiant and x86 Servers and Options

www.hpe.com/support/ProLiantServers-Warranties

HPE Enterprise Servers

www.hpe.com/support/EnterpriseServers-Warranties

HPE Storage Products

www.hpe.com/support/Storage-Warranties

HPE Networking Products

www.hpe.com/support/Networking-Warranties

Regulatory information

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

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

Additional regulatory information

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

www.hpe.com/info/reach

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

www.hpe.com/info/ecodata

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

www.hpe.com/info/environment

Documentation feedback

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Acronyms and abbreviations

AHCI

Advanced Host Controller Interface

CSR

Customer Self Repair

DDR

double data rate

GPU

graphics processing unit

HP SUM

HP Smart Update Manager

HPE APM

HPE Advanced Power Manager

HPE SSA

HPE Smart Storage Administrator

IEC

International Electrotechnical Commission

iLO

Integrated Lights-Out

IML

Integrated Management Log

ISO

International Organization for Standardization

LFF

large form factor

LOM

LAN on Motherboard

LRDIMM

load reduced dual in-line memory module

NIC

network interface controller

NMI

nonmaskable interrupt

NVRAM

nonvolatile memory

PCIe

Peripheral Component Interconnect Express

PDU

power distribution unit

POST

Power-On Self-Test

RBSU

ROM-Based Setup Utility

RCM

Rack Consolidation Management

RDIMM

registered dual in-line memory module

RDP

Remote Desktop Protocol

RoHS

Restriction of Hazardous Substances

SAS

serial attached SCSI

SATA

serial ATA

SFF

small form factor

SPP

Service Pack for ProLiant

SUV

serial, USB, video

TMRA

recommended ambient operating temperature

TPM

Trusted Platform Module

UEFI

Unified Extensible Firmware Interface

UID

unit identification

USB

universal serial bus